**SWE645 – HW2**

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Steps to create and push the Docker image:

* I installed Docker Desktop on my mac machine and created an account on docker hub.
* Then I have created a docker file in the same folder where my homework-1 part-2 war file is present. Docker file consists of commands. Below are the commands in my Docker file:
* **FROM tomcat:8.0.43-jre8** --> It is used to get the Tomcat image from the docker hub. If it is not present in local, so that we can run our war file inside Tomcat.
* **COPY swe645hw2.war /usr/local/tomcat/webapps/ -**-> It is used to deploy war file in the webapps folder.
* We will have the CMD command to run the Catalina.sh in dockerfile.
* Next, I have built the docker image for my web application from the Docker file using the command:

**docker image build -t hsomasri/mywebapp:1.0 .**

* To create and start a container, used the following command in my terminal:

**docker container run -it –p 8089:8080 hsomasri/mywebapp:1.0**

* By using docker images and docker ps command in terminal we can see list of the available images and running containers on our machine.
* Once we are done with docker run command in terminal, we can check whether the image is running properly or not in the browser by visiting <http://localhost:8089/swe645hw2>
* If our application is loaded successfully then the docker image is running as expected.
* The next step is to push the docker image present on the local machine to the docker hub. For this, we will first login to our docker hub from the command line using the command:

**docker login**

* Then enter username and password.
* After logging in to our docker hub account(https://hub.docker.com), using the following command we will push the docker image to docker hub:

**docker push hsomasri/mywebapp:1.0**

* We can check whether image is pushed to docker hub or not by logging into docker hub on the browser.

Steps to create EC2 instance:

* After installing the docker, we need to install ubuntu machine.
* After logging in to AWS academy, we need to click on Learner Lab - Associate Services under Modules.
* Then, go to AWS console by clicking on Start lab.
* I followed the instructions in the pdf to create EC2 instance.
* We need to add the port numbers in the inbound rules of the security group of the instance: 22(SSH), 80(HTTP), 443(HTTPS) and a Custom TCP with port number (In my case it is 30675) after creating a cluster in Rancher.
* After launching this EC2 instance, by using the following commands connect to this EC2 instance in your local machine.
* Move to the location where your pem file exists.
* Then run the command: chmod 400 awslabacademy.pem
* And then run another command:

ssh -i "645hw2.pem" ubuntu@ec2-3-237-99-178.compute-1.amazonaws.com

* Now, successfully you have installed ubuntu on EC2 instance. On these both instances, you need to install docker by using the following commands:

**sudo apt-get update**

**sudo apt install docker.io**

**sudo usermod -aG docker ubuntu**

* To check whether docker is installed or not run the command: **docker --version**

Steps to Set up Rancher/Kubernetes cluster in AWS Learner Lab:

* The first step is to install and run Rancher, execute the following docker command on your ubuntu host:
* **docker run -d --restart=unless-stopped -p 80:80 -p 443:443 --privileged rancher/rancher:latest**
* Once the installation of Rancher gets completed, run the command:

**docker ps** -> to view the current docker instance.

**docker logs container-id 2>&1 | grep "Bootstrap Password:"**

* Go back to your instance terminal and paste the command. In the terminal you will get a password and paste that password into Rancher UI web page and then log in with local user.
* Once you log in, select the option “Set a specific password to use” and set a password, then click on continue.
* Once you are logged in, you'll see a cluster already created and we need to create a new cluster. click on create.
* Once that is done running, click done in the RancherUI and you should see a cluster that is provisioning. After the cluster gets completed, you should see it as active which means we are ready to deploy.
* So, to deploy click on the explore button on the cluster we created. Then click on the workload, then deployments.

Click on create,

* Gave a name, (I gave the name as hw2-cluster-deployment)
* Increased the replicas to 3,
* Added the container Image that I uploaded to docker hub (I gave it as ananyakorrapati/myfirstrepo:4.0), and add a port,
* For the port service type, select NodePort,
* Then I named it (I gave the name as node port) and for the private container port, listed 8080.
* Left the listening port blank as it will auto generate that with a port from the range 30000-32767,
* Then click create at the bottom.
* Once it gets completed, you can see it as active.
* To view your newly deployed image, click on the Public IPv4 DNS address of the instance you created.
* My Public IPv4 DNS address of the instance I have created is:

ec2-3-237-99-178.compute-1.amazonaws.com We need to add the high port number and the war file onto the above URL path. The port number can be seen when we click on the name that you gave (hw2-cluster-deployment).

* You can see the Endpoint which is a port number. In my case the Endpoint is 31719 and name of my war file is: swe645hw2
* Also make sure you are searching with http, and not https.

So, the URL of my deployed application is:

<http://ec2-3-237-99-178.compute-1.amazonaws.com:31719/swe645hw2/>

References of my work:

Class notes

Docker hub(hub.docker.com)