WSO2CON 2025

OpenChoreo



Sameera Jayasoma
VP & Distinguished Engineer
WSO2

About me

- VP and Distinguished Engineer at WSO2
- Lead architect of the **Ballerina** platform
  - Creator of the Ballerina compiler, package model, Bal persist, Java interop
- Now working on the **OpenChoreo** initiative.
- Based in Seattle.



@sameerajayasoma


Developers infrastrumure
Developers Pevof Team
Internal Developer Team
PLATFORM TEAM
PLATFORM TEAM
PLATFORM TEAM
PLATFORM TEAM
An absorctiont over Infrastructure.

Platform

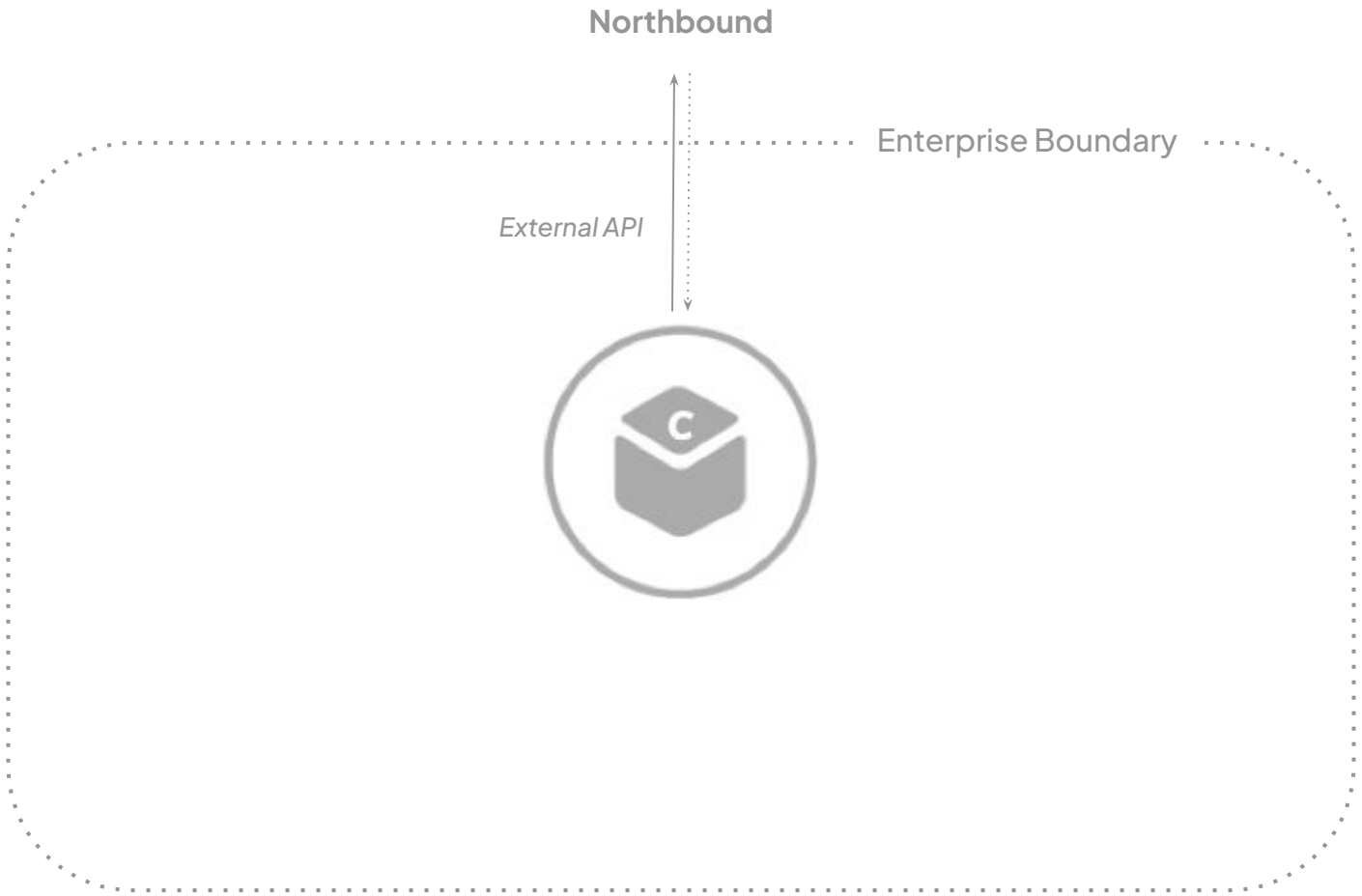
Internal Platform

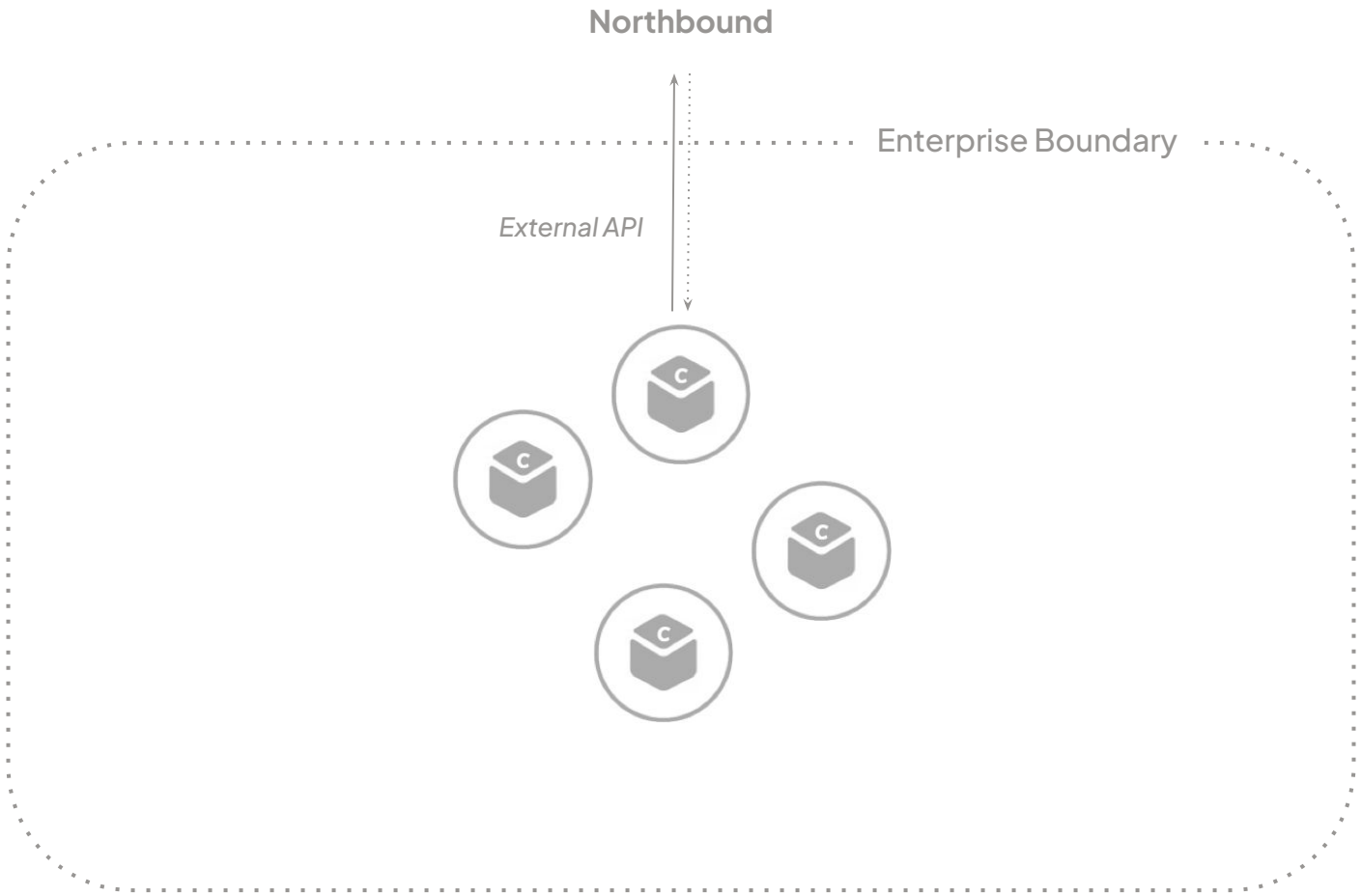

Internal
Developer
Platform

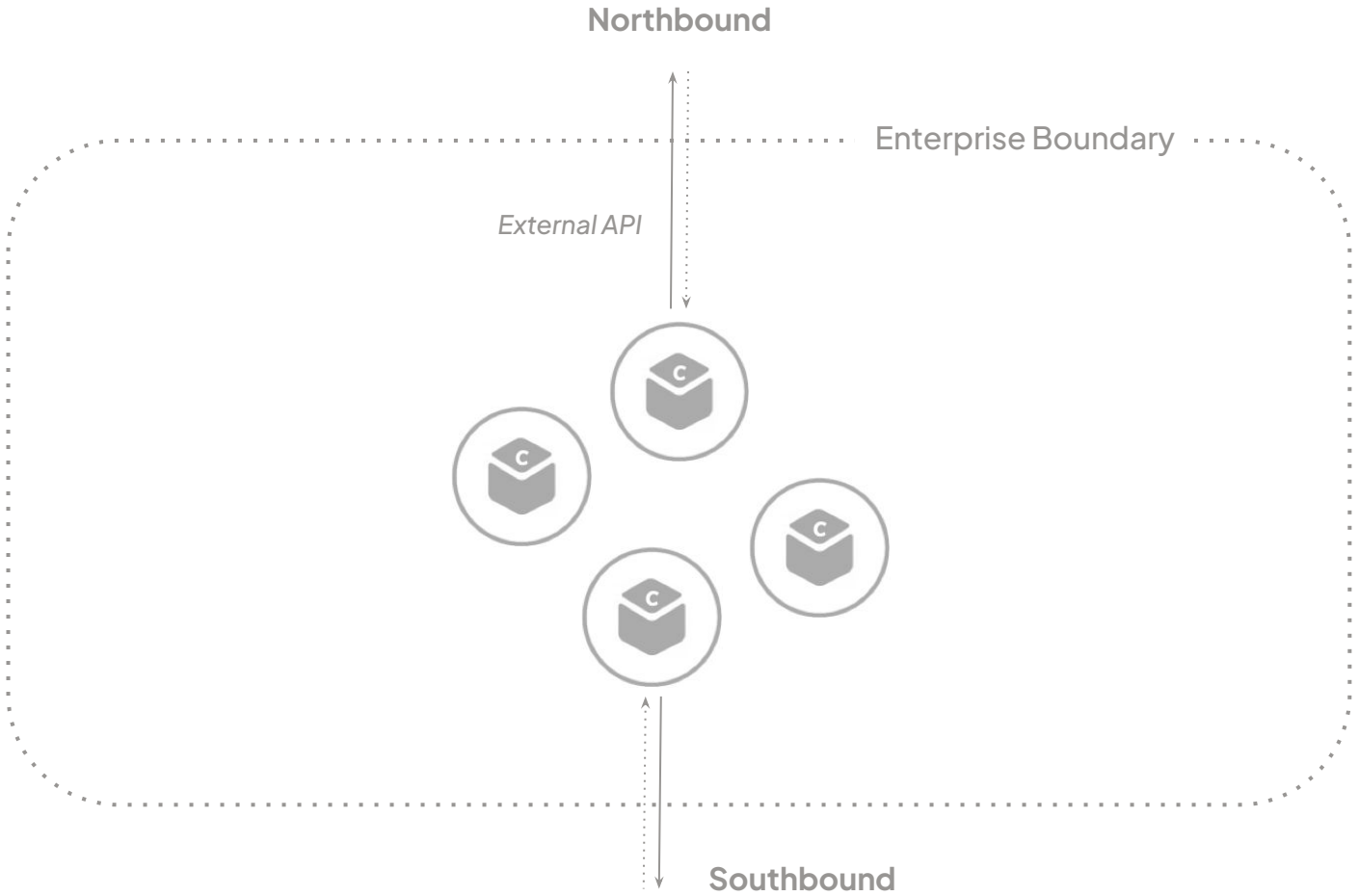
Enterprise Software Engineering

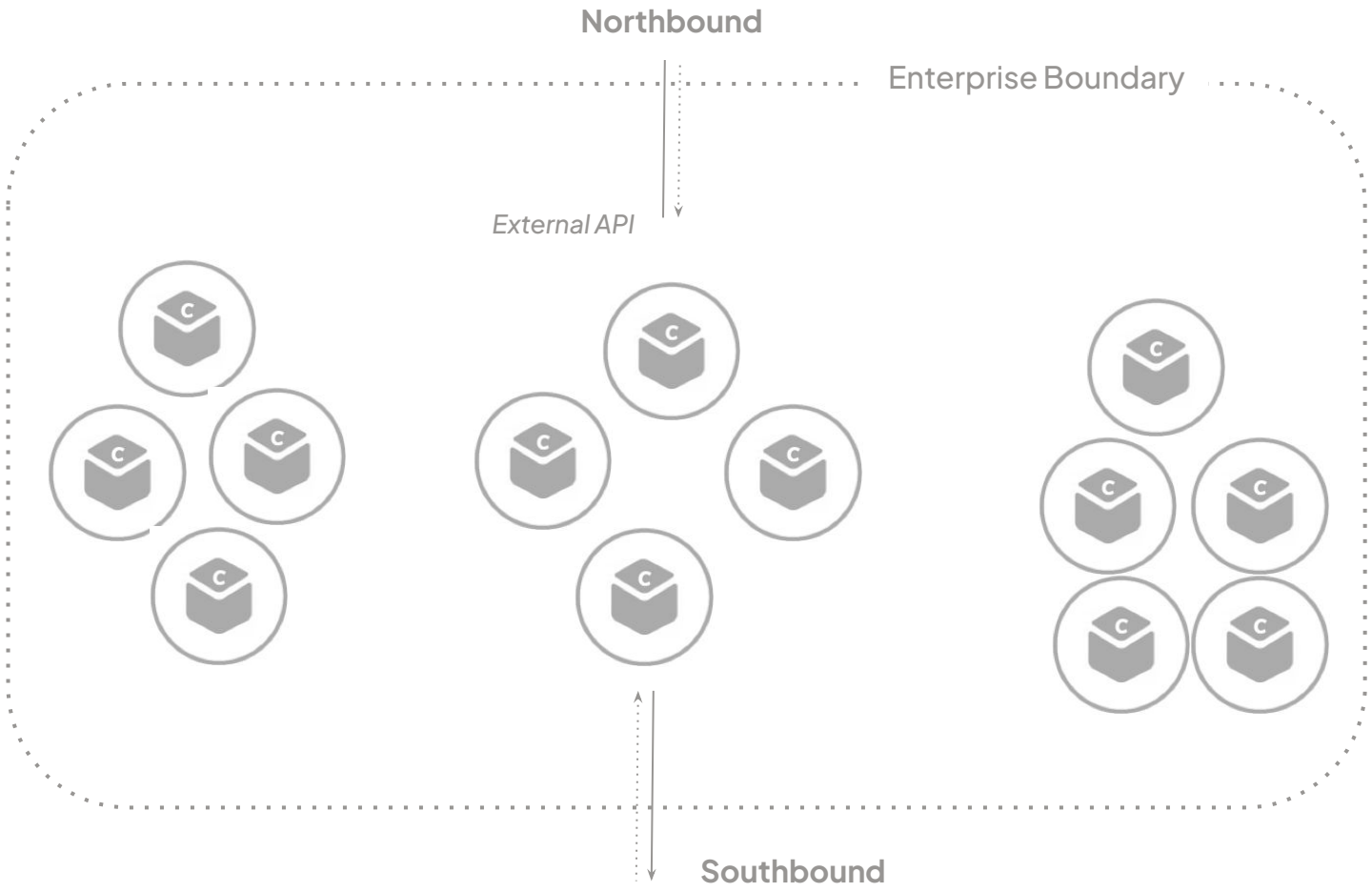
