Helm 3 Sneak Preview

What you can expect to see in Helm version 3

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BRIEF HISTORY OF HELM

OCT 2015 — "k8splace" is developed at a Deis hackathon

NOV 2015 — Helm v1 is announced at the first KubeCon

JAN 2016 — Helm merges with Google Deployment Manager

NOV 2016 — Helm 2.0.0 is released

FEB 2018 — Helm Summit takes place to kick off discussion on Helm 3

JUN 2018 — Helm project joins the CNCF

Major changes to expect in Helm 3

- **Embedded Lua engine**

  Removal of Tiller

  Chart repo auth & upload

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Embedded Lua engine

Making Helm charts more robust and programmable

Embedded Lua engine

- Lua can be used with, or in place of, YAML templates
- Treat Kubernetes resources as objects, not strings
- Intercept lifecycle events, modify chart on-the-fly
- Sandboxed - optionally limit access to network/io
- Develop and import reusable “library charts”
- Helm plugins will have access to the Lua runtime

Helm 2

```
apiVersion: v1
kind: Pod
metadata:
  name: {{ template "alpine.fullname" . }}
  labels:
    heritage: {{ .Release.Service }}
    release: {{ .Release.Name }}
    chart: {{ .Chart.Name }}-{{ .Chart.Version }}
    app: {{ template "alpine.name" . }}
spec:
  restartPolicy: {{ .Values.restartPolicy }}
  containers:
  - name: waiter
    image: "{{.Values.img}}:{{.Values.img.tag}}"
    imagePullPolicy: {{ .Values.img.pullPolicy }}
    command: ["/bin/sleep", "9000"]
```

Helm 3

Helm 2

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apiVersion: v1
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metadata:
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  restartPolicy: {{ .Values.restartPolicy }}
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  - name: waiter
    image: "{{.Values.img}}:{{.Values.img.tag}}"
    imagePullPolicy: {{ .Values.img.pullPolicy }}
    command: ["/bin/sleep", "9000"]
```

Helm 3

```
function create_alpine_pod(_)
  local pod = {
    apiVersion = "v1",
    kind = "Pod",
    metadata = {
      name = alpine_fullname(_),
      labels = {
        heritage = _.Release.Service or "helm",
        release = _.Release.Name,
        chart = _.Chart.Name .. "-" .. _.Chart.Vers
        app = alpine_name(_)
      }
    },
    spec = {
      restartPolicy = _.Values.restartPolicy,
      containers = {
        {
          name = waiter,
          image = _.Values.image.repository .. ":"
          imagePullPolicy = _.Values.image.pullPoli
          command = {
            "/bin/sleep",
```

Helm 2

```
apiVersion: v1
kind: Pod
metadata:
  name: {{ template "alpine.fullname" . }}
  labels:
    heritage: {{ .Release.Service }}
    release: {{ .Release.Name }}
    chart: {{ .Chart.Name }}-{{ .Chart.Version }}
    app: {{ template "alpine.name" . }}
spec:
  restartPolicy: {{ .Values.restartPolicy }}
  containers:
  - name: waiter
    image: "{{.Values.img}}:{{.Values.img.tag}}"
    imagePullPolicy: {{ .Values.img.pullPolicy }}
    command: ["/bin/sleep", "9000"]
```

Helm 3

```
-- Example of using a "library chart"
local pods = require("mylib.pods");

