# CNCF On-Demand Webinar

## Basics of Flux and GitOps

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# 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**

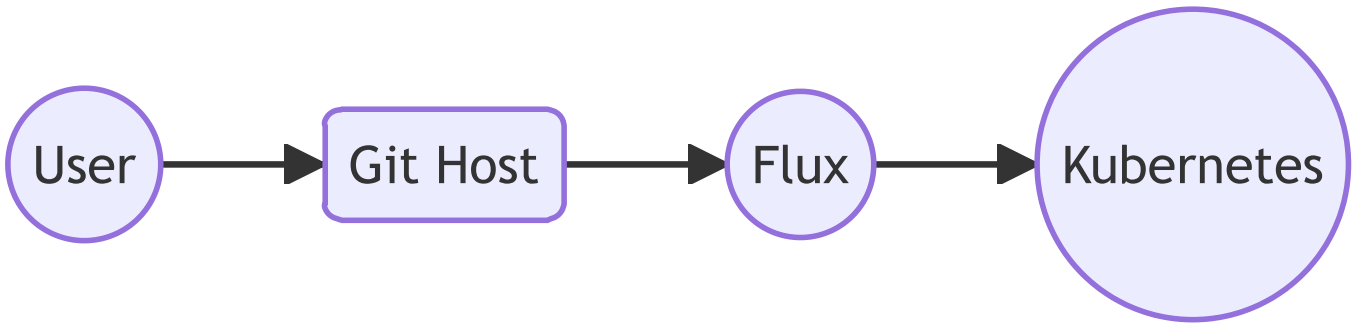
Dist. from regular imperative CI/CD

# 4 Principles of GitOps

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

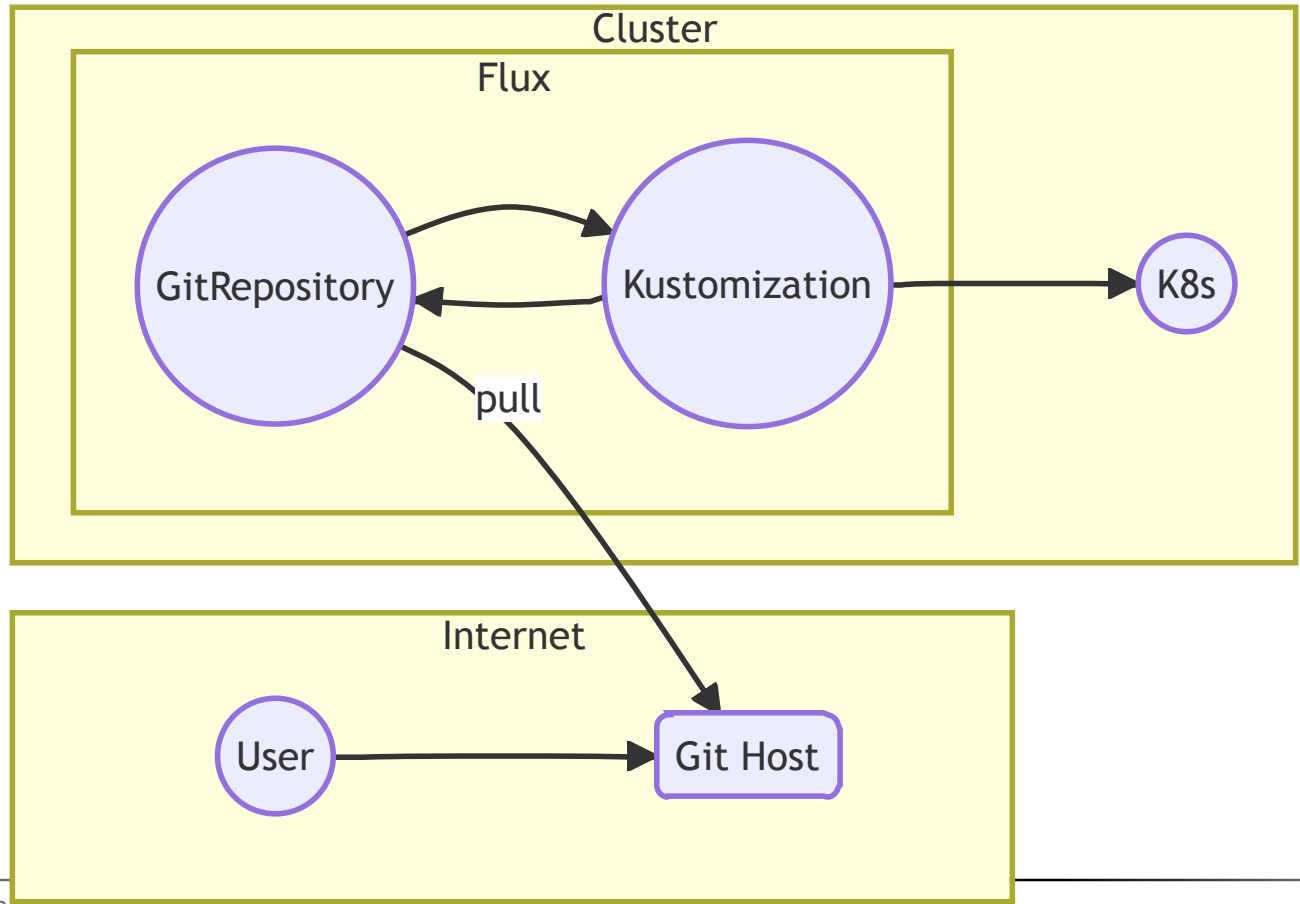
Detail: [opengitops.dev](opengitops.dev) from GitOps WG

