



Running the Elastic Stack on Kubernetes with ECK

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“



On my *Kubernetes* cluster,
the *Elastic Stack* I want to run...

says Baby Yoda

“



...but many *challenges*
I have to face.

says Baby Yoda

Challenges of running on Kubernetes

- Managing resources
 - Pods, Secrets, Services, ConfigMaps, Deployments, StatefulSets, etc.
- Day-2 operations
 - Scale up/down
 - Configuration change
 - Version upgrade
- Stateful workloads
 - Availability, consistency
 - Volume management

ECK

Elastic Cloud on Kubernetes

Deploy

Elasticsearch, Kibana, APM Server, Enterprise Search, Beats

On Kubernetes

Vanilla, Openshift, GKE, EKS, AKS, etc.

Simple integration

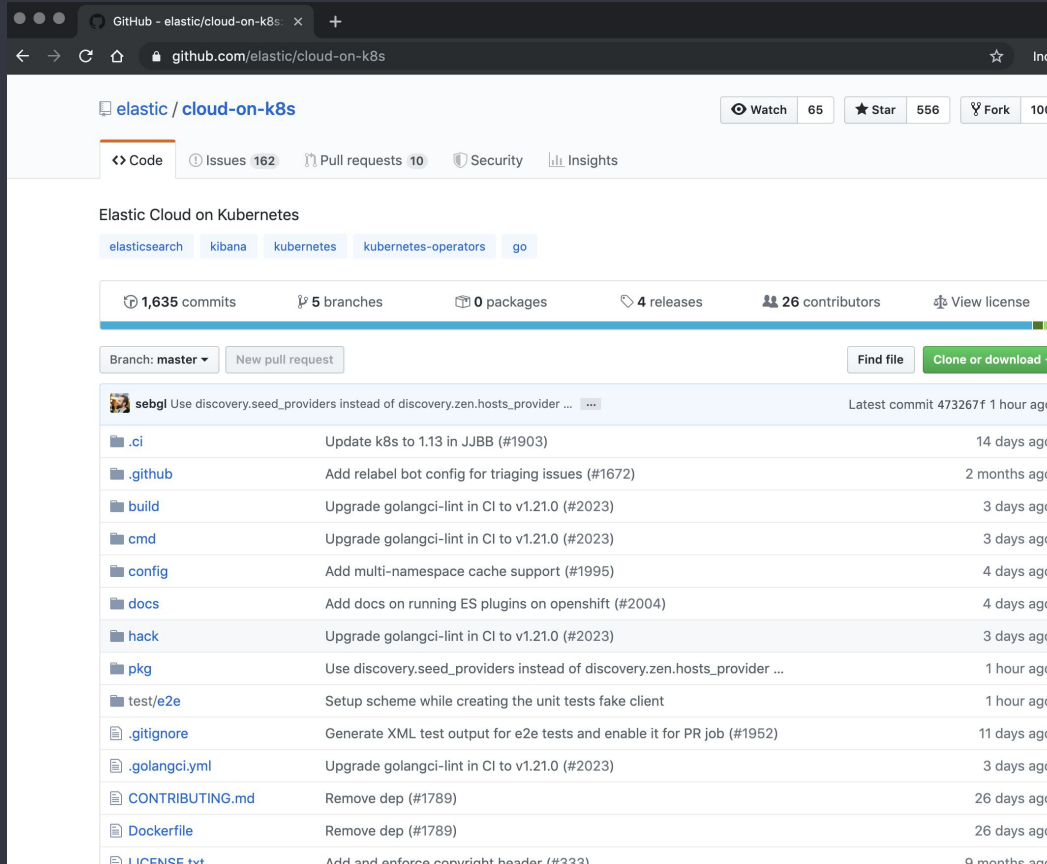
kubectl & usual k8s tooling

Advanced orchestration

Hot/warm/cold, dedicated masters

Smooth operations

Scale up/down, rolling upgrade, version upgrade





Quickstart (demo)

elastic.co/guide/en/cloud-on-k8s/current/k8s-quickstart.html



*What happened
I want to know*

requests Baby Yoda



Operators are clients of the Kubernetes API, that act as **controllers** for a **Custom Resource**.



plz explain

Operators?

