

## **Cloud Computing Assignment: 4**

**Title :-** Implementation of Virtualization in Cloud Computing to Learn Virtualization Basics, Benefits of Virtualization in Cloud using Open Source Operating System. (Docker).

**Objective :-** From this experiment, the students will be able to,

- Understand the concepts of building, deploying and managing applications on Docker.
- Understand Docker interface, its commands and implement on playwithdocker.com

**Problem Statement :-** To understand the basic commands, its platform how it works, configuration of its instances by creating and deploying applications on both ubuntu terminal as well as playwithdocker.com.

**Outcomes :-**

- Students will be able to easily build, debug and deploy apps on docker terminal.
- By using dockerHub, one gets to know the container movement from and to the instance.
- One will get to know the various types of commands used in docker for various uses.

**Software and Hardware Requirements :- (DOCKER)**

- Software:- Windows/Linux Operating System, DockerHub Account
- Hardware:- Nil

**Theory:-**

Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. Containers allow a developer to package up an application with all of the parts it needs, such as libraries and other dependencies, and deploy it as one package. By doing so, thanks to the container, the developer can rest assured that the application will run on any other Linux machine regardless of any customized settings that machine might have that could differ from the machine used for writing and testing the code.

In a way, Docker is a bit like a virtual machine. But unlike a virtual machine, rather than creating a whole virtual operating system, Docker allows applications to use the same Linux kernel as the system that they're running on and only requires applications be shipped with things not already running on the host computer. This gives a significant performance boost and reduces the size of the application.

And importantly, Docker is open source. This means that anyone can contribute to Docker and extend it to meet their own needs if they need additional features that aren't available out of the box.

Docker is a tool that is designed to benefit both developers and system administrators, making it a part of many DevOps (developers + operations) toolchains. For developers, it means that they can focus on writing code without worrying about the system that it will ultimately be running on. It also allows them to get a head start by using one of thousands of programs already designed to run in a Docker container as a part of their

application. For operations staff, Docker gives flexibility and potentially reduces the number of systems needed because of its small footprint and lower overhead.

