



ArgoCon

NORTH AMERICA

The Case for ArgoCD and cdEvents Integration

Luke Philips – Kostis Kapelonis

Agenda



1. GitOps broke Dev EX
2. Intro to CD events
3. Existing support from other projects
4. Argo CD and CD events
5. Demo / examples
6. Specific use cases and more resources

Your hosts



ArgoCon
NORTH AMERICA



Luke Philips
Principal ~~Staff~~
Software Engineer

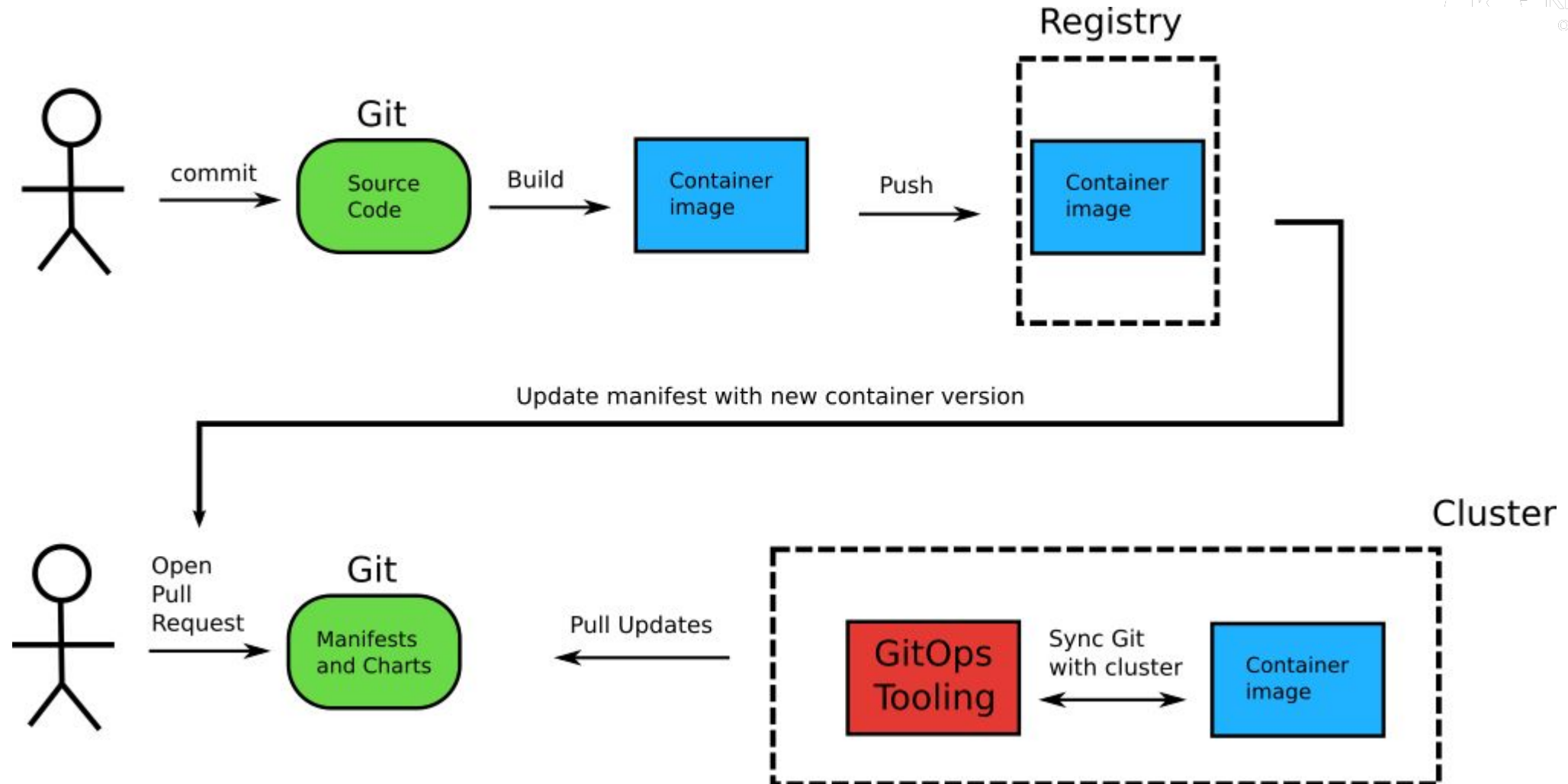


Kostis Kapelonis
Developer Advocate
Octopus Deploy

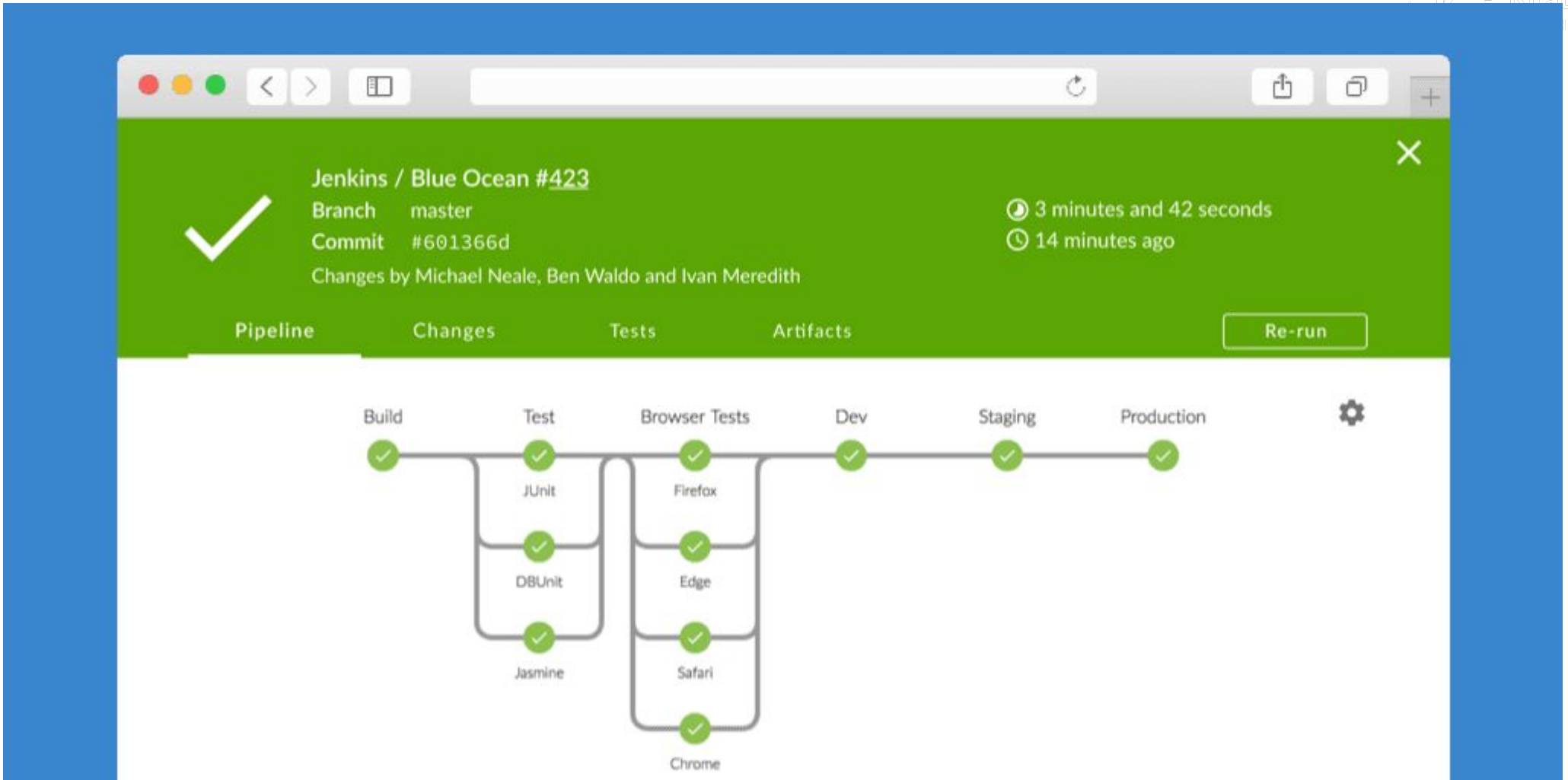


Dev Ex for GitOps

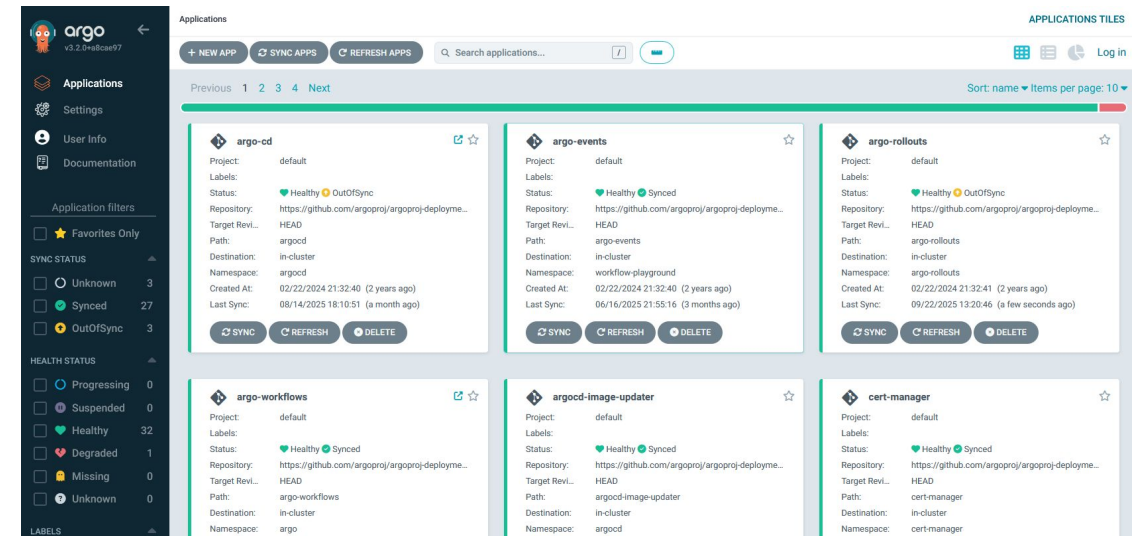
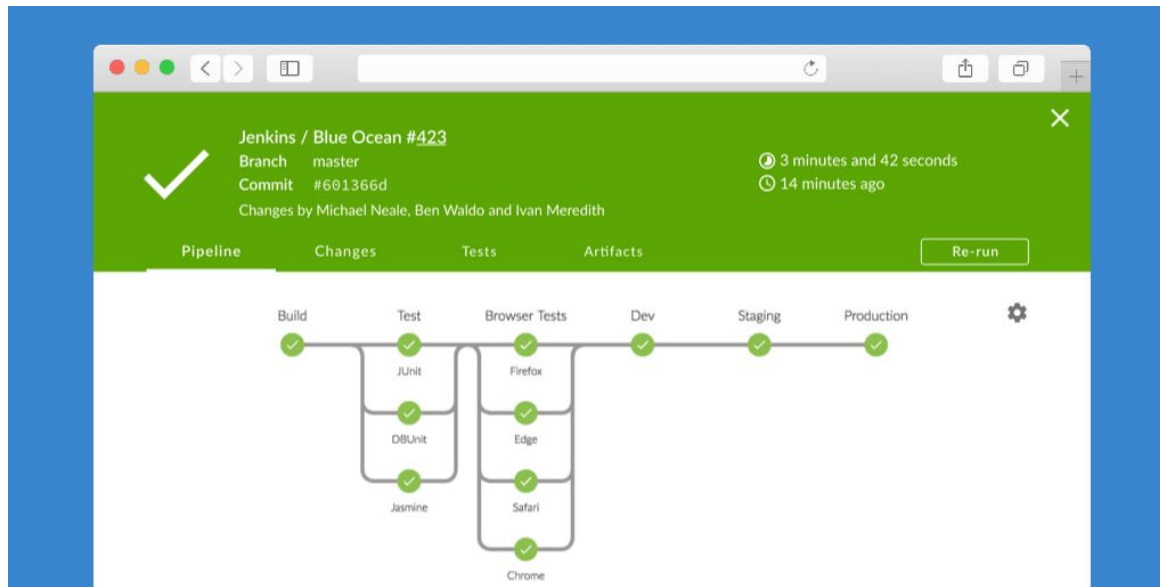
Converting to GitOps



Before



After



argo v3.2.0-rc1ca97

Applications

+ NEW APP + SYNC APPS + REFRESH APPS

Search applications...

Sort: name Items per page: 10

Previous 1 2 3 4 Next

Application filters

★ Favorites Only

SYNC STATUS

Unknown 3

Synced 27

OutOfSync 3

HEALTH STATUS

Progressing 0

Suspended 0

Healthy 32

Degraded 1

Missing 0

Unknown 0

Labels

argo-cd

Project: default

Labels:

Status: Healthy OutOfSync

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: argocd

Destination: in-cluster

Namespace: argocd

Created At: 02/22/2024 21:32:40 (2 years ago)

Last Sync: 08/14/2025 18:10:51 (a month ago)

SYNC REFRESH DELETE

argo-events

Project: default

Labels:

Status: Healthy Synced

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: argo-events

Destination: in-cluster

Namespace: workflow-playground

Created At: 02/22/2024 21:32:40 (2 years ago)

Last Sync: 06/16/2025 21:55:16 (3 months ago)

SYNC REFRESH DELETE

argo-rollouts

Project: default

Labels:

Status: Healthy OutOfSync

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: argo-rollouts

Destination: in-cluster

Namespace: argo-rollouts

Created At: 02/22/2024 21:32:41 (2 years ago)

Last Sync: 09/22/2025 13:20:46 (a few seconds ago)

SYNC REFRESH DELETE

argo-workflows

Project: default

Labels:

Status: Healthy Synced

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: argo-workflows

Destination: in-cluster

Namespace: argo

argocd-image-updater

Project: default

Labels:

Status: Healthy Synced

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: argocd-image-updater

Destination: in-cluster

Namespace: argocd

cert-manager

Project: default

Labels:

Status: Healthy Synced

Repository: https://github.com/argoproj/argoproj-deploye...

Target Revl... HEAD

Path: cert-manager




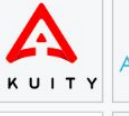
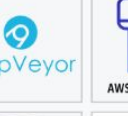

