Secrets

In day 6, we have creted 2 pods with different containers in which one stores the database(back-end) and one pod stores is Webapp(front-end) with clients only access to the front-end.

Also, we secured our DB by a password so that even if someone has the access then needed password to proceed(root-password).

Let's say from Internal pod, if anyone can connect to DB, if knowing password, **all data will be loosed.** As Data is so much critical and we don't want anyone can access that. **We have to safeguard it but how???**

We created one environmental variables but anyone working with same level or working in group can see that while developing. Its not user friendly. As a boss(leader) of my team I don't want all to get access to the DB. I am the only one who will have the access. But the question is how we will do this without sharing our password. Since password is visible by describe pods(environmental variables) or by history command it is easy for the workers.

Here, a concept of Secrets came which is also called as vault in other technologies. But in k8, Secrets are files where you can(Master) saves the password and the workers or developers developing with me can't see the password.

They can use that password(Credentials) but via reference. Say(go to this directory and check this variable its your password). Then they can easily work on the development section only.

Benefits of Using Secrets:-

- No one can see Credentials even in Live Training.
- I am the only one who has the access to the Database.

Let's Start from Scratch:-

Kubectl get pods

```
C:\Users\Abhishek kumar>kubectl get pods
NAME          READY    STATUS             RESTARTS    AGE
dbms          1/1      Running            1           24h
lbpod         0/1      Error              1           5d21h
lbpod1        0/1      Error              1           5d21h
lbpod2        0/1      Error              1           5d20h
mydb          0/1      Error              25          25h
mydbms        1/1      Running            1           24h
mypod1        1/1      Running            3           6d2h
myrc1-54tmc   0/1      Error              2           6d2h
myrc1-lt6t6   1/1      Running            3           6d2h
myrc1-nkrrl   1/1      Running            3           6d2h
myrc1-zv8fl   1/1      Running            3           6d2h
mywp          0/1      ContainerCreating  0           24h
mywp1         1/1      Running            1           24h
os1           0/1      Error              0           25h
os2           1/1      Running            1           24h
```

Detele all and start with scratch

Kubectl delete all --all

```
C:\Users\Abhishek kumar>kubectl delete all --all
pod "dbms" deleted
pod "lbpod" deleted
pod "lbpod1" deleted
pod "lbpod2" deleted
pod "mydb" deleted
pod "mydbms" deleted
pod "mypod1" deleted
pod "myrc1-54tmc" deleted
pod "myrc1-lt6t6" deleted
pod "myrc1-nkrrl" deleted
pod "myrc1-zv8fl" deleted
pod "mywp" deleted
pod "mywp1" deleted
pod "os1" deleted
pod "os2" deleted
replicationcontroller "myrc1" deleted
service "kubernetes" deleted
service "mylb2" deleted
service "myrc1" deleted
service "mywp1" deleted
```

Kubectl get secrets

```
C:\Users\Abhishek kumar>Kubectl get secrets
NAME                  TYPE                                  DATA    AGE
default-token-vw8mn   kubernetes.io/service-account-token   3       13d
```

Here, a bydefault secret is there, but no secret box present now.
Now,
First, Create a pod,
For that needed a yml file so open Notebook Service.yml

```
pod7.yml - Notepad

File  Edit  Format  View  Help

apiVersion: v1
kind: Pod
metadata:
  name: "mydb"
  labels:
    app: mydb


spec:
  containers:
    - name: "mydb"
      image: "mysql:5.7"
      env:
        - name: MYSQL_ROOT_PASSWORD
          value: redhat
        - name: MYSQL_USER
          value: abhishek
        - name: MYSQL_PASS
          value: Abhishek
        - name: MYSQL_DATABASE
          value: wpdb
```

Kubectl create –f pod7.yml
Kubectl get pods

```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl create -f pod7.yml
pod/mydb created

C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl get pods
NAME    READY    STATUS     RESTARTS    AGE
mydb    1/1      Running    0           7s
```

Kubectl describe pods

```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl describe pods
Name:           mydb
Namespace:      default
Priority:       0
Node:           minikube/192.168.99.100
Start Time:     Thu, 21 Jan 2021 18:59:36 +0530
Labels:         app=mydb
Annotations:    <none>
Status:         Running
IP:             172.17.0.5
IPs:
  IP:  172.17.0.5
Containers:
  mydb:
    Container ID:   docker://aaf6785e515a44c70513040a7a422abf8be4f42fe1bdf907a77f333ec0431b0b
    Image:          mysql:5.7
    Image ID:       docker-pullable://mysql@sha256:b3d1eff023f698cd433695c9506171f0d08a8f92a0c
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 21 Jan 2021 18:59:38 +0530
    Ready:          True
    Restart Count:  0
    Environment:
      MYSQL_ROOT_PASSWORD:  redhat
      MYSQL_USER:           abhishek
      MYSQL_PASS:           Abhishek
      MYSQL_DATABASE:       wpdb
```

In the Above screenshot you can see the pod is displaying the <mark>Clear Format of the Password.</mark> Which I Don't want

So, we need to Create a **Secret file**.

