Jenkins X for the future
Easy CI/CD for Kubernetes

James Rawlings
CloudBees
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https://jenkins-x.io/
https://github.com/jenkins-x/jx

Why Kubernetes?

aws

Google Cloud Platform

Docker

Microsoft Azure

CLOUD FOUNDRY

IBM Cloud

DigitalOcean

OPENSHIFT

MESOSPHERE

ORACLE CLOUD

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Briefly what does Kubernetes give us?

- Service discovery
- Rolling upgrades
- Networking
- Persistence
- Cluster elasticity
- Resource request / limits
- Container scheduling
- Container orchestration
- Scalability
- Container probes

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What are the benefits?

- Multi cloud provider support
- Application Portability
- Standardisation
- Rich open source ecosystem
- Tooling
- Innovative and vibrate community
- Significant savings in operational costs running applications in containers compared with VMs

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Which container orchestration tools does your organization use most frequently?

Source: https://portworx.com/2017-container-adoption-survey/
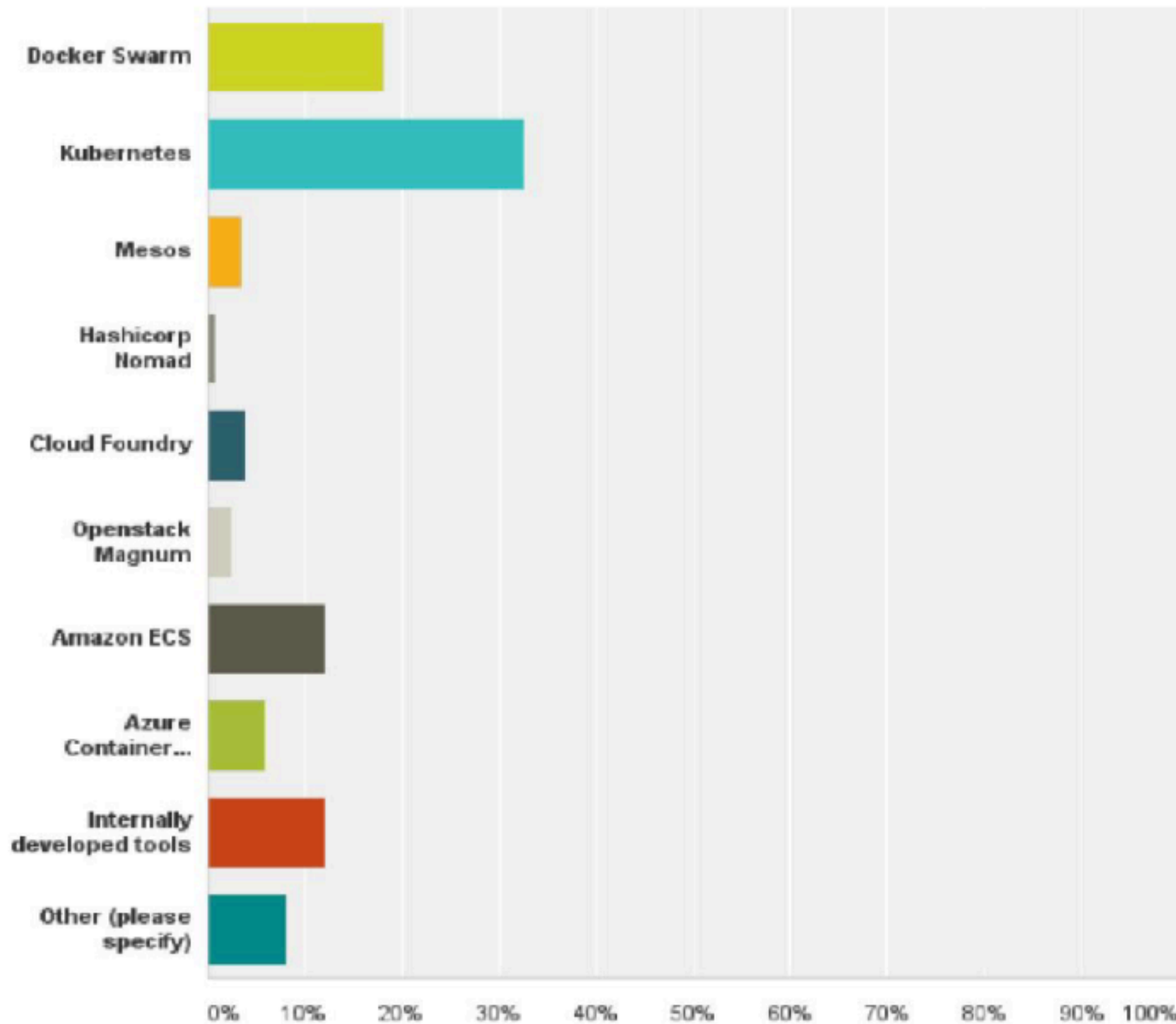
What are the challenges?

