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

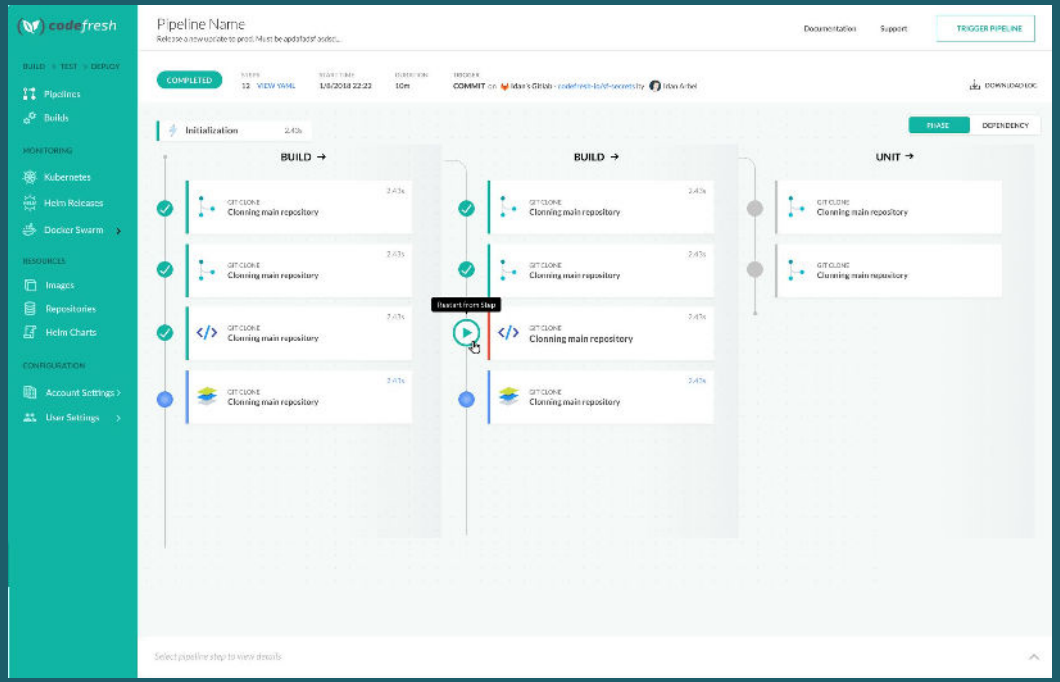
... and more!

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

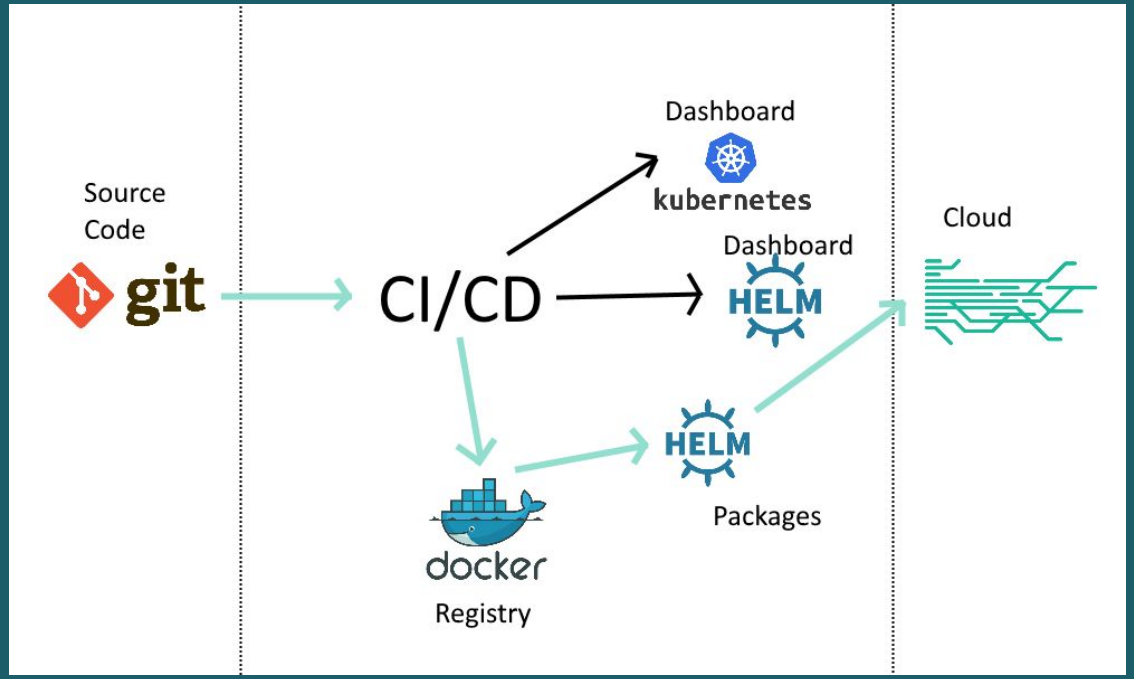
- Docker based CI/CD solution
- Each build step is a Docker image
- Native support for Docker, Helm, Kubernetes deployments
- Includes built-in Helm repository
- 20,000+ users