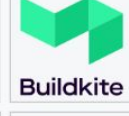

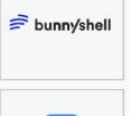
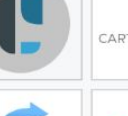
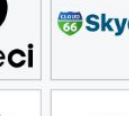
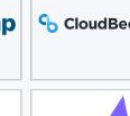
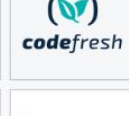




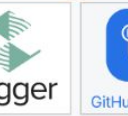





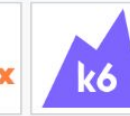



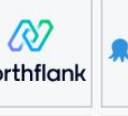
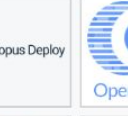


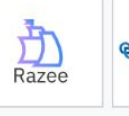
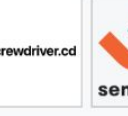
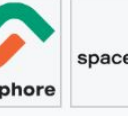
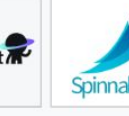

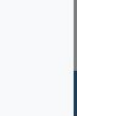





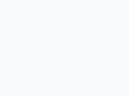
Destination: in-cluster

Namespace: cert-manager






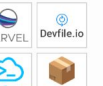







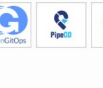



How We Got Here

App Definition and Development

Continuous Integration & Delivery

 argo CNCF GRADUATED	 flux CNCF GRADUATED	 keptn CNCF INCUBATING	 OpenKruise CNCF INCUBATING	 agola	 AKUTY	 AppVeyor	 AWS CodePipeline	 Azure Pipelines	 Bamboo	 BRIGADE	 Buildkite				
 bunshell	 Bytebase	 CARTOGRAPHER	 circleci	 Skycap	 CloudBees	 codefresh									
 Concourse	 D2IQ Dispatch	 devtron	 flagger	 GitHub Actions	 GitLab	 gitnexus	 go	 Google Cloud Build	 harness	 HELMWAVE	 hyscale	 Jenkins	 JENKINS X	 k6	 Keploy
 Liquibase	 Mergify	 Northflank	 Octopus Deploy	 OpenGitOps	 OpsMx	 ORTUS	 ozone	 PipeCD	 Razee	 Screwdriver.cd	 semaphore	 spacelift	 Spinnaker	 TeamCity	 TEKTON
 terramate	 TESTKUBE	 Travis CI	 unleash	 werf		 DEPLOY	 kube-burner								

FILTERS APPLIED (reset all): TAG: APP DELIVERY

App Definition and Development	Application Definition & Image Build	Streaming & Messaging																					
	 CNCF GRADUATED	 CNCF GRADUATED	 CNCF INCUBATING	 CNCF INCUBATING	 CNCF INCUBATING	 CNCF INCUBATING	 CNCF INCUBATING	 CNCF INCUBATING	 DevSpace	 ko	 CNCF GRADUATED	 CNCF INCUBATING											
Continuous Integration & Delivery	 CNCF GRADUATED											 CNCF GRADUATED		 CNCF INCUBATING		 CNCF INCUBATING		 OpenGitOps		 werf		 kubernetes	
	Container Registry																						
Provisioning	 CNCF GRADUATED																						

Challenge Your Preconceived Notions

**App Delivery
team**



CI/CD team





Intro to CD Events

- Common **specification** for Continuous Integration, Continuous Delivery, and Continuous Operation event communication
- Tool-agnostic, vendor-neutral
- Part of Continuous Delivery Foundation (CDF)
- Not a tool - a shared language

