Authoring Helm Charts for DayTrader

Lessons Learned Writing the Helm Charts for DayTrader

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Outline

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TL;DR: Show me the Code!

- https://github.com/jpmorganchase/daytrader-helm-charts
- https://github.com/jpmorganchase/daytrader-helm-charts-repo

About the Speaker

Dominic is a Public Cloud Architect with a hands-on background in AWS, Azure, and K8s. He also has an application developer background in Python and likes to recite PEP 20.

K8s is Great!

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- For a bit of Cargo Cult: Google is actively developing/using it...

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- In short: K8s can have a mind of its own when not used carefully

Working with K8s

This sounds great!

Let's release a containerised app on a K8s cluster!

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8. Enjoy feeling of accomplishment
9. Repeat for all other environments

So, Where's the Problem?!

YAML

- Whitespace really(!) matters in YAML
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The Manual Maintenance Problem

- YAML files are most likely environment specific
- YAML files for different environments are very similar
- Separating config from YAML file needed

Enter Helm

What's Helm?

"The package manager for Kubernetes" (quote from https://helm.sh/)

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- Providing a standard way of adding and searching *Helm chart repositories*

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- Being backed by some of the biggest names in the industry (people and code)

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- Debugging K8s templates
- Debugging YAML templates
- Solving YAML brittleness
- Out-of-the-box security

Helm and Security

Wait a minute...

The internet if full of articles telling me how insecure Helm is?!

Helm and Security - It Starts With You

Yes, but...

We also don't remove `sudo` from all Linux boxes as it allows escalation to *root*. Rather, we *manage who has access to what when and how*.

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So,...

Securing Helm is Your Responsibility!

Helm and Security - It Takes Effort!

Options for Securing Helm

- It depends on the use case!
- Helm can be installed with different privileges (RBAC role/binding)
- There's a tiller-less install
- More to come in Helm 3...

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- It depends on the use case!
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In any case...

- Don't leave it at the default settings unless *you know what you are doing and are comfortable with it*!
- Read the Helm documentation on how to secure your Helm/tiller installation

Installing Helm

macOS

```
$ brew install helm
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Other OS

See OS package manager or download from https://github.com/helm/helm/releases

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What's in the Box?!

- `helm` CLI
- Built-in access to `stable` Helm Chart repository
- Access to hundreds of curated Helm charts

Install a Helm Chart

Installing a Local Helm Chart

```
$ helm install /path/to/local/dir --name my-app
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$ helm install stable/nginx-ingress --name nginx-ingress
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Installing a Helm Chart Using Custom Values

```
$ helm install stable/nginx-ingress --name nginx-ingress -f
my-values.yaml
```

Upgrading and Deleting a Helm Chart

Uprading a Helm Chart Using Custom Values

```
$ helm upgrade nginx-ingress -f my-values.yaml
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Deleting a Release

```
$ helm delete nginx-ingress
```

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$ helm upgrade nginx-ingress -f my-values.yaml
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Deleting a Release

```
$ helm delete nginx-ingress
```

Deleting a Release and Purging Release History

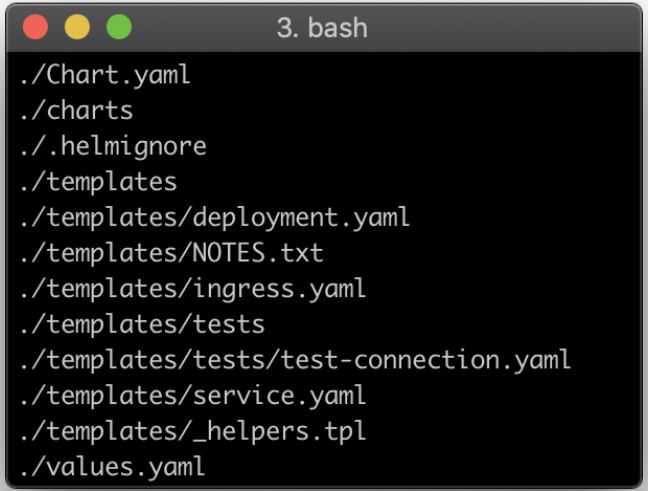
```
$ helm delete nginx-ingress --purge
```

Authoring Helm Charts for DayTrader

Starting a Helm Chart

```
$ helm create daytrader-web
```

What's in the Box?!



Authoring a Helm Chart for DayTrader

Steps

1. Create new Helm Chart using `helm create daytrader`
2. Add Helm charts for individual micro services to `requirements.yaml`

Updating Dependencies and Packaging Charts

Updating Dependencies for a Helm Chart

```
$ helm dependencies update
```

Updating Dependencies and Packaging Charts

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Packaging a Helm Chart

```
$ helm package <directory>
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A Bash Script

The Bash script package-charts.sh updates the dependencies and packages all Helm charts in a given directory.

Creating a Helm Chart Repository

A Home for Helm Charts

Numerous options:

- AWS S3 bucket
- Google Cloud Storage bucket
- GitHub repository

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A Home on GitHub

Package charts and then execute the following commands:

```
$ git add .
$ git commit -m "Adding packaged Helm charts for daytrader v1.0.17"
$ git push
```

Using the Custom Repository via `helm` CLI

Adding the Repository to `helm`

```
$ helm repo add jpmc 'https://raw.githubusercontent.com/
jpmorganchase/daytrader-helm-charts-repo/master/'
$ helm repo update
```

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$ helm repo update
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Searching the Repository via `helm`

```
$ helm search jpmc
```

Installing DayTrader via `helm`

```
$ helm install jpmc/daytrader -f my-values.yaml --name daytrader
```

That's It!

Happy Helming!