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

Jenkins X

Jenkins X is not Jenkins on Kubernetes

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Jenkins X is an opinionated developer solution with CI/CD on Kubernetes

- Heavily influence by the the State of DevOps reports from recent years

- More recently we see Jenkins X as a possible opinionated implementation following recommended capabilities from the Accelerate book

THE SCIENCE OF LEAN SOFTWARE AND DEVOPS

ACCELERATE

Building and Scaling High Performing Technology Organizations

Nicole Forsgren, PhD
Jez Humble, and Gene Kim

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Why?

Because the Accelerate book has analysed data from the last four years to help us identify high performing teams and allow organisations to deliver better value faster.

Jenkins X implements these capabilities and is continually working to improve them.

4 Key metrics to highlight from the book are:
- Deployment frequency
- Lead time
- Mean time to recover
- Change failure rate

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Why?

High performing teams achieved this compared with low performing teams:

- 46 times more frequent code deployments
- 440 times faster lead time from commit to deploy
- 170 times faster mean time to recover from downtime
- 5 times lower change failure rate

Source: Accelerate, Nicole Forsgren, Jez Humble, Gene Kim

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What is Jenkins X?

- ☑ Cloud native journey for Jenkins
- ☑ Extensible using Kubernetes primitives
- ☑ Integrated OOTB experience
- ☑ Command Line Interface
- ☑ Environments
- ☑ Bootstrapping applications
- ☑ Comprehensive config management via GitOps
- ☑ Developer tooling
- ☑ Feedback!!!!

How do I get started?

Install the command line tool: jx

https://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/
v1.2.16/jx-linux-amd64.tar.gz | tar xzv

sudo mv jx /usr/local/bin

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Jenkins X: setup Kubernetes + Jenkins X

- If using the public cloud use:

  - jx create cluster aws
  - jx create cluster gke
  - jx create cluster aks
  - jx create cluster oce

