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Community Days  
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# Declarative helm chart Installation with Helmfile

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**Kubernetes  
Community Days**  
Indonesia 2021

# Agenda


- Kubernetes Resources
- Helm
- Helmfile
- Demo
- Reference
- Q&A

# Kubernetes Resources

- Pod is the smallest computing unit in kubernetes.
- To run application in k8s using Pod only is enough.
- To make it accessible, secure, reliable, and scalable, we need to have other components deployed together.



## ✓ KCD-PROJECT

✓  manifest/helm

- YAML configmap.yaml
- YAML deployment.yaml
- YAML hpa.yaml
- YAML ingress.yaml
- YAML secret.yaml
- YAML service.yaml

```
$ kubectl apply -f manifest/helm/configmap.yaml
$ kubectl apply -f manifest/helm/secret.yaml
$ kubectl apply -f manifest/helm/deployment.yaml
$ kubectl apply -f manifest/helm/hpa.yaml
$ kubectl apply -f manifest/helm/service.yaml
$ kubectl apply -f manifest/helm/ingress.yaml
```

OR

```
$ kubectl apply -f manifest/helm/
```

✓ It works

✗ But not recommended. Why?

*Why it's not recommended?*

Case: we want to have multiple environments

1. So many files need to be maintained.
2. Need to configure every specific values in each environments, while declaring default values together in a file.
3. Not reusable. Manifest might not be used on another project.

**We need to find a better approach** 🤔



```
▼ KCD-PROJECT
  ▼ manifest / helm
    ▼ prod
      configmap.yaml
      deployment.yaml
      hpa.yaml
      ingress.yaml
      secret.yaml
      service.yaml
    ▼ stg
      configmap.yaml
      deployment.yaml
      hpa.yaml
      ingress.yaml
      secret.yaml
      service.yaml
```

# Helm

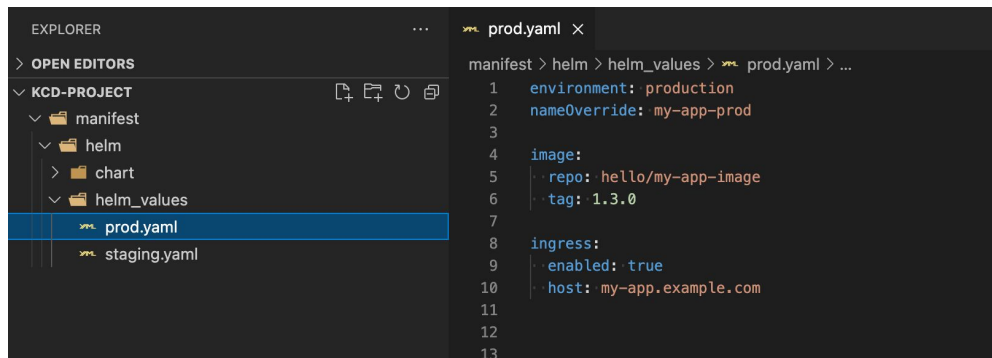
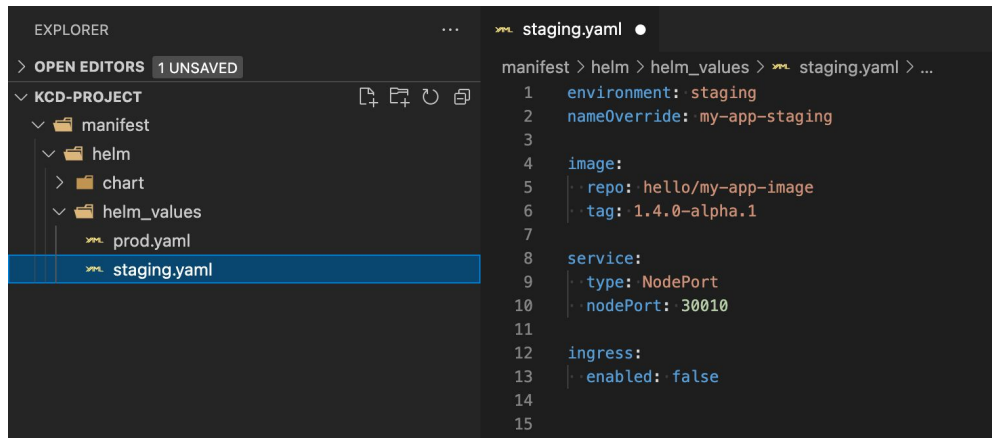
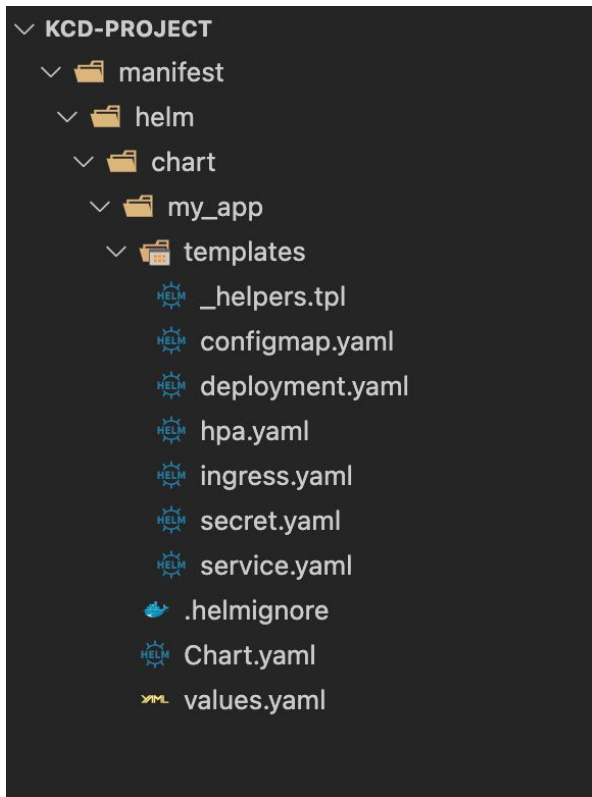
<https://helm.sh>



