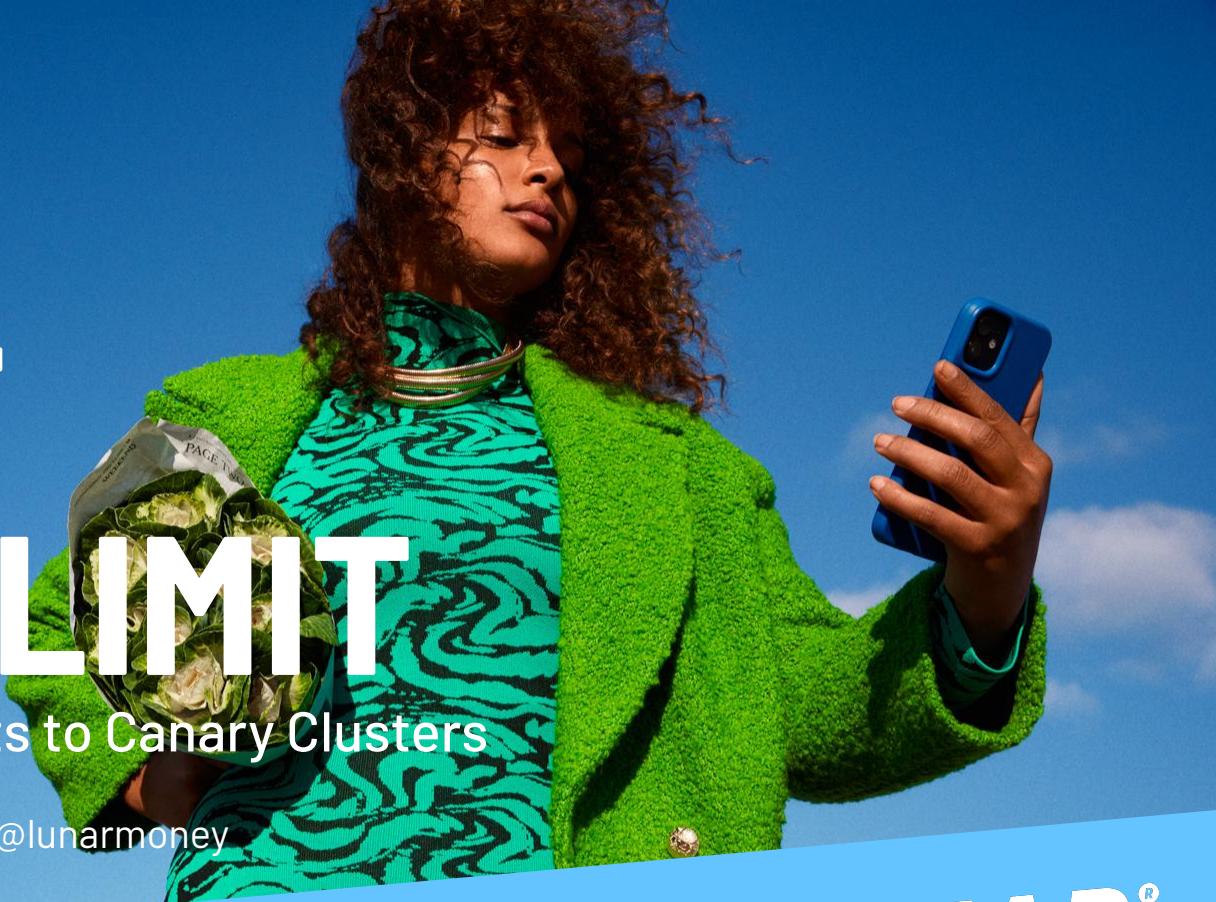


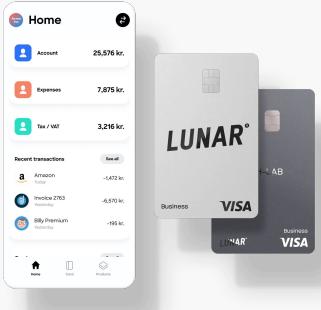
PUSH IT TO THE LIMIT

From Canary Deployments to Canary Clusters

Henrik Høegh - Platform Engineer @lunarmoney
@HenrikHoegh



LUNAR®



15,000

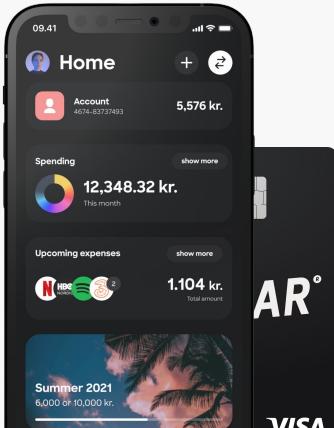
Total number of Business Customers



Company founded in 2015

650

Employees



€345m

Total amount raised



European Banking License issued in Denmark

500,000

Customers in total

Series D ✓

Recently closed our Series D of €210m

We have offices in these locations



UNICORN

APPARENTLY
WE ARE NOW
A UNICORN x 2



WHO?

HENRIK RENÉ HØEGH

PLATFORM ENGINEER

@HenrikHoegh

Co-organizer in Cloud Native Aarhus

Occasional speaker at Meetups, Conferences

Working as a consultant for more than 14 years

Hobby : Dungeon & Dragons





CLOUD NATIVE
NORDICS



NORDIC

MEETUP ALLIANCE



Agenda

- Our tech stack
- How we did failovers
- Key changes for speed
- Future



Our failover journey starts

- **3 years of hard work**
- **From monolith to microservices**
- **From deployment pipelines to GitOps**