function create_alpine_pod(_)
  myPod = pods.new("alpine:3.7", _)
  myPod.spec.restartPolicy = "Always"
  -- set any other properties
  _.Manifests.add(myPod)
end
```

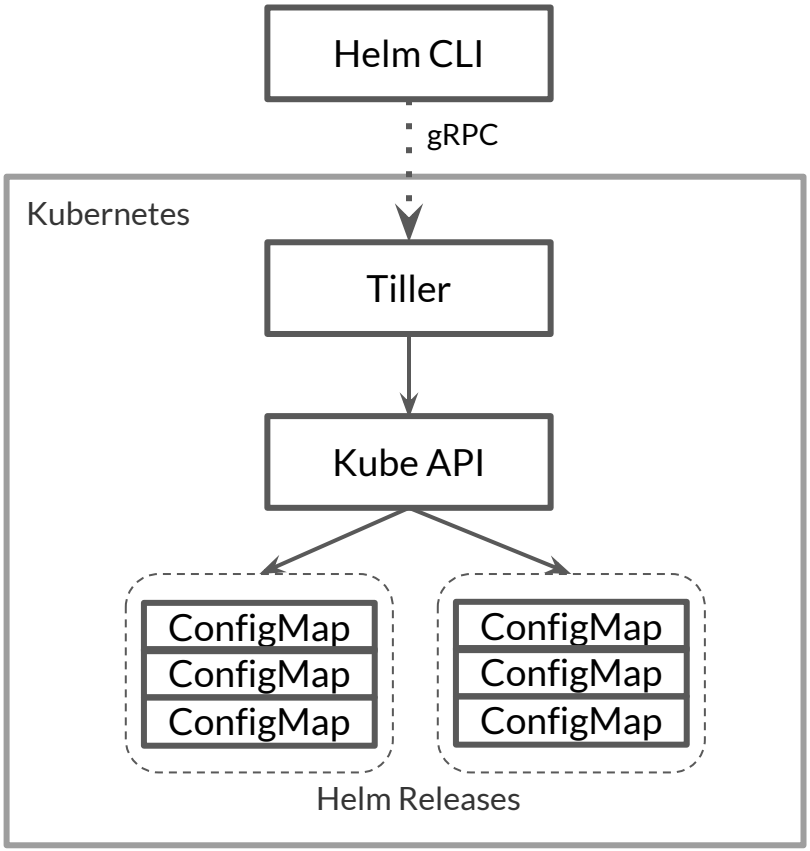
Removal of Tiller

Improving security by delegating auth to Kubernetes RBAC

Removal of Tiller

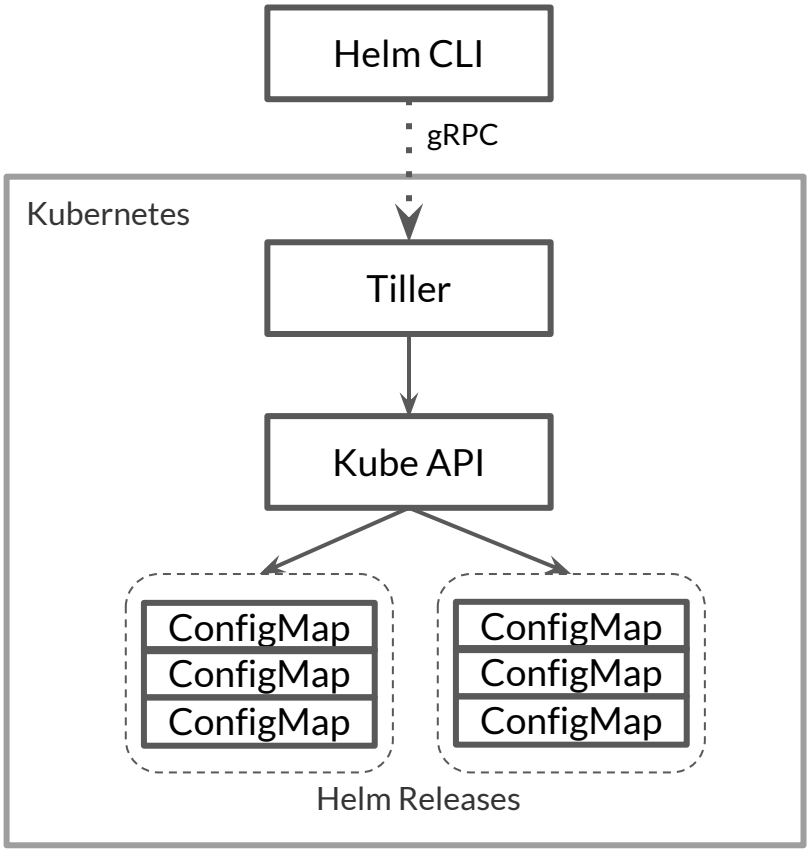
- Shrinks the security model for Helm, now client-only
- Auth is delegated to Kubernetes RBAC
- Release history maintained using ULIDs vs. integers
- “Release” CRD will store instance of an application
- “ReleaseVersion” CRD will store version of release

Helm 2


Helm CLI
gRPC
Kubernetes
Tiller
Kube API
ConfigMap
ConfigMap
ConfigMap
ConfigMap
ConfigMap
ConfigMap
Helm Releases

Helm 3

Helm 2