- ✅ Containers standardized shipping
- ↻ cdEvents standardizes communication



What happened

Where it
happened

```
{
  "context": {
    "version": "0.4.1",
    "id": "271069a8-fc18-44f1-b38f-9d70a1695819",
    "chainId": "4c8cb7dd-3448-41de-8768-eec704e2829b",
    "source": "/event/source/123",
    "type": "dev.cdevents.environment.created.0.2.0",
    "timestamp": "2023-03-20T14:27:05.315384Z",
    "schemaUri": "https://myorg.com/schema/custom",
    "links": [
      {
        "linkType": "RELATION",
        "linkKind": "TRIGGER",
        "target": {
          "contextId": "5328c37f-bb7e-4bb7-84ea-9f5f85e4a7ce"
        },
        "tags": {
          "foo1": "bar",
          "foo2": "bar"
        }
      }
    ]
  },
  "subject": {
    "id": "mySubject123",
    "source": "/event/source/123",
    "type": "environment",
    "content": {
      "name": "testEnv",
      "url": "https://example.org/testEnv"
    }
  }
}
```

Types of Events

(Core)

pipelineRun, taskRun

(Source control)

repositoryCreated,
branchDeleted, changeCreated

(Operations)

incidentReported, ticketCreated

(Continuous Integration)

buildStarted, artifactPackaged

(Continuous Deployment)

environmentCreated,
serviceDeployed

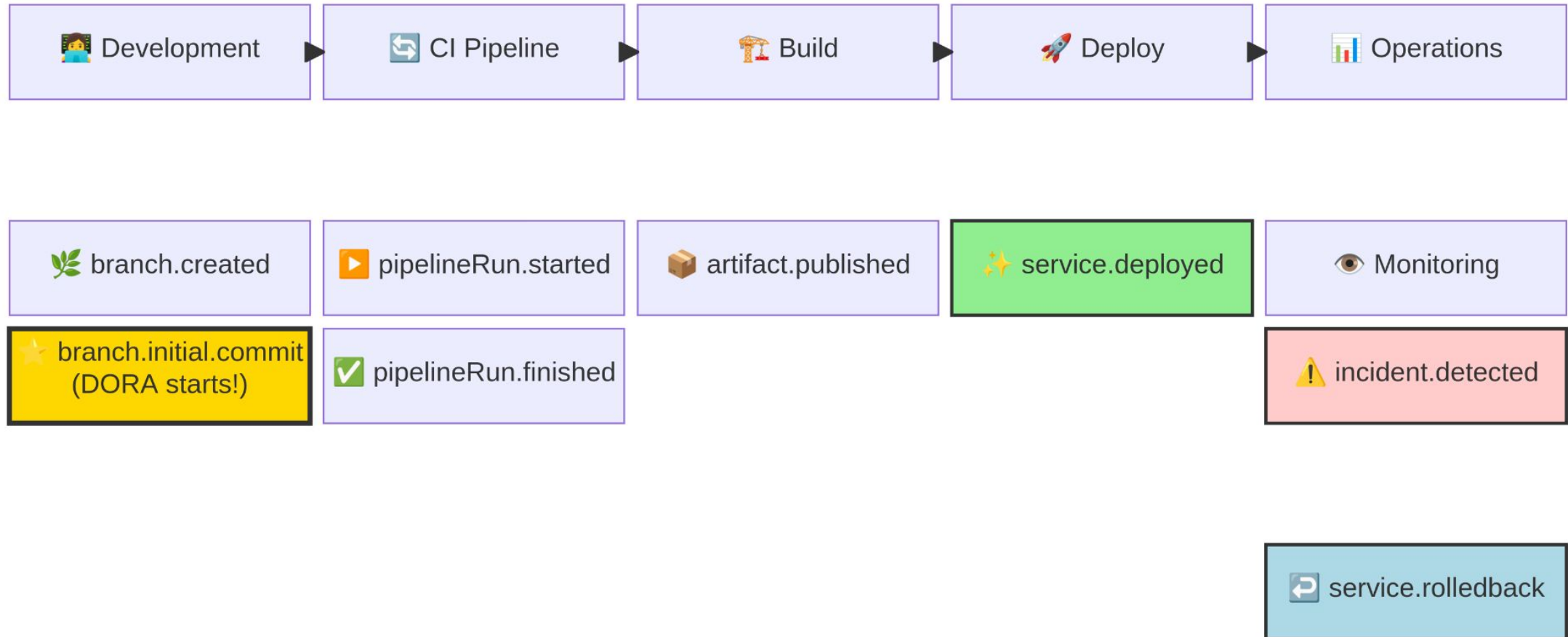
(Testing)

testCaseRunStarted,
testSuiteRunQueued

Most relevant to Argo CD



cdEvents - In Action



Each event has standard structure: subject (what), predicate** (action), context (when/where)

Integration Complexity

- **Every tool speaks a different language**
- **Glue code multiplies with each new tool**
- **Example: 3 companies, 3 completely different tool stacks**

Observability Gaps



- **Can't see the full picture across tools**
- **Questions we can't answer:**
 - **What's running right now?**
 - **Where's the bottleneck?**
 - **How long did end-to-end take?**

Vendor Lock-in






- **Switching tools means rewriting integrations**
- **Technical debt prevents innovation**
- **Cost of change is prohibitive**

Ecosystem support



cdEvents - Already Adopted



Production Ready:

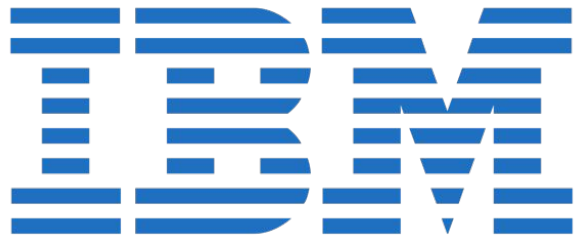
-  Jenkins - Plugin available in official repository
-  Tekton
-  Spinnaker
-  Flux
-  Argo Events

In Progress:

-  Harbor - CloudEvents support, cdEvents planned
-  ArgoCD - That's why we're here!



cdEvents - contributors



ERICSSON



Red Hat



vmware®



Argo CD and CDEvents

cdEvents - direct



cd
events

cd
events

Receiver

cdEvents - intermediate proxy



cdEvents - Receive

cd
events

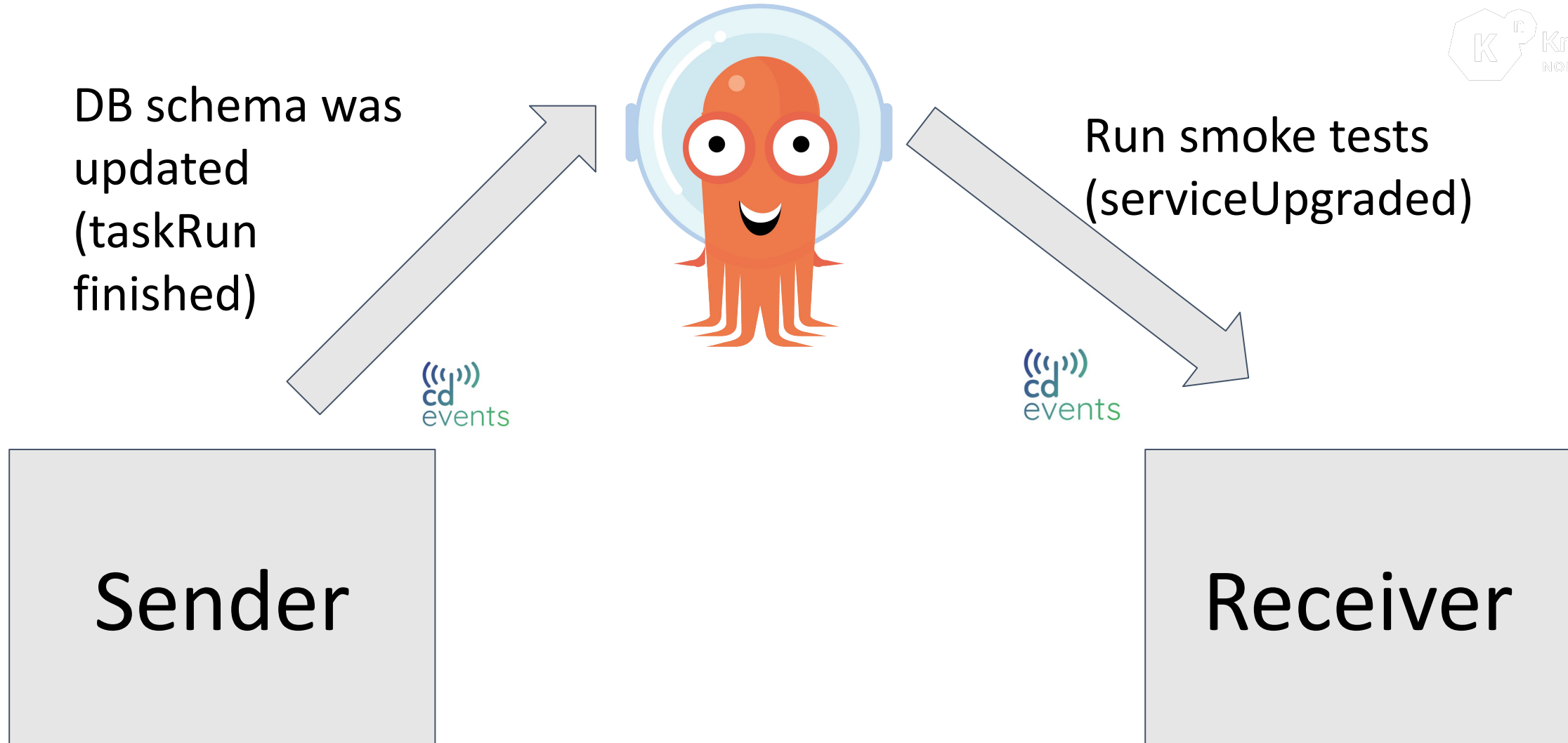
Sender



cd
events



cdEvents - full vision





Demo

Demo



cd
events

cd
events

Receiver

- Argo CD mapping for cdEvents via Notifications
- serviceDeployed, servicePublished, serviceRemoved
- incidentDetected, incidentResolved




