FILL IN : Lab 3

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Questions from the lab

*In the lab assignment, you’ll see several questions in red boxes. Paste those questions and their respective answers below. Make sure your answer is concise and well-formatted. You may submit this as e.g. a screenshot of a filled-out cell in a copy of the Notion document (e.g. with code, so that code formatting is maintained).*

**3.0 Kubernetes setup**

*k3d version v5.8.3*

*k3s version v1.31.5-k3s1 (default)*

Kubectl Client Version: v1.32.2

Kubectl Kustomize Version: v5.5.0

**Q1 :** Which command did you use to create a cluster with 1 control-plane and 3 workers, using the config file.

**A1 :** k3d cluster create --config k3d.config

**Kubectl commands:**

* **kubectl config get-contexts**
* **kubectl config use-context k3d-k3s-default**
* **kubectl cluster-info**
* **kubectl get nodes**
* **kubectl get pods --all-namespaces**
* **Everything runs and is as expected**

**Q2 :** What's the command to set the default namespace in kubectl?

**A2 :** kubectl config set-context --current --namespace=howest-fastapi-ls

* kubectl create namespace howest-fastapi-ls

**3.1 Kubernetes Basic**

**Q3 :** Paste your updated YAML file for the deployment and service below

**A3 :**

* **deployment-vue-docker.yaml**
* apiVersion: apps/v1
* kind: Deployment
* metadata:
* name: vue-docker
* namespace: howest-fastapi-ls # Replace with your namespace name
* spec:
* replicas: 1
* selector:
* matchLabels:
* app: vue-docker # Ensures the deployment matches pods with this label
* template:
* metadata:
* labels:
* app: vue-docker # This label will be applied to each pod created by the deployment
* spec:
* containers:
* - name: vue-container
* image: spartanroyalty/docker-new-frontend:latest
* ports:
* - containerPort: 5000
* **svc-vue-docker.yaml**
* apiVersion: v1
* kind: Service
* metadata:
* name: svc-vue-docker
* namespace: howest-fastapi-ls
* spec:
* selector:
* app: vue-docker
* ports:
* - protocol: TCP
* port: 5000
* targetPort: 5000
* type: ClusterIP

**Q4 :** Why do we need the service? Can't we just access the pod directly?

**A4 :** Pod IPs are dynamic and can change if the pod is restarted or rescheduled.

* Services allow you to access your app using a consistent DNS name or IP, regardless of which pod is running.
* Services can load-balance traffic across multiple pod replicas.

**Q3 :** Which Kubernetes component(s) is/are the one(s) responsible for creating these Pods?

**A3 :** The Deployment is the Kubernetes component responsible for creating and managing the Pods in your example.  
The Deployment instructs the ReplicaSet to create and maintain the desired number of Pod replicas.  
So, both the Deployment and its underlying ReplicaSet are responsible for creating the Pods.

**Q4 :** What did you add to the YAML file to specify the nodes where the vue-docker application should run on? TIP: You can use the NodeLabel kubernetes.io/hostname

**A4 :**

**spec:**

      affinity:

        nodeAffinity:

          requiredDuringSchedulingIgnoredDuringExecution:

            nodeSelectorTerms:

              - matchExpressions:

                  - key: kubernetes.io/hostname

                    operator: In

                    values:

                      - k3d-k3s-default-agent-0

      containers:

        - name: vue-container

          image: spartanroyalty/docker-new-frontend:latest

          ports:

            - containerPort: 5000

**Q5 :** Where can you find the logs?

* In the Dashboard?
* Using the kubectl command line?

**A5 :**

* **In the Dashboard:**
  + Go to the "Pods" section, select your pod, and click on the "Logs" tab to view the logs for that pod.
* **CMD**
  + kubectl logs <pod-name> -n <namespace>
  + kubectl logs nginx-app-7df7b66fb5-8c8zh -n howest-fastapi-ls

**Q6 :** What value should you configure in the MYSQL\_HOST variable?

**A6 :** MYSQL\_HOST=mariadb

Questions to answer for every lab

**What did you learn?**

*Fill in your three take aways that you learned during this lesson.*

1. You can use NodePorts to link (Services).
2. Kubernetes Dashboard to check logs and other info.
3. Using Secrets to get rid of visible passwords.

**Givethree interesting exam questions about the contents of the lab and/or the theory**.

*Thinking about this will make sure you remember the key take-aways and important details better and longer.*

1. How do you view the logs of a running Pod using the kubectl command line tool?
2. Which field in a Deployment YAML specifies the Docker image to use for a container?
3. How do you expose a Kubernetes Deployment to external traffic using a NodePort service?

**Check the following:**

* I have made the entire lab assignment (be careful, some labs consist out of two or more Notion documents!).
* I have answered all the questions from the lab assignment.
* I have submitted my code as a zip file and/or as a link to a *public* Git repository.
* <For labs on Azure> I have shut down any resources that are in use, in order to avoid unexpected costs.