



# 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!](#)



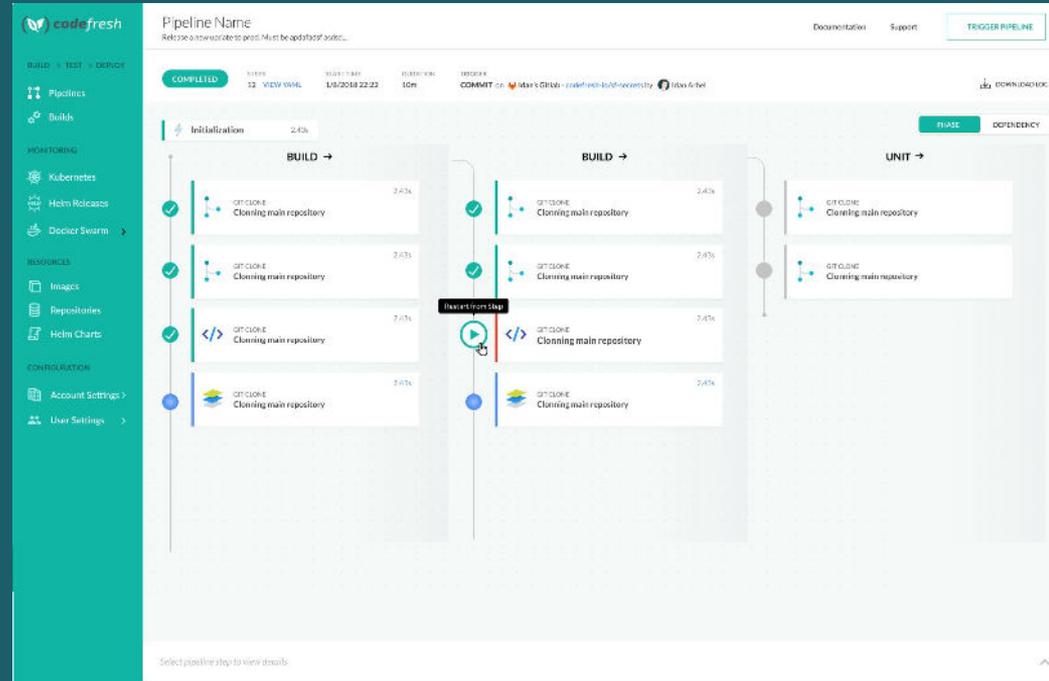
# Why use Helm?

- 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



The screenshot displays the Codefresh web interface for a pipeline. The pipeline is titled "Pipeline Name" and is in a "COMPLETED" state. The interface shows a sequence of steps across three stages: "Initialization", "BUILD", and "UNIT". Each stage contains three steps, all of which are "GIT CLONE" tasks for "Cloning main repository". The steps are marked with green checkmarks, indicating successful completion. The "BUILD" stage has a "Play from step" button over the second step. The interface also includes a sidebar with navigation options like "Pipelines", "Builds", "Monitoring", "Resources", and "Configuration".