github.com/argo-multiverse-labs/local-cluster/tree/main/argo-cdviz

Demo


```
# CDEvents-compliant notification templates
templates:
# Service Deployed/Upgraded Template
template.cdevents-service-deployed: |
  webhook:
    cdevents:
      method: POST
      body: |
        {
          "context": {
            "version": "0.4.1",
            "id": "{{ .app.metadata.uid }}",
            "source": "/argocd/{{ .app.metadata.name }}",
            "type": "dev.cdevents.service",
            "timestamp": "{{ .app.status.lastUpdatedTime }}",
            "subject": {
```

```
      "subject": {
        "id": "{{ .app.spec.destination.namespace }}/{{ .app.spec.destination.name }}",
        "type": "service",
        "source": "/argocd/{{ .app.spec.destination.namespace }}/{{ .app.spec.destination.name }}",
        "content": {
          "environment": {
            "id": "{{ .app.spec.destination.namespace }}/{{ .app.spec.destination.name }}",
            "source": "{{ .app.spec.destination.namespace }}/{{ .app.spec.destination.name }}",
          },
          "artifactId": "pkg:git/{{ .app.spec.sourceRepository.url }}",
        },
      },
      "customData": {
        "argocdApp": "{{ .app.metadata.name }}",
        "syncStatus": "{{ .app.status.sync.status }}",
        "healthStatus": "{{ .app.status.health.status }}",
        "targetRevision": "{{ .app.spec.destination.revision }}",
        "cluster": "{{ .app.spec.destination.name }}"
```



Demo

 **guestbook-dev** ★


Project: default
Labels:
Status: Healthy Synced
Repository: <https://github.com/argocd-multiverse-labs/argocd>
Target Revision: master
Path: [https://github.com/argocd-multiverse-labs/argocd](#)
Destination: in-cluster
Namespace: default
Created At: 2025-11-05 21:31:33
Last Sync: 2025-11-05 21:31:33

 **hello-app**

Project: default
Labels:
Status: Healthy Synced
Repository: <https://github.com/argocd-multiverse-labs/argocd>
Target Revision: master
Path: [https://github.com/argocd-multiverse-labs/argocd](#)
Destination: in-cluster
Namespace: default
Created At: 2025-11-05 21:31:33
Last Sync: 2025-11-05 21:31:33

 **guestbook-prod** ★

Project: default
Labels:
Status: Healthy Synced
Repository: <https://github.com/argocd-multiverse-labs/argocd>
Target Revision: master
Path: [https://github.com/argocd-multiverse-labs/argocd](#)
Destination: in-cluster
Namespace: default
Created At: 2025-11-05 21:31:33
Last Sync: 2025-11-05 21:31:33

 **guestbook-staging** ★

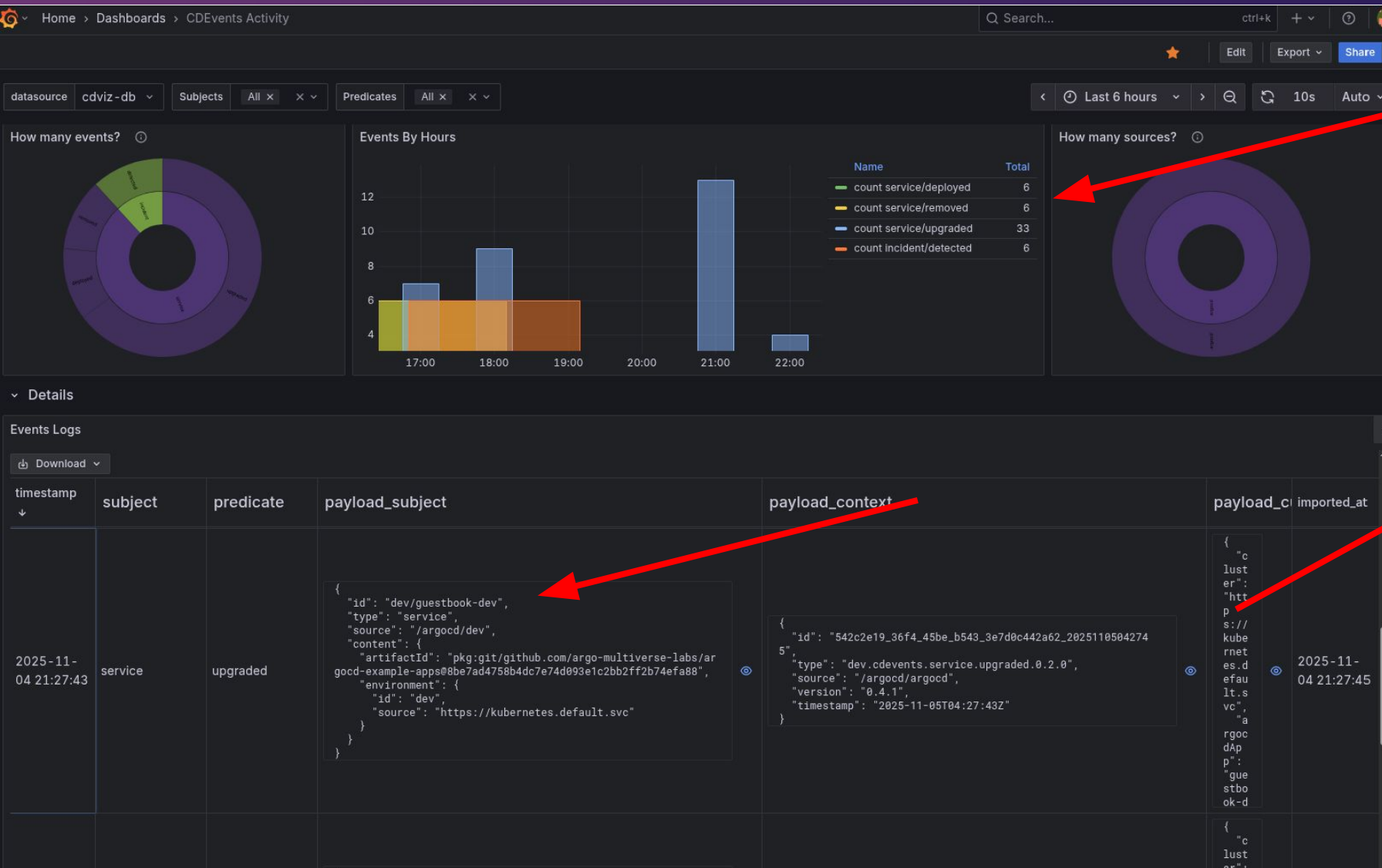
Project: default
Labels:
Status: Healthy Synced
Repository: <https://github.com/argocd-multiverse-labs/argocd>
Target Revision: master
Path: [https://github.com/argocd-multiverse-labs/argocd](#)
Destination: in-cluster
Namespace: default
Created At: 2025-11-05 21:31:33
Last Sync: 2025-11-05 21:31:33

```
Logs(argocd/argocd-notifications-controller-67b649bdb8-spp7x:notifications-controller)[tail]
Autoscroll:On FullScreen:Off Timestamps:Off Wrap:Off
{"level":"info","msg":"Trigger on-health-recovered-cdevents result: [{[0].LYPjeGE3jNFG1RL2f-jarm0r4fA [cdevents-incident-resolved] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-sync-running-cdevents result: [{[0].ic91dZU3WrtgRdLZCpg-L8ARI0Q [] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-sync-status-unknown-cdevents result: [{[0].6S2Wb05EK-0v90hwjyytTbN7S6A [cdevents-incident-detected] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-deployed-cdevents result: [{[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g [cdevents-service-deployed] true}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Sending notification about condition 'on-deployed-cdevents.[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g' to '{cdevents}' using the configuration 'on-deployed-cdevents'", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Processing completed", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Start processing", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-deployed-cdevents result: [{[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g [cdevents-service-deployed] true}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
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{"level":"info","msg":"Trigger on-health-degraded-cdevents result: [{[0].zoG5zUjYgJmKwCGgIQGjx1h05s [cdevents-incident-detected] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-deleted-cdevents result: [{[0].BmlU8P6R19BGtNv5gj8udVypmxQ [cdevents-service-removed] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-sync-failed-cdevents result: [{[0].QocUZC1Qz0--b2WEwALX85YPE5o [cdevents-sync-failed] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-health-recovered-cdevents result: [{[0].LYPjeGE3jNFG1RL2f-jarm0r4fA [cdevents-incident-resolved] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-sync-running-cdevents result: [{[0].ic91dZU3WrtgRdLZCpg-L8ARI0Q [] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-sync-status-unknown-cdevents result: [{[0].6S2Wb05EK-0v90hwjyytTbN7S6A [cdevents-incident-detected] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-deployed-cdevents result: [{[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g [cdevents-service-deployed] true}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Notification about condition 'on-deployed-cdevents.[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g' already sent to '{cdevents}' using the configuration 'on-deployed-cdevents'", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Trigger on-health-degraded-cdevents result: [{[0].zoG5zUjYgJmKwCGgIQGjx1h05s [cdevents-incident-detected] false}]", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Processing completed", "resource":"argocd/hello-app-dev", "time":"2025-11-05T21:31:33Z"}
{"level":"info","msg":"Start processing", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-deleted-cdevents result: [{[0].BmlU8P6R19BGtNv5gj8udVypmxQ [cdevents-service-removed] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-failed-cdevents result: [{[0].QocUZC1Qz0--b2WEwALX85YPE5o [cdevents-sync-failed] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-health-recovered-cdevents result: [{[0].LYPjeGE3jNFG1RL2f-jarm0r4fA [cdevents-incident-resolved] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-running-cdevents result: [{[0].ic91dZU3WrtgRdLZCpg-L8ARI0Q [] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-status-unknown-cdevents result: [{[0].6S2Wb05EK-0v90hwjyytTbN7S6A [cdevents-incident-detected] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-deployed-cdevents result: [{[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g [cdevents-service-deployed] true}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Notification about condition 'on-deployed-cdevents.[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g' already sent to '{cdevents}' using the configuration 'on-deployed-cdevents'", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-health-degraded-cdevents result: [{[0].zoG5zUjYgJmKwCGgIQGjx1h05s [cdevents-incident-detected] false}]", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Processing completed", "resource":"argocd/guestbook-prod", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Start processing", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-deleted-cdevents result: [{[0].BmlU8P6R19BGtNv5gj8udVypmxQ [cdevents-service-removed] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-failed-cdevents result: [{[0].QocUZC1Qz0--b2WEwALX85YPE5o [cdevents-sync-failed] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-health-recovered-cdevents result: [{[0].LYPjeGE3jNFG1RL2f-jarm0r4fA [cdevents-incident-resolved] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-running-cdevents result: [{[0].ic91dZU3WrtgRdLZCpg-L8ARI0Q [] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-sync-status-unknown-cdevents result: [{[0].6S2Wb05EK-0v90hwjyytTbN7S6A [cdevents-incident-detected] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-deployed-cdevents result: [{[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g [cdevents-service-deployed] true}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Notification about condition 'on-deployed-cdevents.[0].Yv81TUs0gmPTEyk-v8Lb6ZKEo0g' already sent to '{cdevents}' using the configuration 'on-deployed-cdevents'", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Trigger on-health-degraded-cdevents result: [{[0].zoG5zUjYgJmKwCGgIQGjx1h05s [cdevents-incident-detected] false}]", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
{"level":"info","msg":"Processing completed", "resource":"argocd/guestbook-staging", "time":"2025-11-05T21:31:38Z"}
```

