

## Class Assignment / Homework X

- **Storage:**

- Deploy EMQTT cluster of

- three nodes

- Have the configuration in a ConfigMap

- Have the /opt/emqx/data folder persisted

- Example:

- [https://www.emqx.io/docs/en/v5.0/deploy/install\\_docker.html#use-docker-compose-to-build-an-emqx-cluster](https://www.emqx.io/docs/en/v5.0/deploy/install_docker.html#use-docker-compose-to-build-an-emqx-cluster)

- Verify the running nodes with “emqx\_ctl cluster status” on the nodes

```
bojan@bojan-VirtualBox:~$ sudo k3d cluster create mycluster
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl get nodes
```

```
bojan@bojan-VirtualBox:~$ -p emqtt-config
```

```
bojan@bojan-VirtualBox:~$ nano emqtt-config/emq.conf
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl create configmap emqx-config --from-file=emq.conf=emqtt-config/emq.conf
```

```
bojan@bojan-VirtualBox: ~
bojan@bojan-VirtualBox:~$ sudo k3d cluster create mycluster
INFO[0000] Prep: Network
INFO[0000] Created network 'k3d-mycluster'
INFO[0000] Created image volume k3d-mycluster-images
INFO[0000] Starting new tools node...
INFO[0000] Starting node 'k3d-mycluster-tools'
INFO[0001] Creating node 'k3d-mycluster-server-0'
INFO[0001] Creating LoadBalancer 'k3d-mycluster-serverlb'
INFO[0001] Using the k3d-tools node to gather environment information
INFO[0001] HostIP: using network gateway 172.18.0.1 address
INFO[0001] Starting cluster 'mycluster'
INFO[0001] Starting servers...
INFO[0001] Starting node 'k3d-mycluster-server-0'
INFO[0009] All agents already running.
INFO[0009] Starting helpers...
INFO[0009] Starting node 'k3d-mycluster-serverlb'
INFO[0016] Injecting records for hostAliases (incl. host.k3d.internal) and for 2 network members into CoreDNS configmap.
..
INFO[0018] Cluster 'mycluster' created successfully!
INFO[0018] You can now use it like this:
kubectl cluster-info
bojan@bojan-VirtualBox:~$ sudo kubectl get nodes
NAME                                STATUS    ROLES    AGE   VERSION
k3d-mycluster-server-0             Ready    control-plane,master   25s   v1.28.8+k3s1
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ mkdir -p emqtt-config
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ nano emqtt-config/emq.conf
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ sudo kubectl create configmap emqx-config --from-file=emq.conf=emqtt-config/emq.conf
configmap/emqx-config created
bojan@bojan-VirtualBox:~$
```

```
bojan@bojan-VirtualBox: ~
GNU nano 7.2                               emqtt-config/emq.conf *
# EMQTT basic configuration
node.name = emqx@127.0.0.1
node.cookie = emqxsecretcookie
|
```

bojan@bojan-VirtualBox:~\$ nano pv.yaml

bojan@bojan-VirtualBox:~\$ sudo kubectl apply -f pv.yaml

bojan@bojan-VirtualBox:~\$ nano nano pvc.yaml

bojan@bojan-VirtualBox:~\$ sudo kubectl apply -f pvc.yaml

```
bojan@bojan-VirtualBox: ~
GNU nano 7.2 pv.yaml *
apiVersion: v1
kind: PersistentVolume
metadata:
  name: emqx-pv
spec:
  capacity:
    storage: 1Gi
  accessModes:
    - ReadWriteOnce
  hostPath:
    path: /mnt/data/emqx
```

```
bojan@bojan-VirtualBox: ~
GNU nano 7.2 pvc.yaml *
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: emqx-pvc
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 1Gi
```

```
bojan@bojan-VirtualBox:~$ nano pv.yaml
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pv.yaml
persistentvolume/emqx-pv created
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ nano pvc.yaml
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pvc.yaml
persistentvolumeclaim/emqx-pvc created
bojan@bojan-VirtualBox:~$
```

