

# Jenkins X

Continuous Delivery for Kubernetes



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

## Key Findings - Elite Performers



**46 TIMES MORE**  
frequent code deployments



**2,555 TIMES FASTER**  
lead time from commit to deploy

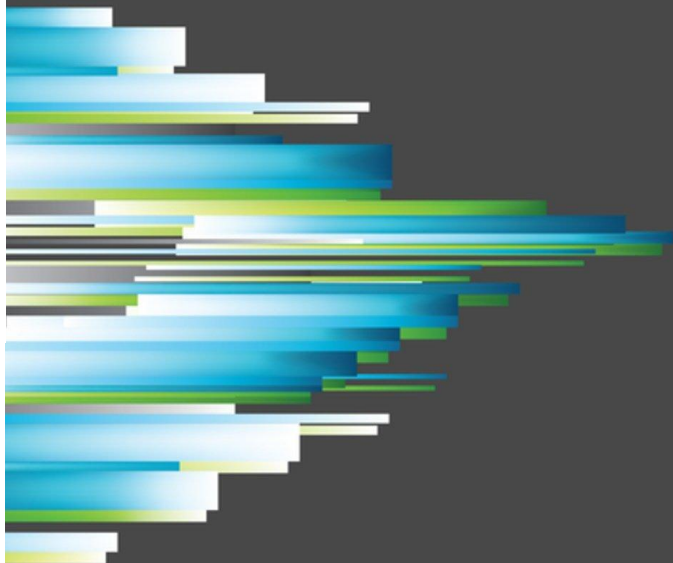


**2,604 TIMES FASTER**  
time to recover from incidents



**7 TIMES LOWER**  
change failure rate  
(changes are 1/7 as likely to fail)

# THE SCIENCE OF DEVOPS **ACCELERATE** Building and Scaling High Performing Technology Organizations



Nicole Forsgren, PhD  
Jez Humble *and* Gene Kim



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We all want to be high  
performing teams!!



## Capabilities of Jenkins X

Jenkins X uses capabilities identified by the Accelerate book by Nicole Forsgren, Jez Jumble & Gene Kim



Use version control for all artifacts.



Automate your deployment process.



Use trunk-based development.



Implement continuous integration.



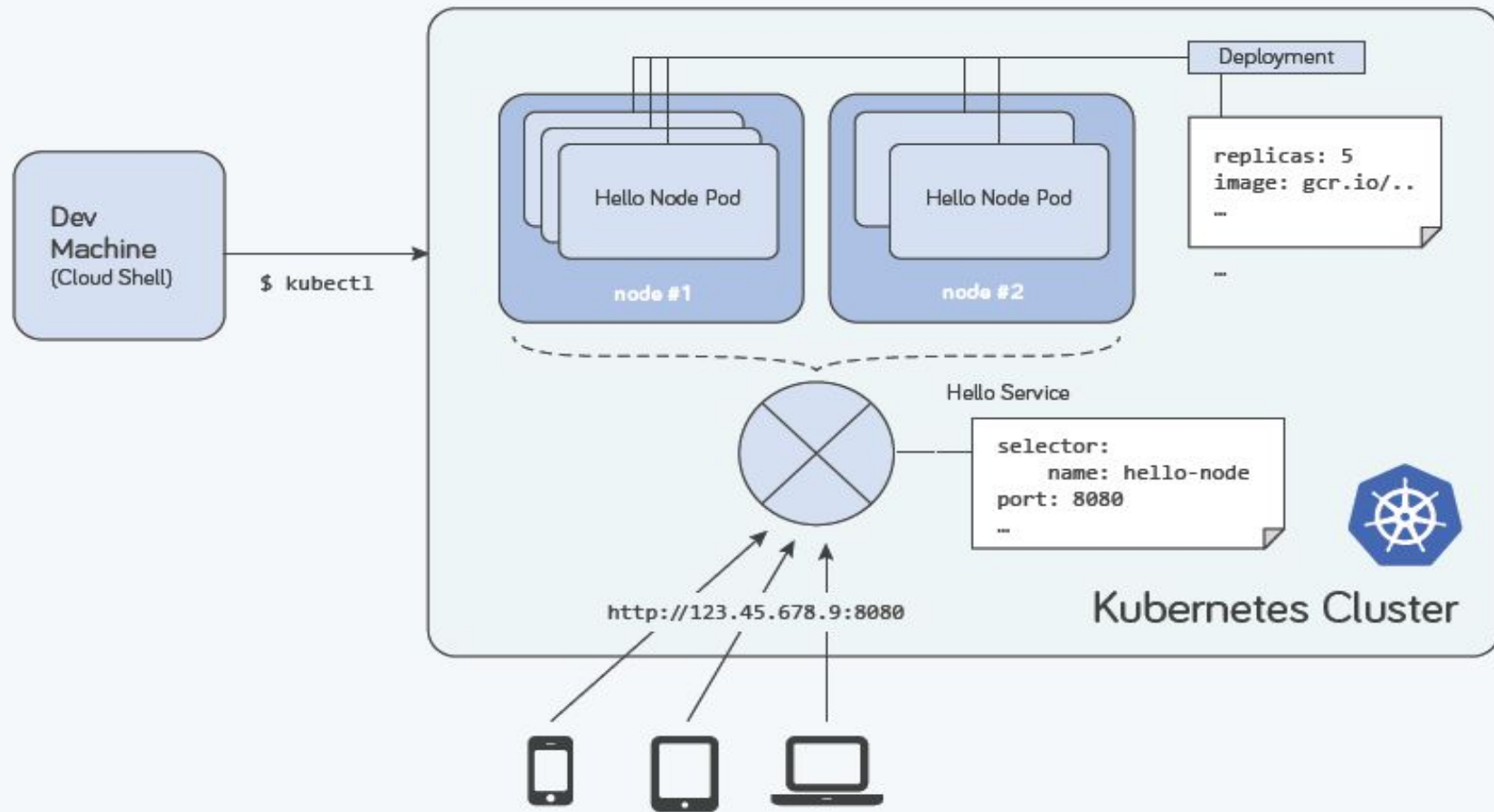
Implement continuous delivery.