# Diagram

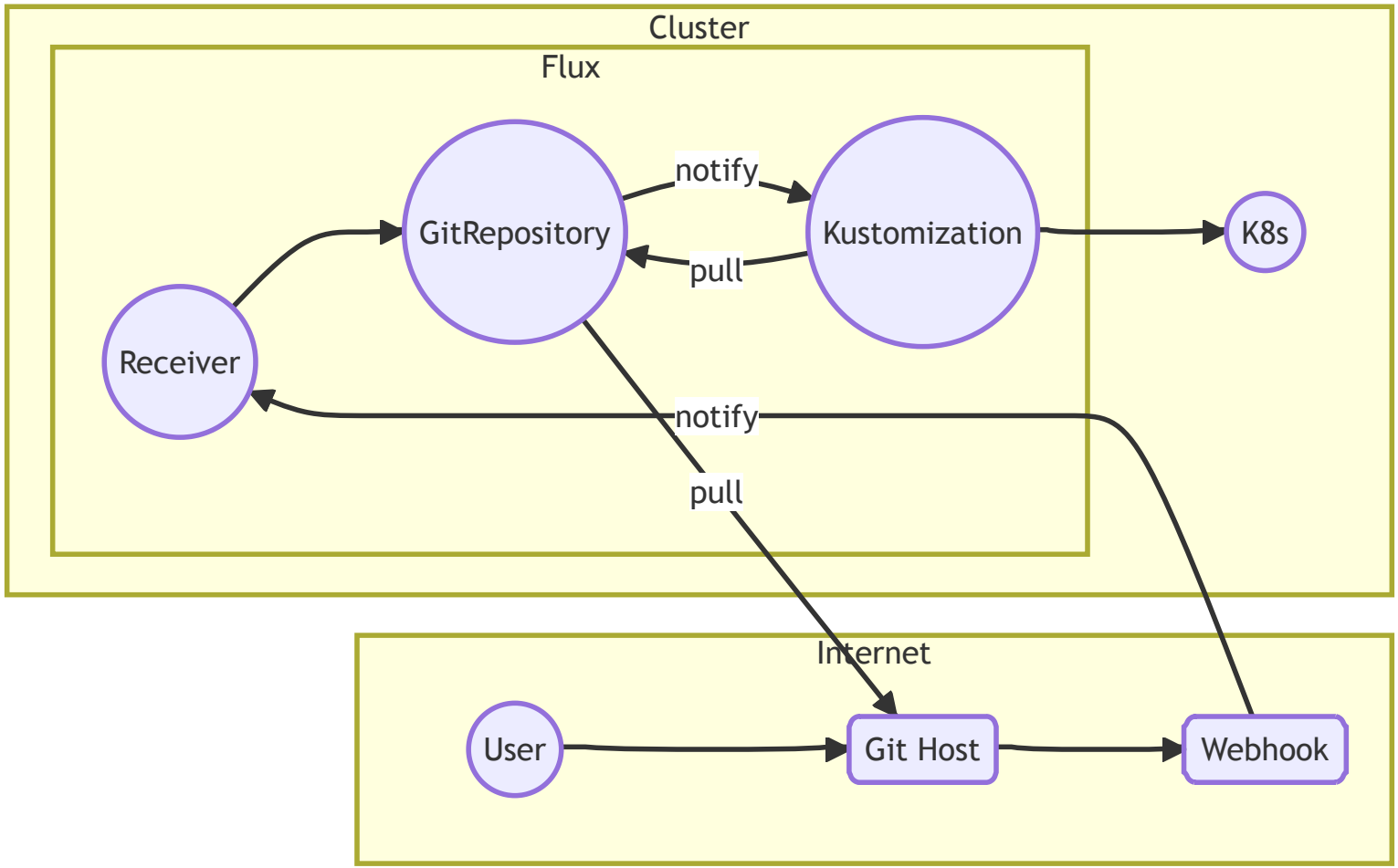



Easy Version

# How Flux does GitOps



# Flux is hosted on a K8s cluster


Cluster
Flux
GitRepository
notify
Kustomization
K8s
pull
Receiver
notify
pull
Internet
User
Git Host
Webhook

# 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

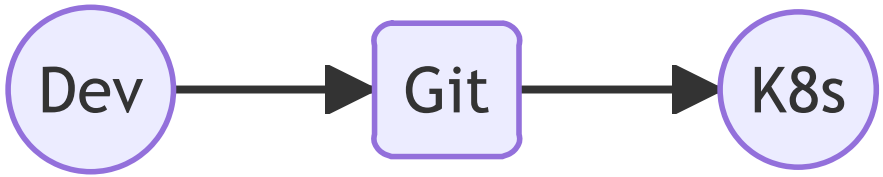
- Flux Developed in open under CNCF
