Helm

Kubernetes Application

- Kubernetes application are the resources that are deployed on a cluster
  - Eg. pods, volumes, volume claims, secrets, ingress, etc
  - Resources maps to servers/nodes, disk, network, etc
- Resources are describe by Kubernetes objects
  - Think the YAML file
  - Eg. Deployment

- Some application requires many YAML file
  - Eg. WordPress application requires about 13 Kubernetes objects
- Complex if everyone need to repeatedly create these YAML files repeatedly
- Package manager can automate deployment of complex applications

What is Helm?

- Package manager for Kubernetes applications
  - Like NPM, apt,
- Applications are packaged in Charts
- Benefits of using Helm
  - Single command to provision an application instead of multiple `kubectl create`/`delete` command
  - Easily upgrade or rollback releases
    - Releases are apps that Helm installed in a Kubernetes cluster
- Charts are helm packages
  - Versioned to keep track of applications
- Charts are listed in repos

Installing Helm

- Download an appropriate release
    - https://helm.sh/docs/intro/install/

- Single binary
    - Save to execution path
    - Eg. `/usr/local/bin,c:\bin`

- No longer require `tiller` (version 2)

Concepts

- Charts
  - A Helm package
  - Consists of parameterized Kubernetes resource definitions
  - Meta information like package name, version, substitutable values
- Release
  - A instances of an installed chart running in Kubernetes
  - You can set the release name when installing an application or helm will generate a name
- Repository
  - Public location of a chart
  - The helm comes preconfigured with the stable repository

Helm Repositories

- Helm repository
    - `hub` - https://hub.helm.sh/
    - `repo`
        - List of alternative repositories you add
        - Repo is initially empty. You must add your repositories
        - Eg. private repository

```
helm repo add stable https://kubernetes-charts.storage.googleapis.com
helm repo add bitnami https://charts.bitnami.com/bitnami
```

Searching for Charts

- Searching for charts
  - From the hub

    ```
    helm search hub nfs
    ```

  - From a local added repository called stable

    ```
    helm search repo stable nfs
    helm search repo bitnami nfs
    ```

Installing Charts

- Chart names are prefixed with their repository
  - \<repo-name\>/\<chart-name\>
- Certain charts can be configured
  - See the chart's documentation
  - Eg https://hub.helm.sh/charts/stable/nginx-ingress

```
helm install nginx-ingress \
   stable/nginx-ingress \
   --set controller.publishService.enabled=true \
   -n nginx-ns
```

Managing Helm Releases

- List installed charts

```
helm list
```

- Delete a chart

```
helm uninstall <release-name>
```

Installing Charts with Values File

- Use a YAML file to provide a large set of parameters to Helm during installation

- Use −f option

- Use template subcommand instead of install to view Helm generated files

```
values.yaml
```
```
mysqlRootPassword: fred
mysqlDatabase: northwind
```

```
helm install my-ingress \
    stable/mysql -f values.yaml
```

```
helm template my-ingress \
    stable/mysql -f values.yaml
```