Joget on Google Kubernetes Engine

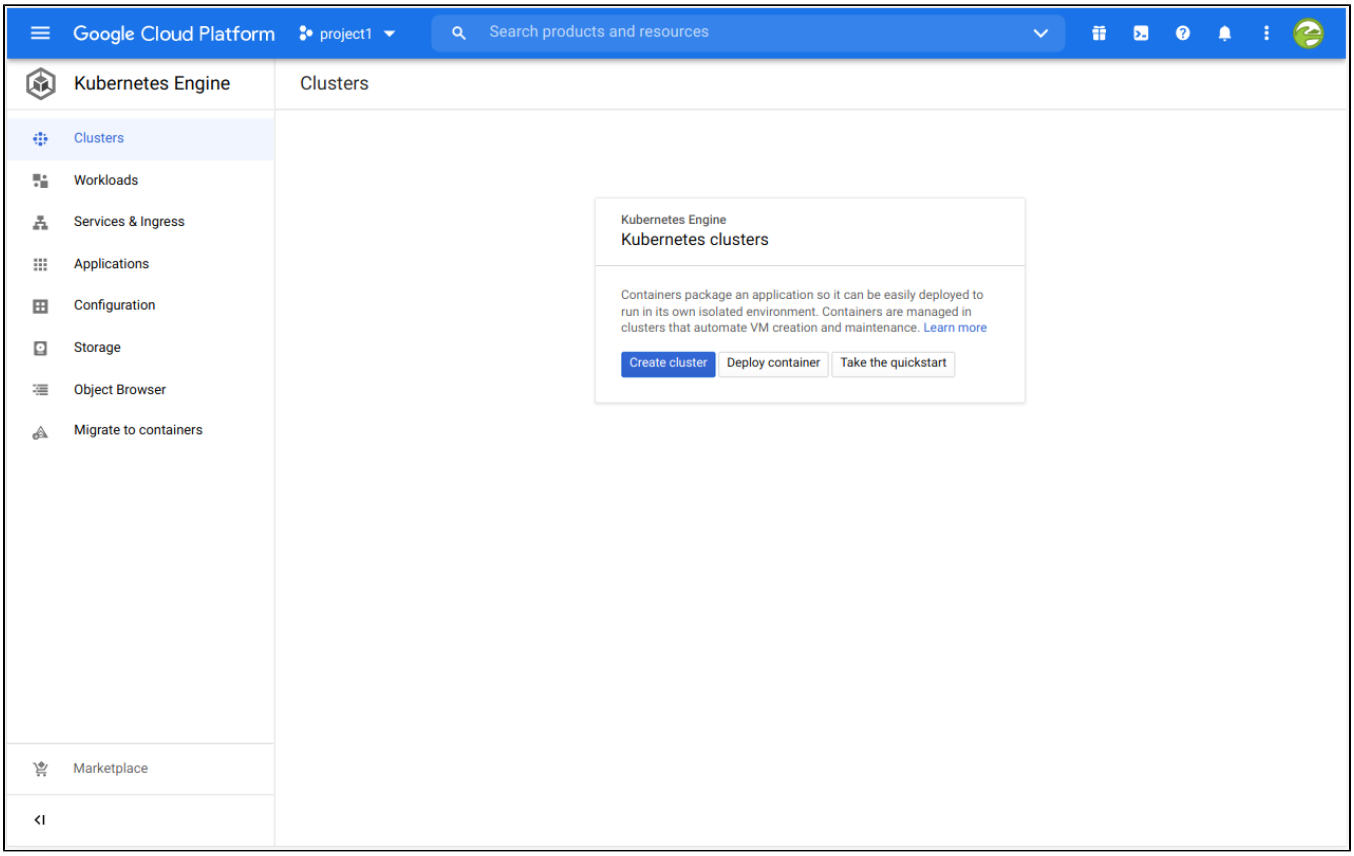
This article provides a tutorial on deploying, running and scaling Joget on Google Kubernetes Engine (GKE). GKE is a managed Kubernetes service offered by Google Cloud.

> If you are not familiar with Kubernetes, refer to Joget on Kubernetes for a quick introduction.

Deploy Joget on Google Kubernetes Engine (GKE)

1. Create Kubernetes Cluster

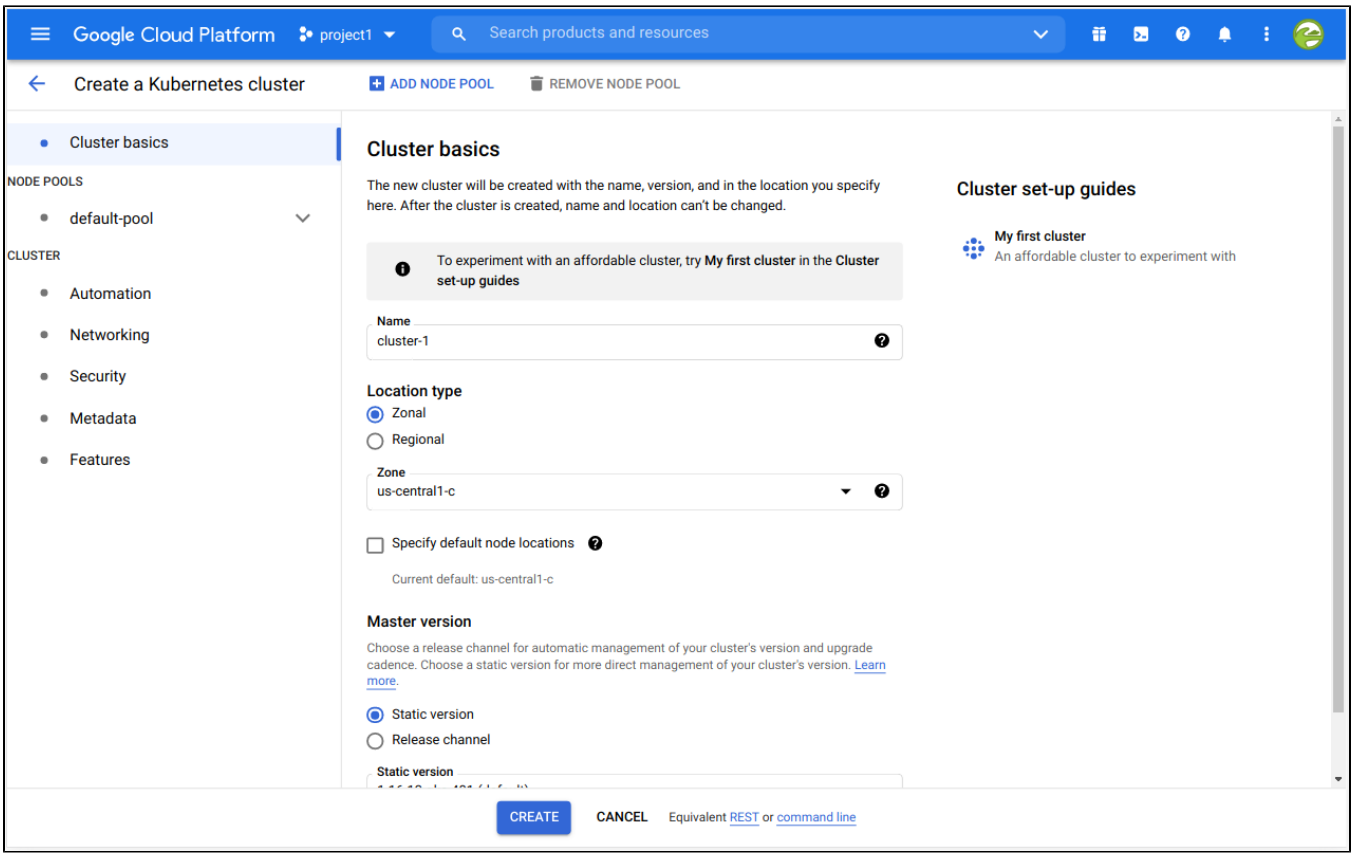
Access the Google Kubernetes Engine console. In the **Clusters** page, click on the **Create cluster** button.



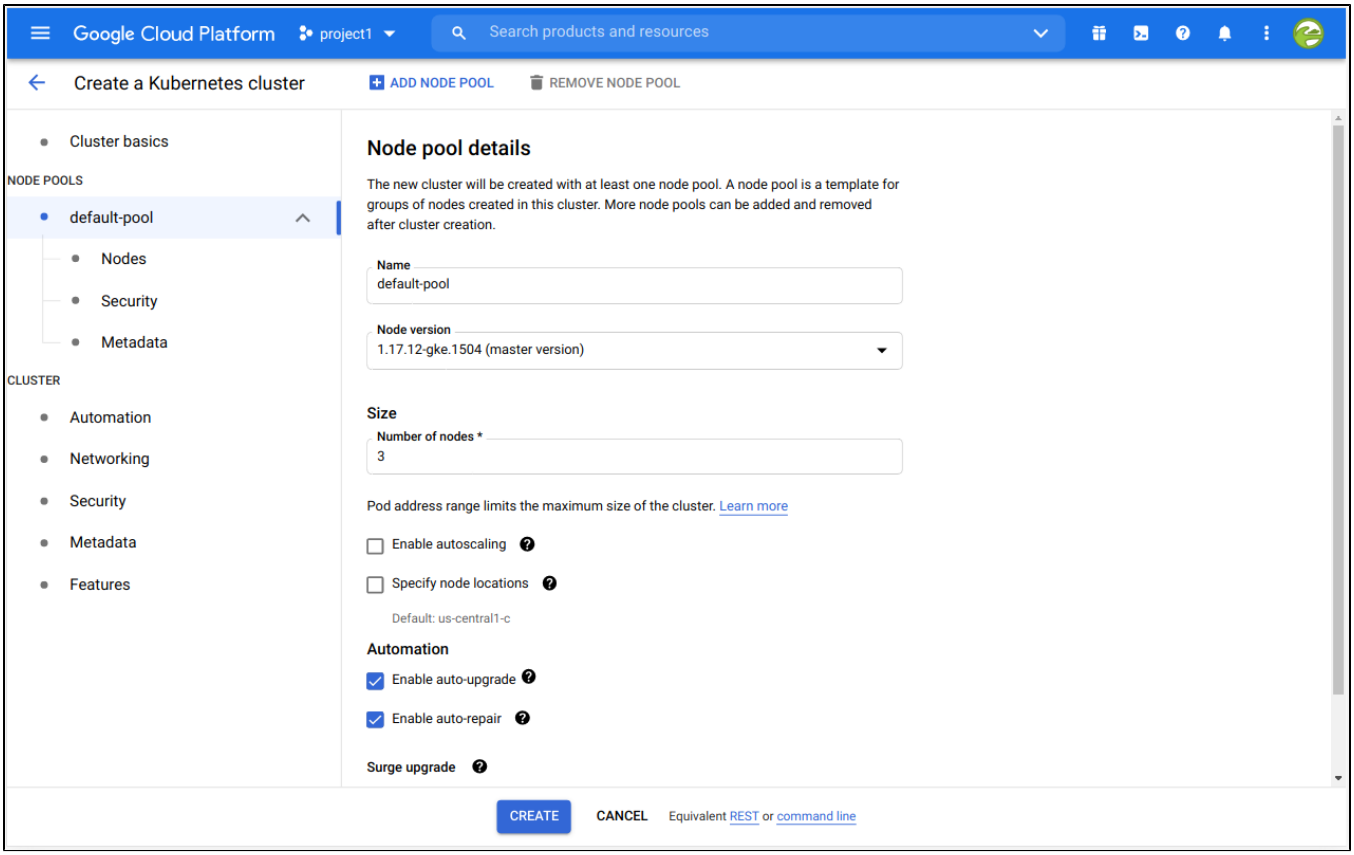
You will be presented with several configuration pages. Adjust the cluster configuration as desired, or just use the default values.

In the **Cluster basics** page, you can configure the name, zone and Kubernetes version for the cluster.