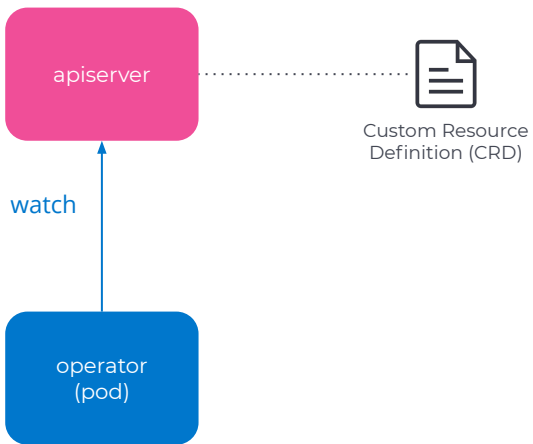
CRDs



```
apiVersion:
elasticsearch.k8s.elastic.co/v1
kind: Elasticsearch
metadata:
  name: quickstart
spec:
  version: 7.9.0
  nodeSets:
    - name: master-nodes
      count: 3
      config:
        node.master: true
    - name: data-nodes
      count: 2
      config:
        node.data: true
```

Operators?

Reconciliation loop

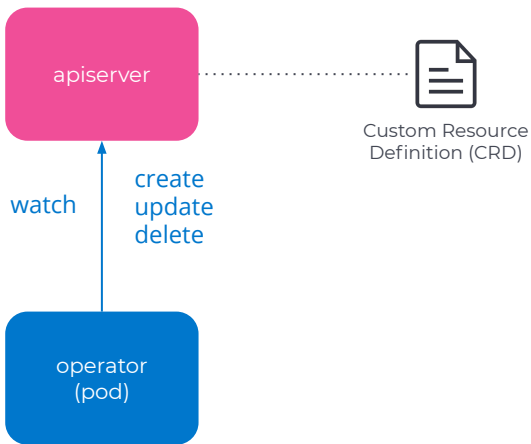


New event

A **watched resource** was created/updated/deleted

Operators?

Reconciliation loop



New event

A **watched resource** was created/updated/deleted



Reconcile!

Get resource spec

Create/update **expected** resources

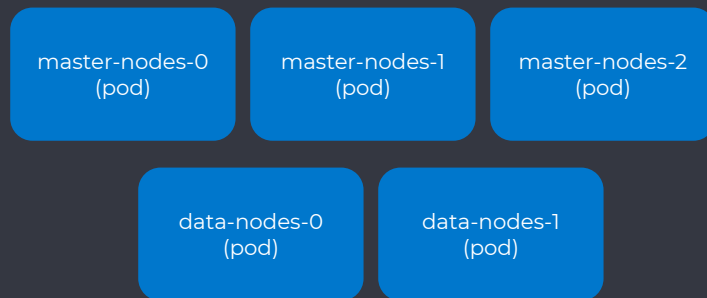
Reconciliation loop

In ECK

```
apiVersion:
elasticsearch.k8s.elastic.co/v1
kind: Elasticsearch
metadata:
  name: quickstart
spec:
  version: 7.9.0
  nodeSets:
  - name: master-nodes
    count: 3
    config:
      node.master: true
  - name: data-nodes
    count: 2
    config:
      node.data: true
```



Create/update Elasticsearch Pods...