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

  - jx install

    More help here: https://jenkins-x.io/getting-started/
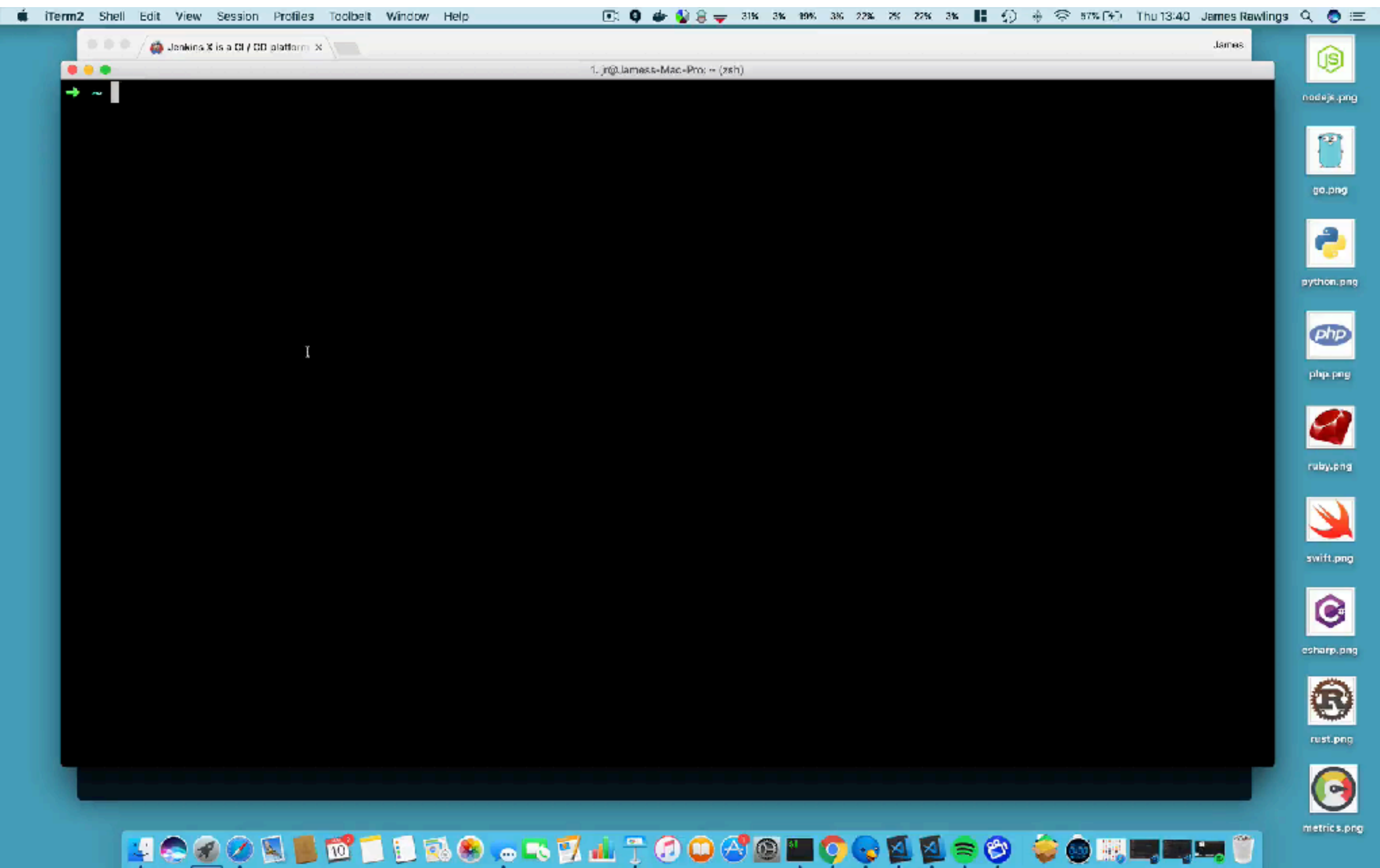
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What does that give me?

- Team home environment
  - Jenkins master
  - Elastic pool of build agents
  - Nexus + chartmuseum + monocular
- Staging environment
- Production environment
- Initialises local machine for developing

How do I create applications?

- Available commands:
  - jx create spring
  - jx create quickstart
  - jx import
- Automatically set up CI/CD pipelines for new + imported projects
  - Setups up git repository
  - Registers webhooks to trigger pipelines for PR / master
  - Generates packaging for running the app on Kubernetes
 - Triggers the first pipeline

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How do I extend Jenkins X?

- jx create addon metrics
- jx create addon anchore
- jx create addon cloudbees
- jx create addon istio

~~Live~~ demo time!!

