



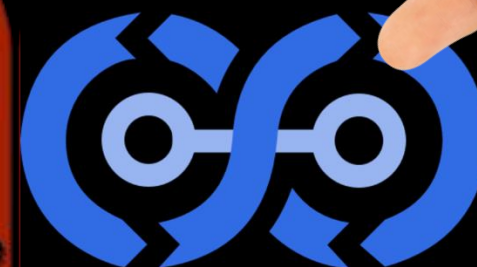


ArgoCon
NORTH AMERICA


⚡ Progressive Infrastructure Delivery

using Kargo and Argo CD





GitOps
Engine
flux



Hello!

I am **Engin Diri**,

X @_EDIRI

in ENGIN-DIRI

m @ EDIRI@CLOUD-NATIVE.SOCIAL

@DIRIEN

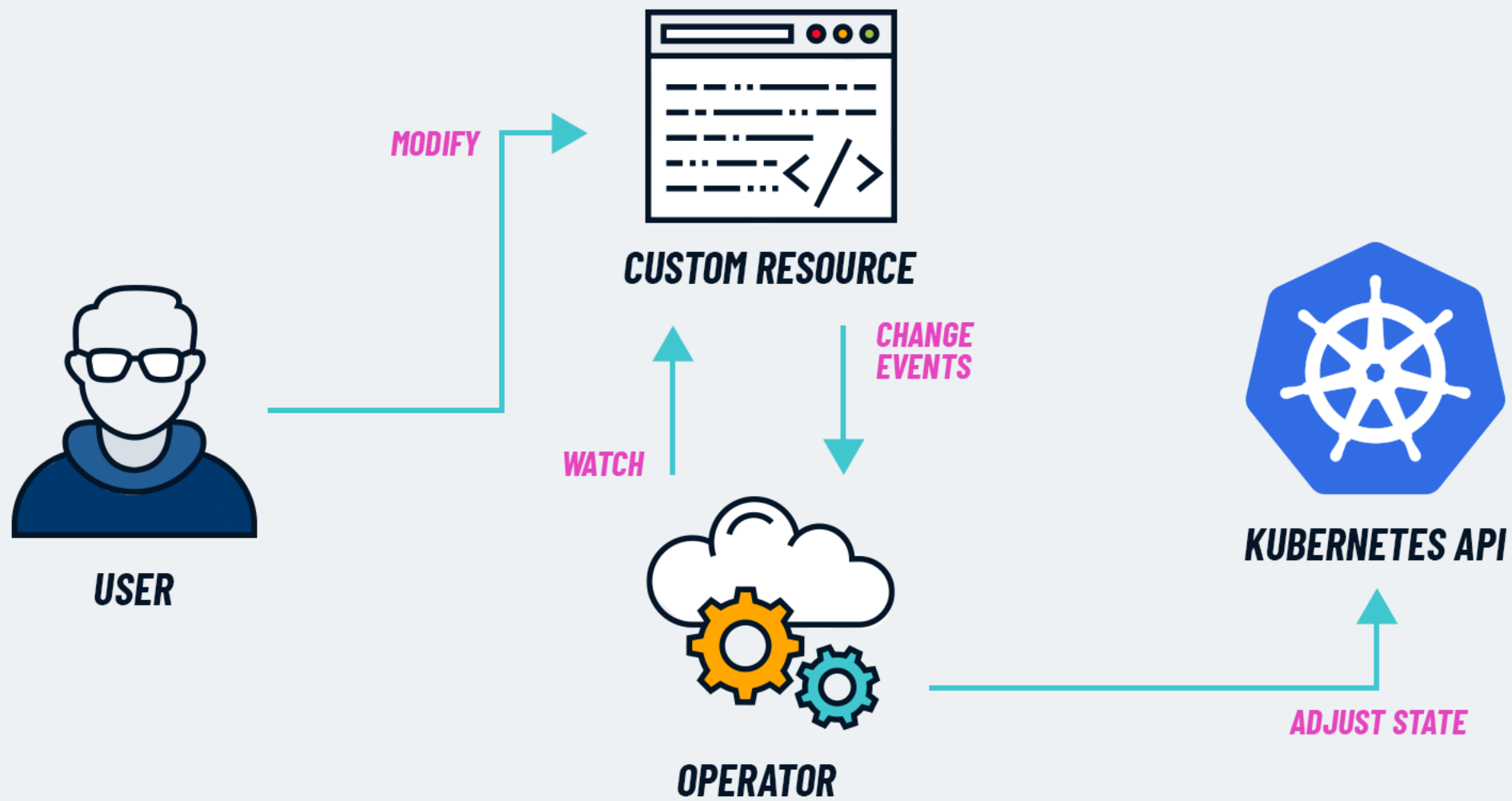
- Working at Pulumi as Customer Experience Architect
- Cloud Transformation and Enablement
- Continuous everything...



GITOPS

OPERATORS

To Deploy
Infrastructure with
GitOps we need
Operators



Deploy Infrastructure with **GitOps**:



Crossplane



Pulumi

argoproj / argocd-example-apps

<> Code

Issues 29

Pull requests 82

Actions

Projects

Security

Files

master

Go to file

> apps

> blue-green

> guestbook

guestbook-ui-deployment.yaml

guestbook-ui-svc.yaml

argocd-example-apps / guestbook

jannfis and alexec Use apps/v1 API for Deployment

Name
..
guestbook-ui-deployment.yaml
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<> Code Issues 29 Pull requests 82 Actions Projects Security

Files

master + Q

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▼ guestbook

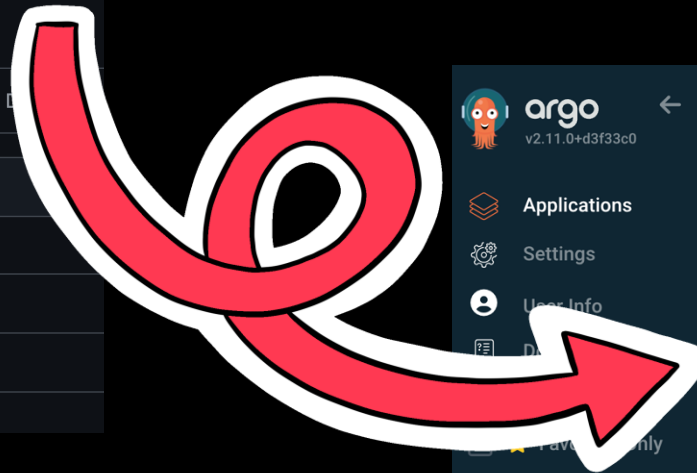
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- guestbook-ui-svc.yaml



argo v2.11.0+d3f33c0

Applications Settings User Info

Applications

+ NEW APP SYNC APPS REFRESH APPS Search applicatio

guestbook ☆

Project: default

Labels:

Status: ♥ Healthy ✔ Synced

Repository: https://github.com/argoproj/argocd-example-ap...

