



KubeCon



CloudNativeCon

Europe 2024



Rapid IDP Capability Development

Jesse Sanford & Greg Haynes
Autodesk

About Us



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Software Architect, Autodesk



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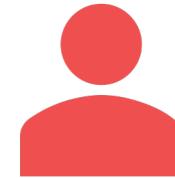
What is this talk about?



Why we need a reference
Cloud-Native developer
platform

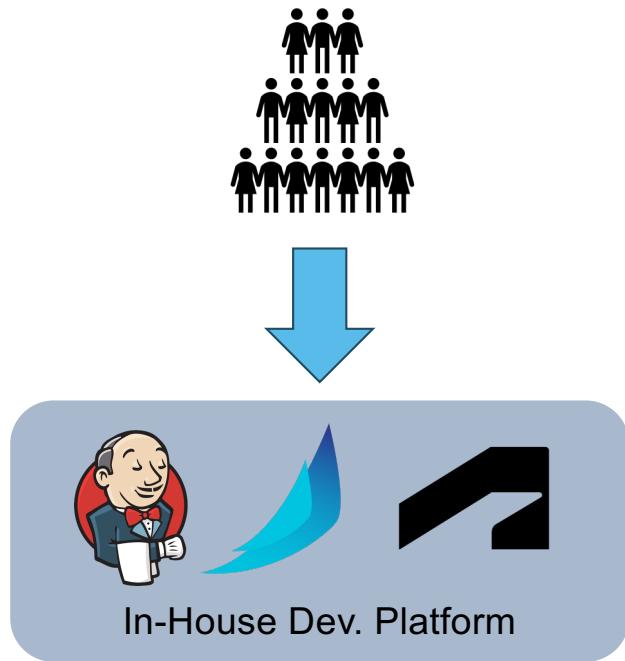


How we created our reference
platform
(and open sourced it!)

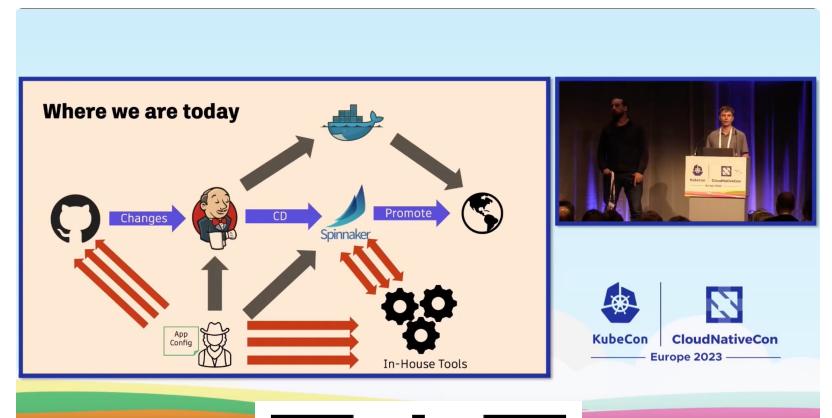
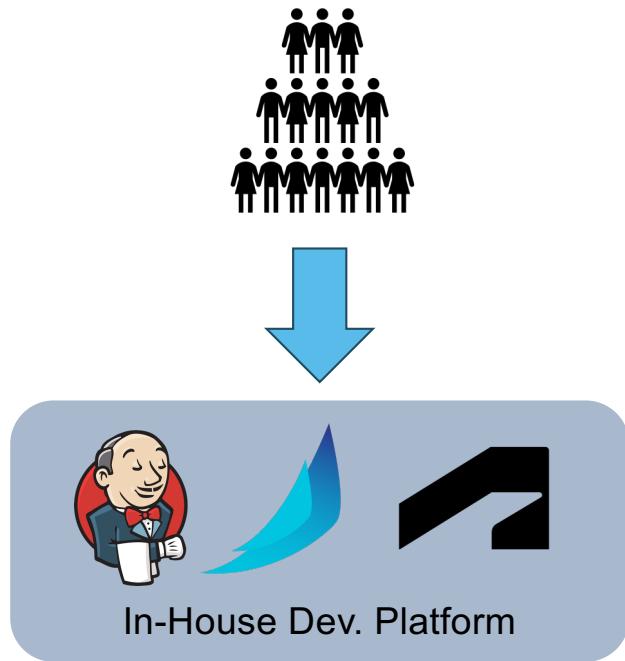


How to super-charge your
Internal Developer Platform
creation.

