



// GITOPS: IS THIS SOMETHING FOR ME - OR NOT?

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Agenda

- Basics
- Tools
- Challenges
- 🍕 💬 🍻

The background features a dark grey surface with numerous 3D question marks scattered across it. Some are black and mostly out of focus, while one prominent orange question mark is in sharp focus in the lower center. A white rectangular box with a thin grey border is centered horizontally and contains the text 'GitOps basics'.

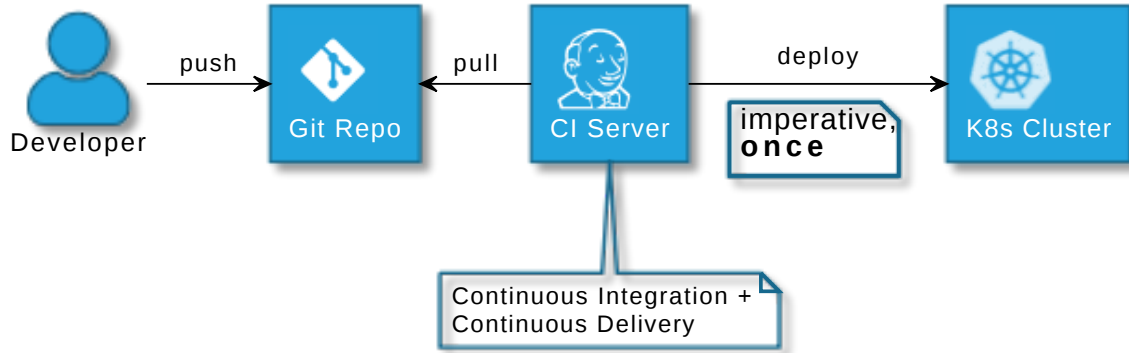
GitOps basics

August 2017: GitOps - Operations by Pull Request

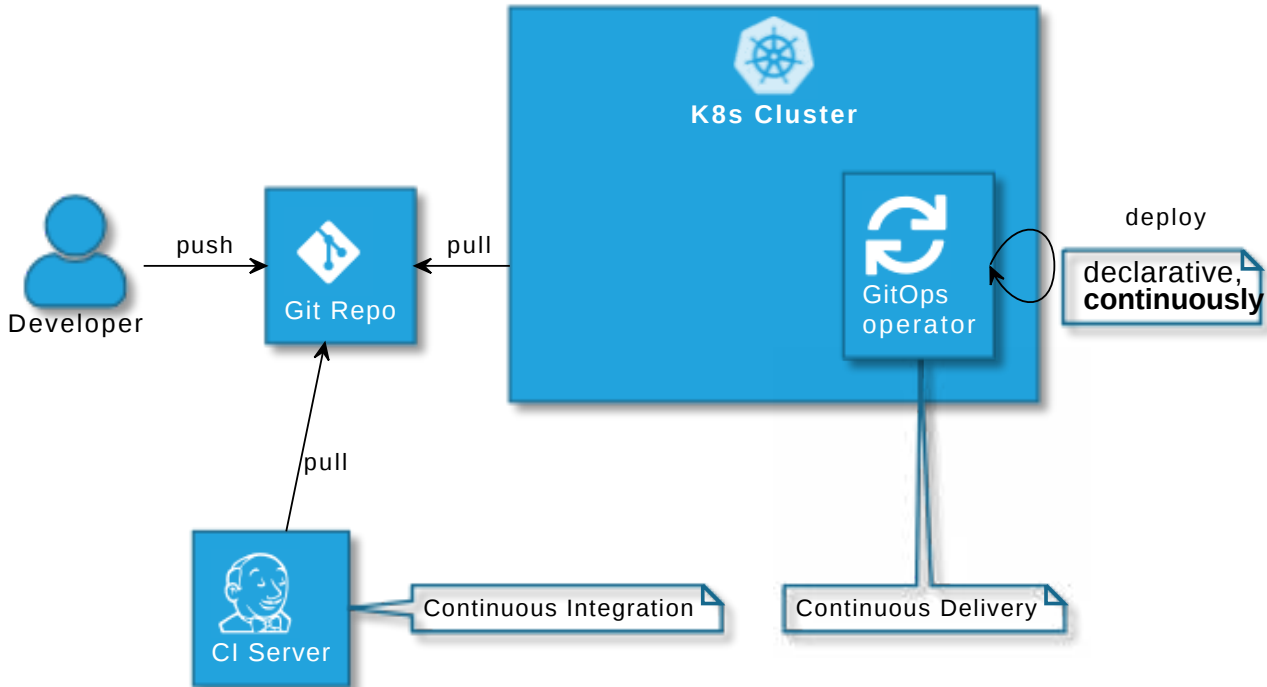
 ~~weave.works/blog/gitops-operations-by-pull-request~~