Enterprise Boundary

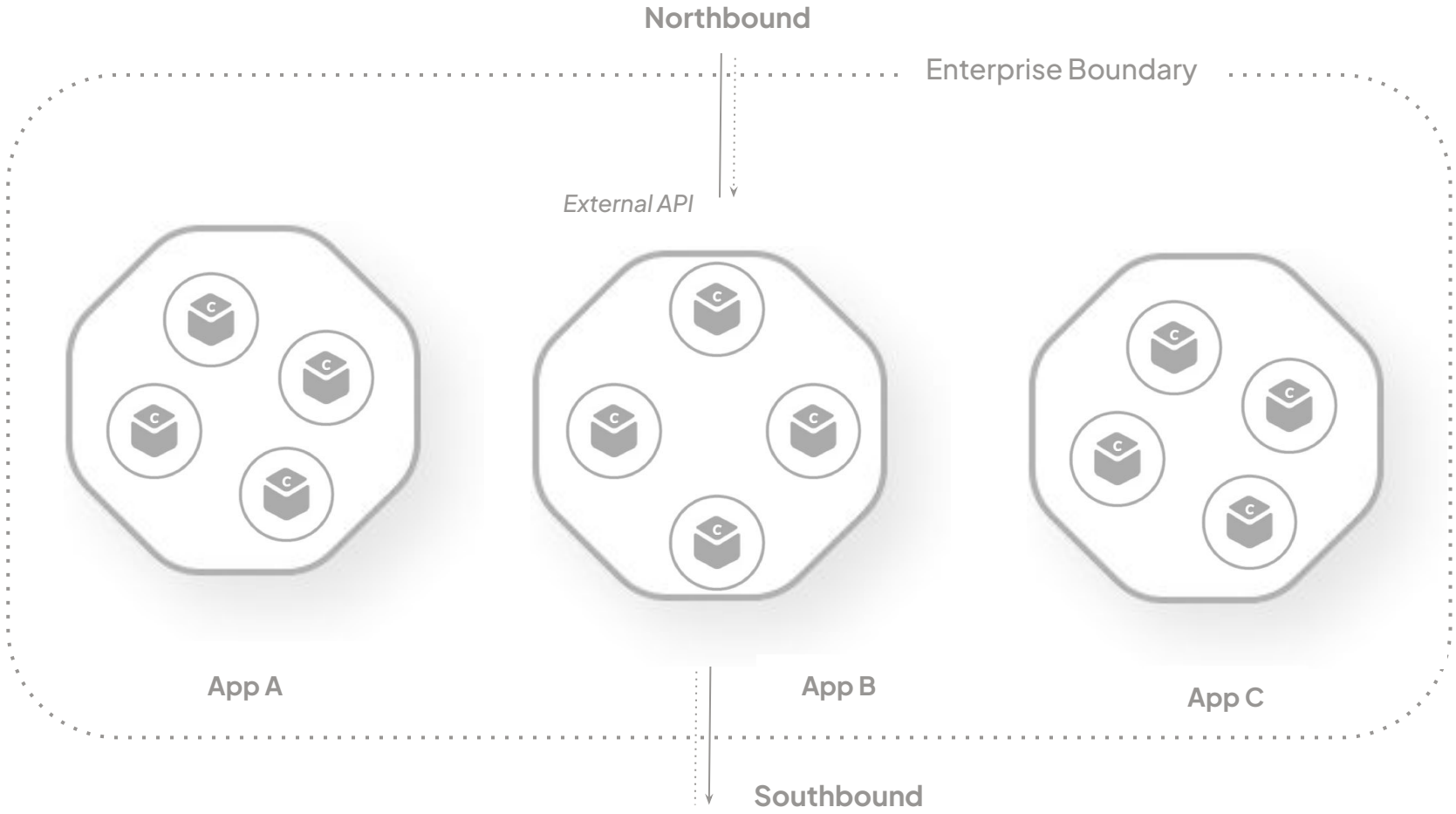


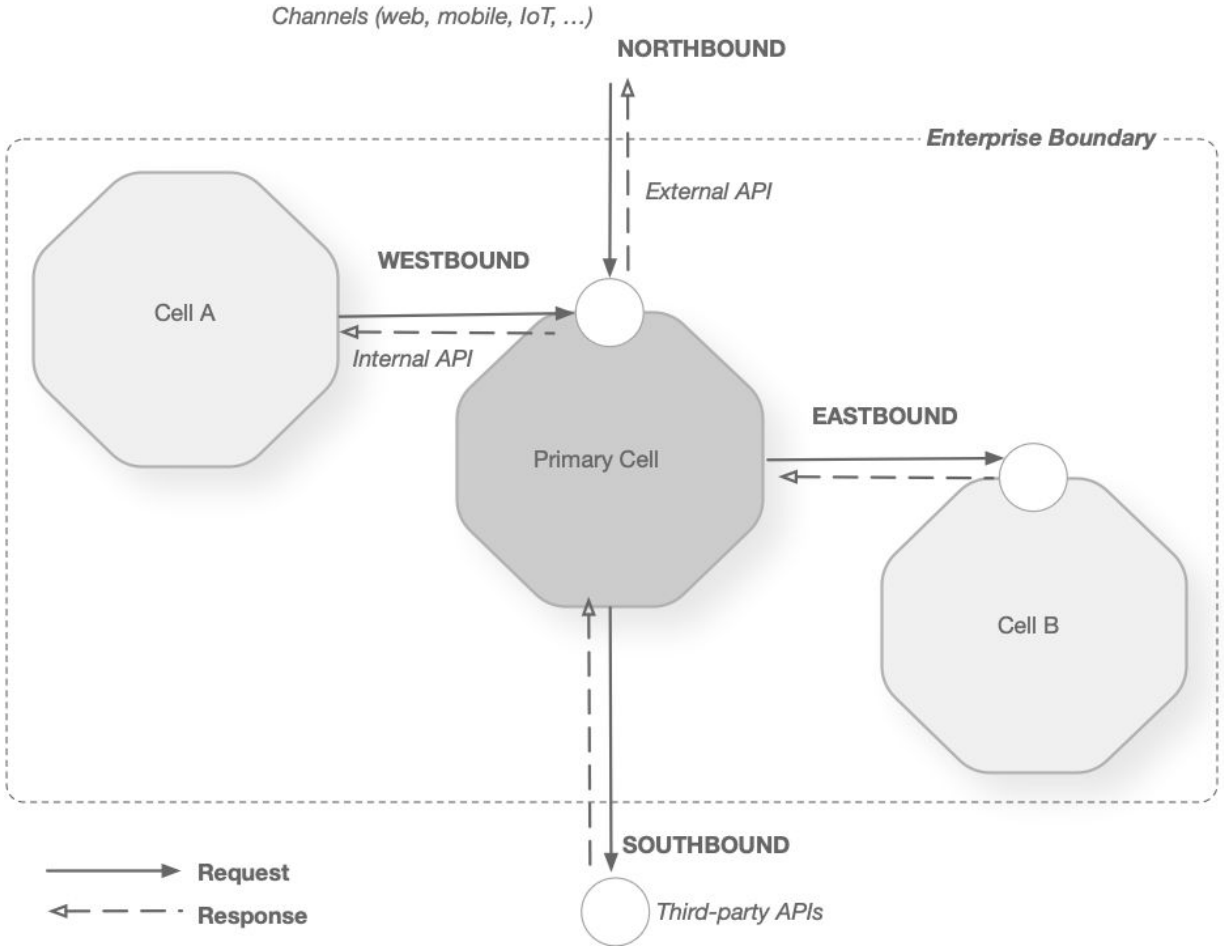

Northbound
Enterprise Boundary
External API
C


Northbound
Enterprise Boundary
External API

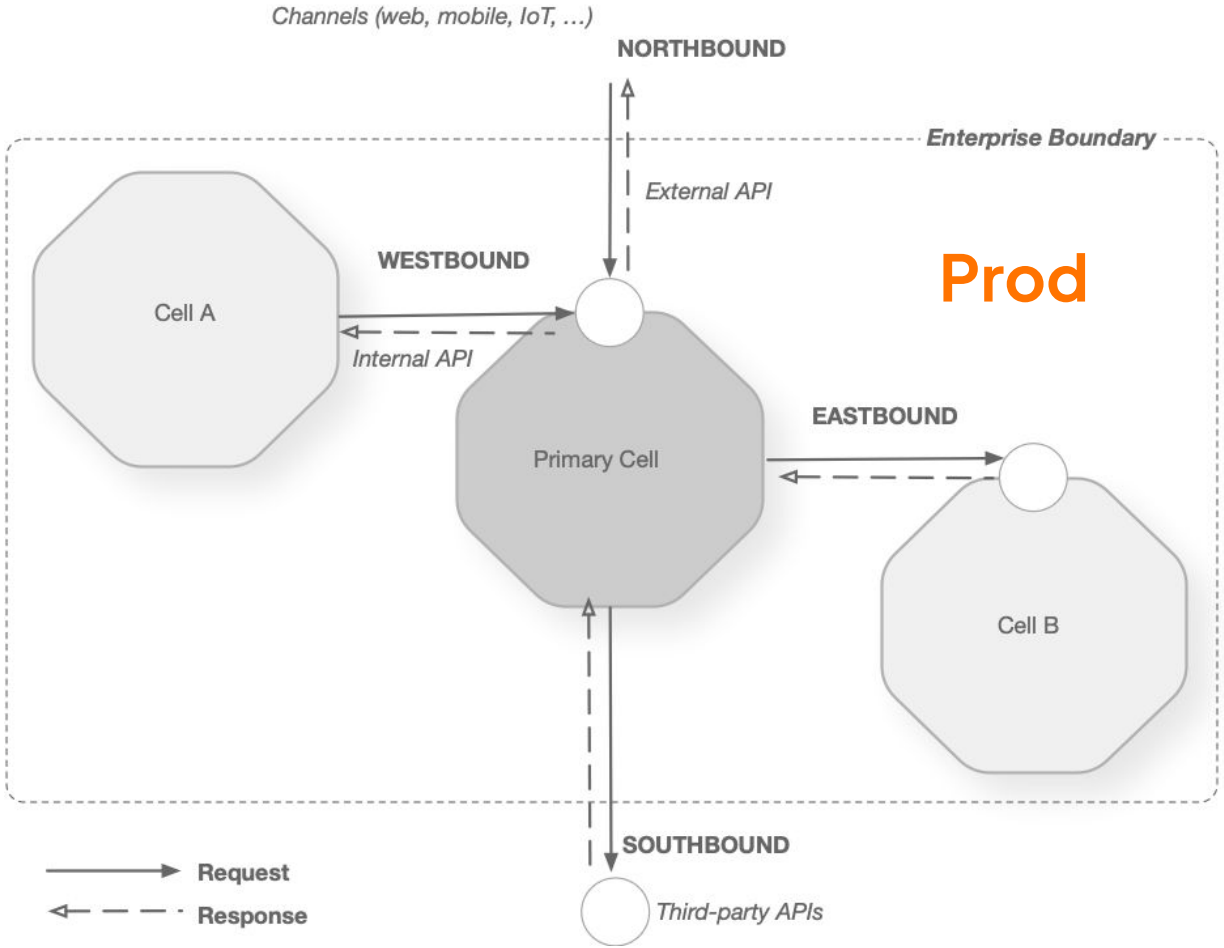

Northbound
Enterprise Boundary
External API
Southbound


Northbound
Enterprise Boundary
External API
Southbound

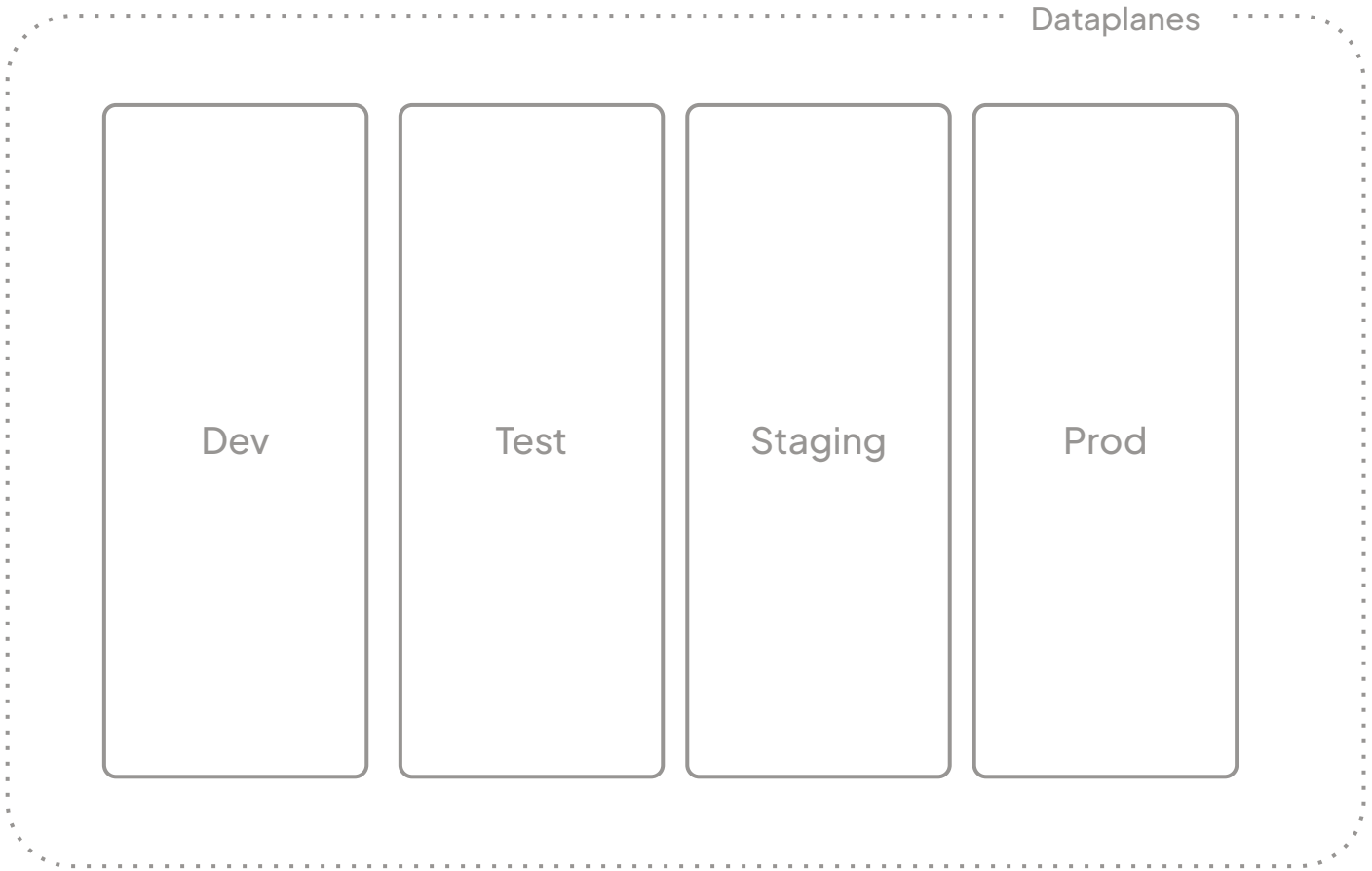

Northbound
Enterprise Boundary
External API
App A
App B
App C
Southbound



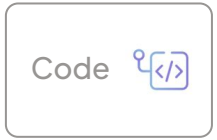
https://github.com/wso2/reference-architecture/blob/master/reference-architecture-cell-based.md

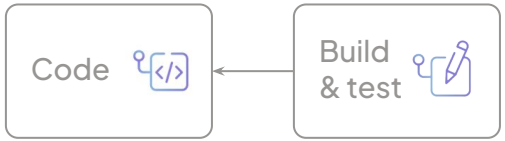


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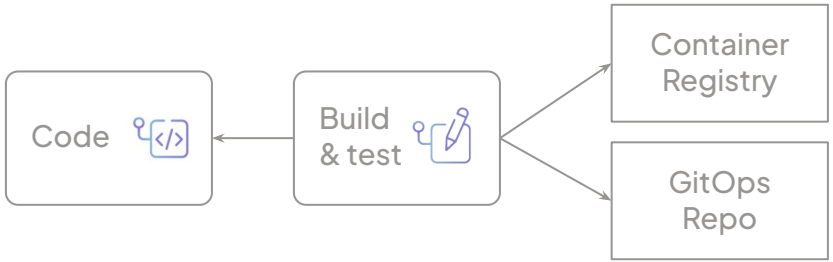

