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Kubernetes GitOps with ArgoCD

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Agenda

- GitOps and Kubernetes
 - What is GitOps
 - CI/CD vs GitOps
 - Benefits and Challenges
 - Tooling Landscape
- Demo
- Q&A Session

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GitOps and Kubernetes

A Modern Approach to Infrastructure and Application Management

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What is GitOps

GitOps = Git + Operations

GitOps is a set of (DevOps) **practices** for **managing infrastructure** and **applications** using **Git** as the **single source of truth**

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GitOps Principles

- **Declarative**

A system managed by GitOps must have its **desired state** expressed declaratively

- **Versioned and Immutable**

Desired state is stored in a way that enforces immutability, versioning and retains a complete version history

- **Pulled Automatically**

Software agents automatically pull the **desired state** declarations from the source

- **Continuously Reconciled**

Software agents continuously observe actual system state and attempt to apply the **desired state**

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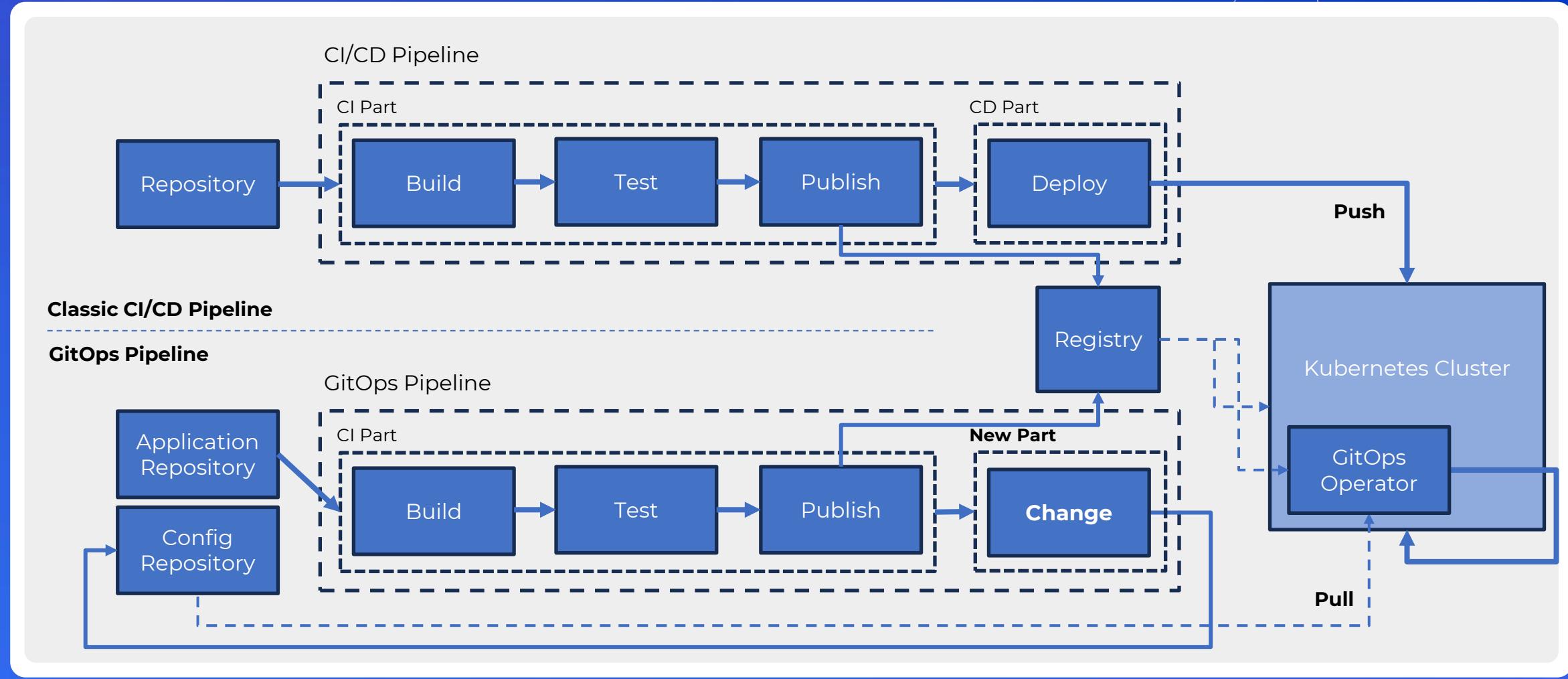