github.com/argocd-multiverse-labs/local-cluster/tree/main/argo-cdviz



Demo



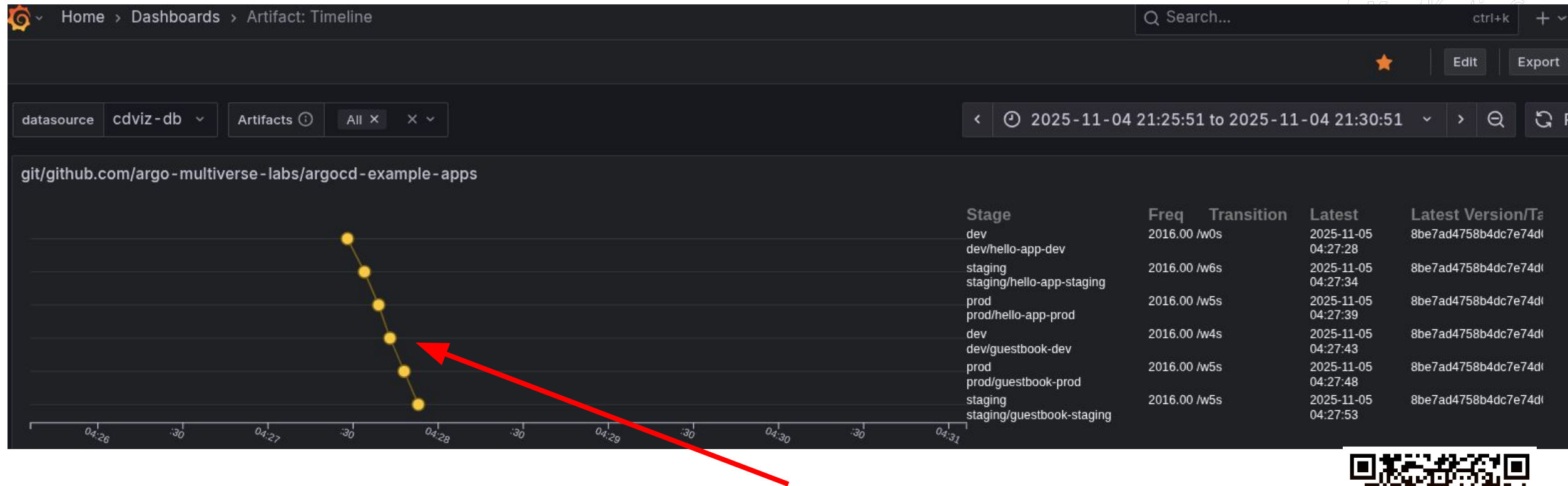
Inspect value

```
{
  "cluster": "https://kubernetes.default.svc",
  "argocdApp": "guestbook-dev",
  "namespace": "dev",
  "syncStatus": "Synced",
  "healthStatus": "Healthy",
  "targetRevision": "<no value>"
}
```



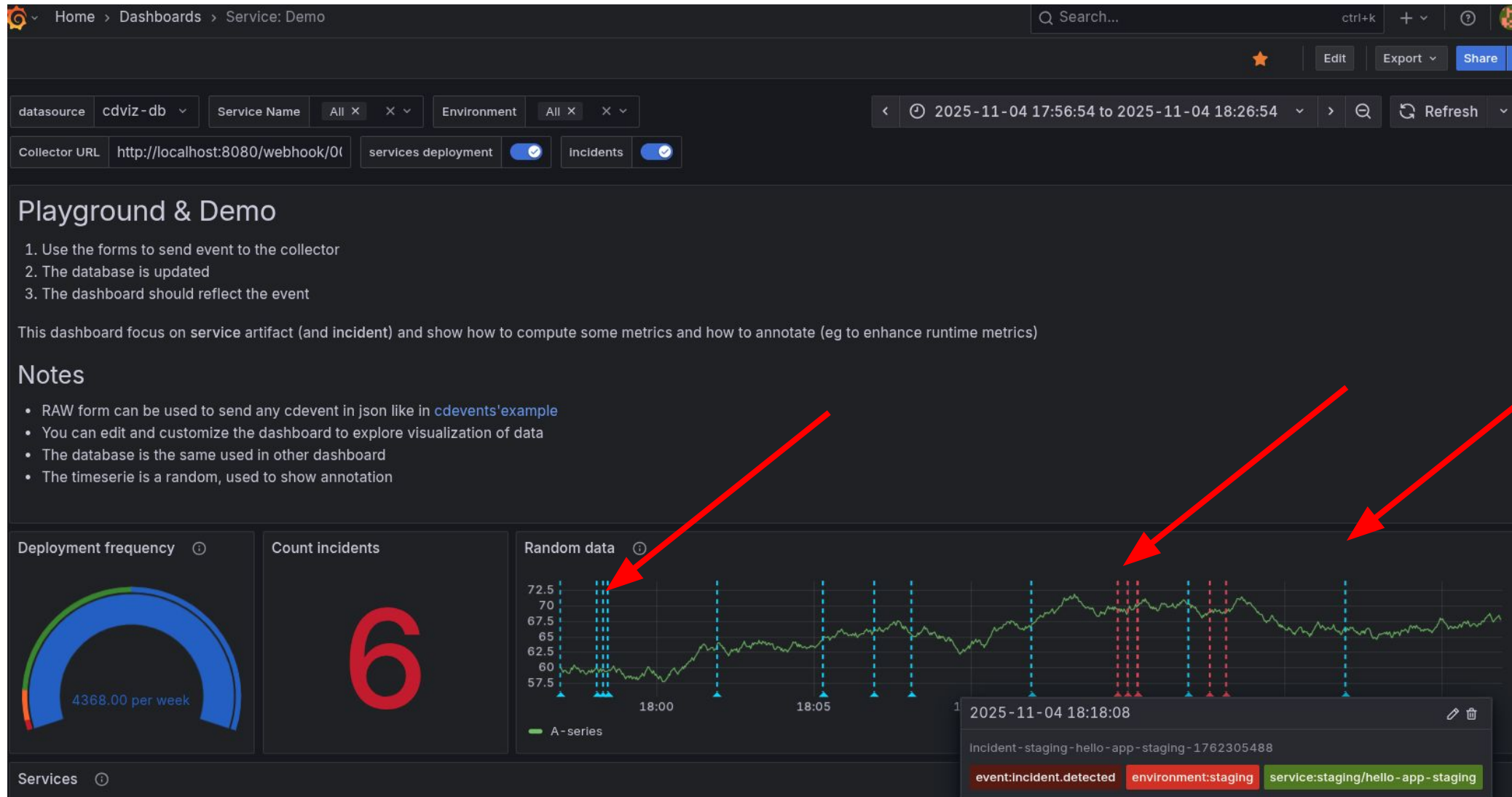
github.com/argomultiverse-labs/local-cluster/tree/main/argo-cdviz