Target Revi... HEAD

Path: guestbook

Destination: in-cluster

Namespace: guestbook

Created At: 09/19/2024 06:55:45 (a minute ago)

Last Sync: 09/19/2024 06:56:31 (a few seconds ago)

↻ SYNC ↻ REFRESH ✖ DELETE

SYNC STATUS

<input type="checkbox"/>	Unknown	0
<input type="checkbox"/>	Synced	1
<input type="checkbox"/>	OutOfSync	0

HEALTH STATUS

argoproj / argocd-example-apps

<> Code Issues 29 Pull requests 82 Actions Projects Security

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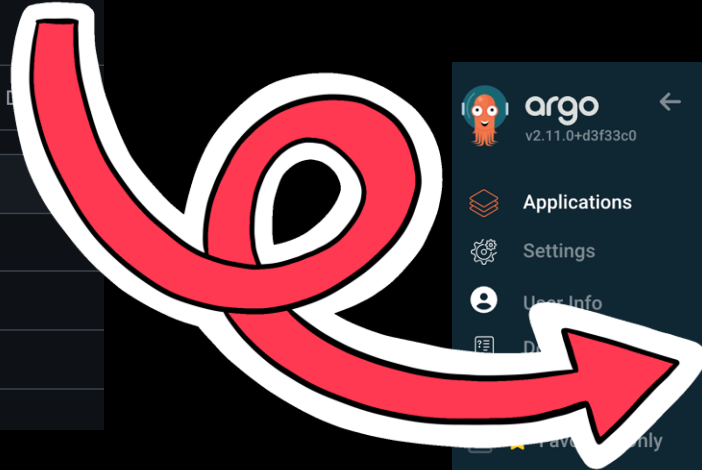
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argo v2.11.0+d3f33c0

Applications

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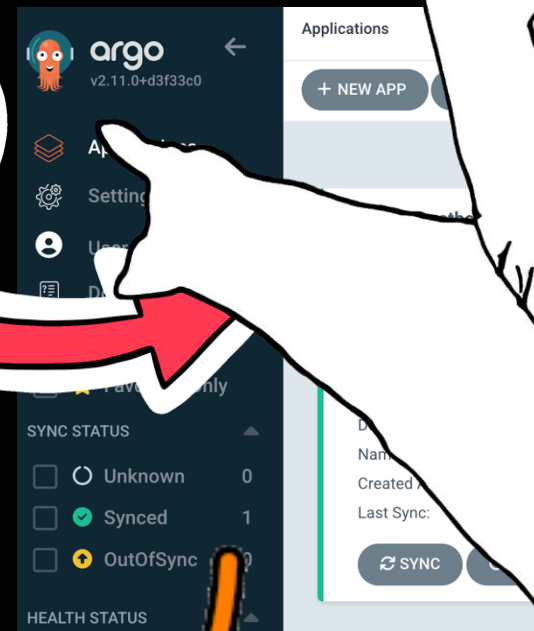
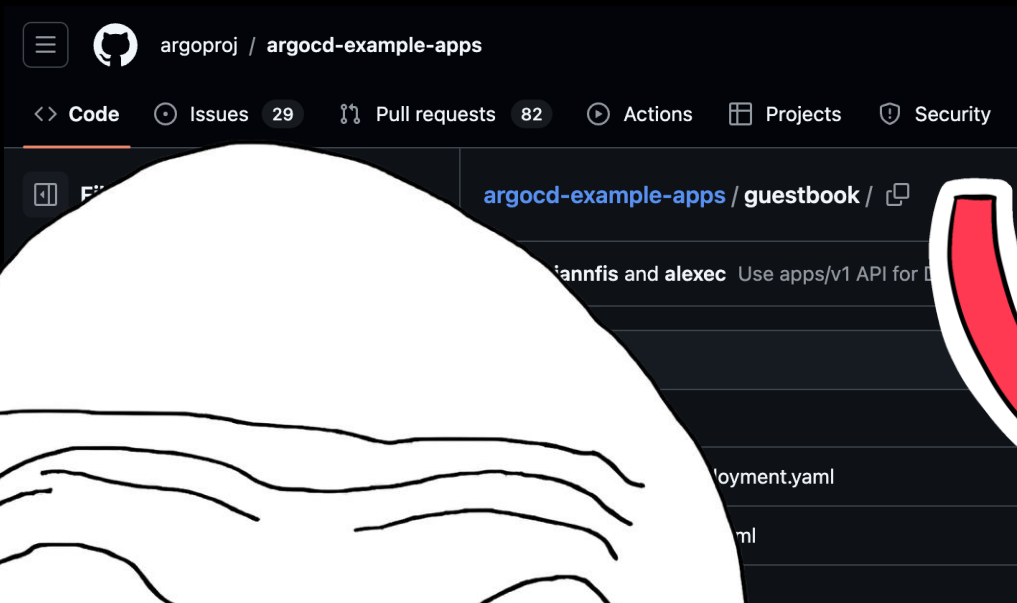
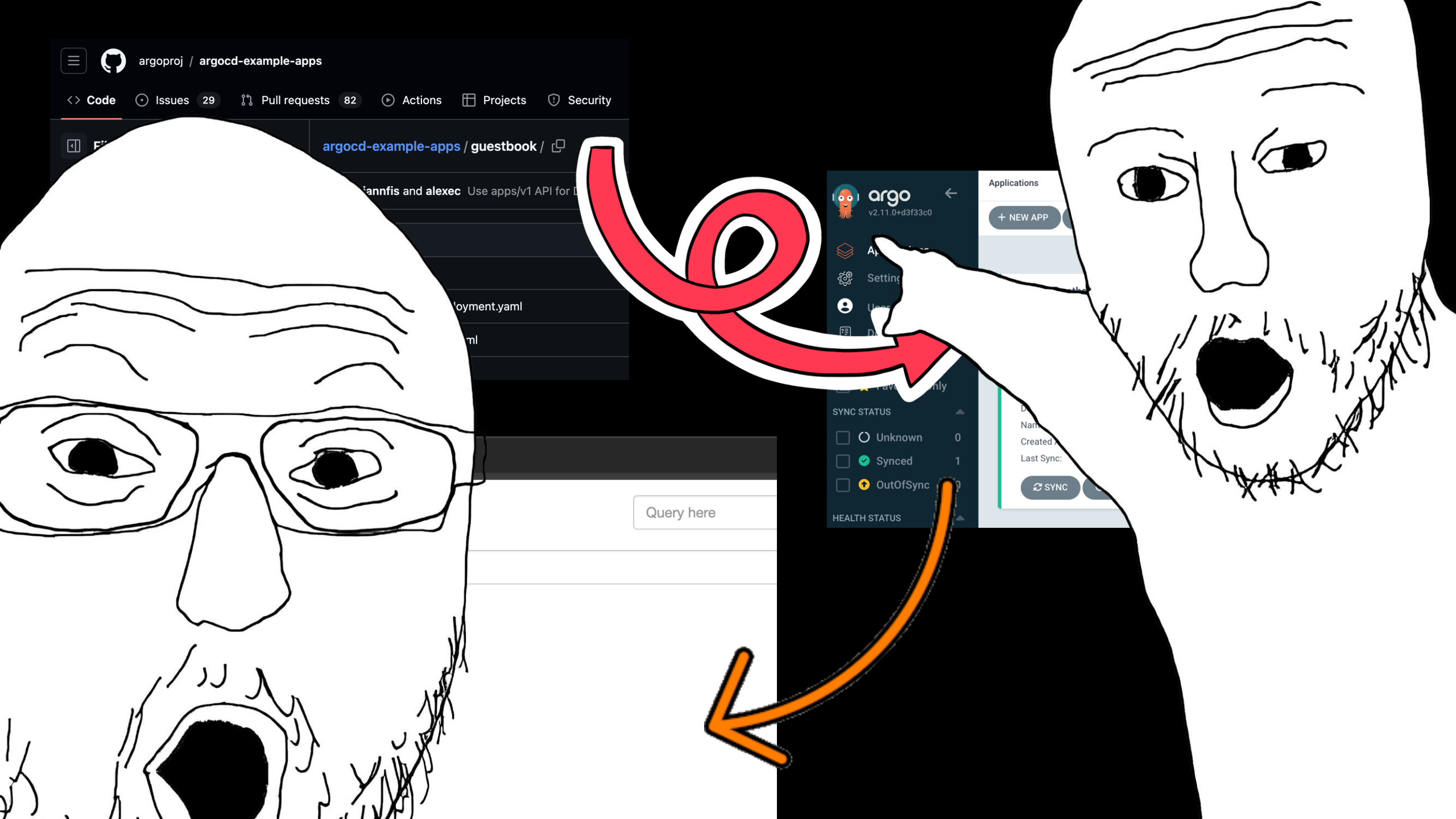
← → ↻ ⓘ http://localhost:8080

