



Growth
from
Knowledge

Continuous Delivery on Kubernetes with GitOps

Using Flux CD

Daniel Aguado Araujo
daniel.aguadoaraujo@gfk.com

Site Reliability Engineer

Agenda



- GitOps
- Continuous Delivery using Flux CD
- Helm Operator
- Secret Management
- Disaster Recovery FAQ

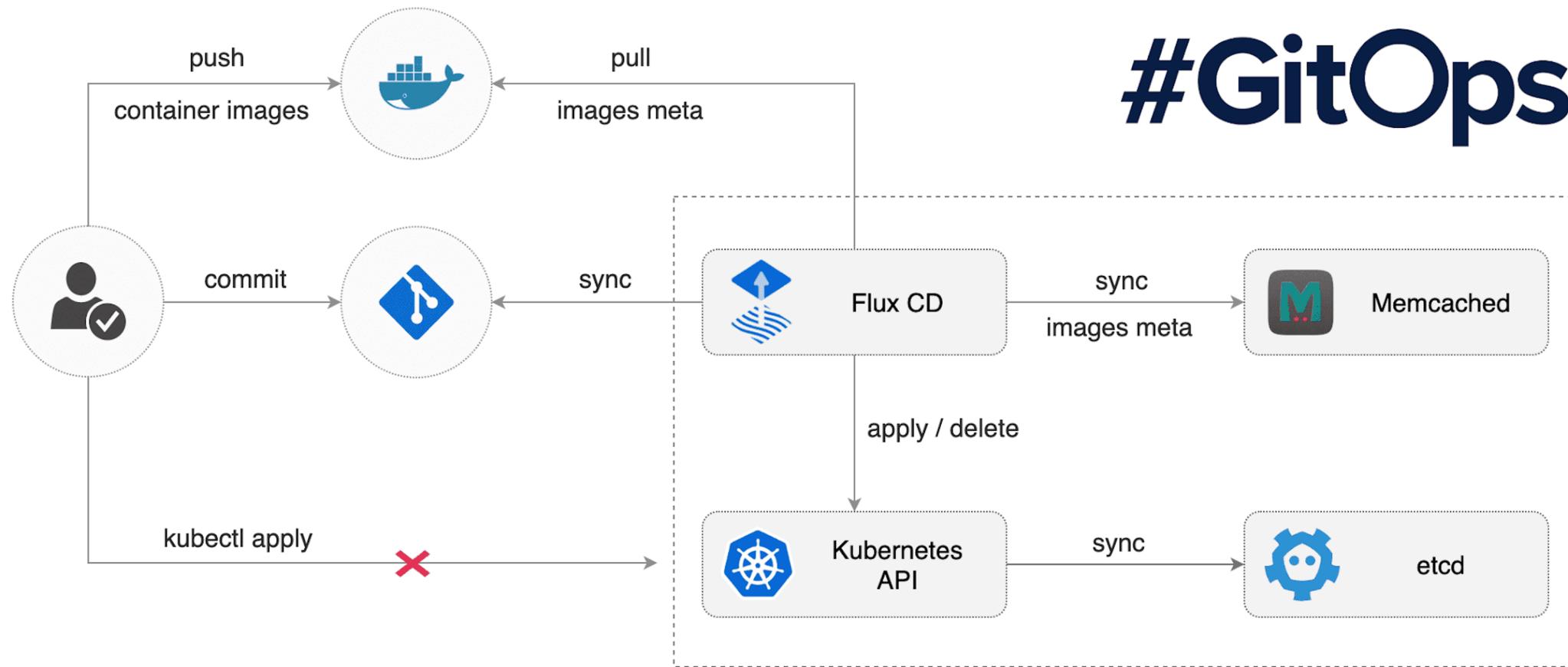
GitOps

Define the cluster state on Git



- Single source of truth
- Single place to operate
- Track changes
- Rollback changes

