



# Making The Most of Helm 3 with Codefresh

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# Agenda



- Codefresh/Helm Overview
- What's New in Helm 3
- Codefresh + Helm
- Demos

<https://github.com/codefresh-contrib/helm-sample-app>

# What is Helm?

- Helm is the only existing package manager for Kubernetes (think apt/yum/homebrew)
- It simplifies the process of creating, managing, and deploying applications on Kubernetes by using Helm Charts
- Official site and documentation: <https://helm.sh>



# What is a Helm Chart?

- A collection of manifests that describe a related Kubernetes resource
  - **Templates** go through the Helm template rendering engine
  - **values.yaml** defines the default values for your chart templates
  - Charts can be packaged/published and made available to other users in **repositories**
  - Each time a chart is installed, a new **release** is created

```
mychart/  
  Chart.yaml  
  values.yaml  
  charts/  
  templates/  
  ...
```

# How to use Helm Charts

- Helm charts can be installed using helm install command by one of several methods:
- A chart repository (helm install <release-name> stable/foo)
- A local chart archive (helm install foo foo-0.1.1.tgz)
- An unpacked chart directory (helm install foo path/to/foo)
- A full URL (helm install foo <https://example.com/charts/foo-1.2.3.tgz>)

```
mychart/  
  Chart.yaml  
  values.yaml  
  charts/  
  templates/  
  ...
```

# Push vs. Install

- Pushing a chart will only push a chart to a Helm repository (and automatically package it)
- Installing a chart will create a brand new release from a Helm chart





# New in Helm 3!

- Removal of Tiller
  - Now, only the Helm binary is necessary
  - Security is now on a per user basis
  - Chart installation information stored in Kubernetes itself
  - Release names are now scoped to the release namespace (instead of the Tiller namespace)



# New in Helm 3!

- 3-way Strategic Merge Patches
  - On rollbacks/upgrades, only 2-way merge patch (old chart → new chart)
  - Helm 3 considers the old chart → live state → new chart



# New in Helm 3!

- Templates do not use Lua
- Secrets as the default storage driver for release information
- JSONSchema Chart Validation
- Namespaces not automatically created for releases

... and [more!](#)



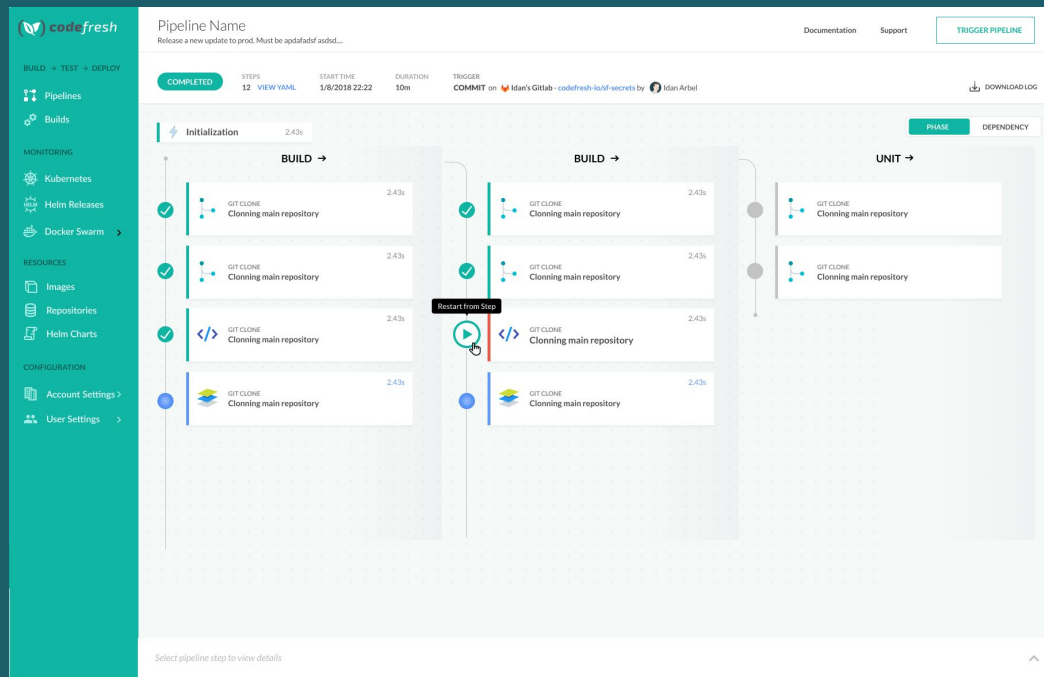
# Why use Helm?

