



# Embracing Cloud Native Landscape in Drupal Development

**Beyond Docker and Kubernetes**

Ricardo Amaro @acquia.com



**DRUPAL IBERIA**



ASOCIACIÓN  
ESPAÑOLA  
DE DRUPAL



Drupal  
Portugal



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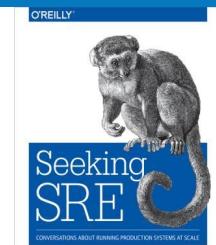


Drupal  
Portugal



# Who am I?

Published author

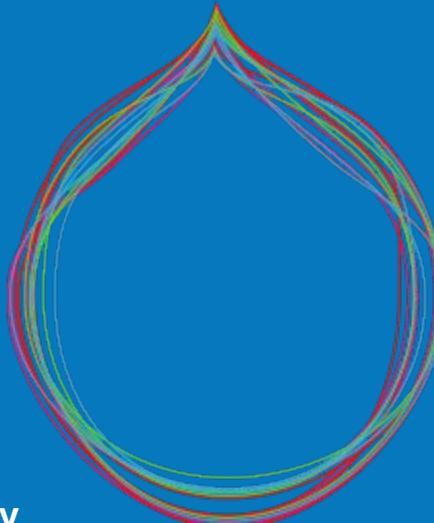


**DevOps PhD  
Research**

**Drupal  
Portugal**

**DevOps  
Lisbon**

**Kubernetes  
OpenTelemetry**



**+14 years Drupal  
(DevOps & Infra)**

**90's Linux & FreeSoftware**

**12 years at Acquia**

**Senior Engineering  
Manager**

**Applying Platform Automation Engineering,  
Machine Learning and Cloud Native**



@ricardoamaro

<https://drupal.org/user/666176>



# Session Overview

- **Current Challenges**
- **Impact for Drupal Devs & Ops**
- **Cloud Native Principles**
- **Key Projects and Products**
- **Drupal in a Cloud-Native environment overview**
- **Successful Drupal Transition Use-case**
- **Conclusion and Key Takeaways**



# The Challenge at Hand

- The need for scalability, resilience, and flexibility.
- Modernizing Drupal environments and applications.
- Modernizing Drupal applications to leverage distributed systems and cloud-native architectures.



# The Impact on Drupal Devs & Ops

- **Performance improvements.**
- **Cost reduction at scale.**
- **improved reliability.**
- **“It also works on my machine!”**



# Why Cloud Native?

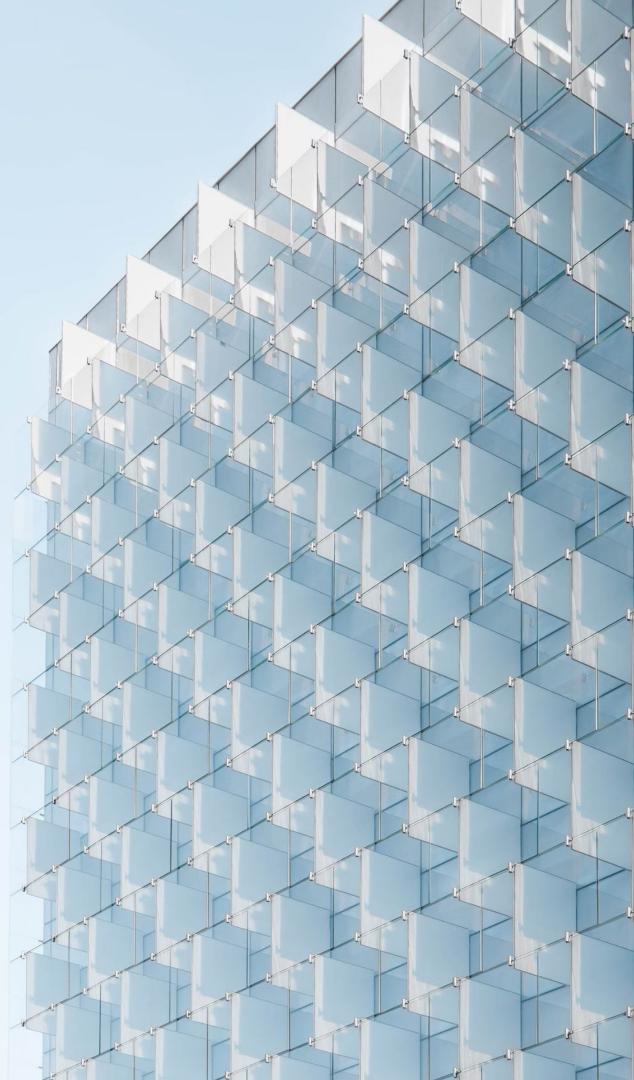
- **Architectural Design**
- **Operational Efficiency**
- **System Reliability**