Dataplanes
Dev
Test
Staging
Prod

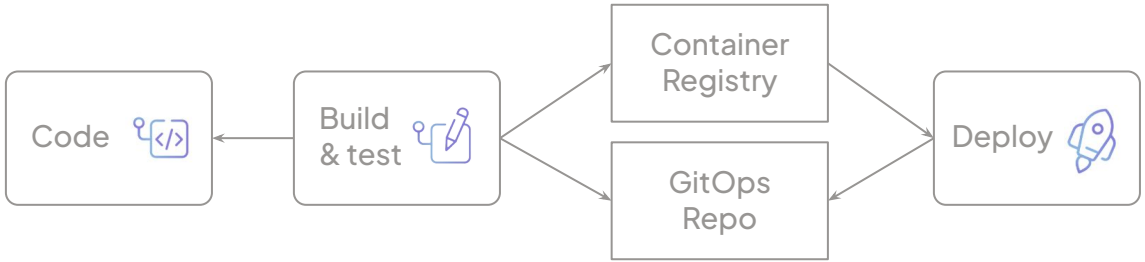
Software Delivery & Operations

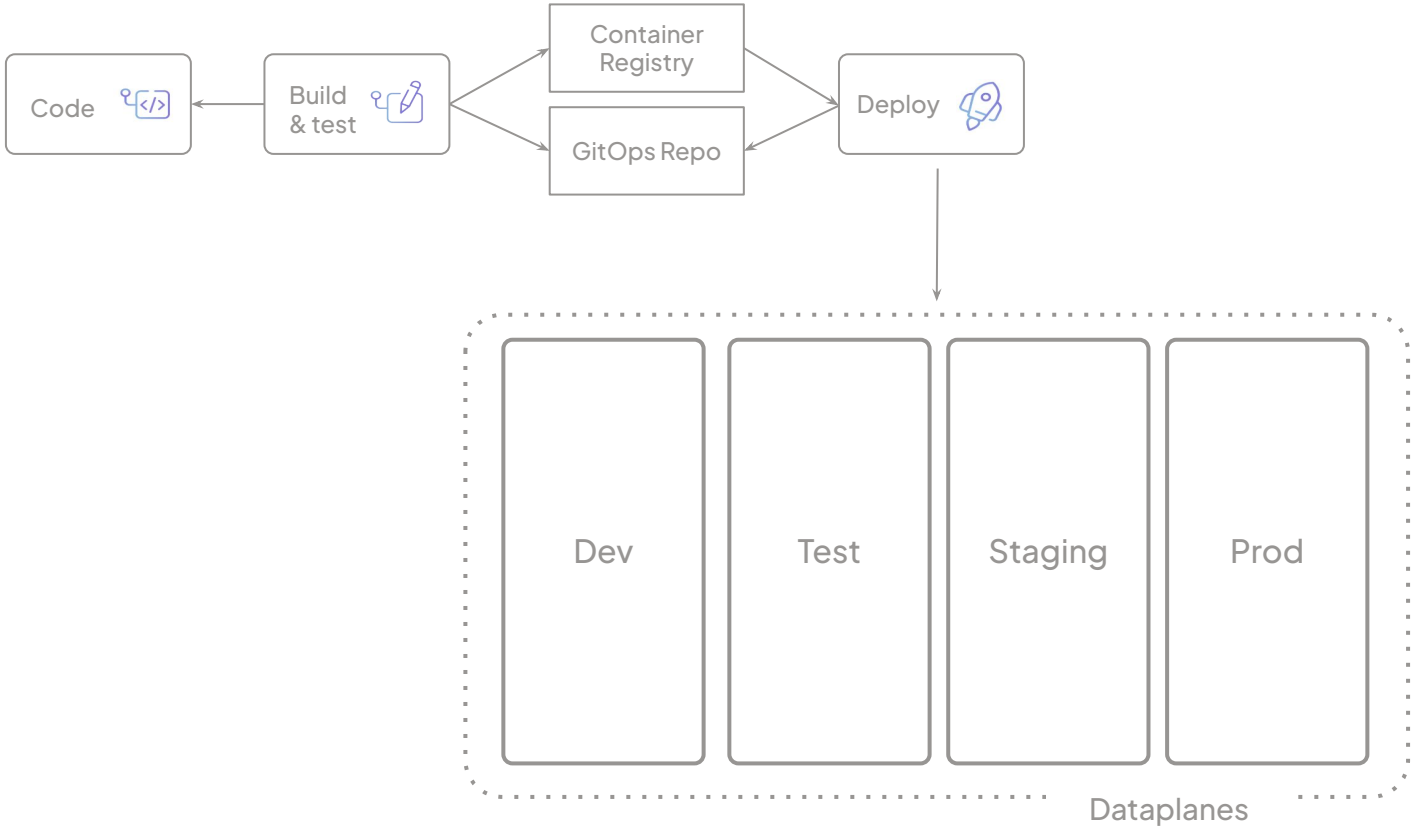

Code

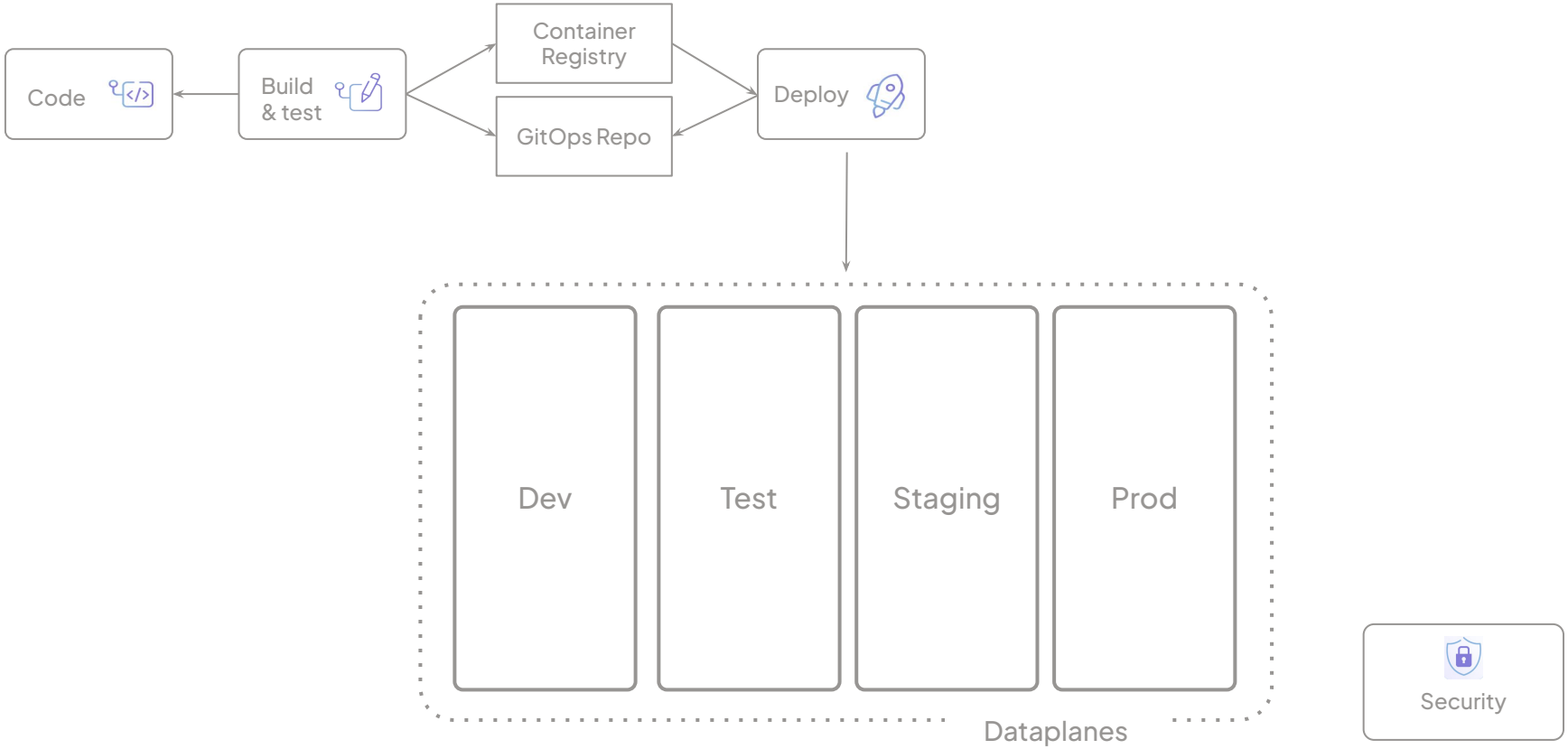

Code
Build
& test

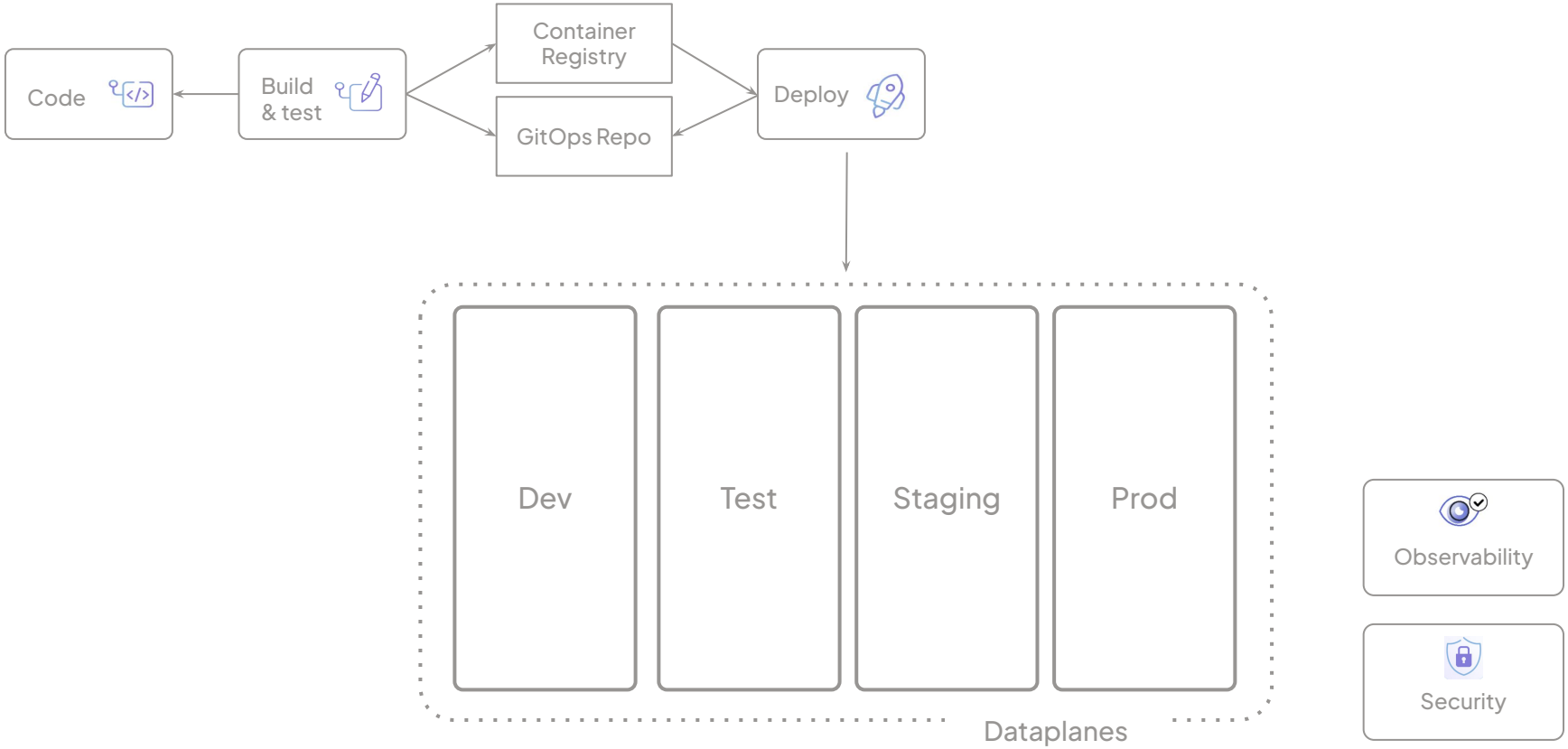

Code
Build
& test
Container
Registry

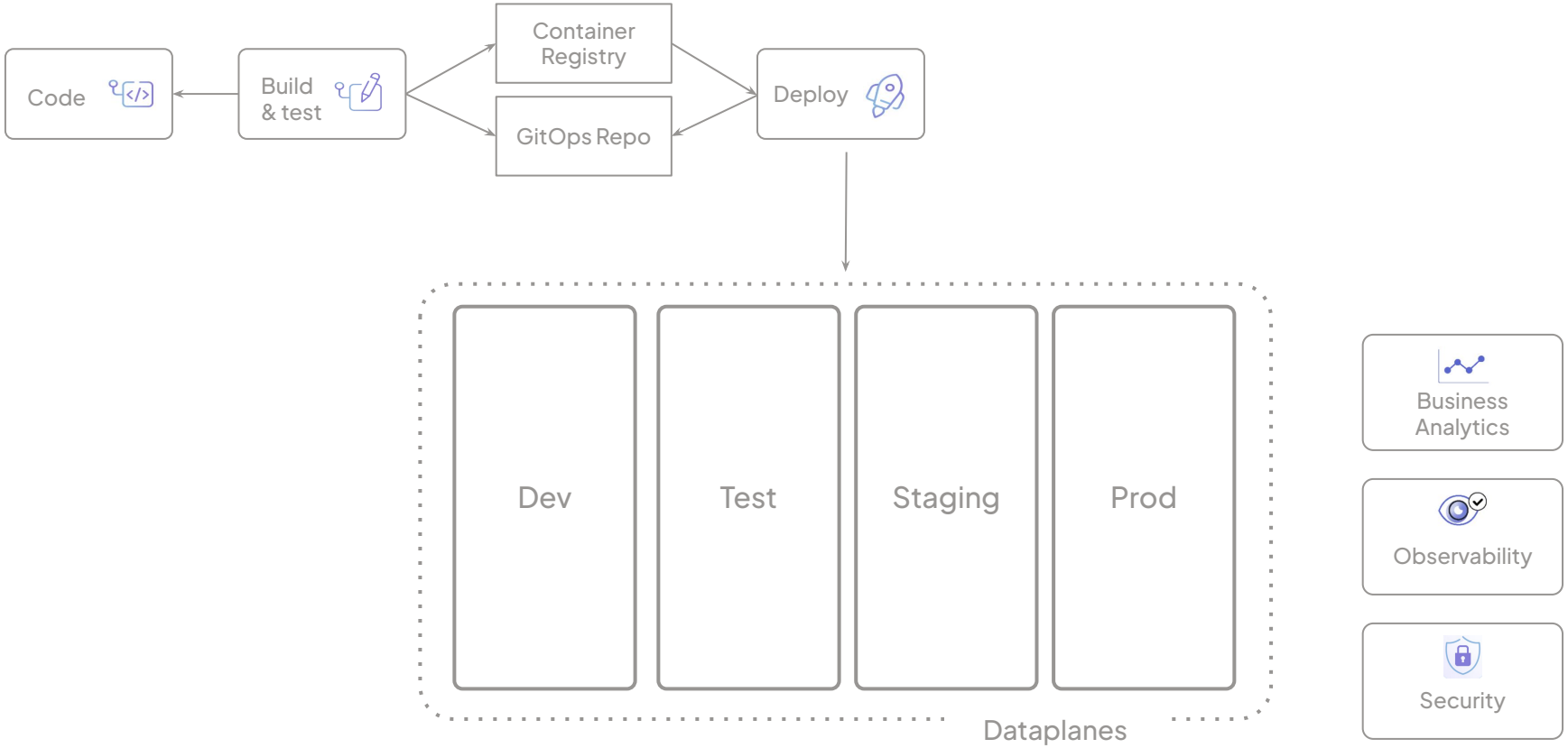

Code
Build
& test
Container
Registry
GitOps
Repo

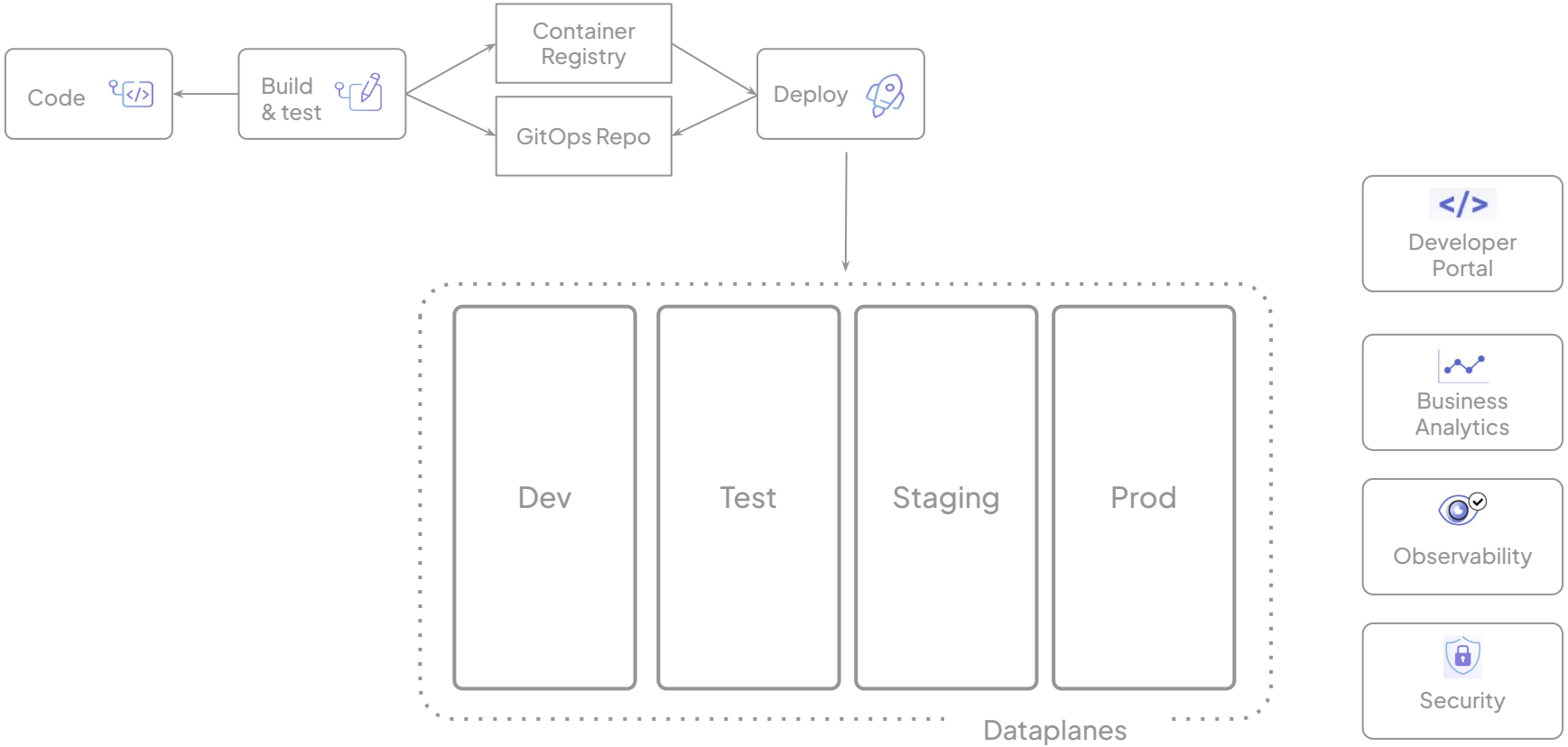

Code
Build
& test
Container
Registry
GitOps
Repo
Deploy

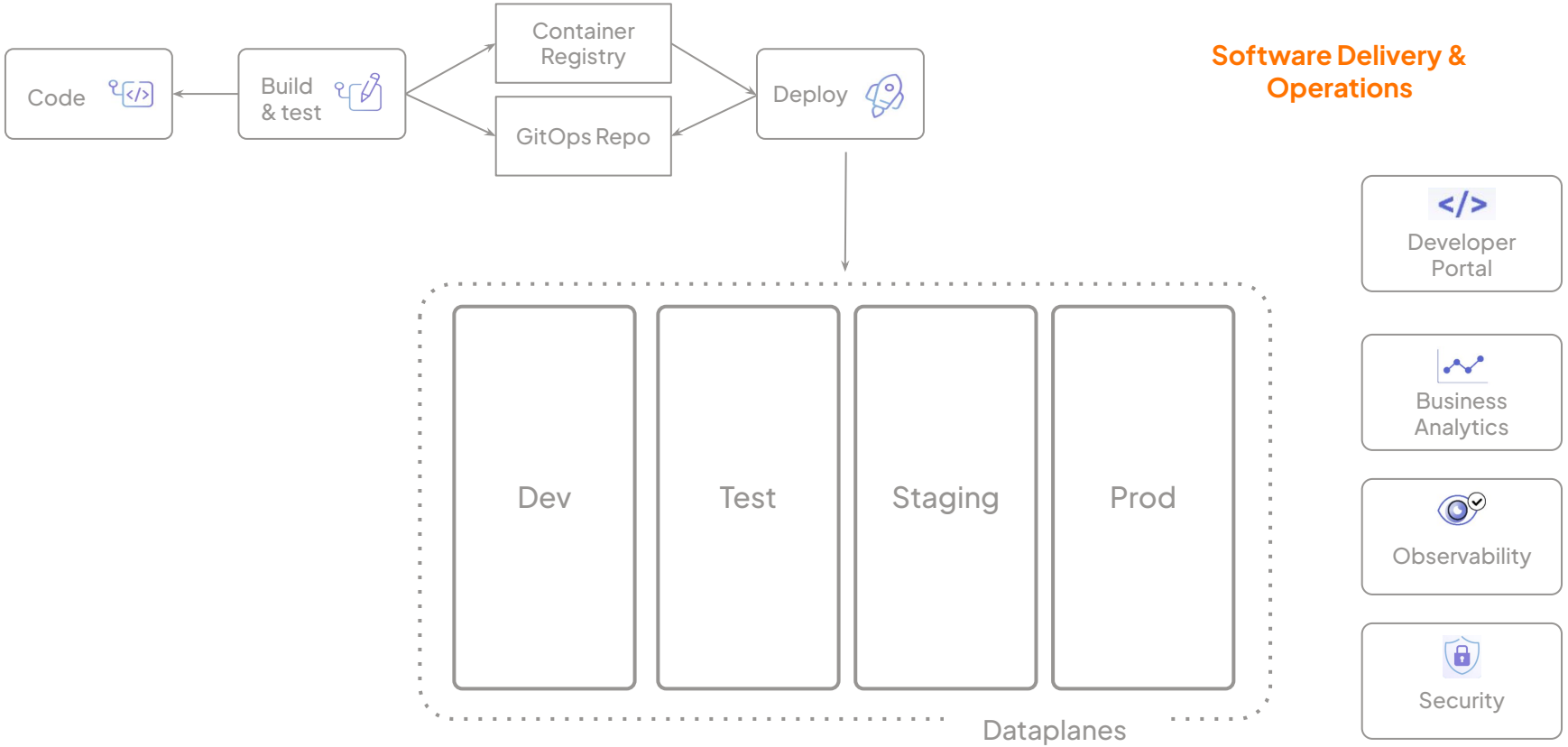

Code
Build & test
Container Registry
GitOps Repo
Deploy
Dev
Test
Staging
Prod
Dataplanes

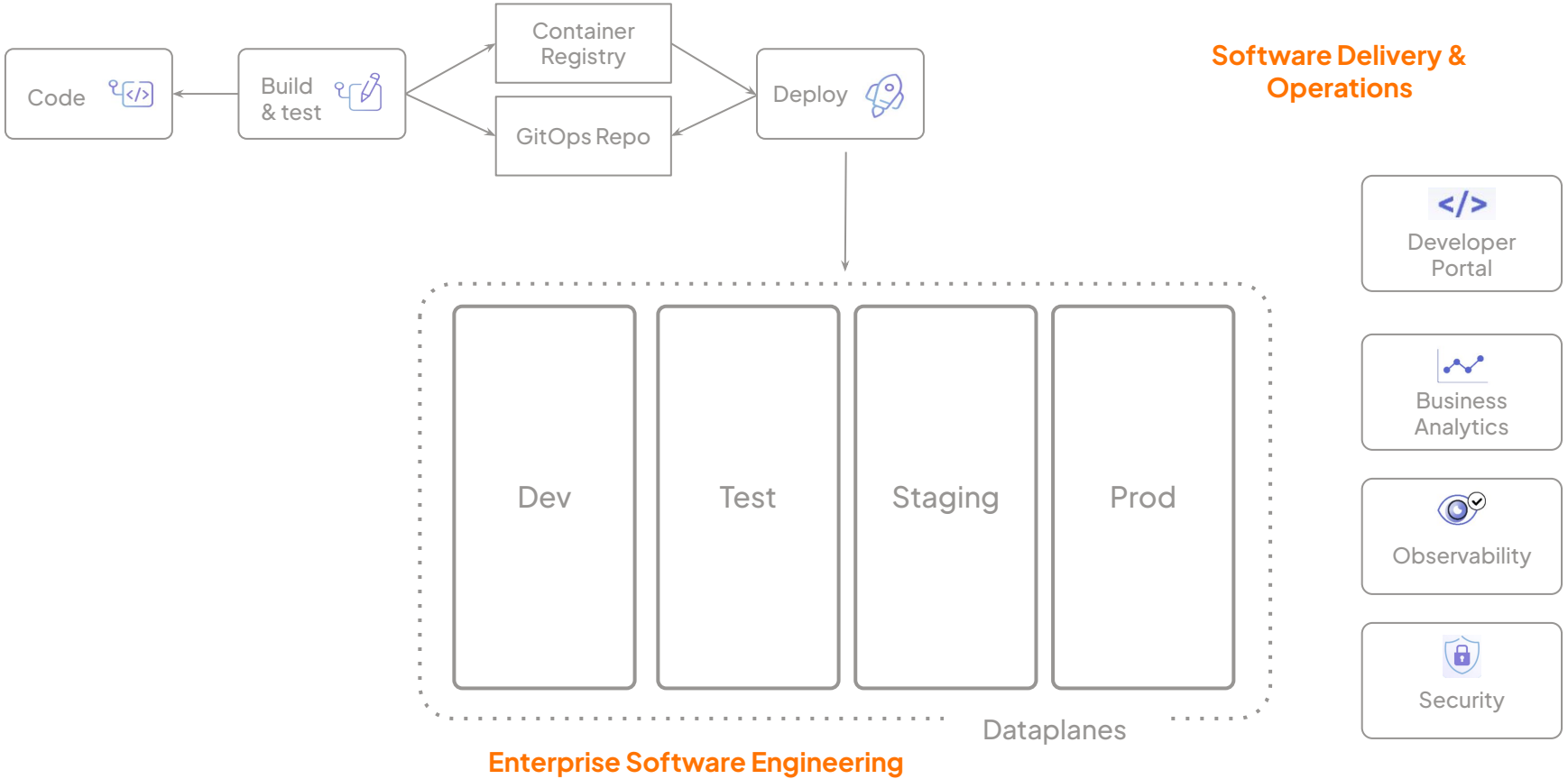

Code
Build & test
Container Registry
GitOps Repo
Deploy
Dev
Test
Staging
Prod
Dataplanes
Security


Code
Build & test
Container Registry
GitOps Repo
Deploy
Dev
Test
Staging
Prod
Dataplanes
Observability
Security

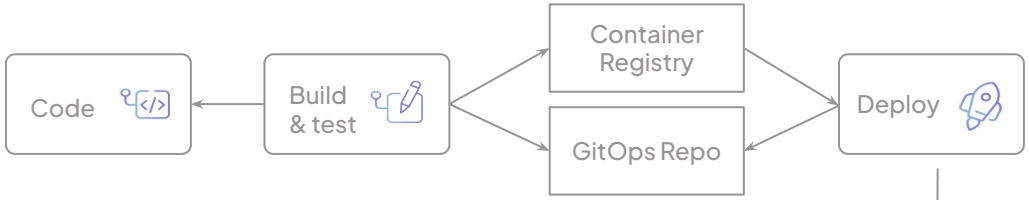

Code
Build & test
Container Registry
GitOps Repo