- Helm automatically maintains a versioned history of your releases
  - If something goes wrong, it's as simple as running `helm rollback`
- Combined with CI/CD, you can easily integrate actions into your pipelines, i.e.
  - Before installation begins
  - After an upgrade has finished



# About Codefresh

- Docker based CI/CD solution
- Each build step is a Docker image
- Native support for Docker, Helm, Kubernetes deployments
- Includes built-in Helm repository
- 20,000+ users

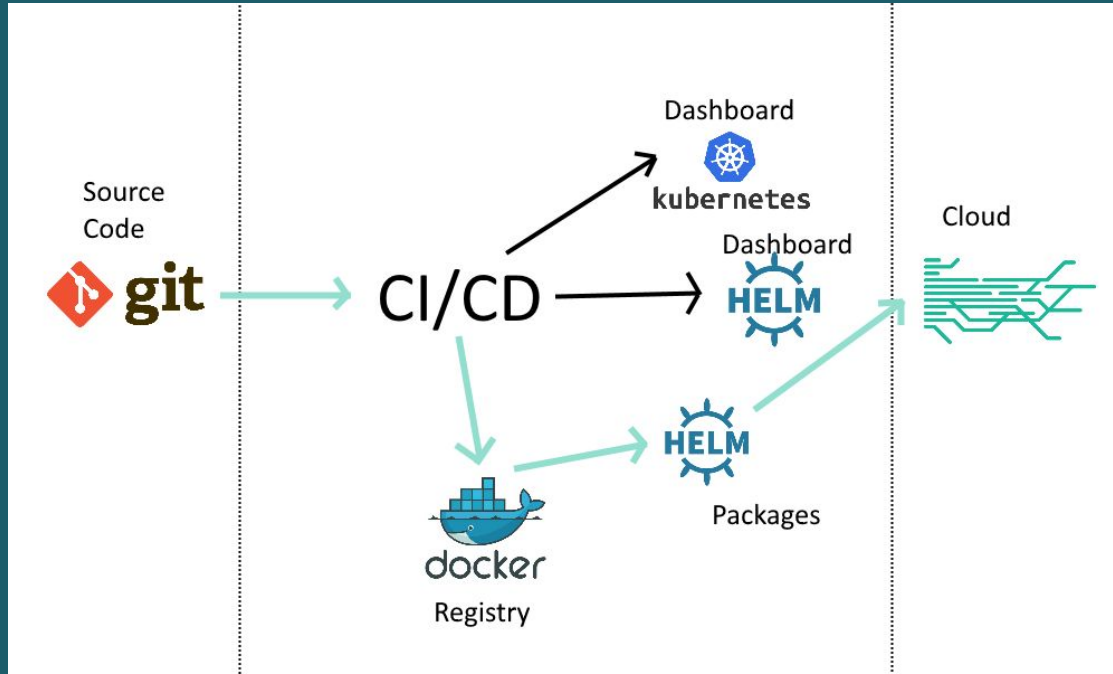


# Helm 2/3 + Codefresh

- Codefresh offers native support for Helm 2 and 3 packages, deployments, repositories, and environments.
  - Fully managed/hosted Helm repository for Codefresh users
  - Helm Release Dashboard
  - Helm/Kubernetes Environments Dashboard
  - Helm Promotion Dashboard
  - If you are already familiar with Helm 2 support in Codefresh, you still have the same capabilities for Helm 3