Fancy Guestbook Query here

Messages

Submit





Directed by
ROBERT B. WEIDE



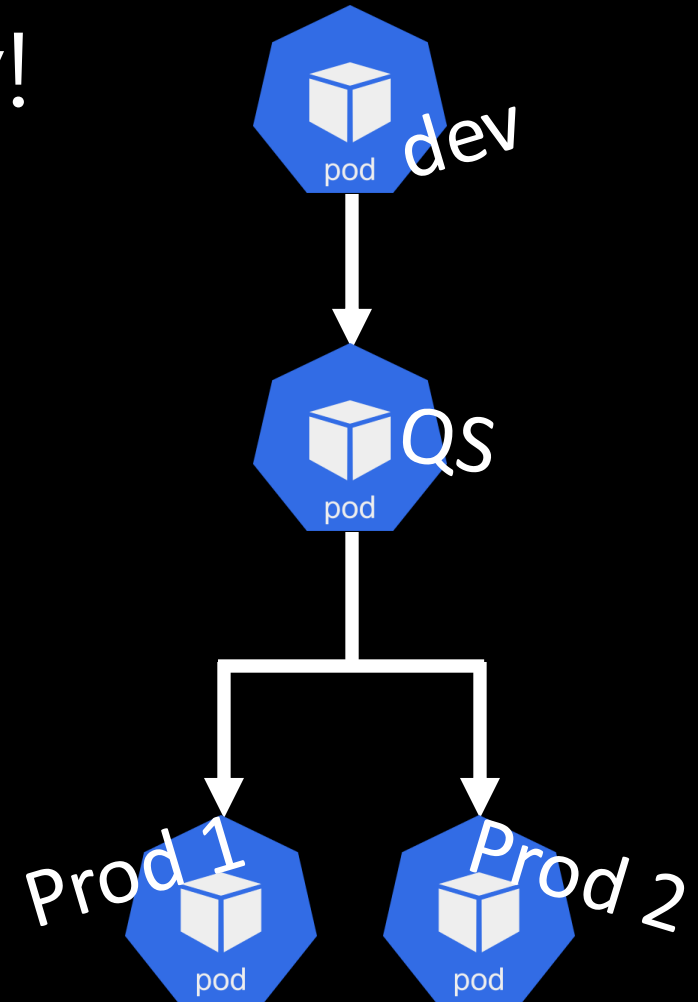
Ackshually...

- ... we only synced now to dev!



