

Configuring Helm Repositories



Andrew Pruski

SQL SERVER DBA, MICROSOFT DATA PLATFORM MVP, AND CERTIFIED
KUBERNETES ADMINISTRATOR

@dbafromthecold www.dbafromthecold.com



Overview



Repository overview

Packaging a Helm Chart

Creating a local Helm repository

Creating a remote Helm repository



Repository Overview



Helm Hub



Repository is any HTTP server

<https://hub.helm.sh>

Multiple repositories available

Repositories can be added

Packaging a Helm Chart



Creating a Helm Chart

helm create ourchart

```
PS C:\> helm create ourchart
Creating ourchart
PS C:\> ls ./ourchart

Directory: C:\ourchart

Mode                LastWriteTime         Length Name
----                -
d-----          25/06/2020    17:13             charts
d-----          25/06/2020    17:13             templates
-a----          25/06/2020    17:13           342 .helmignore
-a----          25/06/2020    17:13           906 Chart.yaml
-a----          25/06/2020    17:13          1491 values.yaml

PS C:\>
```



Within the Templates Directory

```
PS C:\ourchart\templates> ls
```

Directory: C:\ourchart\templates

Mode	LastWriteTime		Length	Name
----	-----		-----	----
d----	25/07/2020	12:45		tests
-a---	25/07/2020	12:45	1830	_helpers.tpl
-a---	25/07/2020	12:45	1833	deployment.yaml
-a---	25/07/2020	12:45	911	hpa.yaml
-a---	25/07/2020	12:45	1054	ingress.yaml
-a---	25/07/2020	12:45	1585	NOTES.txt
-a---	25/07/2020	12:45	364	service.yaml
-a---	25/07/2020	12:45	322	serviceaccount.yaml

```
PS C:\ourchart\templates> |
```



Yaml Files

```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    run: nginx
  name: nginx
spec:
  replicas: 1
  selector:
    matchLabels:
      run: nginx
  template:
    metadata:
      labels:
        run: nginx
    spec:
      containers:
      - image: nginx
        name: nginx
```

```
kubectl create deployment nginx
--image=nginx
--dry-run=client
--output=yaml
```



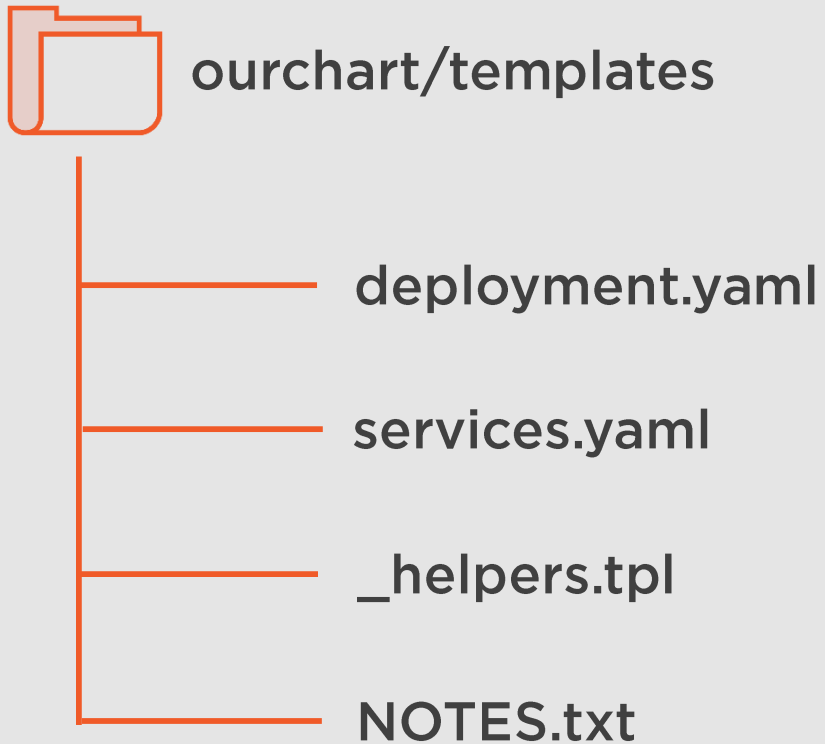
Yaml Files

```
apiVersion: v1
kind: Service
metadata:
  labels:
    run: nginx
  name: nginx
spec:
  ports:
  - port: 80
    protocol: TCP
    targetPort: 80
  selector:
    run: nginx
  type: LoadBalancer
```

```
kubectl expose deployment nginx
--type=LoadBalancer
--port=80
--dry-run=client
--output=yaml
```



