

# Implementing GitOps for Kubernetes Applications

Establishing a GitOps-driven Deployment Model



**Praveenkumar Bouna**

Cloud Instructor

[linkedin.com/in/praveenkumarbouna](https://linkedin.com/in/praveenkumarbouna)

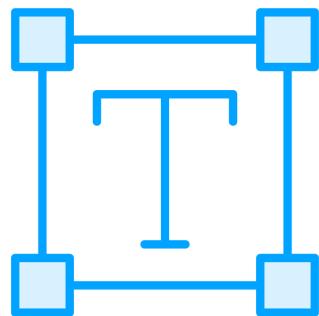
# Introduction to GitOps Principles

# GitOps

**A set of practices that uses Git repositories as the single source of truth for infrastructure and application deployments.**

---

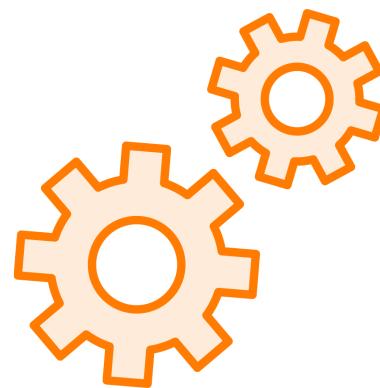
# Core Principles of GitOps



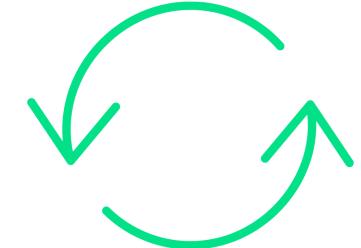
**Declarative  
infrastructure**



**Version controlled**



**Automatically  
applied**



**Automatic drift  
detection**

# Benefits for Cloud-native Applications

Improved security through declarative deployments

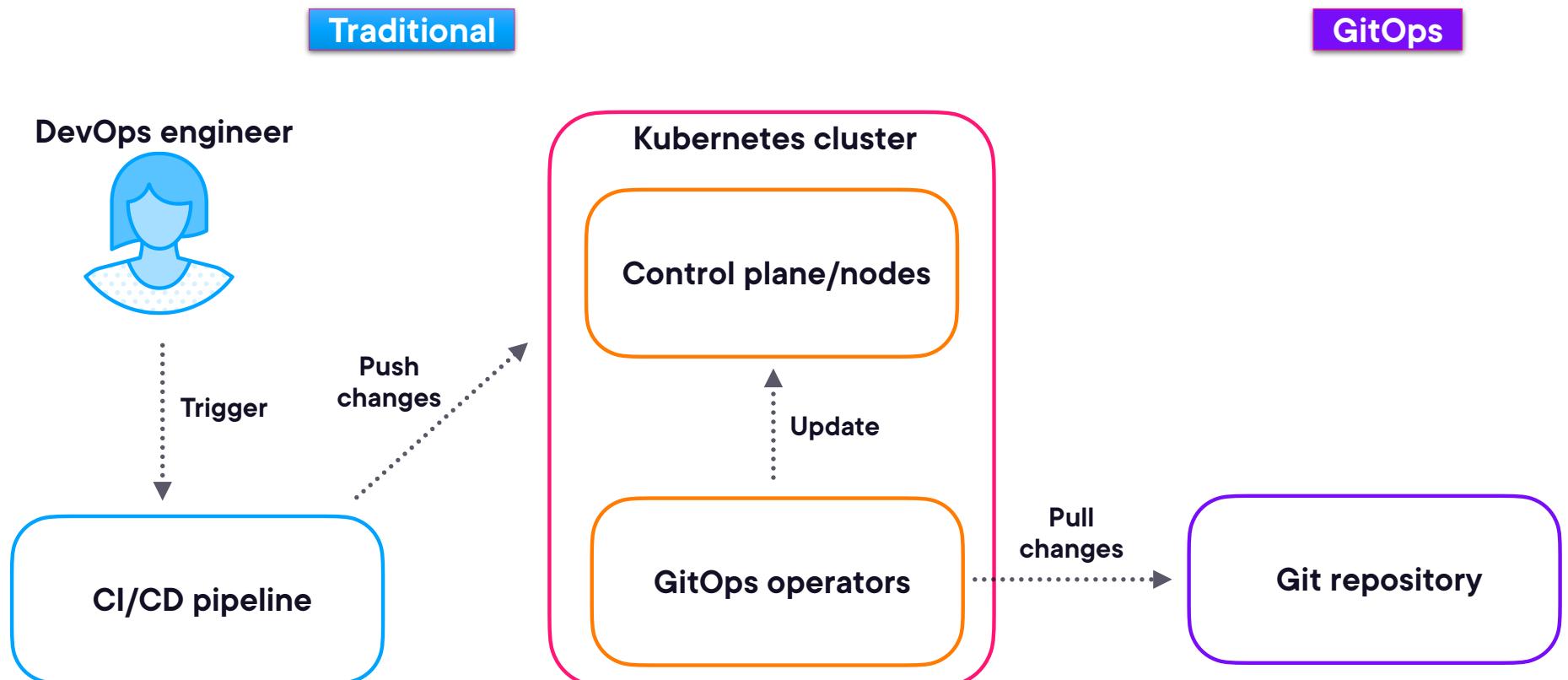
Reduced configuration drift and human error