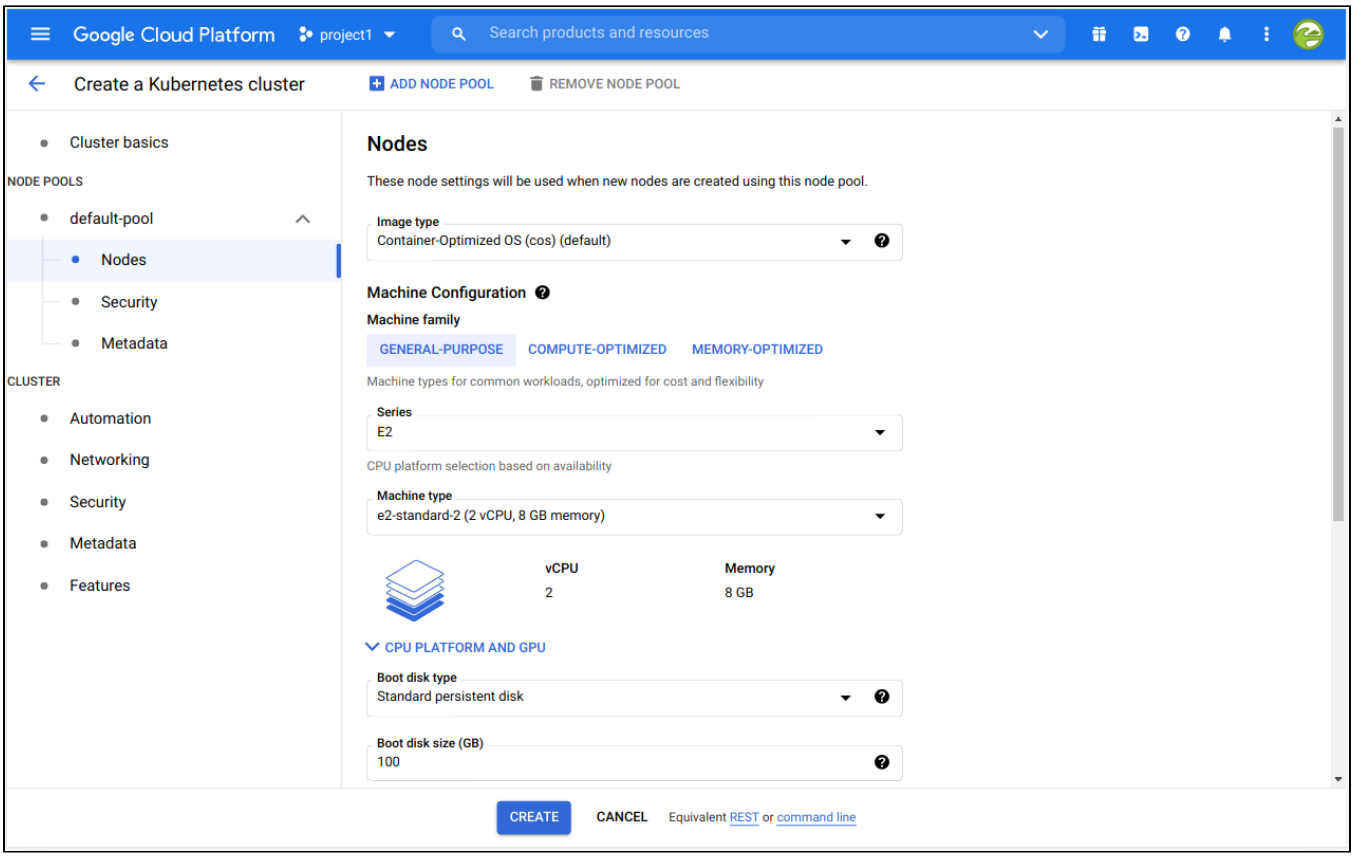
> Do take note of the **Zone** used as this will be used for storage configuration later.



In the **Node Pools** page, you can configure the number of nodes and scaling options.

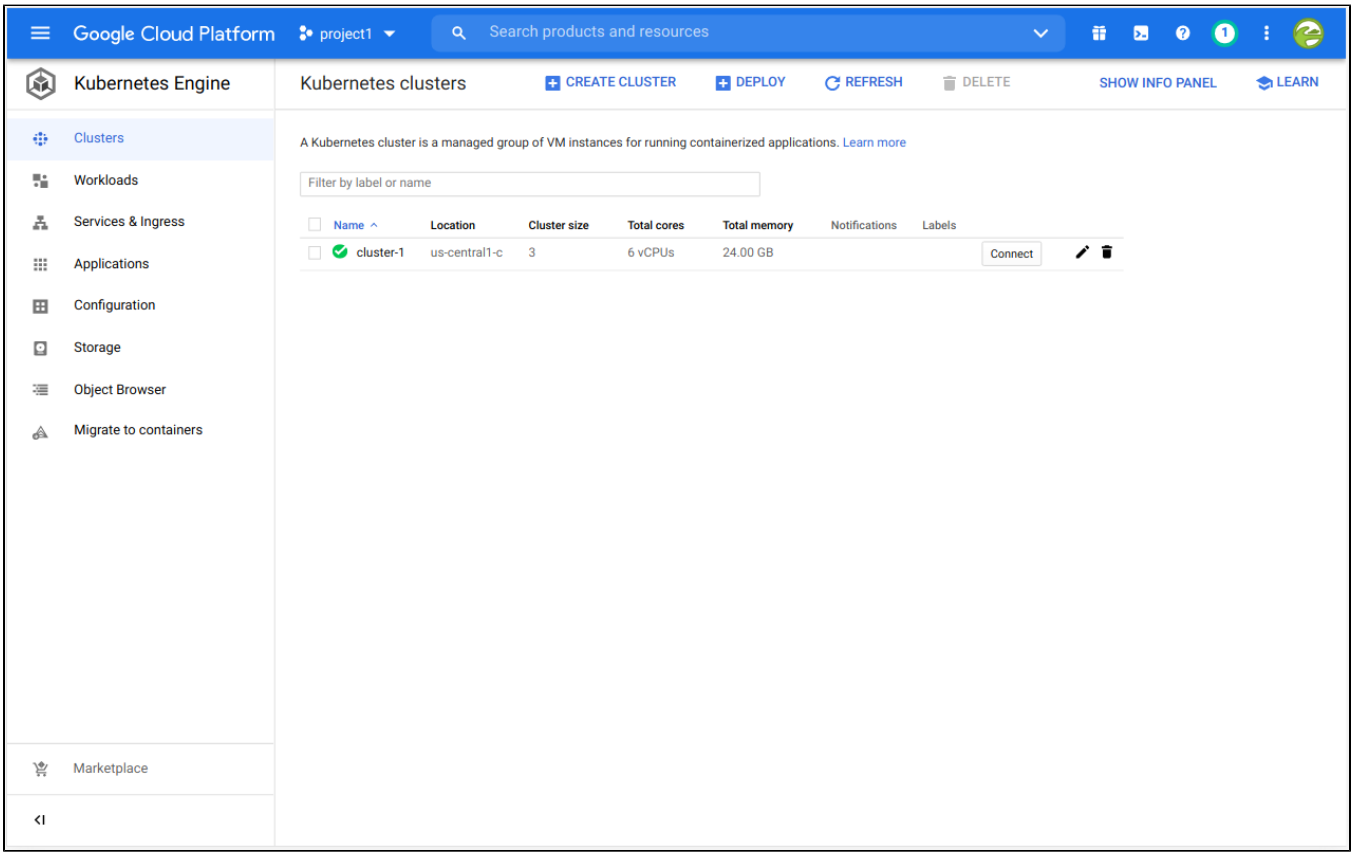


Under the **Nodes** page, you can choose the machine configuration to specify the machine type, CPU and disk options.



Click on the **CREATE** button at the bottom to start creating the cluster.

When the cluster has been created, you will see a tick next to the cluster name, and a **Connect** button will become available.