# Helm 2/3 + Codefresh

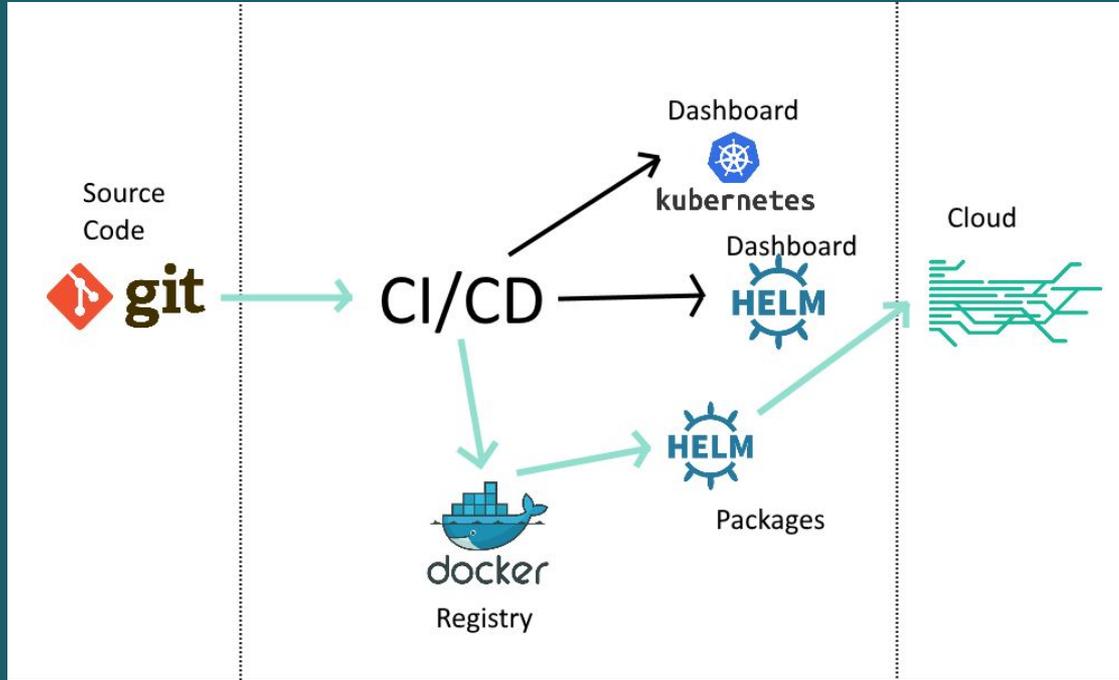
- Codefresh offers native support for Helm 2 and 3 packages, deployments, repositories, and environments.
  - Fully managed/hosted Helm repository for Codefresh users
  - Helm Release Dashboard
  - Helm/Kubernetes Environments Dashboard
  - Helm Promotion Dashboard
  - If you are already familiar with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