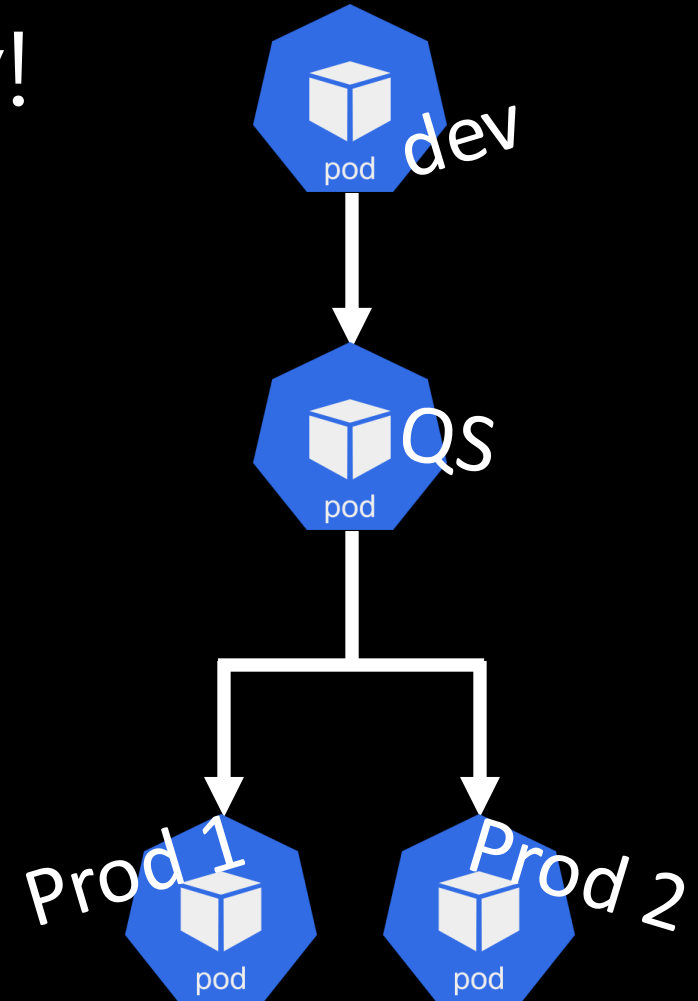
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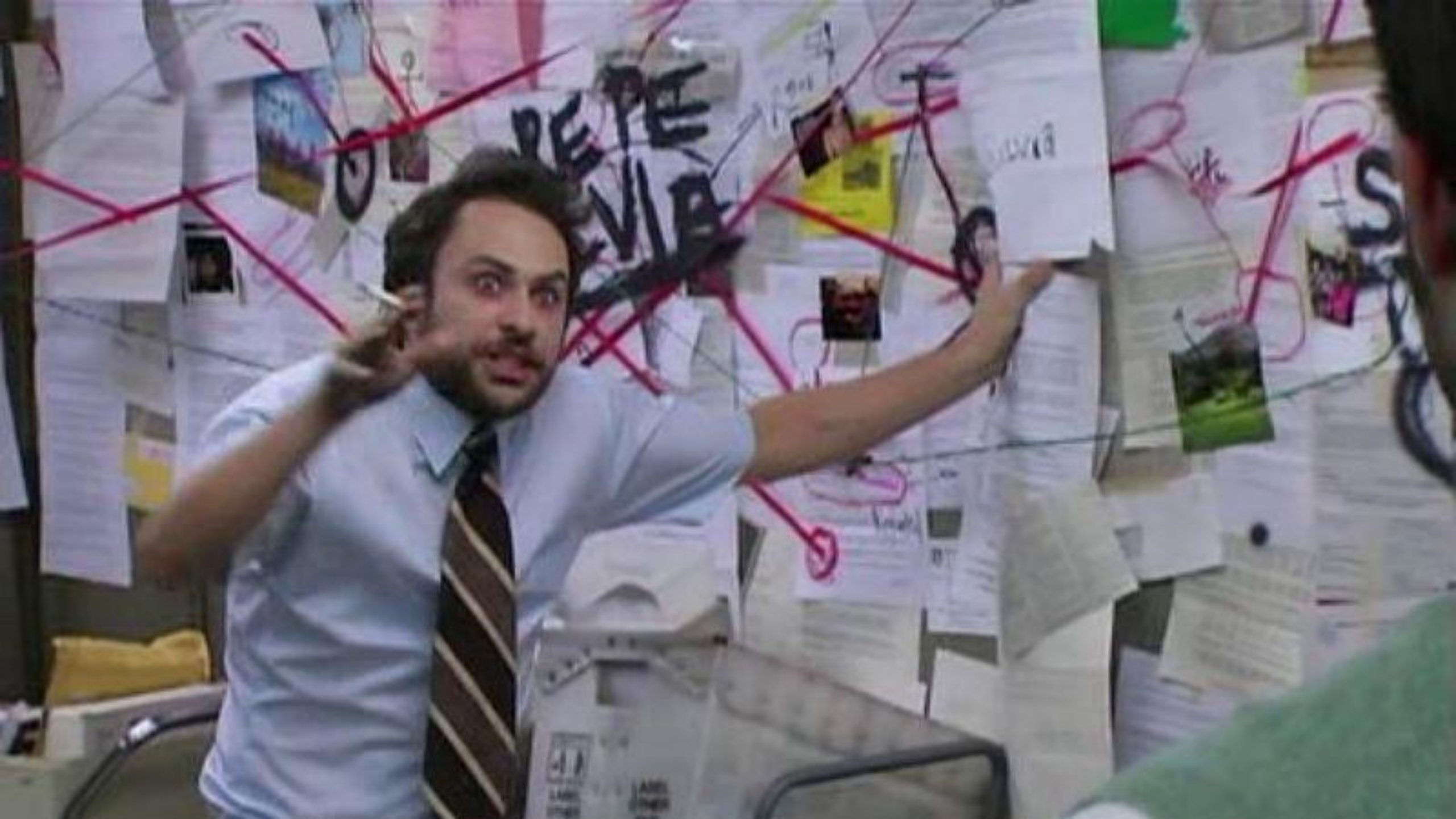
- ... we only synced now to dev!
- ... real talk: There are more environments than dev!