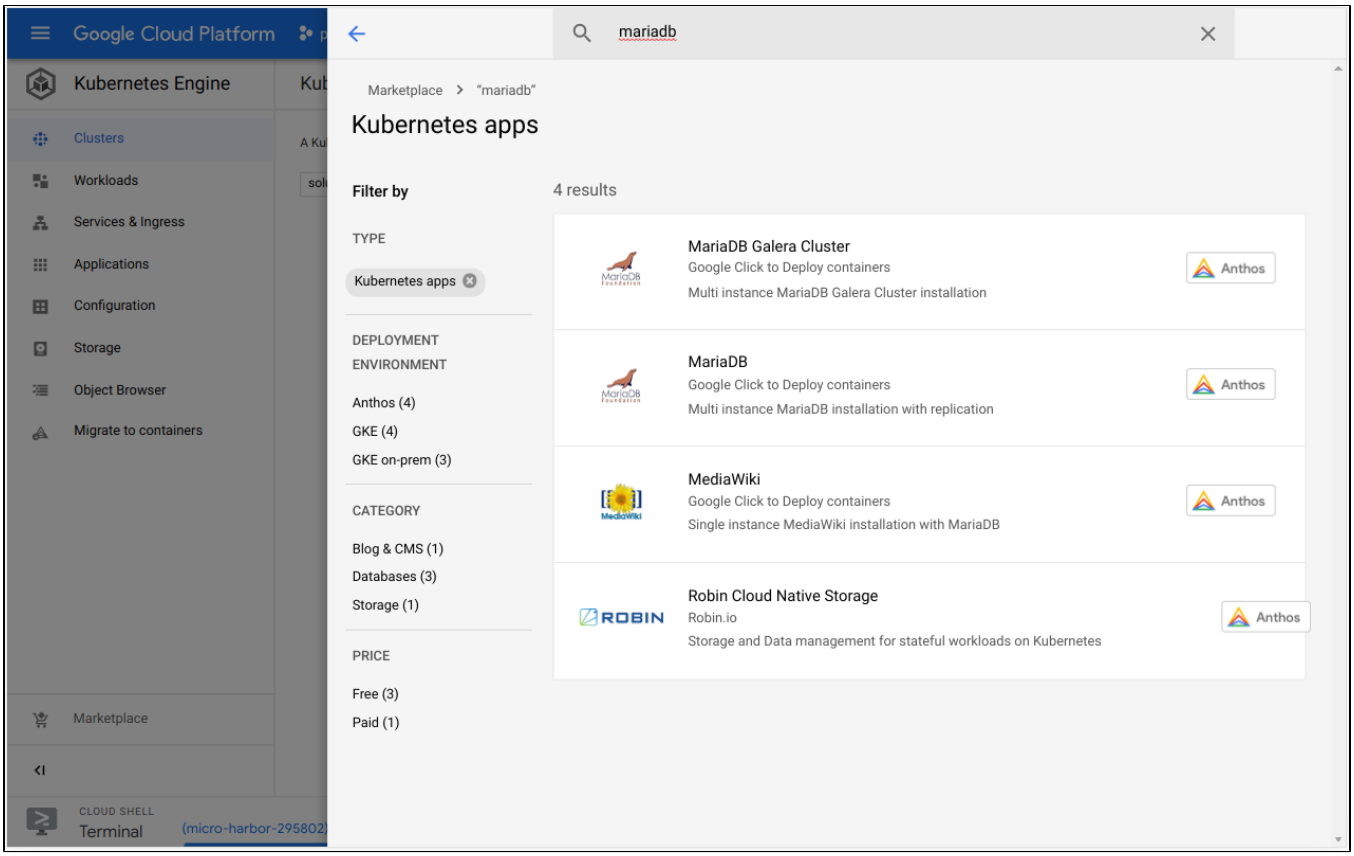


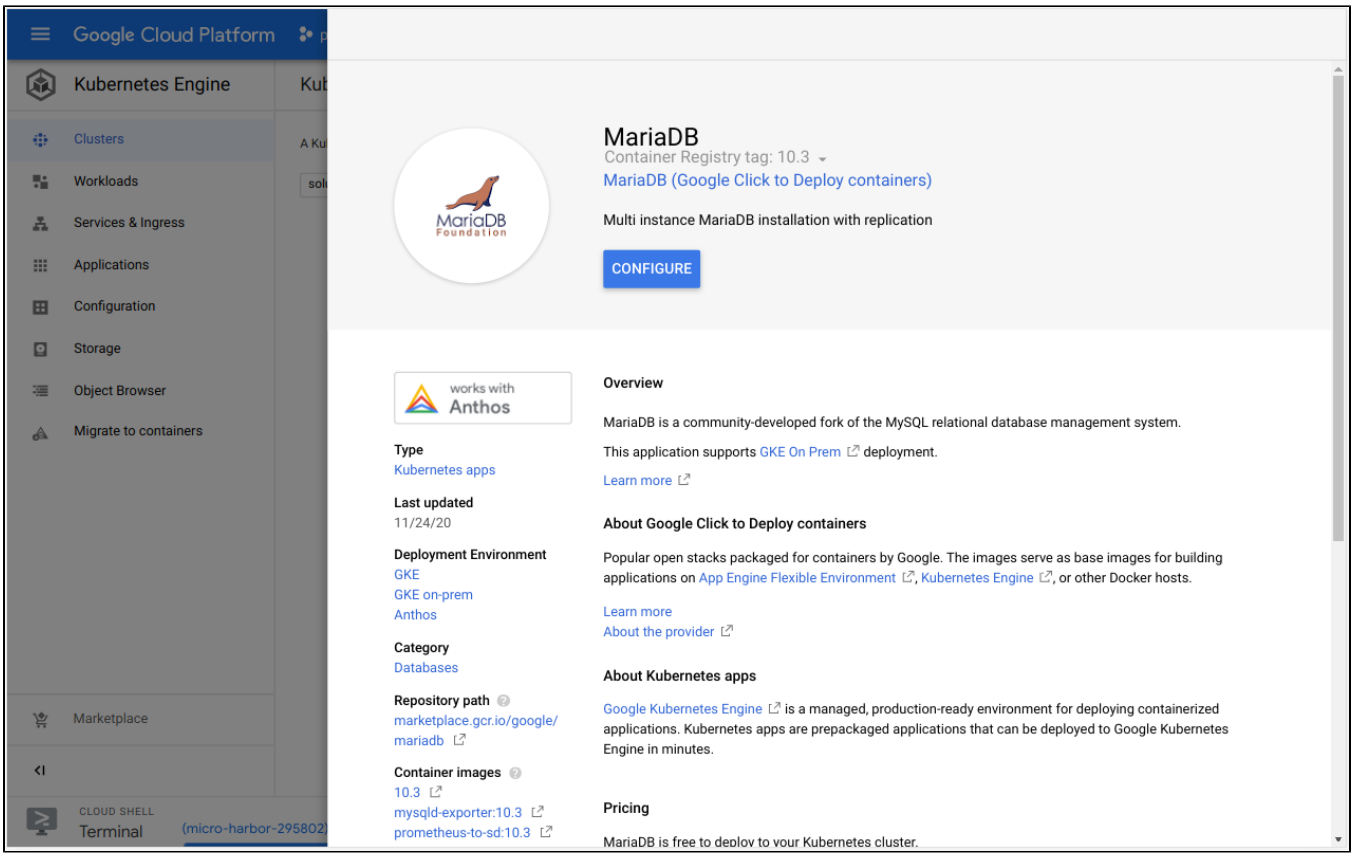
2. Deploy MariaDB Database

Once we have a running cluster, you will need to deploy a database to be used by the Joget platform. In this case, we will use a MariaDB database that is available in the Google Cloud Marketplace.

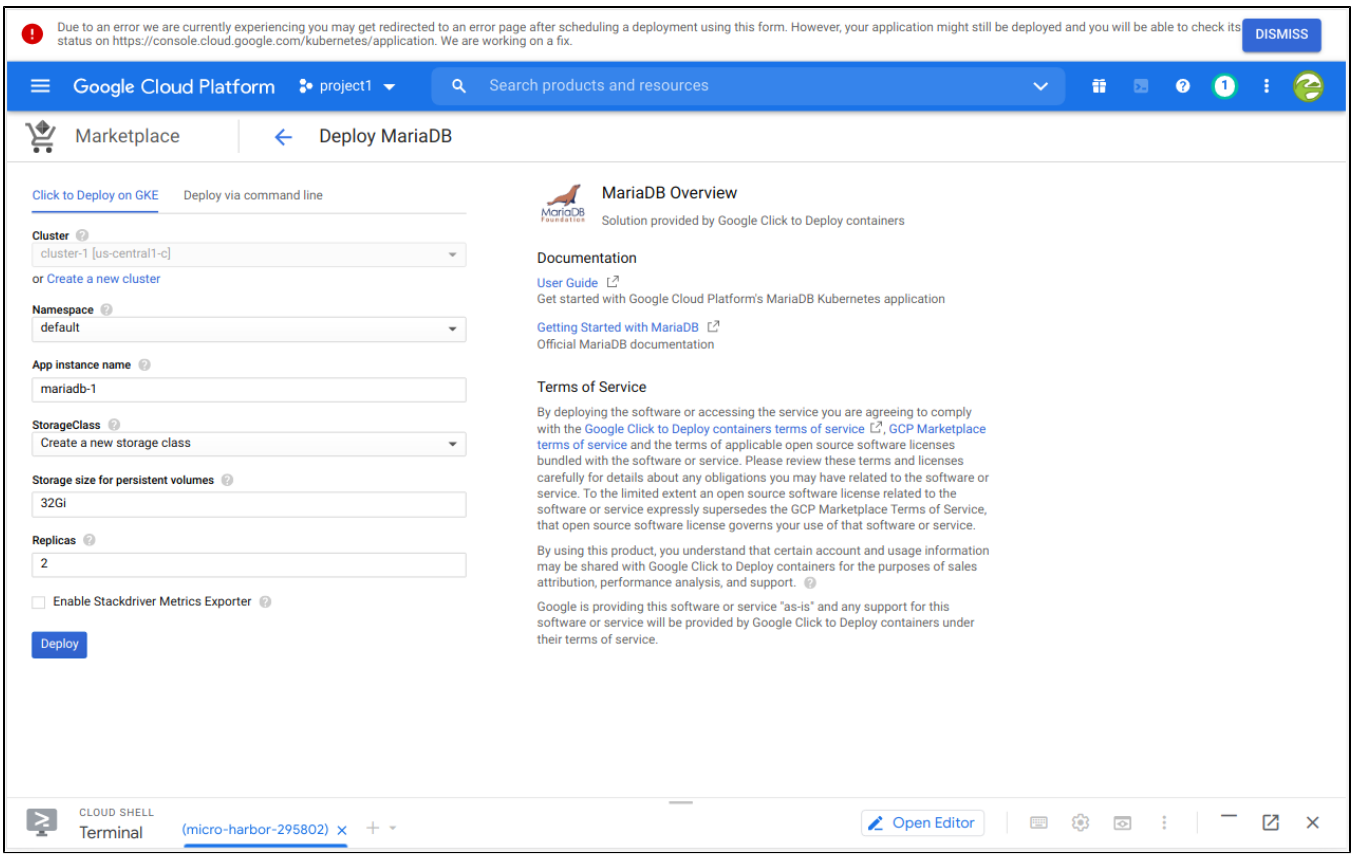
Open the **Applications** page, and click on the **Deploy from Marketplace** button.

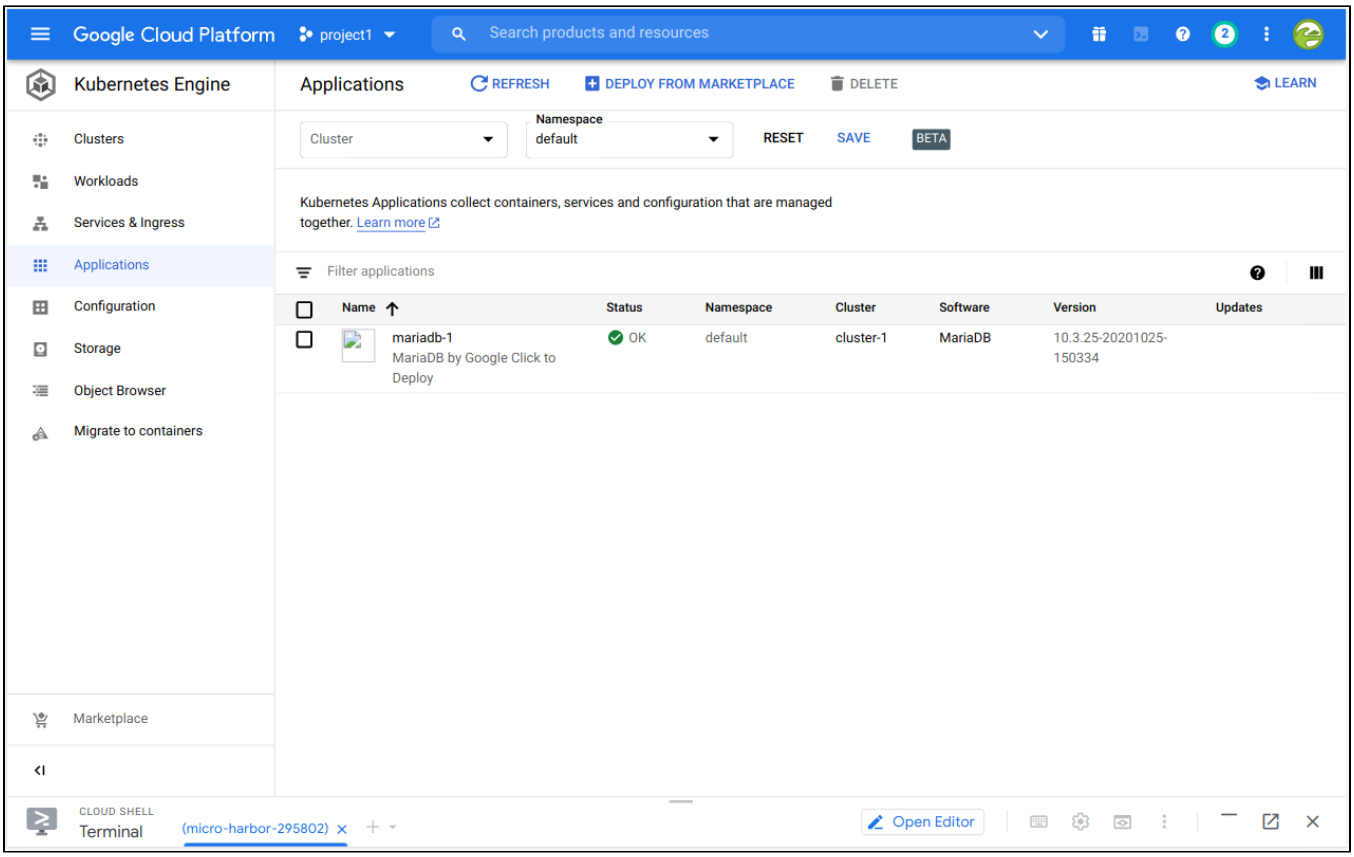
In the **Marketplace**, search for **MariaDB**, click on the **MariaDB** entry and click on the **Configure** button.