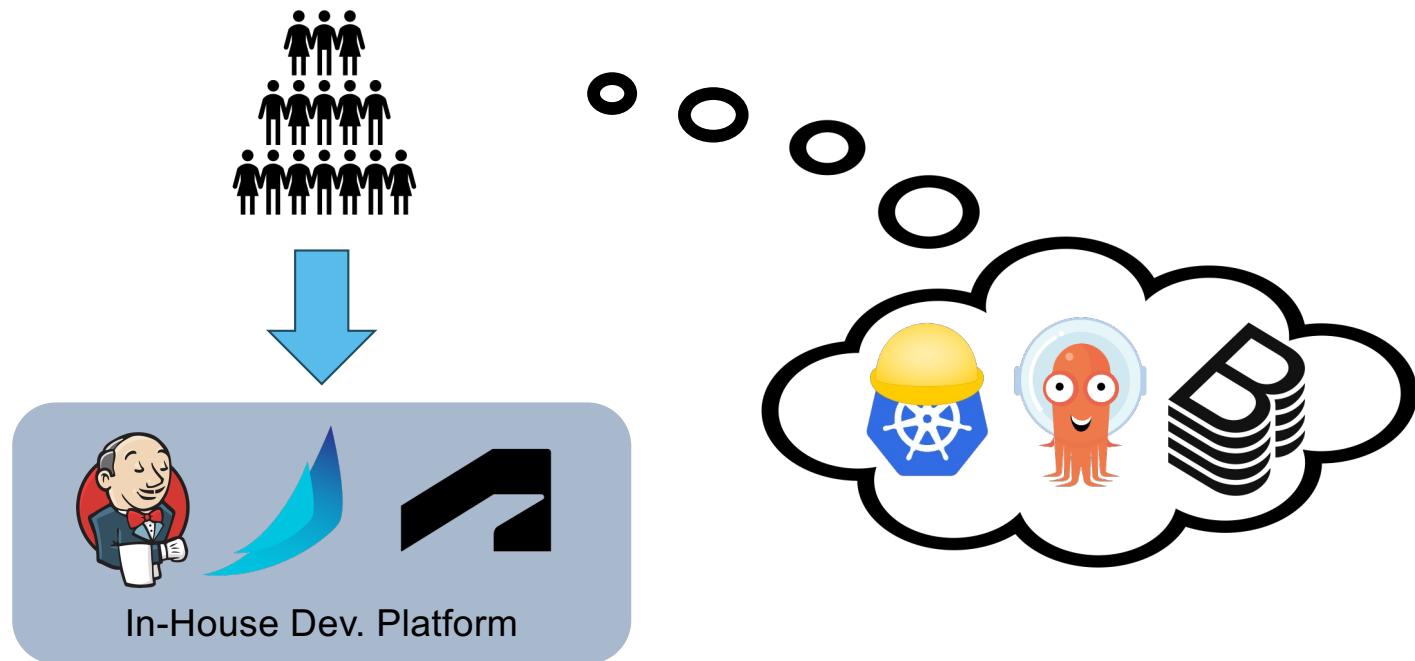
How it started



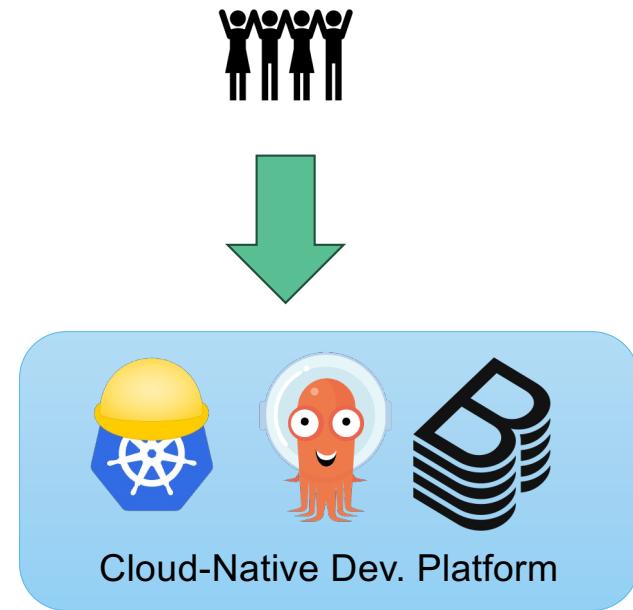
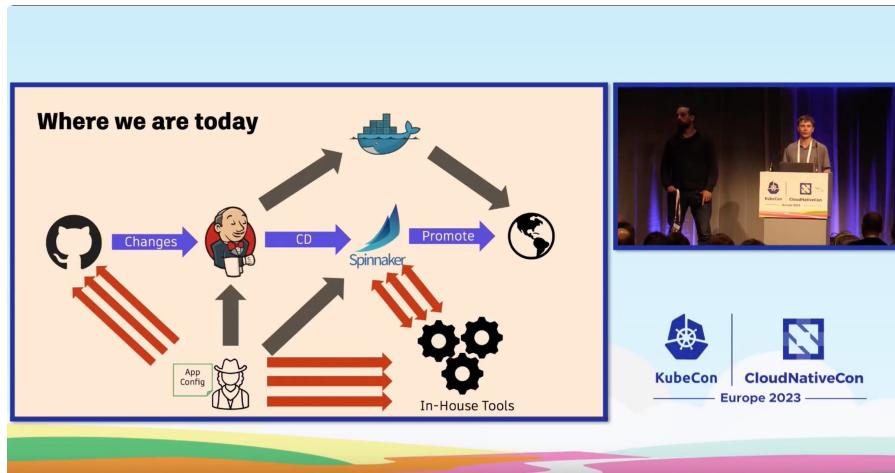
How it started