# Helm 2/3 + Codefresh



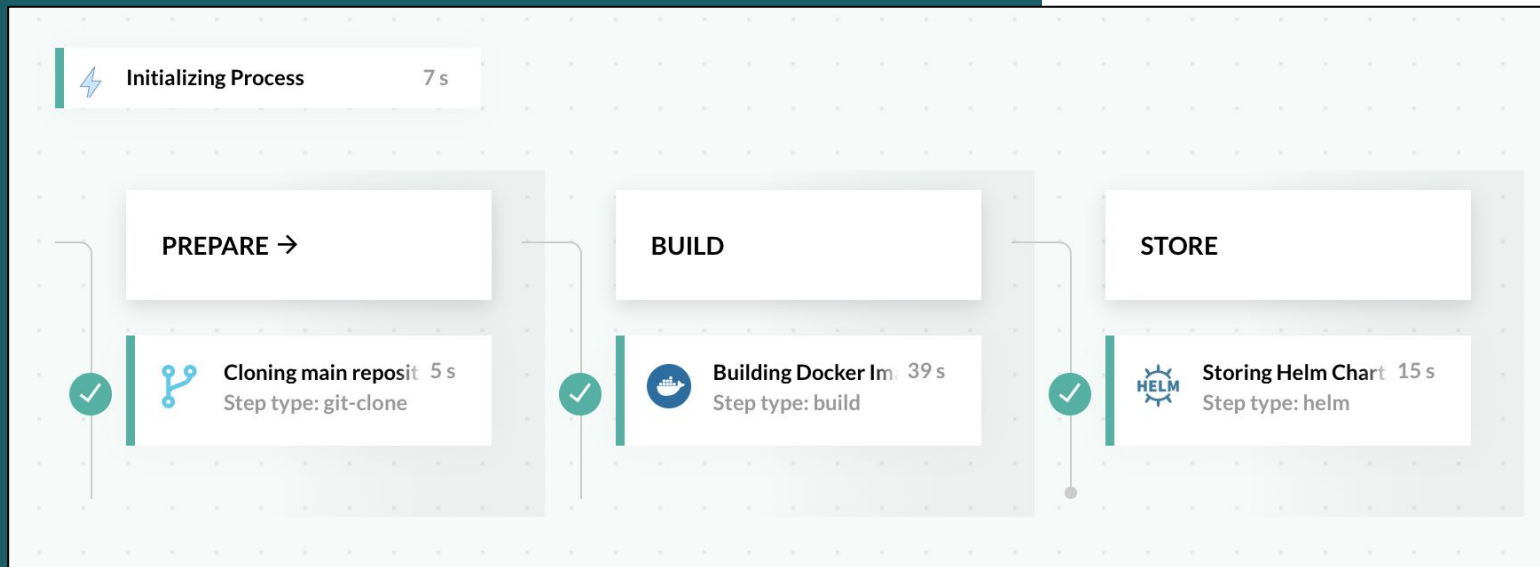
# Codefresh Helm Repository

- A default, managed Helm repository created for every user
- Can manually install Charts from the repository view with the click of a button
- Can also add and use external Helm repositories if you wish





# Demo: A pipeline that pushes a chart to the internal Codefresh Repository



# Helm Release Dashboard

Helm Releases

?

Help

kostis-codefresh

codefreshdemo

codefresh

example-voting-app

Rollback to 37

CLUSTER

sales-demo@FirstKubernetes

REVISION

38

MODIFIED

13 days ago

CHART

example-voting-app-1.7.1

DEPLOYED

Helm Chart for Docker example-voting-app

▶ RUN TEST

✕ DELETE

↔ BADGE

chartmuseum

Install complete

CLUSTER

sales-demo@FirstKubernetes

REVISION

1

MODIFIED

a year ago

CHART

chartmuseum-1.8.3

DEPLOYED

Host your own Helm Chart Repository

▶ RUN TEST

✕ DELETE

↔ BADGE

codefresh

cert-manager

Install complete

CLUSTER

sales-demo@FirstKubernetes

REVISION

1

MODIFIED

a year ago

CHART

cert-manager-v0.5.2

DEPLOYED

A Helm chart for cert-manager

<https://github.com/jetstack/cert-manager>

▶ RUN TEST

✕ DELETE

↔ BADGE

nginx

ingress-nginx

Install complete

CLUSTER

sales-demo@FirstKubernetes

REVISION

1

MODIFIED

a year ago

CHART

nginx-ingress-1.1.2

DEPLOYED

An nginx Ingress controller that uses ConfigMap to store the nginx configuration.

