Secret And Configmap

1. Background

Up to now, perhaps you haven't had to pass any kind of configuration data to the apps. Because almost all apps require configuration, which shouldn't be baked into to the built app itself. This article shows two ways to pass the configuration data to the apps.

2. Secret

Secret is for the information you've passed to the containers is sensitive. K8s provides a separate object called a Secret. There are 4 ways to create the Secret.

- Through the --from-literal

```
kubectl create secret generic mysecret --from-literal=username=admin --from-
literal=password=123456
```

- Through the --from-file, each file contains one item.

```
echo -n admin > ./username
echo -n 123456 > ./password
kubectl create secret generic mysecret1 --from-file=./username --from-file=./password
```

- Through the --from-env-file. In the env.txt, every line key-value match one item.

```
cat << EOF > env.txt
username=admin
password=123456
EOF
kubectl create secret generic mysecret --from-env-file=env.txt
```

- Through the YAML file.

```
apiVersion: v1
kind: Secret
metadata:
  name: mysecret
data:
  username: YWRtaW4=
  password: NTY3ODk=
```

The username and password is the sensitive information, then are encrypted. Then can use: "kubectl apply -f my secret.yaml" to create the secret.

After create the secret, then can use command to show the secret. Like this.

```
ylsccnul_gmail_com@liansong-instance:~$ kubectl get secrets
NAME                  TYPE                                  DATA   AGE
default-token-pt2bh   kubernetes.io/service-account-token   3      41d
mysecret              Opaque                                2      15h
mysecret1             Opaque                                2      15h
mysecrete3            Opaque                                2      14h
```

Also you can use describe command to show the details.

```
ylsccnu1_gmail_com@liansong-instance:~$ kubectl describe secrets mysecret
Name:         mysecret
Namespace:    default
Labels:       <none>
Annotations:  <none>

Type:  Opaque

Data
====
password:  6 bytes
username:  5 bytes
```

```
# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: v1
data:
  password: MTIzNDU2
  username: YWRtaW4=
kind: Secret
metadata:
  creationTimestamp: "2020-05-02T13:50:00Z"
  name: mysecret
  namespace: default
  resourceVersion: "5870201"
  selfLink: /api/v1/namespaces/default/secrets/mysecret
  uid: 8745e94e-a224-4bba-baa2-56b3442c882e
type: Opaque
```

In this picture, you can see the password and username are encrypted.

3. How to use secret in the Pod

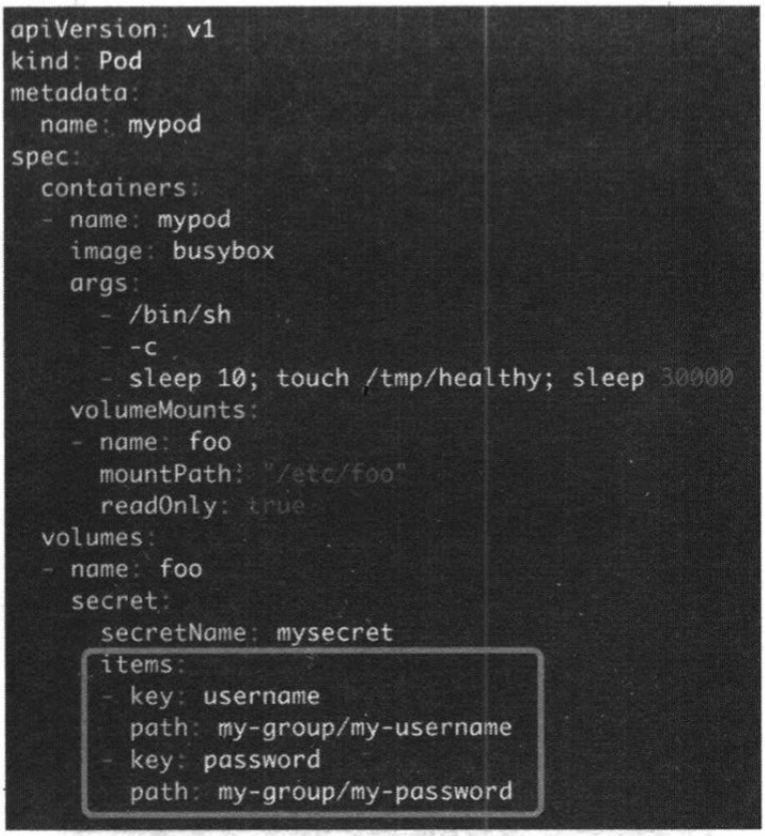
As we known, Secret is the separated object in the k8s, so pod would use secret through the volume. How to use, like below.