Use developer tooling to drive operations

"Classic" Continuous Delivery ("CI/CD")



GitOps



GitOps Principles

The desired state of a GitOps managed system must be:

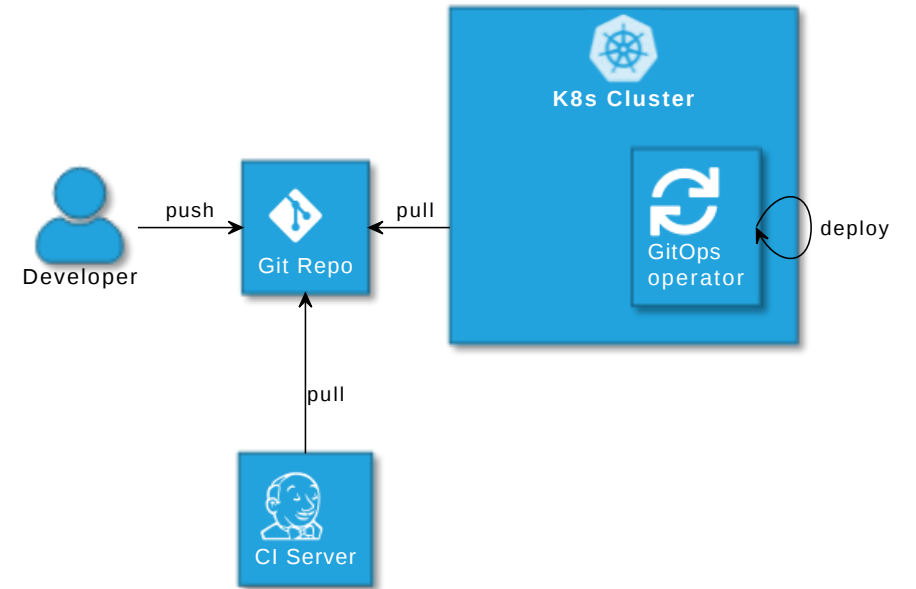
1. **Declarative**
2. **Versioned and Immutable**
3. **Pulled Automatically**
4. **Continuously Reconciled**



 github.com/open-gitops/documents/blob/main/PRINCIPLES.md

Advantages of GitOps

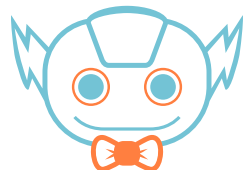
- No access to cluster from outside
- No credentials on CI server
- Forces declarative description
- Config is auditable
- Self-healing
- Scalability - one repo many applications
- Innovations provided by tools





GitOps tools

GitOps operators/controllers



Supplementary GitOps tools

- Secrets Management
- Backup + Restore
- Deployment Strategies - Progressive Delivery



• ...

 **GitOps**  **operators**



A photograph of a child standing on a large set of stone steps in front of a stone wall. The child is wearing a hat and overalls. The steps are made of large, rectangular stone blocks. The wall is also made of large, rectangular stone blocks. The scene is brightly lit, suggesting a sunny day. A white rectangular box with a thin black border is overlaid on the right side of the image, containing the text 'Challenges with GitOps'.