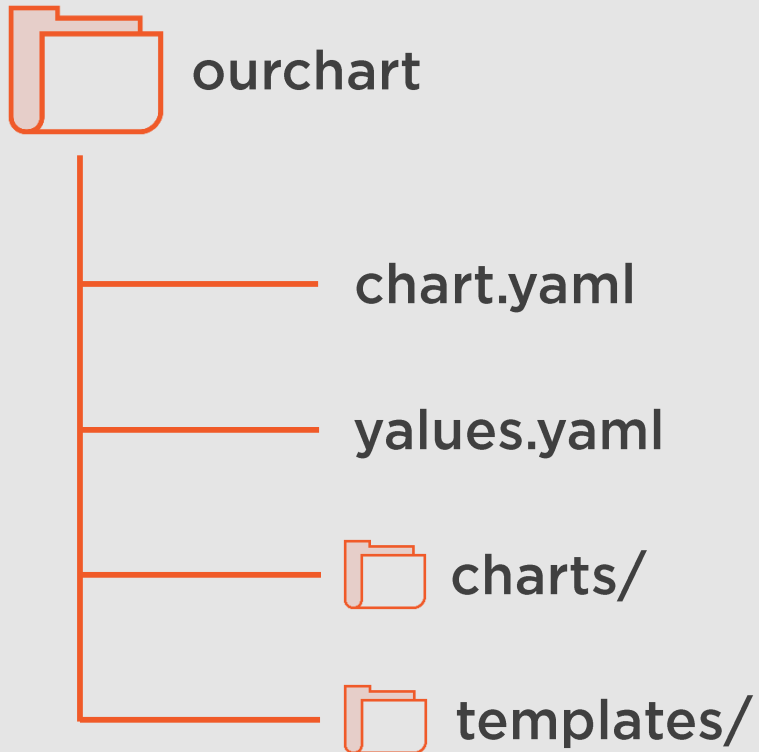
Updating Templates



- ◀ Templates directory
- ◀ Add in custom deployment yaml
- ◀ Add in custom services yaml
- ◀ Template helpers (not used in this chart)
- ◀ Add in some notes on chart usage



Updating Chart Directory



- ◀ Chart Name
- ◀ Add in description of the chart
- ◀ Add in default values (not used)
- ◀ No other charts required
- ◀ Templates already updated



Deploy Chart

```
helm install ourchart .\ourchart\
```

```
PS C:\> helm install ourchart .\ourchart\  
NAME: ourchart  
LAST DEPLOYED: Sat Aug  1 14:10:39 2020  
NAMESPACE: default  
STATUS: deployed  
REVISION: 1  
TEST SUITE: None  
NOTES:  
A test Helm Chart  
PS C:\>
```



View Deployment

```
helm list
```

```
PS C:\> helm list
```

NAME	NAMESPACE	REVISION	UPDATED	STATUS	CHART	APP VERSION
ourchart	default	1	2020-07-01 15:47:50.516902 +0100 BST	deployed	ourchart-0.1.0	1.16.0

```
PS C:\> |
```

```
kubectl get all
```

```
PS C:\> kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/nginx-6db489d4b7-v8l46	1/1	Running	0	43s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	5d6h
service/nginx	LoadBalancer	10.108.51.202	localhost	80:32691/TCP	43s

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/nginx	1/1	1	1	43s

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/nginx-6db489d4b7	1	1	1	43s

```
PS C:\> |
```



Package the Chart

```
helm package .\ourchart --destination C:\charts
```

```
PS C:\> helm package .\ourchart --destination C:\charts  
Successfully packaged chart and saved it to: C:\charts\ourchart-0.1.0.tgz  
PS C:\> |
```



Demo



Packaging a Helm Chart



Creating a Local Helm Repository



Chart Museum



<https://chartmuseum.com>

Open source Helm Chart Repository

Deployed as a Helm Chart



Deploy Chart Museum

```
helm install chartmuseum stable/chartmuseum --set env.open.DISABLE_API=false
```

```
PS C:\> helm install chartmuseum stable/chartmuseum --set env.open.DISABLE_API=false
NAME: chartmuseum
LAST DEPLOYED: Wed Jul 1 15:50:29 2020
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Get the ChartMuseum URL by running:

    export POD_NAME=$(kubectl get pods --namespace default -l "app=chartmuseum" -l "release=chartmuseum" -o jsonpath="{.items[0].metadata.name}")
    echo http://127.0.0.1:8080/
    kubectl port-forward $POD_NAME 8080:8080 --namespace default
PS C:\> |
```



Set up Port Forwarding

```
$POD_NAME=$(kubectl get pods -l "app=chartmuseum" -o  
jsonpath="{.items[0].metadata.name}")
```

