Shortening the feedback loop
with Preview Environments in Jenkins X

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CoWork

The Feedback Loop

Image by pch.vector on Freepik

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Continuous Delivery

- The art of moving changes into production quickly and safely.

- Without feedback loop - continuous delivery of bugs

Jenkins X

- All In One CI/CD including everything you need to start exploring Kubernetes
- Multi-cluster GitOps, Tekton pipelines, Secrets management, Pull Request ChatOps and Preview Environments
- Accelerate with Jenkins X and our friendly community
- https://jenkins-x.io/

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All in one CI/CD

- Quickstarts for many programming languages
  - tiny, runnable application
  - Creates Kubernetes native apps, ready to run in any Kubernetes environment
- Tekton pipelines
  - test, build and package any application
- Staging and production environments
- Preview environments
  - rapid feedback and testing

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Continuous Integration in Jenkins X

- Opinionated!
- Trunk based development
- Pipelines run on Pull Request and push to main branch
- Releases are made on successful build on main branch
  - Container image
  - Helm chart

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Continuous Deployment in Jenkins X

A new release for an application may:

- Auto-promote to an environment (staging/production)

- Create Pull request for manual review on environment

- No action

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Preview Environment

main ▾   **spring-demo** / **preview** /

👤 **babadofar** chore: Jenkins X build pack

..

📄 Kptfile

📄 helmfile.yaml

📄 values.yaml.gotmpl

Preview Environment

Configurable

Helmfile

Kubernetes

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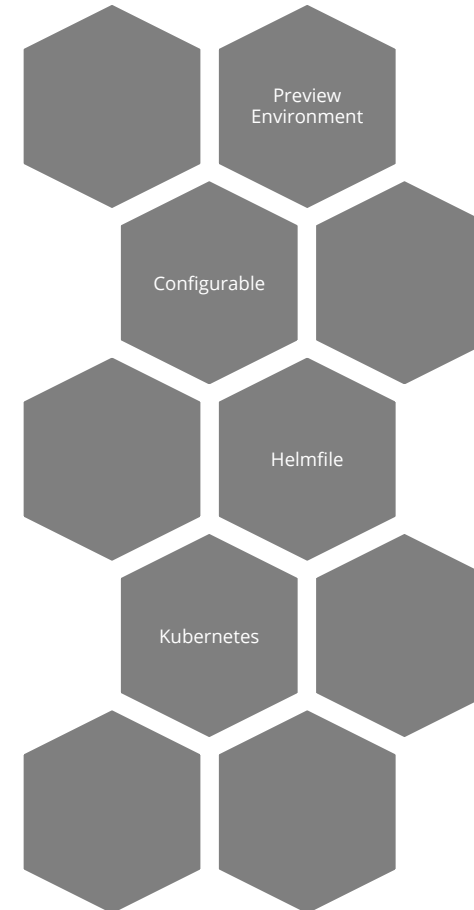
Demo

- Create a new application in Jenkins X

- Start a pull request

- Preview Environment is created

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```
[~/jx] (22:07:41)
>>> jx create quickstart                                         ❄ (default/jx)
```

- Issues
- Pull requests
- Actions
- Projects
- Security
- Insights
- Settings

main · 1 branch · 1 tag

Go to file | Add file · Code · | Gitpod

About

babadofar fix(plugins): use a better version of maven plugins   ✕ 66f3cce 1 hour ago · ⟲ 3 commits

No descrip
provided.

.lighthouse/jenkins-x	chore: Jenkins X build pack	1 hour ago
.mvn/wrapper	chore: initial import	1 hour ago
charts/spring-demo	chore: Jenkins X build pack	1 hour ago
preview	chore: Jenkins X build pack	1 hour ago
src	chore: initial import	1 hour ago
.gitignore	chore: initial import	1 hour ago
Dockerfile	chore: Jenkins X build pack	1 hour ago
OWNERS	chore: Jenkins X build pack	1 hour ago
OWNERS_ALIASES	chore: Jenkins X build pack	1 hour ago
buildspec.yml	chore: initial import	1 hour ago
mvnw	chore: initial import	1 hour ago
mvnw.cmd	chore: initial import	1 hour ago
pom.xml	fix(plugins): use a better version of maven plugins	1 hour ago
readme.md	chore: initial import	1 hour ago

📖 Readme

☆ 0 stars

👁 1 watch

⑂ 0 forks

Releases

🏷 1 tags

Create a new

Packages

No packages
Publish your f

Languages

● Java 37.8
● Mustach

≡ readme.md   ✏

Spring Boot REST application with Prometheus support
(Java 11)

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```
21          private MeterRegistry registry;
22
23          @GetMapping(path = "/", produces = "application/json")
24          @ResponseBody
25          public Map<String, Object> landingPage() {
26                  Counter.builder("mymetric").tag("foo", "bar").register(registry).increment();
27          return singletonMap("hello", "Continuous Delivery Mini Summit");
28          }
29
30          public static void main(String[] args) {
31                  SpringApplication.run(RestPrometheusApplication.class, args);
32          }
33
34  }
35
```

Commit changes

Update RestPrometheusApplication.java

Add an optional extended description...