<https://github.com/kubernetes/ingress-nginx>

▶ RUN TEST

✕ DELETE

↔ BADGE

clair

clair-demo

Upgrade complete

CLUSTER

sales-demo@FirstKubernetes

REVISION

7

MODIFIED

9 months ago

CHART

clair-0.1.4

DEPLOYED

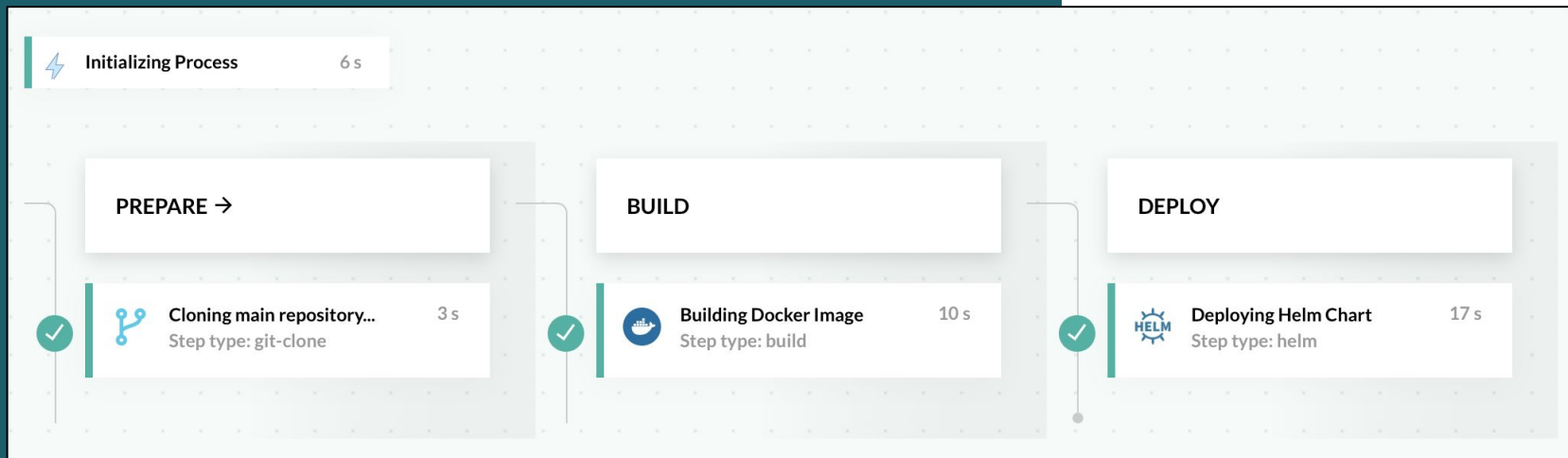
Clair is an open source project for the static analysis of vulnerabilities in application containers.

# Helm Release Dashboard

- Easily toggle releases between Helm 2 or Helm 3
- View release details and services for a particular release
- Rollback releases
- Define your own pipelines for test/rollback/delete operations