NOW

OUR TECH STACK



Kubernetes



GitOps



Flux v1



AWS RDS database



Rabbit MQ



External DNS

NOW

OUR TECH STACK - HOME BREW



Shuttle



Release-manager

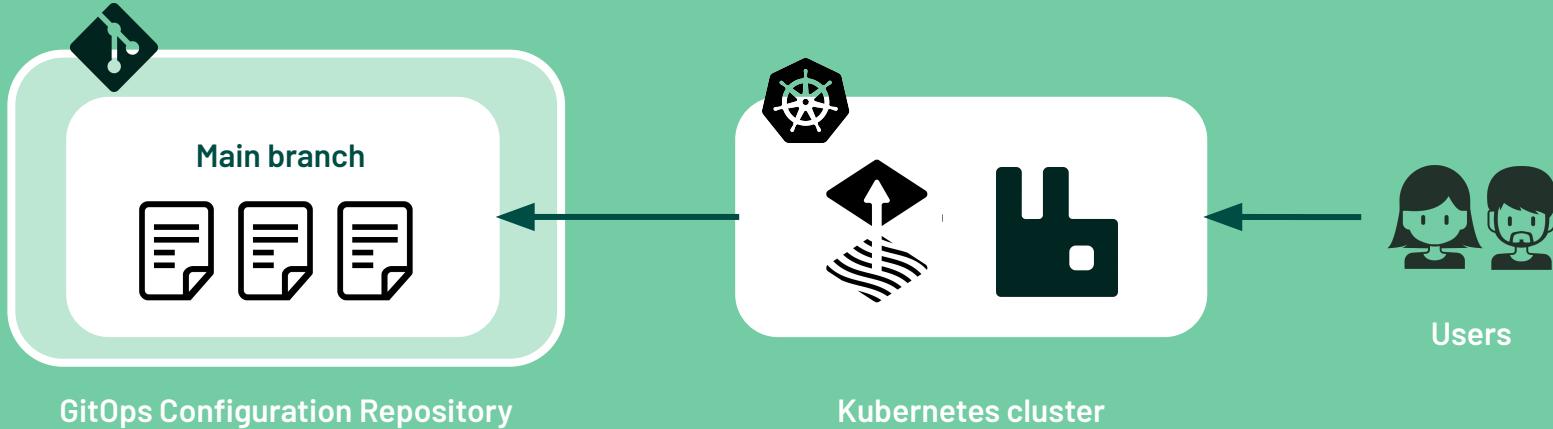
FAILOVER

1. GENERATION



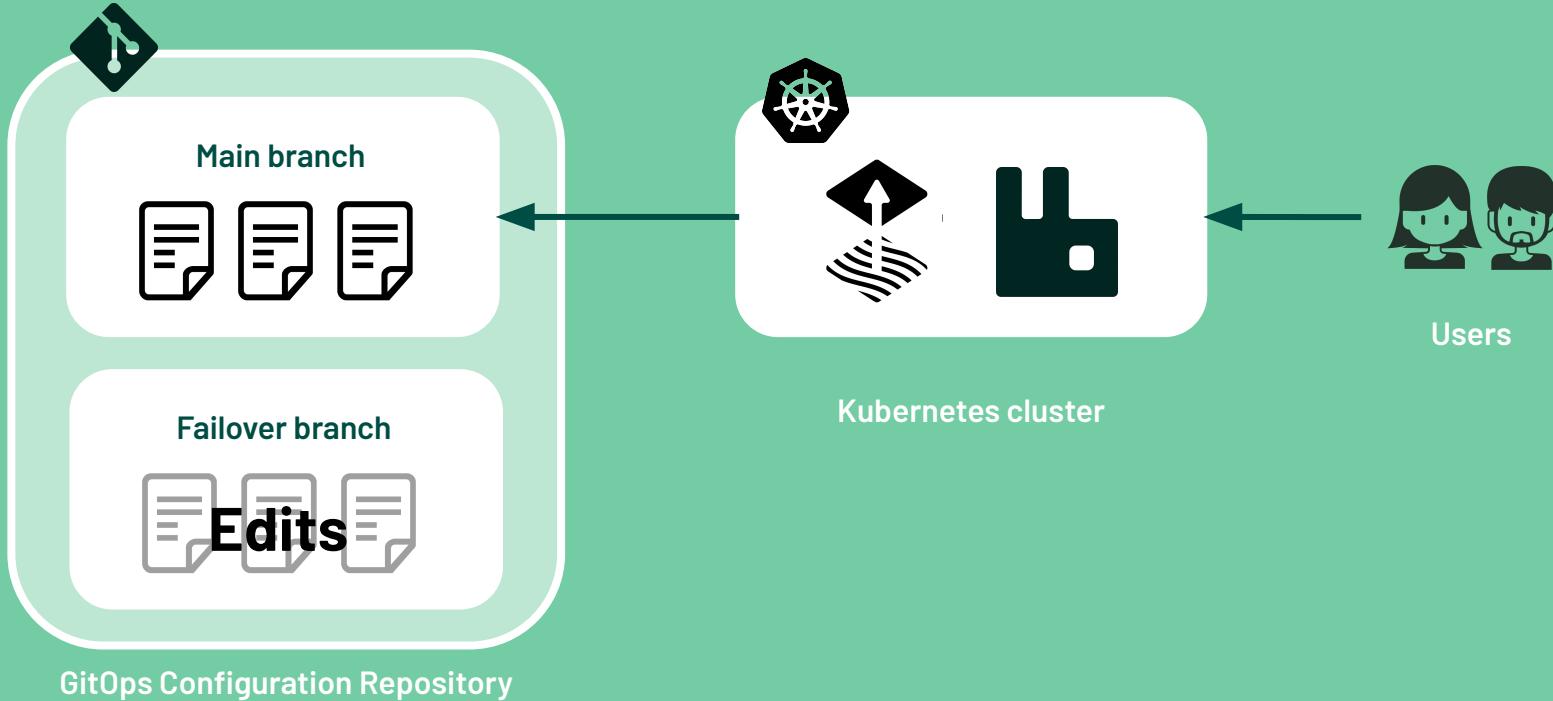
FAILOVER

1. GENERATION



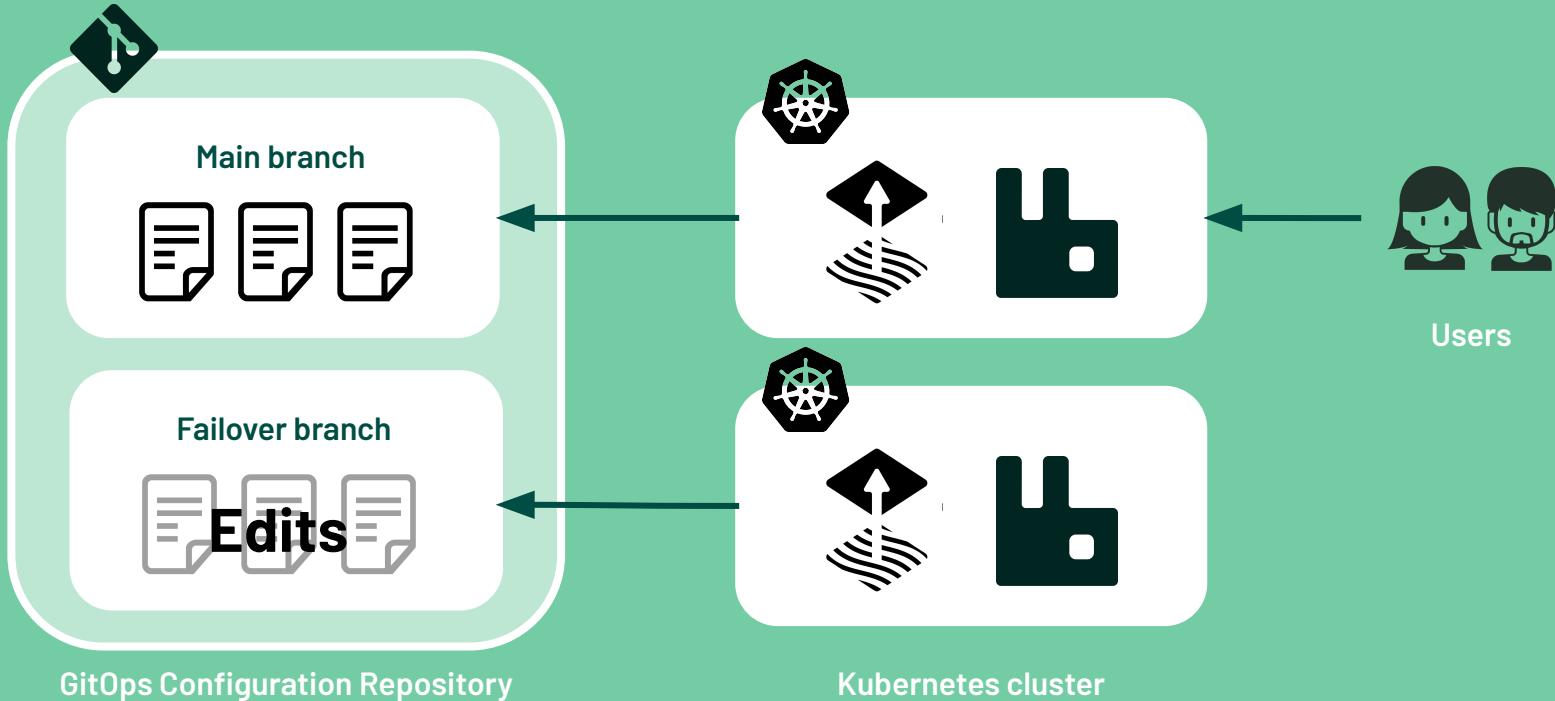
FAILOVER

1. GENERATION



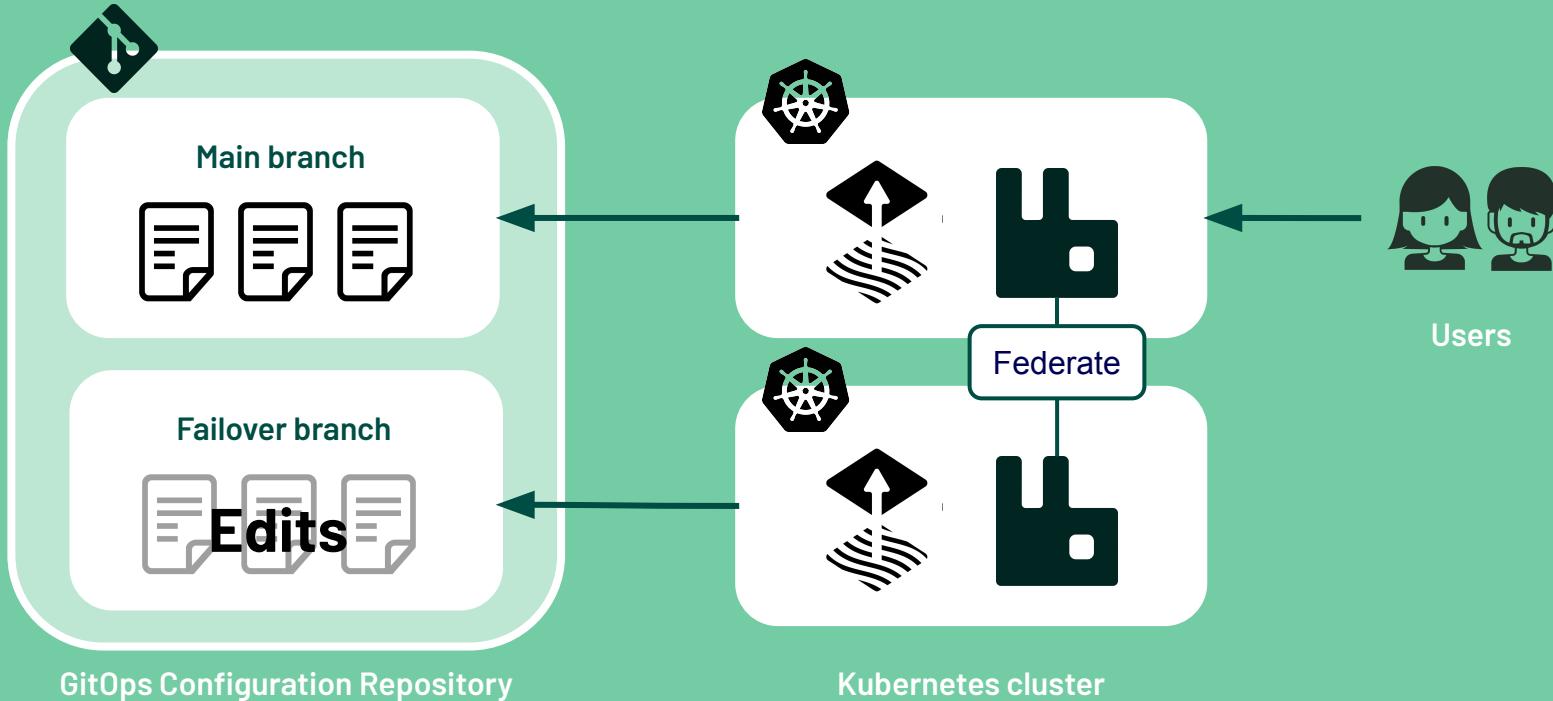
FAILOVER

1. GENERATION



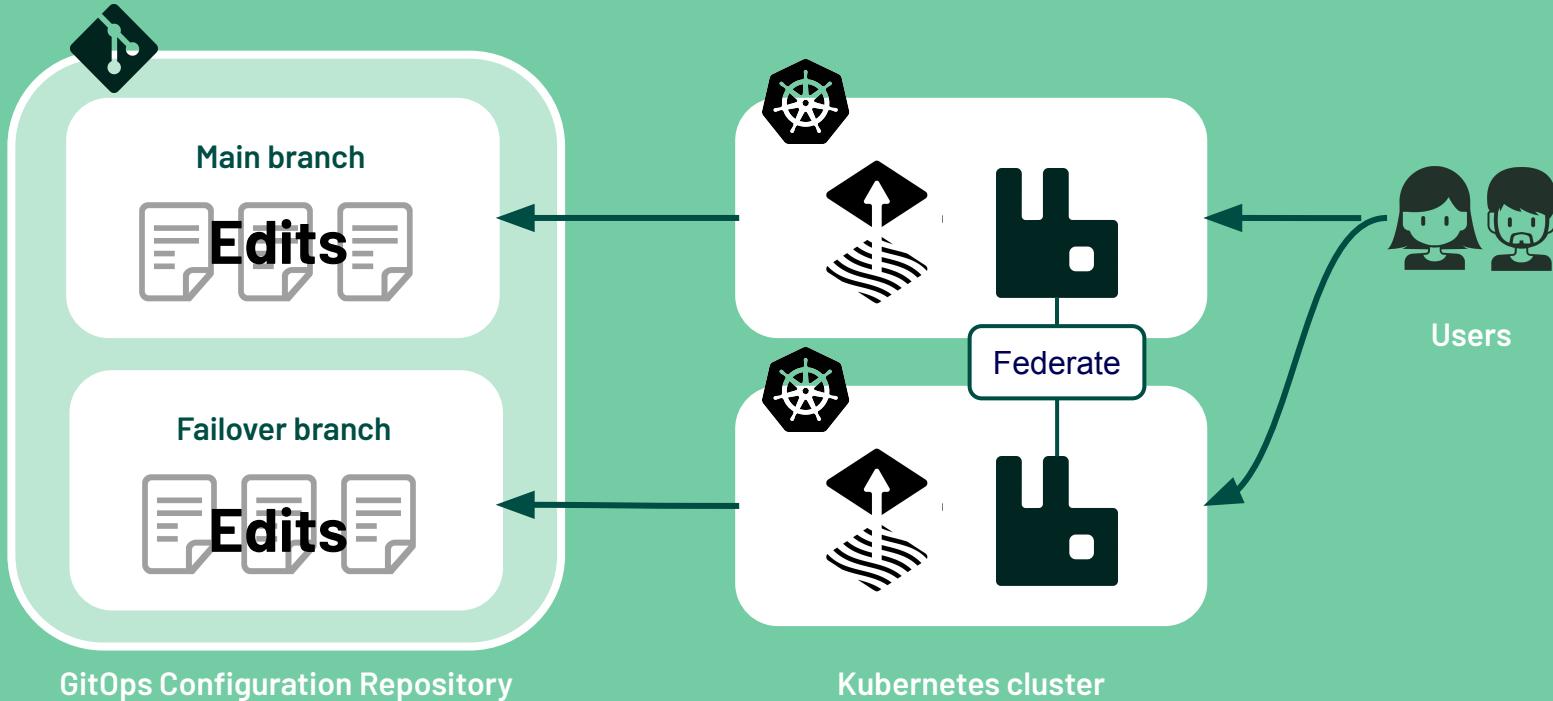
FAILOVER

1. GENERATION



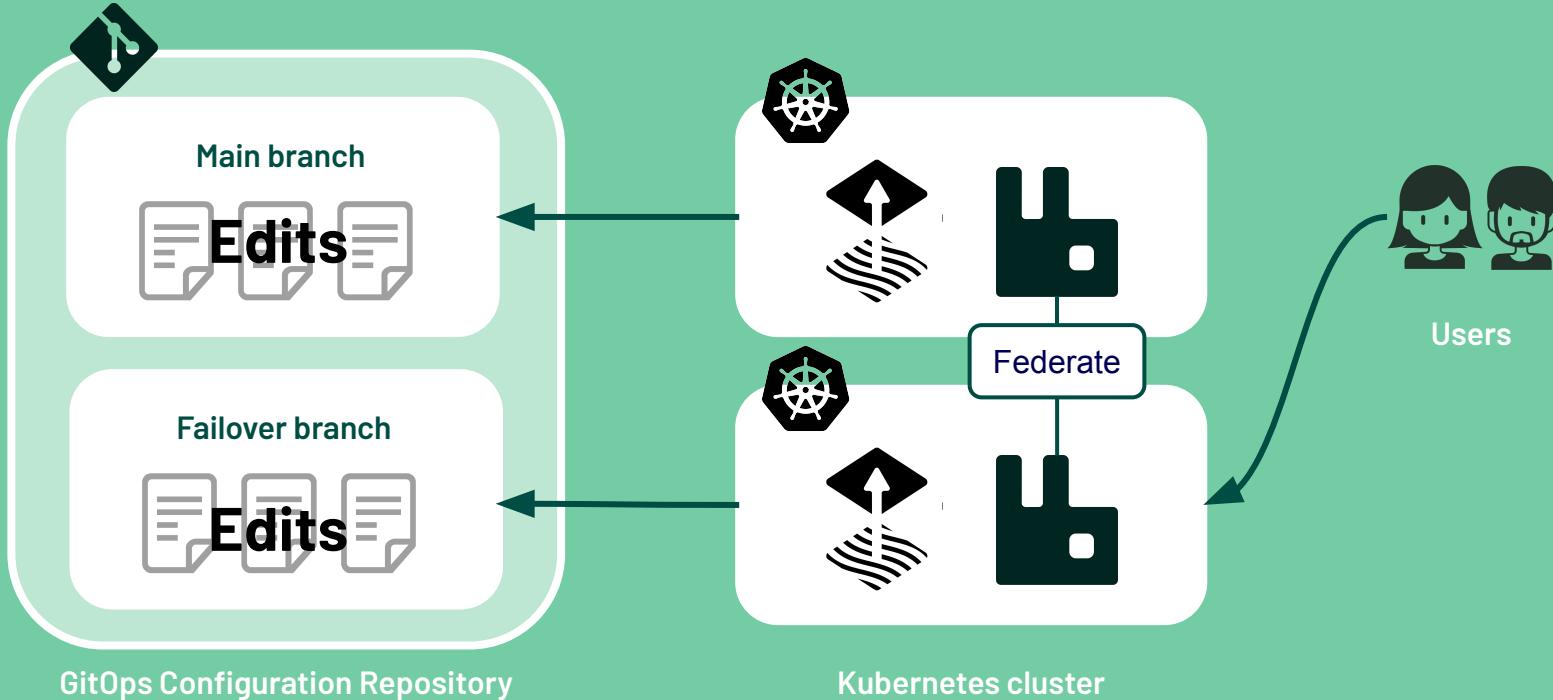
FAILOVER

1. GENERATION



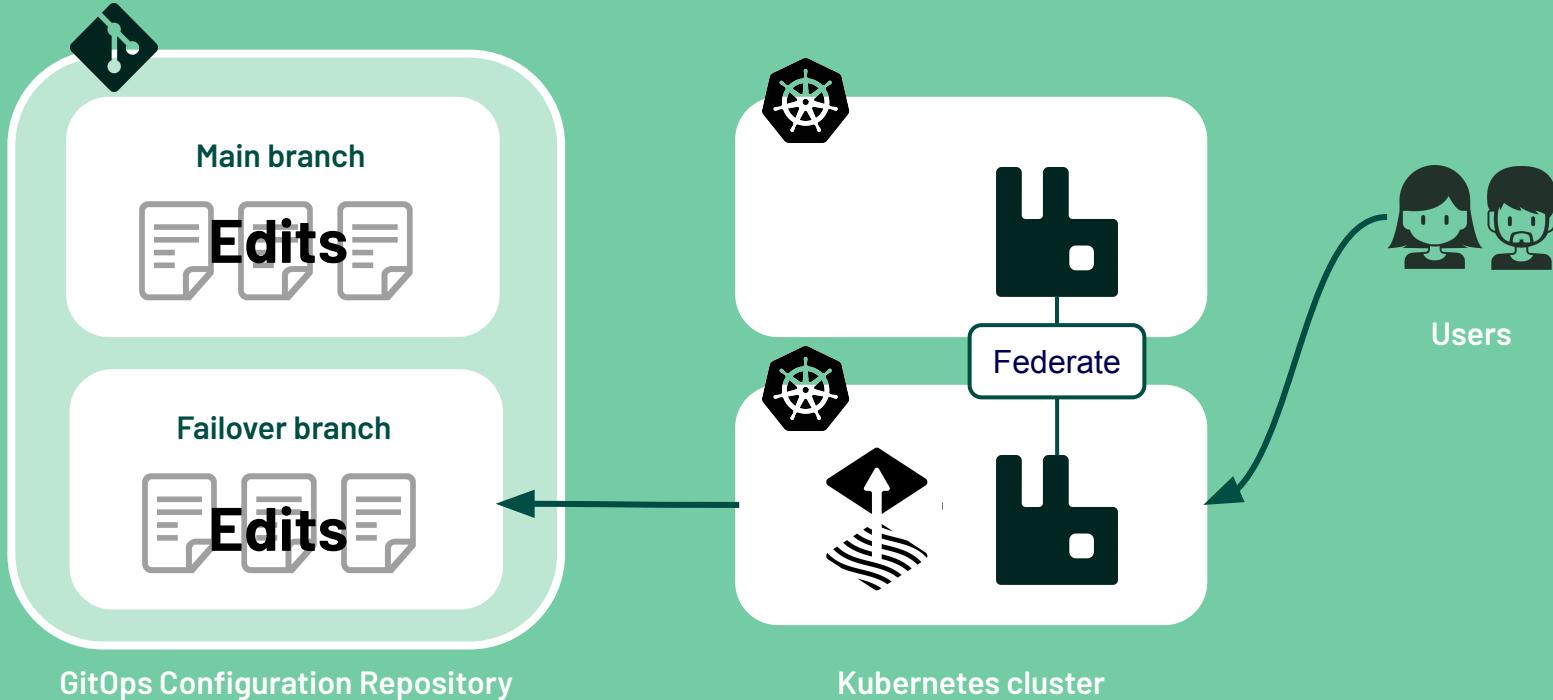
FAILOVER

1. GENERATION



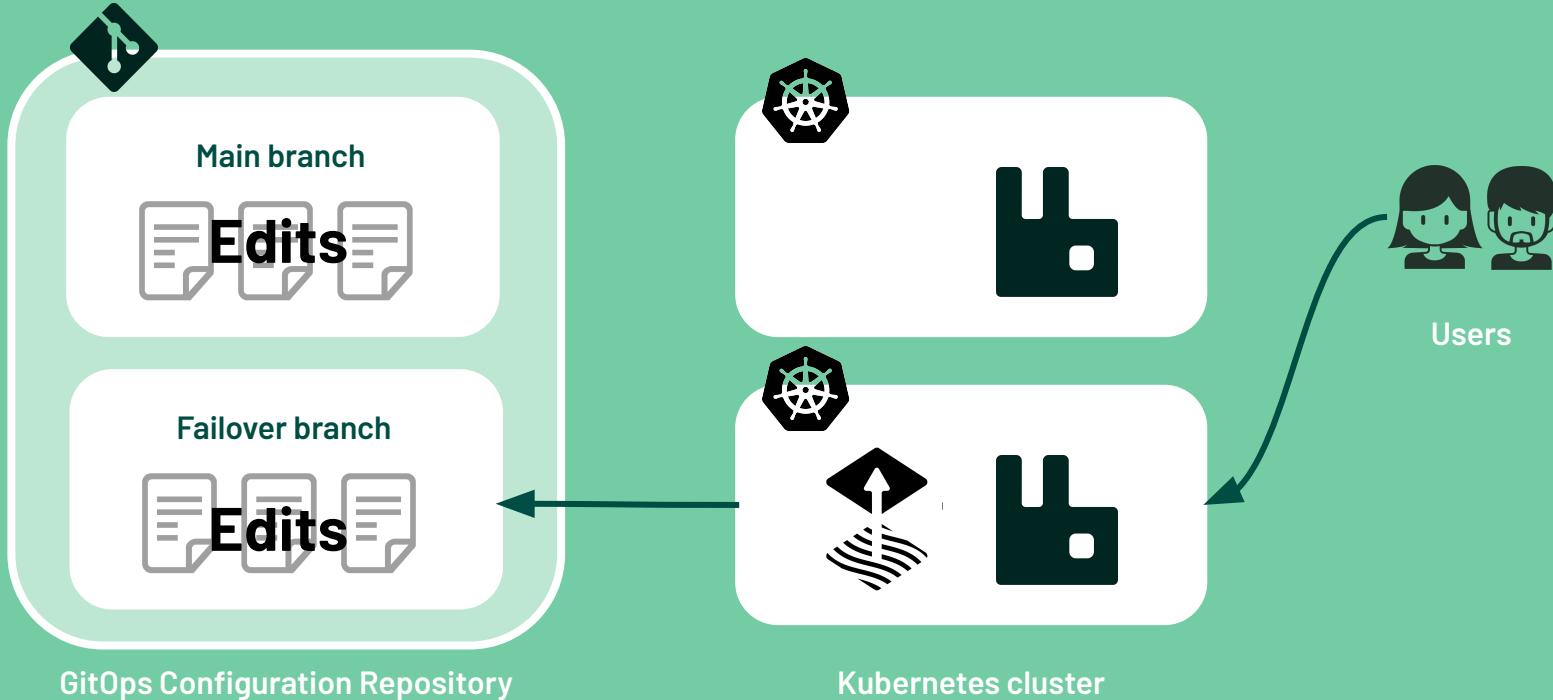
FAILOVER

1. GENERATION