○ ⚬ Commit directly to the `main` branch.

◉ ⑂ Create a **new branch** for this commit and start a pull request. Learn more about pull requests.

⑂ babadofar-patch-1

Propose changes   Cancel

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fix: changed text returned #1

⑪ Open **babadofar** wants to merge 3 commits into `main` from `babadofar-patch-1` ⎘

💬 Conversation 2 | ⊶ Commits 3 | ☑ Checks 0 | ⊡ Files changed 3

---

babadofar commented 15 minutes ago   ☺ ⋯

No description provided.

⊶ Update `RestPrometheusApplication.java`   Verified ✕ 8312234

🏷 **babadofar** added the `size/XS` label 14 minutes ago

---

babadofar commented 14 minutes ago   Author   ☺ ⋯

[APPROVALNOTIFIER] This PR is **NOT APPROVED**

This pull-request has been approved by:
To complete the pull request process, please assign **babadofar**
You can assign the PR to them by writing `/assign @babadofar` in a comment when ready.

The full list of commands accepted by this bot can be found here.

▼ Detaljer
Needs approval from an approver in each of these files:

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babadofar added `size/S` and removed `size/XS` labels 2 minutes ago

Add more commits by pushing to the **babadofar-patch-1** branch on **babadofar/spring-demo**.

○ **Some checks haven't completed yet**   Hide all checks
  2 pending checks

  ● **Lighthouse Merge Status**   *Pending — Not mergeable. Needs approved label.*   Details

  ● **pr**   *Pending — Pipeline running stage(s): from-build-pack*   Details

✓ **This branch has no conflicts with the base branch**
  Merging can be performed automatically.

[**Merge pull request** ▾]   You can also open this in GitHub Desktop or view command line instructions.

Write   Preview   H B I ≣ <> 🔗 ≣ ≣ ☰ @ ↗ ↩

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.   M↓

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○─○ chore: dependency   ● 71bcf3b

babadofar commented 12 minutes ago   Author ☺ ⋯

⭐ PR built and available in a preview **babadofar-spring-demo-pr-1** here

Add more commits by pushing to the `babadofar-patch-1` branch on **babadofar/spring-demo**.

Some checks haven't completed yet   Hide all checks
1 pending and 1 successful checks

● 🧑 **Lighthouse Merge Status**   *Pending — Not mergeable. Needs approved label.*   Details

✓ 🧑 **pr** — Pipeline successful   Details

✓ **This branch has no conflicts with the base branch**
Merging can be performed automatically.

Merge pull request ▼   You can also open this in GitHub Desktop or view command line instructions.

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Running Preview environment
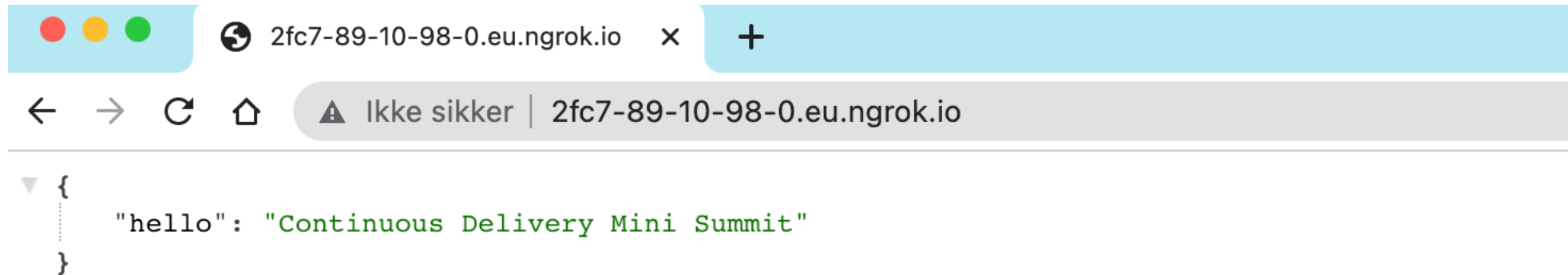
The problem with Preview Environments

- Testing a lonesome micro-service

- Many applications will not be testable independently

- Too little feedback

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Adding context to preview environments

Add dependent services to the preview chart

Connect to services defined in other environments

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Preview: Add dependent services

```
10    releases:
11    - chart: mentor-medier/subscription
12      name: subscription
13      version: 0.2.12
14      namespace: '{{ requiredEnv "PREVIEW_NAMESPACE" }}'
15      values:
16      - jx-values.yaml
17      - subscription-values.yaml.gotmpl
18    - chart: './crd'
19      name: appconf
20      version: 0.1.0-SNAPSHOT
21      namespace: '{{ requiredEnv "PREVIEW_NAMESPACE" }}'
22      values:
23      - values.yaml.gotmpl
24    - chart: jx3/jx-verify
25      name: jx-verify
26      namespace: '{{ requiredEnv "PREVIEW_NAMESPACE" }}'
27    - chart: '../charts/{{ requiredEnv "APP_NAME" }}'
28      name: preview
29      wait: true
30      createNamespace: true
31      namespace: '{{ requiredEnv "PREVIEW_NAMESPACE" }}'
32      values:
```