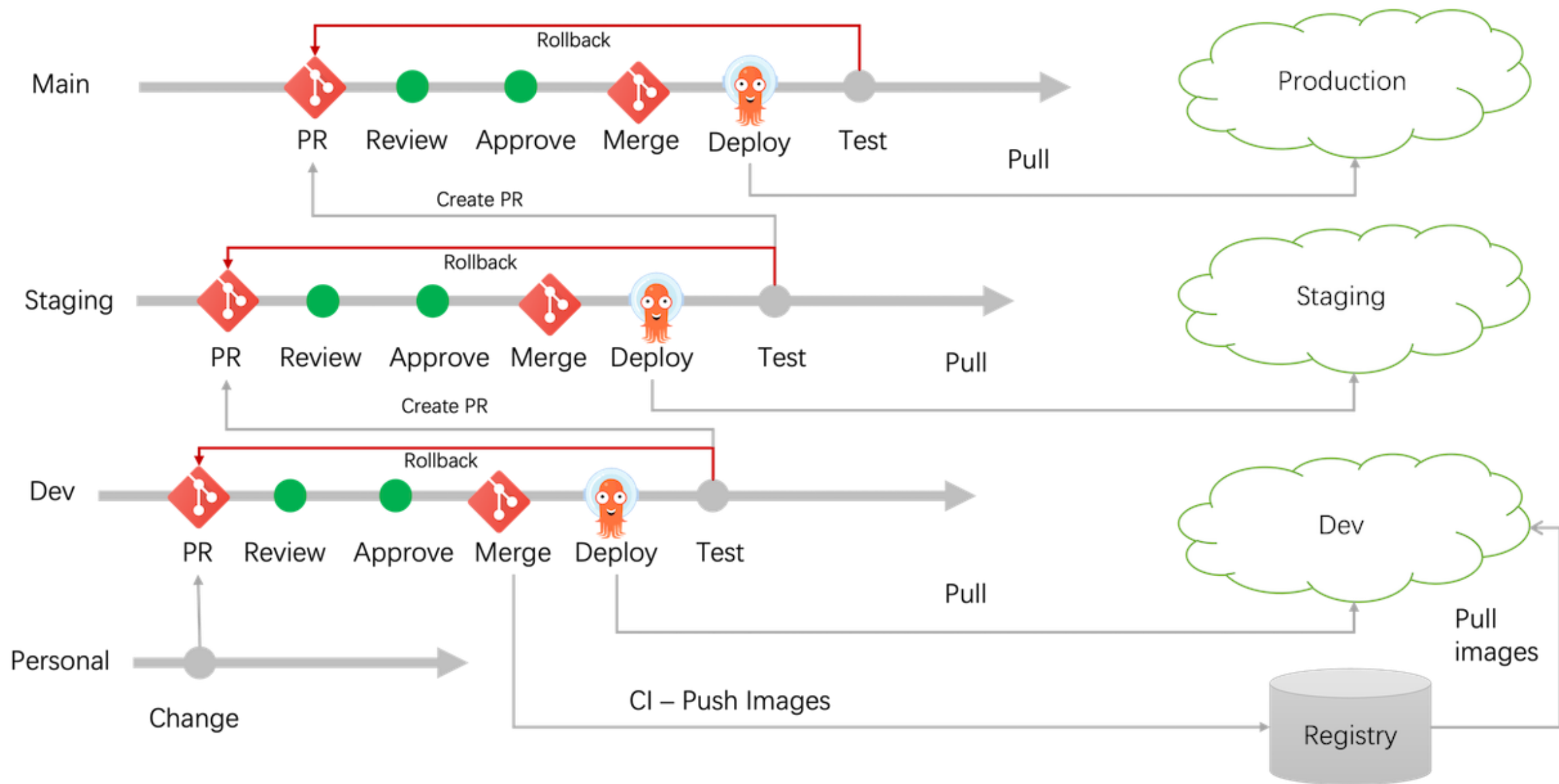


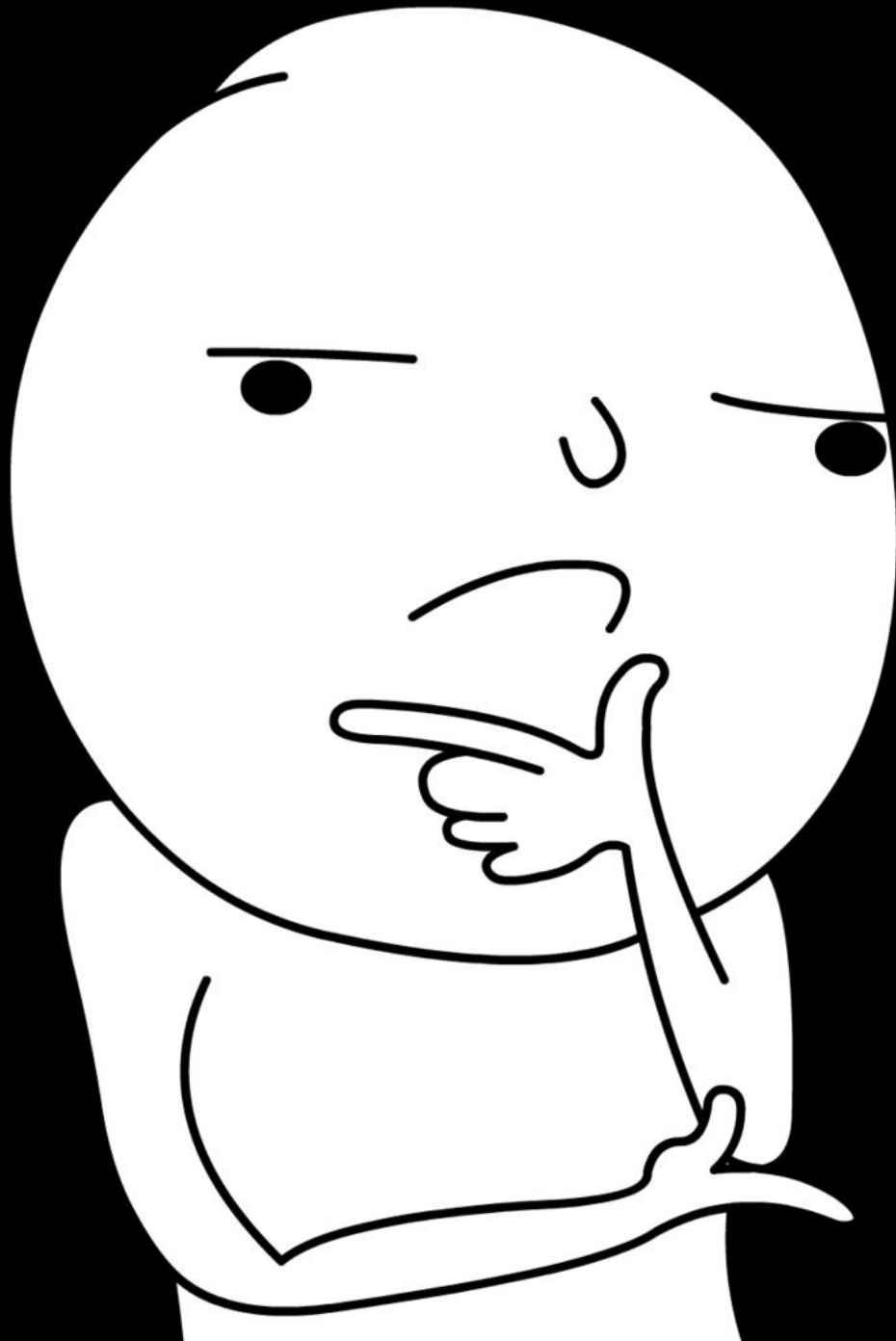
Ackshually...

- ... we only synced now to dev!
- ... real talk: There are more environments then dev!
- ... how do we promote beyond dev?









**Is There Not a Better
Way To Promote
Infrastructure
Changes the GitOps
Way?**

Promotion Patterns

Promotion Patterns

Promotion patterns describe different ways to implement environments (also known as stages, for example "Test", "Staging" and "Production") with GitOps.

Promotion Patterns

The question is: How do we realize environments in GitOps?