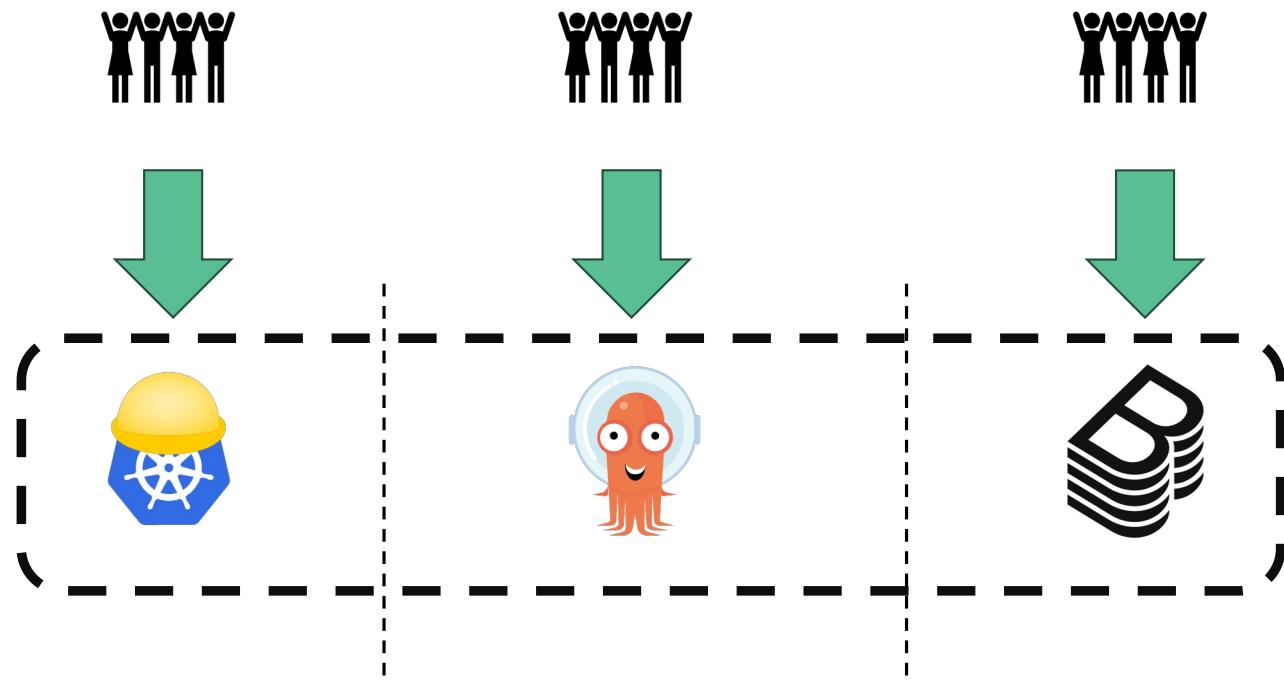
How it started



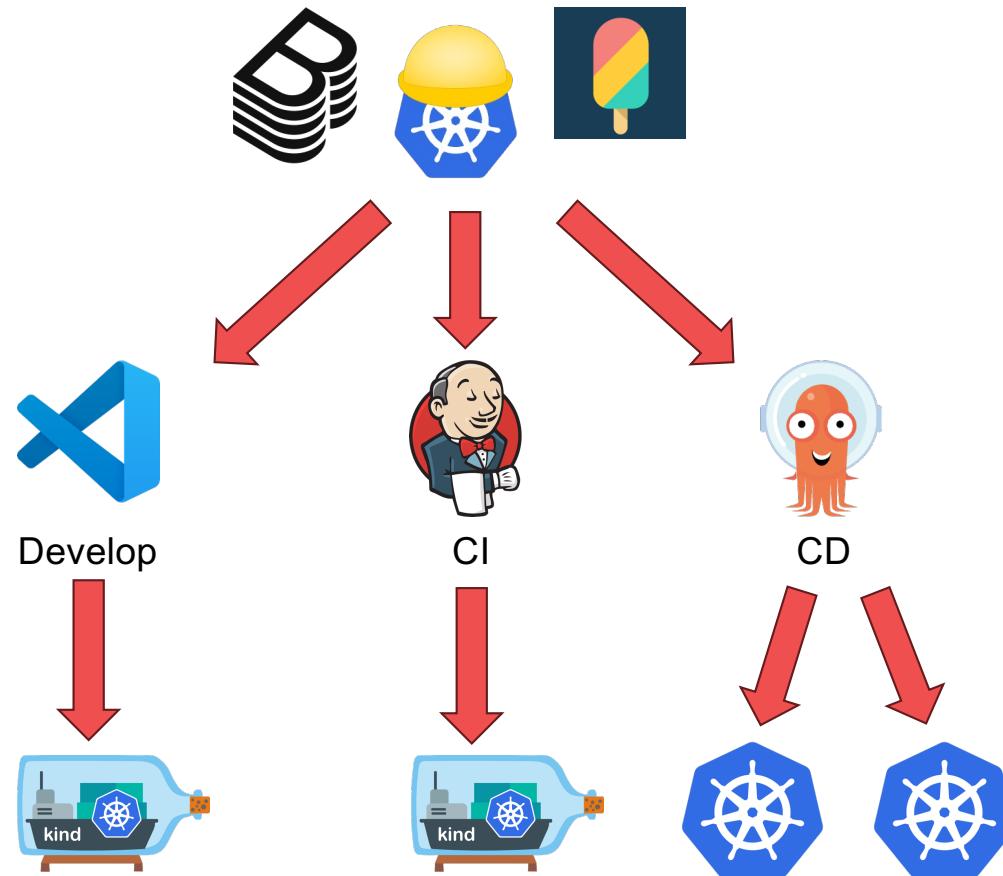
Kubecon EU 2023



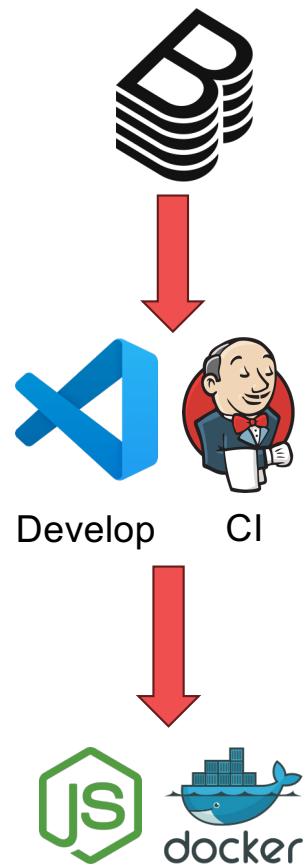
Kubecon EU 2023



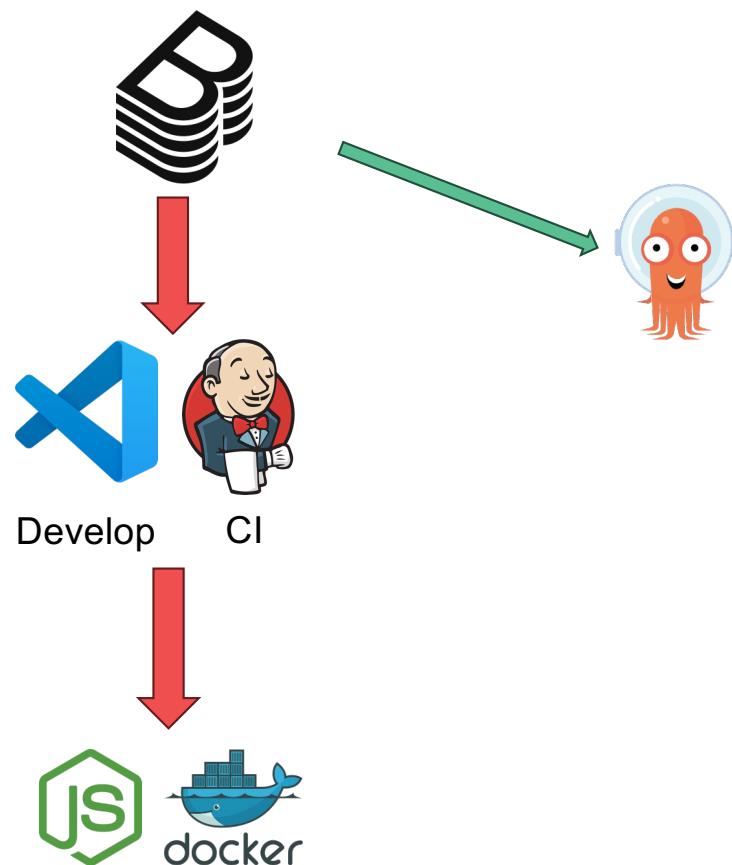
Platform Feature Dev/Deploy



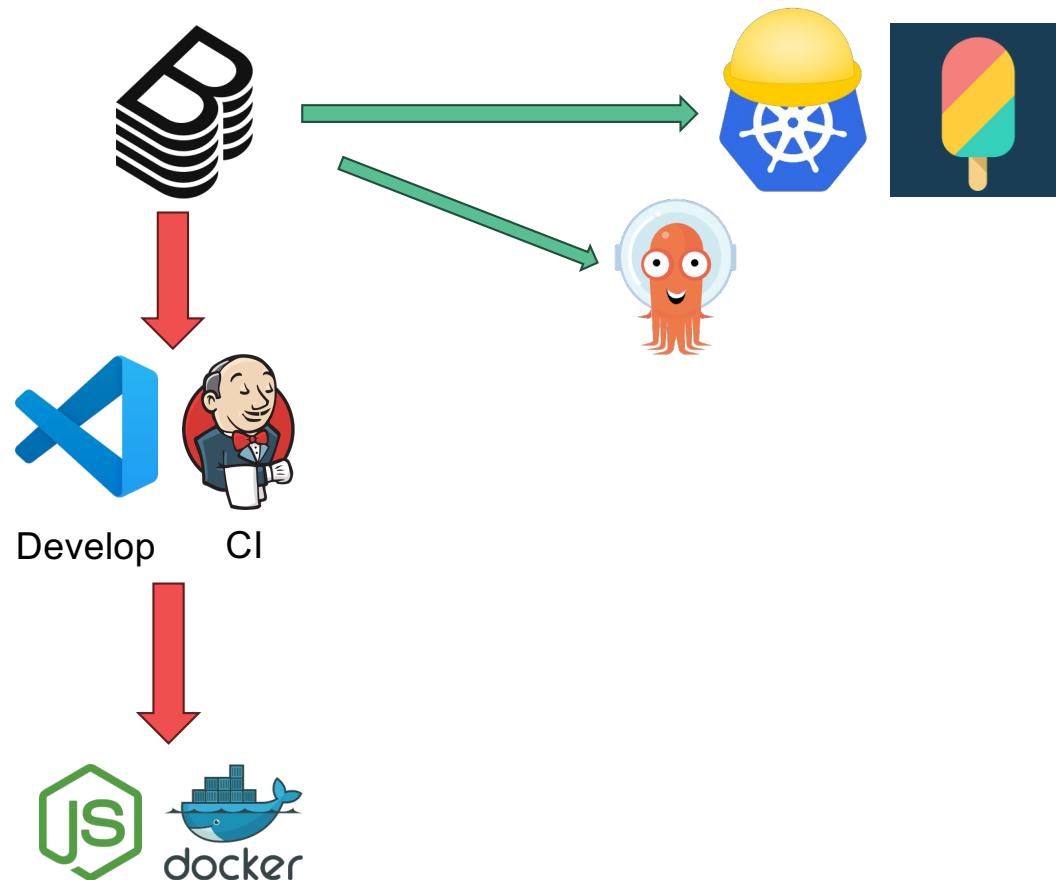
Platform Feature Dev/Deploy



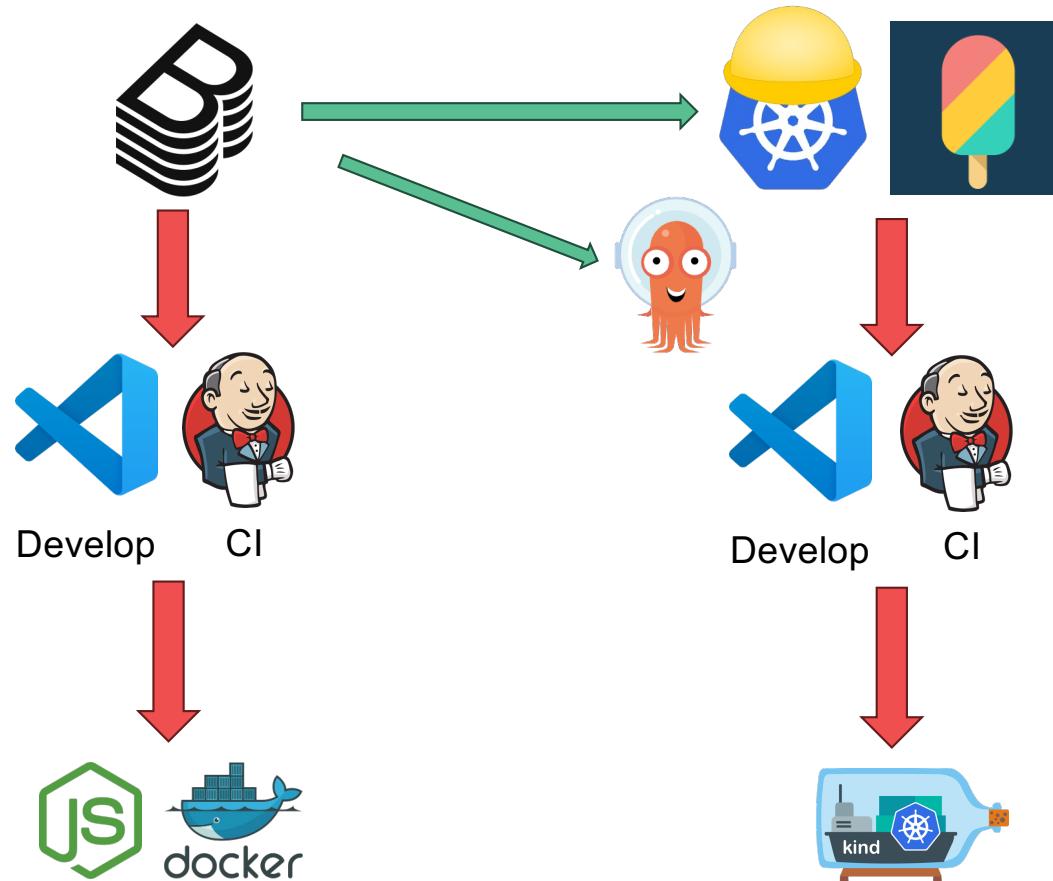
Platform Feature Dev/Deploy



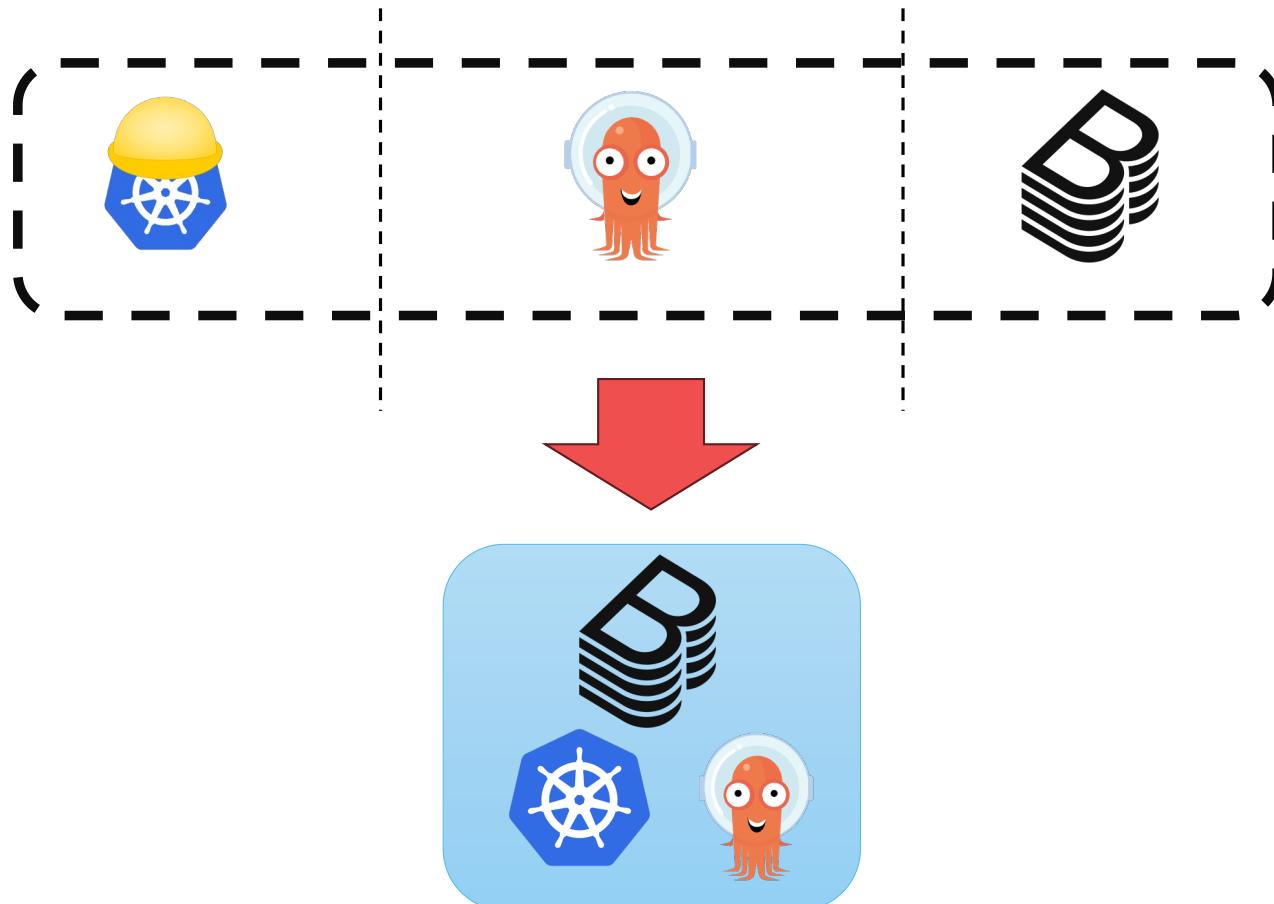
Platform Feature Dev/Deploy



Platform Feature Dev/Deploy



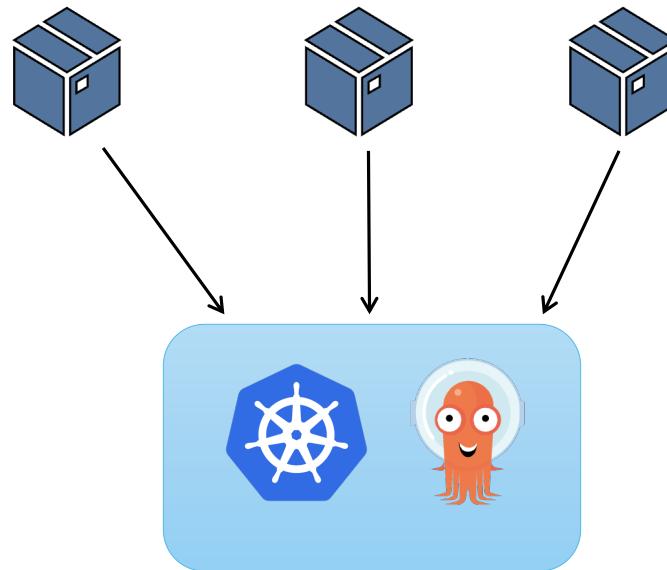
Platform Feature Dev/Deploy



Controller Dev/Deploy



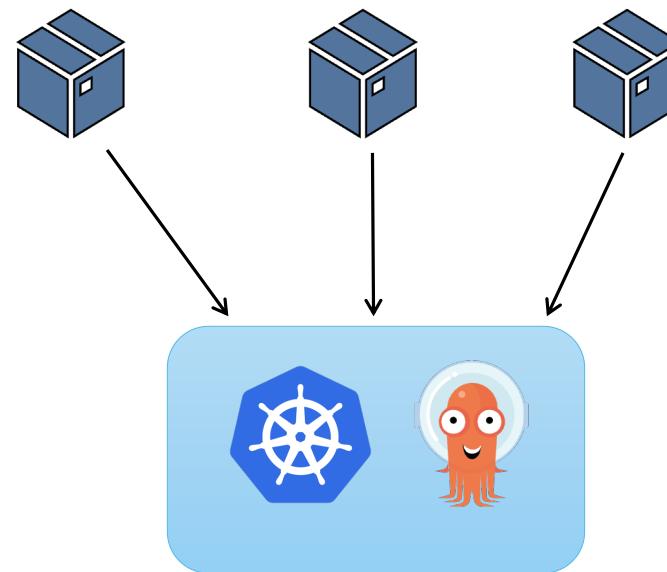
Controller Dev/Deploy



Controller Dev/Deploy

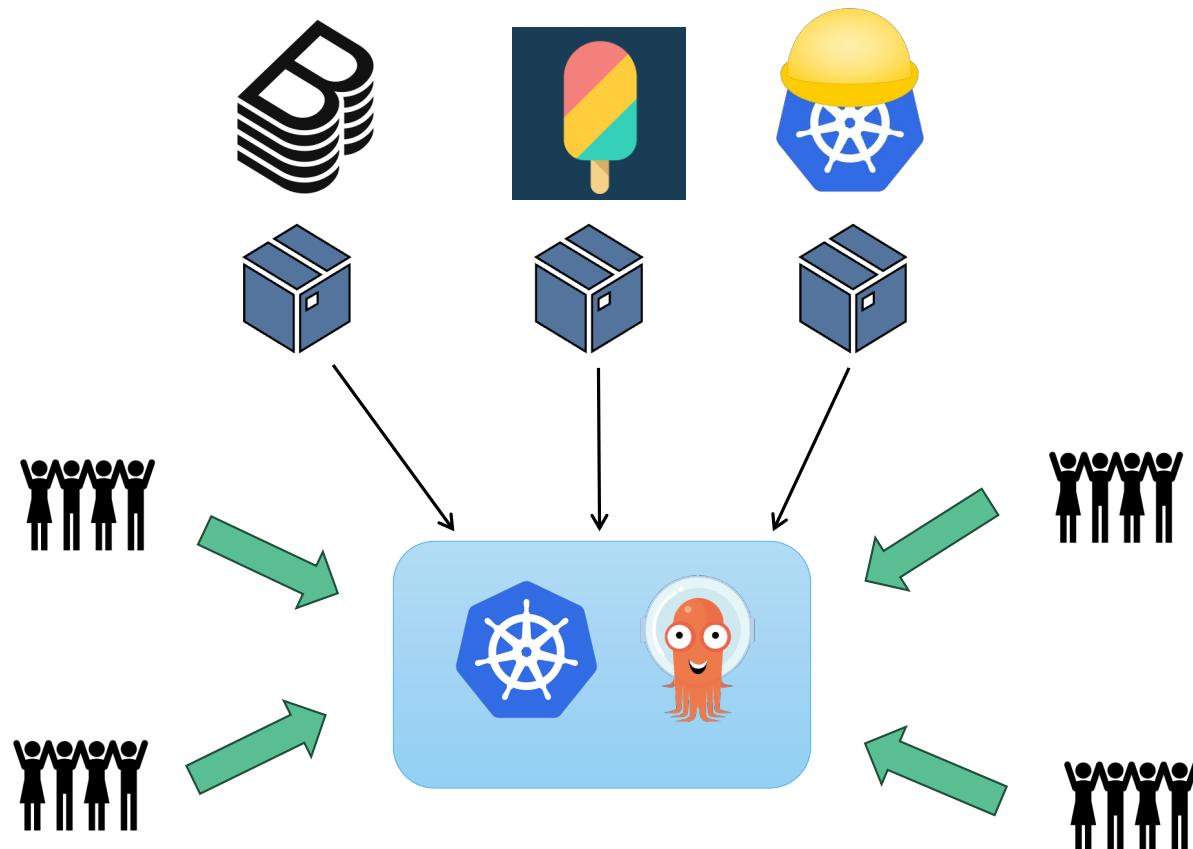


```
spec:  
  source:  
    repoURL: cnoe://manifests
```

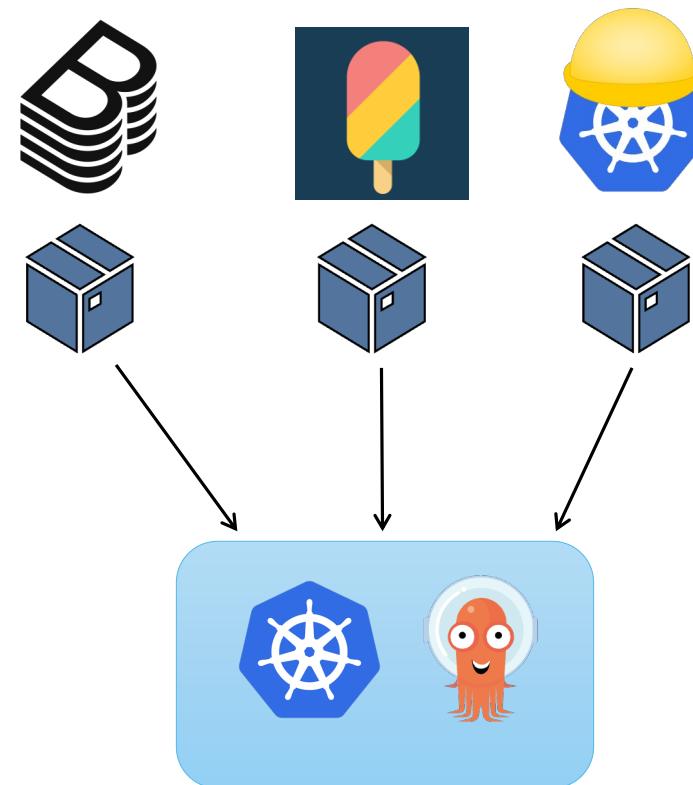


Inspired by ko.build!

Controller Dev/Deploy



Controller Dev/Deploy