```
kubectl port-forward $POD_NAME 8080:8080 --namespace default
```

```
PS C:\> $POD_NAME=$(kubectl get pods -l "app=chartmuseum" -o jsonpath="{.items[0].metadata.name}")  
PS C:\> kubectl port-forward $POD_NAME 8080:8080 --namespace default  
Forwarding from 127.0.0.1:8080 -> 8080  
Forwarding from [::1]:8080 -> 8080  
|
```



Add Chart Museum as a Repository

```
helm repo add chartmuseum http://127.0.0.1:8080
```

```
PS C:\> helm repo add chartmuseum http://127.0.0.1:8080
"chartmuseum" has been added to your repositories
PS C:\> helm repo list
NAME                URL
stable              https://kubernetes-charts.storage.googleapis.com
chartmuseum         http://127.0.0.1:8080
PS C:\> |
```



Push to Chart Museum

```
curl --data-binary "@ourchart-0.1.0.tgz"  
http://localhost:8080/api/charts
```

```
PS C:\charts> curl --data-binary "@ourchart-0.1.0.tgz" http://localhost:8080/api/charts  
{"saved":true}  
PS C:\charts> |
```



Search Chart Museum

helm repo update

```
PS C:\charts> helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "chartmuseum" chart repository
...Successfully got an update from the "stable" chart repository
Update Complete. ✎ Happy Helming!✎
```

helm search repo chartmuseum/ourchart

```
PS C:\charts> helm search repo chartmuseum/ourchart
NAME                CHART VERSION  APP VERSION     DESCRIPTION
chartmuseum/ourchart 0.1.0          1.16.0          A Helm chart for Kubernetes
PS C:\charts> |
```



Demo



Creating a local Helm repository



Creating a Remote Helm Repository



Helm Repository Options



Chart Museum

Cloud Storage

Nexus

JFrog Container Registry

GitHub




GitHub

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner *

 dbafromthecold ▾

Repository name *

/ DemoHelmRepo ✓

Great repository names are short and memorable. Need inspiration? How about **vigilant-rotary-phone**?

Description (optional)

Repo for Helm Charts

☒  **Public**

Anyone on the internet can see this repository. You choose who can commit.

☐  **Private**

You choose who can see and commit to this repository.

Skip this step if you're importing an existing repository.

☐ **Initialize this repository with a README**

This will let you immediately clone the repository to your computer.

Add .gitignore: None ▾

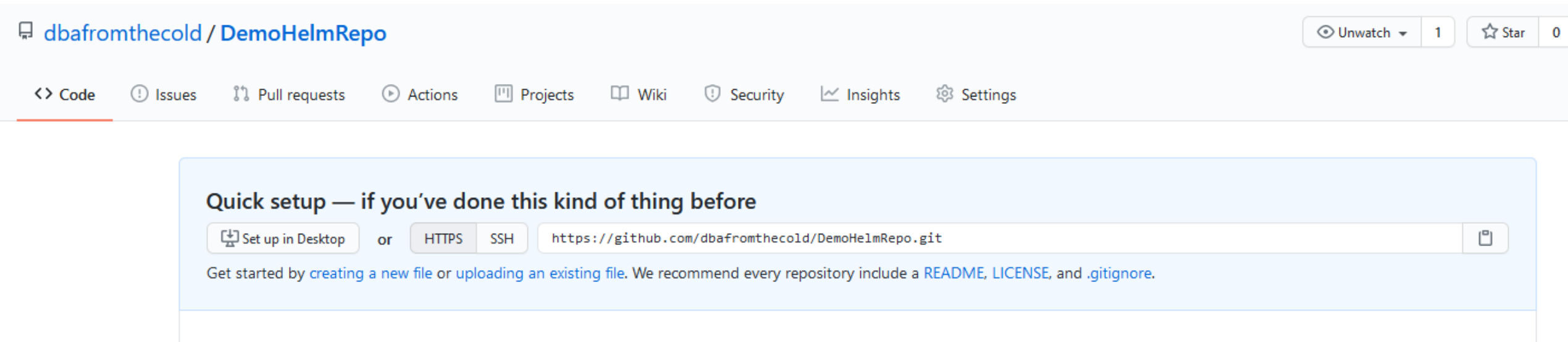
Add a license: None ▾



Create repository



Clone Repository Locally



The screenshot shows the GitHub interface for the repository `dbafromthecold / DemoHelmRepo`. At the top, there are navigation tabs: `<> Code` (selected), `Issues`, `Pull requests`, `Actions`, `Projects`, `Wiki`, `Security`, `Insights`, and `Settings`. On the right, there are buttons for `Unwatch`, `1` (fork count), and `Star` (0 stars).

Below the navigation bar, a light blue box contains the "Quick setup" instructions. It says: "Quick setup — if you've done this kind of thing before". Below this, there are two options: "Set up in Desktop" (with a desktop icon) and "HTTPS" (selected). To the right of "HTTPS" is the repository URL: `https://github.com/dbafromthecold/DemoHelmRepo.git`. Below the URL bar, it says: "Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#)."

