

IBM

Helm

Basics



Helm – A package manager for Kubernetes

A package manager automates the process of installing, configuring, upgrading, and removing defined workload

Helm enables multiple Kubernetes resources to be created with a single command

Deploying an application often involves creating and configuring multiple resources

A Helm chart defines multiple resources as a set

An application in Kubernetes typically consists of (at least) two resource types

Deployment – Describes a set of pods to be deployed together

Services – Endpoints for accessing the APIs in those pods

Could also include ConfigMaps, Secrets, Ingress, etc.

A default chart for an application consists of a deployment template and a service template

- The chart creates all of these resources in a Kubernetes cluster as a set
- Rather than manually having to create each one separately via kubectl

Helm Terminology

Helm Client

Helm installs charts into Kubernetes, creating a new release for each installation

Chart: The Application Package

Templates for a set of resources necessary to run an application including the values file to configure resources

Repository

Storage for Helm charts

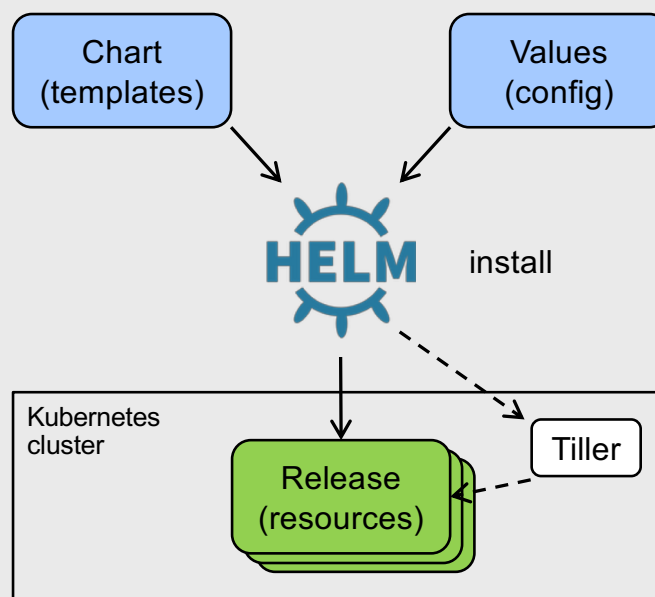
stable – The namespace of the hub for official charts

Release

An instance of a chart running in a Kubernetes cluster

Tiller: The Server-Side Engine

Helm templating engine, runs in a pod in a Kubernetes cluster and processes the chart to generate the resource manifests, then installs the release into the cluster with each release as a Kubernetes config map



Advantages of using Helm

Deploy all the resources for an application with a single command making deployment easy and repeatable

```
$ helm install <chart>
```

Separates configuration settings from manifest formats

- Edit the values without changing the rest of the manifest
- `values.yaml` – Update to deploy the application differently

Upgrade a running release to a new chart version

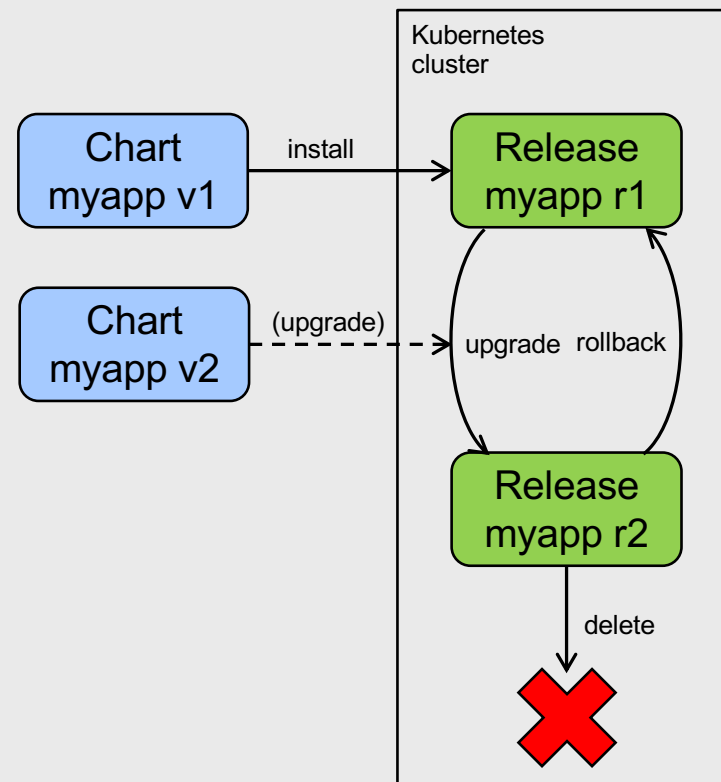
```
$ helm upgrade <release> <chart>
```