Deploy
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Test
Staging
Prod
Dataplanes
Business Analytics
Observability
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Code
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Container Registry
GitOps Repo
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Test
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Prod
Dataplanes
Developer Portal
Business Analytics
Observability
Security

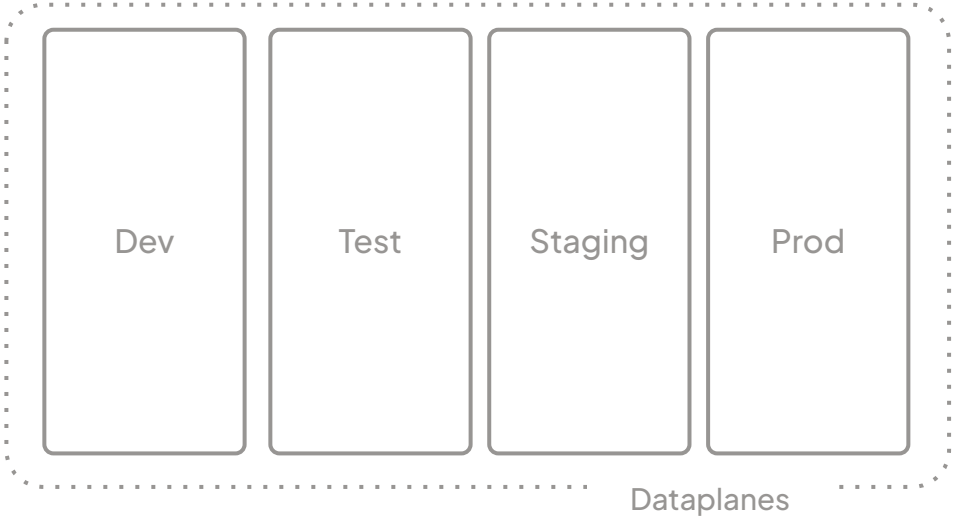

Code
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Internal Developer Platform



Software Delivery & Operations

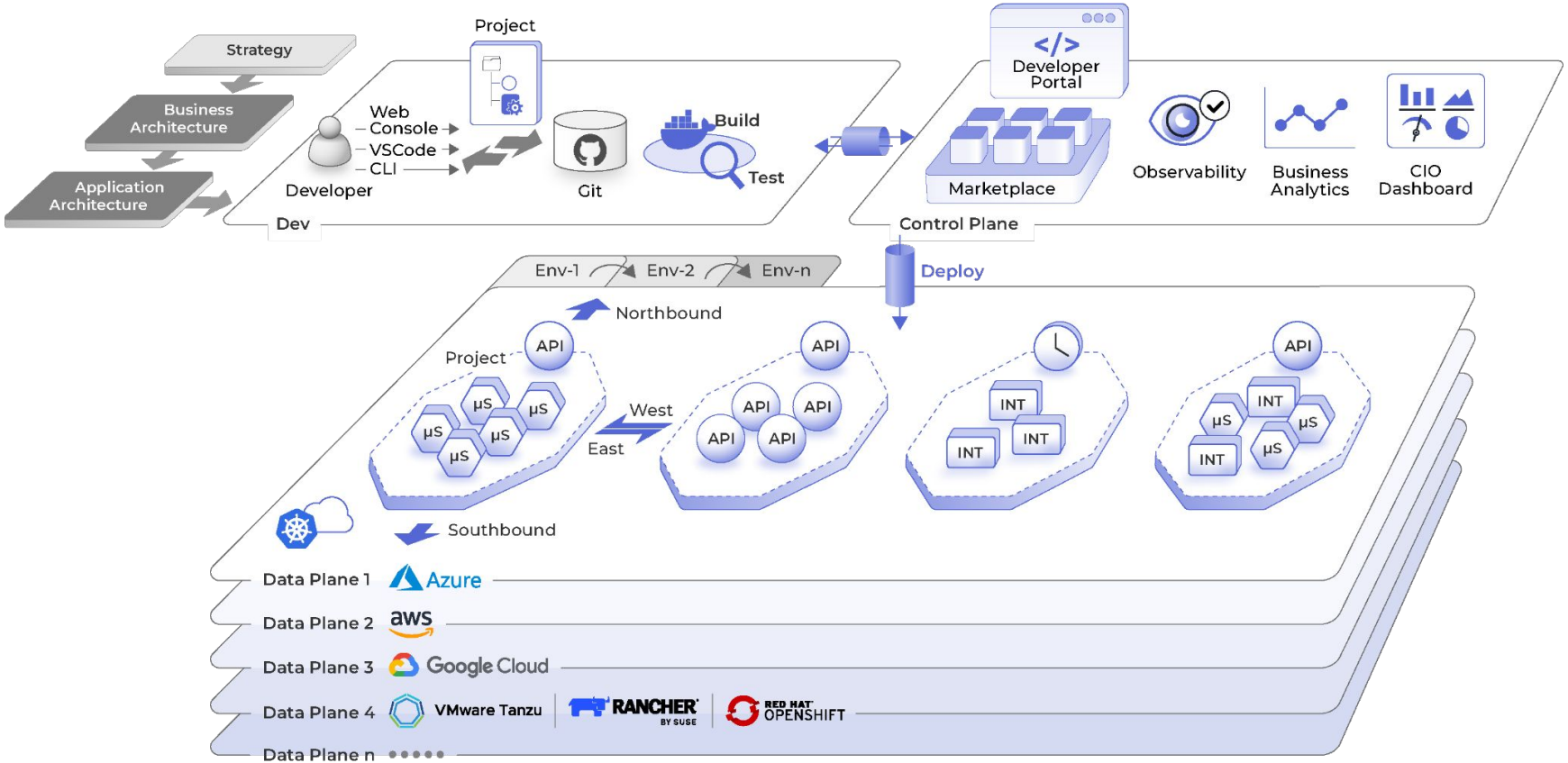


Enterprise Software Engineering

- Developer Portal
- Business Analytics
- Observability
- Security


Developers infrastrumure
Developers Pevof Team
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PLATFORM TEAM
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An absorctiont over Infrastructure.