<https://github.com/cnoe-io/idpbuilder>





If you couldn't tell this content was AI generated and has nothing to do with our employers.



Demo!

What you are about to see:

- Standing up a default idpbuilder cluster
- Installing a custom CNOE “package”
- Creating a Kubebuilder based operator and publishing locally
- Backstage template generation from a CRD w/ local publishing
- Using new template to create k8s resources



Demo!

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The screenshot shows the GitHub repository page for `cnoe-io/idpbuilder`. The repository is described as "Spin up a complete internal developer platform with only Docker required as a dependency." It has 43 issues, 7 pull requests, and 9 actions. The repository is public and has 26 forks and 66 stars. The code tab is selected, showing a list of commits from `jessesanford`. The commits include:

- Render external-secrets t... b5709eb · 16 hours ago 82 Commits
- .devcontainer re-work ref impl to use path base... last week
- .github Update to GoLang 1.21 (#105) 3 months ago
- api/v1alpha1 upgrade controller-gen v0.12.0 -... 2 weeks ago
- docs update readme and add example ... 3 months ago
- examples Render external-secrets template... 16 hours ago
- globals install gitea (#39) 4 months ago
- hack Persist restarts (#176) 4 days ago
- pkg fix check for existing port check. ... 3 days ago
- .gitignore install nginx out of band (#83) 4 months ago
- .goreleaser.yaml Fix #108: Add version command (...) last month
- CONTRIBUTING.md fix: use https for gitea (#121) 3 months ago
- LICENSE Initial commit 6 months ago
- Makefile upgrade controller-gen v0.12.0 -... 2 weeks ago
- README.md fix readme (#172) last week
- go.mod fail if the idpBuilder is launched o... 3 weeks ago
- go.sum fail if the idpBuilder is launched o... 3 weeks ago
- main.go Remove adsk internal domains 6 months ago

On the right side, there is an "About" section with a link to `cloud-native.slack.com/archives/C05TN9WFN55`, a "Readme" link, an "Apache-2.0 license" link, an "Activity" section, a "Custom properties" section, and a summary of statistics: 66 stars, 17 watching, 26 forks, and a "Report repository" link. Below that is a "Releases" section showing a "v0.3.0" release (Latest, last week), and a "+ 2 releases" link. The "Packages" section indicates "No packages published" and "Publish your first package". Finally, the "Contributors" section shows 12 contributors represented by small profile icons.

<https://github.com/cnoe-io/idpbuilder>



github.com/cnoe-io/idpbuilder

cnoe-io/idpbuilder: Spin up a complete internal developer platform with only Docker required as a dependency.

