Making The Most of Helm 3

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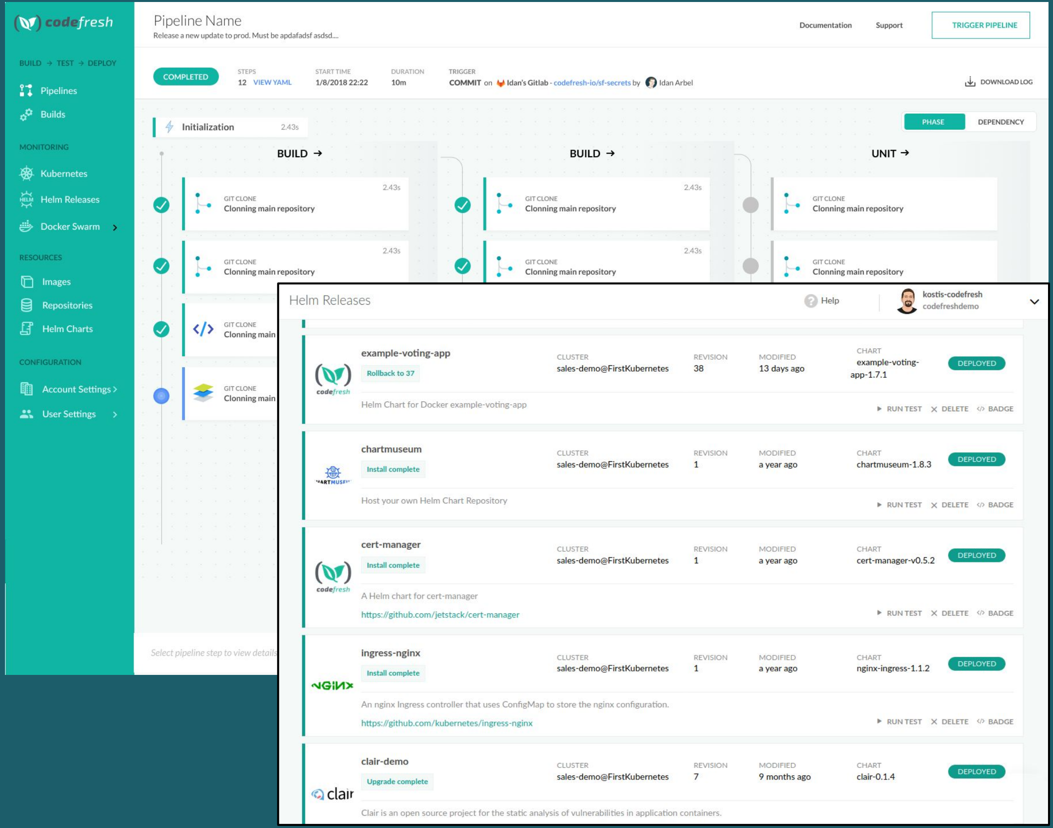
About Codefresh

- Docker based CI/CD solution
- Native support for Docker, Helm, Kubernetes deployments
- UI and tooling for Helm
- Helm Contributors
- Includes built-in Helm repository
- 50,000+ users



Pipeline Name

Release a new update to prod. Must be apdafadsf asdsd....