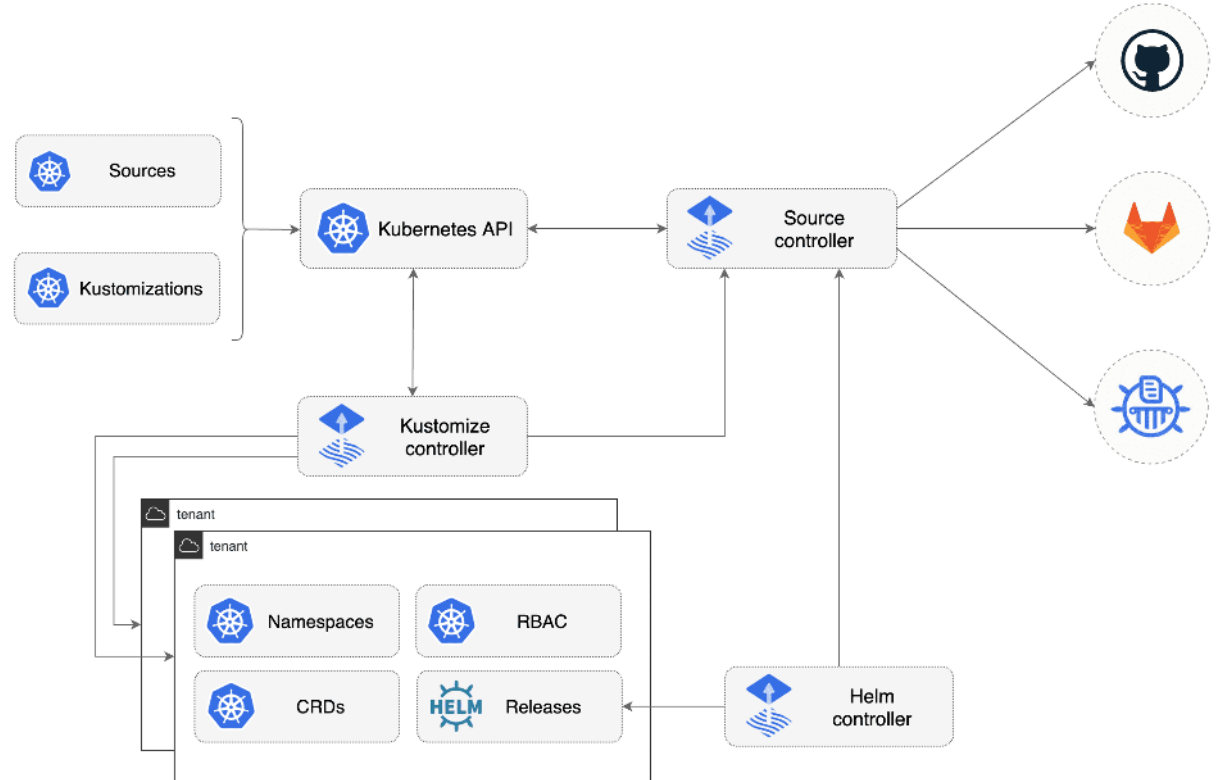
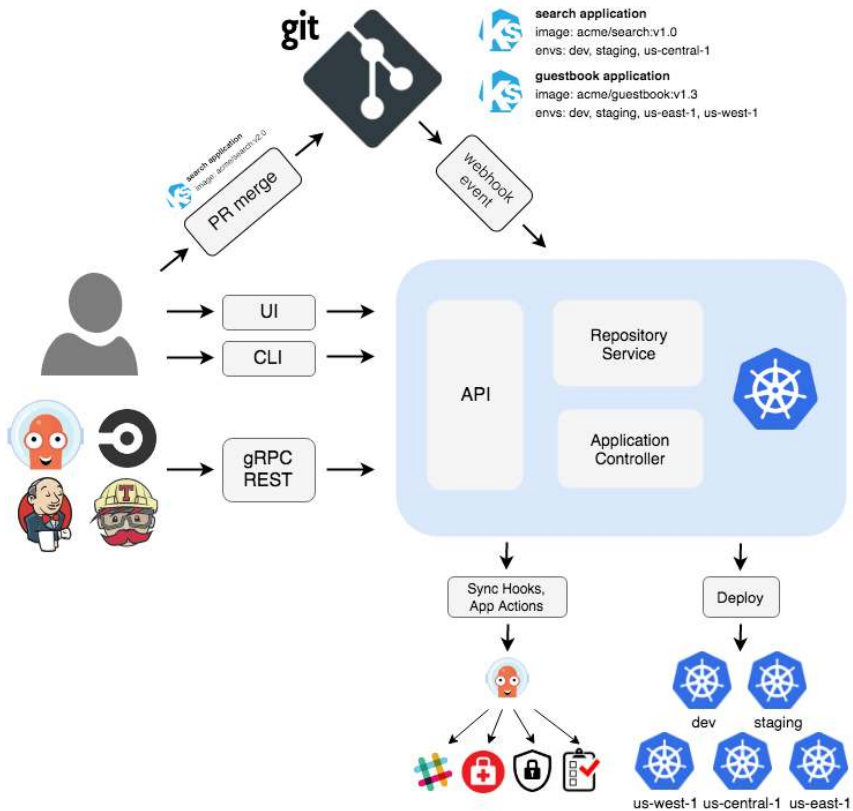
Challenges with GitOps

Downsides

- More infra necessary
- Steep learning curve
- Lots of day two questions

GitOps infra

- GitOps Operator comprises several applications
- Cause ops efforts: maintenance, alerts




Learning curve

- New concepts and tools for developers and platform teams
- Adapt deployment process
- Migrate applications
- Adapt error handling and alerting
 - avoid failing late and silently
 - accustom to new notification mechanism
 - still, reason might be difficult to pinpoint

Day two questions






- How to realize local dev env?
- How to delete resources?
- How to structure repos and folders?
- How to realize different stages/environments?
- Role of CI server?
- ...

