



INDIAN INSTITUTE OF
INFORMATION
TECHNOLOGY

DevOps (CS457)

ASSIGNMENT 1: Task 1

Kubernetes Helm package installation, configuration and revision

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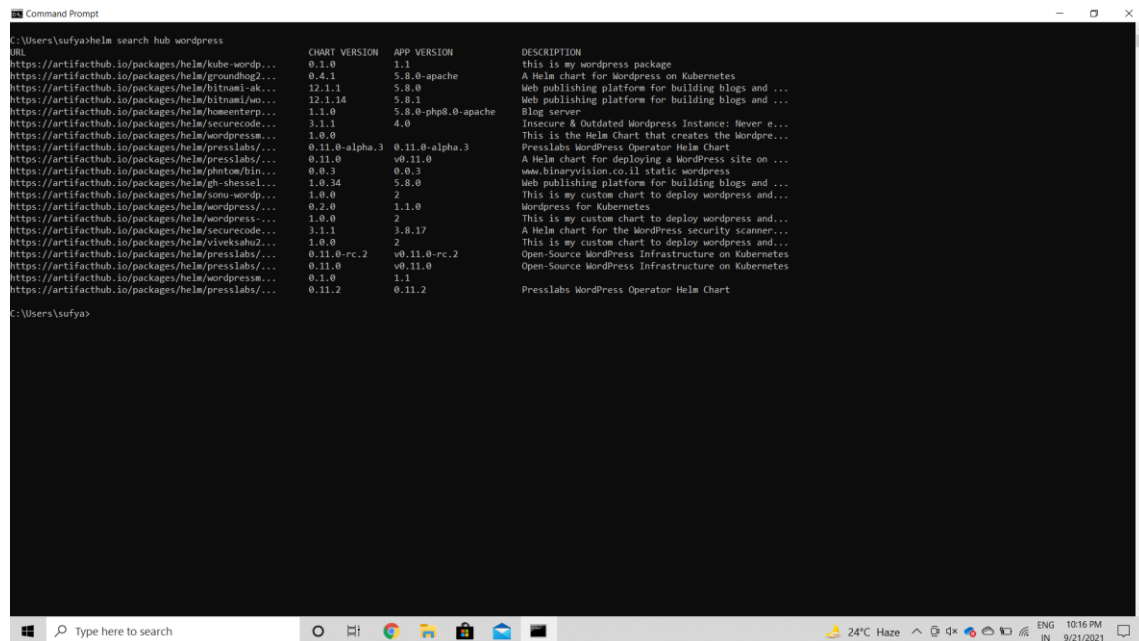
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Helm is a package manager for Kubernetes. Helm is the K8s equivalent of yum or apt. Helm deploys charts, which can be thought of as a packaged application.

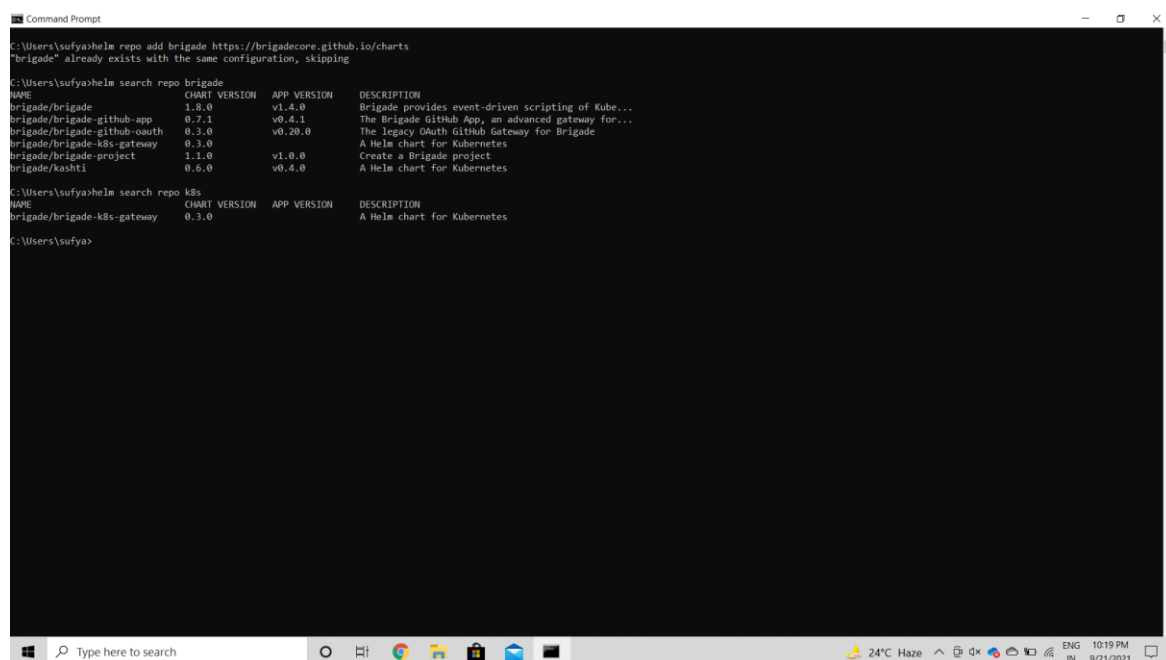
A chart is a Helm package. It contains all of the resource definitions necessary to run an application, tool, or service inside of a Kubernetes cluster. Helm enables authors to create and distribute their own applications using charts.