Continuous Delivery with Flux CD



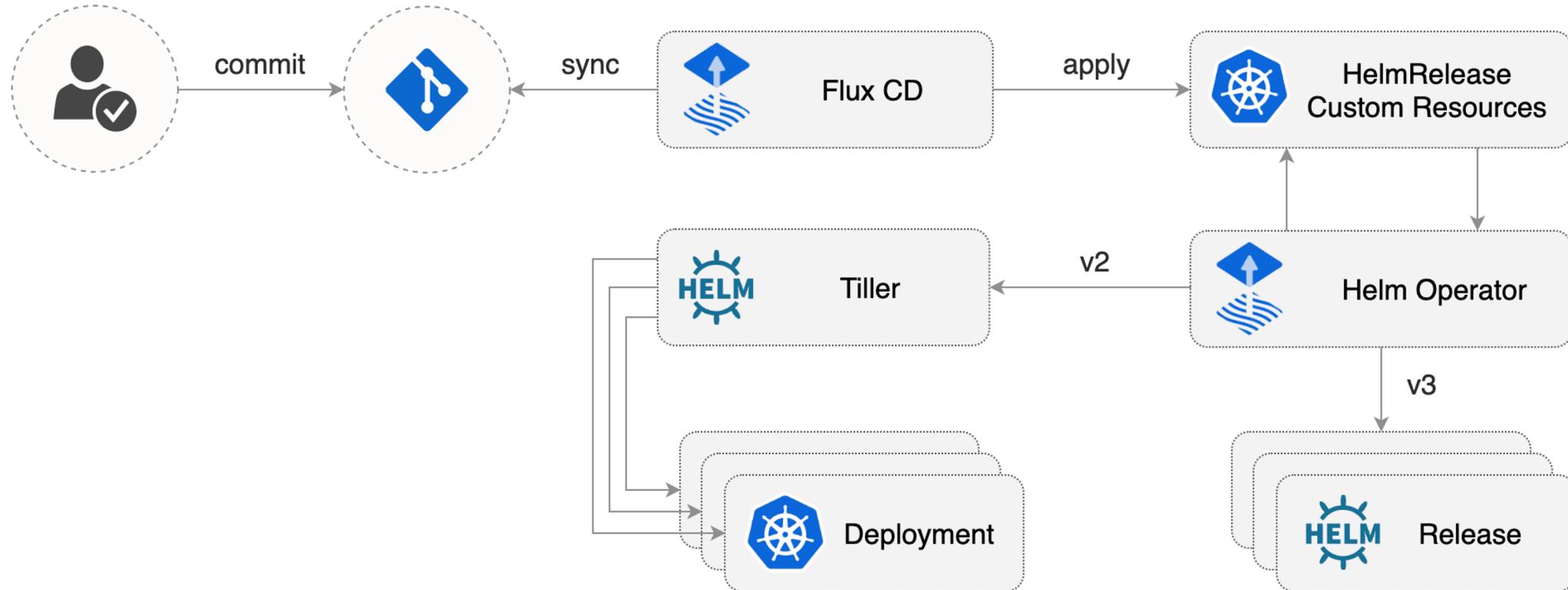
Continuous Delivery with Flux CD



```
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    fluxcd.io/automated: "true"
    fluxcd.io/tag.sidecar: "regex:^stg.*"
    fluxcd.io/tag.app: "glob:dev-*"
spec:
  template:
    spec:
      containers:
        - name: sidecar
          image: my-proxy:stg-4s7bsgv
        - name: app
          image:my-app:dev-9e3bdaf
```

- Turn on automation:
`fluxcd.io/automated: "true"`
- Turn off automation:
`fluxcd.io/automated: "false"` or
`fluxcd.io/locked: "true"`
- Define target for automation:
`fluxcd.io/tag.<CONTAINER>:<TYPE>:<EXPRESSION>`
- Ignore resource:
`fluxcd.io/ignore: "true"`
- Image filtering:
 - `regex:^stg.*` (or regexp)
 - `glob:dev-*`
 - `semver: >= 1.0.0-rc.0, <1.0.1`