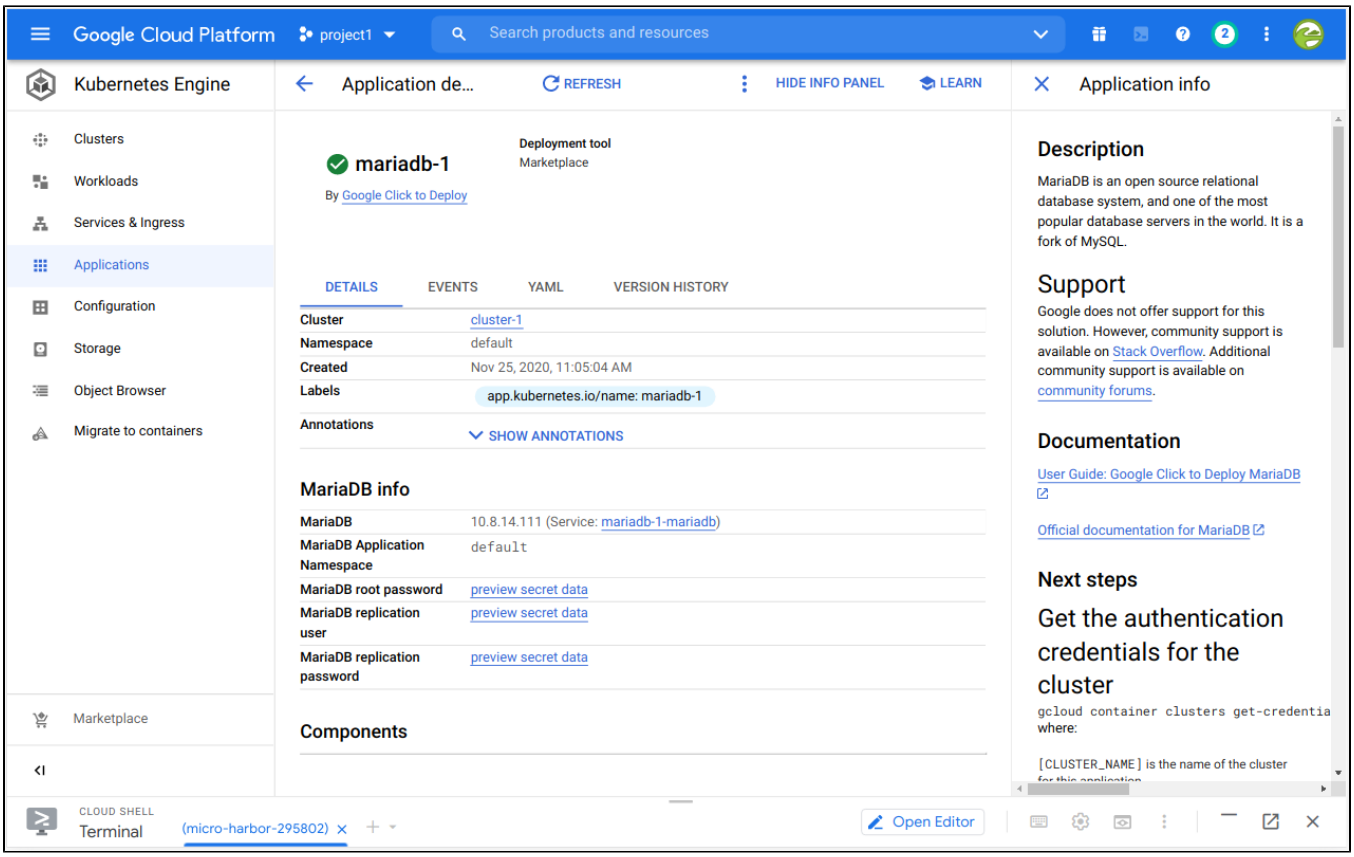
Change the configuration as required, or just use the default values, and click on **Deploy**. Wait for a few minutes while the MariaDB instance is starting.





Once the status is OK, click on the name and view the details. Under **Details**, look for **MariaDB root password** and click on **preview secret data**.

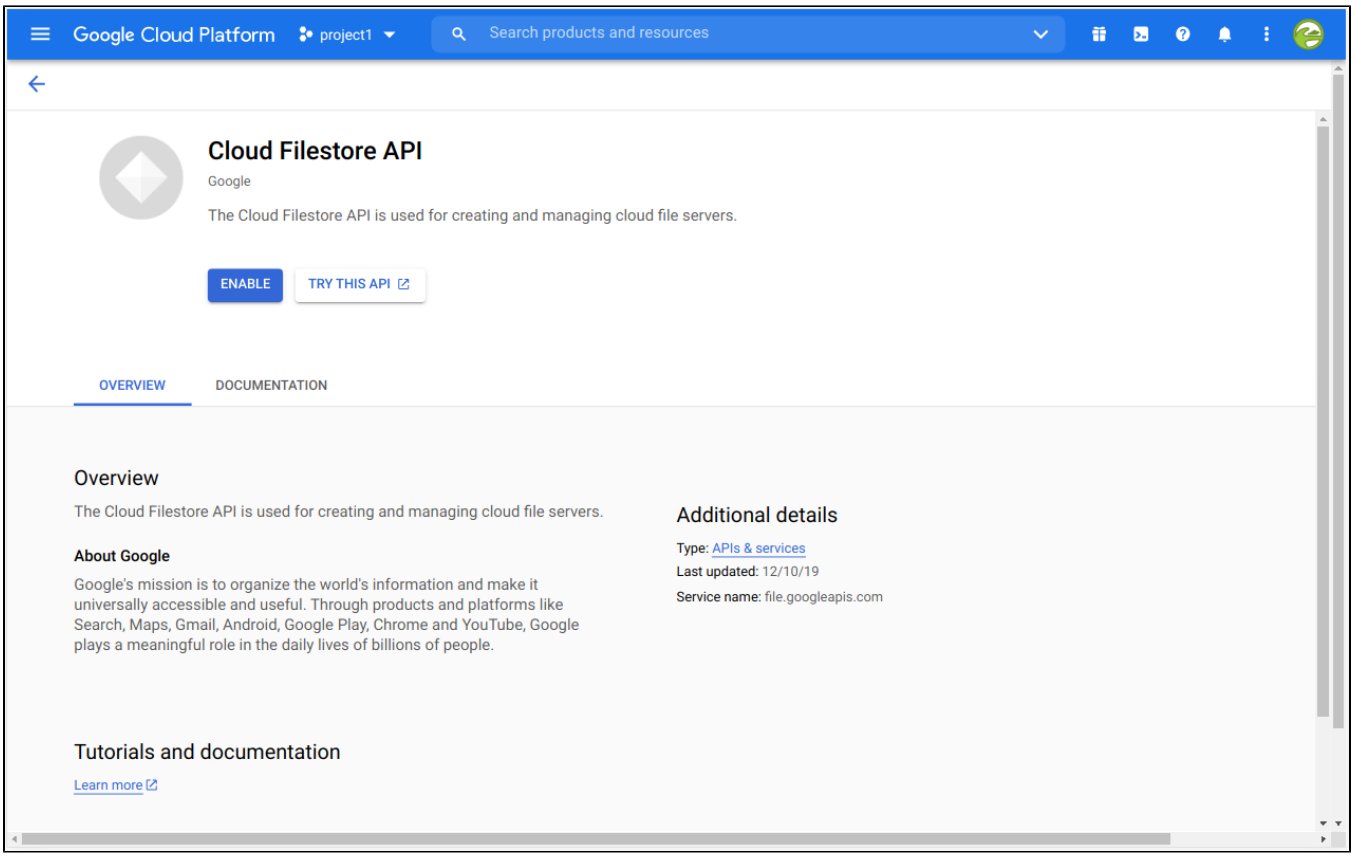
> Copy the **database root password** and **service name** for the database setup later.



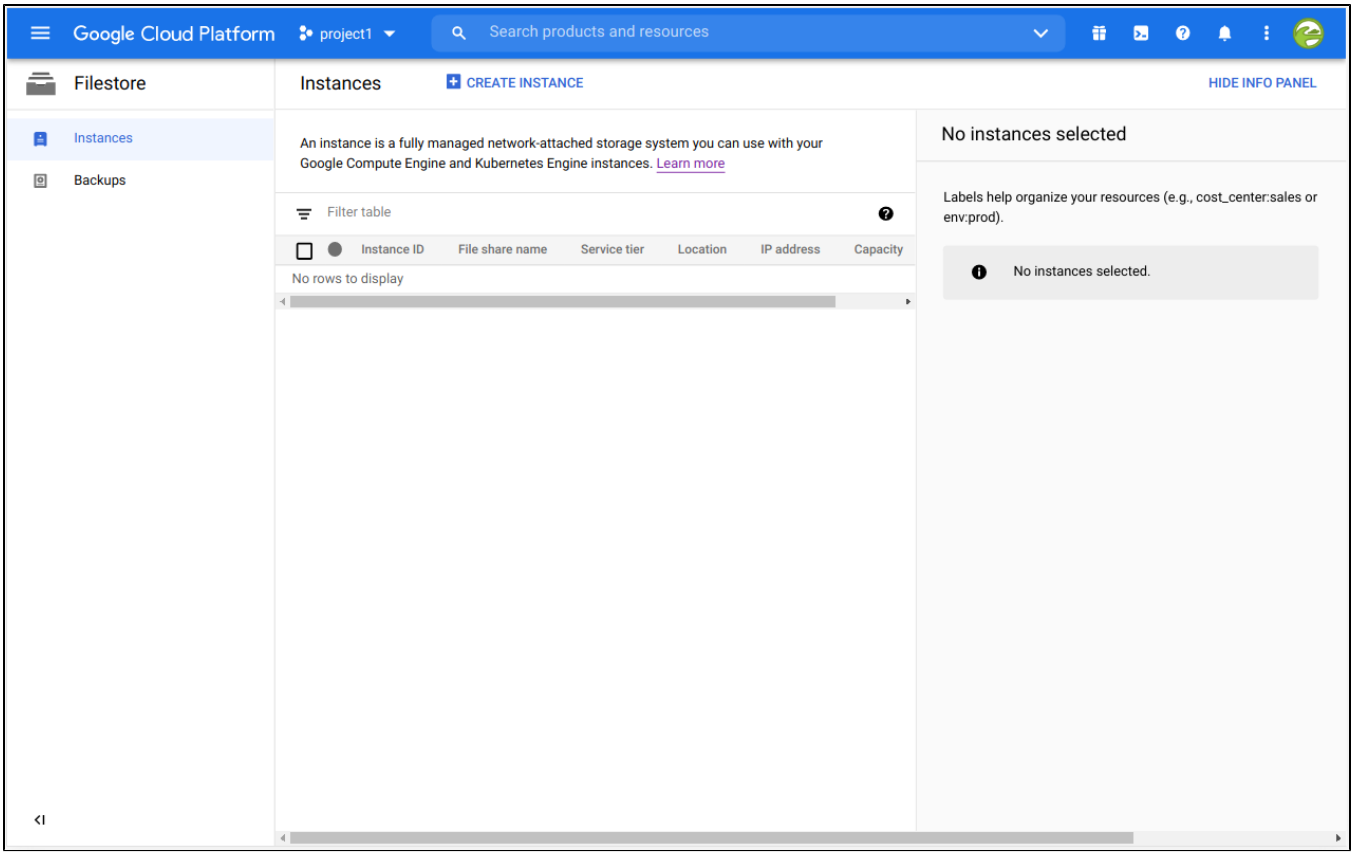
3. Deploy Google Cloud Filestore Persistent Volume

If you are running a multiple node Kubernetes cluster, you will need to allocate shared persistent storage with read write access by multiple nodes. For this purpose, you can use Google Cloud Filestore, a fully managed storage service.

Access the Google Cloud Filestore console. The first time you access it, you will need to click on the **Enable** button.