Demo



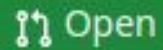
github.com/argo-multiverse-labs/local-cluster/tree/main/argo-cdviz

Demo



PR is already open

feat: Proposal: cdEvents and Argo #24106



Open

lukepatrick wants to merge 3 commits into `argoproj:master` from `lukepatrick:feature/cdevents-proposal` 

👍👎 We need your feedback!



<https://github.com/argoproj/argo-cd/pull/24106>

Use cases

Use Case - Multi-Argo Architecture

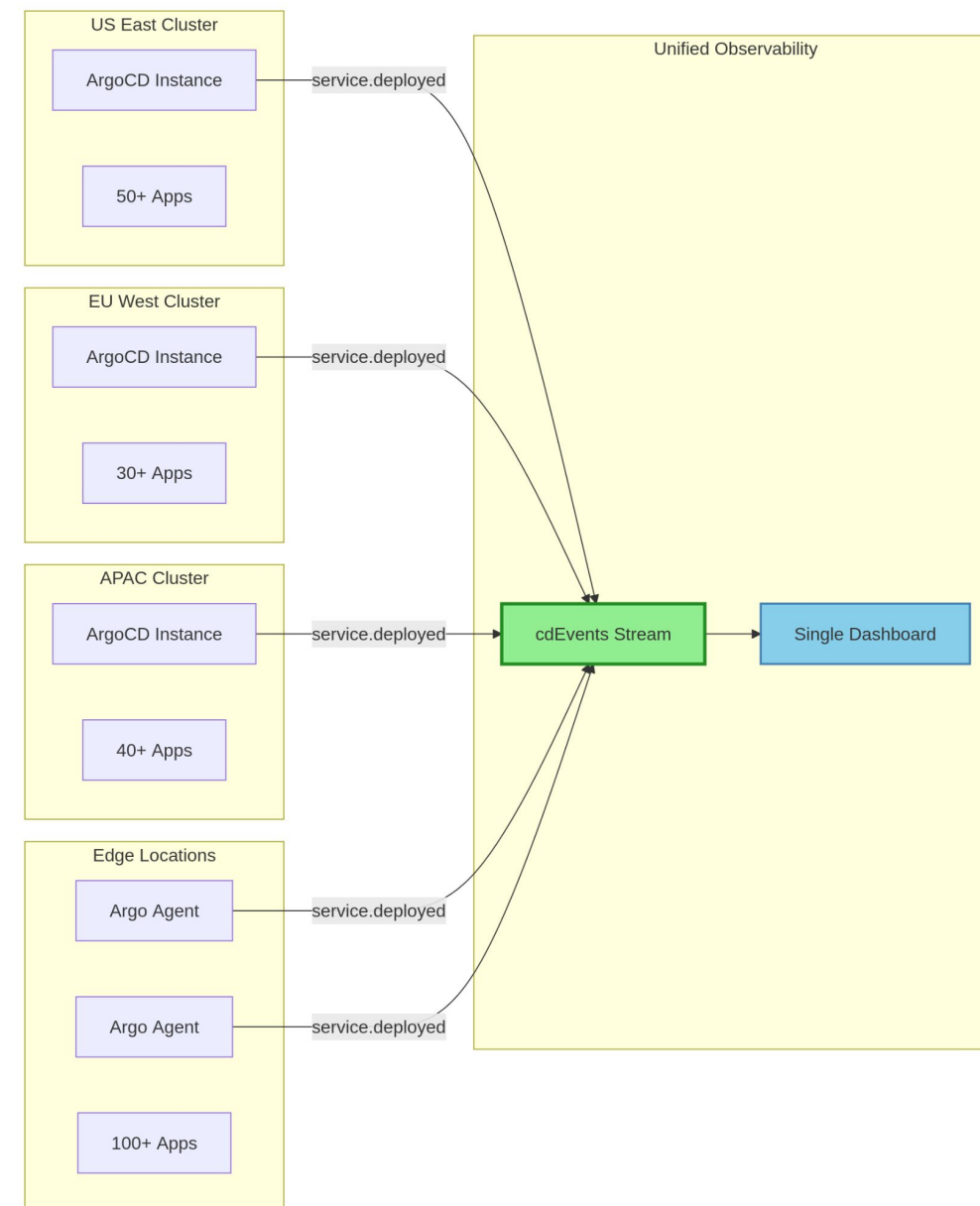


Many ArgoCD Instances, One Event Stream

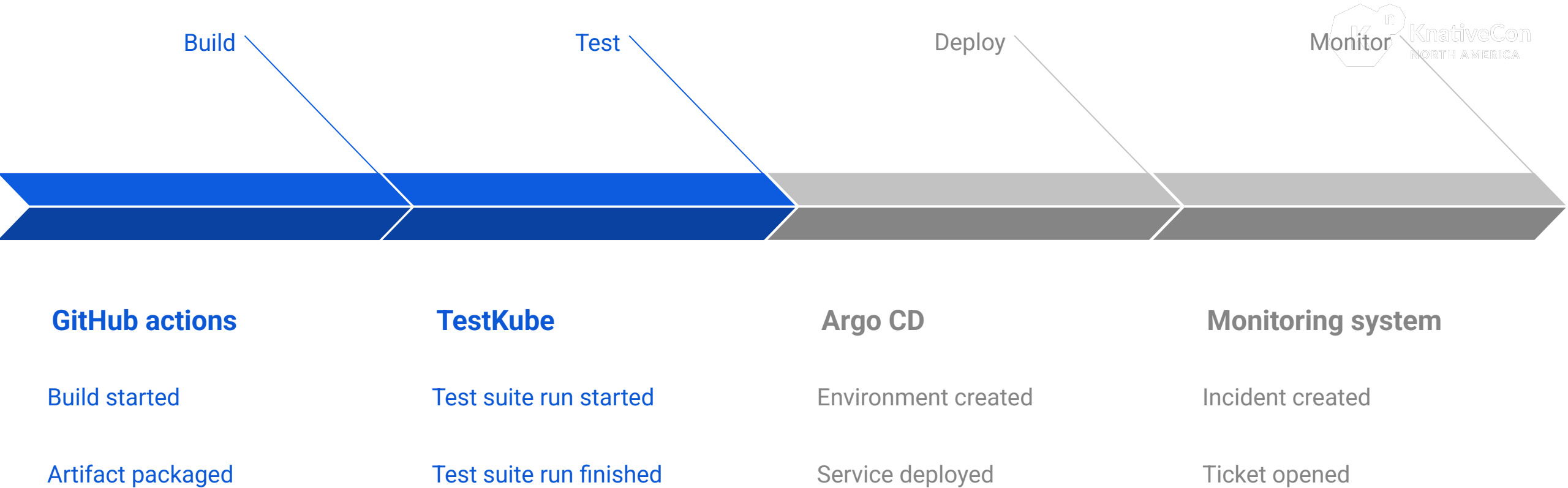
The Challenge:

Which Argo architecture do you choose?