# *Cloud-Native Principles*

# Architectural Design

- **Microservices Architecture**
- **Containerization**
- **Declarative APIs**
- **Loosely Coupled Services**



# *Cloud-Native Principles*

# Operational Efficiency

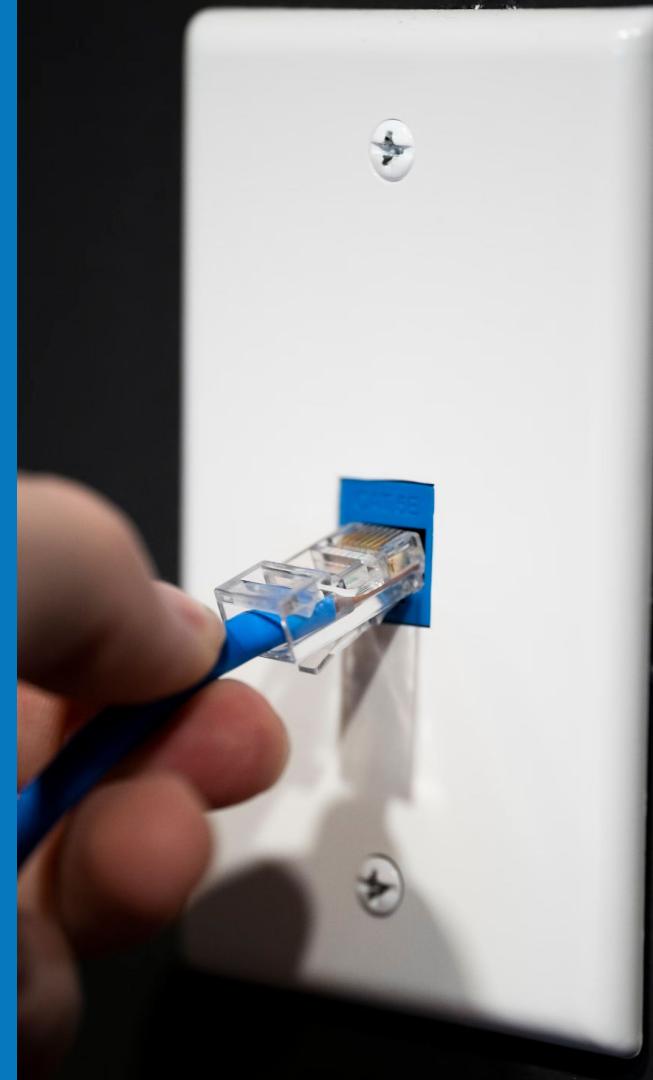
- **Orchestration**
- **Continuous Integration and Delivery**
- **Automation**