## Program Codes with Output Screenshots:- <DOCKER COMMANDS IMPLEMENTED ON PLAYWITHDOCKER.COM>

### Screenshots:-

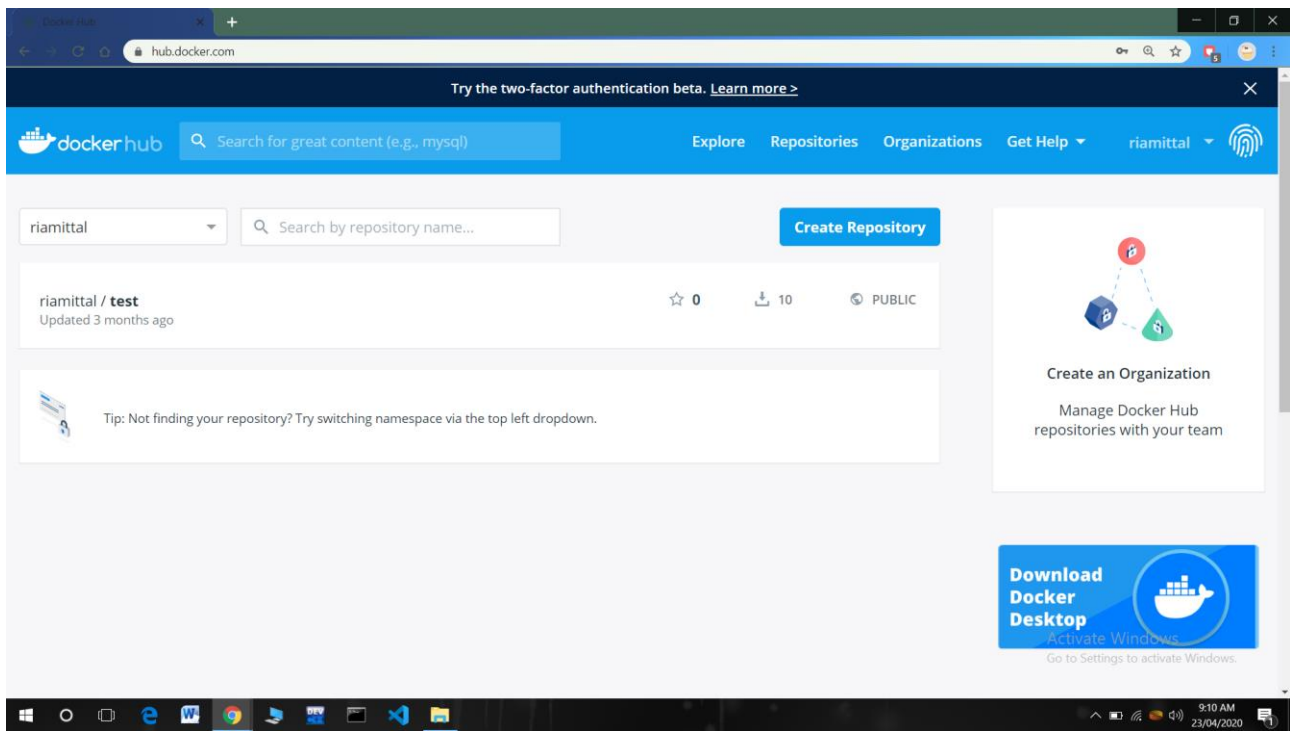
```
Activities Terminal Wed 15 Apr 6:44 PM
root@391dc984d69b: /home

(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker run -it -d shashnagaral/ubuntu
391dc984d69b5adde05777b309f625b174ff46dac85eaf5be4ae0967f603d234
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ docker ps
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://%2Fvar%2Frun%2Fdocker.sock/v1.39/containers/json: dial unix /var/run/docker.sock: connect: permission denied
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
391dc984d69b       shashnagaral/ubuntu "/bin/bash"        15 seconds ago     Up 11 seconds              boring_ritchie
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
391dc984d69b       shashnagaral/ubuntu "/bin/bash"        31 seconds ago     Up 27 seconds              boring_ritchie
38c025de19da       shashnagaral/ubuntu "/bin/bash"        About a minute ago Exited (0) About a minute ago mystifying_kirc
52b0802e78bf       4014223117d6       "/bin/bash"        2 months ago       Exited (255) 2 months ago elastic_ishizak
19e73a6bcb23       shashnagaral/ubuntu "/bin/bash"        2 months ago       Exited (255) 2 months ago recursing_sande

(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker exec -it 391dc984d69b bash
root@391dc984d69b:/# ls
bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys usr var
root@391dc984d69b:/# cd home/
root@391dc984d69b:/home# ls
root@391dc984d69b:/home# python3
Python 3.6.9 (default, Nov 7 2019, 10:44:02)
[GCC 8.3.0] on linux
Type "help", "copyright", "credits" or "license()" for more information.
>>> print("hello world")
hello world
>>>
KeyboardInterrupt
>>>
KeyboardInterrupt
>>>
[1]+  Stopped                  python3
root@391dc984d69b:/home# sudo docker stop
```

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Activities Terminal Wed 15 Apr 6:43 PM
shashidhar@shashidhar-Lenovo-G50-80: ~

/images/create?fromImage=shashnagaral%2Fubuntu&tag=latest: dial unix /var/run/docker.sock: connect: permission denied
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker pull shashnagaral/ubuntu:latest
latest: Pulling from shashnagaral/ubuntu
Digest: sha256:07cbbdc0938f05c3624230767bf90faa3f25ab6bd70d23130d27419640a76e31
Status: Image is up to date for shashnagaral/ubuntu:latest
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker images
REPOSITORY          TAG             IMAGE ID          CREATED           SIZE
shashnagaral/ubuntu latest          4014223117d6     2 months ago     127MB
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ docker run shashnagaral/ubuntu
docker: Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Post http://%2Fvar%2Frun%2Fdocker.sock/v1.39/containers/create: dial unix /var/run/docker.sock: connect: permission denied.
See 'docker run --help'.
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker run shashnagaral/ubuntu bash
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ docker run -it -d shashnagaral/ubuntu
docker: Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Post http://%2Fvar%2Frun%2Fdocker.sock/v1.39/containers/create: dial unix /var/run/docker.sock: connect: permission denied.
See 'docker run --help'.
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker run -it -d shashnagaral/ubuntu
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19e73a6bcb23       shashnagaral/ubuntu "/bin/bash"        2 months ago       Exited (255) 2 months ago recursing_sande
(base) shashidhar@shashidhar-Lenovo-G50-80:~$ sudo docker exec -it
```



**Conclusion:-** Students were able to get themselves hands-on experience on docker interface, understanding lots of commands and also gained knowledge about implementation of a cloud application.