Rollback a running release to a previous revision

```
$ helm rollback <release> <revision>
```

Delete a running release

```
$ helm delete <release>
```



Installing Helm

Helm runs as a CLI client

Typically installed on your laptop

https://docs.helm.sh/using_helm/#installing-helm

Helm Installation Options

Options for installing Helm

1. Download the release, including the binary from:

<https://github.com/kubernetes/helm/releases>

2. Homebrew on MacOS

```
brew install kubernetes-helm
```

3. Installer script

```
curl  
https://raw.githubusercontent.com/kubernetes/helm/master/scripts/get  
> get_helm.sh
```

4. Install from ICP Image

https://www.ibm.com/support/knowledgecenter/en/SSBS6K_2.1.0.3/app_center/create_helm_cli.html

Helm commands

Install Tiller

```
$ helm init
```

Create a chart

```
$ helm create <chart>
```

List the repositories

```
$ helm repo list
```

Search for a chart

```
$ helm search <keyword>
```

Info about a chart

```
$ helm inspect <chart>
```

Deploy a chart (creates a release)

```
$ helm install <chart>
```

List all releases

```
$ helm list --all
```

Get the status of a release

```
$ helm status <release>
```

Get the details about a release

```
$ helm get <release>
```

Upgrade a release

```
$ helm upgrade <release> <chart>
```

Rollback a release

```
$ helm rollback <release> <revision>
```

Delete a release

```
$ helm delete <release>
```

Working with repositories

```
$ helm repo list
```

NAME	URL
stable	https://kubernetes-charts.storage.googleapis.com/

```
$ helm search jenkins
```

NAME	VERSION	DESCRIPTION
stable/jenkins	0.1.14	A Jenkins Helm chart for Kubernetes.

```
$ helm repo add my-charts https://my-charts.storage.googleapis.com
```

```
$ helm repo list
```

NAME	URL
stable	https://kubernetes-charts.storage.googleapis.com/
my-charts	https://my-charts.storage.googleapis.com

Helm and IBM Cloud Private

Catalog entries are Helm charts that can be deployed from the chart repositories

ibm-calico-bgp-peer V 1.0.0

A Helm chart for configuring a bgp peer to your ICP Calico cluster

ibm-charts

[View Licenses](#)

VERSION 1.0.0

PUBLISHED 16th May 2018

TYPE Helm Chart

Configure a BGP Peer Resource to the Kubernetes

Introduction

A BGP peer resource (`BGPPeer`) represents a remote BGP peer with which the node(s) in a Calico network with your datacenter fabric (e.g. ToR). For more information on cluster layouts, see Calico's

A peer can be added as a Global Peer where the added BGP Agent peers with every calico node in the cluster. Or BGP peerings can be configured on a per-node basis, i.e., configured as node-specific peers.

Chart Details

This chart will do the following:

Configure

Catalog

Search items

Deploy your applications and install software packages



ibm-calico-bgp-peer

A Helm chart for configuring a bgp peer to...

ibm-charts



ibm-datapower-dev

IBM DataPower Gateway.

ibm-charts



ibm-dsm-dev

IBM Data Server Manager Developer C Edition. Note that...

ibm-charts



ibm-cam-prod

IBM Cloud Automation Manager.

ibm-charts



ibm-db2oltp-dev

IBM Db2 Developer-C Edition 11.1.3.3

ibm-charts



ibm-dsx-dev

IBM Data Science Experience (DSX) Developer Edition brings together...

ibm-charts



Chart repository

NAME	URL	
local-charts	http://127.0.0.1:8879	Remove
microservicebuilder	http://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/helm	Remove
ibm-charts	https://raw.githubusercontent.com/IBM/charts/master	Remove