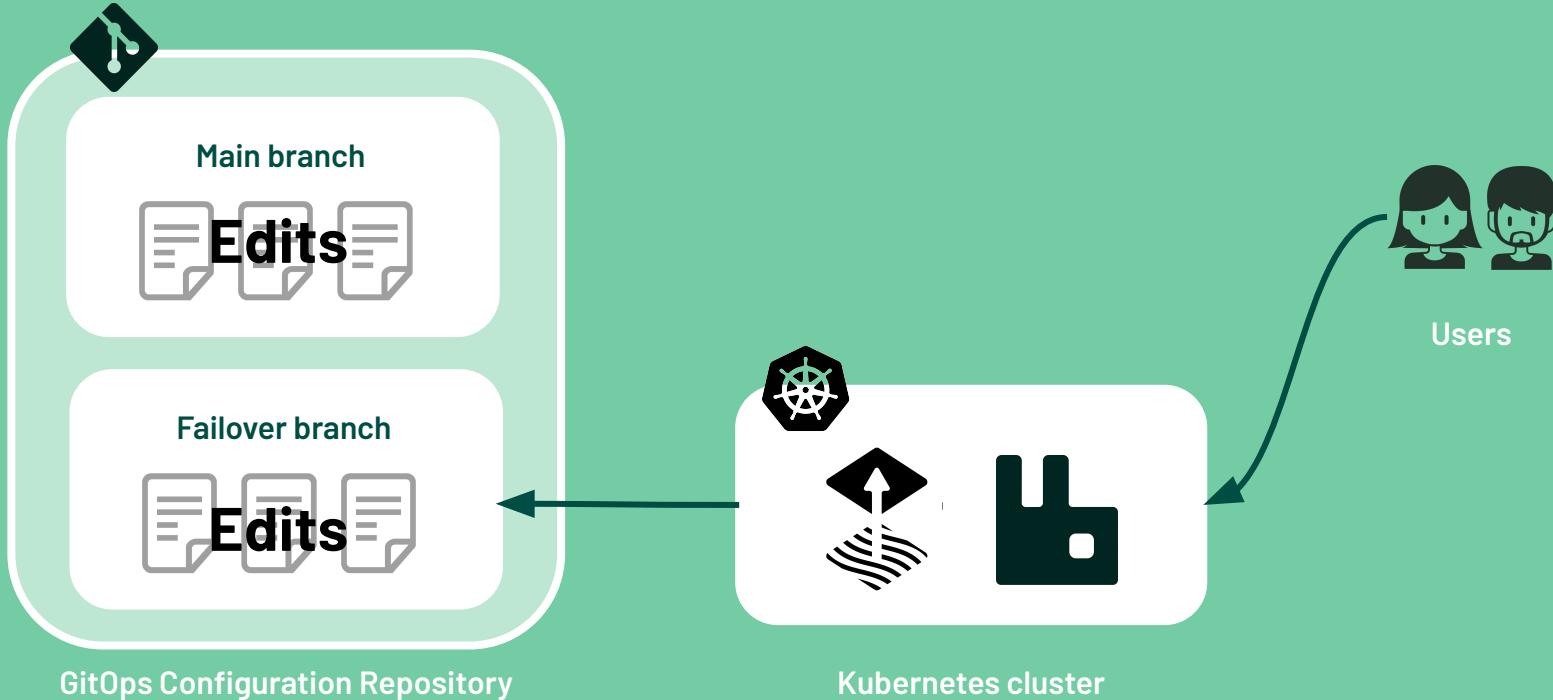
FAILOVER

1. GENERATION



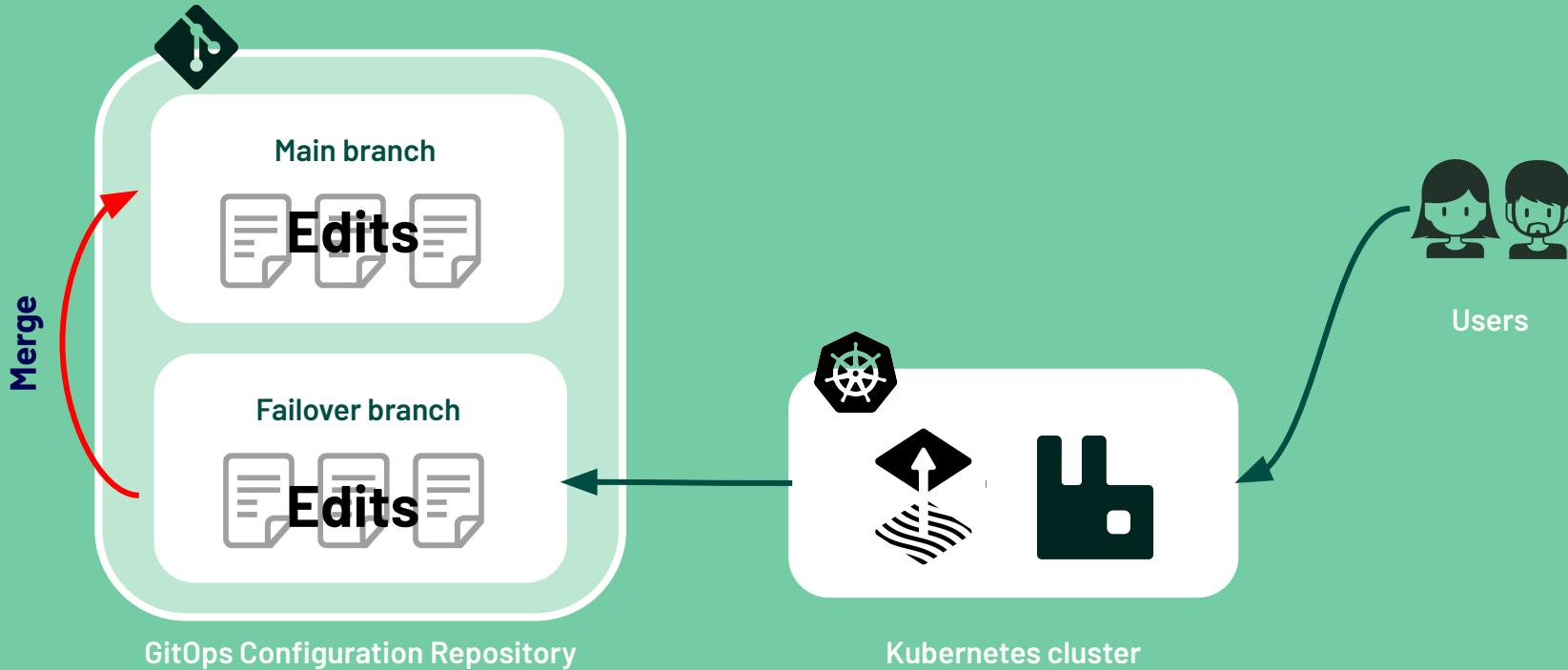
FAILOVER

1. GENERATION



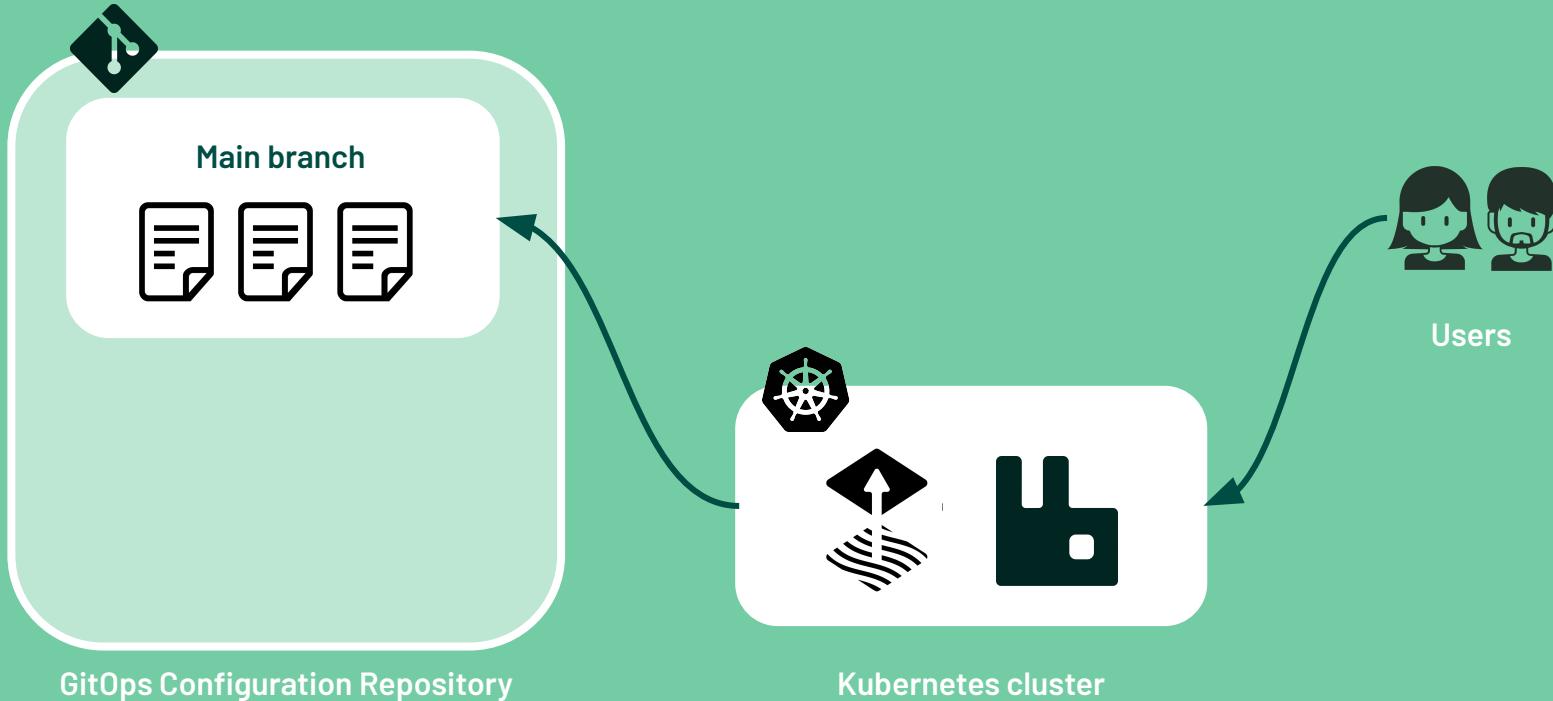
FAILOVER

1. GENERATION



FAILOVER

1. GENERATION



FIRST

GENERATION CHALLENGES

A lot of **merge complexity** in our GitOps repository

New deployments will **stale** if released after branching

Most people **felt uncomfortable** doing a failover

Not in the **spirit of GitOps**

FIRST

GENERATION OBSERVATIONS



Most edits in the
GitOps repository
was
"cluster name"

Fluent Bit logs

AWS-iam-
authenticator

External DNS
annotations



FAILOVER

2. GENERATION

SECOND

GENERATION - TWO NEW CONTROLLERS



Cluster identity