**codefresh**



# Helm 2/3 + Codefresh

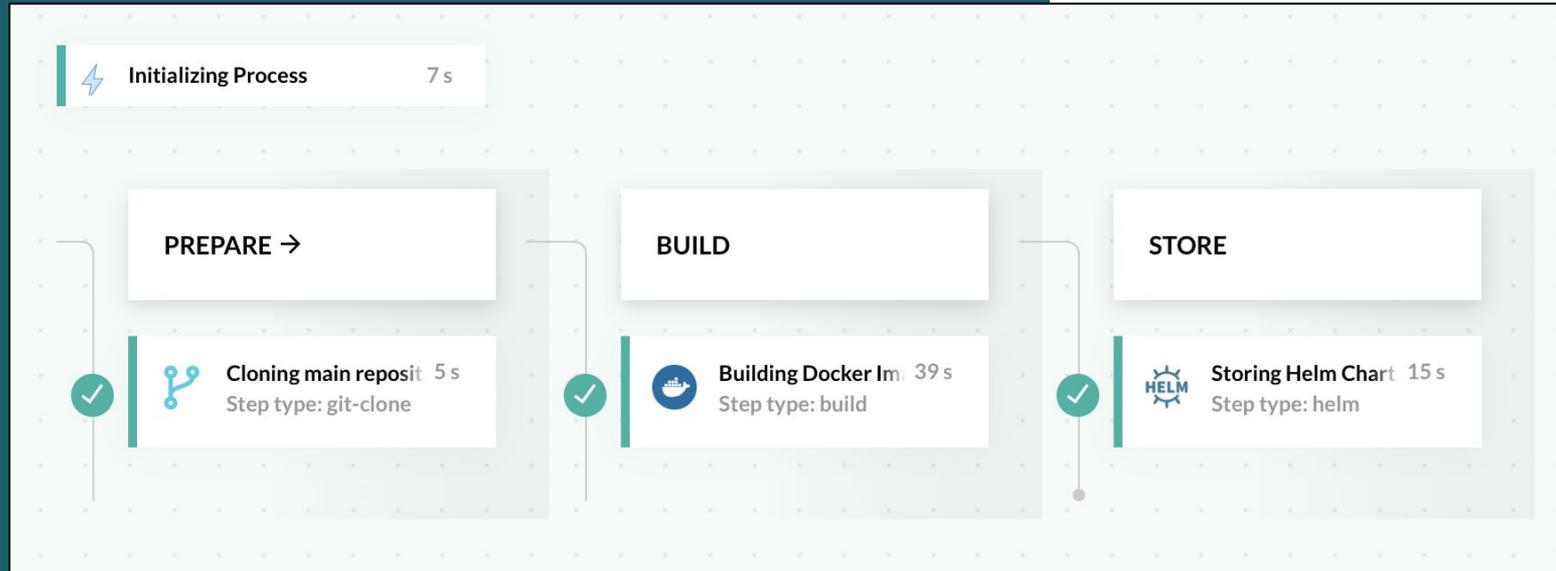


# Codefresh Helm Repository

- 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

The screenshot displays the Helm Releases dashboard for a user named 'kostis-codefresh'. The dashboard lists five installed Helm releases, each with a card containing its name, cluster, revision, modification time, chart name, and a 'DEPLOYED' status button. Each card also includes a description, a link to the chart's repository, and action buttons for 'RUN TEST', 'DELETE', and 'BADGE'.

Name	Cluster	Revision	Modified	Chart	Status
example-voting-app	sales-demo@FirstKubernetes	38	13 days ago	example-voting-app-1.7.1	DEPLOYED
chartmuseum	sales-demo@FirstKubernetes	1	a year ago	chartmuseum-1.8.3	DEPLOYED
cert-manager	sales-demo@FirstKubernetes	1	a year ago	cert-manager-v0.5.2	DEPLOYED
ingress-nginx	sales-demo@FirstKubernetes	1	a year ago	nginx-ingress-1.1.2	DEPLOYED
clair-demo	sales-demo@FirstKubernetes	7	9 months ago	clair-0.1.4	DEPLOYED

**example-voting-app**  
Rollback to 37  
codefresh  
Helm Chart for Docker example-voting-app  
▶ RUN TEST ✕ DELETE ↻ BADGE

**chartmuseum**  
Install complete  
"ARTHURIST"  
Host your own Helm Chart Repository  
▶ RUN TEST ✕ DELETE ↻ BADGE

**cert-manager**  
Install complete  
codefresh  
A Helm chart for cert-manager  
<https://github.com/jetstack/cert-manager>  
▶ RUN TEST ✕ DELETE ↻ BADGE

**ingress-nginx**  
Install complete  
NGINX  
An nginx Ingress controller that uses ConfigMap to store the nginx configuration.  
<https://github.com/kubernetes/ingress-nginx>  
▶ RUN TEST ✕ DELETE ↻ BADGE

**clair-demo**  
Upgrade complete  
clair  
Clair is an open source project for the static analysis of vulnerabilities in application containers.  
▶ RUN TEST ✕ DELETE ↻ BADGE

# Helm Release Dashboard

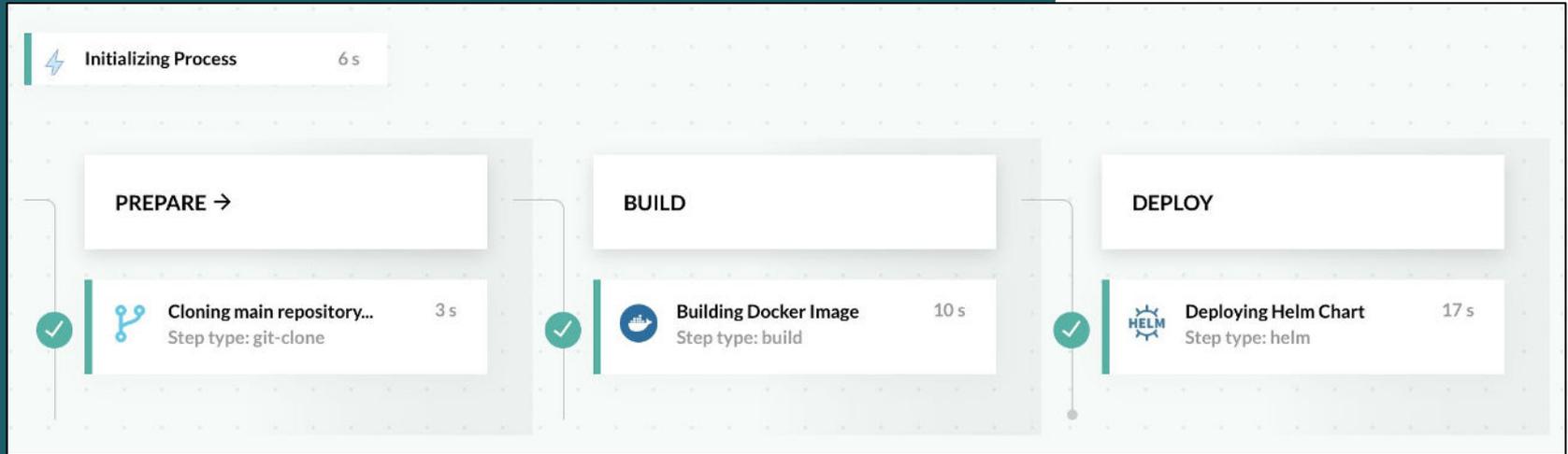
- Easily toggle releases between Helm 2 or Helm 3
- View release details and services for a particular release
- Rollback releases
- Define your own pipelines for test/rollback/delete operations