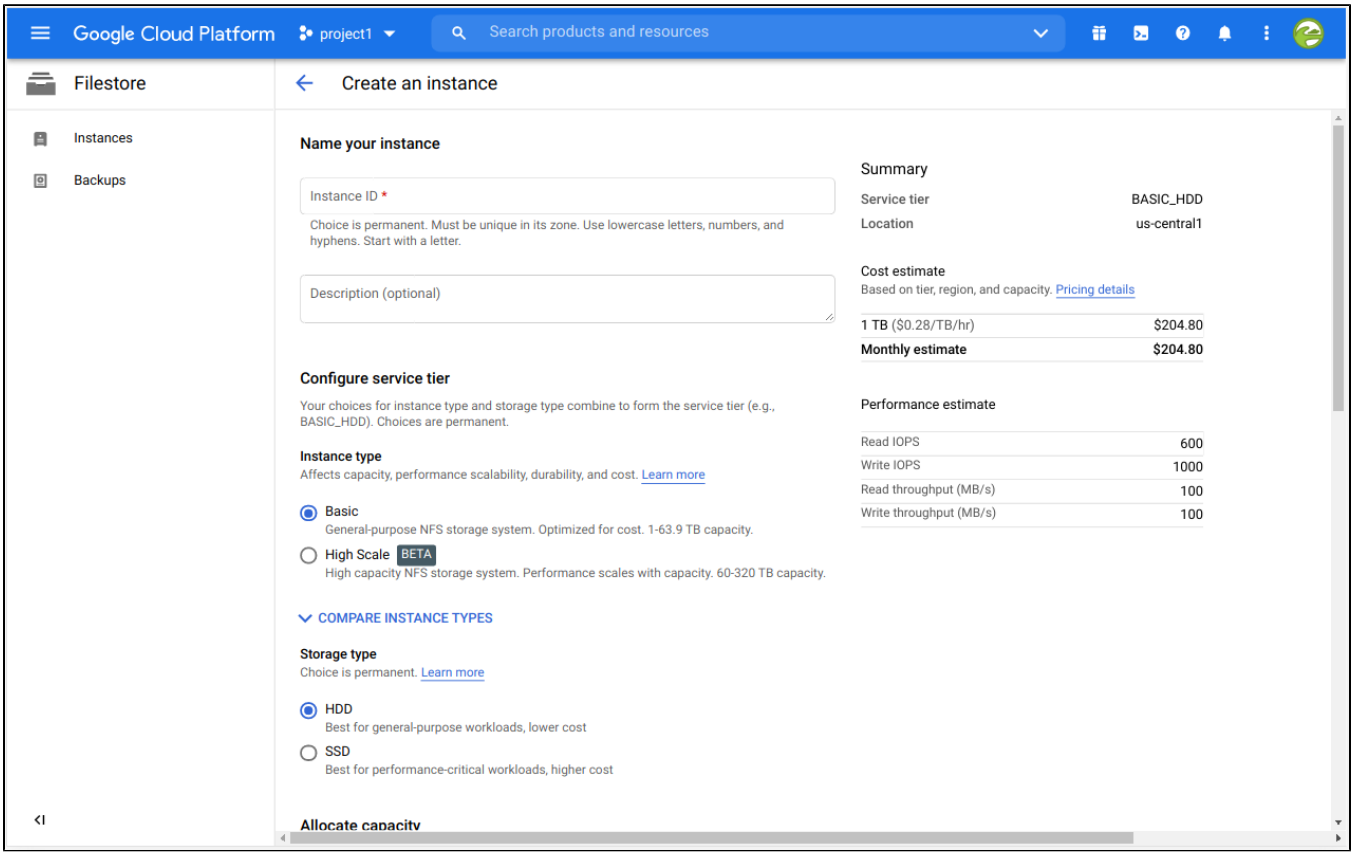
In the Instances page, click on the **Create Instance** button.



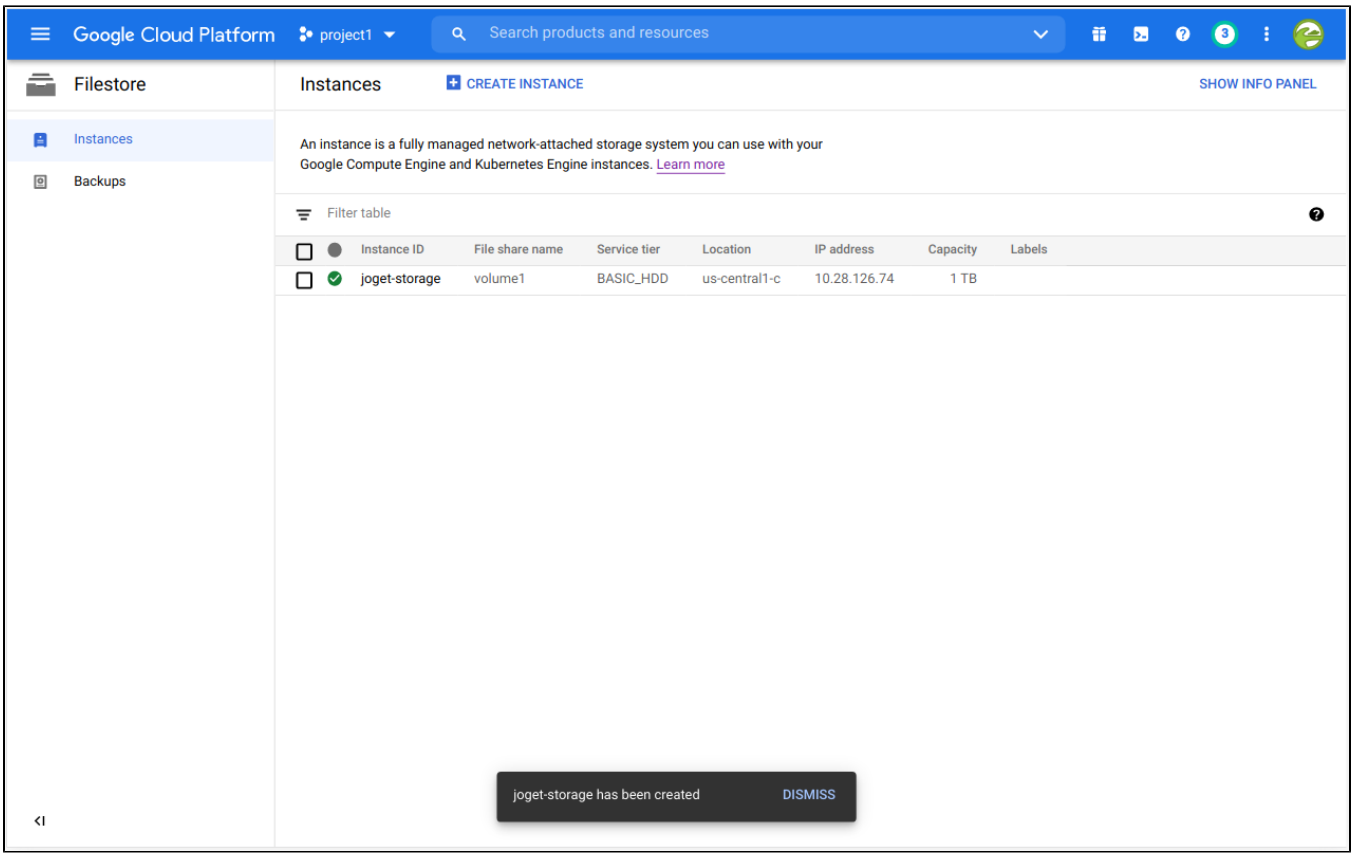
Key in an **Instance ID**, **File share name** and **Region/Zone**, then click on the **Create** button.

Name	Value
Instance ID	joget-storage
File Share Name	volume1

IMPORTANT: You must create the Filestore instance in the **same zone** as your Kubernetes cluster for it to be accessible to the cluster.



Once the instance has been initialized, take note of the IP address and File share name to be used later.



4. Deploy Joget DX

With the prerequisite database and persistent storage available, you can now deploy Joget.

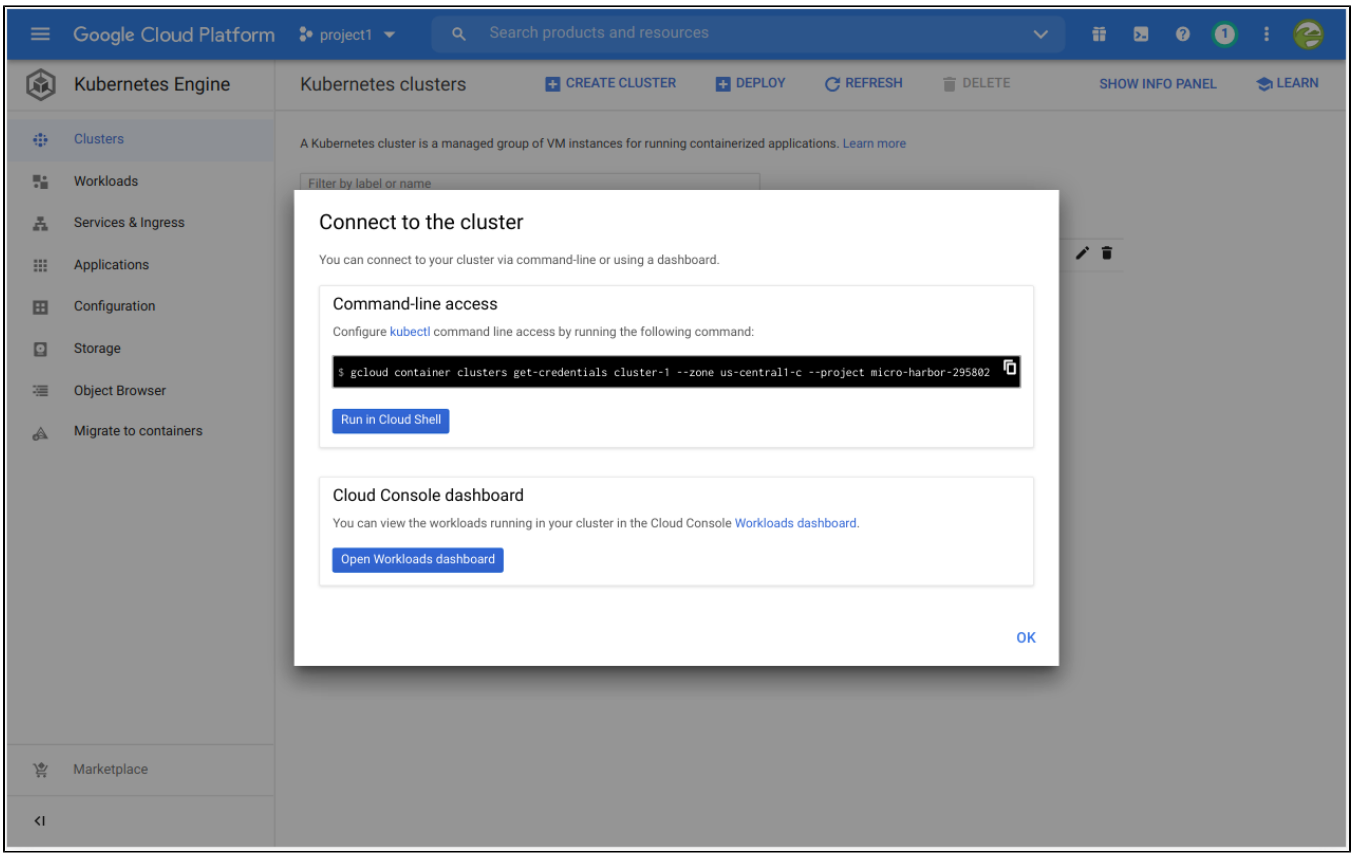
Download the joget-dx7-tomcat9-gke.yaml file below, and modify the PersistentVolume to match the Filestore settings for the **path** (**file share name**) and **server** (**IP address**).