- Create the pod, in the pod, define the volume, also from the secret. (Volume)

```
apiVersion: v1
kind: Pod
metadata:
  name: mypod
spec:
  containers:
  - name: mypod
    image: busybox
    args:
      - /bin/sh
      - -c
      - sleep 10; touch /tmp/healthy; sleep 30000
    volumeMounts:
    - name: foo
      mountPath: "/etc/foo"
      readOnly: true
  volumes:
  - name: foo
    secret:
      secretName: mysecret
```

```
ylsccnu1_gmail_com@liansong-instance:~$ kubectl exec -it mypod sh
/ # ls /etc/foo/
password  username
/ # cat /etc/foo/username
admin/ #
/ # cat /etc/foo/password
123456/ #
/ #
```

From the Yaml file, we can see, mount the secret key value to the path: /etc/foo. Then we can view the secret.



Also can save the data to the group path. In this way, we can save the secret encryptions.

- Create the Pod, define the env variable in the Pod. (environment)

```
apiVersion: v1
kind: Pod
metadata:
  name: mypod-env
spec:
  containers:
  - name: mypod-env
    image: busybox
    args:
      - /bin/sh
      - -c
      - sleep 10; touch /tmp/healthy; sleep 30000
    env:
      - name: SECRET_USERNAME
        valueFrom:
          secretKeyRef:
            name: mysecret
            key: username
      - name: SECRET_PASSWORD
        valueFrom:
          secretKeyRef:
            name: mysecret
            key: password
```

In the pod, define the key and value. Then can get the value through the environment variable.

4. ConfigMap

k8s allows separating configuration options into a separate object called a ConfigMap. It's different from the secret. It's used to the insensitive data. Let's show. It's the same as secret, there are 4 ways to create the ConfigMap.

- Through the --from-literal

```
kubectl create configmap myconfigmap --from-literal=config1=xxx --from-literal=config2=yyy
```

- Through the --from-file

```
echo -n xxx > ./config1
echo -n yyy > ./config2
kubectl create configmap myconfigmap2 --from-file=./config1 --from-file=./config2
```

- Through the --from-evn-file

```
cat << EOF > env.txt
config1=xxx
config2=yyy
EOF
kubectl create configmap myconfigmap3 --from-env-file=env.txt
```

- Through the YAML file

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: myconfigmap
data:
  config1: xxx
  config2: yyy
```

It's the same as secret. From this, can create the separate config object, then can be used in the Pod.

```
ylsccnu1_gmail_com@liansong-instance:~$ kubectl get configmaps
NAME                          DATA   AGE
myconfigmap                   2      6m51s
wrinkled-mite-mysql-test      1      15d
ylsccnu1_gmail_com@liansong-instance:~$ kubectl describe configmaps myconfigmap
Name:         myconfigmap
Namespace:    default
Labels:       <none>
Annotations:  <none>

Data
====
config1:
----
xxx
config2:
----
yyy
Events:  <none>
```

5. How to use configmap in the Pod

It's the same as secret. The configmap is like to the separate object, then Pod can use the object and get the key value. Below is one practice about configmap.

- Create the configmap.

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: myconfigmap5
data:
  logging.conf: |
    class: logging.handlers.RotatingFileHandler
    formatter: precise
    level: INFO
    filename: %hostname-%timestamp.log
```

- Create the Pod with the configmap.

```
apiVersion: v1
kind: Pod
metadata:
  name: mypodconfig
spec:
  containers:
  - name: mypodconfig
    image: busybox
    args:
      - /bin/sh
      - -c
      - sleep 10; touch /tmp/healthy; sleep 30000
    volumeMounts:
    - name: foo
      mountPath: "/etc/foo"
  volumes:
  - name: foo
    configMap:
      name: myconfigmap5
      items:
        - key: logging.conf
          path: myapp/logging.conf
```

In this Pod, define the mount path. Then execute the below command.

```
ylsccnu1_gmail_com@liansong-instance:~$ kubectl exec -it mypodconfig sh
/ # cat /etc/foo/myapp/logging.conf
class: logging.handlers.RotatingFileHandler
formatter: precise
level: INFO
filename: %hostname-%timestamp.log
/ # exit
```