Dependent

Preview

- Adding the helm chart of the other application
- Preview app is a Java REST API, dependent is a React js app
-

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Preview: connect to the outside

Connect to services outside the preview namespace using the fully qualified kubernetes name

yourservice.jx-staging.svc.cluster.local

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File tree:

- ∨ config
  - {} config.json
  - › node_modules
  - ∨ preview ●
    - ∨ crd ●
      - ∨ templates ●
        - ≡ subscription-configmap.yaml   M
    - ⚠ Chart.yaml
  - ⚠ helmfile.yaml
  - ≡ Kptfile

Editor content:

```yaml
kind: ConfigMap
metadata:
  name: configjs
data:
  "config.json": |-
        {
          "appServer": "spring-demo.jx-staging.svc.cluster.local",
          "customerName": "Lemmy"
        }

```

Shortened Feedback loop?

• Adding/connecting to another service to preview

• Rapid feedback on selected parts
• Requires knowledge to understand what to test
• Good for developers
• Some more feedback

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The unit of deployment

- What is needed to deliver «the whole experience»
- The unit of deployment
- The full set of services

Umbrella charts

- Collect multiple applications into one
- Templated configuration
- Makes repeated install easy
- Automates the full environment

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Adding context to preview environments

Add dependent services to the preview chart

Connect to services defined in other environments

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Umbrella chart configuration

add charts

Code editor screenshot:

File tree (GRANDMA):
- .lighthouse / jenkins-x
  - pullrequest.yaml
  - release.yaml
  - triggers.yaml
- charts / grandma
  - templates
    - application.yaml
    - config-json.yaml
  - Chart.yaml
  - values.yaml
- preview
  - crd
    - templates
    - Chart.yaml

Breadcrumb: charts > grandma > ! Chart.yaml > [ ] dependencies > { } 1

Helm Chart.yaml (chart.json)

```yaml
apiVersion: v2
description: Collected applications for demo purpose
name: grandma
version: 0.0.1
dependencies:

- name: spring-demo
  alias: spring-demo-gm
  repository: https://babadofar.github.io/jx3-k3s-vault-demo/
  version: 0.0.10

- name: node-demo
  alias: node-demo-gm
  repository: https://babadofar.github.io/jx3-k3s-vault-demo/
  version: 0.0.2
```

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Templated configuration

```
∨ .lighthouse / jenkins-x        ●

 !  pullrequest.yaml       3, U

 !  release.yaml              U

 !  triggers.yaml             U

∨ charts / grandma             ●

 ∨ templates                   ●

  ☰ application.yaml

  ☰ config-json.yaml         M

  !  Chart.yaml
```

```
 1   apiVersion: v1
 2 ▶ kind: ConfigMap
 3   metadata:
 4     name: configjs
 5   data:
 6     'config.json':  |-
 7         {
 8            "appServer": "spring-demo.{{ .Values.domain }}",
 9            "customerName": "{{ .Values.customerName }}"
10         }
11
```

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Preview pipeline build step

```
 preview                    ●                 28            cpu: 400m
   crd                      ●                 29            memory: 512Mi
     templates                                30         - name: build-helm-build
   ! Chart.yaml             U                 31           resources: {}
   ! helmfile.yaml          U                 32         - image: ghcr.io/jenkins-x-plugins/jx-preview:0.0.220
   ! jx-values.yaml         U                 33           name: promote-jx-preview
     Kptfile                U                 34           resources: {}
     values.yaml.gotmpl     U                 35           script: |
   OWNERS                   U                 36               #!/usr/bin/env sh
   OWNERS_ALIASES           U                 37               source .jx/variables.sh
                                              38               jx preview create
                                              39
```

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Preview domain

```
preview > ☰ values.yaml.gotmpl
1    jxRequirements:
2      ingress:
3        namespaceSubDomain: "-pr{{ requiredEnv "PULL_NUMBER" }}."
4
5    domain: "pr{{ requiredEnv "PULL_NUMBER" }}.nip.io"
6
7
```

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All services running in a preview environment
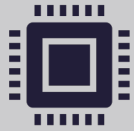
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Umbrella charts

cons

- Adds one more step
- Adds complexity
- Cognitive load
- Adds extra processing, consuming resources

pros

- Automates config
- Makes it easy to deploy a near exact replica of the production environment
- Shortens the feedback loop

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Shortening the Feedback loop

Jenkins X provides all you need for rapid development on Kubernetes

Customizing preview environments shortens the feedback loop even more

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