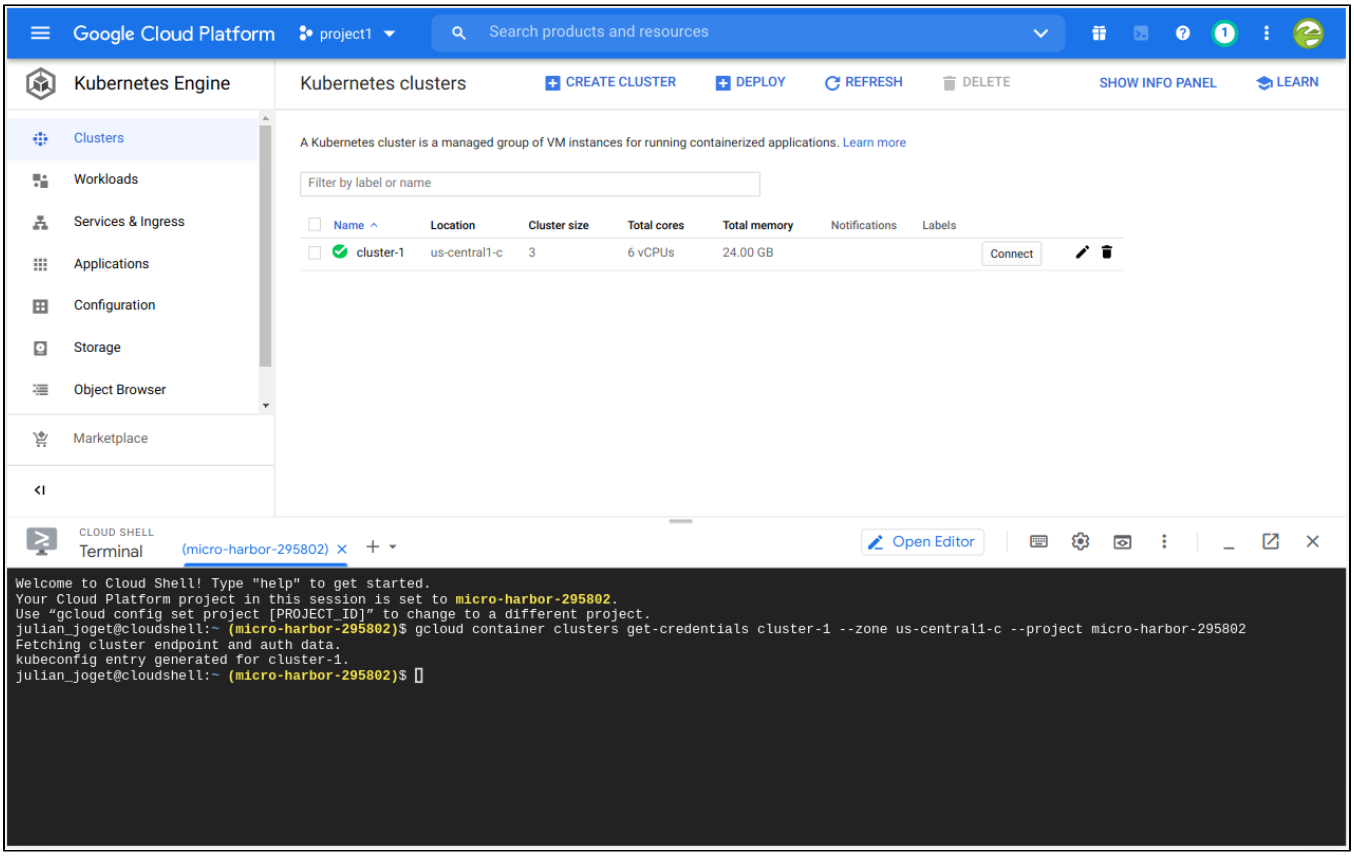
joget-dx7-tomcat9-gke.yaml

```
path: /volume1 # change to match the Filestore instance file share name
server: 10.255.140.178 # change to match the IP address of the Filestore instance
```

You can now use the kubectl command line tool to apply the entire YAML. In GKE, you can run a **Cloud Shell** directly in the browser.

In the GKE **Clusters** page, click on the **Connect** button for your cluster, then **Run in Cloud Shell**.

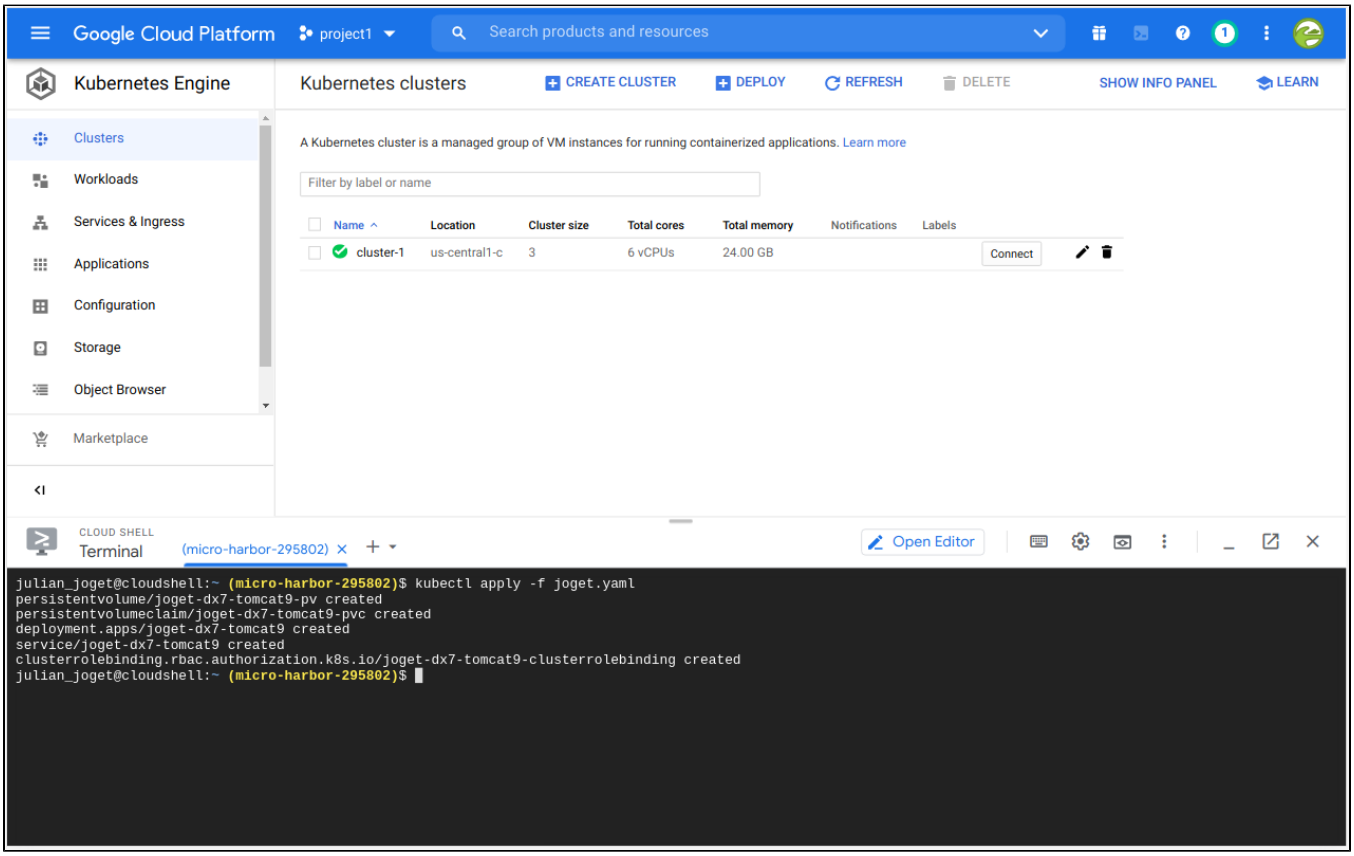




Once you have access to the Cloud Shell command line, use your favourite editor (e.g. **vi** or **nano**) to save your YAML into a file.

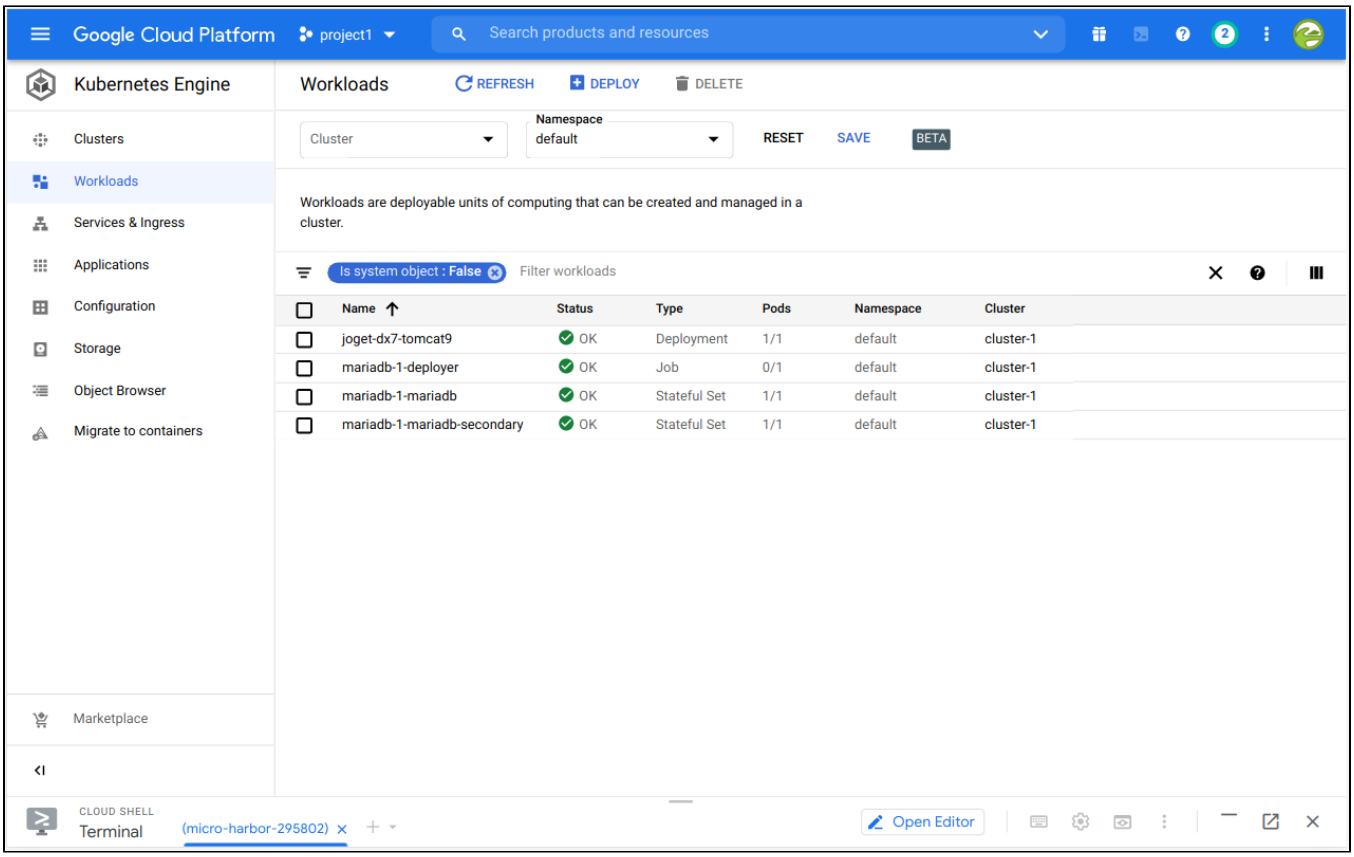
You can then apply the YAML using kubectl e.g.

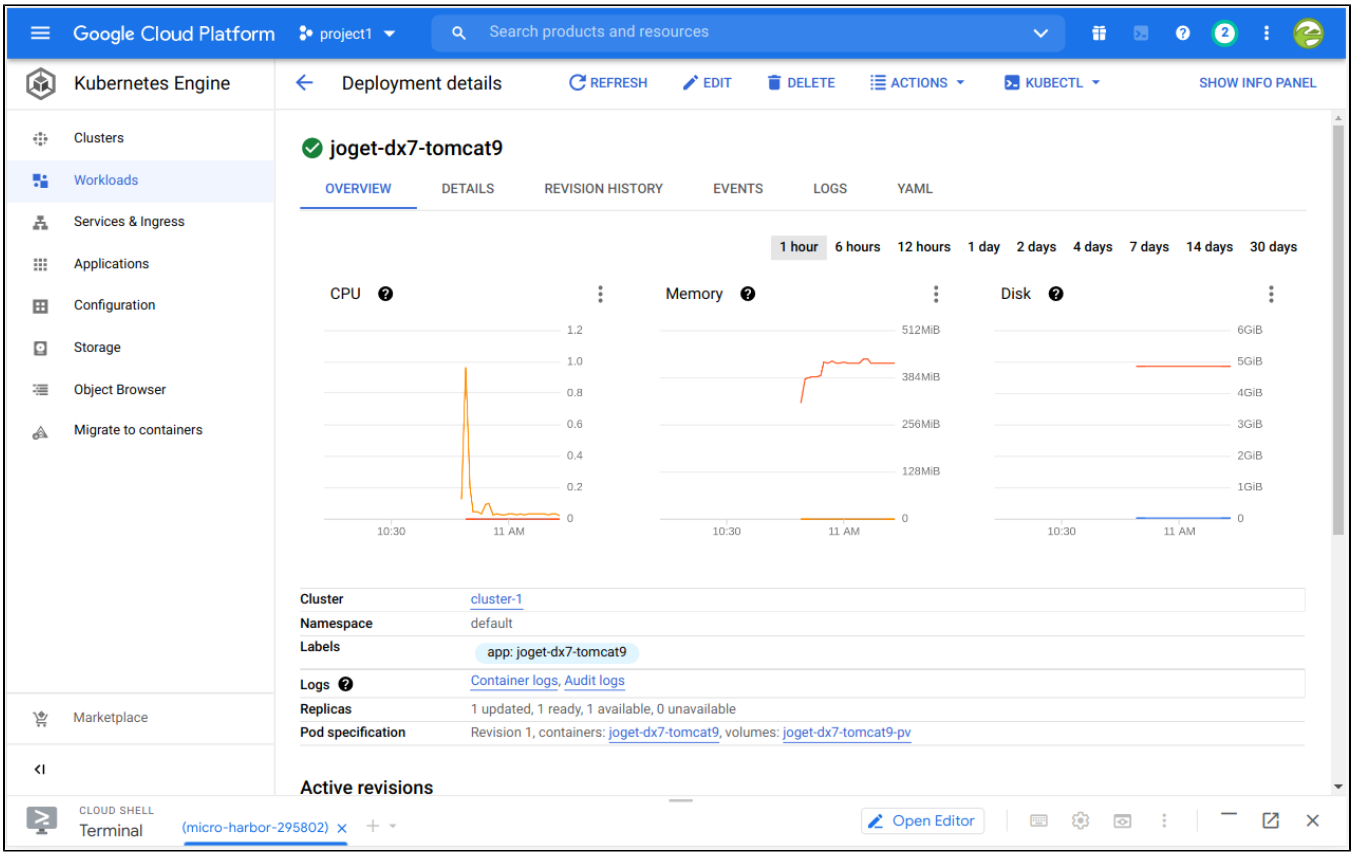
```
kubectl apply -f joget-dx7-tomcat9-gke.yaml
```