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



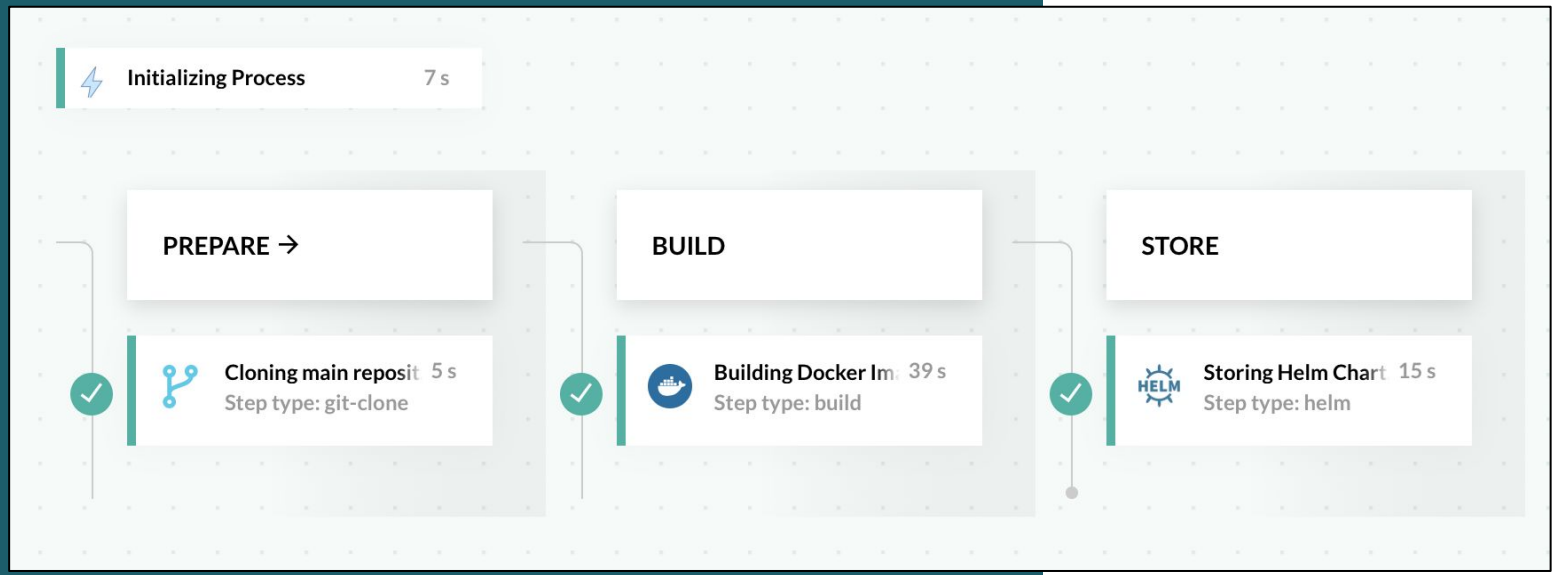
codefresh

3

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

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

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

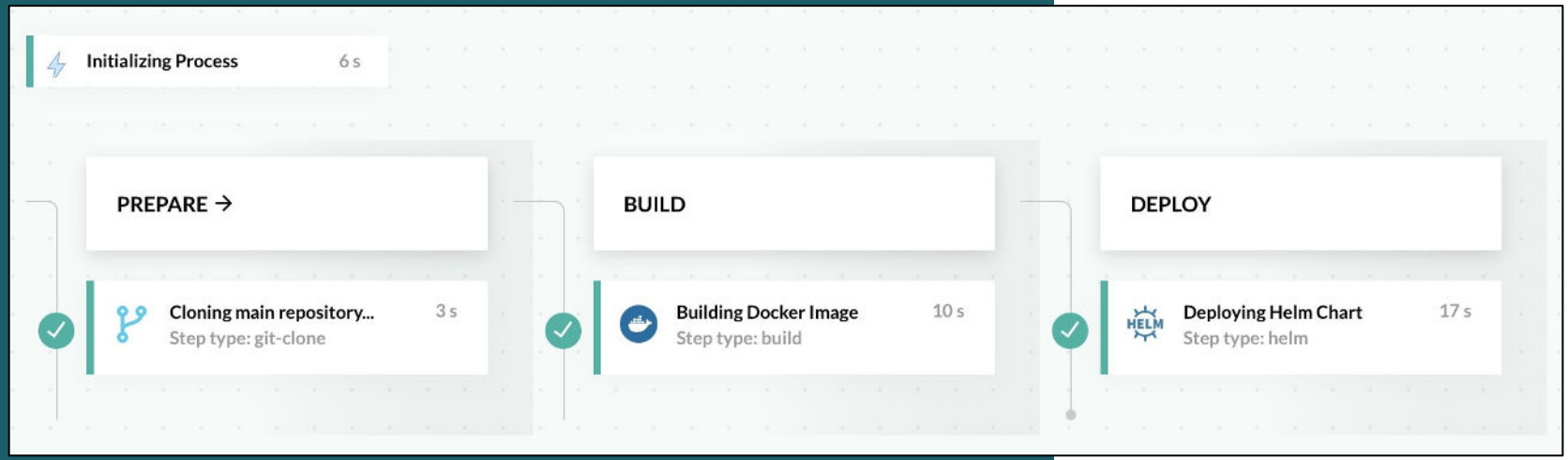
ingress-nginx
Install complete
CLUSTER: sales-demo@FirstKubernetes
REVISION: 1
MODIFIED: a year ago
CHART: nginx-ingress-1.1.2
DEPLOYED
An nginx Ingress controller that uses ConfigMap to store the nginx configuration.
https://github.com/kubernetes/ingress-nginx
RUN TEST · DELETE · BADGE