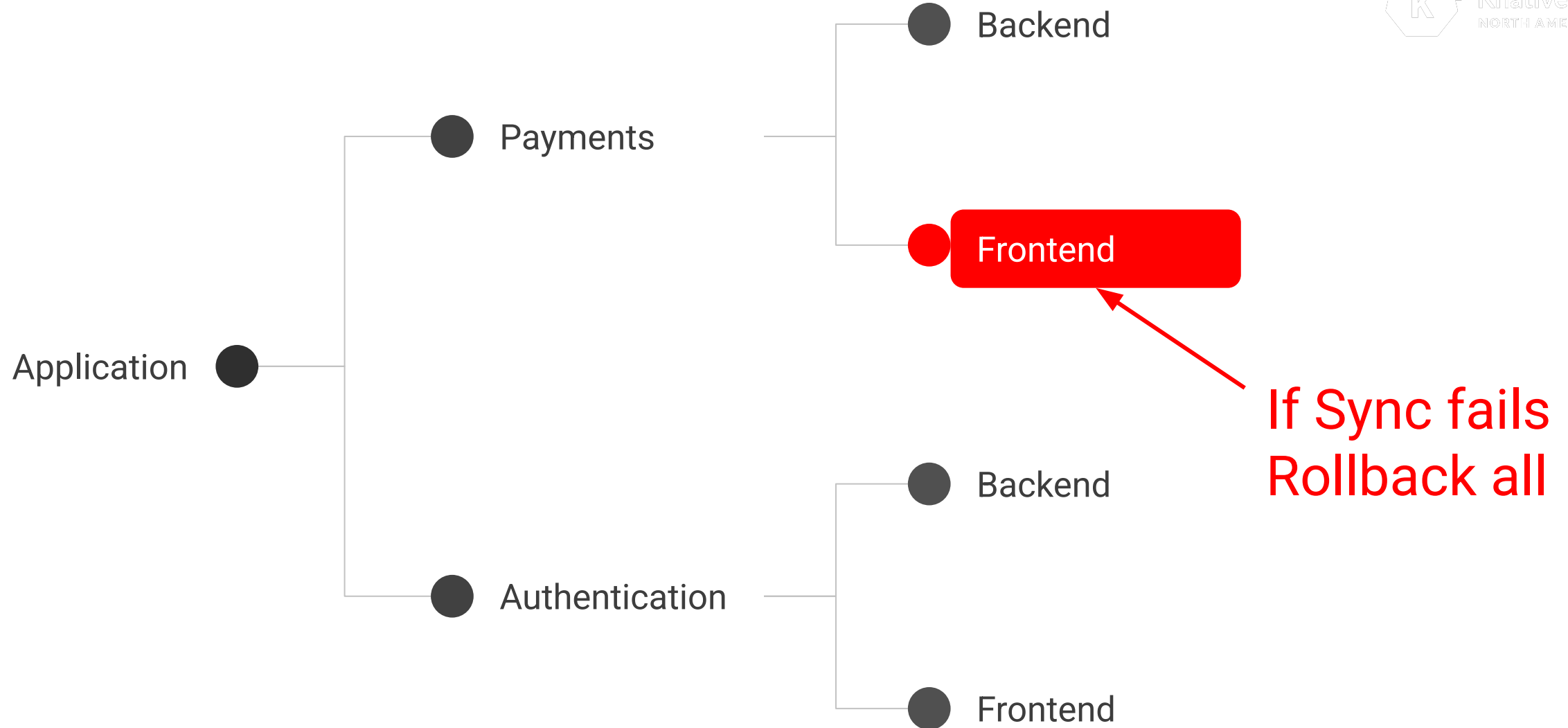
- 🏢 **Hub-and-Spoke** (single control plane)
- 🌐 **Distributed** (many independent instances)
- ☁️ **Managed** (Akuity, Codefresh)
- 🤖 **Argo Agent** (upcoming)