Notebook Secret.yml


```
Secret.yml - Notepad
File  Edit  Format  View  Help
apiVersion: v1
kind: Secret
metadata:
  name: mysecret
data:
  p: redhat
```

Run

Kubectl create –f Secret.yml


```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl create -f Secret.yml
Error from server (BadRequest): error when creating "Secret.yml": Secret in version "v1" cannot be handled as a Secret:
ase64: illegal base64 data at input byte 4, error found in #10 byte of ...|":"redhat"},"kind":"|..., bigger context ...|
":{"name":"mysecret","n|...
```
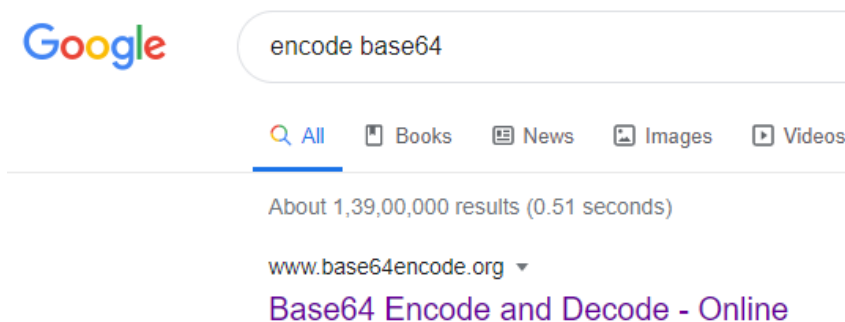
Failed: it says base 64 problem

Needed encoding

What is Encoding??

Changing Clear Format to Encoded Data(non-readable) random letters.

For that we can take help of online Encoders and Decoders. https://www.base64encode.org/

Google   encode base64

Q All   📖 Books   📰 News   🖼 Images   ▶ Videos

About 1,39,00,000 results (0.51 seconds)

www.base64encode.org ▾
Base64 Encode and Decode - Online

string   (encode)   byte
こんにちは   →   \xe3\x81...
                (decode)
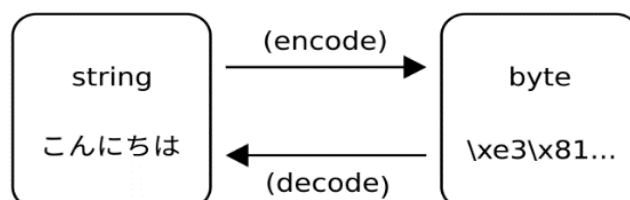
Encode to Base64 format

Simply enter your data then push the encode button.

redhat

ⓘ To encode binaries (like images, documents, etc.) use the file upload form a little further down on this page.

| UTF-8 ⌄ | Destination character set. |
| LF (Unix) ⌄ | Destination newline separator. |

☐ Encode each line separately (useful for when you have multiple entries).

☐ Split lines into 76 character wide chunks (useful for MIME).

☐ Perform URL-safe encoding (uses Base64URL format).

| ◌ Live mode OFF | Encodes in real-time as you type or paste (supports only the UTF-8 character set). |
| **> ENCODE <** | Encodes your data into the area below. |

cmVkaGF0

cmVkaGF0

This is the encoded data of redhat
And if we same decode it it will come again redhat.

Update this in the secret file

Secret.yml - Notepad

File   Edit   Format   View   Help

```
apiVersion: v1
kind: Secret
metadata:
  name: mysecret
data:
  p: cmVkaGF0
```

And run that

```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl create -f Secret.yml
secret/mysecret created

C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl get secrets
NAME                    TYPE                                  DATA    AGE
default-token-vw8mn     kubernetes.io/service-account-token   3       13d
mysecret                Opaque                                1       7s

C:\Users\Abhishek kumar\Desktop\temp\k8>
```

Now,

Update in pod (Add the Reference of the secret)

```
pod7.yml - Notepad
File  Edit  Format  View  Help
apiVersion: v1
kind: Pod
metadata:
  name: "mydb"
  labels:
     app: mydb

spec:
  containers:
     - name: "mydb"
       image: "mysql:5.7"
       env:
        - name: MYSQL_ROOT_PASSWORD
          valueFrom:
            secretKeyRef:
             name: mysecret
             key: p
        - name: MYSQL_USER
          value: abhishek
        - name: MYSQL_PASS
          value: Abhishek
        - name: MYSQL_DATABASE
          value: wpdb
```

Now run this

```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl create -f pod7.yml
pod/mydb created

C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl get pods
NAME    READY   STATUS                      RESTARTS    AGE
mydb    0/1     CreateContainerConfigError  0           2m16s

C:\Users\Abhishek kumar\Desktop\temp\k8>_
```

Kubectl describe pods

```
C:\Users\Abhishek kumar\Desktop\temp\k8>kubectl describe pods
Name:         mydb
Namespace:    default
Priority:     0
Node:         minikube/192.168.99.100
Start Time:   Thu, 21 Jan 2021 19:59:28 +0530
Labels:       app=mydb
Annotations:  <none>
Status:       Running
IP:           172.17.0.5
IPs:
  IP:  172.17.0.5
Containers:
  mydb:
    Container ID:   docker://f01bdd51851f3681c5b5019e76ba145928d923db1a9a948e9cd18ac148ce16ee
    Image:          mysql:5.7
    Image ID:       docker-pullable://mysql@sha256:b3d1eff023f698cd433695c9506171f0d08a8f92a0c8063c1a4d9db9a55808df
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Thu, 21 Jan 2021 20:02:59 +0530
    Ready:          True
    Restart Count:  0
    Environment:
      MYSQL_ROOT_PASSWORD:  <set to the key 'p' in secret 'mysecret'>  Optional: false
      MYSQL_USER:           abhishek
      MYSQL_PASS:           Abhishek
      MYSQL_DATABASE:       wpdb
```

Now, see in the describe command, the PASSWORD is not visible and its clearly showing that it's reading the p variable in mysecret.

Result:-

- *No one can see Credentials even in Live Training.*
- *I am the only one who has the access to the Database.*