Searching for charts in helm hub :



```
C:\Users\sufya>helm search hub wordpress
URL                                CHART VERSION  APP VERSION     DESCRIPTION
https://artifacthub.io/packages/helm/kube-wordpress 0.1.0          1.1             this is my wordpress package
https://artifacthub.io/packages/helm/groundhog2... 0.4.1          5.8.0-apache   A Helm chart for Wordpress on Kubernetes
https://artifacthub.io/packages/helm/bitnami/wordpress 12.1.1         5.8.0          Web publishing platform for building blogs and ...
https://artifacthub.io/packages/helm/bitnami/wordpress 12.1.14        5.8.1          Web publishing platform for building blogs and ...
https://artifacthub.io/packages/helm/homeentert... 1.1.0          5.8.0-php8.0-apache Blog server
https://artifacthub.io/packages/helm/securecode... 3.1.1          4.0            Insecure & Outdated Wordpress Instance: Never e...
https://artifacthub.io/packages/helm/wordpress... 2.0.0          5.8.0          This is the Helm Chart that creates the Wordpre...
https://artifacthub.io/packages/helm/presslabs/... 0.11.0-alpha.3 0.11.0-alpha.3 Presslabs Wordpress Operator Helm Chart
https://artifacthub.io/packages/helm/presslabs/... 0.11.0         v0.11.0        A Helm chart for deploying a WordPress site on ...
https://artifacthub.io/packages/helm/phantom/bin... 0.0.3          0.0.3          www.binaryvision.co.il static wordpress
https://artifacthub.io/packages/helm/gh-shesl... 1.0.24         5.8.0          Web publishing platform for building blogs and ...
https://artifacthub.io/packages/helm/sonu-wordp... 1.0.0          2             This is my custom chart to deploy wordpress and...
https://artifacthub.io/packages/helm/wordpress/... 0.2.0          1.1.0          Wordpress for Kubernetes
https://artifacthub.io/packages/helm/wordpress/... 1.0.0          2             This is my custom chart to deploy wordpress and...
https://artifacthub.io/packages/helm/securecode... 2.1.1          3.0.17        A Helm chart for the Wordpress security scanner...
https://artifacthub.io/packages/helm/viveksahu2... 1.0.0          2             This is my custom chart to deploy wordpress and...
https://artifacthub.io/packages/helm/presslabs/... 0.11.0-rc.2   v0.11.0-rc.2   Open-Source Wordpress Infrastructure on Kubernetes
https://artifacthub.io/packages/helm/presslabs/... 0.11.0         v0.11.0        Open-Source Wordpress Infrastructure on Kubernetes
https://artifacthub.io/packages/helm/presslabs/... 0.1.0          1.1           Presslabs Wordpress Operator Helm Chart
https://artifacthub.io/packages/helm/presslabs/... 0.11.2         0.11.2        Presslabs Wordpress Operator Helm Chart
```