```
git clone https://github.com/dbafromthecold/DemoHelmRepo.git
```

```
PS C:\git> git clone https://github.com/dbafromthecold/DemoHelmRepo.git
Cloning into 'DemoHelmRepo'...
warning: You appear to have cloned an empty repository.
PS C:\git> |
```



Copy Chart to Repo and Index

```
cp C:\charts\ourchart-0.1.0.tgz .  
helm repo index .
```

```
PS C:\git\DemoHelmRepo> cp C:\charts\ourchart-0.1.0.tgz .  
PS C:\git\DemoHelmRepo> helm repo index .  
PS C:\git\DemoHelmRepo> ls
```

Directory: C:\git\DemoHelmRepo

Mode	LastWriteTime		Length	Name
----	-----		-----	----
-a---	01/07/2020	16:12	391	index.yaml
-a---	25/06/2020	18:13	1763	ourchart-0.1.0.tgz

```
PS C:\git\DemoHelmRepo> |
```



View Repository Status

git status

```
PS C:\git\DemoHelmRepo> git status
On branch master
Your branch is up to date with 'origin/master'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        index.yaml
        ourchart-0.1.0.tgz

nothing added to commit but untracked files present (use "git add" to track)
PS C:\git\DemoHelmRepo>
```




Push Chart to GitHub


```
git add .  
git commit -m "added chart to repo"  
git push
```


```
PS C:\git\DemoHelmRepo> git add .  
PS C:\git\DemoHelmRepo> git commit -m "added chart to repo"  
[master 58c81e9] added chart to repo  
 2 files changed, 14 insertions(+)  
  create mode 100644 index.yaml  
  create mode 100644 ourchart-0.1.0.tgz  
PS C:\git\DemoHelmRepo> git push  
Counting objects: 4, done.  
Delta compression using up to 8 threads.  
Compressing objects: 100% (4/4), done.  
Writing objects: 100% (4/4), 2.26 KiB | 2.26 MiB/s, done.  
Total 4 (delta 0), reused 0 (delta 0)  
To https://github.com/dbafromthecold/DemoHelmRepo.git  
   c398d9c..58c81e9  master -> master  
PS C:\git\DemoHelmRepo> |
```






Add GitHub Repository as Helm Repository

 **Andrew Pruski** added chart to repo

Latest commit 58c81e9 26 seconds ago  History

 0 contributors

14 lines (14 sloc) | 391 Bytes

Raw Blame   

```
1  apiVersion: v1
2  entries:
3    ourchart:
4      - apiVersion: v2
5        appVersion: 1.16.0
6        created: "2020-07-01T16:12:31.5770791+01:00"
7        description: A Helm chart for Kubernetes
8        digest: fd0228d556ee2041838eb950bbcea4aa7ad222c8b4b23e8ced01621d2fa3242
9        name: ourchart
10       type: application
11       urls:
12         - ourchart-0.1.0.tgz
13       version: 0.1.0
14  generated: "2020-07-01T16:12:31.5761149+01:00"
```

<https://raw.githubusercontent.com/dbafromthecold/DemoHelmRepo/master/index.yaml>



Add GitHub Repository as Helm Repository

```
helm repo add dbafromthecold  
https://raw.githubusercontent.com/dbafromthecold/DemoHelmRepo/master
```

```
PS C:\> helm repo add dbafromthecold https://raw.githubusercontent.com/dbafromthecold/DemoHelmRepo/master/  
"dbafromthecold" has been added to your repositories  
PS C:\> helm repo list  
NAME                URL  
stable              https://kubernetes-charts.storage.googleapis.com  
dbafromthecold      https://raw.githubusercontent.com/dbafromthecold/DemoHelmRepo/master/  
PS C:\> |
```



Search New Helm Repository

```
helm search repo dbafromthecold/ourchart
```

```
PS C:\> helm search repo dbafromthecold/ourchart
NAME                CHART VERSION  APP VERSION     DESCRIPTION
dbafromthecold/ourchart 0.1.0          1.16.0          A Helm chart for Kubernetes
PS C:\> |
```



Demo



Creating a remote Helm repository