controller



Routing Weight
controller

GENERATION - CLUSTER IDENTITY



```
$ kubectl get cm cluster-identity -n operators -o yaml
```

```
apiVersion: v1
data:
  clusterName: k8s-2022XXX.dev.lunar.com
kind: ConfigMap
metadata:
  name: cluster-identity
  namespace: operators
```

GENERATION - ROUTING WEIGHTS

```
● ● ●

apiVersion: routing.lunar.tech/v1alpha1
kind: RoutingWeight
metadata:
  name: k8s-2022XXX.dev.lunar.com
  namespace: operators
spec:
  annotations:
    - key: external-dns.alpha.kubernetes.io/aws-weight
      value: "100"
    - key: external-dns.alpha.kubernetes.io/set-identifier
      value: k8s-2022XXX.dev.lunar.com
  clusterName: k8s-2022XXX.dev.lunar.com
  dryRun: false
```

SECOND

GENERATION - ROUTING WEIGHTS

```
● ● ●

apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  annotations:
    routing.lunar.tech/controlled: "true"
    external-dns.alpha.kubernetes.io/aws-weight: "100"
    external-dns.alpha.kubernetes.io/set-identifier: k8s-2022XXX.dev.lunar.com
  name: grafana
  namespace: monitoring
spec:
  Rules:
```

SECOND

GENERATION - ROUTING WEIGHTS



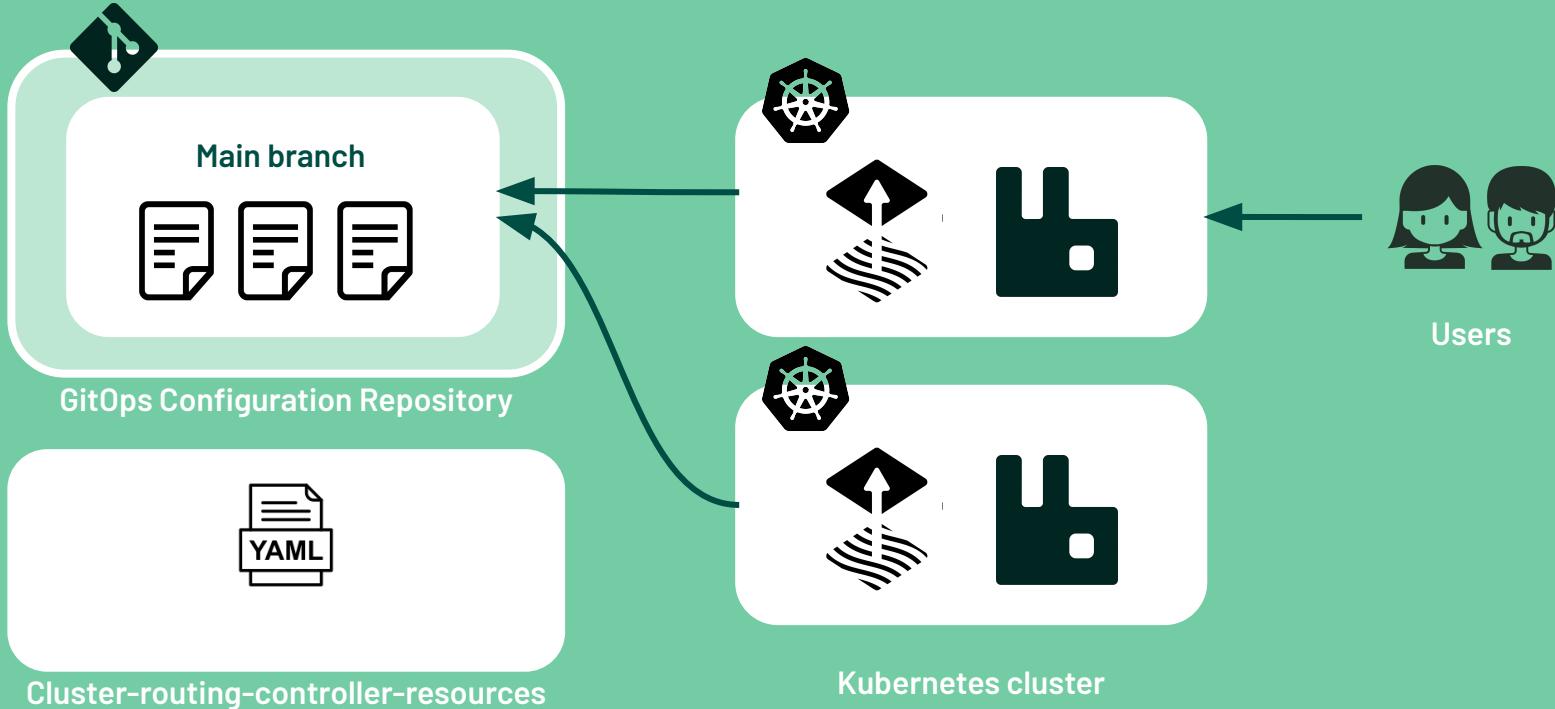
```
$ shuttle run delete_routing_weight  
$ shuttle run add_routing_weight  
$ shuttle run adjust_routing_weight
```



```
k8s:  
  namespace: operators  
  clusters:  
    dev:  
      weights:  
        - clusterName: k8s-2022xx.dev.lunar.com  
          routingWeight: 100
```