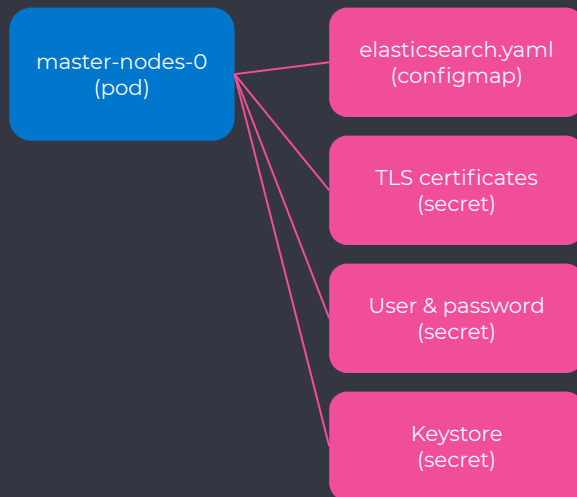
Reconciliation loop

In ECK

```
apiVersion:
elasticsearch.k8s.elastic.co/v1
kind: Elasticsearch
metadata:
  name: quickstart
spec:
  version: 7.9.0
  nodeSets:
  - name: master-nodes
    count: 3
    config:
      node.master: true
  - name: data-nodes
    count: 2
    config:
      node.data: true
```



...and much more



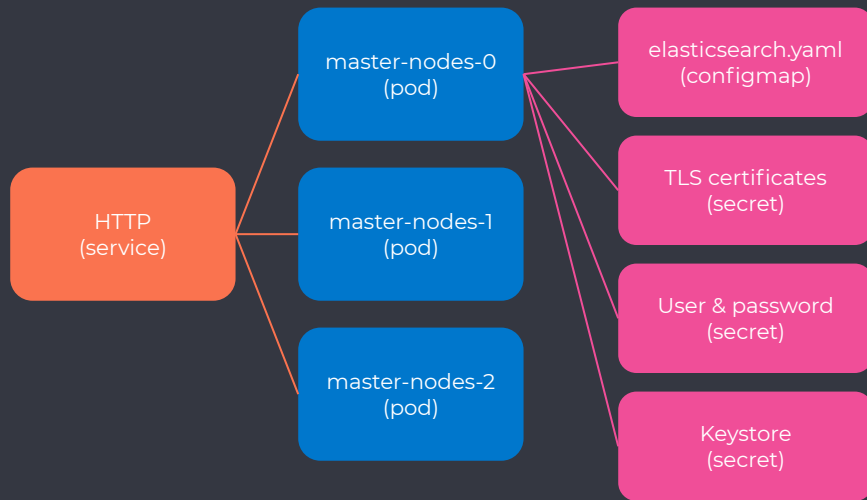
Reconciliation loop

In ECK

```
apiVersion:
elasticsearch.k8s.elastic.co/v1
kind: Elasticsearch
metadata:
  name: quickstart
spec:
  version: 7.9.0
  nodeSets:
  - name: master-nodes
    count: 3
    config:
      node.master: true
  - name: data-nodes
    count: 2
    config:
      node.data: true
```

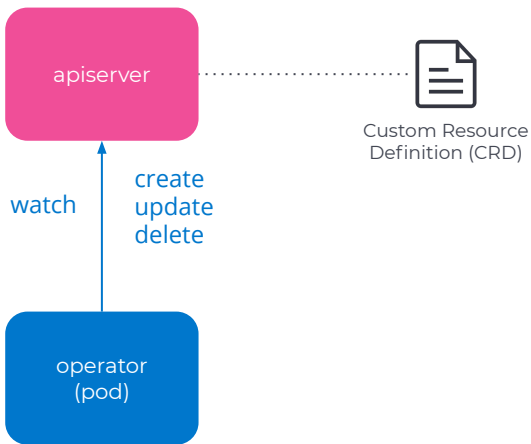


...and much much more



Operators?

Reconciliation loop



New event

A **watched resource** was created/updated/deleted



Reconcile!

