

Kubernetes



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Homework Storage and Persistence

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Tasks

Note: Due to technicle issues with my main working pc, tasks are done with minicube :(

```
Operating System: Debian GNU/Linux 11 (bullseye)
Kernel: Linux 5.10.0-15-amd64
Architecture: x86-64
```

```
vox@vox:~/SoftUni/kubernetes/M3_Security_And_Policies/homework$ free -m
              total        used        free      shared  buff/cache   available
Mem:           3781        2849         186         188         745         510
Swap:           974         974           0
```

```
model name      : Intel(R) Celeron(R) CPU  N3060  @ 1.60GHz
stepping        : 4
microcode       : 0x411
cpu MHz         : 480.000
cache size      : 1024 KB
physical id     : 0
siblings        : 2
core id         : 2
cpu cores       : 2
```

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

minikube-m02
type: Worker
host: Running
kubelet: Running

minikube-m03
type: Worker
host: Running
kubelet: Running
```

Try to solve the following set of tasks:

1. Configuration maps and secrets
 - a. Create a **ConfigMap** resource **hwcm** that:
 - i. has two key-value pairs (**k8sver** and **k8sos**) initialized as literals that hold your **Kubernetes version** and the name of the **OS** where **Kubernetes** is running

```
kubectrl create configmap hwcm --from-literal=k8sver=$(kubectrl version --short 2>&1 |
sed -n 's/^Server Version: //p') --from-literal=k8sos="$(uname -v)"
```

- ii. has two more key-value pairs (**main.conf** and **port.conf**) initialized from files. The first one (**main.conf**) should contain:

```
# main.conf
name=homework
path=/tmp
certs=/secret
And the second one (port.conf):
8080
```

kubectl create configmap hwcm --from-literal=k8sver=\$(kubectl version --short 2>&1 | sed -n 's/^Server Version: //p') --from-literal=k8sos="\$(uname -v)" --from-file=port=port.conf --from-file=main.conf

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ kubectl describe cm hwcm
Name:          hwcm
Namespace:     default
Labels:        <none>
Annotations:   <none>

Data
====
k8sos:
----
#1 SMP Debian 5.10.120-1 (2022-06-09)
k8sver:
----
v1.24.1
main.conf:
----
name=homework
path=/tmp
certs=/secret

port:
----
8080
```

- b. Create a **Secret** resource **hwsec** that:
- Has two data entries – **main.key** and **main.crt** created from files
 - The content for the above two generate by using the **openssl** utility. For example:
openssl genrsa -out main.key 4096
openssl req -new -x509 -key main.key -out main.crt -days 365 -subj /CN=www.hw.lab

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ openssl genrsa -out main.key 4096
Generating RSA private key, 4096 bit long modulus (2 primes)
.....+++++
e is 65537 (0x010001)
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ openssl req -new -x509 -key main.key -out main.crt -days 365 -subj /CN=www.hw.lab
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ ls -la
total 24
drwxr-xr-x 2 vox vox 4096 Jul  5 10:48 .
drwxr-xr-x 3 vox vox 4096 Jul  5 10:21 ..
-rw-r--r-- 1 vox vox  38 Jul  5 09:58 main.conf
-rw-r--r-- 1 vox vox 1809 Jul  5 10:48 main.crt
-rw----- 1 vox vox 3247 Jul  5 10:47 main.key
-rw-r--r-- 1 vox vox   5 Jul  5 09:58 port.conf
```

```
kubectl create secret generic hwsec --from-file=main.key=main.key --from-file=main.crt=main.crt
```

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ kubectl describe secret hwsec
Name:          hwsec
Namespace:     default
Labels:        <none>
Annotations:   <none>

Type: Opaque

Data
====
main.crt: 1809 bytes
main.key: 3247 bytes
```

- c. Mount the above resources to a pod created from the **shekeriev/k8s-environ** image (used during the practice) by
 - i. **k8sver** and **k8sos** should be mounted as environment variables with prefix **HW_**
 - ii. **main.conf** should be mounted as a volume to the **/config** folder inside the container
 - iii. **port.conf** should be mounted as an environment variable **HW_PORT**
 - iv. **main.key** and **main.crt** should be mounted as a volume to the **/secret** folder inside the container

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework$ kubectl apply -f homework-pod.yaml
pod/hwpod created
```

