Kubernetes assignment

Jonas Fockstedt

April 27, 2020

1 Some basics

In this section, a official kubernetes tutorial[1] was followed in order to answer the questions.

1.1 Create a Kubernetes cluster

a) **Describe differences between master node and worker nodes?**
The master node manages the cluster, which is a collection of nodes. The tasks of the master node consists of scheduling different tasks, handling new updates and scaling the application. Each worker node in return is running the individual applications in the cluster.

b) **What version of minikube is used in the tutorial?**
Version 1.8.1.

1.2 Deploy an app

a) **Describe kubectl?**
Kubectl is a command line tool for controlling Kubernetes clusters.

b) **What is the output of *kubectl get nodes***
All nodes that can be disposed to host applications. It displays the status, age, role, name and version of the node(s).

c) **What is the ouput of *kubectl get deployments***
It displays the number of different deployments and their status.

1.3 Explore your app

a) **What is a pod, describe its entities?**
A pod is a group of instances of a given application containers and shared resources for those containers. These shared resources include volumes, IP addresses and information on how to run the applications themselves.

b) **What information do the *kubectl describe pods* command give**
Shows detailed information about the pods.

1.4 Expose your app publicly

a) **Describe what a service is in Kubernetes?**
It is an abstraction layer that defines a group of pods and enables for external traffic exposure, service discovery and load balancing for all those pods. For example, when one pod dies, it needs to be some service in place that ensures that the traffic can be redirected to another, new, pod.

b) **What do *thekubectl expose deployment/kubernetes-bootcamp –type="NodePort" –port 8080* command do?**
It creates a new service named "kubernetes-bootcamp" where the type of the service is "NodePort", which exposes the service itself on each node's IP at a static port.

[1] https://kubernetes.io/docs/tutorials/kubernetes-basics/

1.5 Scale up your app

a) **How do labels and Label Selector objects relate to a Service?**
Labels are key/ value pairs that can be attached to objects, in this case services. This is helpful when a user wants to easily identify objects. Label selector enables a user to select one, or a group of, labels.

b) **What is the output *kubectl get rs* command?**
It displays the ReplicaSet created by the deployment. It shows the desired amount of replicas of the application as well as how many replicas are currently running.

1.6 Update your app

a) **Describe rolling updates in Kubernetes?**
It is a way for developers to update their application without introducing any downtime. This is done by first scaling the application and then updating the different pods one at a time.

b) **Whats doe the *kubectl set image deployments/kubernetes-bootcamp kubernetes-bootcamp=jocatalin/kubernetes-bootcamp:v2* command do?**
It updates the current image from version 1 to version 2. This is done by applying rolling updates.

2 Installing MINIKUBE

For installing MINIKUBE on the local machine, a tutorial was followed[2].

3 Hello World

In order to ensure that things work as intended after the installation, a short guide was followed[3].

4 Set up a webserver and scale it

For this section, the same steps where followed as on the official tutorial found in section 1.

a) **What does the web browser show when you access the web server?**
A web page saying ”Hello Kubernetes bootcamp! — Running on: kubernetes-bootcamp-6f6656d949-fnnr5 — v=1”.

b) **What is the output from the *kubectl get pods* command**
It displays the active pods, which in this case is 4 since that is the number of replicas chosen.

c) **What is the output from the *kubectl get deployment* command**
It shows the deployments, which in this case is named ”kubernetes-bootcamp” and displays that 4/4 pods are up to date and for how long they have been running.

d) **What is the output from the *kubectl get services* command**
It displays a NodePort service, named ”kubernetes-bootcamp”. It describes which IP address the service has within the cluster as well as its corresponding ports.

[2] https://kubernetes.io/docs/tasks/tools/install-minikube/
[3] https://kubernetes.io/docs/setup/learning-environment/minikube/