COMPLETED

STEPS 12 VIEW YAML

START TIME 1/8/2018 22:22

DURATION 10m

TRIGGER COMMIT on Idan's Gitlab - codefresh-io/sf-secrets by Idan Arbel

Initialization 2.43s

BUILD →

GIT CLONE Cloning main repository 2.43s

GIT CLONE Cloning main repository 2.43s

GIT CLONE Cloning main

GIT CLONE Cloning main

BUILD →

GIT CLONE Cloning main repository 2.43s

GIT CLONE Cloning main repository 2.43s

UNIT →

GIT CLONE Cloning main repository

GIT CLONE Cloning main repository

Select pipeline step to view details

Helm Releases

kostis-codefresh
codefreshdemo

Release	Status	CLUSTER	REVISION	MODIFIED	CHART	
example-voting-app	Rollback to 37	sales-demo@FirstKubernetes	38	13 days ago	example-voting-app-1.7.1	DEPLOYED
chartmuseum	Install complete	sales-demo@FirstKubernetes	1	a year ago	chartmuseum-1.8.3	DEPLOYED
cert-manager	Install complete	sales-demo@FirstKubernetes	1	a year ago	cert-manager-v0.5.2	DEPLOYED
ingress-nginx	Install complete	sales-demo@FirstKubernetes	1	a year ago	nginx-ingress-1.1.2	DEPLOYED
clair-demo	Upgrade complete	sales-demo@FirstKubernetes	7	9 months ago	clair-0.1.4	DEPLOYED

example-voting-app: Helm Chart for Docker example-voting-app

chartmuseum: Host your own Helm Chart Repository

cert-manager: A Helm chart for cert-manager
https://github.com/jetstack/cert-manager

ingress-nginx: An nginx Ingress controller that uses ConfigMap to store the nginx configuration.
https://github.com/kubernetes/ingress-nginx

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

Agenda

- Helm Overview
- What’s New in Helm 3
- Migrating
- Demos

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

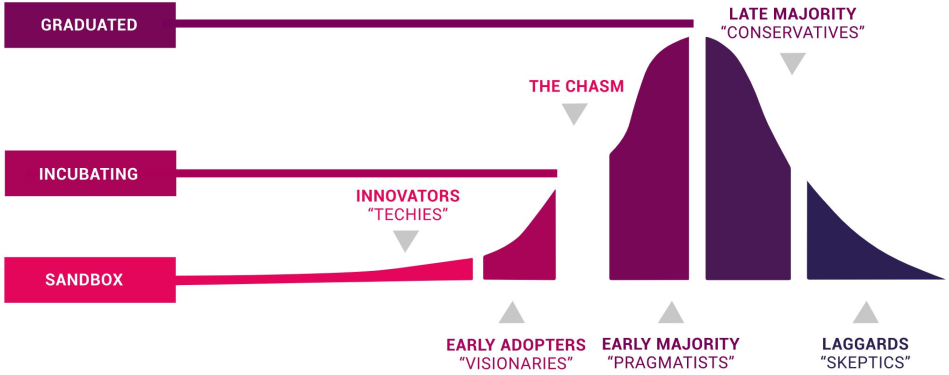
CONGRATS

CLASS OF 2020

Love, CNCF

Graduated Projects

- Passed independent, 3rd party security audit.
- Supermajority vote from TOC
- Committers from 2 orgs
- “Crossed the chasm”



CORE INFRASTRUCTURE INITIATIVE BEST PRACTICES

https://github.com/cncf/toc/blob/master/process/graduation_criteria.adoc

If Kubernetes is the operating system of the internet,

then Helm is a package manager for that OS.

bitnami/drupal
stable/datadog
billimek/cloudflare-dyndns
banzaicloud-stable/clair
stable/chartmuseum
nginx-stable/nginx-ingress

```
helm install        stable/wordpress
```

bitnami/grafana
stable/prometheus
stable/fluentd
stable/kong
stable/logstash
stable/mysql

https://hub.helm.sh

Why use Helm?

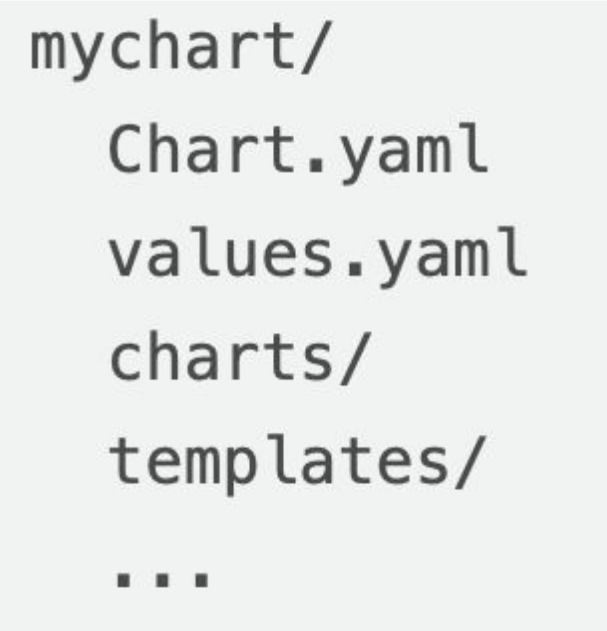
- Helm automatically maintains a versioned history of your releases
    - If something goes wrong, it’s as simple as running `helm rollback`
- Combined with CI/CD, you can easily integrate actions into your pipelines, i.e.
    - Before installation begins
    - After an upgrade has finished