```
← → ↻ 192.168.49.2:30001 ☆
```

Environment Landscape

```
APACHE_CONFDIR => /etc/apache2
APACHE_ENVVARS => /etc/apache2/envvars
APACHE_LOCK_DIR => /var/lock/apache2
APACHE_LOG_DIR => /var/log/apache2
APACHE_PID_FILE => /var/run/apache2/apache2.pid
APACHE_RUN_DIR => /var/run/apache2
APACHE_RUN_GROUP => www-data
APACHE_RUN_USER => www-data
GPG_KEYS => 1729F83938DA44E27BA0F4D3DBDB397470D12172 BFDDDD28642824F8118EF77909B67A5C12229118F
HOSTNAME => hwpod
HW_PORT => 8080
HW_k8sos => #1 SMP Debian 5.10.120-1 (2022-06-09)
HW_k8sver => v1.24.1
HW_port => 8080
KUBERNETES_PORT => tcp://10.96.0.1:443
KUBERNETES_PORT_443_TCP => tcp://10.96.0.1:443
KUBERNETES_PORT_443_TCP_ADDR => 10.96.0.1
KUBERNETES_PORT_443_TCP_PORT => 443
KUBERNETES_PORT_443_TCP_PROTO => tcp
KUBERNETES_SERVICE_HOST => 10.96.0.1
KUBERNETES_SERVICE_PORT => 443
KUBERNETES_SERVICE_PORT_HTTPS => 443
LANG => C
```

Folder (/config) Dump

/config/main.conf

```
name=homework
path=/tmp
certs=/secret
```

Folder (/secret) Dump

/secret/main.crt

-----BEGIN CERTIFICATE-----

```
MIIFCzCCAvoGAwIBAgIUUV8tCDWp5VVS
BQAwFTETMBEGA1UEAwKd3d3Lmh3LmXhYjAeFw0yMjA3MDUwNzQ4MDRaFw0yMzA3
MDUwNzQ4MDRaMBUxEzARBgNVBAMMCnd3dy5ody5sYWlwggiMA0GCSqGSIb3DQEB
AQUAA4ICDwAwggIKAoICAQDZVl/4i7BhcZruk8RsjfoqIKtF89gp+5pzluaeb6g
AZWZwnS1JVkdeoT7SGLArE/uMDeHDk0HEsj/5g8FVUkDKRrk9zdTdjohz96Awmkw
NrKE/q7QyZYkepz/A/5EuWdaEDUMEIkgDdD5wVcdxf2DqTNWJUUV8tCDWp5VVS
geu3tUCqD71joe3krYDncijqIHABJ8WZfrQrJSw/Sf3vrcFABW014cuiUUMuuvbv
iY5R4ugulCw2ILCKeO2z6gNhe9X2of4DxP/1vRWjMDLsV6rvvwhIP9H5/m0lV02Q
zH4hrQLRC3BI9QjlNwBKefEDMk+ghn6zNvar1PxWwfO42S0w/wlkiFnUvnhzmanh
ecMeL8/kXsgD13OWNzZJSYL/kVKzaCo3ceJr90fkz3yB+oR6DP/f1jLRhkB72/QZ
mWP68UyyTIsJnRnMQEqREgBD1VZV2qPDQpfgmvqTJL7t3HnFdGPhmmnObfuLK5kF
vnu5nQVn8yDeL3Kc2hEFPF66ra817P5AmoomB41vYvY8v30cQigfuzGDw7IVc+0K
```

2. Create and run a set of manifest files to spin application

```
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework/task2$ ./homework-up.sh
configmap/homework-cm created
persistentvolume/pv-1 created
persistentvolume/pv-2 created
persistentvolume/pv-3 created
service/service-be created
service/service-fe created
statefulset.apps/facts created
deployment.apps/pod-fe created
```

```
deployment.apps/pod-fe created
vox@vox:~/SoftUni/kubernetes/M4_Storage_And_Persistence/homework/task2$ kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/facts-0	1/1	Running	0	9m5s
pod/facts-1	1/1	Running	0	8m53s
pod/facts-2	1/1	Running	0	8m44s
pod/pod-fe-5cdbf655cc-2nrqk	1/1	Running	0	9m4s
pod/pod-fe-5cdbf655cc-bx44q	1/1	Running	0	9m4s
pod/pod-fe-5cdbf655cc-fhfn7	1/1	Running	0	9m4s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	24h
service/service-be	ClusterIP	10.107.57.158	<none>	5000/TCP	9m7s
service/service-fe	NodePort	10.109.137.86	<none>	5000:30001/TCP	9m6s

NAME	READY	UP-T0-DATE	AVAILABLE	AGE
deployment.apps/pod-fe	3/3	3	3	9m4s

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/pod-fe-5cdbf655cc	3	3	3	9m4s

NAME	READY	AGE
statefulset.apps/facts	3/3	9m5s

NOTE: Result is not what I was expecting :(



Internal Server Error

The server encountered an internal error and was unable to complete your request. Either the server is overloaded or there is an error in the application.