Index of /ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/helm

Name	Last modified	Size	Description
Parent Directory			
fabric-1.0.0.tgz	21 Jun 2017 05:11	6.3K	
index.yaml			
pipeline-1.0.0.tgz			

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```
apiVersion: v1
entries:
  fabric:
    - apiVersion: v1
      created: 2017-06-06T10:33:02.800784489Z
      description: Microservice Builder Fabric
      digest: 4d1f14f9f2f893460e614bd4077096ef1783b0d9a2a8d8d0f2e65
      icon: https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/icon.png
      name: fabric
      urls:
        - https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/helm/fabric-1.0.0.tgz
      version: 1.0.0
  pipeline:
    - apiVersion: v1
      created: 2017-06-06T10:33:02.801909061Z
      description: Microservice Builder Pipeline
      digest: e3e73c769412db45ec0d33a8ce2b2809f89da08da989a311c95dbd7c68426a5c
      icon: https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/icon.png
      name: pipeline
      urls:
        - https://public.dhe.ibm.com/ibmdl/export/pub/software/websphere/wasdev/microservicebuilder/helm/pipeline-1.0.0.tgz
      version: 1.0.0
generated: 2017-06-06T10:33:02.799077378Z
```

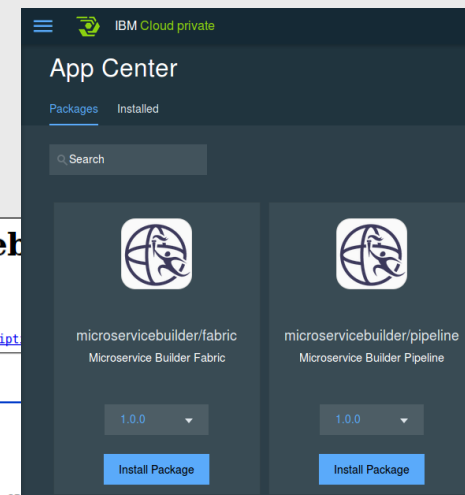


Chart repository:

- HTTP server that houses an `index.yaml` file and optionally some packaged charts
- Server can be any HTTP server that can serve YAML and tar files and can answer GET requests

To serve a local repo

```
$ helm serve
```

To add a chart to the repository, copy it to the directory and regenerate the index

```
$ helm repo index <charts-path>
```

Deploying an application with its Helm chart

```
$ helm search mysql

NAME                VERSION DESCRIPTION
stable/mysql 0.1.1      Chart for MySQL

$ helm install stable/mysql

Fetched stable/mysql to mysql-0.1.1.tgz
NAME: loping-toad
LAST DEPLOYED: Thu Oct 20 14:54:24 2016
NAMESPACE: default
STATUS: DEPLOYED

RESOURCES:
==> v1/Secret
NAME                TYPE    DATA    AGE
loping-toad-mysql   Opaque  2        3s

==> v1/Service
NAME                CLUSTER-IP    EXTERNAL-IP    PORT(S) AGE
loping-toad-mysql   192.168.1.5    <none>         3306/TCP    3s

==> extensions/Deployment
NAME                DESIRED CURRENT UP-TO-DATE    AVAILABLE    AGE
loping-toad-mysql   1        0          0              0
0

==> v1/PersistentVolumeClaim
NAME                STATUS    VOLUME    CAPACITY    ACCESSMODES    AGE
loping-toad-mysql   Pending
```

Install output includes details about the release and resources

Chart: stable/mysql

Release name: loping-toad (auto generated)

Resources

- Four total, one of each type
- All named loping-toad-mysql
- Secret
- Service
- Deployment
- PersistentVolumeClaim

Overriding values

Default values are stored in the chart

```
<chart-path>/values.yaml
```

Helm CLI uses Kubernetes CLI's configuration to connect to your current cluster

```
~/.kube/config
```

```
$ kubectl config view
```

To specify a release's name, use the *name* flag

```
$ helm install --name CustomerDB stable/mysql
```

To deploy the release into a particular Kubernetes namespace, use the *namespace* flag

```
$ helm install --namespace ordering-system stable/mysql
```

To override an individual value, use the *set* flag

```
$ helm install --set user.name='student',user.password='passw0rd'  
stable/mysql
```

To override values with a values file, use the *values* or *f* flag

```
$ helm install --values myvalues.yaml stable/mysql
```