Benefits of using Helm

- Simple install and upgrade
- Tracks versions and changes
- Easy rollbacks
- Distribute dependencies
- Templating with dynamic values

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

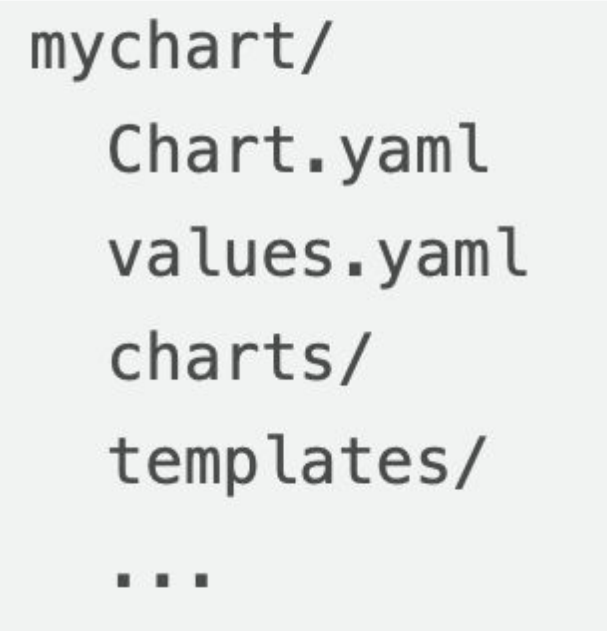


```
mychart/
   Chart.yaml
   values.yaml
   charts/
   templates/
   ...
```

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!

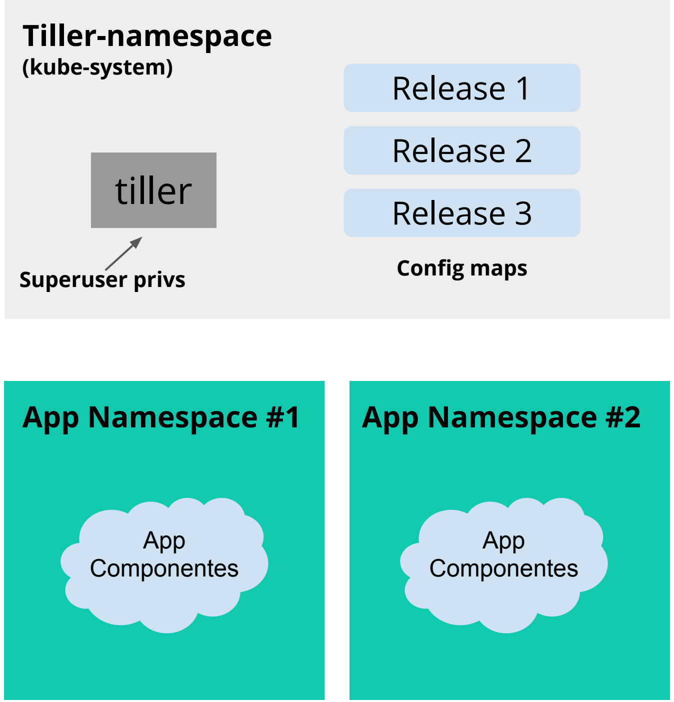
- 3-way Strategic Merge Patches
    - On rollbacks/upgrades, only 2-way merge patch (old chart → new chart)
    - Helm 3 considers the old chart → live state → new chart

New in Helm 3!