- https://helm.sh - package manager for Kubernetes
- https://draft.sh - build packs used to bootstrap applications so they build and run on Kubernetes
- [Skaffold](#) - enabled RAD development, abstracts building and pushing images
- [Anchore](#) - service that analyzes docker images and applies user-defined acceptance policies to allow automated container image validation and certification
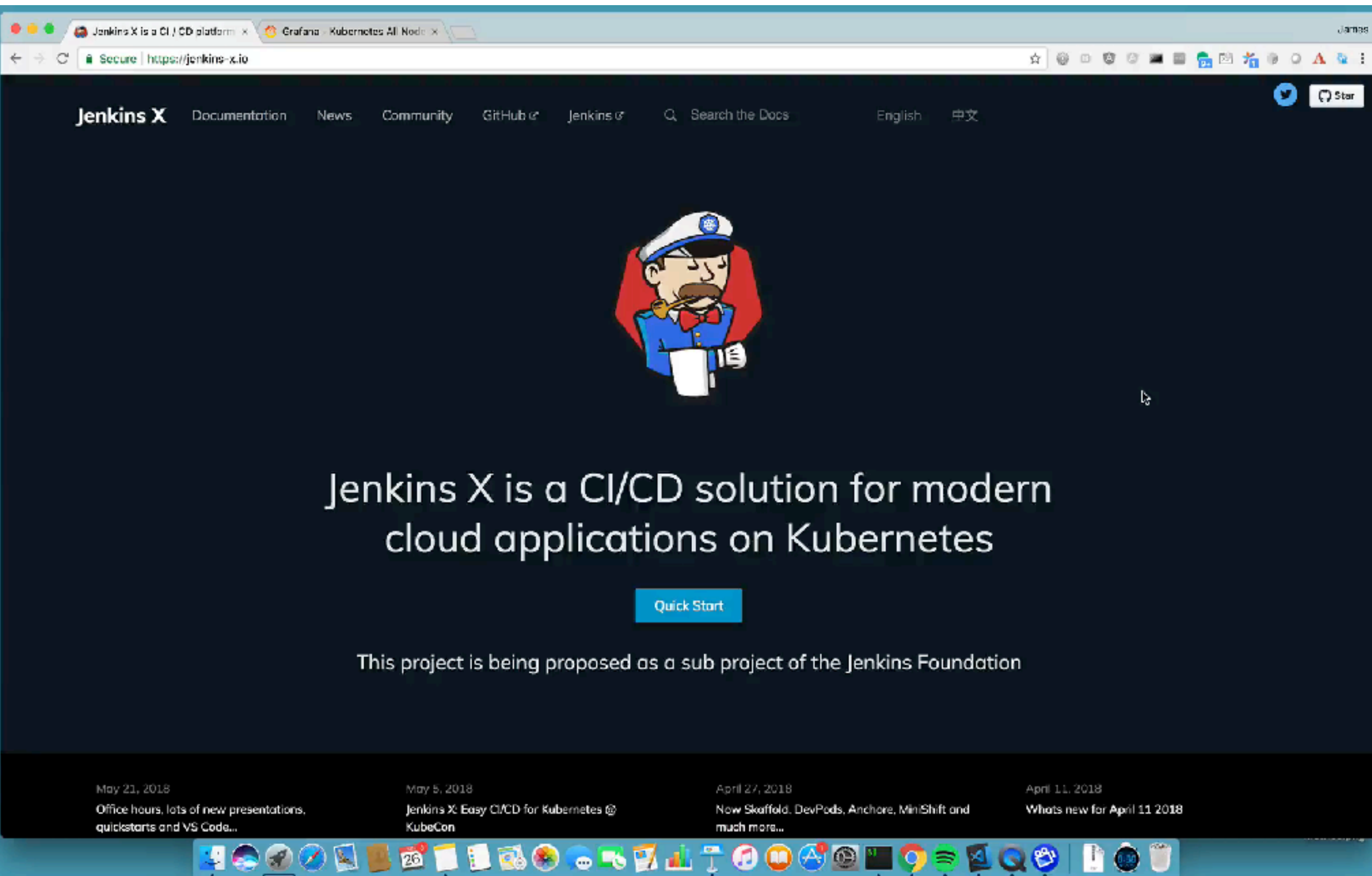
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Jenkins X: on pull requests (CI)

- Compile and run tests
- Creates a preview image and helm chart
- Creates a Preview Environment and comments on PR with link to access preview app

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Jenkins X: on merge to master (CD)