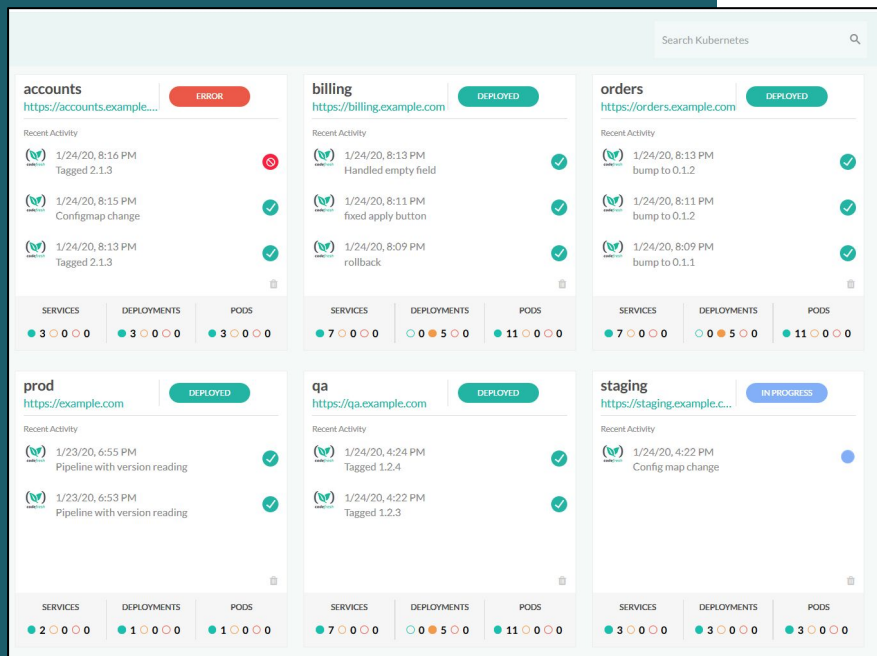


# Demo: A pipeline that installs a Helm Chart to a K8s cluster



# Helm Environment Board

- Track overview of cluster status and the builds that affect it (both Kubernetes and Helm)



# Helm Promotion Board

- Track applications as they move through your environment

The screenshot displays the Helm Release Promotion interface for a board named "MySampleBoard". The interface is organized into three columns representing different environments: Load-testing, Staging, and Production. Each environment column contains a list of applications with their respective chart versions and namespaces. The top navigation bar includes a "Help" link, an "UPGRADE" button, an "ADD REPOSITORY" button, a user profile for "kostis-codefresh", and a "Search Releases" input field. The "Load-testing" environment shows one application, "color-coded", with chart version 0.8.0 and namespace "canary". The "Staging" environment shows two applications: "python" (chart version v0.3.0, namespace bluegreen) and "dokuwiki" (chart version 4.0.0, namespace bluegreen). The "Production" environment shows three applications: "my-app" (chart version python-v0.2.0, namespace default), "prod-voting-app" (chart version example-voting-app-0.1.1, namespace voting-app), and "ghost" (chart version 6.1.8, namespace default). Each application card includes a "DELETE" button and a dropdown arrow.

Helm Release Promotion > MySampleBoard

Help \* UPGRADE \* ADD REPOSITORY

+ ADD FILTER EDIT PROPERTIES REMOVE BOARD Search Releases + ADD ENVIRONMENT

**Load-testing** gke-kostisdemo-codefresh-kostis

color-coded Colors-0.8.0 3 MONTHS AGO

NAMESPACE: canary CHART VERSION: 0.8.0 X DELETE

**Staging** gke-kostisdemo-codefresh-kostis

python python-v0.3.0 18 MINUTES AGO

NAMESPACE: bluegreen CHART VERSION: v0.3.0 X DELETE

dokuwiki dokuwiki-4.0.0 3 MINUTES AGO

NAMESPACE: bluegreen CHART VERSION: 4.0.0 X DELETE

**Production** gke-kostisdemo-codefresh-kostis

my-app python-v0.2.0 7 MINUTES AGO

NAMESPACE: default CHART VERSION: v0.2.0 X DELETE

prod-voting-app example-voting-app-0.1.1 2 MONTHS AGO

NAMESPACE: voting-app CHART VERSION: 0.1.1 X DELETE

ghost ghost-6.1.8 9 MINUTES AGO

NAMESPACE: default CHART VERSION: 6.1.8 X DELETE

# Related Resources

- [Helm Documentation](#)
- [Codefresh / Helm Documentation](#)
- [Helm Sample Application](#)



# Questions?

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