The  
package manager  
for Kubernetes



# Helm





## Another new case...

*What if we want to use multiple helm chart in multiple environments?*

```

✓ KCD-PROJECT
  ✓ manifest
  ✓ helm
    > chart
  ✓ helm_values
    ✓ prod
      elasticsearch.yaml
      my-app.yaml
      mysql.yaml
    ✓ staging
      elasticsearch.yaml
      my-app.yaml
      mysql.yaml
```

```
$ helm repo add bitnami https://charts.bitnami.com/bitnami
$ helm install project1-mysql bitnami/mysql
```

```
$ helm repo add elastic https://helm.elastic.co
$ helm install project1-es elastic/elasticsearch
```

```
# our custom chart must be uploaded to chart repository
$ helm repo add custom-app https://custom-app.host
$ helm install project1-my-app custom-app/apps
```

✓ It works

🤔 Hmmmmm...

## Another new case...

*What if we want to use multiple helm chart in multiple environments?*



```
▼ KCD-PROJECT
  ▼ manifest
    ▼ helm
      > chart
    ▼ helm_values
      ▼ prod
        elasticsearch.yaml
        my-app.yaml
        mysql.yaml
      ▼ staging
        elasticsearch.yaml
        my-app.yaml
        mysql.yaml
```

1. But the more charts you use, the more `helm repo add` & `helm install` you declare them on CI/CD.
2. I want it more declarative, not an imperative one.
3. Let say I want to use redis in production only, not on staging. How can I achieve this?

There must be a better way...