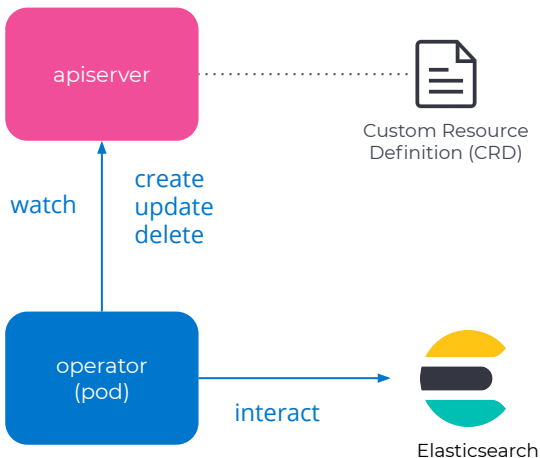
Get resource spec

Create/update **expected** resources

- HTTP service
- TLS certificates (secret)
- Users (secret)
- Keystore (secret)
- ES configuration (configmap)
- ES Nodes StatefulSets (Pod + PersistentVolume)

Operators?

Reconciliation loop



New event

A **watched resource** was created/updated/deleted



Reconcile!

Get resource spec

Create/update **expected** resources

- HTTP service
- TLS certificates (secret)
- Users (secret)
- Keystore (secret)
- ES configuration (configmap)
- ES Nodes StatefulSets (Pod + PersistentVolume)

Interact with the **Elasticsearch API**

- Change cluster settings
- Migrate data
- Prepare for rolling upgrade

```
apiVersion: elasticsearch.k8s.elastic.co/v1beta1
kind: Elasticsearch
metadata:
  name: elasticsearch-sample
spec:
  version: 7.9.0
  nodeSets:
  - name: default
    count: 1
```

```
  podTemplate:
    metadata:
      labels: {"foo": "bar"}
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecution:
            nodeSelectorTerms:
            - matchExpressions:
              - key: environment
                operator: In
                values: ["e2e", "production"]
      containers:
      - name: elasticsearch
        env:
        - name: ES_JAVA_OPTS
          value: "-Xms2g -Xmx4g"
```

Empower users
But provide good defaults

optional podTemplate

```
apiVersion: elasticsearch.k8s.elastic.co/v1
kind: Elasticsearch
metadata:
  name: elasticsearch-sample
spec:
  version: 7.9.0
  nodeSets:
  - name: master-nodes
    count: 3
    config:
      node.master: true
      node.data: false
  - name: data-nodes
    count: 3
    config:
      node.master: false
      node.data: true
```

volumeClaimTemplates:

```
- metadata:
  name: elasticsearch-data
```

spec:

resource:

requests:

```
storage: 100Gi
```

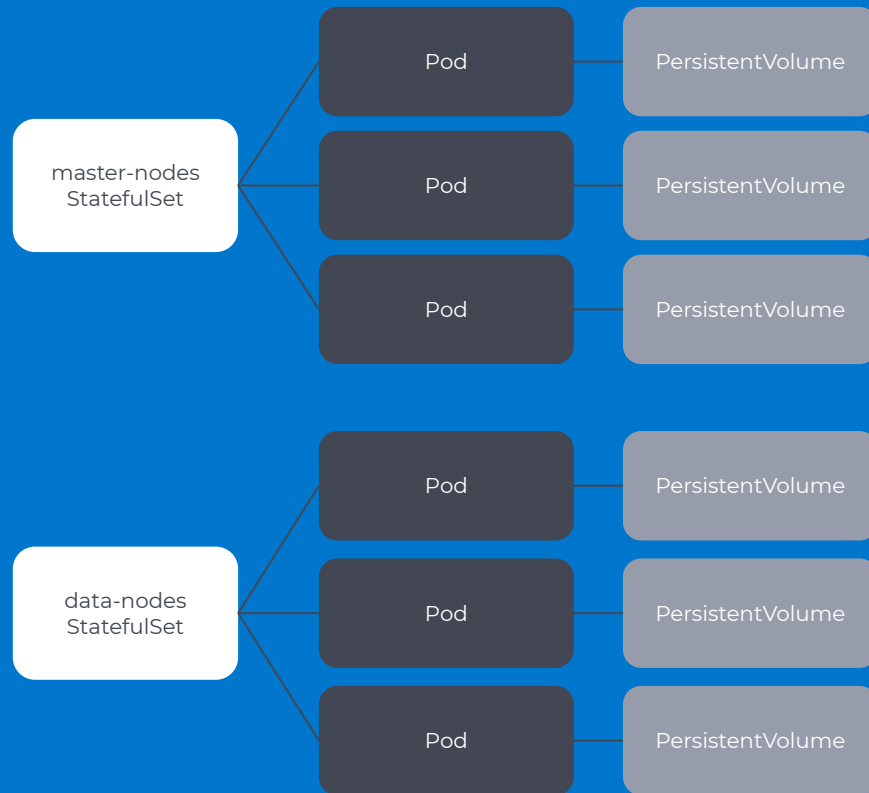
```
storageClassName: <name>
```

```
(gce-pd)
```

```
(aws-ebs)
```

```
(local-storage)
```

```
(your-own)
```