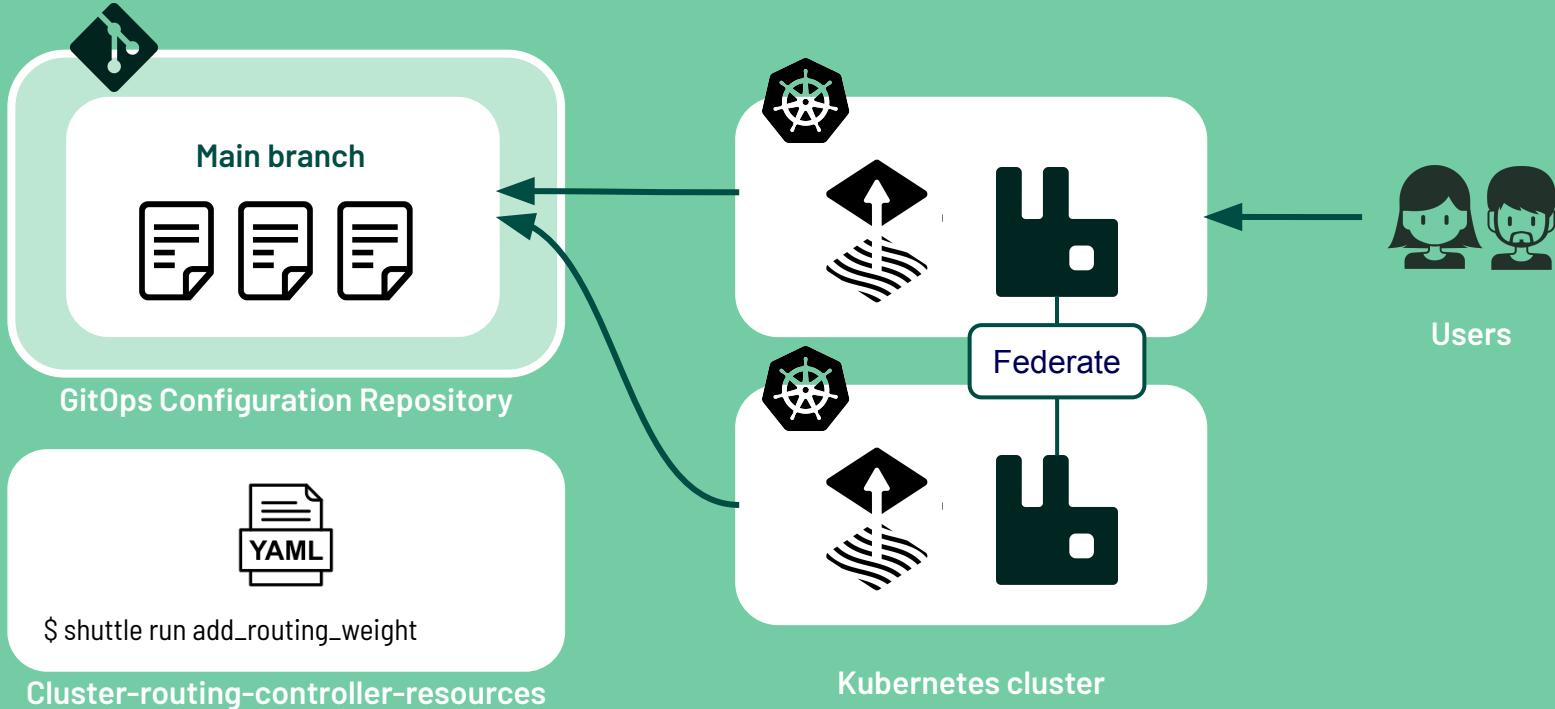
FAILOVER

2. GENERATION



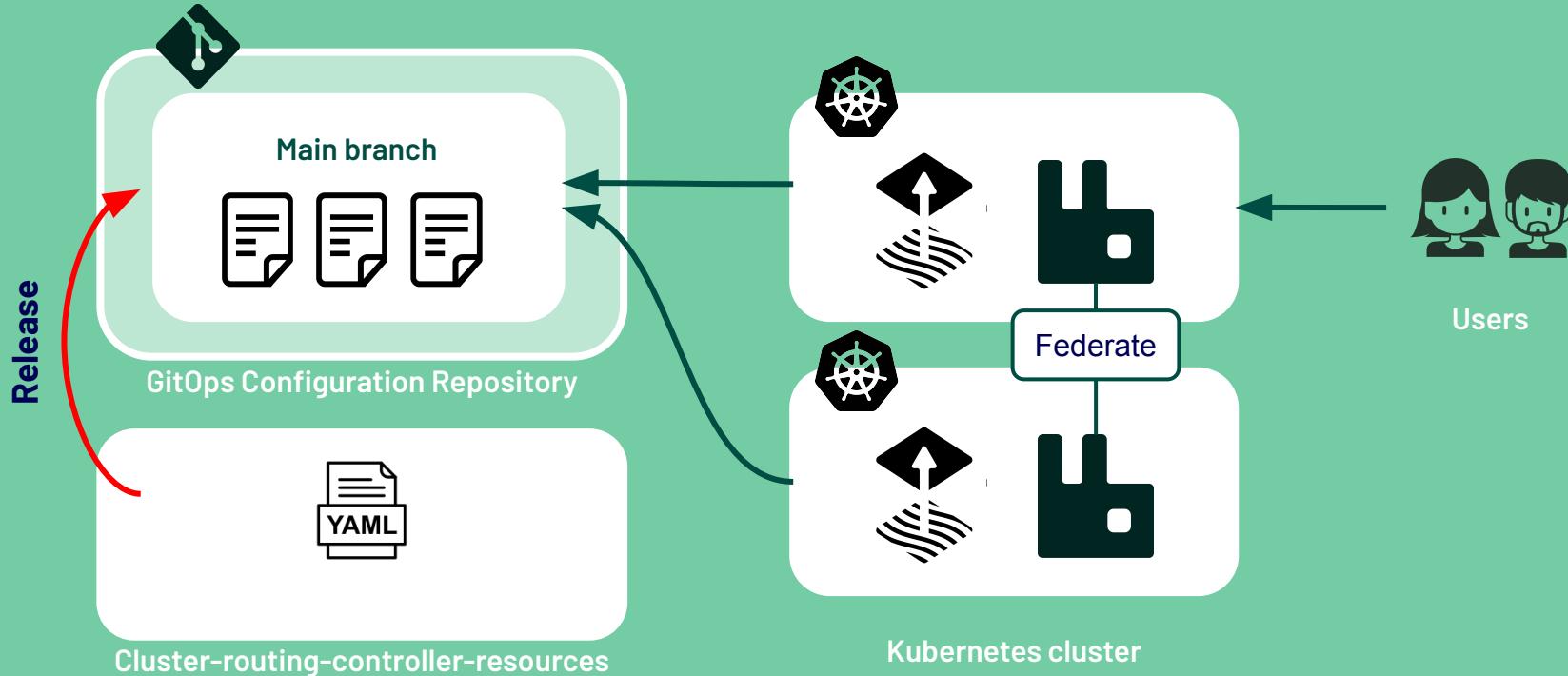
FAILOVER

2. GENERATION



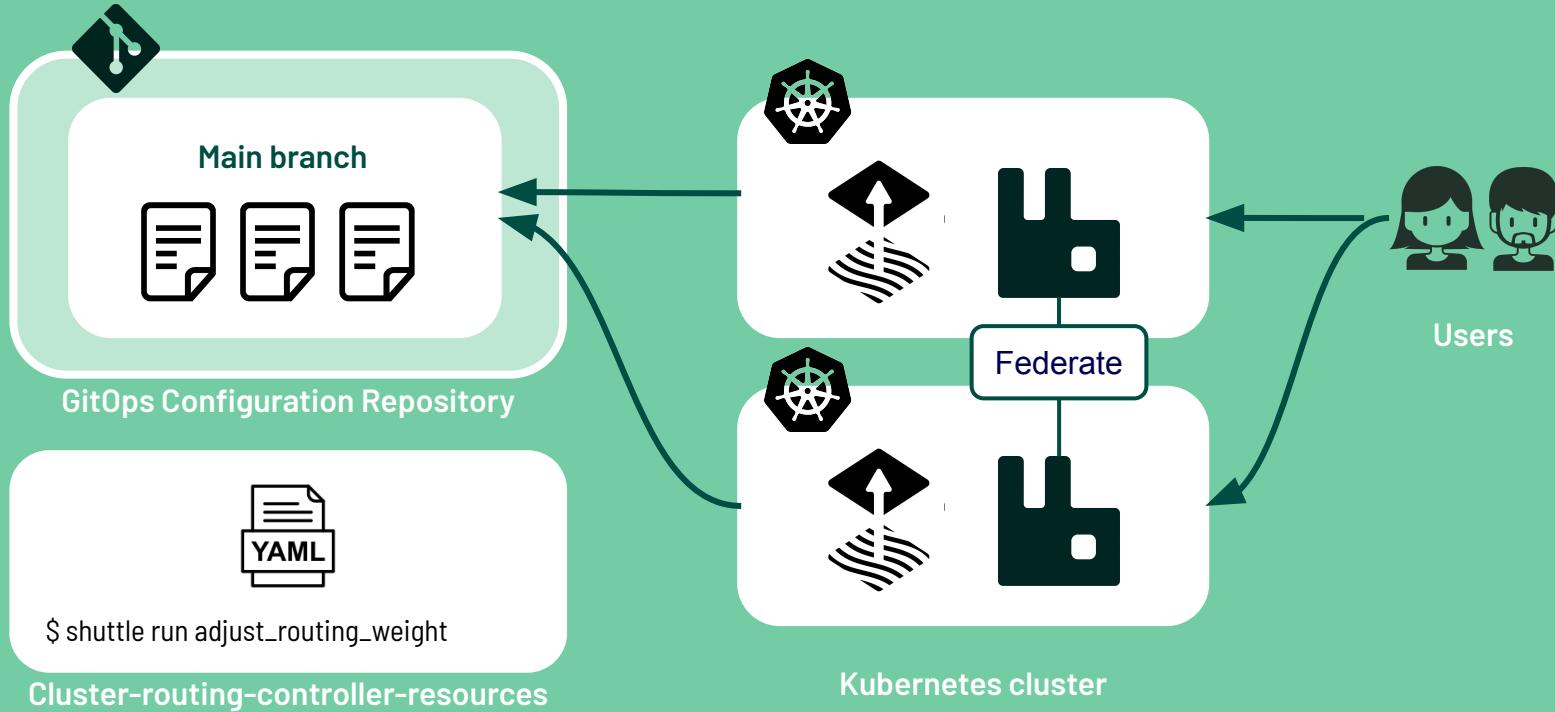
FAILOVER

2. GENERATION



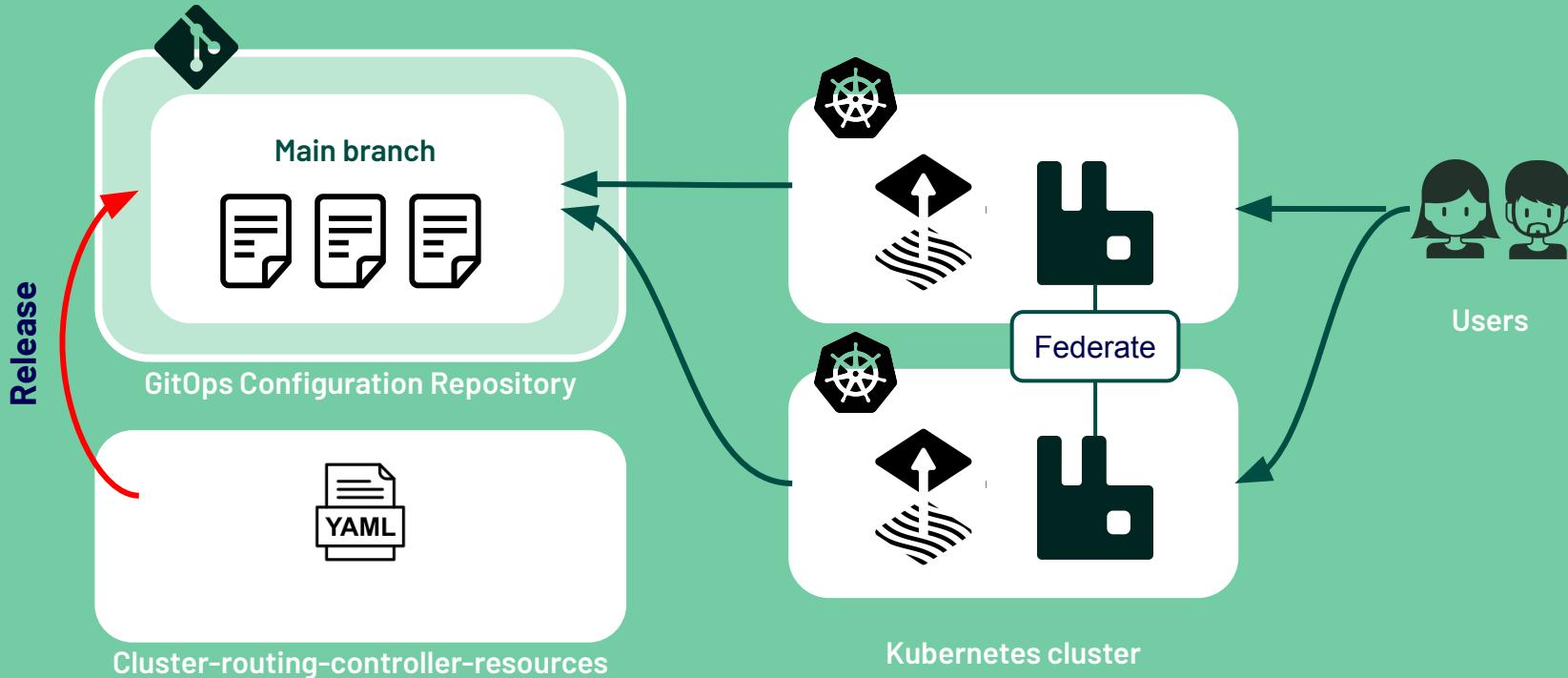
FAILOVER

2. GENERATION



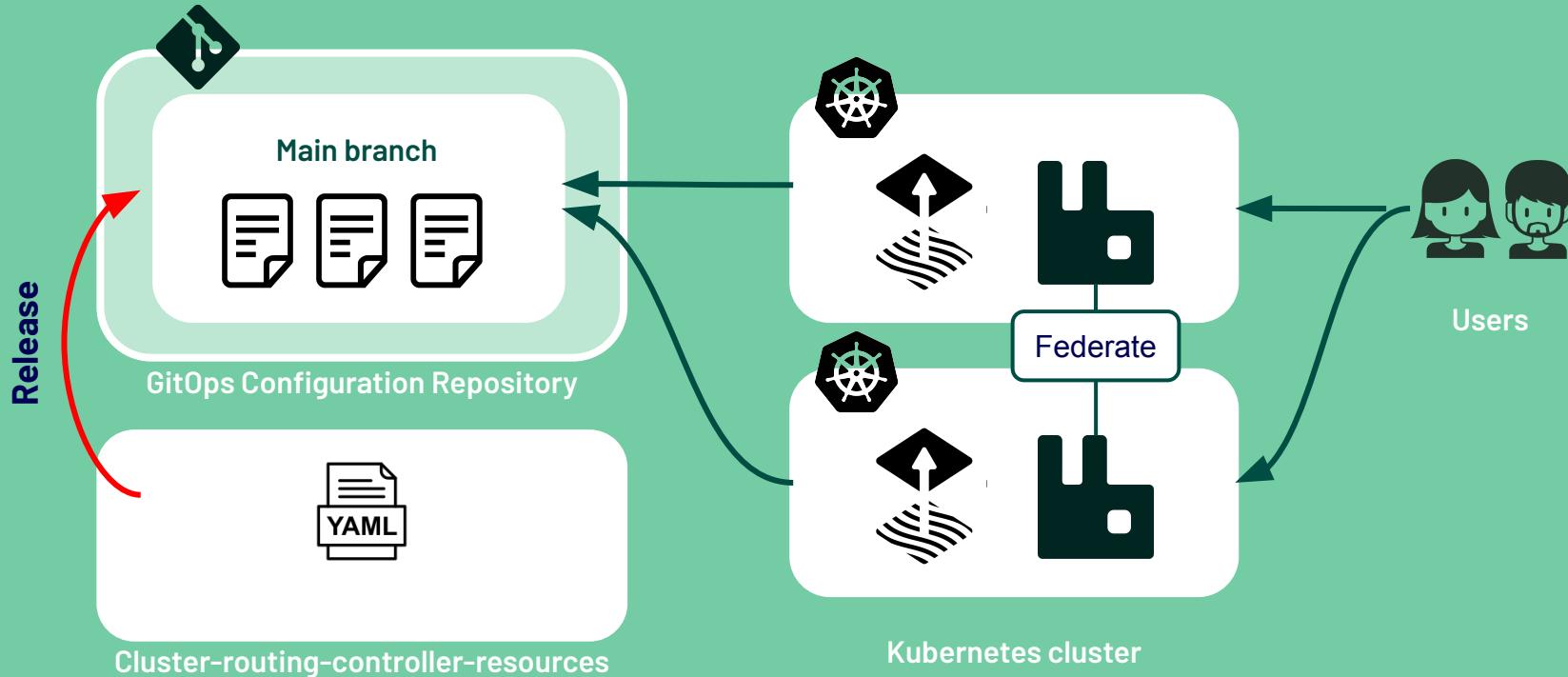
FAILOVER

2. GENERATION



