**DevOps Exercises**

There are many good sandboxes on O’Reilly. These sandboxes are preconfigured virtual machines that contain various software products and are configured for a specific purpose. We can use many sandboxes to function in many roles and run many products. The sandbox you will use for Docker is at <https://learning.oreilly.com/scenarios/docker-sandbox/9781492086161/>. This exercises is based on this sandbox, but you can use any Docker product you have installed.

**Ex. 1 - Docker and MySQL**

1. We discussed Docker as a tool that manages containers. Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure. In this exercise we will create a MySQL image and look at various aspects of Docker.
2. Click on **Start Scenario**. You will see an editor workspace at the top and a Linux terminal window at the bottom. You can click on the **+** tab to create additional terminal windows. If the session terminates you can just refresh the browser. This usually works better than waiting for the session to reconnect or clicking on a button to reconnect. You can save any work in the editor by copying it and pasting into a document outside the sandbox. From the terminal window highlight the code as normal then right click and choose **Copy** - Ctrl + C will not work. To copy from your source to the sandbox on the laptop you can copy any way you want but right click and choose **Paste** – Ctrl + V will not work.
3. Type uname -e to find information about the environment and machine. Remember to get help on any command you can type man <command> or <command> --help if the former command is not enabled on your machine or sandbox.
4. Below are some docker commands you may use often. For a complete list type docker at the terminal command line. Please understand the purpose of the images below.

docker images # show images

docker start <container> # run this to start container

docker stop <long alphanumeric container name or alias> # stop running container

docker ps # show docker containers

docker pull <image name> # pull docker image but mysql already there - see docker images

docker rm <container> # remove container

docker exec # run a command in a running container

docker run # run command in new container

docker create # create a new container

docker image # manage images

docker system # manage Docker

docker container # manage containers

docker build # build an image from a Docker file

1. Use the open terminal (call it Terminal 1) to act as the MySQL server for this exercise. Click on the **+** tab to open Terminal 2. Terminal 2 will be the client or the terminal to run any other Linux command. You can also open another terminal to enter any commands.
2. In terminal 2 run the command you used to start MySQL from the command line before – mysql What do you see?
3. From terminal 1 run the following command to get the latest version of MySQL. You can copy and paste it in the terminal if you want : docker run --name mysqltest -e MYSQL\_ROOT\_PASSWORD=mypass -p 3306:3306 -d docker.io/library/mysql:latest
4. What is docker run?
5. What is the –name switch used for? What about the -e switch?
6. What is the -p switch and is MYSQL\_ROOT\_PASSWORD or can we use any name for the key for the password?
7. What is the long alphanumeric code you see after this command?
8. Try running the command again. What do you see? In order to run the command can you use the docker command(s) to run it again successfully? Try the following commands from above if you are having trouble. Can you use the long name in part 7d above also?

docker stop mysqltest

docker rm mysqltest

1. Run docker ps to show running containers. Do you see mysqltest, our new container? Note the image is mysql:latest.We could have used docker pull to pull the image but it was in Docker. However, this is not the same image as the preinstalled image.
2. What does the ps command do in Linux? Compare command switches by running both ps -e and ps -r. Use man ps or

ps –help to give you information.

1. From terminal 2 run the following command to start the client:

docker exec -it mysqltest mysql -uroot -p. Then enter password ‘mypass’ when prompted for the password.

Look above or with docker command to recall what this command does.

1. What are the switches -it?
2. Identify mysqltest mysql -uroot -p. Doesn’t this line look like the line you typed (without Docker command of course) earlier when you wanted to use MySQL from the command line instead of MySQL Workbench? You should now see the familiar mysql prompt mysql>.
3. Note: Another way to start the client but it may not work here is:
4. mysql -h 172.18.0.1 -uroot -p The host ip address is after the -h switch. You can find it with the ifconfig command or ip a.
5. Type show databases; (See the four databases)
6. Type use sys; (change to sys database – don’t edit table)
7. Type show tables; (See the tables – admin tables)
8. Type describe session; (shows information about table)
9. These are admin tables so we can run a script. We may have used this data before but if we have, then the script contains instructions to drop the database and tables anyway.
10. Create the database and tables by running script file db.sql where <path-to> is the location of file db.sql. Normally you access and run a script file with the command below but for now just drag the file to the sandbox editor, copy the contents and paste it in the terminal at the mysql> prompt.

source <path-to>db.sql

You should understand this script.

1. Complete steps 13 – 16 but use the database and Teachers table from the script.
2. Type show databases; (See the db database)
3. Type use db; (change to db database )
4. Type show tables; (See the Teachers, Classes tables)
5. Type describe Teachers; (shows information about Teachers table)
6. Write a query such as SELECT \* FROM Teachers;

or SELECT \* FROM Classes;

1. Write a join query to show the Teachers and the Classes they teach.
2. Close the mysql session by typing quit.
3. You can get Docker Desktop for Windows, along with information including guides, documentation at [Get Docker | Docker Documentation](https://docs.docker.com/get-docker/). Docker Desktop may not be part of the initial installation on your HCL laptops but you can install it on your personal computers.