Pull requests (7) Discussions Actions Projects Security (9) Insights ...

Edit Pins Unwatch (17) Fork (26) Starred (66)

Go to file + <> Code

er external-secrets t... b5709eb · 16 hours ago 82 Commits

re-work ref impl to use path base... last week

Update to GoLang 1.21 (#105) 3 months ago

upgrade controller-gen v0.12.0 -... 2 weeks ago

update readme and add example ... 3 months ago

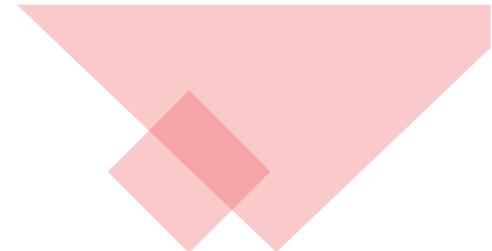
Render external-secrets template... 16 hours ago

About

Spin up a complete internal developer platform with only Docker required as a dependency.

cloud-native.slack.com/archives/C05TN9WFN5S

- Readme
- Apache-2.0 license
- Activity
- Custom properties
- 66 stars



HINT HINT



Architecture | CNOE

Cloud Native Operational Excellence (CNOE)

Approach

Technology Capabilities

Reference Implementations

- Installation
- Configurations
- Extensions

idpBuilder CLI

- Architecture**
- Pluggability

STAY UP-TO-DATE

Find the latest on the idpBuilder here: cnoe-io/idpbuilder

idpbuilder is made of two phases: CLI and Kubernetes controllers.

```

graph TD
    subgraph IDPBUILDER_CLI [IDPBUILDER CLI]
        direction TB
        1[1. Create Kind cluster] --> 2[2. Install]
        2 --> 3[3. Create Repositories and hand over control to ArgoCD]
        3 --> 4[4. Read]
        4 --> 5[5. Sync Custom Packages]
    end

    subgraph CLUSTER [Kind Cluster]
        direction TB
        1[Core Packages: ArgoCD, Gitea, Ingress-nginx] --> 2[ArgoCD Apps: ArgoCD, Ingress-nginx, Gitea, Backstage, Crossplane]
        2 -- GitOps --> 3[Gitea]
        3 --> 4[Core Packages]
        4 --> 5[Local Directory contents: argocd-app.yaml, manifest files]
    end

```

The architecture diagram illustrates the five-step process of setting up idpBuilder in a Kind cluster:

1. Create Kind cluster
2. Install
3. Create Repositories and hand over control to ArgoCD
4. Read
5. Sync Custom Packages

The Kind cluster contains Core Packages (ArgoCD, Gitea, Ingress-nginx). ArgoCD Apps (ArgoCD, Ingress-nginx, Gitea, Backstage, Crossplane) are deployed via GitOps. Gitea manages Git Repositories (ArgoCD, Ingress-nginx, Gitea, Backstage, Crossplane). The Local Directory contains the argocd-app.yaml and manifest files.



<https://cnoe.io>

github.com/cnoe-io/website/pulls

cnoe-io / website

Type ⌘ to search

Pull requests (1) Issues (14) Discussions Actions Projects (2) Wiki

Label issues and pull requests for new contributors

Now, GitHub will help potential first-time contributors [discover issues](#) labeled with [good first issue](#)

Filters is:pr is:open Labels (9) Milestones (1) New pull request

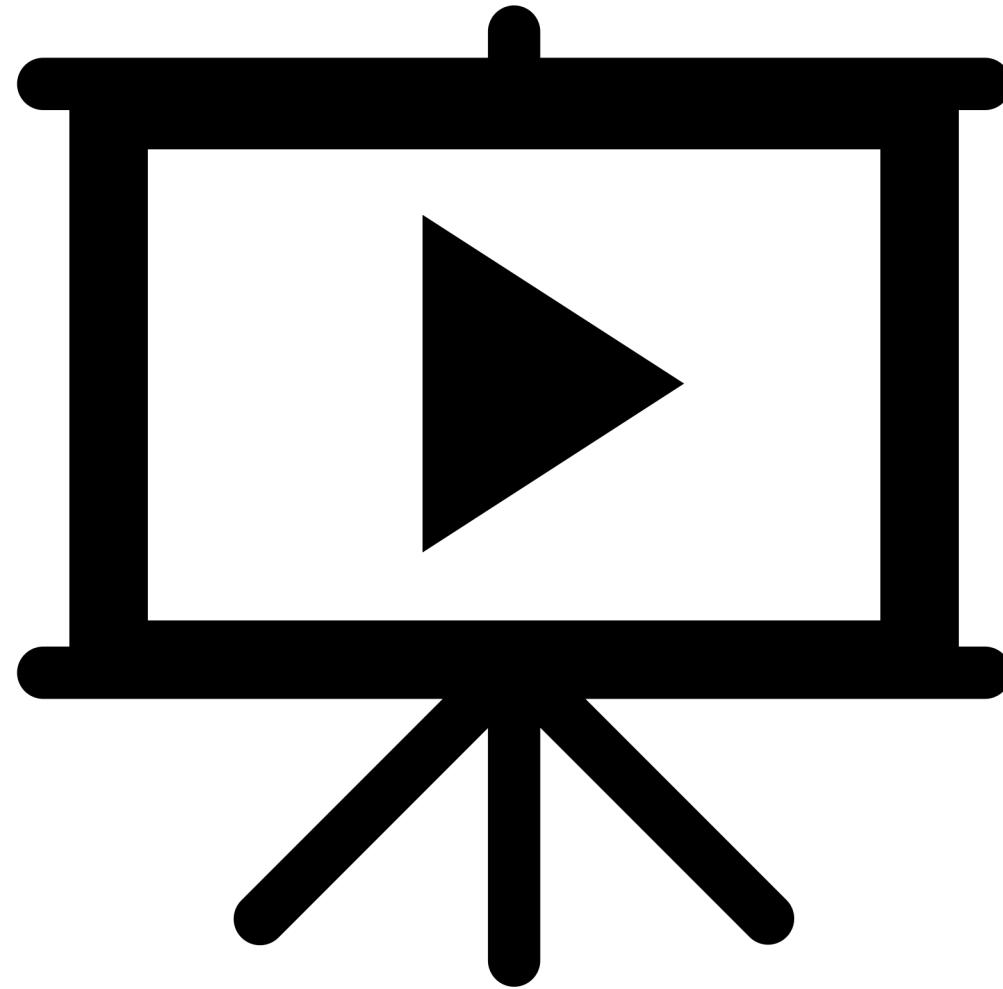
1 Open ✓ 13 Closed Author Label Projects Milestones Reviews Assignee Sort

AGAIN HINT!