FAILOVER

2. GENERATION



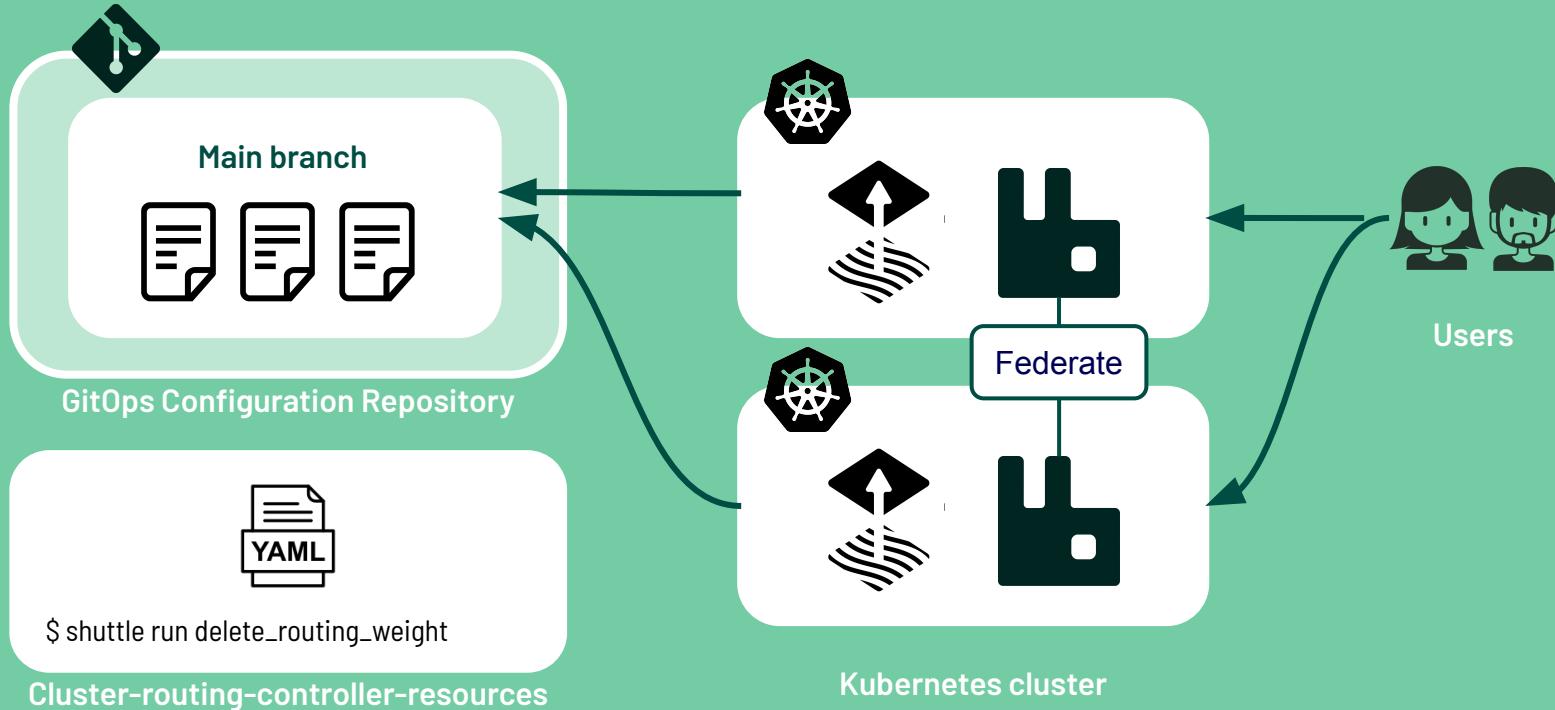
Routing Weight Resources



```
● ● ●  
  
k8s:  
  namespace: operators  
  clusters:  
    dev:  
      weights:  
        - clusterName: k8s-2022xx.dev.lunar.com  
          routingWeight: 80  
        - clusterName: k8s-2022yy.dev.lunar.com  
          routingWeight: 20
```