- Compile and run tests
- Creates a semantic release version
- Publish versioned artifacts, docker image and helm chart
- Promotes to all 'automatic' environments, e.g. staging
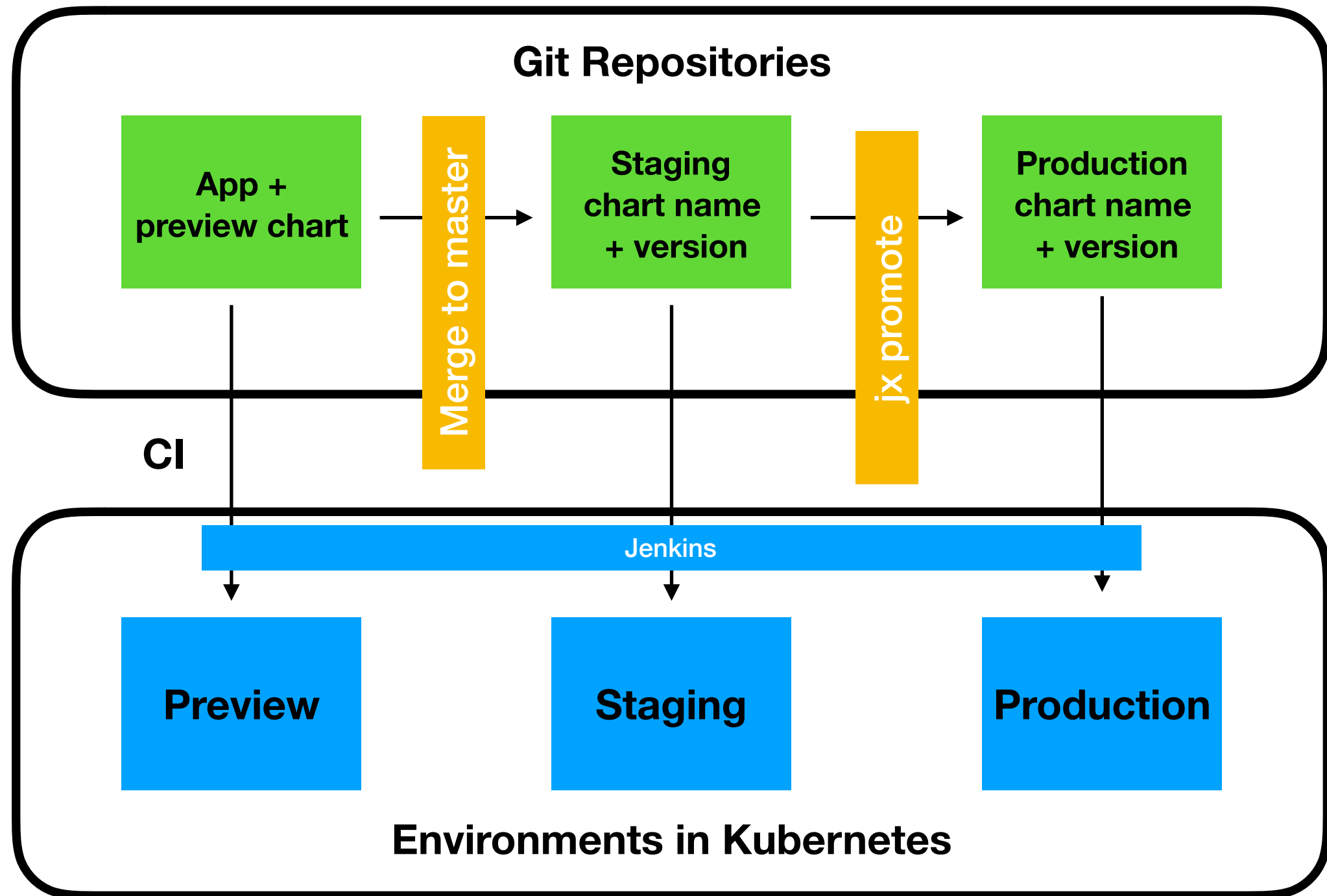
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Jenkins X: promotion via GitOps

- Each environment stores its configuration as helm charts in a git repository
  - Configuration as code
  - All changes audited and easy to revert
  - 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, merge and for the environments pipeline to complete applying the change

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Git Repositories

| App + preview chart | Merge to master | Staging chart name + version | jx promote | Production chart name + version |

CI

Jenkins

| Preview | Staging | Production |

Environments in Kubernetes

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What is the Jenkins X aim?

⭐ Help development teams go faster

⭐ Enable developers and product managers to experiment more easily

⭐ Help developers spend more time developing

⭐ Improve developer, leader and organisational feedback

⭐ Help businesses identify and provide better value faster

⭐ Enable high performing teams

Roadmap

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

Try me!

- https://jenkins-x.io
- https://jenkins-x.io/community/
- https://pages.cloudbees.com/K8s

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