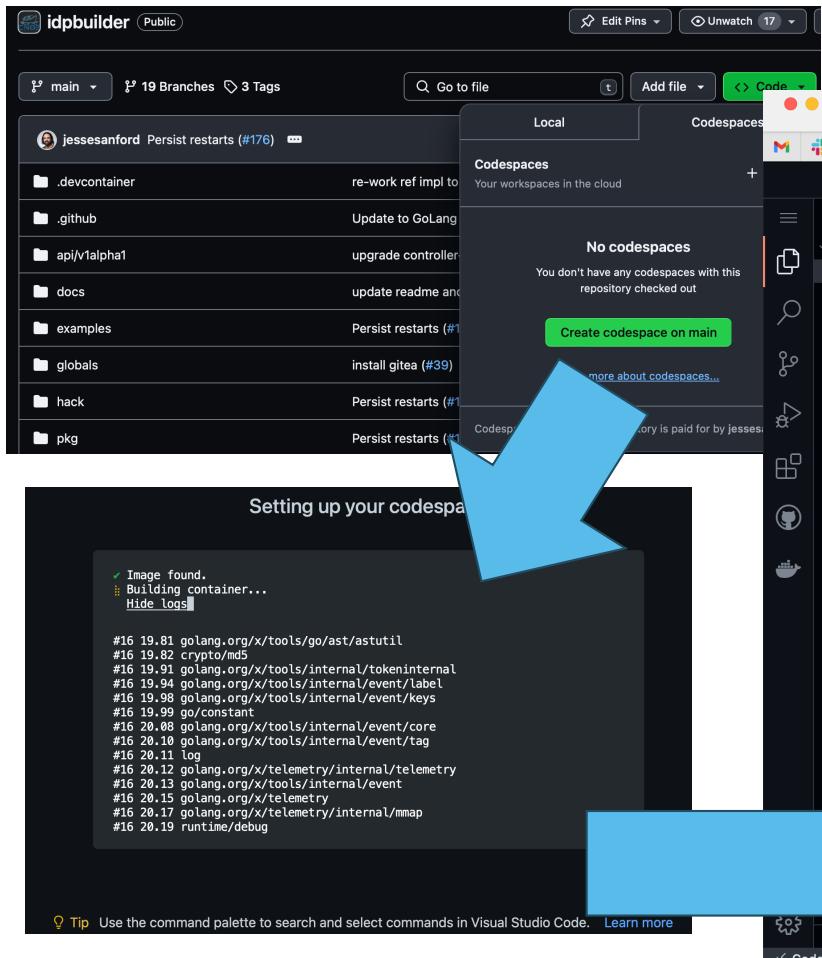
Live Demo?!



Live Demo?



Try it on Codespaces!



Credit: Carlos Santana (csantanapr)
& Manabu McCloskey (nabuskey)

A screenshot of a Visual Studio Code interface. On the left, the Explorer sidebar shows the project structure of 'IDPUILDER [CODESPACES: SYMMETRICAL SP...]' which includes '.devcontainer', '.github', 'workflows', and various configuration files like 'issue_template.yaml' and 'config.yml'. A large blue arrow points from the GitHub step towards this interface. On the right, the Terminal tab is active, displaying logs of the code creation process:

```
ustompackage controllerGroup=idpbuilder.cnoe.io controllerKind=CustomPackage
time=2024-03-18T21:50:00.557Z level=INFO msg="Shutdown signal received, waiting for all workers to finish" controller=gitrepository controllerGroup=idpbuilder.cnoe.io controllerKind=GitRepository
time=2024-03-18T21:50:00.557Z level=INFO msg="All workers finished" controller=gitrepository controllerGroup=idpbuilder.cnoe.io controllerKind=GitRepository
time=2024-03-18T21:50:00.557Z level=INFO msg="Shutdown signal received, waiting for all workers to finish" controller=localbuild controllerGroup=idpbuilder.cnoe.io controllerKind=LocalBuild
time=2024-03-18T21:50:00.557Z level=INFO msg="All workers finished" controller=localbuild controllerGroup=idpbuilder.cnoe.io controllerKind=LocalBuild
time=2024-03-18T21:50:00.557Z level=INFO msg="All workers finished" controller=custompackage controllerGroup=idpbuilder.cnoe.io controllerKind=CustomPackage
time=2024-03-18T21:50:00.557Z level=INFO msg="Stopping and waiting for caches"
time=2024-03-18T21:50:00.565Z level=INFO msg="Stopping and waiting for webhooks"
time=2024-03-18T21:50:00.565Z level=INFO msg="Stopping and waiting for HTTP servers"
time=2024-03-18T21:50:00.565Z level=INFO msg="Wait completed, proceeding to shutdown the manager"

#####
Finished Creating IDP Successfully!
#####

Can Access ArgoCD at https://argocd.cnoe.localtest.me:8443/
Username: admin
Password can be retrieved by running: kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath='{.data.password}' | base64 -d
@jessesanford ~ /idpbuilder (main) $
```

Testimony



...I think it's pretty awesome that the whole reference implementation could run on a Raspberry Pi
Also in a vscode remote dev container...
Kind of impressive to me. –Arron Atchison

Daniel Kirillov 5 hours ago

have to say - it's really neat being able to work on the whole stack locally - via idpbuilder

i'm trying to break apart the controllers right now, and being able to do the deployment locally (iterate on deployment issues) - and see how it looks - gives me some confidence it will be okay in CI (still here)/SB/....

(even found a bug in the current main/manager 😅 - harmless till broken apart) (edited)



One more thing!



Credit: Arron Atchison

The screenshot shows a desktop environment with several open windows:

- Terminal Window:** Shows system monitoring output. It includes a 'top' command showing CPU usage, a 'df -h' command showing disk space usage, and a 'curl' command to a local Argo endpoint.
- Browser Window:** Displays the Argo UI. It shows a list of applications and workflows, each with a status card indicating health, sync status, and logs.
- Large Application Window:** Titled "APPLICATIONS TILES", this window lists many services and their status across clusters. Services listed include argo-workflows, argo, backstage, backstage, crossplane, crossplane-compositions, crossplane-providers, external-secrets, gitea, keycloak, and nginx. Each service has a detailed status card with logs and sync history.

Thanks



Thanks to everyone who helped get idpbuilder over the line!

- MVP to Manabu McCloskey!
- Big thanks to Charles Moulliard!
- Nima Kaviani and the rest of the CNOE core team!



<https://github.com/cnoe-io/idpbuilder>



<https://cnoe.io>