Faster recovery through rollbacks

Enhanced collaboration through Git workflows

# GitOps Pull-based Deployment

# GitOps Pull-based Deployment



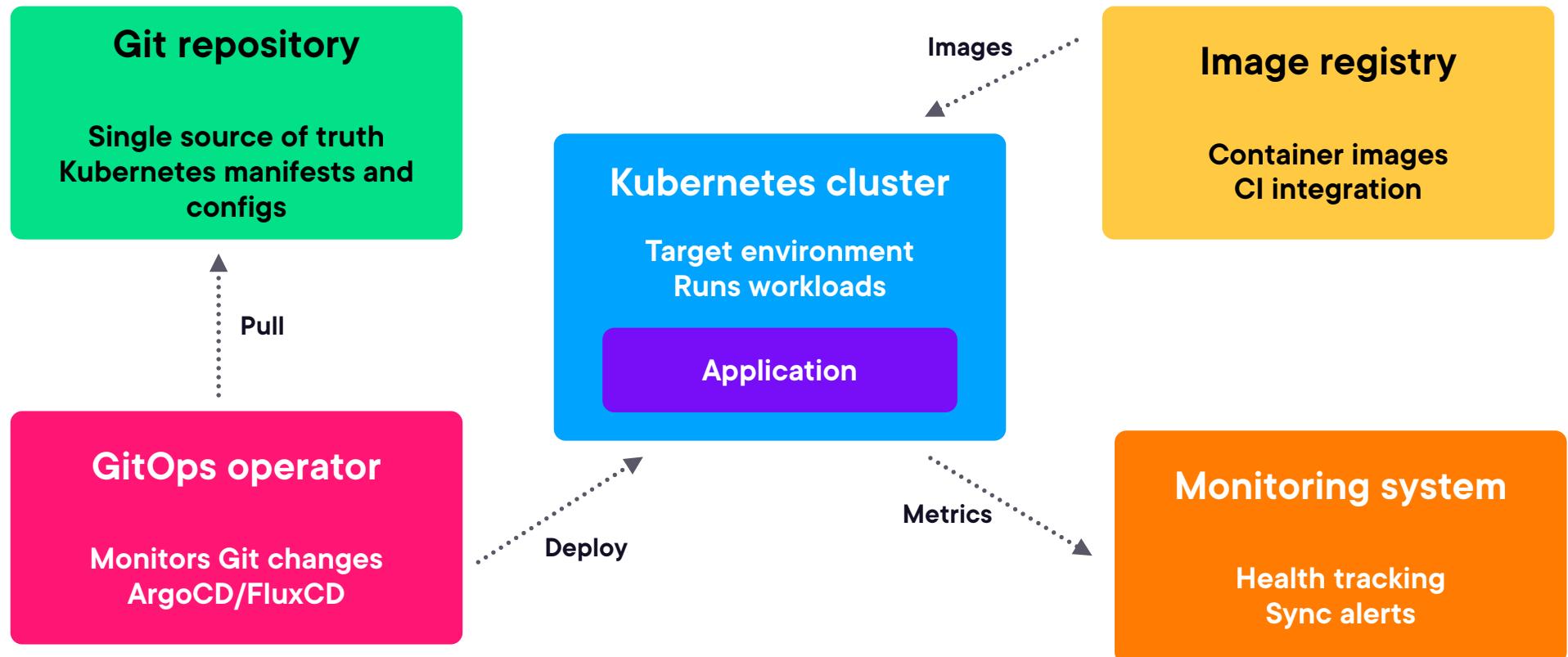
# GitOps vs. Traditional DevOps Workflows

# GitOps vs. Traditional DevOps

Aspect	Traditional DevOps	GitOps
Deployment	<b>Push-based</b> <ul style="list-style-type: none"><li>Requires cluster credentials</li><li>Direct cluster modification</li></ul>	<b>Pull-based</b> <ul style="list-style-type: none"><li>Agents pull from Git</li><li>No external credentials</li></ul>
Audit Trail	<b>Limited</b> <ul style="list-style-type: none"><li>Changes not tracked</li><li>Manual documentation</li></ul>	<b>Complete</b> <ul style="list-style-type: none"><li>Git history tracks all changes</li><li>PR reviews for approval</li></ul>
Drift Detection	<b>Manual</b> <ul style="list-style-type: none"><li>No automatic detection</li><li>Environment inconsistency</li></ul>	<b>Automatic</b> <ul style="list-style-type: none"><li>Continuous monitoring</li><li>Auto-correction of drift</li></ul>
Rollback	<b>Manual</b> <ul style="list-style-type: none"><li>Manual procedures</li><li>Error-prone process</li></ul>	<b>Automated</b> <ul style="list-style-type: none"><li>Git revert</li><li>Fast and reliable</li></ul>

# GitOps Architecture Components

# GitOps Architecture Components



## Demo: Implementing Declarative Kubernetes Manifests