



# CNCF On-Demand Webinar

Basics of Flux and GitOps

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*Weaveworks*

*2023-09-14*



# Flux in 2 Minutes



# GitOps

- For Beginners: (ELI5)
  - Developer just pushes changes
  - (**new desired state**) to Git
  - They go automatically to **Kubernetes**
- (User Experience should be simple)



# GitOps

- For Beginners: (ELI5)
  - **Developer** just pushes changes
  - (**new desired state**) to **Git**
  - ...notify us if everything went alright
- (User Experience should be simple)



# GitOps

- Developer just pushes changes to **Git**
- ...in case anything changes, <->  
**GitOps** reconciling (**Flux**)  
will automatically put it back  
This is called **Drift Correction**

Dist. from regular imperative CI/CD



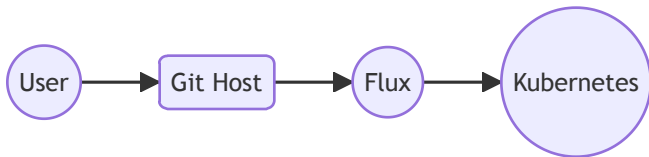
# 4 Principles of GitOps

1. **Declarative** Configuration
2. **Versioned** Storage
3. Pulled **automatically**
4. Reconciled **continuously**

Detail: [opengitops.dev](https://opengitops.dev) from GitOps WG



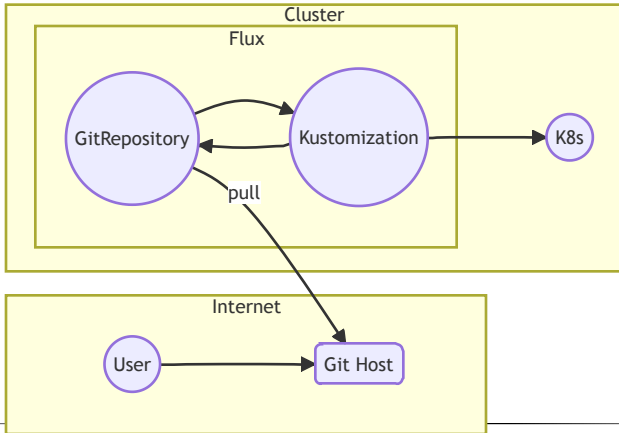
# Diagram



## Easy Version



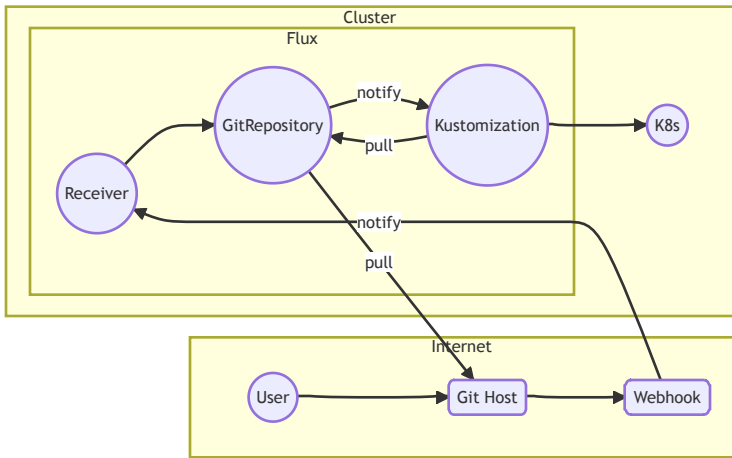
# How Flux does GitOps







# **Flux is hosted on a K8s cluster**





# **Subscriptions in K8s are automatic**



# Subscriptions in K8s are negotiated automatically

- On the other hand, across the internet (GitHub, GitLab, Gitea, CodeCommit, ...)
- Webhooks typically need configured



# Flux is Community

- Flux Developed in open under CNCF
- **Weekly Dev Meetings** - Public (Zoom)
- Transparent RFCs, Public Roadmap

[fluxcd.io/#calendar](https://fluxcd.io/#calendar)



# Flux is Supported



Kingdon Barrett



OSS Engineer @ Weaveworks



Flux Maintainer @ [github.com/fluxcd](https://github.com/fluxcd)



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**@yebyen@hachyderm.io**     
@yebyen

All computers, all the time

📍 41.6970, -86.2375 📅 Joined October 2007

1,225 Following 370 Followers



# Flux Manages Itself



# GitOps

If this is GitOps...

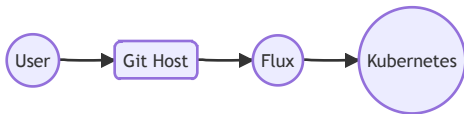




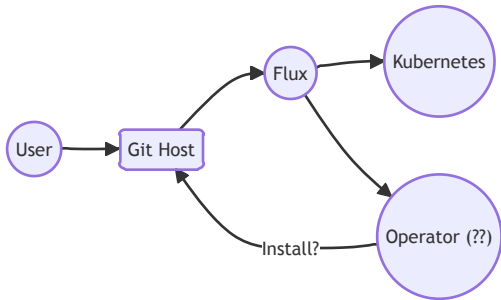


# Flux does GitOps

And Flux does GitOps...



# How does Flux get installed?



# How does Flux get installed?



??? That's up to you

- ? : copy Flux into Git
- ^ - Typically: `flux bootstrap` does this



# What is Bootstrap?



# Bootstrap Decomposed

- `clusters/my-cluster/`
  - `flux-system/`
    - `gotk-components` - Flux itself (controllers)
    - `gotk-sync` - Business end of Flux (**config**)

K8s CRs GitRepo and Kustomization represent a running Flux installation



# Bootstrap Decomposed

- Bootstrap also sets up some secrets
- Repository secrets: usually SSH key
- Read-only by default, probably private
- (but needs write access to bootstrap)

# How does Flux get installed?



- **?:** copy Flux controllers into **Git**? **no**
- Other possibility: Flux is **managed by** GitOps only some other way ... **how?**

Another **Operator** can install Flux!



# Flux as OCI Artifact

You do not need to copy Flux into Git

- (controllers **released** as OCI artifact)

```
oci://ghcr.io/fluxcd/  
flux-manifests:v2.1.0
```

- OCIRepository is another Flux **source kind** - more about that later





# Demo