Helm CLI
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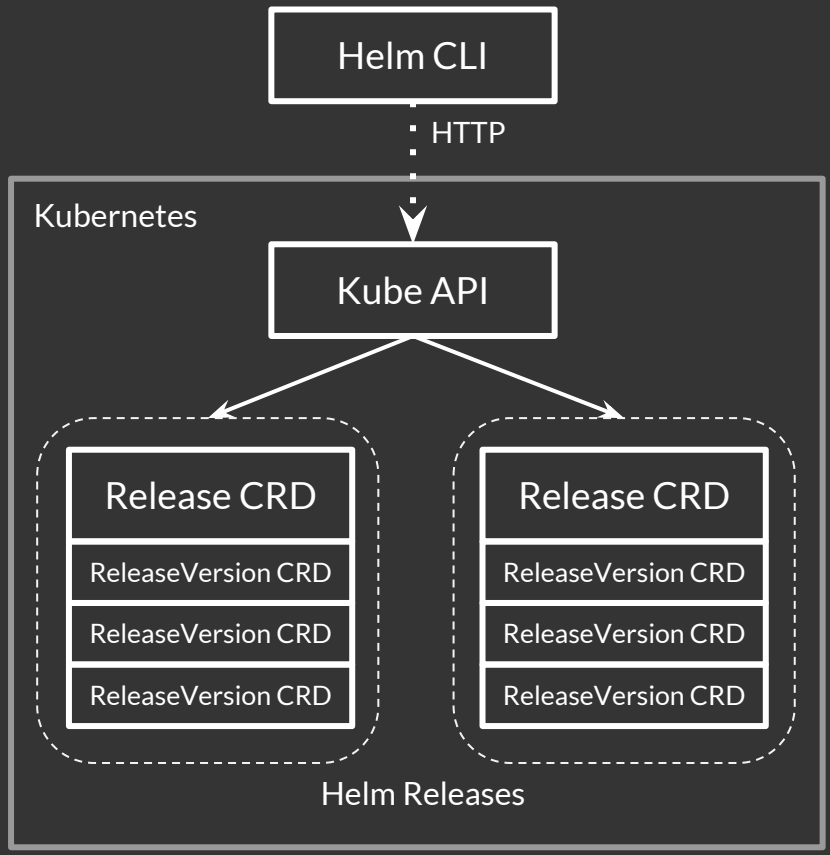
Helm 3


Helm CLI
HTTP
Kubernetes
Kube API
Release CRD
ReleaseVersion CRD
ReleaseVersion CRD
ReleaseVersion CRD
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Helm Releases

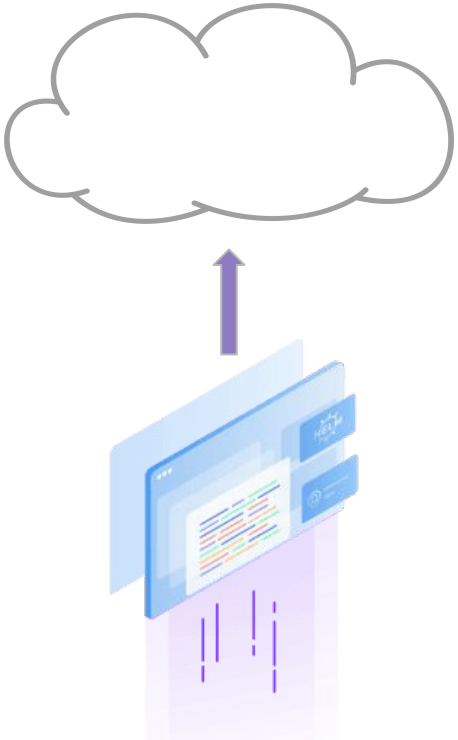

Chart repo auth & upload

New commands and API spec for working with chart repositories

Chart repo auth & upload

- “helm push” command to upload chart to a repo
- API spec for HTTP uploads, based on ChartMuseum
- Plugins can supply custom protocols (e.g. `s3://`)
- “helm login” command to authenticate against a repo
- OAuth2 authorization flow, bearer/token auth
- Limit which users can upload/install which charts

Helm 2