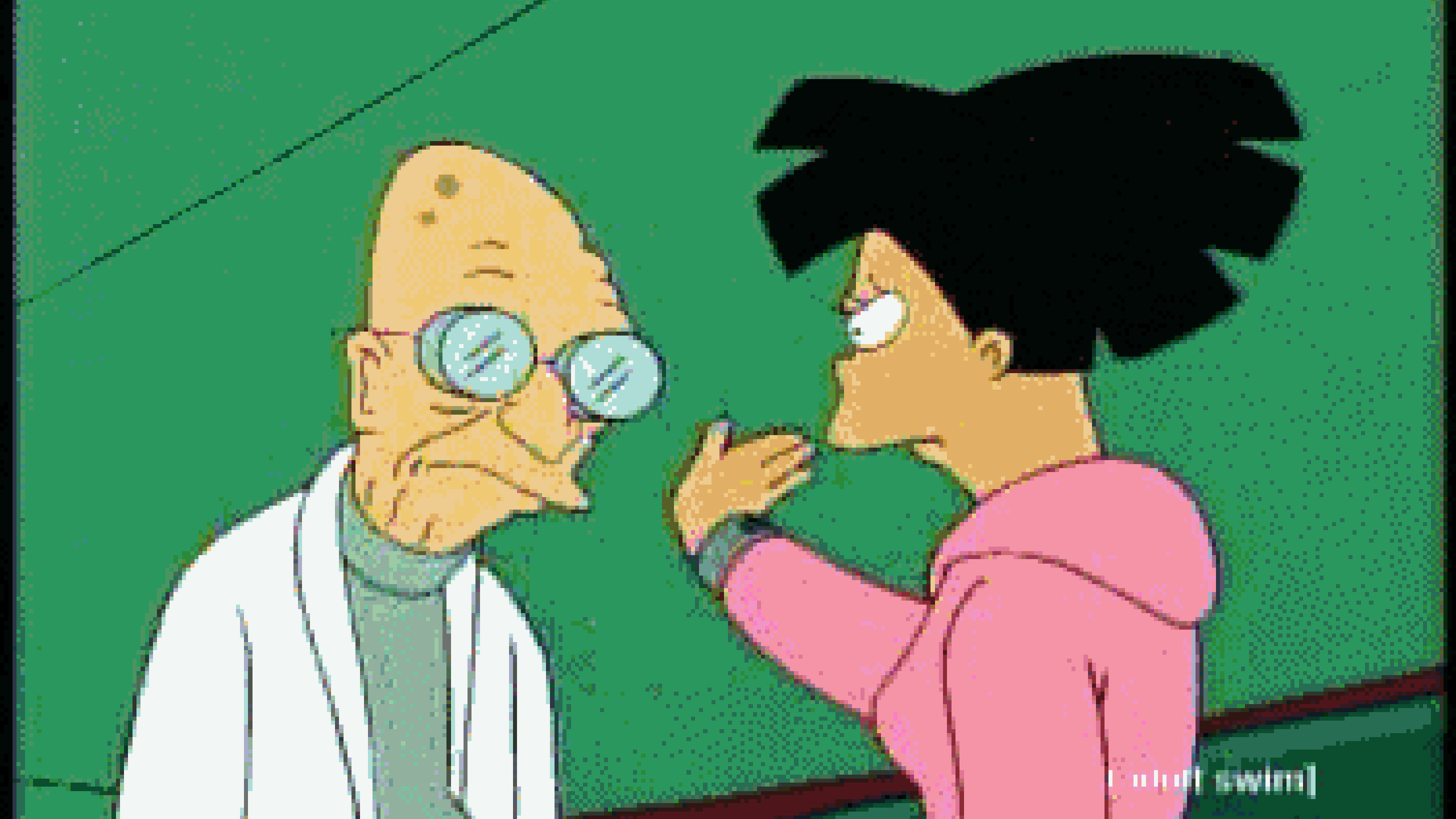
A green, one-eyed alien with two long antennae stands in a forest. The alien has a smug expression and is looking towards the viewer. The background consists of a green tree trunk on the left and blue tree trunks on the right, with a brown ground surface at the bottom. The text '- IT'S TOO EASY.' is written in white, bold, sans-serif font at the bottom of the image.

- IT'S TOO EASY.

Promotion Patterns

The central question is: How do we realize environments in GitOps?

- Environment by Branches !



Why not use Branches for environments!

Kostis Kapelonis: Stop Using Branches for Deploying to Different GitOps Environments - 2021



Why not use Branches for environments!

Kostis Kapelonis: Stop Using Branches for Deploying to Different GitOps Environments - 2021



- Using Git branches for different environments is outdated and problematic, leading to configuration drift and maintenance challenges.
- Promotion via Git merges can cause unwanted changes and merge conflicts.
- Helm and Kustomize, popular Kubernetes tools, advocate using files/folders over branches for environment modeling.
- Branch-per-environment models are difficult to scale with many environments.

Promotion Patterns

The central question is: How do we realize environments in GitOps?

- ~~Environments as branches~~

Promotion Patterns

The central question is: How do we realize environments in GitOps?

- ~~Environment by Branches~~
- Environment by Folders

Why use Folders for environments!

Kostis Kapelonis: How to Model Your GitOps Environments and Promote Releases between Them – 2022

Christian Hernandez: Git best practices: Workflows for GitOps deployment - 2022



Why use Folders for environments!

Kostis Kapelonis: How to Model Your GitOps Environments and Promote Releases between Them – 2022



Christian Hernandez: Git best practices: Workflows for GitOps deployment - 2022



- Separate configuration and environment-specific files for cleaner management.
- Handle environment promotions with simple file copy operations.
- Gradual promotion ensures smooth transitions between environments without causing disruptions.
- Use trunk-based development and tags for versioning to improve consistency.



Files

main + 🔍

Go to file t

- > .github
- > charts
- > setup
- ▼ stages
 - > prod-ams
 - > prod-lon
 - > prod-nyc
 - > test
 - > uat

.gitignore

kargo-test / stages /

Kargo Render updated stages/test/Chart.yaml to use subchart infra-chart:0.1.6

Name

Last commit message

..