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CI/CD vs GitOps: Pipeline Evolution



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Key Benefits

- Faster releases through automation
- Safer operations thanks to versioned audits
- Easy rollbacks by reverting Git commits
- Consistent environments across dev, test, and production
- Improved security by minimizing direct access to systems

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Typical Challenges

- Steep learning curve
- Tooling fragmentation
- Security concerns
- Cultural shift



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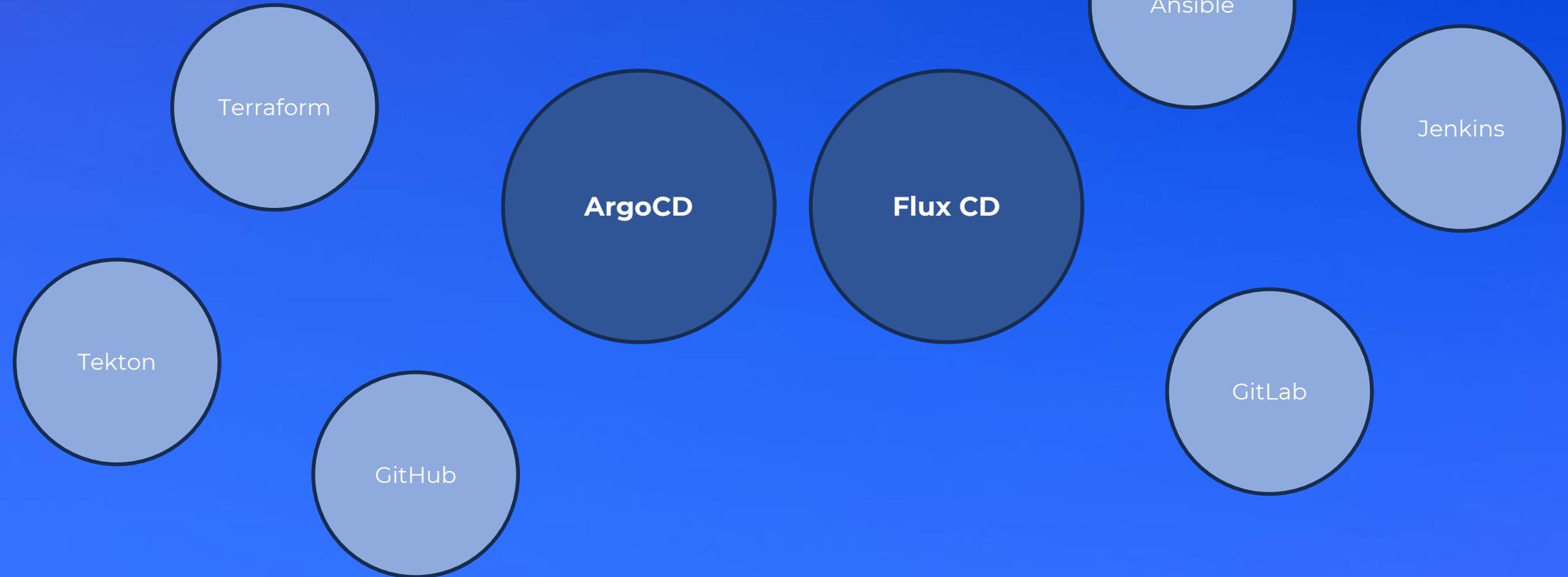