bojan@bojan-VirtualBox:~\$ nano statefulset.yaml

bojan@bojan-VirtualBox:~\$ sudo kubectl apply -f statefulset.yaml

```
bojan@bojan-VirtualBox: ~
GNU nano 7.2 statefulset.yaml *
apiVersion: apps/v1
kind: StatefulSet
metadata:
  name: emqx
spec:
  serviceName: emqx
  replicas: 3
  selector:
    matchLabels:
      app: emqx
  template:
    metadata:
      labels:
        app: emqx
    spec:
      containers:
        - name: emqx
          image: emqx/emqx:latest
          ports:
            - containerPort: 1883
            - containerPort: 8083
            - containerPort: 8084
            - containerPort: 18083
          volumeMounts:
            - name: emqx-data
              mountPath: /opt/emqx/data
            - name: config-volume
              mountPath: /opt/emqx/etc/emqx.conf
              subPath: emqx.conf
      volumes:
        - name: config-volume
          configMap:
            name: emqx-config
  volumeClaimTemplates:
    - metadata:
        name: emqx-data
      spec:
        accessModes: [ "ReadWriteOnce" ]
        resources:
          requests:
            storage: 1Gi
```

```
bojan@bojan-VirtualBox:~$ nano statefulset.yaml
bojan@bojan-VirtualBox:~$
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f statefulset.yaml
statefulset.apps/emqx created
bojan@bojan-VirtualBox:~$
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl create configmap emqx-config --from-file=emq.conf=emqtt-
config/emq.conf
configmap/emqx-config created
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pv.yaml
persistentvolume/emqx-pv created
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pvc.yaml
persistentvolumeclaim/emqx-pvc created
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f statefulset.yaml
statefulset.apps/emqx created
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl get pvc
NAME          STATUS  VOLUME                                     CAPACITY  ACCESS MODES  STORAGECLASS  AGE
emqx-pvc      Pending                                1Gi       RWO           local-path    33s
emqx-data-emqx-0 Bound    pvc-8ad759fa-9e78-4609-954c-c48dbc44de40 1Gi       RWO           local-path    17s
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl get pv
NAME          CAPACITY  ACCESS MODES  RECLAIM POLICY  STATUS  CLAIM
STORAGECLASS  REASON  AGE
emqx-pv      1Gi       RWO           Retain          Available
pvc-8ad759fa-9e78-4609-954c-c48dbc44de40 1Gi       RWO           Delete          Bound
default/emqx-data-emqx-0 local-path 50s
pvc-fe5896a0-14e0-4b2a-9b27-22525146a594 1Gi       RWO           Delete          Bound
default/emqx-data-emqx-1 local-path 10s
pvc-52230c49-6877-427f-b2d3-14e8832c593a 1Gi       RWO           Delete          Bound
default/emqx-data-emqx-2 local-path 1s
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl get pods
NAME    READY  STATUS    RESTARTS  AGE
emqx-1  0/1    Error     3 (48s ago)  89s
emqx-0  0/1    CrashLoopBackOff 3 (27s ago)  2m10s
emqx-2  0/1    Error     3 (39s ago)  79s
```

```
bojan@bojan-VirtualBox:~$ sudo kubectl get sts
NAME    READY  AGE
emqx    0/3    2m20s
```

```
bojan@bojan-VirtualBox: ~  
bojan@bojan-VirtualBox:~$ sudo kubectl create configmap emqx-config --from-file=emq.conf=emqtt-config/emq.conf  
configmap/emqx-config created  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pv.yaml  
persistentvolume/emqx-pv created  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f pvc.yaml  
persistentvolumeclaim/emqx-pvc created  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl apply -f statefulset.yaml  
statefulset.apps/emqx created  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl get pvc  
NAME STATUS VOLUME CAPACITY ACCESS MODES STORAGECLASS AGE  
emqx-pvc Pending  
emqx-data-emqx-0 Bound pvc-8ad759fa-9e78-4609-954c-c48dbc44de40 1Gi RW0 local-path 33s  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl get pv  
NAME STORAGECLASS REASON AGE CAPACITY ACCESS MODES RECLAIM POLICY STATUS CLAIM  
emqx-pv local-path 88s 1Gi RW0 Retain Available  
pvc-8ad759fa-9e78-4609-954c-c48dbc44de40-0 local-path 50s 1Gi RW0 Delete Bound default/emqx-data-emqx  
pvc-fe5896a0-14e0-4b2a-9b27-22525146a594-1 local-path 10s 1Gi RW0 Delete Bound default/emqx-data-emqx  
pvc-52230c49-6877-427f-b2d3-14e8832c593a-2 local-path 1s 1Gi RW0 Delete Bound default/emqx-data-emqx  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl get pods  
NAME READY STATUS RESTARTS AGE  
emqx-1 0/1 Error 3 (48s ago) 89s  
emqx-0 0/1 CrashLoopBackOff 3 (27s ago) 2m10s  
emqx-2 0/1 Error 3 (39s ago) 79s  
bojan@bojan-VirtualBox:~$  
bojan@bojan-VirtualBox:~$ sudo kubectl get sts  
NAME READY AGE  
emqx 0/3 2m20s
```

**Изработил:**  
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