*Safe is my data,
available is my cluster*

realizes Baby Yoda



TLS by default

Simplified configuration

No **downtime**, no **data loss**

Safe data migration

Rolling configuration changes

Rolling version upgrades

Hot/warm/cold deployments

Availability zone awareness

Cross-cluster search and replication

Learn more

Give it a try!

github.com/elastic/cloud-on-k8s
elastic.co/guide/en/cloud-on-k8s/current

The screenshot shows the GitHub repository page for `elastic/cloud-on-k8s`. The repository has 65 watchers, 556 stars, and 10 forks. It contains 162 issues, 10 pull requests, and 1 insight. The repository is titled "Elastic Cloud on Kubernetes" and includes sub-repositories for `elasticsearch`, `kibana`, `kubernetes`, `kubernetes-operators`, and `go`. The repository statistics show 1,635 commits, 5 branches, 0 packages, 4 releases, and 26 contributors. The current branch is `master`, and there is a button to "New pull request". The file list includes:

File	Description	Latest commit
<code>.ci</code>	Update k8s to 1.13 in JJBB (#1903)	14 days ago
<code>.github</code>	Add relabel bot config for triaging issues (#1672)	2 months ago
<code>build</code>	Upgrade golangci-lint in CI to v1.21.0 (#2023)	3 days ago
<code>cmd</code>	Upgrade golangci-lint in CI to v1.21.0 (#2023)	3 days ago
<code>config</code>	Add multi-namespace cache support (#1995)	4 days ago
<code>docs</code>	Add docs on running ES plugins on openshift (#2004)	4 days ago
<code>hack</code>	Upgrade golangci-lint in CI to v1.21.0 (#2023)	3 days ago
<code>pkg</code>	Use discovery.seed_providers instead of discovery.zen.hosts_provider ...	1 hour ago
<code>test/e2e</code>	Setup scheme while creating the unit tests fake client	1 hour ago
<code>.gitignore</code>	Generate XML test output for e2e tests and enable it for PR job (#1952)	11 days ago
<code>.golangci.yml</code>	Upgrade golangci-lint in CI to v1.21.0 (#2023)	3 days ago
<code>CONTRIBUTING.md</code>	Remove dep (#1789)	26 days ago
<code>Dockerfile</code>	Remove dep (#1789)	26 days ago
<code>LICENSE.txt</code>	Add and enforce copyright header (#333)	9 months ago



Survey

https://elastic.eu.qualtrics.com/jfe/form/SV_djqQKy4bIF2fGWF?&Event=Running%20the%20Elastic%20stack%20on%20Kubernetes%20with%20ECK%20&Region=EMEA&Subregion=EMEA-S&country=Virtual

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