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The GitOps Universe *



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- Declarative application definitions
- Automated synchronization
- Real-time application status monitoring
- Role-based access control (RBAC)
- Multi-cluster support
- Web UI and CLI
- Created by Intuit, now part of CNCF

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Demo

Let's see it in action

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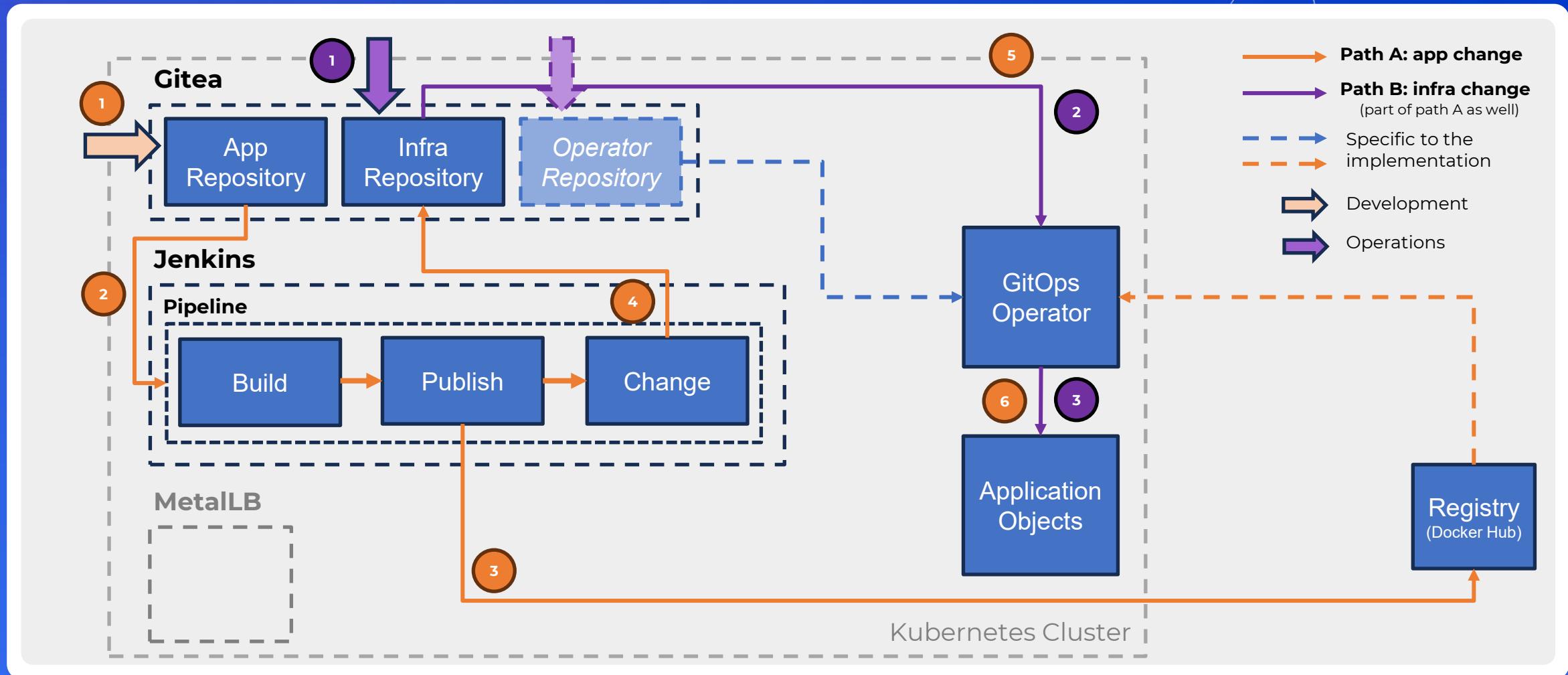


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Demo Setup



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Q&A Session

You ask, I answer (if I can)

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Thank you!

Contacts:

 <https://www.linkedin.com/in/dzahariev/>

 <https://github.com/shekeriev/kubernetes-gitops-w-argocd>

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