Wait for a few minutes while the required Kubernetes objects (Deployment, PersistentVolume, PersistentVolumeClaim, Deployment, Service and ClusterRoleBinding) are created for the Joget deployment.

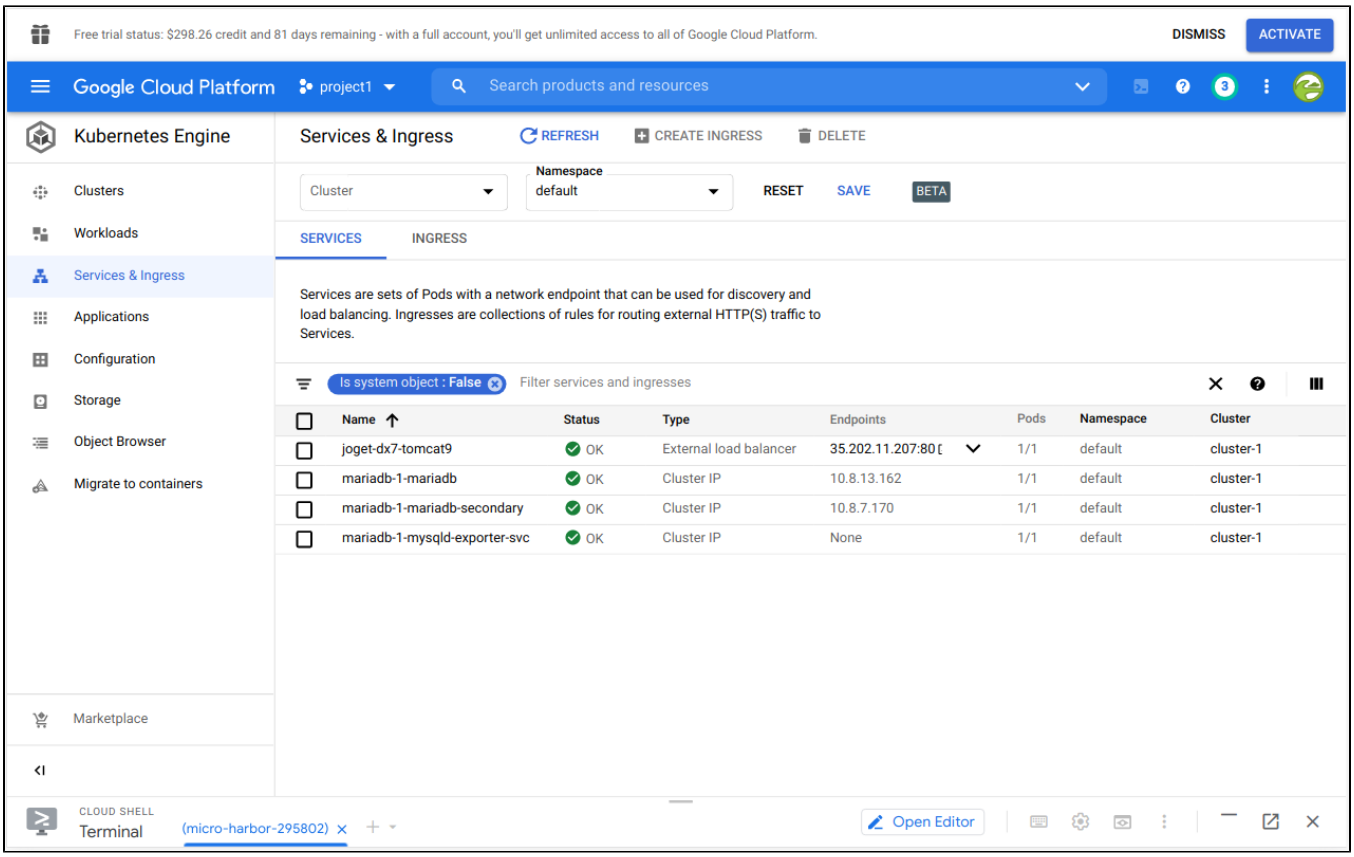
You can view the deployment in the **Workloads** page in the GKE console.





In the **Services & Ingress** page, you can see an **External load balancer** service with a corresponding **Endpoint** URL.

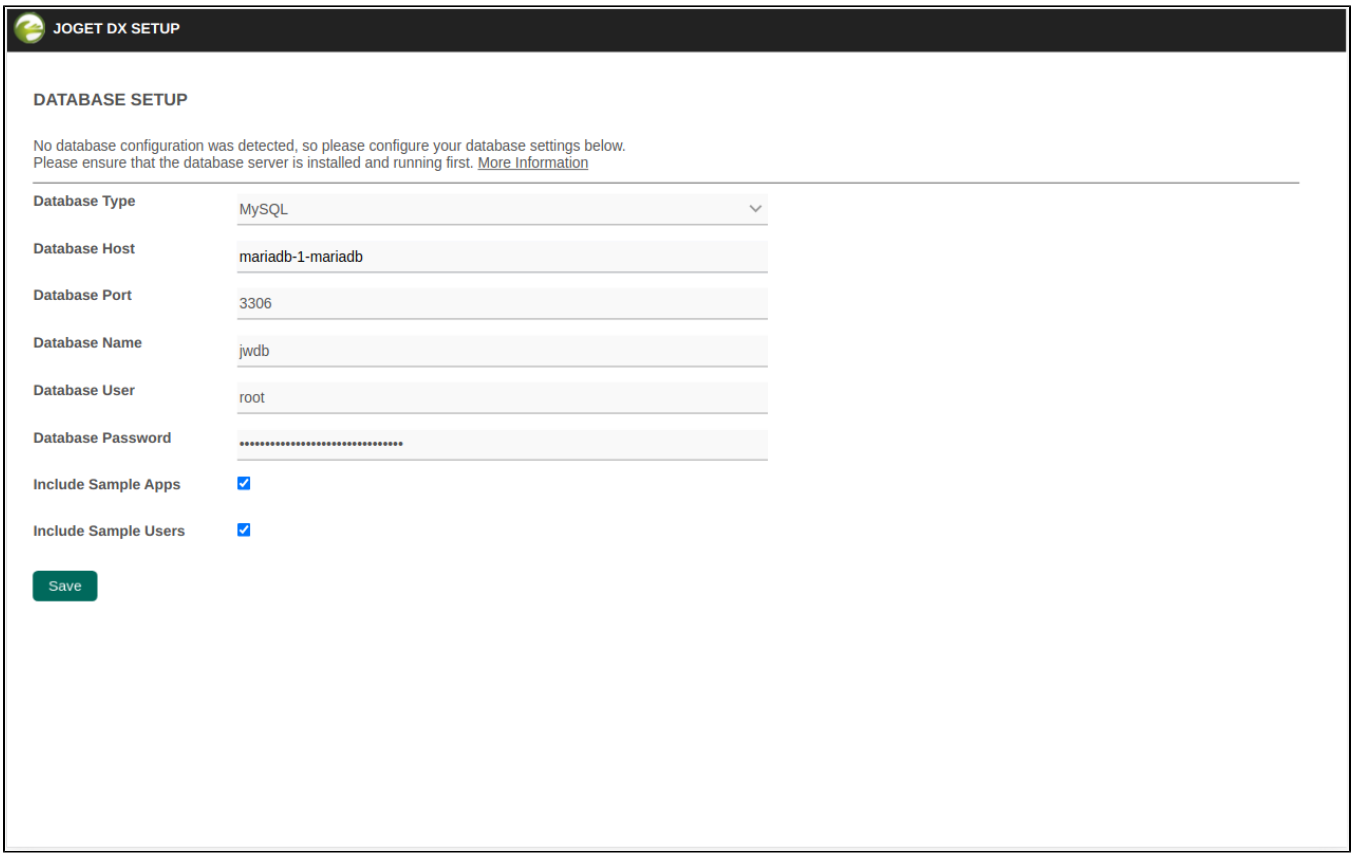
Click on that **Endpoint** URL to access Joget.



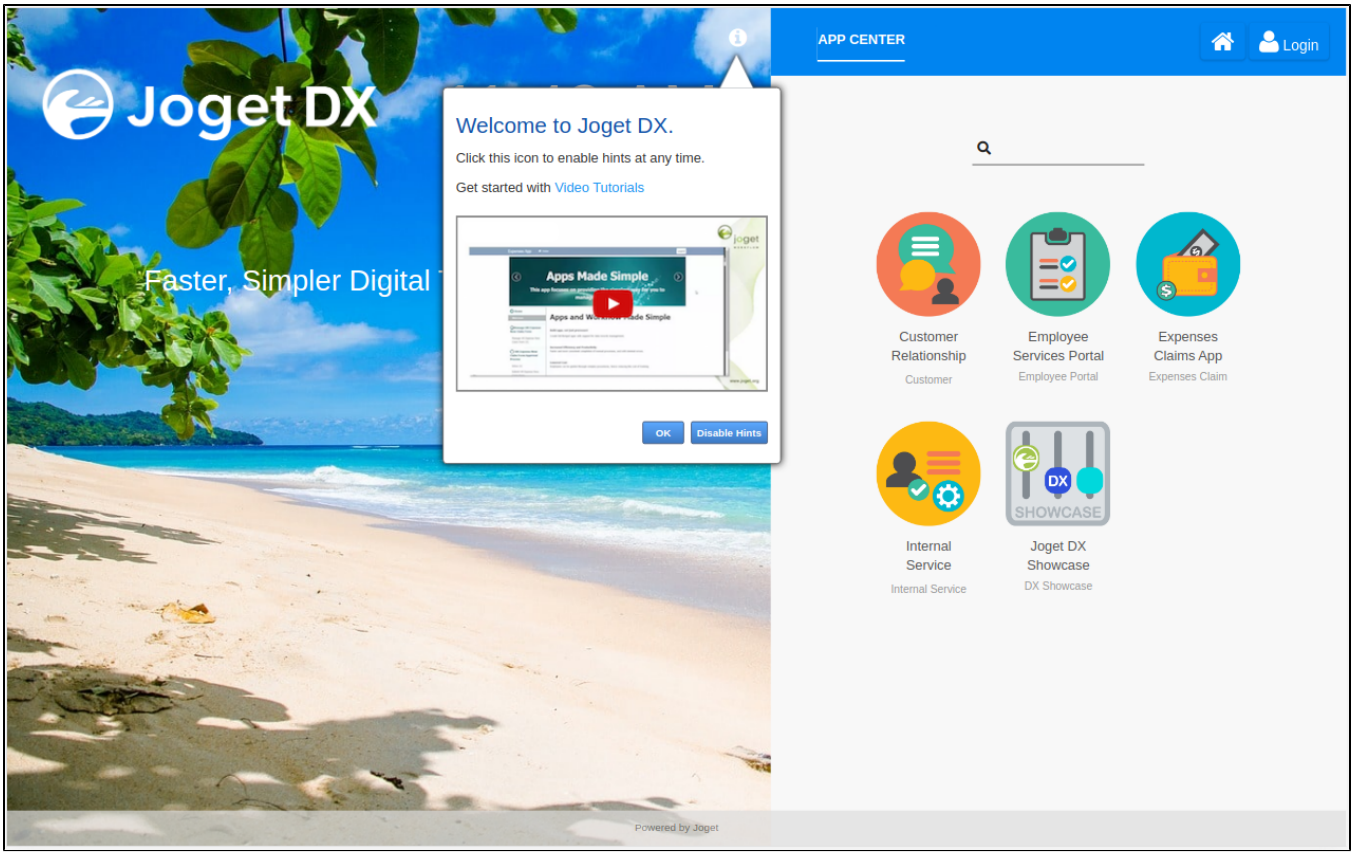
5. Setup Database

To complete the Joget deployment, you need to perform a one-time Database Setup.