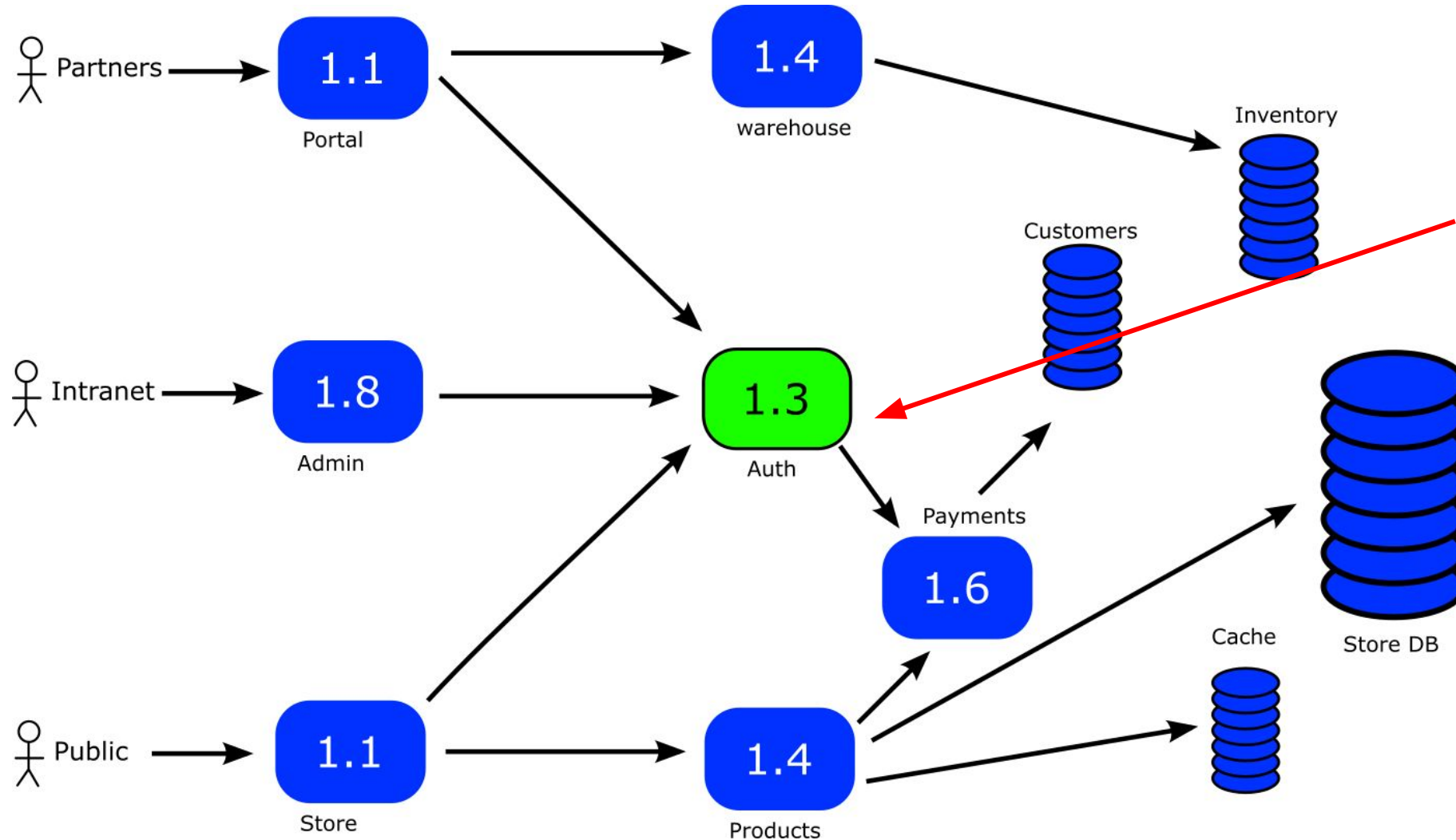
Use Case - Developer Dashboard



Use Case - Distributed Rollback

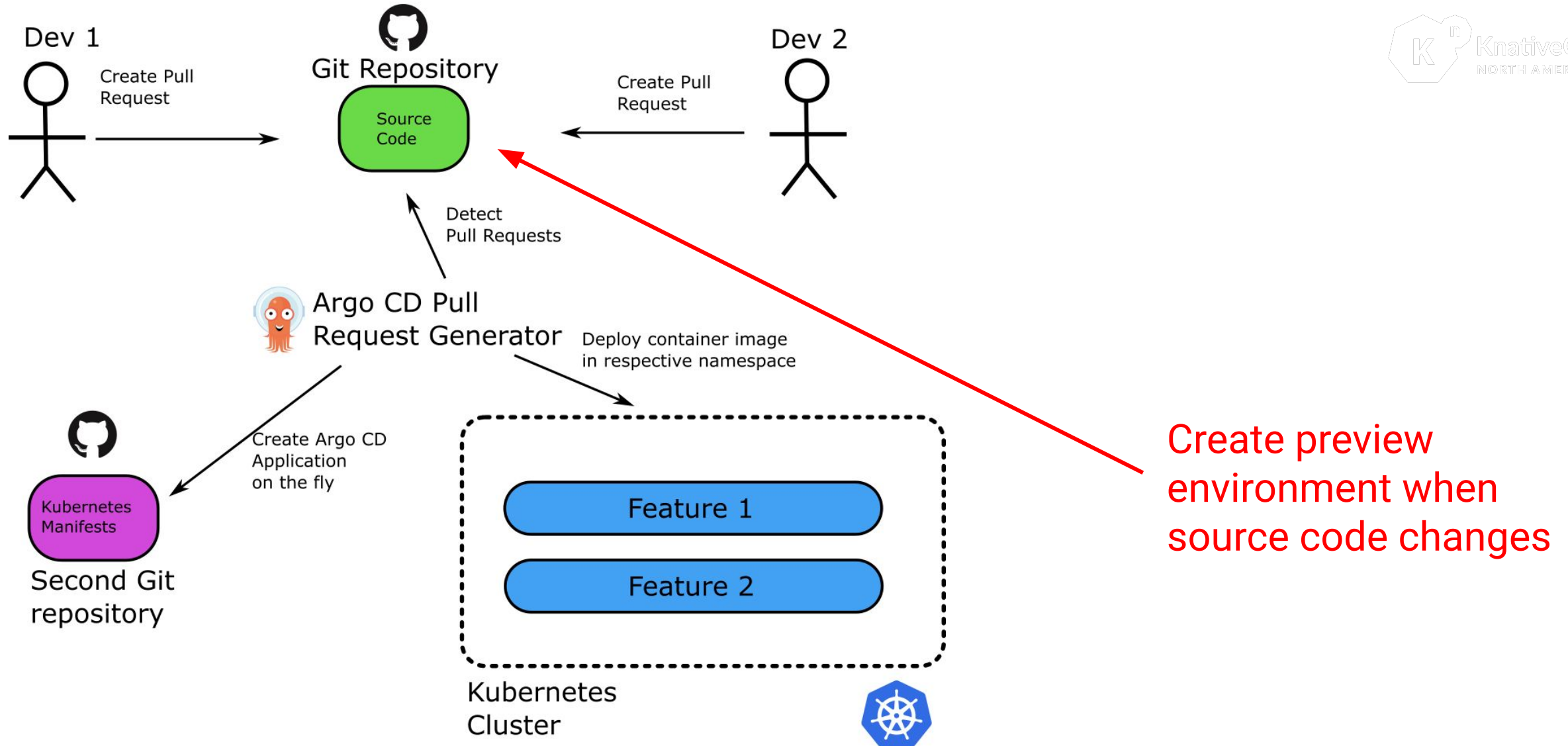


Use Case - Microservice Testing



Test portal, admin, store when Auth is deployed

Simple Preview Environments

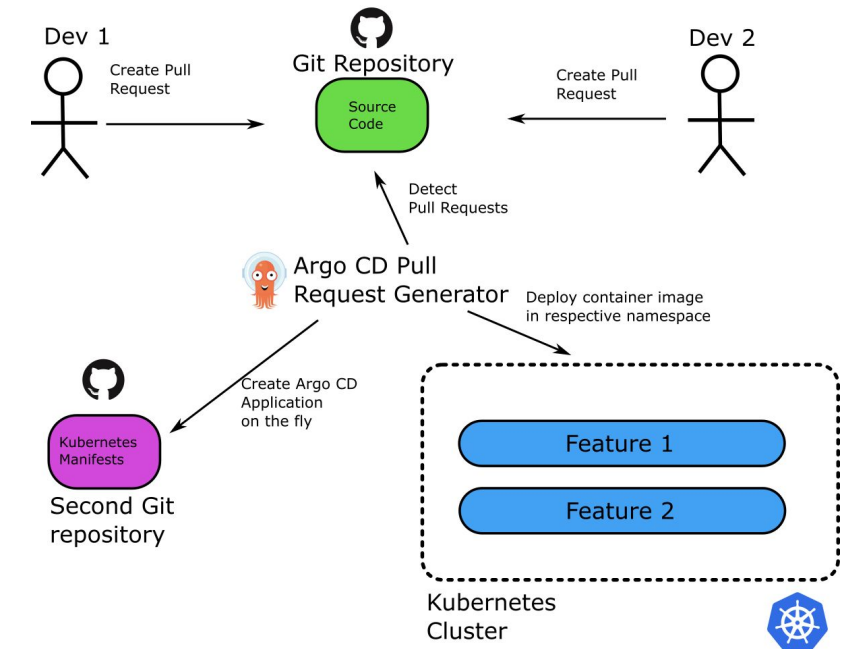


Use Case - Preview Environments

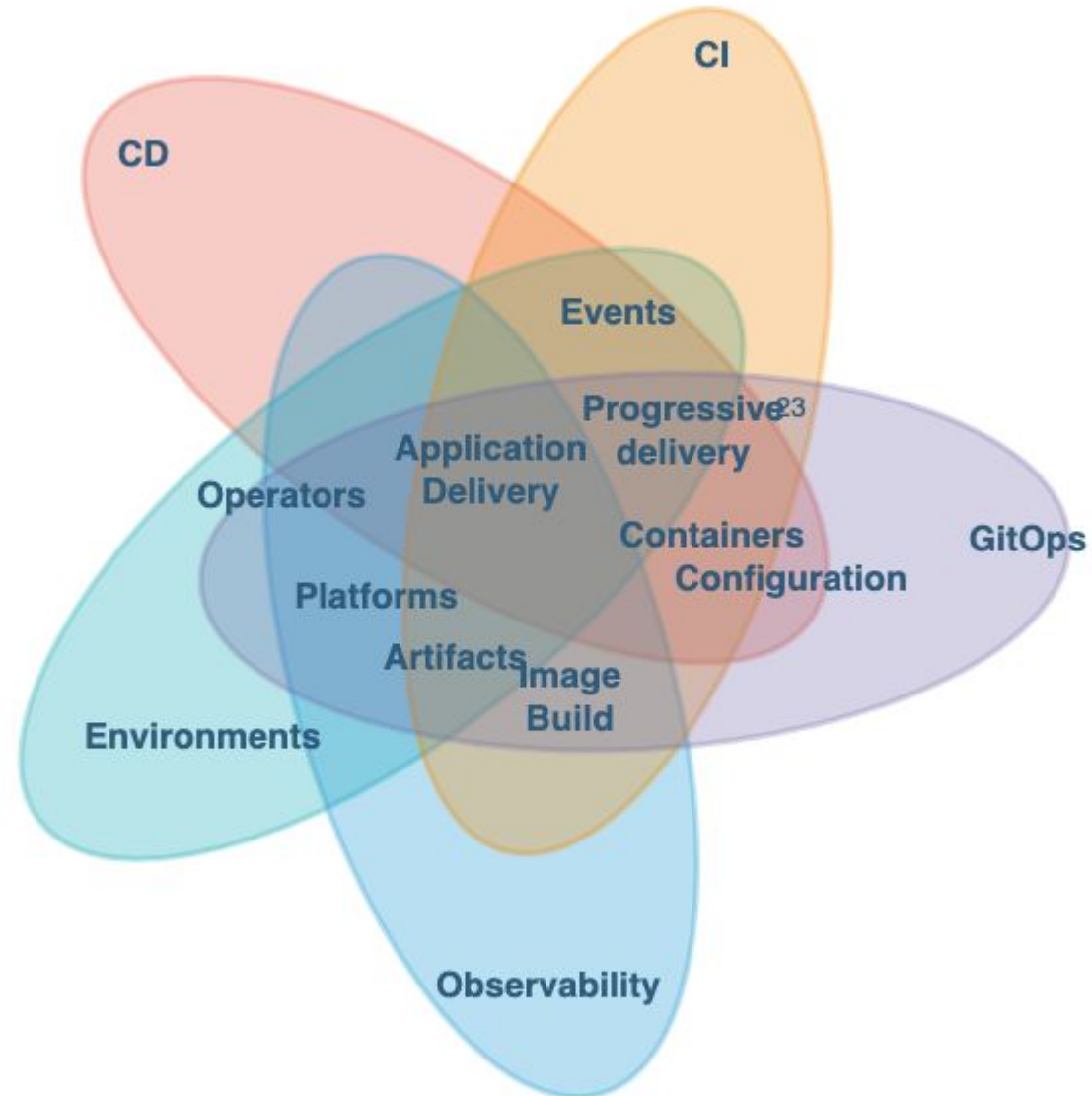
Advanced scenarios

Create/Update preview environment when

- the new DB schema is updated
- A cache is cleared
- A 3rd party service is updated
- When security controls/RBAC changes



The Expanding Domain



Conclusion

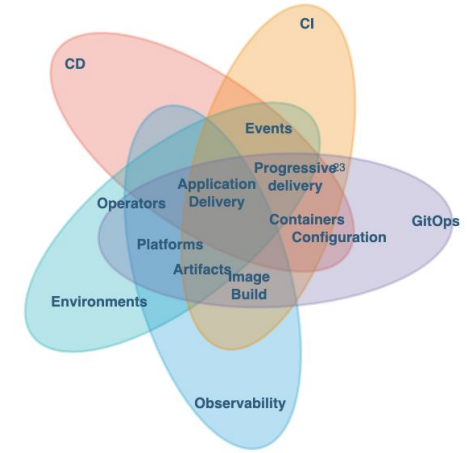
Summary



- cdEvents is a standard for cloud communication
- Already supported by Jenkins, Flux, Spinnaker etc
- Proposal is open for Argo CD - give feedback !
- <https://github.com/argoproj/argo-cd/pull/24106>

Join **#argo-cd** in [CNCF slack](#) @luke @kostis

Contact lukephilips@gmail.com and kostis.kapelonis@octopus.com



Resources - Thank You!



1. github.com/argomultiverse-labs/local-cluster/tree/main/argo-cdviz
2. <https://cdviz.dev/>
3. <https://cdviz.dev/docs/getting-started>