clair-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

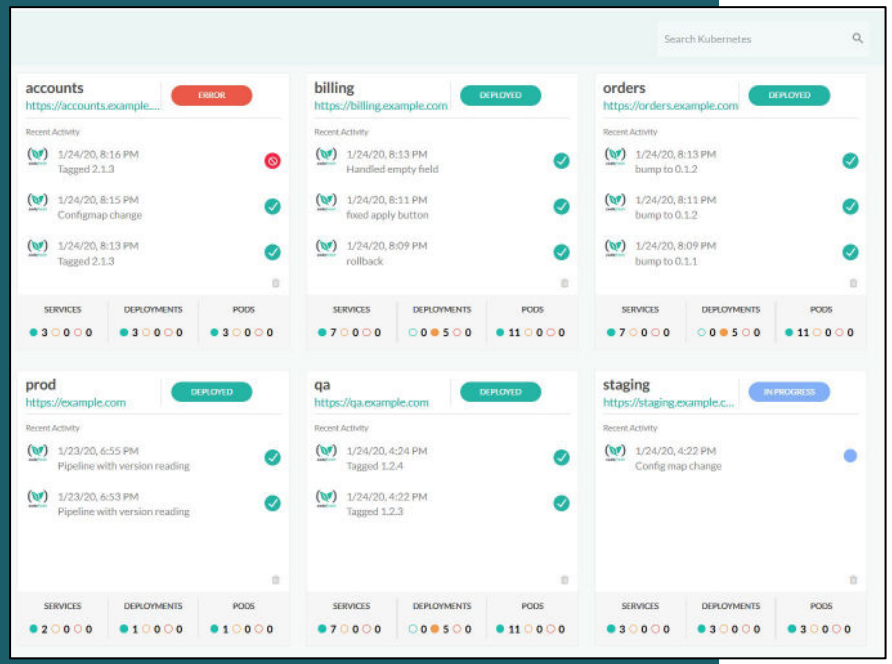
- Easily toggle releases between Helm 2 or Helm 3
- View release details and services for a particular release
- Rollback releases
- Define your own pipelines for test/rollback/delete operations

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



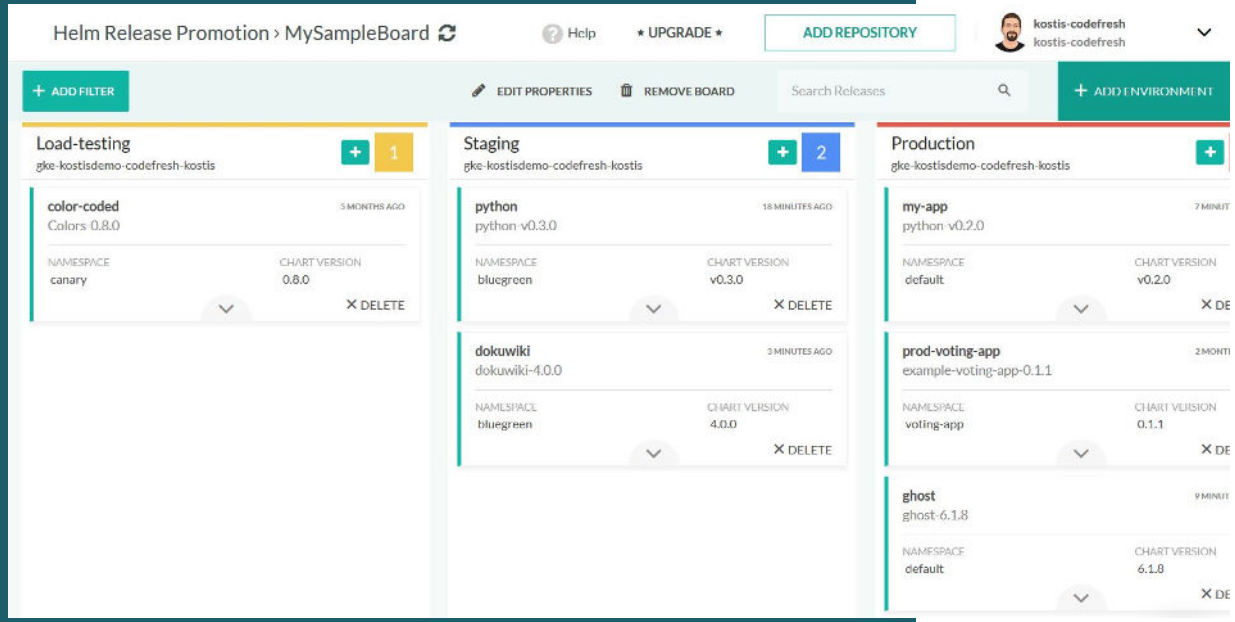
Helm Environment Board

- 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



Related Resources

- Helm Documentation
- Codefresh / Helm Documentation
- Helm Sample Application

Questions?

Build Fast, Deploy Faster

Signup for a FREE account with UNLIMITED builds

& schedule a 1:1 with our experts at https://codefresh.io