WSO2 Choreo SaaS


Strategy
Business Architecture
Application Architecture
Project
Web Console
VSCode
CLI
Developer
Git
Build
Test
Dev
Developer Portal
Marketplace
Observability
Business Analytics
CIO Dashboard
Control Plane
Deploy
Env-1
Env-2
Env-n
Northbound
Project
API
μS
West
East
INT
Southbound
Data Plane 1
Azure
Data Plane 2
aws
Data Plane 3
Google Cloud
Data Plane 4
VMware Tanzu
RANCHER BY SUSE
RED HAT OPENSHIFT
Data Plane n


argo
Buildpacks.io
cilium
envoy
etcd
fluentbit
Flux
HARBOR
HELM
HUBBLE

JAEGER
KEDA
kubecost
kubernetes
OpenSearch
OpenTelemetry
Prometheus
aqua trivy
redis
Thanos

~ 300 person years

Our Way is Open Source

At WSO2, we provide free open source software – which can be used and improved by anyone – together with valuable business services that help customers save time at a reasonable cost.

We believe open source to be the future of the industry, where permissive open source licenses provide the greatest alignment between the interests of creators and users of software.

Open Source Primer

TCO of Open Source

Why Contribute to Open Source



https://wso2.com/open-source/


choreo
by WSO2





OpenChoreo

Open-Source Internal Developer Platform

OpenChoreo: The Successor to WSO2 Choreo SaaS

- Brings WSO2 Choreo's best ideas

OpenChoreo: The Successor to WSO2 Choreo SaaS

- Brings WSO2 Choreo's best ideas
- Aiming for complete feature parity with the SaaS version

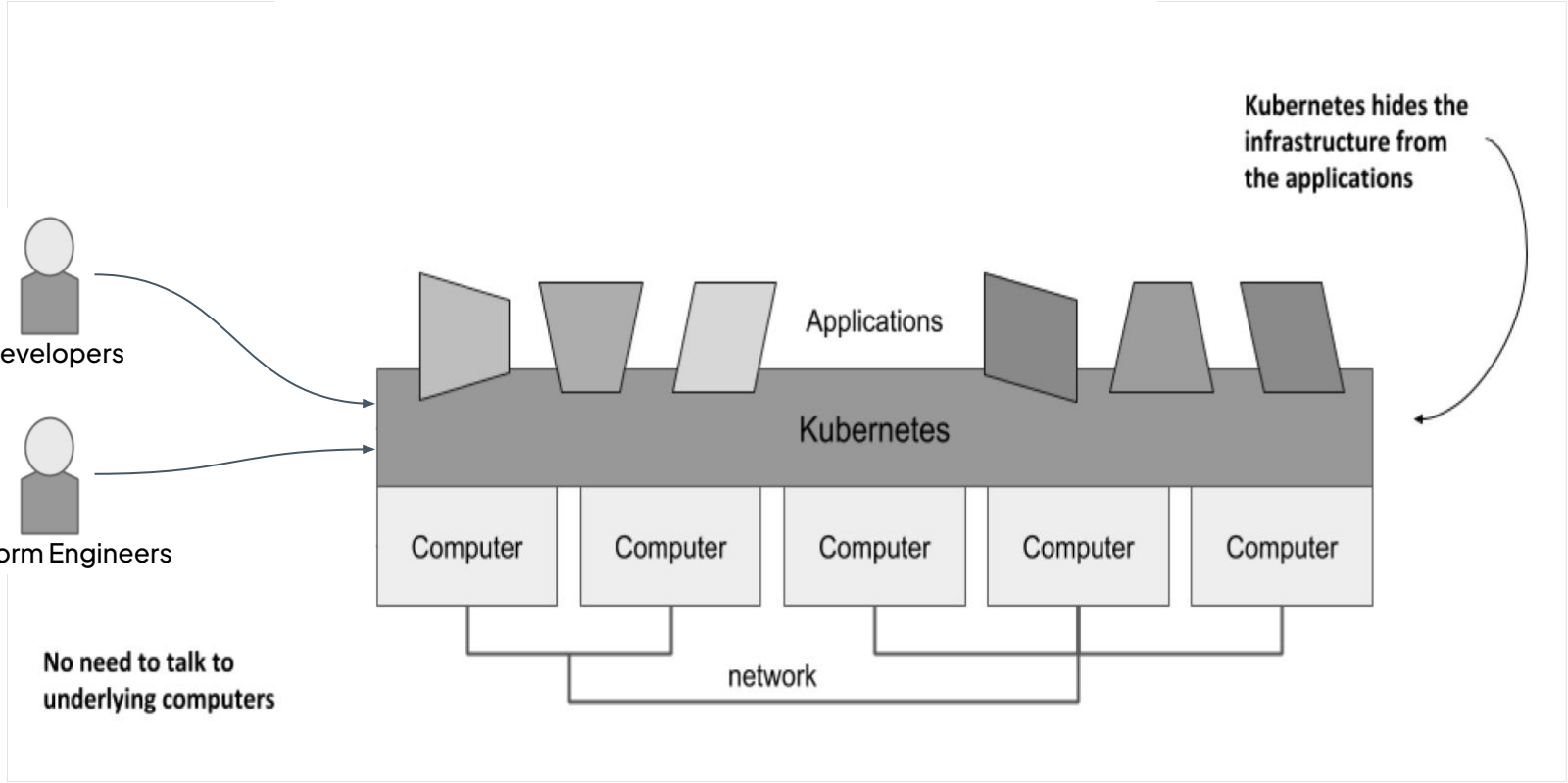
OpenChoreo: The Successor to WSO2 Choreo SaaS

- Brings WSO2 Choreo's best ideas
- Aiming for complete feature parity with the SaaS version
- Fully Kubernetes-native and GitOps-friendly architecture

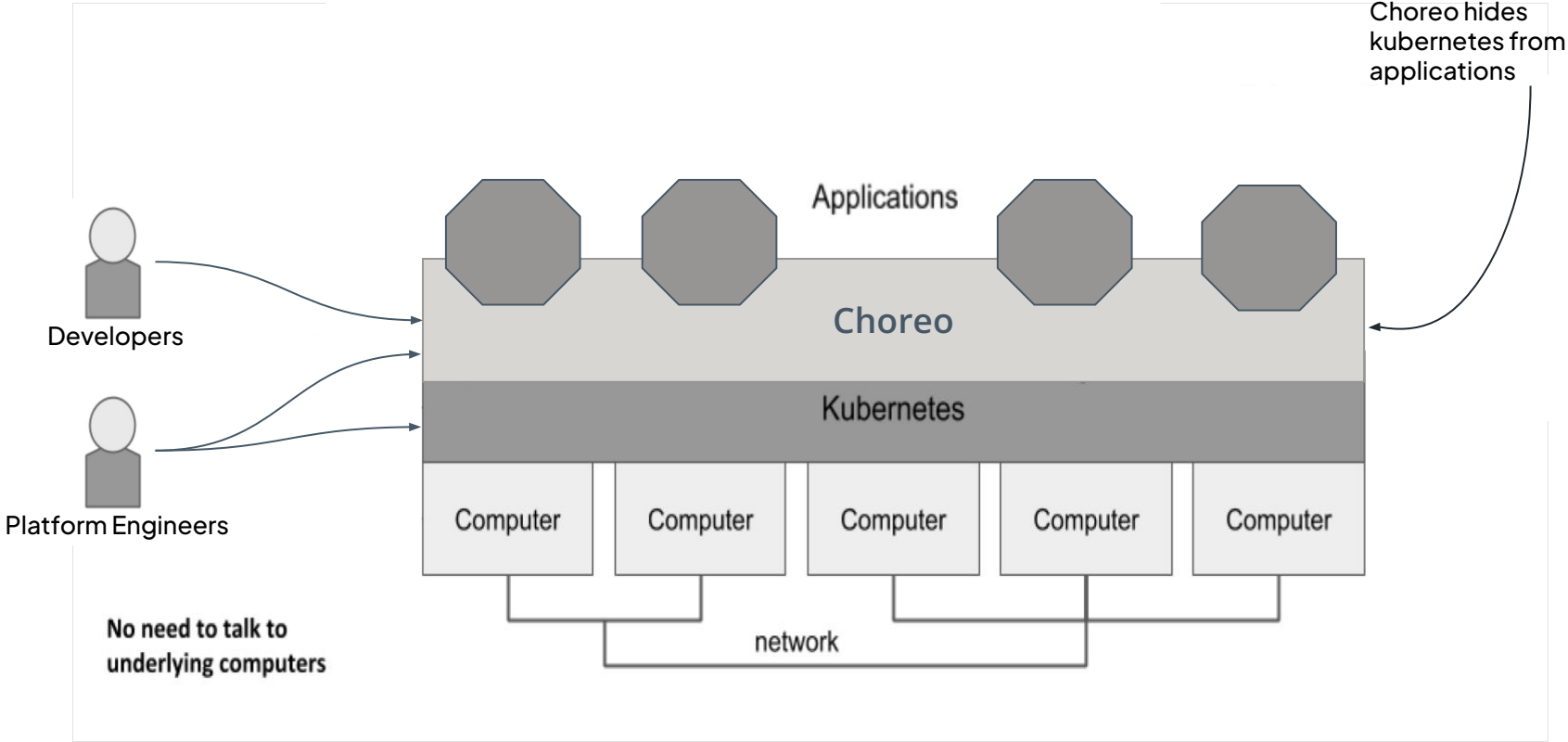
OpenChoreo: The Successor(???) to WSO2 Choreo SaaS

- Brings WSO2 Choreo's best ideas
- Aiming for complete feature parity with the SaaS version
- Fully Kubernetes-native and GitOps-friendly architecture
- Completely (re)written in Go.