*Cloud-Native Principles*

# System Reliability

- Scalability
- Resiliency





# 62 Graduated + Incubating Projects and Products

Application Definition & Image Build																								
App Definition and Development						Streaming & Messaging																		
Continuous Integration & Delivery			Database			Service Proxy			Remote Procedure Call															
Orchestration & Management						Coordination & Service Discovery						API Gateway												
Runtime						Cloud Native Storage						Container Runtime						Cloud Native Network						
Provisioning						Security & Compliance						Container Registry												
Observability and Analysis						Automation & Configuration						Key Management												
Observability						Chaos Engineering						Feature Flagging												
 HELM CNCF GRADUATED	 Backstage CNCF INCUBATING	 Buildpacks.io CNCF INCUBATING	 dapr CNCF INCUBATING	 KubeVela CNCF INCUBATING	 KubeVirt CNCF INCUBATING	 OPERATOR FRAMEWORK CNCF INCUBATING	 cloudevents CNCF GRADUATED	 NATS CNCF INCUBATING	 STRIMZI CNCF INCUBATING	 argo CNCF GRADUATED	 flux CNCF GRADUATED	 keptn CNCF INCUBATING	 OpenCruise	 KV CNCF GRADUATED	 Vitess CNCF GRADUATED	 KEDA CNCF GRADUATED	 kubernetes CNCF GRADUATED	 Crossplane CNCF INCUBATING	 KARMADA CNCF INCUBATING	 Knative CNCF INCUBATING	 VOLCANO CNCF INCUBATING	 envoy CNCF GRADUATED	 CONTOUR CNCF INCUBATING	 gRPC CNCF INCUBATING
 CoreDNS CNCF GRADUATED	 etcd CNCF GRADUATED	 ROOK CNCF GRADUATED	 CubeFS CNCF INCUBATING	 LONGHORN CNCF INCUBATING	 Istio CNCF GRADUATED	 LINKERD CNCF GRADUATED	 EMISSARY INGRESS CNCF INCUBATING	 ROCK CNCF GRADUATED	 KEYCLOAK CNCF INCUBATING	 TUF CNCF GRADUATED	 in-toto CNCF INCUBATING	 Kyverno CNCF INCUBATING	 notary CNCF INCUBATING	 cri-o CNCF GRADUATED	 cilium CNCF GRADUATED	 CNI CNCF INCUBATING	 HARBOR CNCF GRADUATED	 Dragonfly CNCF INCUBATING						
 Falco CNCF GRADUATED	 Open Policy Agent CNCF GRADUATED	 TUF CNCF GRADUATED	 KEYCLOAK CNCF INCUBATING	 in-toto CNCF INCUBATING	 Kyverno CNCF INCUBATING	 notary CNCF INCUBATING	 spiffe CNCF GRADUATED	 SPIRE CNCF GRADUATED	 KubeEdge CNCF INCUBATING	 OpenFeature CNCF INCUBATING														
 fluentd CNCF GRADUATED	 ALIC CNCF GRADUATED	 Prometheus CNCF GRADUATED	 CORTEX CNCF INCUBATING	 OPENMETRICS CNCF INCUBATING	 OpenTelemetry CNCF INCUBATING	 Thanos CNCF INCUBATING	 Chaos Mesh CNCF INCUBATING	 Litmus CNCF INCUBATING	 Open Feature CNCF INCUBATING															



# Drupal in a Cloud-Native environment

- **Development and Management**
- **Hosting and Provisioning**
- **Monitoring**
- **Continuous Integration and Delivery (CI/CD)**
- **Orchestration**
- **Security and Compliance**