- **Weekly Dev Meetings** - Public (Zoom)
- Transparent RFCs, Public Roadmap

fluxcd.io/#calendar

# Flux Manages Itself

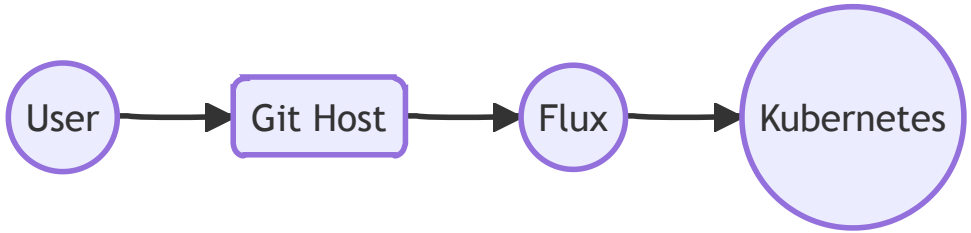
# GitOps

If this is GitOps...

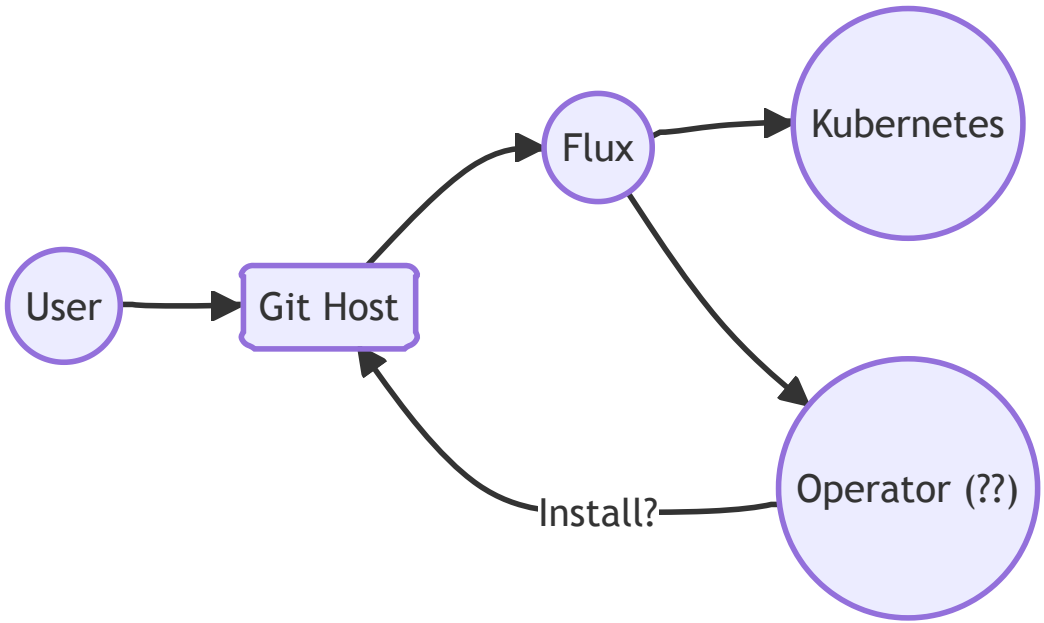


# Flux does GitOps

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,
- (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