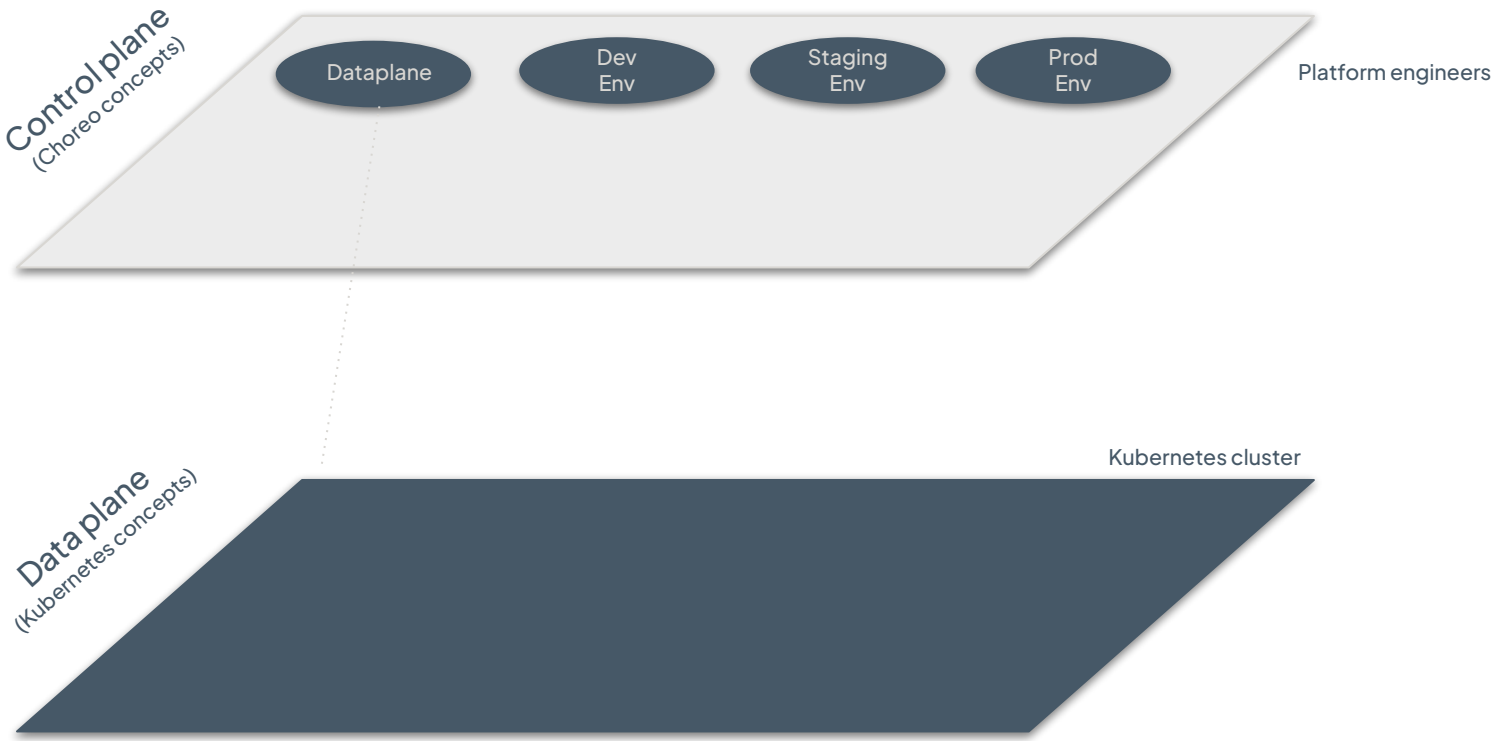
Kubernetes-Native Architecture

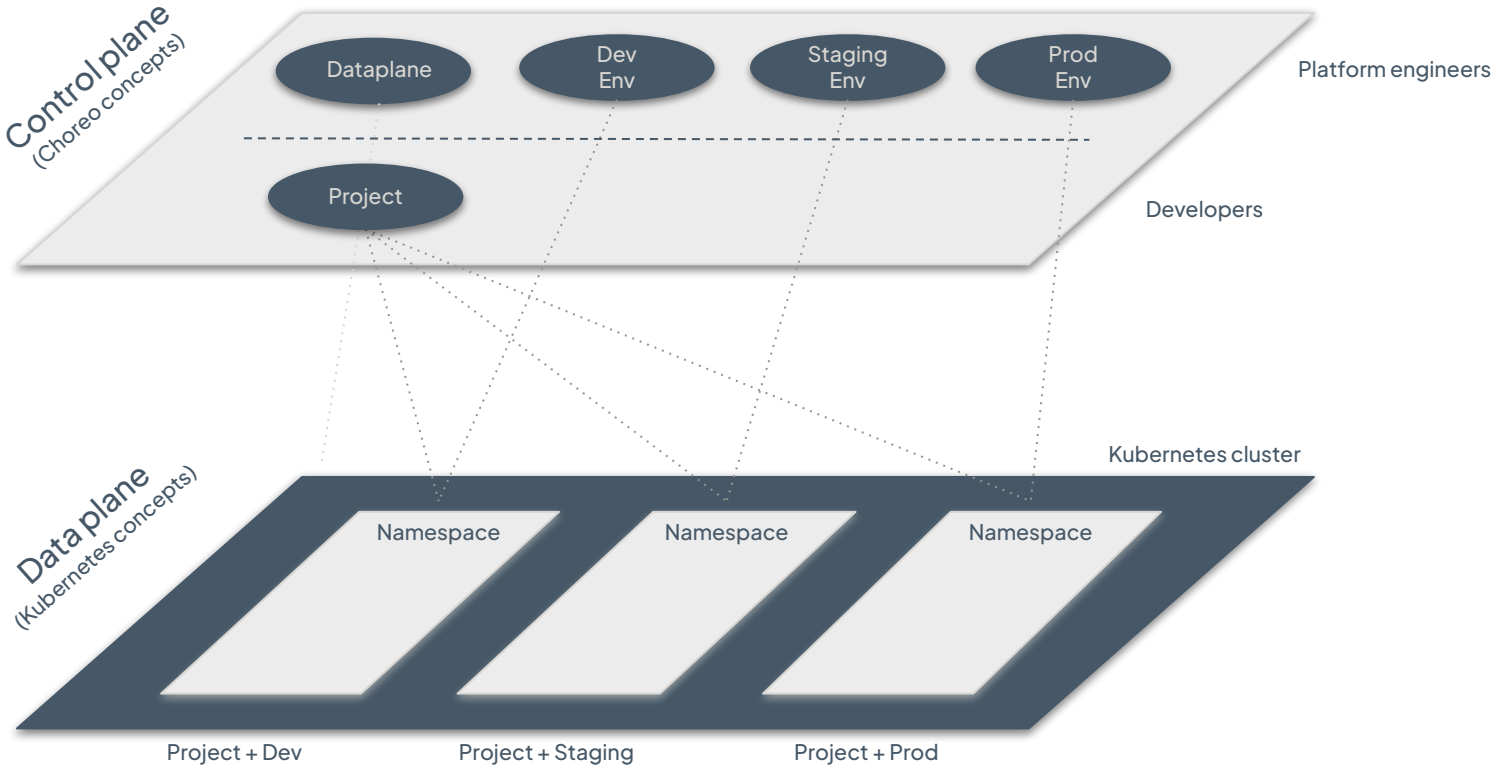


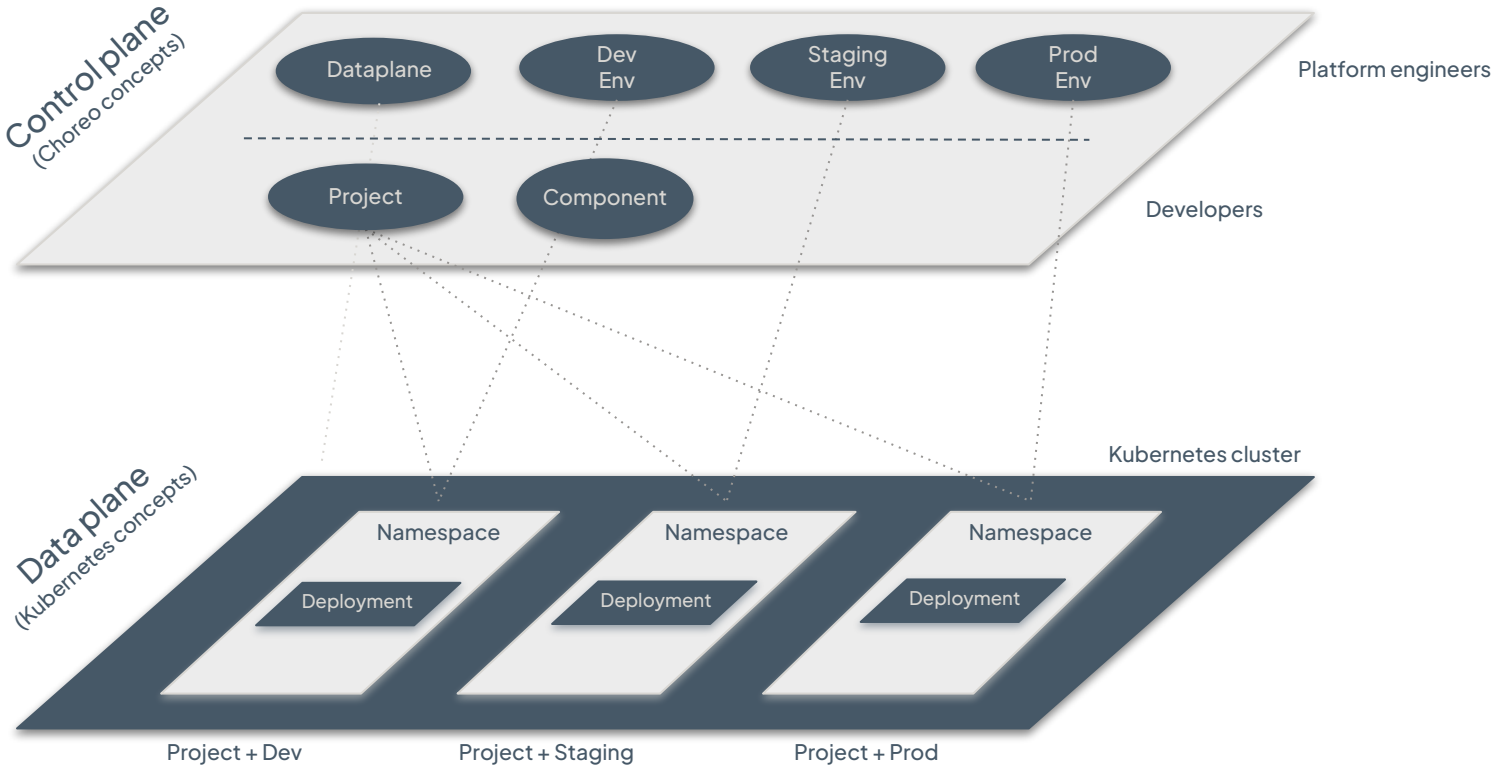
https://wangwei1237.github.io/Kubernetes-in-Action-Second-Edition/docs/Introducing_Kubernetes_1.html

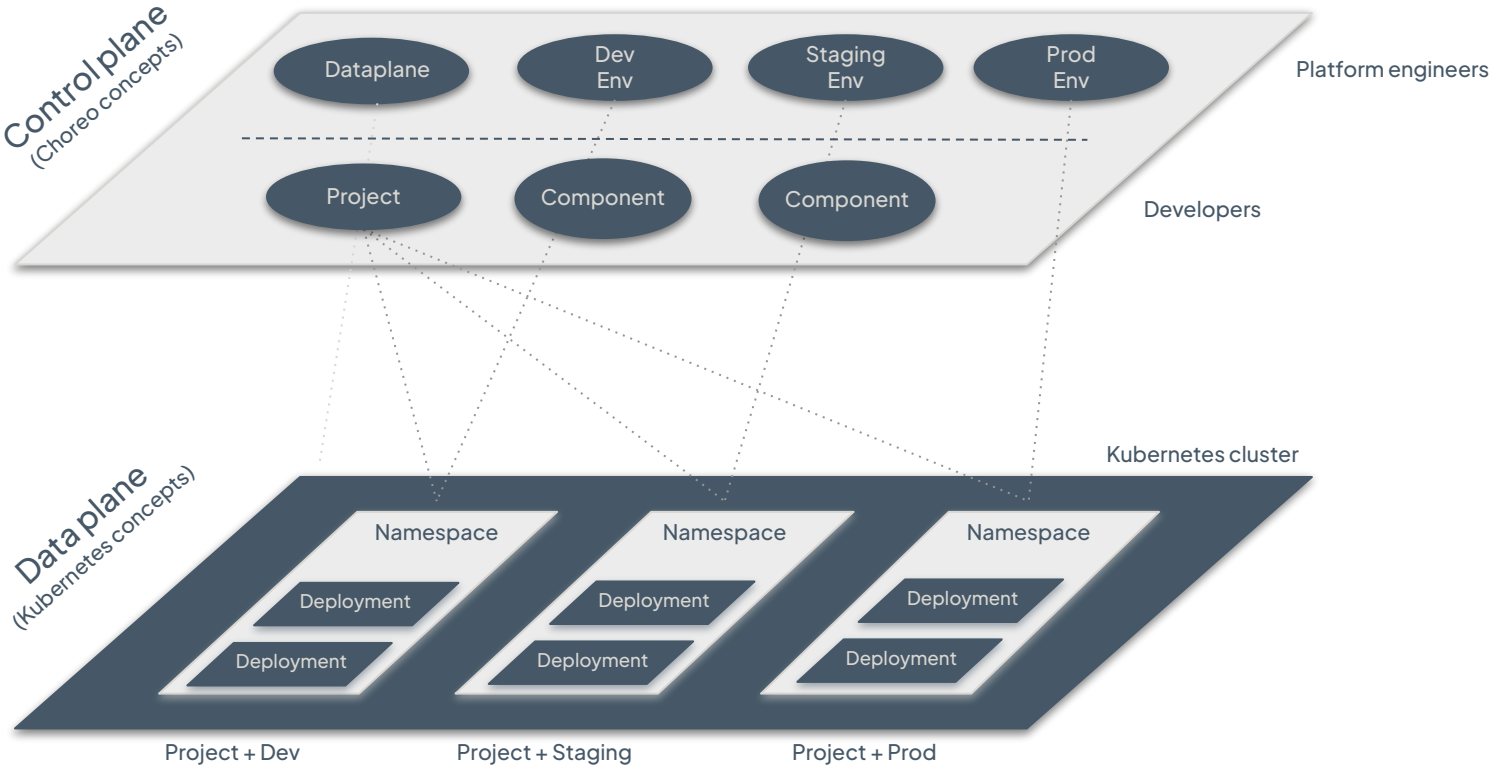

Choreo hides kubernetes from applications
Applications
Developers
Choreo
Kubernetes
Platform Engineers
Computer
Computer
Computer
Computer
Computer
network
No need to talk to underlying computers


Control plane
(Choreo concepts)
Dataplane
Platform engineers
Kubernetes cluster
Data plane
(Kubernetes concepts)

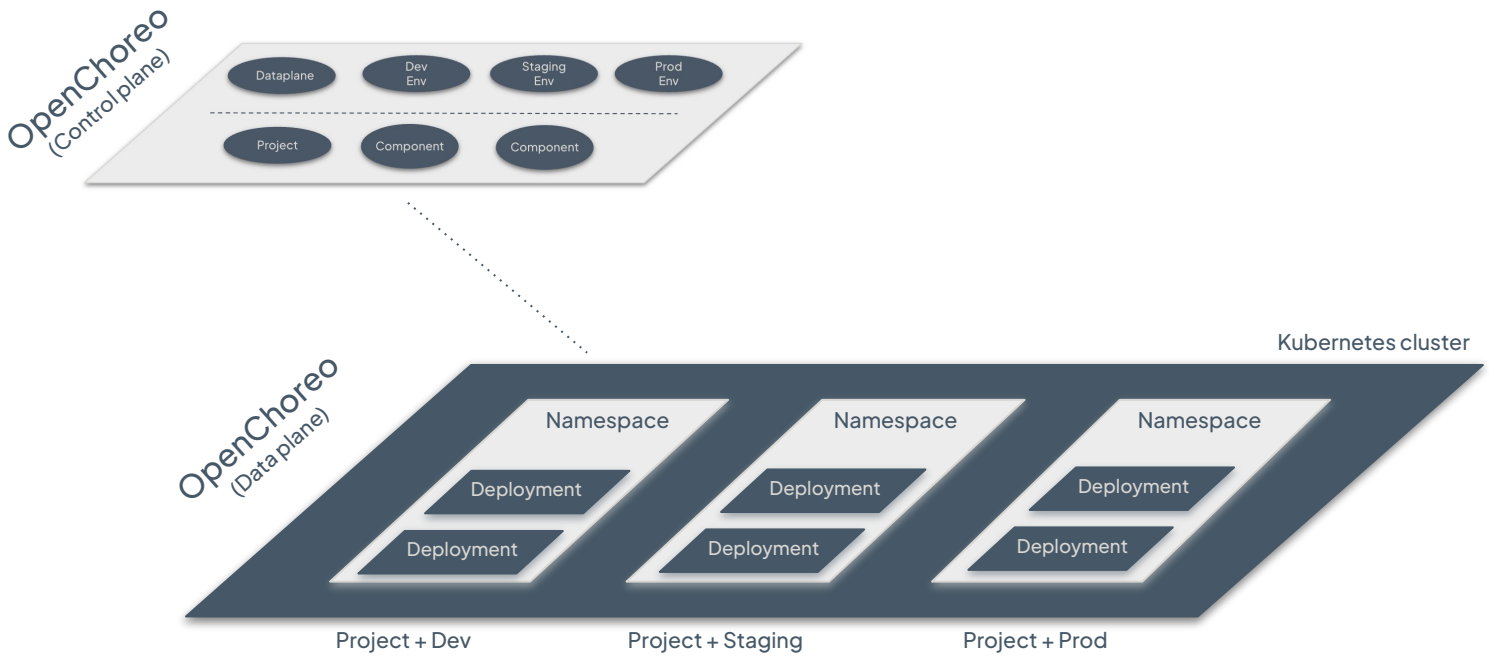

Control plane
(Choreo concepts)
Dataplane
Dev Env
Staging Env
Prod Env
Platform engineers
Kubernetes cluster
Data plane
(Kubernetes concepts)


Control plane
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Dataplane
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Staging Env
Prod Env
Platform engineers
Project
Developers
Kubernetes cluster
Data plane
(Kubernetes concepts)
Namespace
Namespace
Namespace
Project + Dev
Project + Staging
Project + Prod