Adding charts to local repo and searching for it :



```
C:\Users\sufya>helm repo add brigade https://brigadecore.github.io/charts
"brigade" already exists with the same configuration, skipping

C:\Users\sufya>helm search repo brigade
NAME                                CHART VERSION  APP VERSION     DESCRIPTION
brigade/brigade                    1.8.0          v1.4.0          Brigade provides event-driven scripting of Kube...
brigade/brigade-github-app         0.7.1          v0.4.1          The Brigade Github App, an advanced gateway for...
brigade/brigade-github-oauth       0.3.0          v0.20.0         The Legacy OAuth Github Gateway for Brigade
brigade/brigade-k8s-gateway        0.3.0          v1.0.0          A Helm chart for Kubernetes
brigade/brigade-project            1.1.0          v1.0.0          Create a Brigade project
brigade/kashti                     0.6.0          v0.4.0          A Helm chart for Kubernetes

C:\Users\sufya>helm search repo k8s
NAME                                CHART VERSION  APP VERSION     DESCRIPTION
brigade/brigade-k8s-gateway        0.3.0          v1.0.0          A Helm chart for Kubernetes
```

Installing an application using Helm chart :

```
Command Prompt

C:\Users\sufya>helm search repo k8s
NAME                CHART VERSION  APP VERSION     DESCRIPTION
brigade/brigade-k8s-gateway  0.3.0          A Helm chart for Kubernetes

C:\Users\sufya>helm install team-01 brigade/brigade-k8s-gateway
NAME: team-01
LAST DEPLOYED: Tue Sep 21 22:30:21 2021
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
Release name: team-01

C:\Users\sufya>
```

```
Command Prompt

C:\Users\sufya>helm search hub stable/mysql
URL                CHART VERSION  APP VERSION     DESCRIPTION
https://artifacthub.io/packages/helm/kanister/k...  0.32.0         5.7.14          MySQL w/ Kanister support based on stable/mysql

C:\Users\sufya>helm repo add bitnami https://charts.bitnami.com/bitnami
"bitnami" has been added to your repositories

C:\Users\sufya>helm search repo stable/mysql
No results found

C:\Users\sufya>helm search repo mysql
NAME                CHART VERSION  APP VERSION     DESCRIPTION
bitnami/mysql       8.8.7          8.0.26          Chart to create a Highly available MySQL cluster
bitnami/phpmyadmin  8.2.12         5.1.1           phpMyAdmin is an mysql administration frontend
bitnami/mariadb     9.6.0          10.5.12         Fast, reliable, scalable, and easy to use open-...
bitnami/mariadb-cluster 1.0.2          10.2.14         DEPRECATED Chart to create a Highly available M...
bitnami/mariadb-galera 5.13.4         10.5.12         MariaDB Galera is a multi-master database clust...

C:\Users\sufya>helm install team01-release bitnami/mysql
NAME: team01-release
LAST DEPLOYED: Tue Sep 21 22:52:38 2021
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Tip:

  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:

  echo Primary: team01-release-mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:

  echo Username: root
  MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)

To connect to your database:

  1. Run a pod that you can use as a client:

      kubectl run team01-release-mysql-client --rm --tty -i --restart='Never' --image docker.io/bitnami/mysql:8.0.26-debian-10-r31 --namespace default --command -- bash

  2. To connect to primary service (read/write):
```

```
Command Prompt
C:\Users\sufyash\helm search repo mysql
NAME          CHART VERSION  APP VERSION  DESCRIPTION
bitnami/mysql  8.8.7          8.0.26       Chart to create a Highly available MySQL cluster
bitnami/phpmyadmin  8.2.12        5.1.1        phpMyAdmin is an mysql administration frontend
bitnami/mariadb  9.6.0          10.5.12      Fast, reliable, scalable, and easy to use open-...
bitnami/mariadb-cluster  1.0.2         10.2.14      DEPRECATED Chart to create a Highly available M...
bitnami/mariadb-galera  5.13.4         10.5.12      MariaDB Galera is a multi-master database clust...

C:\Users\sufyash\helm install happy-team01 bitnami/mysql
NAME: happy-team01
LAST DEPLOYED: Wed Sep 22 10:34:04 2021
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Tip:

  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:

  echo Primary: happy-team01-mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:

  echo Username: root
  MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default happy-team01-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)

To connect to your database:

  1. Run a pod that you can use as a client:

      kubectl run happy-team01-mysql-client --rm --tty -i --restart='Never' --image docker.io/bitnami/mysql:8.0.26-debian-10-r31 --namespace default --command -- bash

  2. To connect to primary service (read/write):

      mysql -h happy-team01-mysql.default.svc.cluster.local -uroot -p"$MYSQL_ROOT_PASSWORD"

To upgrade this helm chart:

  1. Obtain the password as described on the 'Administrator credentials' section and set the 'root.password' parameter as shown below:

      ROOT_PASSWORD=$(kubectl get secret --namespace default happy-team01-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)
      helm upgrade --namespace default happy-team01 bitnami/mysql --set auth.rootPassword=$ROOT_PASSWORD
```