# Development and Management

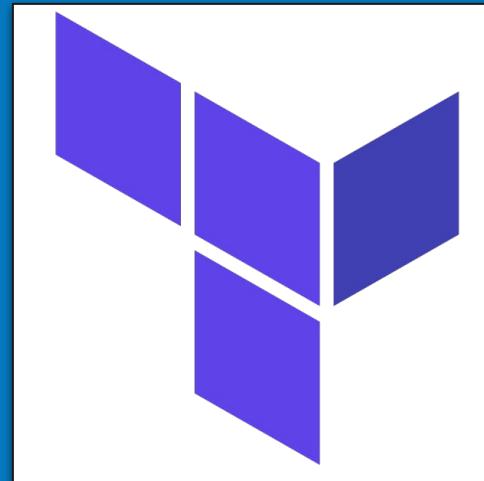


Helm

# Hosting and Provisioning



Kubernetes



Terraform

# Monitoring



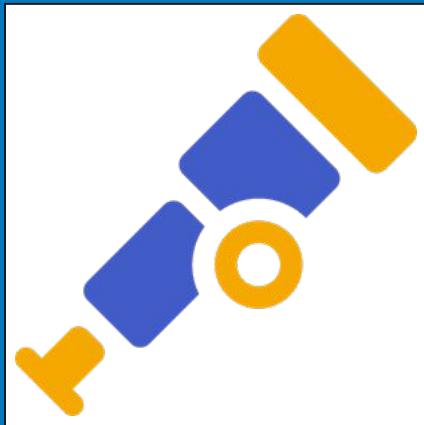
Prometheus



Grafana



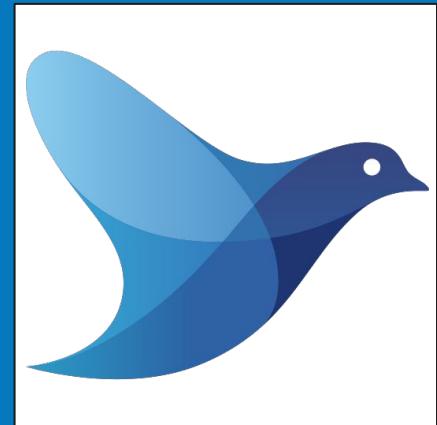
# Observability



OpenTelemetry



Jaeger



Fluentd

# CI/CD and Orchestration

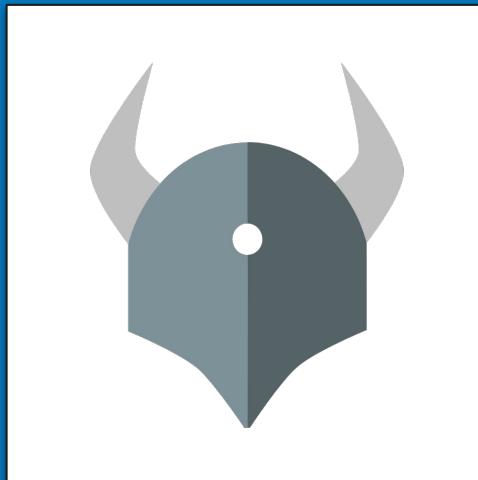


*TEKTON*



*ArgoCD*

# Security and Compliance



Open Policy Agent (OPA)



Falco



Cert Manager



# Drupal Developer Workflow



```
$ ddev composer update
Loading composer repositories with package information
Updating dependencies
Lock file operations: 0 installs, 2 updates, 0 removals
- Upgrading drupal/asset_injector (2.19.0 => 2.20.0)
  - Upgrading webflo/drupal-finder (1.2.2 => 1.3.0)
Writing lock file
Installing dependencies from lock file (including require-dev)
Package operations: 0 installs, 2 updates, 0 removals
- Downloading drupal/asset_injector (2.20.0)
- Downloading webflo/drupal-finder (1.3.0)
No patches applied
Gathering patches for dependencies. This might take a minute.
- Upgrading drupal/ass
- Upgrading webflo/dr
Package doctrine/refl
Package symfony/debug is
Package webmucart/path-u
Gathering patches for dependencies
57 packages you are usin
Use the 'composer fund'
Found 3 security vulnera
Run "composer audit" for

```

**CN Drupal Test Site**

Welcome!

You haven't created any frontpage content yet.

Congratulations and welcome to the Drupal community.

Drupal is an open source platform for building amazing digital experiences. It's made, used, taught, documented, and marketed by the [Drupal community](#). Our community is made up of people from around the world with a shared set of [values](#), collaborating together in a respectful manner, as we like to say:

Come for the code, stay for the community.



**Applications**

+ NEW APP    SYNC APPS

**guestbook**

Project: default  
Status: Healthy / Synced  
RepoURL: https://github.com/argoproj/argocd-examples  
Target Revision: latest  
Path: guestbook  
Destination: https://kubernetes.default.svc  
Namespace: default