Helm Operator



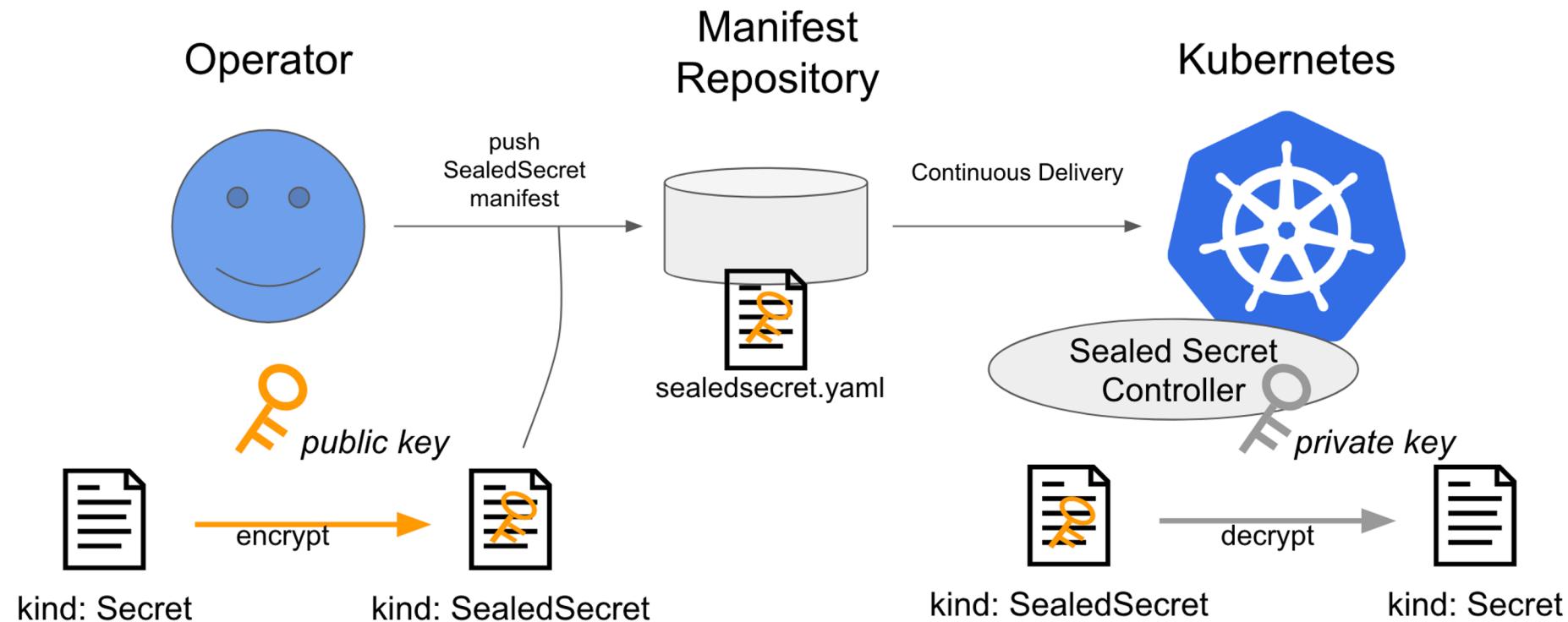
Helm Operator



```
apiVersion: helm.fluxcd.io/v1
kind: HelmRelease
metadata:
  name: nginx-ingress
  namespace: kube-system
  annotations:
    fluxcd.io/automated: "false"
spec:
  chart:
    repository: https://kubernetes-
charts.storage.googleapis.com
    name: nginx-ingress
    version: 1.29.3
  values:
    replicaCount: 1
```

```
apiVersion: helm.fluxcd.io/v1
kind: HelmRelease
metadata:
  name: my-app
  namespace: dev
  annotations:
    fluxcd.io/automated: "true"
    filter.fluxcd.io/tag: "glob:*-development"
spec:
  chart:
    git: ssh://my-repo-url.git
    path: helm/my-app
    ref: master
  values:
    replicaCount: 1
```

Secret Management With Sealed Secrets



Disaster Recovery and FAQ



- **How can I rollback a change?**

You can revert a commit but be sure your app can handle it.

- **How can I recover from a cluster error?**

If you need to migrate your application to a new cluster you need to:

- Configure flux in the new cluster
- Recreate your secrets or restore them (but you need to backup the seal/unseal certificate)
- Restore your data from your backups

- **What happens if I add an invalid k8s object or one object use a non installed CRD?**

Flux will throw an error and it will continue with the rest of the objects. It will retry it in the next loop

- **What happens if I add a new k8s object with the same name of a previous one?**

Flux will crash and stop working until you fix it

Links



- <https://fluxcd.io/>
- <https://github.com/fluxcd/flux>
- <https://github.com/fluxcd/helm-operator>
- <https://github.com/bitnami-labs/sealed-secrets>
- Demo: <https://github.com/drazul/flux-demo>



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See you soon!