Checking the status of applications :

```
Command Prompt
C:\Users\sufyash\helm list
NAME          NAMESPACE  REVISION  UPDATED                               STATUS  CHART          APP VERSION
happy-team01  default    1         2021-09-22 10:34:04.469541 +0530 IST  deployed  mysql-8.8.7    8.0.26
team-01       default    1         2021-09-21 22:30:21.7993953 +0530 IST  deployed  brigade-k8s-gateway-0.3.0
team-1        default    1         2021-09-21 22:34:45.5800149 +0530 IST  deployed  brigade-project-1.1.0    v1.0.0
team01-release default    1         2021-09-21 22:52:38.7836121 +0530 IST  deployed  mysql-8.8.7    8.0.26

C:\Users\sufyash\helm status team01-release
NAME: team01-release
LAST DEPLOYED: Tue Sep 21 22:52:38 2021
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Tip:

  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:

  echo Primary: team01-release-mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:

  echo Username: root
  MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)

To connect to your database:

  1. Run a pod that you can use as a client:

      kubectl run team01-release-mysql-client --rm --tty -i --restart='Never' --image docker.io/bitnami/mysql:8.0.26-debian-10-r31 --namespace default --command -- bash

  2. To connect to primary service (read/write):

      mysql -h team01-release-mysql.default.svc.cluster.local -uroot -p"$MYSQL_ROOT_PASSWORD"

To upgrade this helm chart:

  1. Obtain the password as described on the 'Administrator credentials' section and set the 'root.password' parameter as shown below:

      ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)
      helm upgrade --namespace default team01-release bitnami/mysql --set auth.rootPassword=$ROOT_PASSWORD

C:\Users\sufyash\
```

Pulling latest updates to the charts and uninstalling one of the applications by maintaining history :

```
Command Prompt

C:\Users\sufya>helm list
NAME            namespace    revision    updated              status    chart              app version
happy-team01    default     1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default     1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default     1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0
team01-release  default     1           2021-09-22 10:49:12.0213232 +0530 IST    deployed    mysql-8.8.7        8.0.26

C:\Users\sufya>helm uninstall team01-release --keep-history
release "team01-release" uninstalled

C:\Users\sufya>helm list --all
NAME            namespace    revision    updated              status    chart              app version
happy-team01    default     1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default     1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default     1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0
team01-release  default     1           2021-09-22 10:49:12.0213232 +0530 IST    uninstalled    mysql-8.8.7        8.0.26

C:\Users\sufya>helm repo update
Hang tight while we grab the latest from your chart repositories...
...Unable to get an update from the "bitnami" chart repository (https://charts.bitnami.com/bitnami):
  Get "https://charts.bitnami.com/bitnami/index.yaml": dial tcp: lookup charts.bitnami.com: no such host
...Unable to get an update from the "brigade" chart repository (https://brigadecore.github.io/charts):
  Get "https://brigadecore.github.io/charts/index.yaml": dial tcp: lookup brigadecore.github.io: no such host
Update Complete. @Happy Helming!

C:\Users\sufya>helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "brigade" chart repository
...Successfully got an update from the "bitnami" chart repository
Update Complete. @Happy Helming!

C:\Users\sufya>helm list
NAME            namespace    revision    updated              status    chart              app version
happy-team01    default     1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default     1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default     1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0
team01-release  default     1           2021-09-22 10:49:12.0213232 +0530 IST    uninstalled    mysql-8.8.7        8.0.26

C:\Users\sufya>
```