Use loosely coupled architecture.



Architect for empowered teams.



# Jenkins X



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

# How does Jenkins X help?

- Automates the setup of your tools + environments:
  - Jenkins, nexus + helm, skaffold, nexus, monocular
- Automates CI/CD for your applications on Kubernetes
  - Docker images
  - Helm charts
  - Pipelines
- Uses GitOps to manage promotion between environments
  - Test -> Staging -> Production
- Lots of feedback
  - E.g. commenting on issues as they hit Staging + Production

# Installing Jenkins X



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

- Install the **jx** binary:  
<https://jenkins-x.io/getting-started/install/>
- Create a new k8s cluster on GKE:

```
$ jx create cluster gke
```

- Install Jenkins X on an existing cluster:

```
$ jx install --provider=...
```

# jx create cluster (aks|aws|gke|minikube)

```
2. gke (helm)

data:
  tls.crt: <Base64 encoded cert>
  tls.key: <Base64 encoded key>
  type: kubernetes.io/tls

Waiting for external loadbalancer to be created and update the nginx-ingress-controller service in kube-system namespace
External loadbalancer created
You can now configure a wildcard DNS pointing to the new loadbalancer address 55.189.117.38
? Domain 55.189.117.38.nip.io
nginx ingress controller installed and configured
Context "gke_jenkins-dev_europe-west2-b_roadspring" modified.
Let's set up a git username and API token to be able to perform CI / CD

? Do you wish to use rajdovries as the GitHub username for CI/CD pipelines? Yes
Cloning the Jenkins X cloud environments repo to /Users/rajdovries/.jx/cloud-environments
? A local Jenkins X cloud environments repository already exists, recreate with latest? Yes
Cloning the Jenkins X cloud environments repo to /Users/rajdovries/.jx/cloud-environments
Counting objects: 388, done.
Compressing objects: 100% (4/4), done.
Total 388 (delta 85, reused 1 (delta 0), pack-reused 384)
helm repo add jenkins-x http://chartmuseum.build.cd.jenkins-x.io
"jenkins-x" has been added to your repositories
rm -rf secrets.yaml.local
helm repo add jenkins-x http://chartmuseum.build.cd.jenkins-x.io
"jenkins-x" has been added to your repositories
helm repo update
Hang tight while we grab the latest from your chart repositories...
...Skip local chart repository
...Successfully got an update from the "monocular" chart repository
...Successfully got an update from the "chartmuseum" chart repository
...Successfully got an update from the "jx" chart repository
...Successfully got an update from the "incubator" chart repository
...Successfully got an update from the "jenkins-x" chart repository
...Successfully got an update from the "stable" chart repository
```



# What does that give me?

Each team gets their own:

- Development Tools Environment
  - Jenkins master
  - Elastic pool of Kubernetes build pods
  - Nexus + Monocular (helm application store)
- Staging Environment
- Production Environment

# Importing & Creating Projects



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

- import existing applications:

```
$ jx import
```

- create new applications from quickstarts:

```
$ jx create quickstart
```

- create new Spring Boot applications:

```
$ jx create spring
```

**I'm so excited.**



# Sneak peek at Jenkins X 2.x

- Pluggable execution engines
  - Static Jenkins master
  - Serverless jenkins via jenkinsfilerunner
    - Uses [custom war packager](#)
  - Knative build support
- Tiller-less Helm on helm 2.x
  - Runs tiller as a local process so no tiller inside k8s
- Prow for webhooks
  - <https://github.com/kubernetes/test-infra/tree/master/prow>
  - Provides commands on Pull Request comments
    - <https://prow.k8s.io/command-help>
- Promotion workflow engine
  - jx controller workflow

To try Jenkins X 2.x now...

```
jx create cluster gke --no-tiller --prow
```

# Jenkins X: Summary

- Please try it out!
  - <https://jenkins-x.io/>
- Feedback:
  - <https://jenkins-x.io/community/>
- CloudBees
  - <https://pages.cloudbees.com/K8s>



# Jenkins X: create/import projects

- Available commands:
  - `jx create spring`
  - `jx create quickstart`
  - `jx import`
- Automatically set up CI/CD Pipelines for new + imported projects
  - Setups git repository
  - Adds webhooks on git provider to trigger Jenkins pipelines on PR / master
  - Triggers first pipeline

# Jenkins X: on Pull Request

- Compiles + runs tests
- Creates preview docker image + helm chart
- Creates a Preview Environment and comments on the PR with a link to the app



# Jenkins X: on Release (push to master)

- Compiles + runs tests
- Creates semantic release version
- Publishes versioned artifacts, docker image & helm chart
- Promotes through all *automatic* environments, e.g. Staging

# 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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# Jenkins X



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

# Everything has changed in software in 5 years...

- Move from on premise -> public cloud
- Move from VMs to containers
  - Immutable infrastructure for DevOps speed and reduced cost
- Kubernetes has become the defacto standard in orchestrating containers
  - 2018 all public clouds will support GA kubernetes as a service
  - All other significant operating system, PaaS and platform vendors support kubernetes now too
- Move from monoliths -> microservices
  - Hypothesis driven development, small iterations, fast feedback
- Become high performing teams via CI/CD
  - Deliver business value faster!