Key in the previously created MariaDB **service name** in the **Database Host**, and the **root password** in the **Database Password** fields. Click on **Save**.



Once the setup is complete, click on **Done** and you will be brought to the Joget App Center.

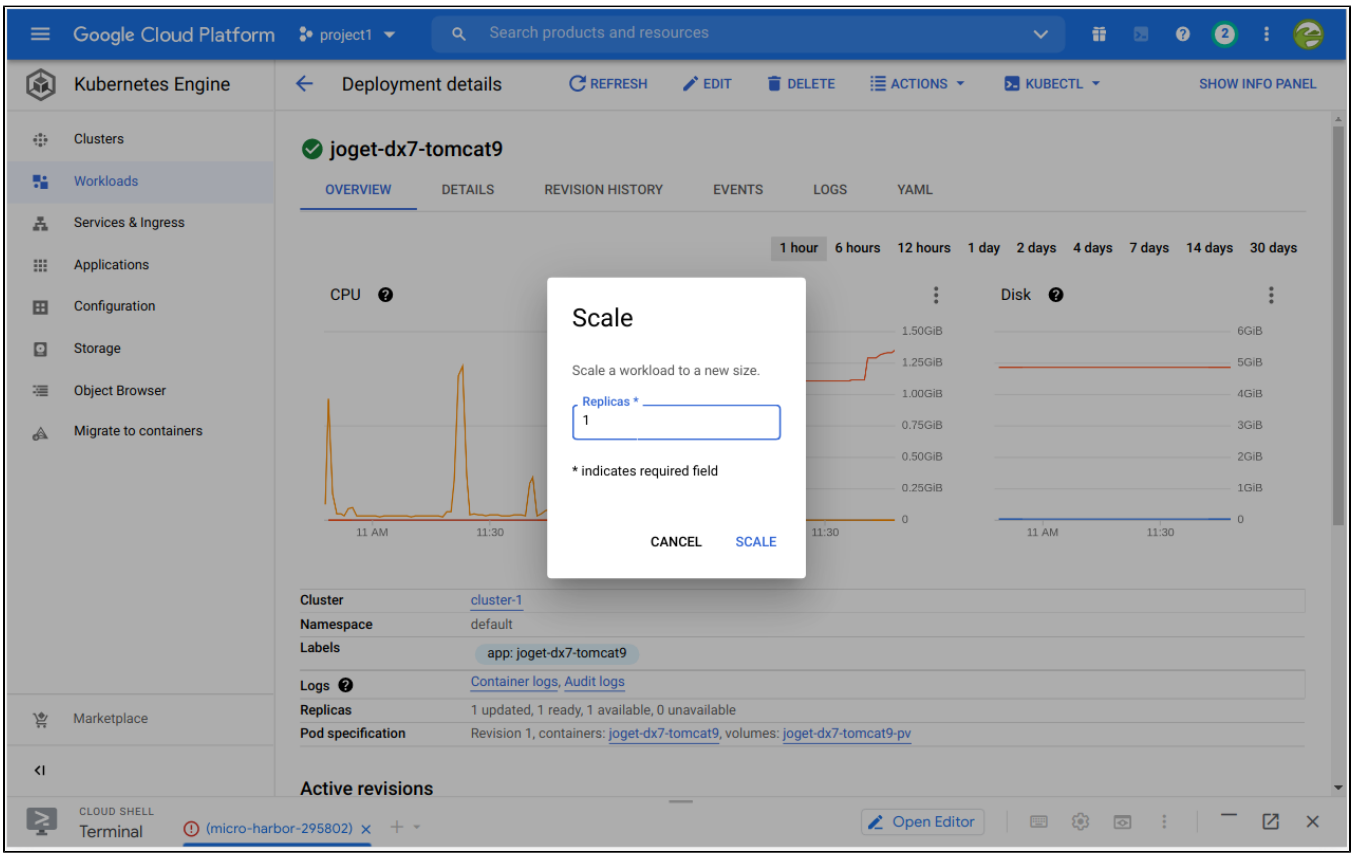


6. Scale Deployment

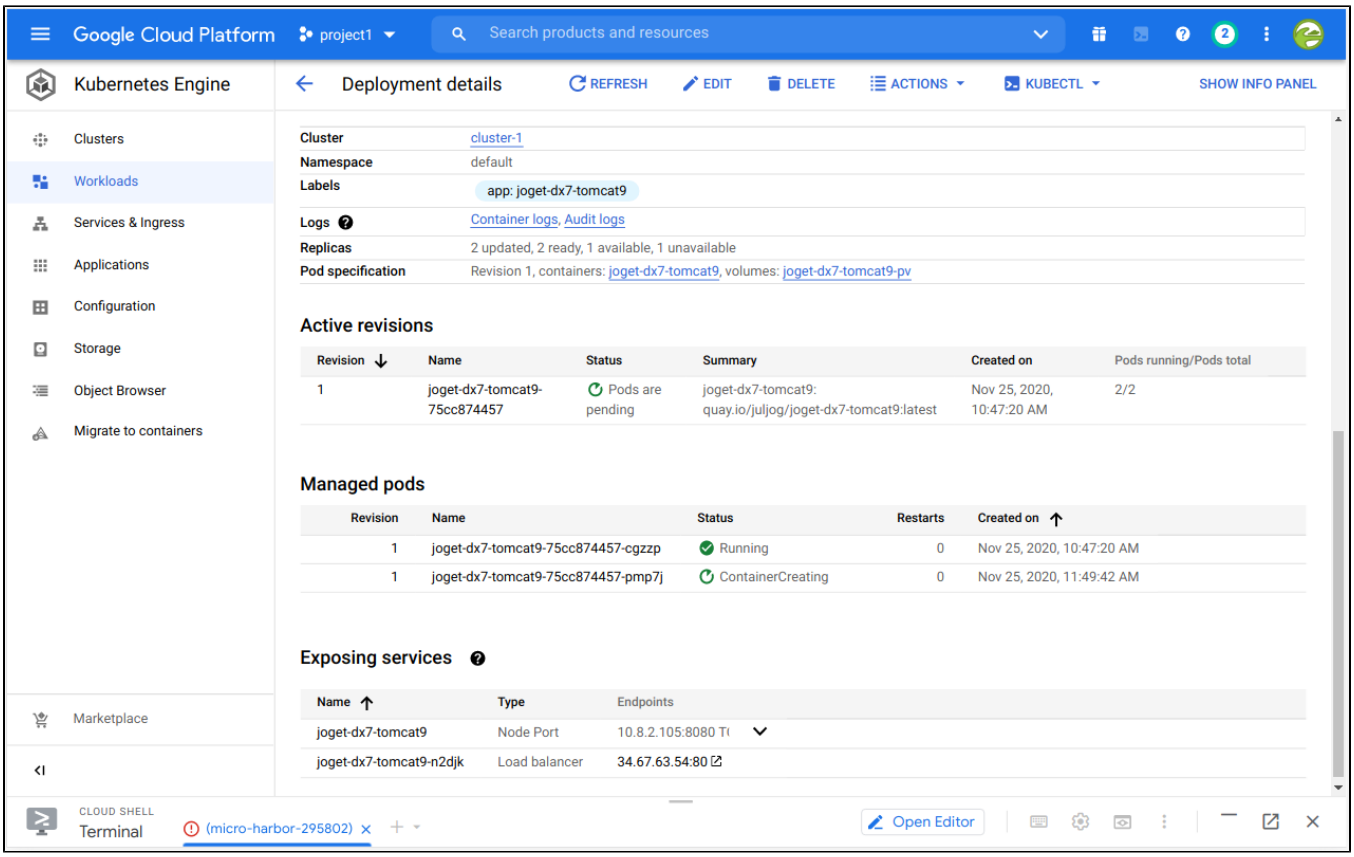
To scale the number of pods running Joget, you can use the GKE console.

In the **Workloads** page, choose the Joget deployment and in the **Deployment details** header, select **Actions** > **Scale**.

Key in the required number of replicas (pods) that you require and click on the **Scale** button.



The desired number of pods will initialize and startup. These instances will have session replication configured, so load can be balanced between them and transparent failover will happen in the event of failure.



Sample Deployment YAML

```
# Example YAML for Google Kubernetes Engine (GKE) deployment using Google Cloud Filestore as persistent volume
# https://cloud.google.com/filestore/docs/accessing-fileshares
---
apiVersion: v1
kind: PersistentVolume
metadata:
  name: fileserver
spec:
  capacity:
    storage: 1Ti
  accessModes:
  - ReadWriteMany
  nfs:
    path: /volume1 # change to match the Filestore instance file share name
    server: 10.145.99.42 # change to match the IP address of the Filestore instance
---
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: joget-dx7-tomcat9-pvc
spec:
  accessModes:
    - ReadWriteMany
  storageClassName: ""
  volumeName: fileserver
  resources:
    requests:
      storage: 100Gi
---
apiVersion: apps/v1
kind: Deployment
```

```yaml
metadata:
  name: joget-dx7-tomcat9
  labels:
    app: joget-dx7-tomcat9
spec:
  replicas: 1
  selector:
    matchLabels:
      app: joget-dx7-tomcat9
  template:
    metadata:
      labels:
        app: joget-dx7-tomcat9
    spec:
      volumes:
        - name: joget-dx7-tomcat9-pv
          persistentVolumeClaim:
            claimName: joget-dx7-tomcat9-pvc
            readOnly: false
      initContainers:
        - name: init-volume
          image: busybox:1.28
          command: ['sh', '-c', 'chmod -f -R g+w /opt/joget/wflow; exit 0']
          volumeMounts:
            - name: joget-dx7-tomcat9-pv
              mountPath: "/opt/joget/wflow"
      containers:
        - name: joget-dx7-tomcat9
          image: jogetworkflow/joget-dx7-tomcat9:latest
          ports:
            - containerPort: 8080
          volumeMounts:
            - name: joget-dx7-tomcat9-pv
              mountPath: /opt/joget/wflow
          env:
            - name: KUBERNETES_NAMESPACE
              valueFrom:
                fieldRef:
                    fieldPath: metadata.namespace
---
apiVersion: v1
kind: Service
metadata:
  name: joget-dx7-tomcat9
  labels:
    app: joget-dx7-tomcat9
spec:
  ports:
  - name: http
    port: 80
    targetPort: 8080
  - name: https
    port: 443
    targetPort: 9080
  selector:
    app: joget-dx7-tomcat9
  type: LoadBalancer
---
apiVersion: rbac.authorization.k8s.io/v1
kind: ClusterRoleBinding
metadata:
  name: joget-dx7-tomcat9-clusterrolebinding
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: ClusterRole
  name: view
subjects:
  - kind: ServiceAccount
    name: default
    namespace: default
```