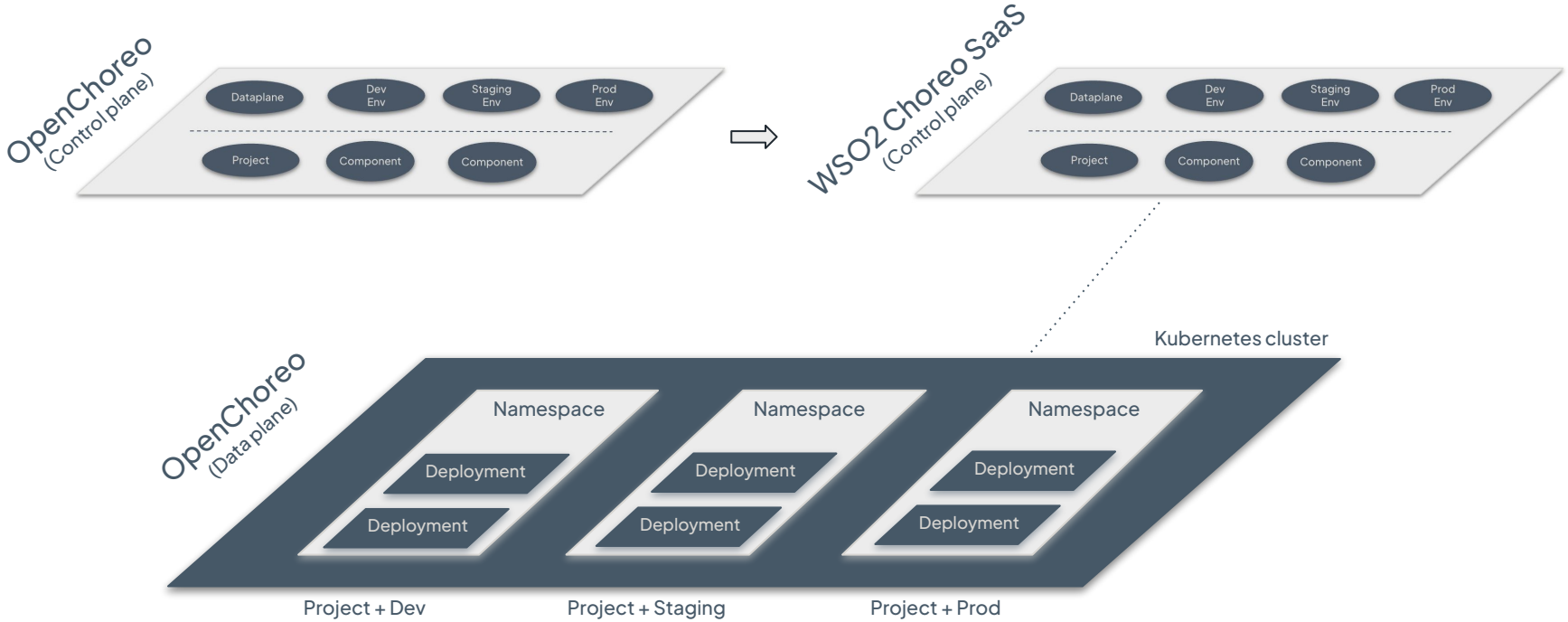

Control plane
(Choreo concepts)
Dataplane
Dev Env
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Prod Env
Platform engineers
Project
Component
Developers
Kubernetes cluster
Data plane
(Kubernetes concepts)
Namespace
Namespace
Namespace
Deployment
Deployment
Deployment
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Control plane
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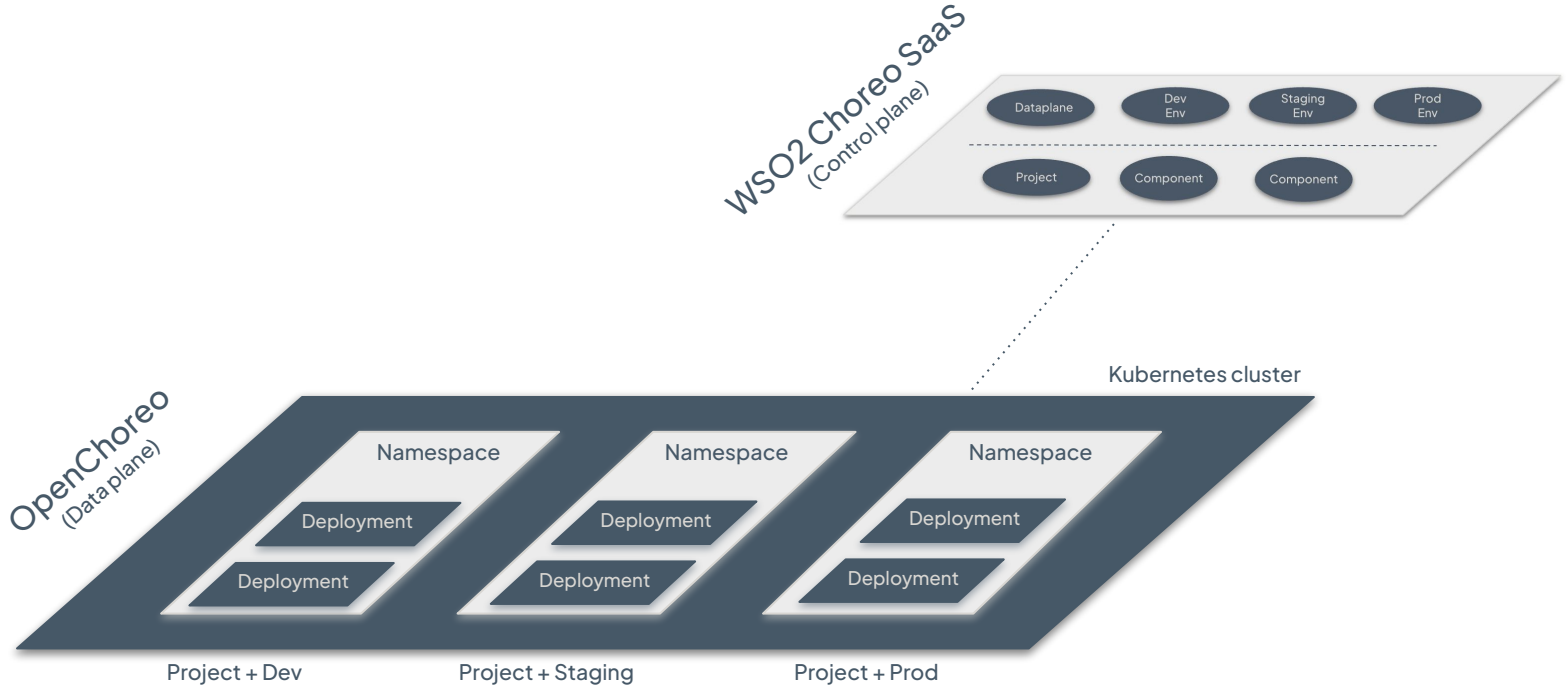
Flexible Deployment Options



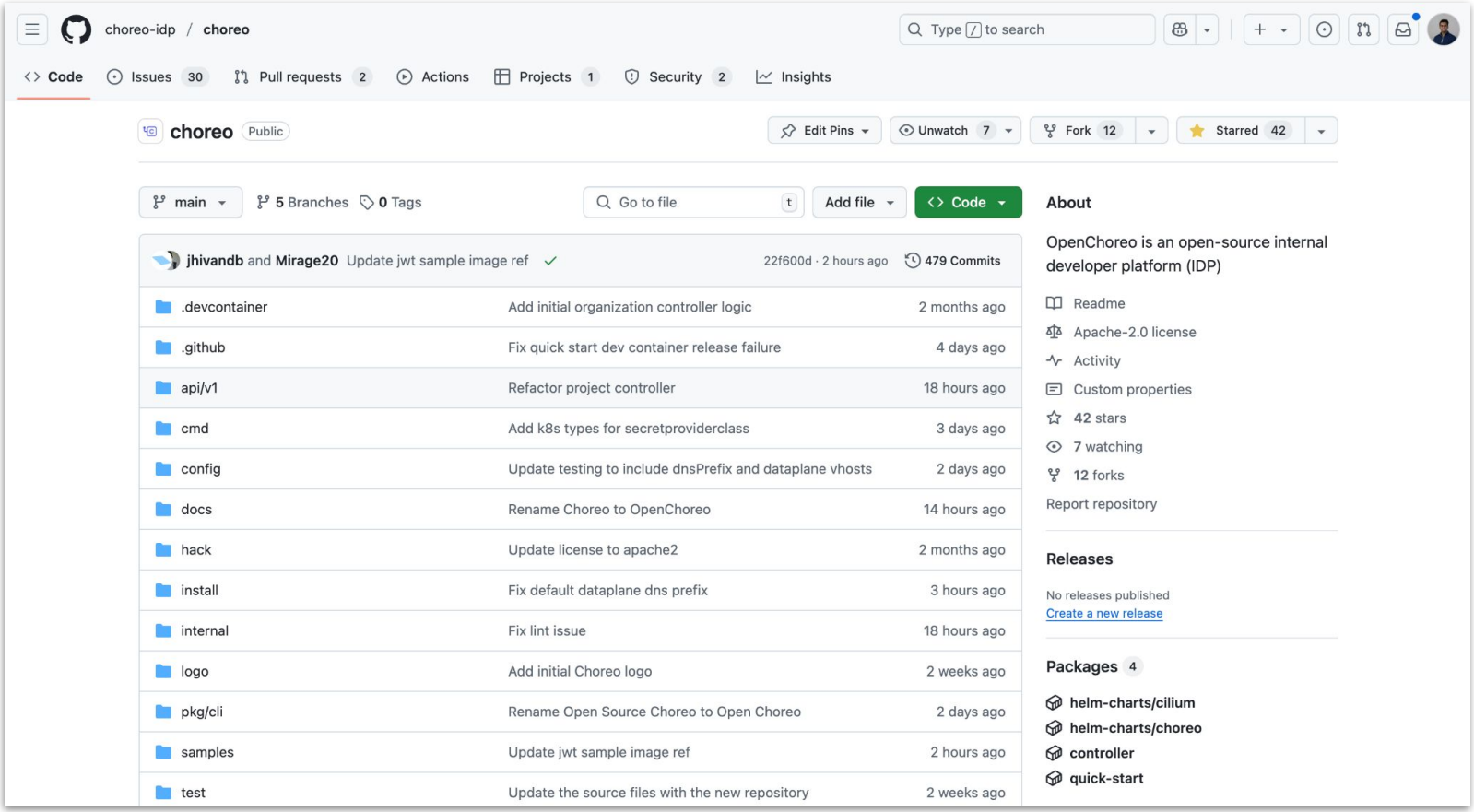
Flexible Deployment Options...



Flexible Deployment Options...



https://github.com/choreo-idp/choreo



Quick Start Guide

Setting up OpenChoreo in a Kubernetes cluster involves multiple steps and tools. This guide provides a fast and simple way to install a fully functional OpenChoreo instance on your local machine with minimal prerequisites and effort by using a pre-configured dev container. This dev container has all the necessary tools installed for setting up OpenChoreo and is ready to be used. Once the installation is complete, you can explore the underlying setup to understand how it works. When you're done, you can fully clean up the setup, leaving your machine clutter-free.

Prerequisites

To get started, you'll need:

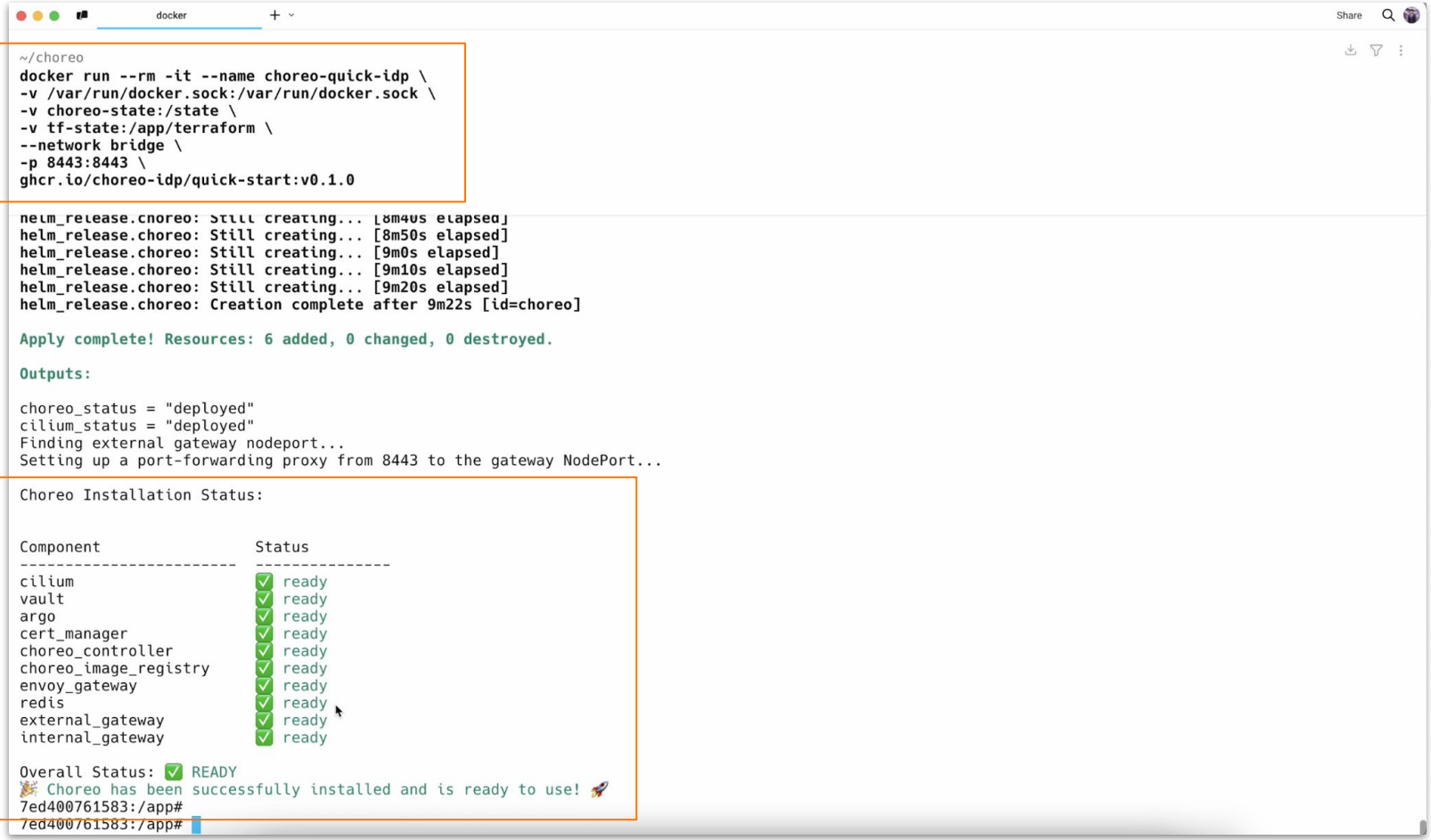
- **Docker** – Just have it installed on your machine, and you're good to go.
  - We recommend using Docker Engine version 26.0+.
- **5–10 minutes of your time** – Setup is quick and depends on your internet connection speed.

Start the Dev Container

Run the following command to start the dev container and launch a terminal session within it:

```
docker run --rm -it --name choreo-quick-idp \
-v /var/run/docker.sock:/var/run/docker.sock \
-v choreo-state:/state \
-v tf-state:/app/terraform \
--network bridge \
-p 8443:8443 \
ghcr.io/choreo-idp/quick-start:v0.1.0
```

https://github.com/choreo-idp/choreo/blob/main/docs/quick-start-guide.md


docker
Share
~/choreo
docker run --rm -it --name choreo-quick-idp \
-v /var/run/docker.sock:/var/run/docker.sock \
-v choreo-state:/state \
-v tf-state:/app/terraform \
--network bridge \
-p 8443:8443 \
ghcr.io/choreo-idp/quick-start:v0.1.0
helm_release.choreo: Still creating... [8m40s elapsed]
helm_release.choreo: Still creating... [8m50s elapsed]
helm_release.choreo: Still creating... [9m0s elapsed]
helm_release.choreo: Still creating... [9m10s elapsed]
helm_release.choreo: Still creating... [9m20s elapsed]
helm_release.choreo: Creation complete after 9m22s [id=choreo]
Apply complete! Resources: 6 added, 0 changed, 0 destroyed.
Outputs:
choreo_status = "deployed"
cilium_status = "deployed"
Finding external gateway nodeport...
Setting up a port-forwarding proxy from 8443 to the gateway NodePort...
Choreo Installation Status:
Component Status
cilium ✅ ready
vault ✅ ready
argo ✅ ready
cert_manager ✅ ready
choreo_controller ✅ ready
choreo_image_registry ✅ ready
envoy_gateway ✅ ready
redis ✅ ready
external_gateway ✅ ready
internal_gateway ✅ ready
Overall Status: ✅ READY
🎉 Choreo has been successfully installed and is ready to use! 🚀
7ed400761583:/app#
7ed400761583:/app#

```
Overall Status: ✅ READY
🎉 Choreo has been successfully installed and is ready to use! 🚀
f3b450f898bd:/app#
f3b450f898bd:/app#
f3b450f898bd:/app# kubectl get pods -A
NAMESPACE             NAME                                                        READY   STATUS    RESTARTS   AGE
choreo-system         choreo-argo-workflows-server-69bd66cf94-kznhz               1/1     Running   0          20m
choreo-system         choreo-argo-workflows-workflow-controller-66f6c55774-nnbs8  1/1     Running   0          20m
choreo-system         choreo-certmanager-565fc47c9d-49ds9                         1/1     Running   0          20m
choreo-system         choreo-certmanager-cainjector-54b9498c5d-nsr9s              1/1     Running   0          20m
choreo-system         choreo-certmanager-webhook-57c874f9f7-b95bm                 1/1     Running   0          20m
choreo-system         choreo-controller-manager-5c76f9789d-brqdz                  1/1     Running   0          20m
choreo-system         choreo-secrets-store-csi-driver-4v4tx                       3/3     Running   0          20m
choreo-system         choreo-secrets-store-csi-driver-p2bgn                       3/3     Running   0          20m
choreo-system         choreo-vault-0                                              1/1     Running   0          20m
choreo-system         choreo-vault-csi-provider-ghhj2                             1/1     Running   0          20m
choreo-system         cilium-55gfw                                                1/1     Running   0          23m
choreo-system         cilium-ftzhb                                                1/1     Running   0          23m
choreo-system         cilium-operator-87b89765d-dtkjw                             1/1     Running   0          23m
choreo-system         envoy-choreo-system-gateway-external-a3e2e525-987644595-n5kz2  2/2  Running   0          15m
choreo-system         envoy-choreo-system-gateway-internal-7e0f4e93-547c6c6684-tzvbd  2/2  Running   0          15m
choreo-system         envoy-gateway-785986c6b4-rjwk7                              1/1     Running   0          20m
choreo-system         envoy-ratelimit-74b4895cdf-tvwv8                            1/1     Running   0          19m
choreo-system         redis-7f545fb766-p5b4w                                      1/1     Running   0          20m
choreo-system         registry-5d69559bf9-kt5vp                                   1/1     Running   0          20m
kube-system           coredns-668d6bf9bc-8v6hx                                    1/1     Running   0          23m
kube-system           coredns-668d6bf9bc-jc8zd                                    1/1     Running   0          23m
kube-system           etcd-choreo-control-plane                                   1/1     Running   0          23m
kube-system           kube-apiserver-choreo-control-plane                         1/1     Running   0          23m
kube-system           kube-controller-manager-choreo-control-plane                1/1     Running   0          23m
kube-system           kube-proxy-hzxjs                                            1/1     Running   0          23m
kube-system           kube-proxy-xxzjq                                            1/1     Running   0          23m
kube-system           kube-scheduler-choreo-control-plane                         1/1     Running   0          23m
local-path-storage    local-path-provisioner-7dc846544d-s9867                     1/1     Running   0          23m
f3b450f898bd:/app#
```

```
f3b450f898bd:/app#
f3b450f898bd:/app#
f3b450f898bd:/app# choreoctl get components
NAME          TYPE             STATUS                       AGE   PROJECT           ORGANIZATION
go-greeter    Service          Created: ComponentCreated    5m    default-project   default-org
react-spa     WebApplication   Created: ComponentCreated    7m    default-project   default-org
time-logger   ScheduledTask    Created: ComponentCreated    3m    default-project   default-org
f3b450f898bd:/app#
f3b450f898bd:/app#
f3b450f898bd:/app#
f3b450f898bd:/app#
f3b450f898bd:/app# choreoctl get component time-logger -o yaml
```