Checking status of uninstalled application (In case we want to rollback) :

```
Command Prompt

C:\Users\sufya>helm list --all
NAME            namespace    revision    updated              status    chart              app version
happy-team01    default     1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default     1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default     1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0
team01-release  default     1           2021-09-22 10:49:12.0213232 +0530 IST    uninstalled    mysql-8.8.7        8.0.26

C:\Users\sufya>helm status team01-release
NAME: team01-release
LAST DEPLOYED: Wed Sep 22 10:49:12 2021
NAMESPACE: default
STATUS: uninstalled
REVISION: 1
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Tip:
  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:
  echo Primary: team01-release-mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:
  echo Username: root
  MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)

To connect to your database:
  1. Run a pod that you can use as a client:
    kubectl run team01-release-mysql-client --rm --tty -i --restart='Never' --image docker.io/bitnami/mysql:8.0.26-debian-10-r31 --namespace default --command -- bash
  2. To connect to primary service (read/write):
    mysql -h team01-release-mysql.default.svc.cluster.local -uroot -p"$MYSQL_ROOT_PASSWORD"

To upgrade this helm chart:
  1. Obtain the password as described on the 'Administrator credentials' section and set the 'root.password' parameter as shown below:
    ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)
    helm upgrade --namespace default team01-release bitnami/mysql --set auth.rootPassword=$ROOT_PASSWORD
```

Rollback to previous release and maintaining new revision of the application :

```
Command Prompt
C:\Users\sufya>helm list --all
NAME            NAMESPACE    REVISION    UPDATED                                 STATUS      CHART              APP VERSION
happy-team01    default      1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default      1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default      1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0    v1.0.0
team01-release  default      1           2021-09-22 10:49:12.0213232 +0530 IST    uninstalled mysql-8.8.7        8.0.26

C:\Users\sufya>helm rollback team01-release 1
Rollback was a success! Happy Helming!

C:\Users\sufya>helm list --all
NAME            NAMESPACE    REVISION    UPDATED                                 STATUS      CHART              APP VERSION
happy-team01    default      1           2021-09-22 10:34:04.469541 +0530 IST    deployed    mysql-8.8.7        8.0.26
team-01         default      1           2021-09-21 22:30:21.7993953 +0530 IST    deployed    brigade-k8s-gateway-0.3.0
team-1          default      1           2021-09-21 22:34:45.5800149 +0530 IST    deployed    brigade-project-1.1.0    v1.0.0
team01-release  default      2           2021-09-22 11:03:51.3918834 +0530 IST    deployed    mysql-8.8.7        8.0.26

C:\Users\sufya>helm status team01-release
NAME: team01-release
LAST DEPLOYED: Wed Sep 22 11:03:51 2021
NAMESPACE: default
STATUS: deployed
REVISION: 2
TEST SUITE: None
NOTES:
** Please be patient while the chart is being deployed **

Tip:
  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:
  echo Primary: team01-release-mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:

echo Username: root
MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default team01-release-mysql -o jsonpath="{.data.mysql-root-password}" | base64 --decode)

To connect to your database:

1. Run a pod that you can use as a client:

  kubectl run team01-release-mysql-client --rm --tty -i --restart='Never' --image docker.io/bitnami/mysql:8.0.26-debian-10-r31 --namespace default --command -- bash

2. To connect to primary service (read/write):

  mysql -h team01-release-mysql.default.svc.cluster.local -uroot -p"$MYSQL_ROOT_PASSWORD"
```

REFERENCES :

- <https://www.mirantis.com/blog/install-kubernetes-apps-helm/>
- <https://docs.bitnami.com/tutorials/create-your-first-helm-chart/>