**SYNC**

- Synced 1
- Unknown 0
- OutOfSync 0

**HEALTH**

- Healthy 1
- Unknown 0
- Progressing 0
- Suspended 0
- Degraded 0
- Missing 0

**LABELS**

**PROJECTS**

**CLUSTERS**

**SYNC**    **REFRESH**    **DELETE**

**ArgoCD**

Build

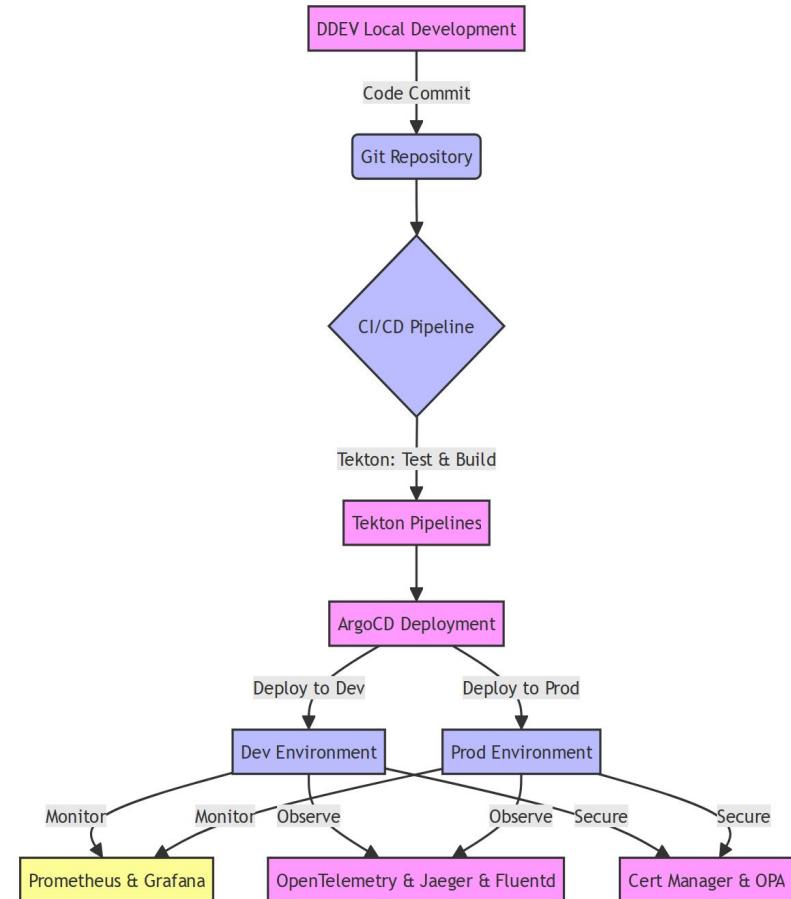
Test

Release

Deploy to Dev/Prod

# The Drupal CNCF Workflow

- **DDEV:** Docker-based local development for Drupal.
- **Git Repository:** Usual Gitlab, GitHub, others.
- **Tekton Pipelines:** For CI/CD test and build process.
- **ArgoCD:** Deploys Drupal to Dev + Prod, ensuring the desired state matches the Git repository.
- **Prometheus & Grafana:** Monitoring and alerting. Collects, stores metrics, visible in Grafana.
- **OpenTelemetry, Jaeger, & Fluentd:** Provide observability through tracing (Jaeger), metrics (OpenTelemetry), and logs (Fluentd).
- **Cert Manager & OPA (Open Policy Agent):** Cert Manager automates the management of TLS certificates, while OPA enforces security policies and practices.



# A Successful Transition

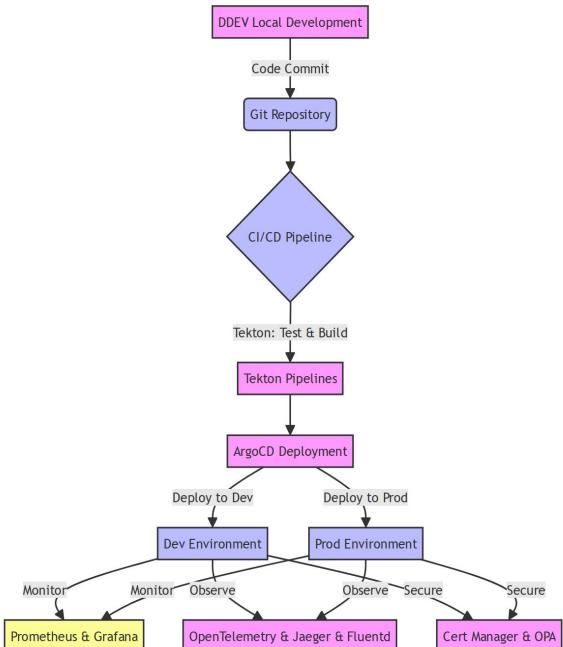
- Drupal Cloud to Cloud-Native transition.
- Key benefits achieved.
  - Scalability
  - Resilience
  - Flexibility
  - Automation
- ~50 clusters and ~68k pods total.
- COGS reduction using Machine Learning.
- Less operational toil, more releases.

ACQUIA



# The Drupal CNCF project

[https://gitlab.com/ricardoamaro/drupal\\_cncf](https://gitlab.com/ricardoamaro/drupal_cncf)



D drupal\_cncf

main drupal\_cncf / +

No Input Found

remove values Ricardo Amaro authored 1 week ago 37428869

Name	Last commit	Last update
argocd	remove values	1 week ago
tekton	updated	1 week ago
LICENSE	Initial commit	1 week ago
README.md	add kustomization.yaml	1 week ago
kind-config.yaml	updated	1 week ago

README.md

This how-to guide focus on a scenario where Drupal is tested using Tekton and the deployment of all applications (including Drupal, MariaDB, Prometheus, and Grafana) is managed via Argo CD. CI/CD pipeline is using Tekton for testing and Argo CD for deployment. This approach requires defining the application configurations declaratively in a Git repository, which Argo CD will use to manage deployments in the Kubernetes cluster.

### Prerequisites

Ensure you have the following prerequisites installed and configured:

- Docker
- kubectl
- kind or k3d
- helm
- kubectl-argo-rollouts plugin for Argo CD interaction (optional but useful)
- Access to a Git repository to store your Kubernetes manifests and Tekton pipelines

Ensure Docker, kubectl, kind/k3d, helm, and git are installed on your system.

# Conclusion and Key Takeaways

- Core principles of cloud-native development.
- Practical overview of the Drupal use case.
- Tools for effective Cloud-Native adoption.
- Example of a successful migration.
- Open source repository for collaborating on the Drupal CNCF project.



Time for some Q&A

# Questions & Answers





# Thank you!

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