```
$ helm repo add myrepo       \
    https://site.com/myrepo  \
    --username=josh          \
    --password=*****
```

```
$ helm package mychart/
```

```
$ ./my-custom-uploader.sh \
     mychart-0.1.0.tgz
```

```
$ helm repo update
```

```
$ helm install myrepo/mychart
```

Helm 3

Helm 2

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```
$ helm repo update
```

```
$ helm install myrepo/mychart
```

Helm 3

```
$ helm login https://site.com
```

```
$ helm repo add myrepo \
    https://site.com/myrepo
```

```
$ helm push mychart/ myrepo
```

```
$ helm repo update
```

```
$ helm install myrepo/mychart
```

Other Helm 3 changes

- “Managed” hooks - if Helm creates something, it will delete it
- index.yaml will move to index.json, and be partitioned for performance
- Schematize your values by including a values.schema.yaml file
- “helm serve” and “helm reset” commands will be removed
- ???

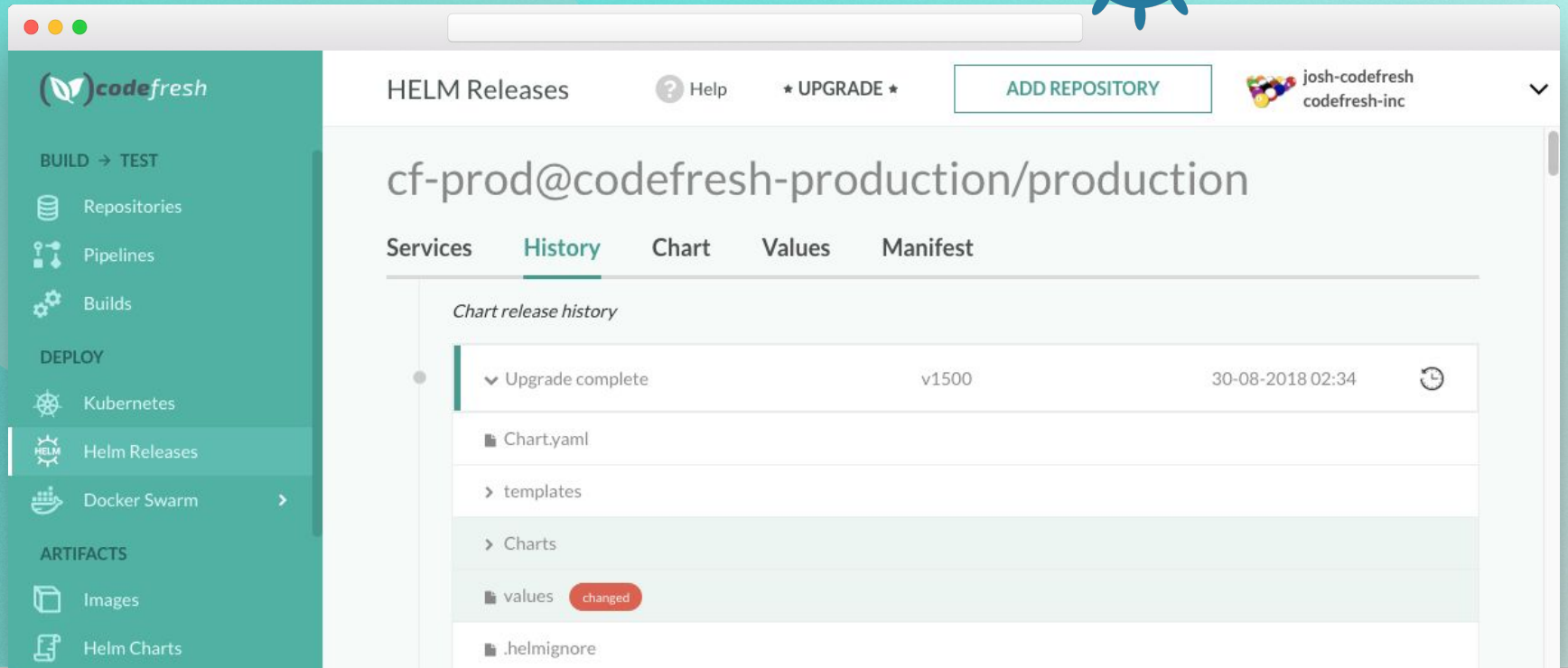
Want to know more about Helm 3?

Helm 3 Design Proposal
https://github.com/helm/community/tree/master/helm-v3

“A First Look at the Helm 3 Plan” by Matt Butcher
https://sweetcode.io/a-first-look-at-the-helm-3-plan/

codefresh

The platform committed to supporting HELM 3 on day 1!



Thank you!

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