**code**fresh

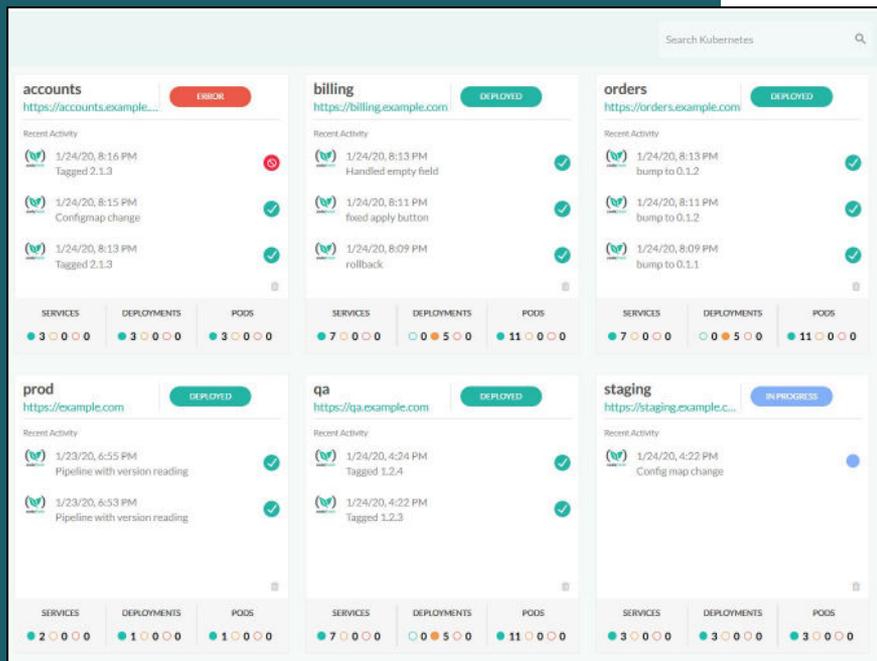


# Demo: A pipeline that installs a Helm Chart to a K8s cluster



# 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 Board interface. At the top, the title is "Helm Release Promotion > MySampleBoard". Navigation options include "Help", "UPGRADE", and "ADD REPOSITORY". A user profile for "kostis-codefresh" is visible in the top right. Below the navigation bar, there are buttons for "ADD FILTER", "EDIT PROPERTIES", "REMOVE BOARD", "Search Releases", and "ADD ENVIRONMENT".

The board is divided into three columns representing different environments:

- Load-testing** (gke-kostisdemo-codefresh-kostis): Contains one release, "color-coded" (Colors 0.8.0), installed in the "canary" namespace. It was installed 3 months ago.
- Staging** (gke-kostisdemo-codefresh-kostis): Contains two releases: "python" (python v0.3.0) in the "bluegreen" namespace, installed 18 minutes ago; and "dokuwiki" (dokuwiki-4.0.0) in the "bluegreen" namespace, installed 3 minutes ago.
- Production** (gke-kostisdemo-codefresh-kostis): Contains three releases: "my-app" (python v0.2.0) in the "default" namespace, installed 7 minutes ago; "prod-voting-app" (example-voting-app-0.1.1) in the "voting-app" namespace, installed 2 months ago; and "ghost" (ghost-6.1.8) in the "default" namespace, installed 9 minutes ago.

Each release card includes a "DELETE" button and a dropdown arrow for further actions.

# Related Resources

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



# Questions?

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Deploy Faster**



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our experts at

<https://codefresh.io>