prod-ams

updated stages/pr

prod-lon

updated stages/pr

prod-nyc

updated stages/pr

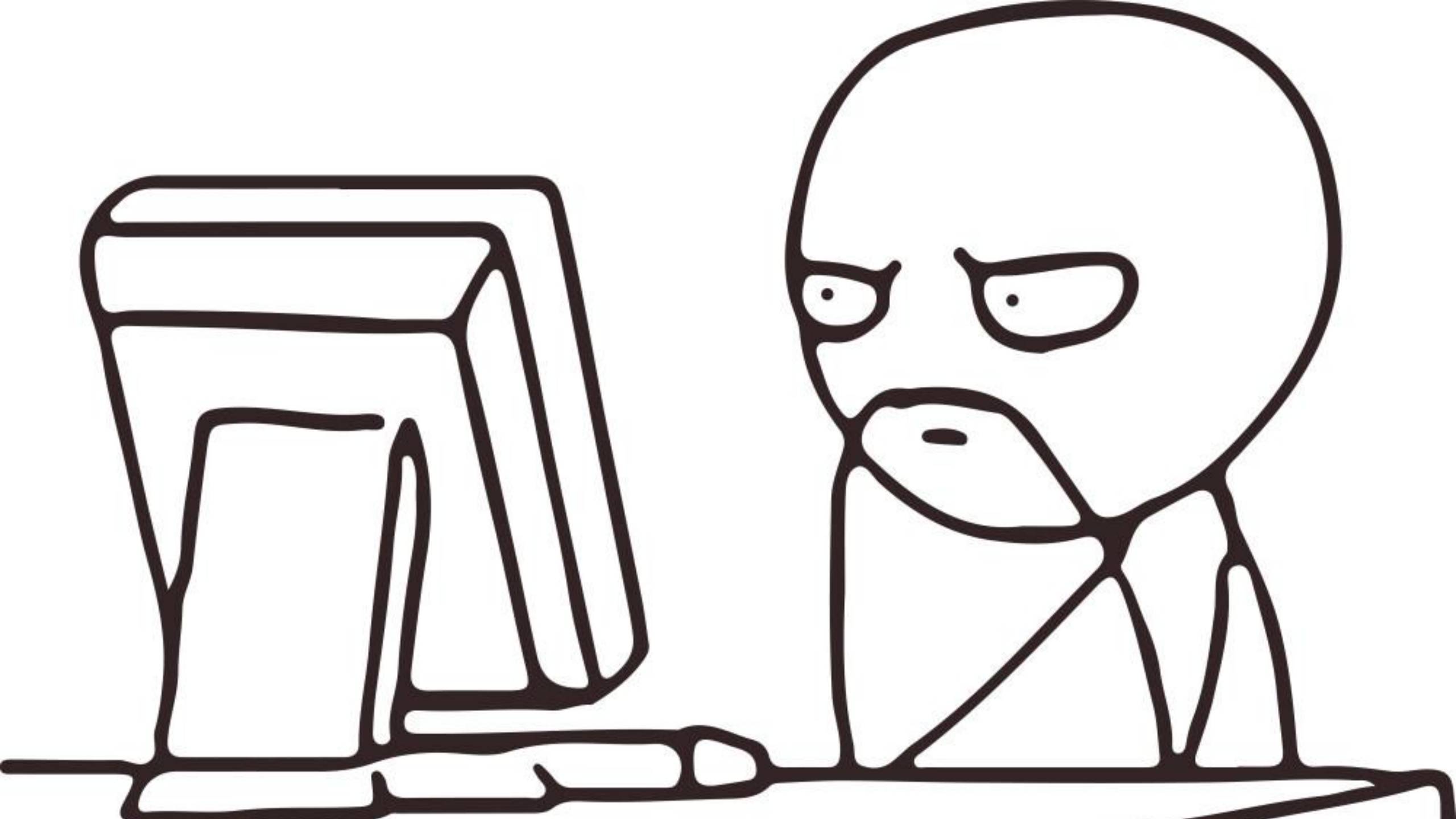
test

updated stages/te

uat

updated stages/ua







Kargo, Kargo, Kargo



kargo

<https://kargo.akuity.io/>

What is Kargo, and why it you should care!

- Multi-stage promotion
- GitOps
- Create flexible promotion pipeline of artifacts.

Artifacts are:

- Container Images
 - Kubernetes Manifests
 - Helm Charts
- Manual and automatic promotion of artifacts.
 - Native Integration into existing ecosystem:
 - Helm
 - Kustomize
 - Argo CD