GitOps-Friendly

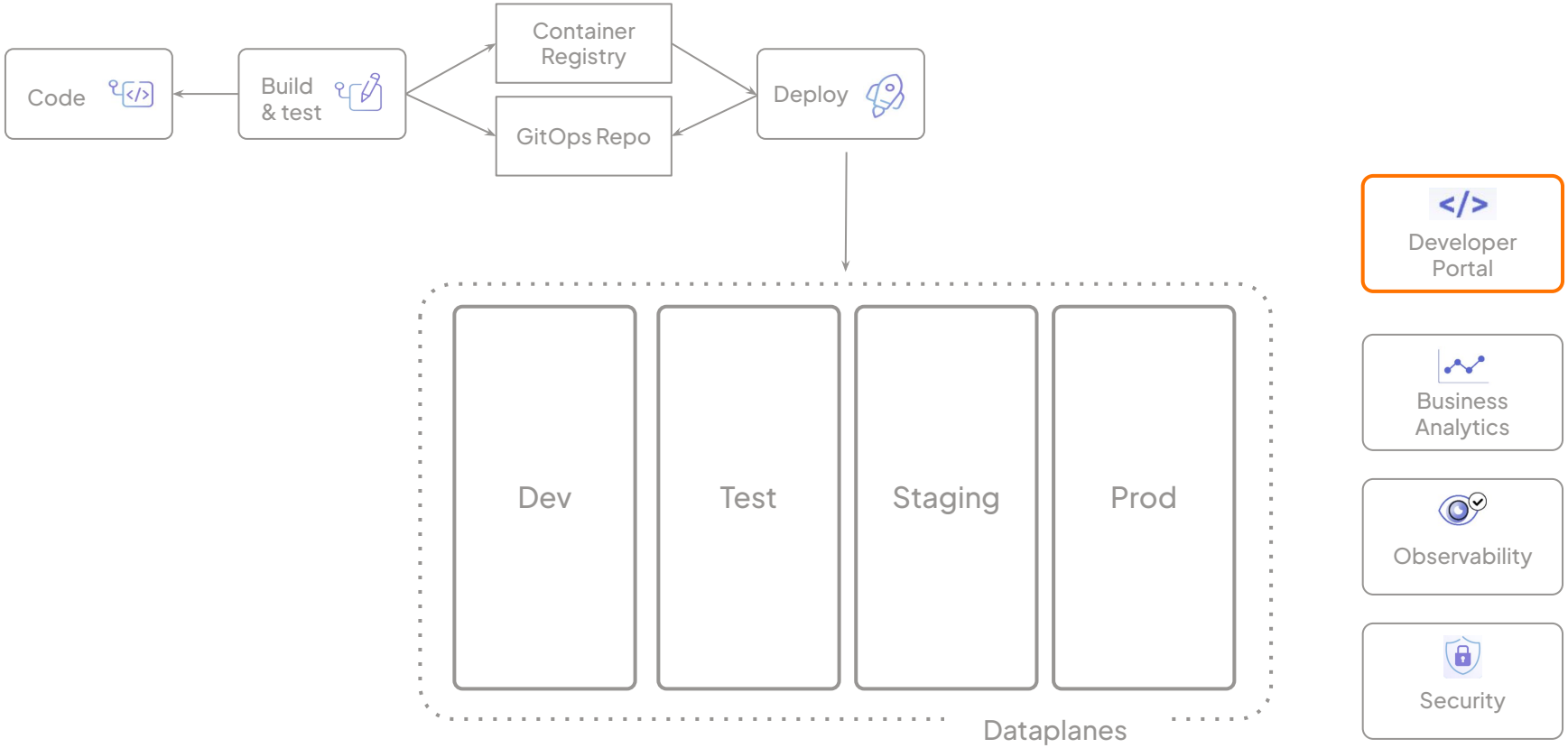
GitOps

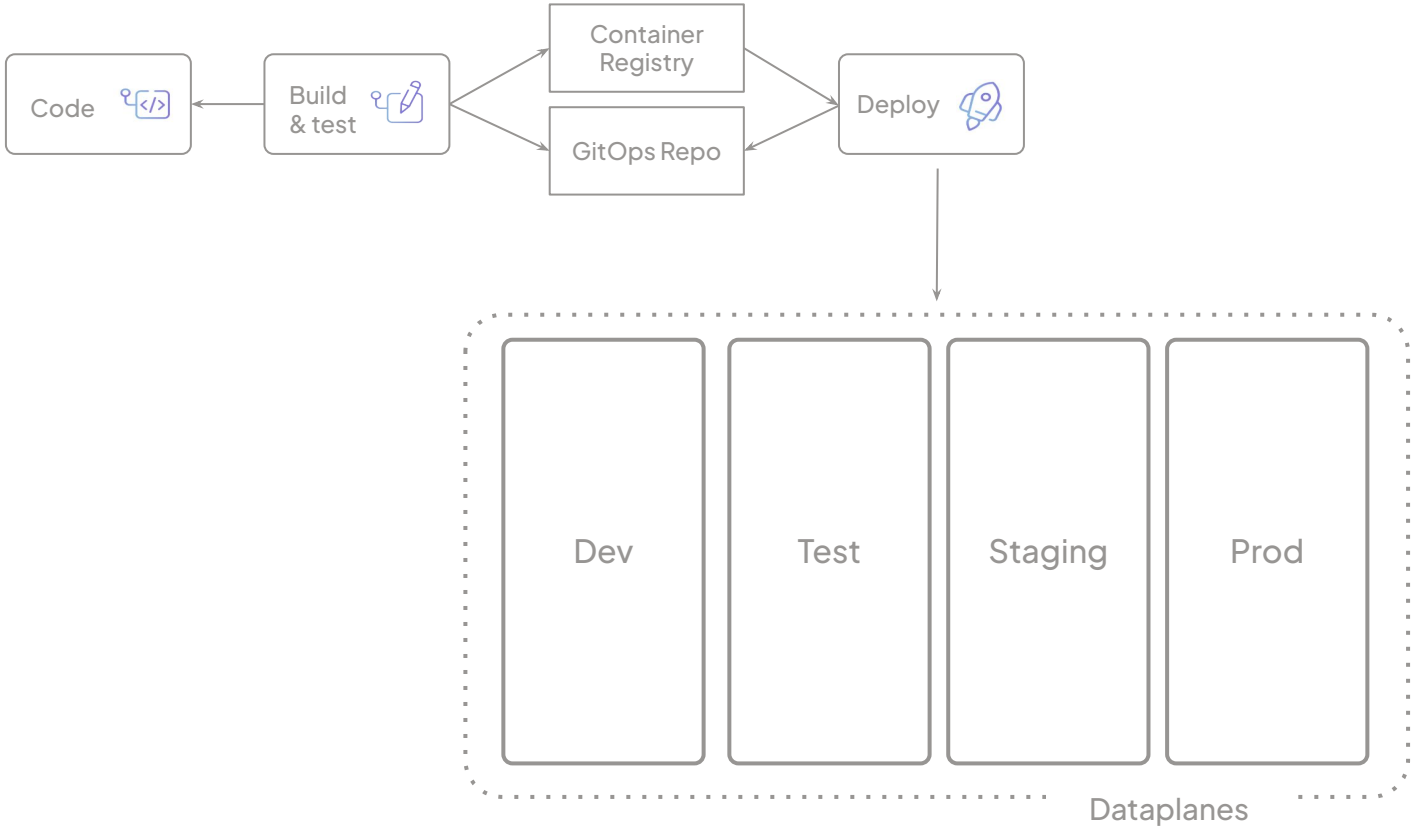
```yaml
apiVersion: core.choreo.dev/v1
kind: Project
metadata:
  name: customer-portal
  namespace: acme
  annotations:
    core.choreo.dev/display-name: Customer Portal
    core.choreo.dev/description: This project contains types that are
  labels:
    core.choreo.dev/organization: acme
    core.choreo.dev/name: customer-portal
spec:
  deploymentPipelineRef: default-pipeline
```

GitOps

```yaml
apiVersion: core.choreo.dev/v1
kind: Component
metadata:
  name: reading-list-service
  namespace: default-org
  annotations:
    core.choreo.dev/display-name: Reading List Service
    core.choreo.dev/description: A REST API to manage a reading list of books
  labels:
    core.choreo.dev/organization: default-org
    core.choreo.dev/project: default-project
    core.choreo.dev/name: reading-list-service
spec:
  type: Service
  source:
    gitRepository:
      url: https://github.com/wso2/choreo-samples
```

Developer Portal


Code
Build & test
Container Registry
GitOps Repo
Deploy
Dev
Test
Staging
Prod
Dataplanes
Developer Portal
Business Analytics
Observability
Security



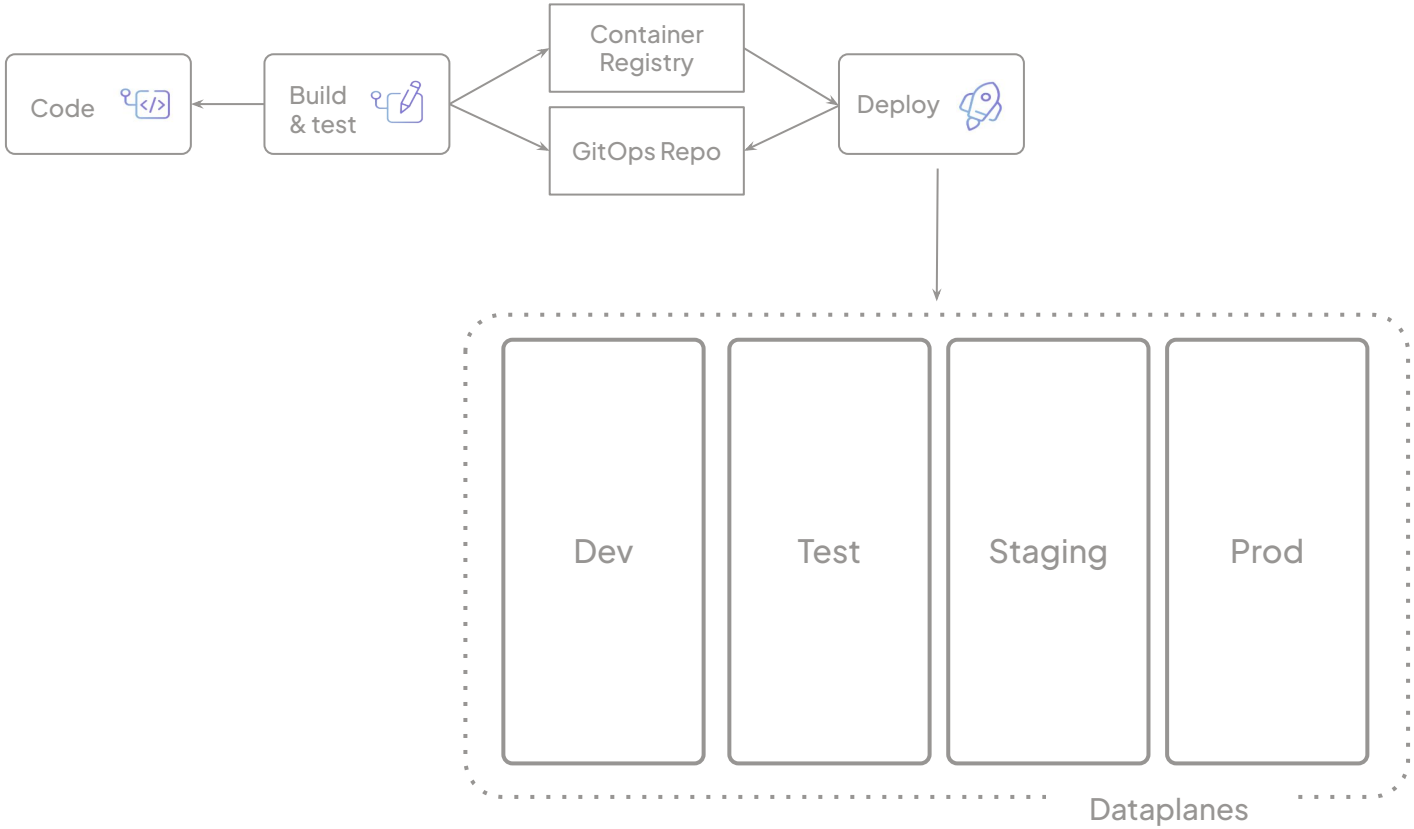
Choreo by WSO2

Developer Portal

Business Analytics

Observability

Security



Backstage

Developer Portal

Business Analytics

Observability

Security


CLOUD NATIVE
COMPUTING FOUNDATION

Borg: The Predecessor to Kubernetes

Thursday, April 23, 2015

Google has been running containerized workloads in production for more than a decade. Whether it's service jobs like web front-ends and stateful servers, infrastructure systems like Bigtable and Spanner, or batch frameworks like MapReduce and Millwheel, virtually everything at Google runs as a container. Today, we took the wraps off of Borg, Google's long-rumored internal container-oriented cluster-management system, publishing details at the academic computer systems conference Eurosys. You can find the paper here.

Kubernetes traces its lineage directly from Borg. Many of the developers at Google working on Kubernetes were formerly developers on the Borg project. We've incorporated the best ideas from Borg in Kubernetes, and have tried to address some pain points that users identified with Borg over the years.

https://kubernetes.io/blog/2015/04/borg-predecessor-to-kubernetes/

Join the Community & Contribute

We'd love for you to be part of OpenChoreo's journey! Whether you're fixing a bug, improving documentation, or suggesting new features, every contribution counts.

- Contributor Guide – Learn how to get started.
- Report an Issue – Help us improve Choreo.
- Join our Discord – Be part of the community.

We're excited to have you onboard! 

https://github.com/choreo-idp/choreo?tab=readme-ov-file#join-the-community--contribute

Question Time!




Thank you!
WSO2CON2025