# Helmfile

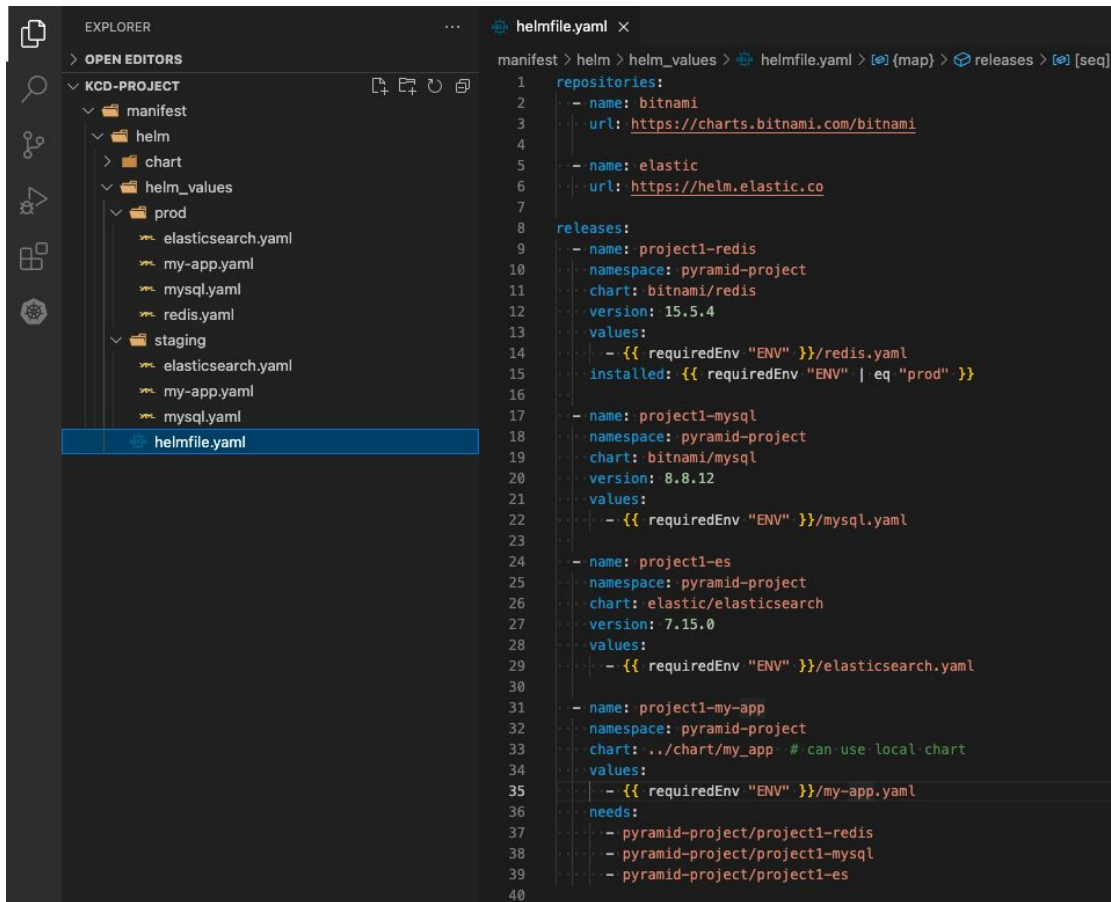
<https://github.com/roboll/helmfile>

An open-source tool to manage helm charts in a declarative way.

Benefits:

1. Declarative
2. Modular
3. Using Go template
4. Can use conditional logic
5. Encryption
6. etc..

# Helmfile



```
manifest > helm > helm_values > helmfile.yaml > [0] (map) > releases > [0] [seq]
1 repositories:
2   - name: bitnami
3     url: https://charts.bitnami.com/bitnami
4
5   - name: elastic
6     url: https://helm.elastic.co
7
8 releases:
9   - name: project1-redis
10     namespace: pyramid-project
11     chart: bitnami/redis
12     version: 15.5.4
13     values:
14       - {{ requiredEnv "ENV" }}/redis.yaml
15     installed: {{ requiredEnv "ENV" | eq "prod" }}
16
17   - name: project1-mysql
18     namespace: pyramid-project
19     chart: bitnami/mysql
20     version: 8.8.12
21     values:
22       - {{ requiredEnv "ENV" }}/mysql.yaml
23
24   - name: project1-es
25     namespace: pyramid-project
26     chart: elastic/elasticsearch
27     version: 7.15.0
28     values:
29       - {{ requiredEnv "ENV" }}/elasticsearch.yaml
30
31   - name: project1-my-app
32     namespace: pyramid-project
33     chart: ../chart/my_app # can use local chart
34     values:
35       - {{ requiredEnv "ENV" }}/my-app.yaml
36     needs:
37       - pyramid-project/project1-redis
38       - pyramid-project/project1-mysql
39       - pyramid-project/project1-es
40
```

```
$ helmfile apply
```

# DEMO....

# References

- <https://helm.sh/docs/>
- <https://github.com/roboll/helmfile>
- <https://pkg.go.dev/text/template>
- <http://masterminds.github.io/sprig>
- <https://github.com/jkroepke/helm-secrets>



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Do you have any questions?

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# Thanks!



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