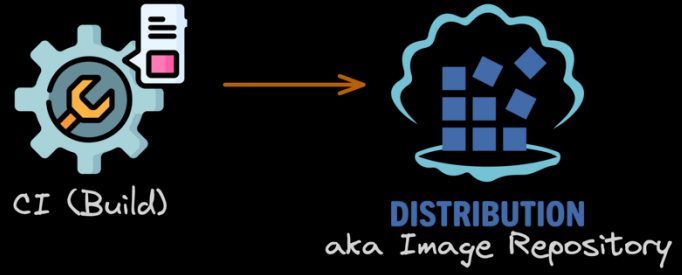
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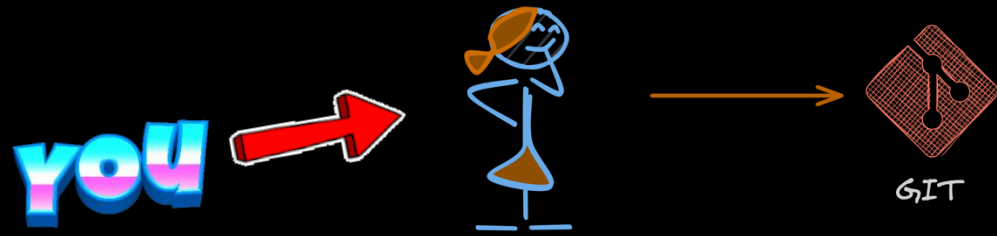
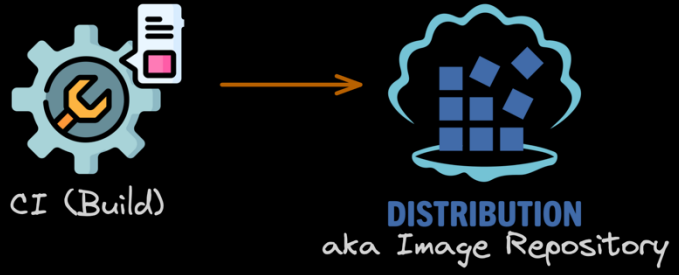
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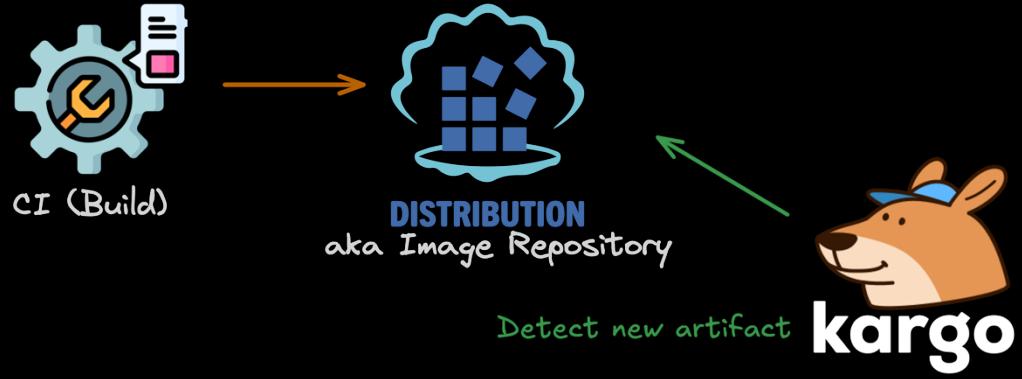
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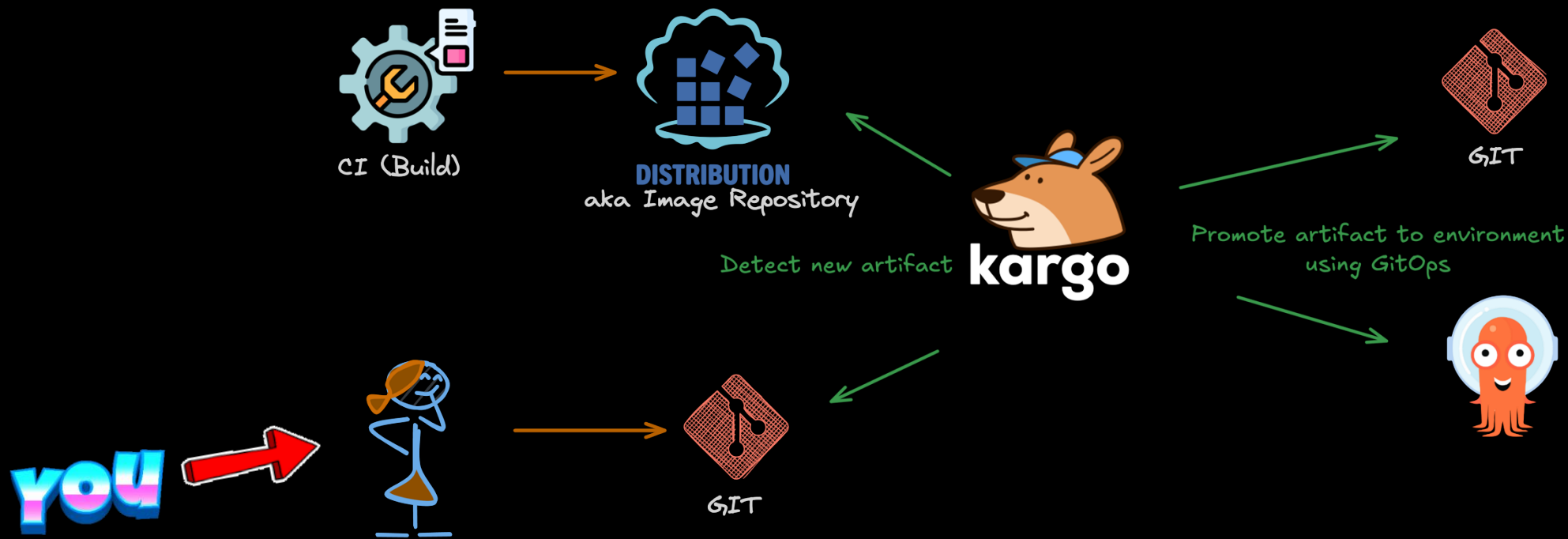
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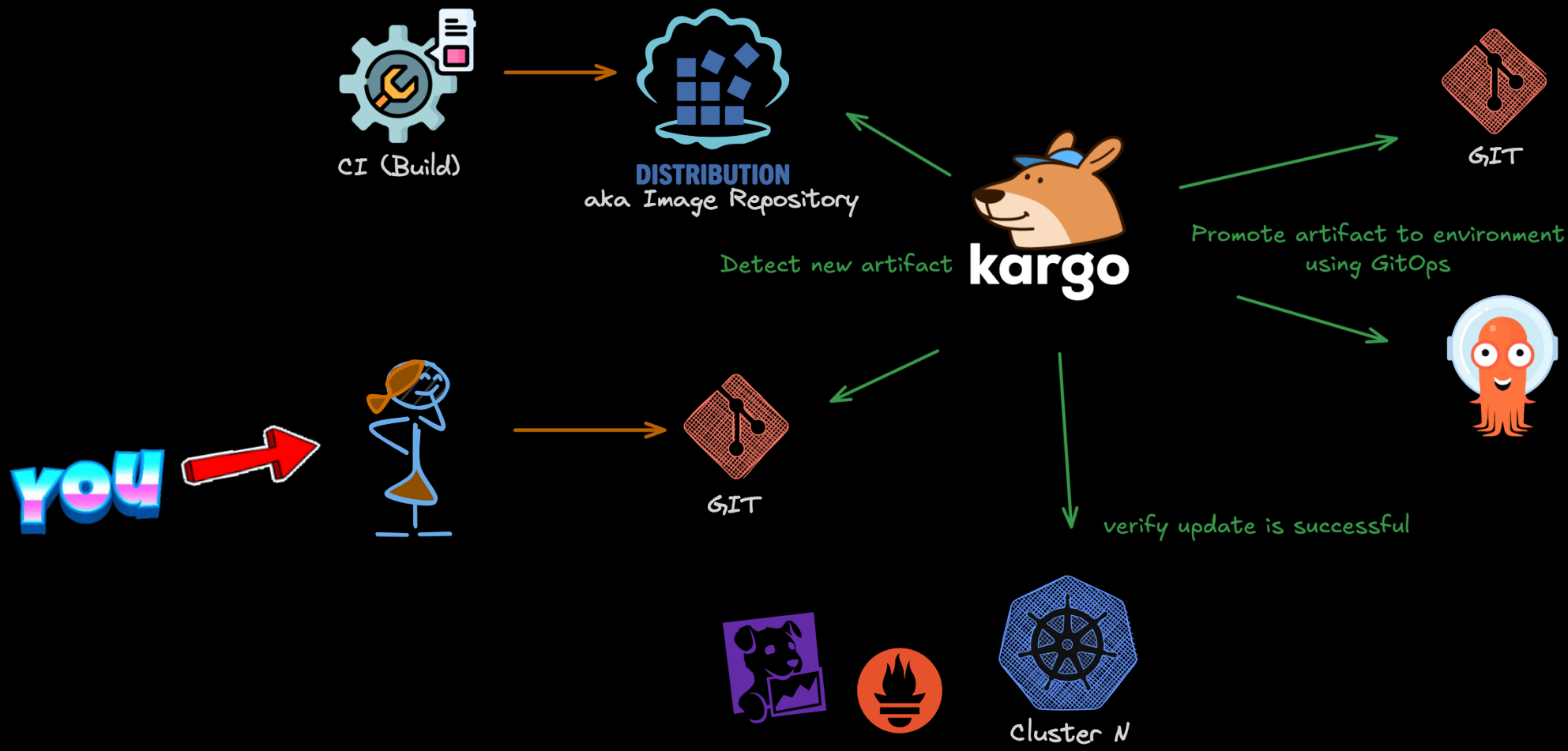
OSS











DEMO!



<https://github.com/dirien/kargo-test>

Key takeaways

- Kargo enforces a strict(er) separation of CI and CD:
 - CI: Builds artifacts
 - CD: Takes care of everything else!
- Kargo is GitOps native
- The previous pain of promotions is very elegantly solved

Follow up

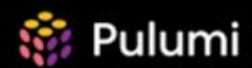
- <https://kargo.akuity.io/>
- <https://codefresh.io/blog/how-to-model-your-gitops-environments-and-promote-releases-between-them/>
- <https://developers.redhat.com/articles/2022/07/20/git-workflows-best-practices-gitops-deployments#>
- <https://codefresh.io/blog/stop-using-branches-deploying-different-gitops-environments/>

TO-DO List

~~Join this Talk~~

Give Kargo a try at Home

Join the Pulumu /
Akuity / Crossplane
Slack



Universal Infrastructure as Code for Kubernetes

KubeCon | Pulumi Booth R1