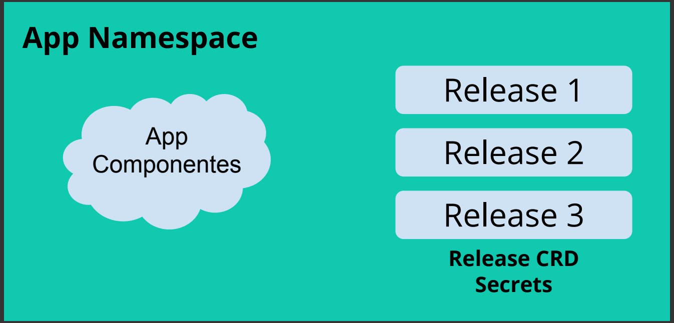
- Templates do not use Lua
- Secrets as the default storage driver for release information
- JSONSchema Chart Validation
- Namespaces not automatically created for releases

… and more!

Helm 2



Helm 3



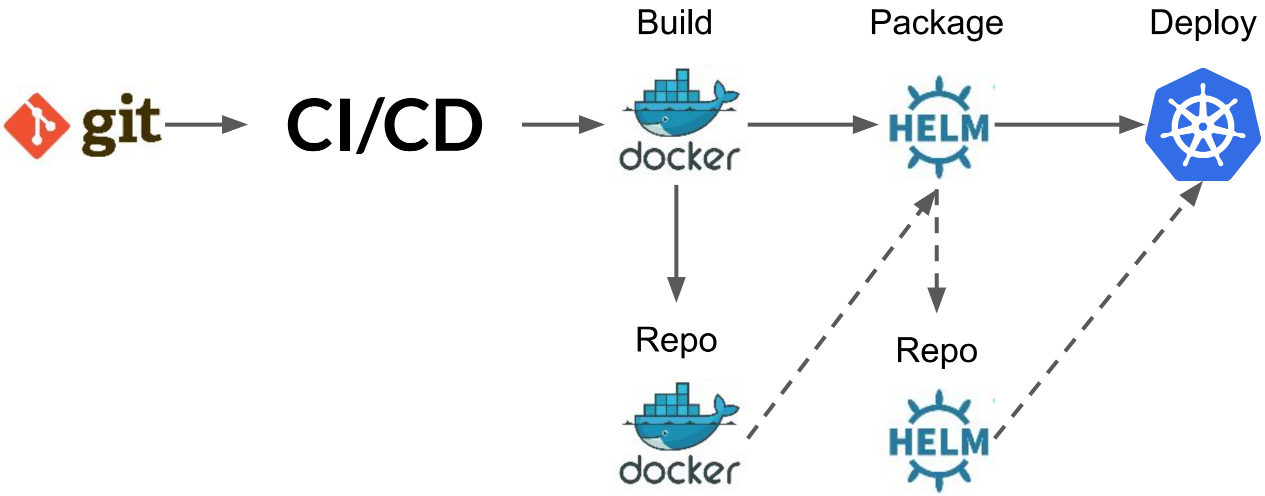
```
kubectl get secrets --field-selector type=helm.sh/release.v1

NAME                              TYPE                 DATA   AGE
sh.helm.release.v1.plex.v1        helm.sh/release.v1   1      6d19h
sh.helm.release.v1.plex.v3        helm.sh/release.v1   1      6d1h
sh.helm.release.v1.plex.v2        helm.sh/release.v1   1      6d6h
sh.helm.release.v1.plex.v4        helm.sh/release.v1   1      6d1h
sh.helm.release.v1.minecraft.v1   helm.sh/release.v1   1      29h
```

github.com/helm/community/blob/master/helm-v3/003-state.md

Demo: Migrating from Helm 2 to Helm 3

https://github.com/helm/helm-2to3

Helm CI/CD Workflows



Demo: Using Codefresh Helm deployment step

Related Resources

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

Questions?

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@anna_codefresh

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