Local development



- App development: Just carry on without GitOps.
Setting up GitOps operator, SCM, etc. complicated
- 💡 Integration: Run GitOps+k8s-based ops platform locally
 -  [cloudogu/gitops-playground](https://github.com/cloudogu/gitops-playground)
 - 2024-06-20 Workshop at CloudLand



How to delete resources?






-  garbage collection /  resource pruning
disabled by default
-  Enable from beginning  avoid manual interaction
- Unfortunately, still often unreliable / too defensive (?) 

Repo and folder structure





- No standard for structures (intentionally)  Conway's law
- How many repos?
- Within repo: folder/branch structure for stage, team, app
- More options:
 - Topology: GitOps controller (s)  Cluster(s) / Namespaces
 - GitOps controller-specific config

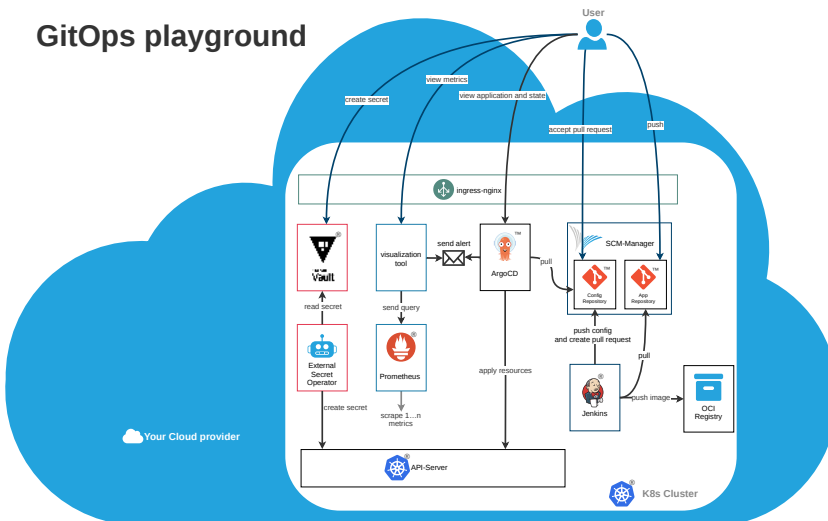
Promotion

How to model environments/stages?

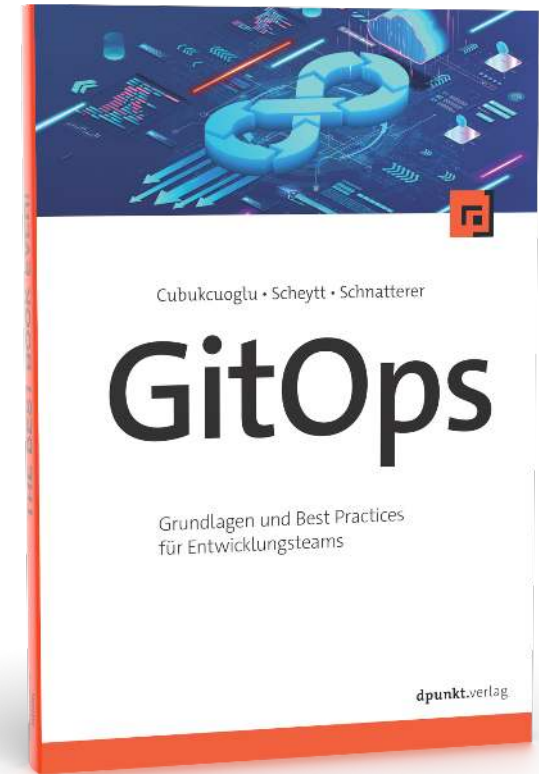
- ⚡ User branches or folders?
- "Operations by Pull Request": (How to) use PRs?
- How to integrate CM tools?     
- How to automate?
- 🔥 (How to) use preview environments?

Further reading

- GitOps Repository Structures and Patterns
 -  Blog post series (Cloudogu Blog); Book
 -  Slides (Continuous Lifecycle 23)
-  [cloudogu/gitops-patterns](#)
-  [cloudogu/gitops-playground](#)



©Cloudogu GmbH 2024. GitOps Playground® for use with Argo™, Git™, Jenkins®, Kubernetes®, Prometheus®, Vault® and SCM-Manager





Is GitOps something for me - or not?

- +** Has advantages, once established
- Don't underestimate learning curve and migrations

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Image sources

- Basics:
<https://pixabay.com/illustrations/question-mark-important-sign-1872665/>
- Tools:
<https://pixabay.com/photos/tools-knives-wrenches-drills-1845426/>
- Challenges:
https://unsplash.com/photos/bJhT_8nbUA0
- Is GitOps something for me?
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