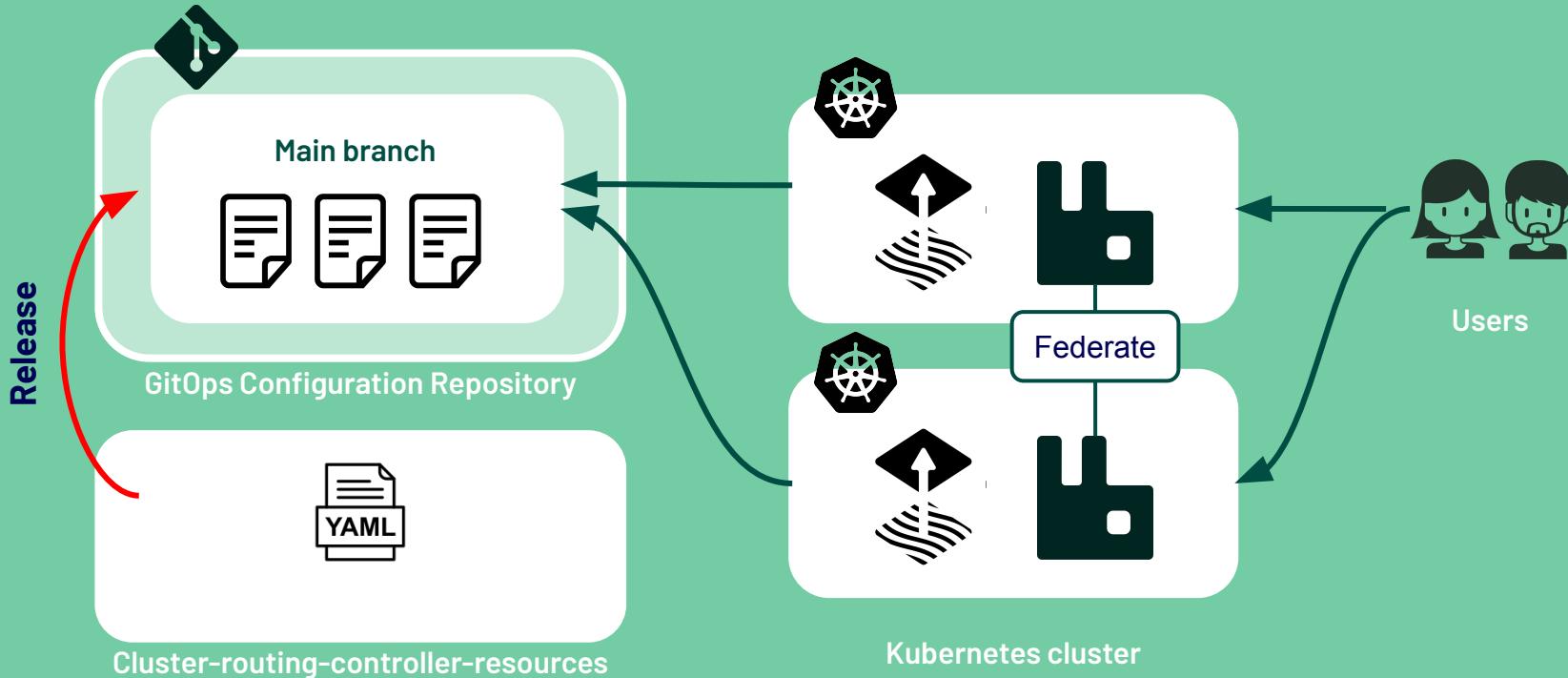
FAILOVER

2. GENERATION



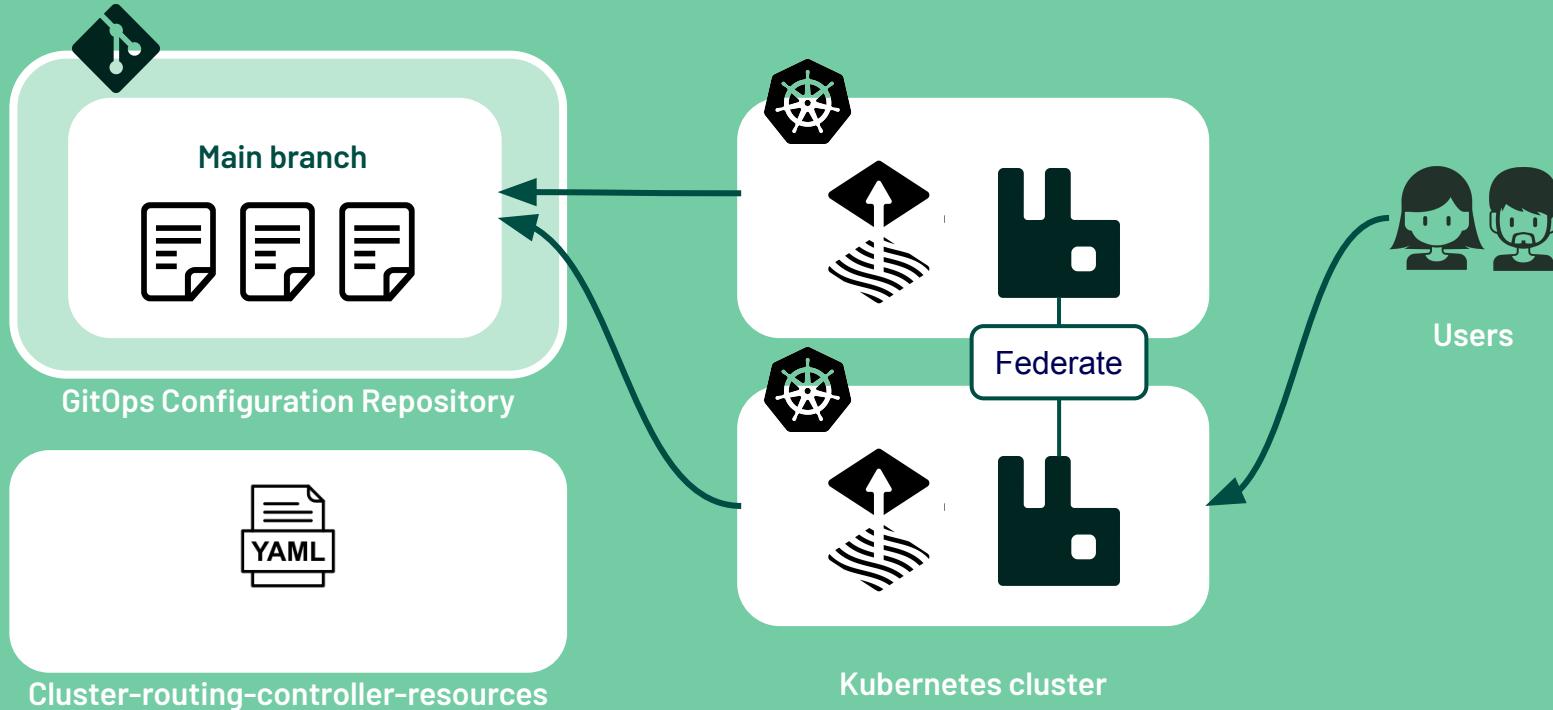
FAILOVER

2. GENERATION



FAILOVER

2. GENERATION



SECOND

GENERATION EFFORT



Coding two
Kubernetes
operators

17 failover runs
in Dev in a 2
month time
period

Every iteration
led to
improvements

FIRST

GENERATION RESULTS

Everyone in
Squad Odyssey
can do a failover
in production

The failover
operation is
down to 5
automated
steps

No GitOps
branching

From spending
4 hours on a
failover to 40
minutes !

FIRST

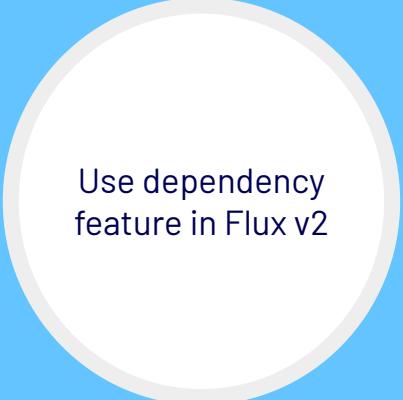
GENERATION PROBLEMS



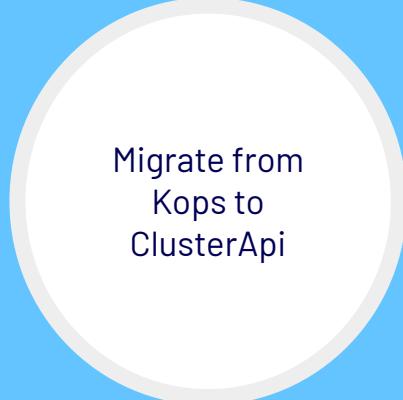
Our Cluster Identity controller has to have “strategies” to find the `clusterName`.

FUTURE

GOALS



Use dependency
feature in Flux v2



Migrate from
Kops to
ClusterApi



We want to
migrate our
Terraform to
Crossplane

FIRST

GENERATION RESULTS



Plan

Do

Study

Act

Open source links :

Shuttle: github.com/lunarway/shuttle

Release-manager: github.com/lunarway/release-manager

Contacts :

LinkedIn: linkedin.com/in/hoeghh

Twitter: twitter.com/HenrikHoegh

E-Mail: her@lunar.app



**THANK
YOU**

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