Cloud Computing Lab - 2

Docker on Linux/Windows/Play-with-Docker

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Semester & Section   : **VI Sem A Section**

Task 1: Installing Docker Engine

Running Docker hello-world

```
(base) ~ % docker run hello-world


Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (arm64v8)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/

(base) ~ %
```
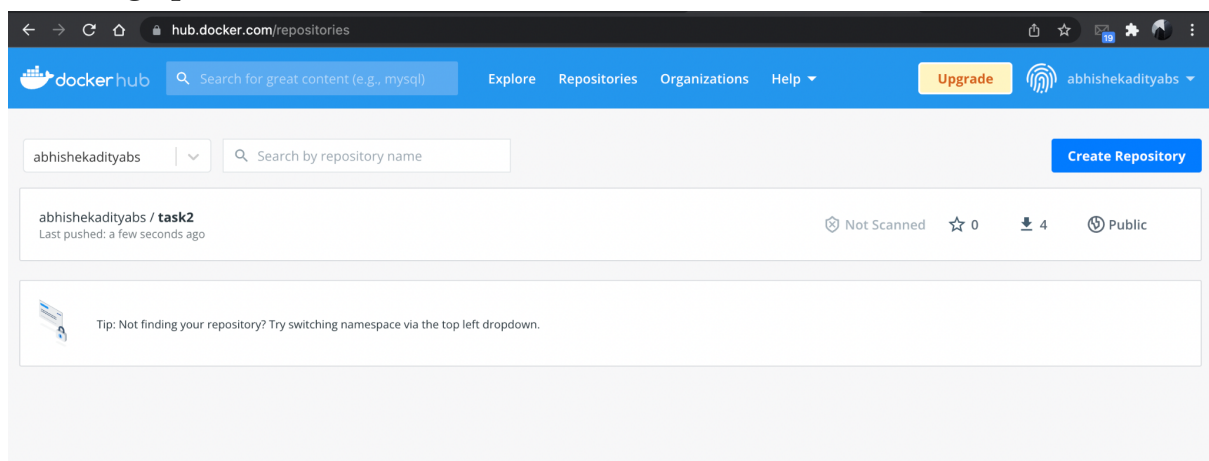
Task 2: Docker images and docker files

2a. C program running inside the container

```
(base) task2 % docker run task2
Running this inside a container !
My SRN is <PES1UG19CS019>
(base) task2 %
```

2b. Image pushed to DockerHub

Task 3: Exposing ports,docker networks

3a. Web page running on browser

My SRN is PES1UG19CS019>

I am running a nginx container!

3b. Docker running nginx

```
(base) task3 % docker run -p 80:80 task3a
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perfo
rm configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-defau
lt.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d
/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf
.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.s
h
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.s
h
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/02/21 05:56:30 [notice] 1#1: using the "epoll" event method
2022/02/21 05:56:30 [notice] 1#1: nginx/1.21.6
2022/02/21 05:56:30 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)

2022/02/21 05:56:30 [notice] 1#1: OS: Linux 5.10.76-linuxkit
2022/02/21 05:56:30 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/02/21 05:56:30 [notice] 1#1: start worker processes
2022/02/21 05:56:30 [notice] 1#1: start worker process 32
2022/02/21 05:56:30 [notice] 1#1: start worker process 33
2022/02/21 05:56:30 [notice] 1#1: start worker process 34
```

3c. Python running and successfully writing and reading from mongDB

```
(base) task3 % docker run task3b
Inserted into the MongoDB database!
Fecthed from MongoDB: {'_id': ObjectId('62132c90d0f0b0179df0a574'), 'Name:': 'Abhishek Aditya BS', 'SRN'
: 'PES1UG19CS019'}
(base) task3 %
```

3d. MongoDB running within the network

```
(base) task3 % docker network create my-bridge-network
756b399e1bccffe47a1b4b3fc4059009c814ae1b16b1ef5584c768fadaf866f8
(base) task3 % docker run -dp 27017:27017 --network=my-bridge-network --name=mongodb mongo:latest

b3038cc41b79e1f56a8002139bcfb9248f772e7ce60ba1aec100473d74b649db
(base) task3 % docker ps
CONTAINER ID    IMAGE          COMMAND             CREATED         STATUS         PORTS
          NAMES
b3038cc41b79    mongo:latest   "docker-entrypoint.s…"  44 seconds ago  Up 43 seconds   0.0.0.0:27017->27
017/tcp    mongodb
(base) task3 %
```

3e. Python file being run within the network and successfully writing and reading from MongoDB

```
(base) task3 % docker run --network=my-bridge-network task3c
Inserted into the MongoDB database!
Fecthed from MongoDB: {'_id': ObjectId('62132d6420b36043c3957d50'), 'Name:': 'Abhishek Aditya BS', 'SRN'
: 'PES1UG19CS019'}
(base) task3 % docker ps
CONTAINER ID   IMAGE          COMMAND               CREATED          STATUS           PORTS
               NAMES
b3038cc41b79   mongo:latest   "docker-entrypoint.s…"  About a minute ago  Up About a minute  0.0.0.0:2
7017->27017/tcp   mongodb
(base) task3 %
```

Task 4: Docker compose

4a. Python-MongoDB application running as docker-compose application

```
mongodb_1  | {"t":{"$date":"2022-02-21T06:17:33.835+00:00"},"s":"I",  "c":"NETWORK",  "id":51800,  "ctx"
:"conn3","msg":"client metadata","attr":{"remote":"172.19.0.3:43444","client":"conn3","doc":{"driver":{"n
ame":"PyMongo","version":"4.0.1"},"os":{"type":"Linux","name":"Linux","architecture":"aarch64","version":
"5.10.76-linuxkit"},"platform":"CPython 3.10.2.final.0"}}}
mongodb_1  | {"t":{"$date":"2022-02-21T06:17:33.835+00:00"},"s":"I",  "c":"STORAGE",  "id":20320,  "ctx"
:"conn3","msg":"createCollection","attr":{"namespace":"sample_db.sample_collection","uuidDisposition":"ge
nerated","uuid":{"uuid":{"$uuid":"cdadf44a-102b-4849-a686-efb032993863"}},"options":{}}}
mongodb_1  | {"t":{"$date":"2022-02-21T06:17:33.841+00:00"},"s":"I",  "c":"INDEX",    "id":20345,  "ctx"
:"conn3","msg":"Index build: done building","attr":{"buildUUID":null,"namespace":"sample_db.sample_collec
tion","index":"_id_","commitTimestamp":null}}
pycode_1   | Inserted into the MongoDB database!
pycode_1   | Fecthed from MongoDB: {'_id': ObjectId('62132e7dee69daeac81ca467'), 'Name:': 'Abhishek Adit
ya BS', 'SRN': 'PES1UG19CS019'}
mongodb_1  | {"t":{"$date":"2022-02-21T06:17:34.337+00:00"},"s":"I",  "c":"-",       "id":20883,  "ctx"
:"conn1","msg":"Interrupted operation as its client disconnected","attr":{"opId":14}}
mongodb_1  | {"t":{"$date":"2022-02-21T06:17:34.341+00:00"},"s":"I",  "c":"NETWORK",  "id":22944,  "ctx"
:"conn1","msg":"Connection ended","attr":{"remote":"172.19.0.3:43440","uuid":"79dc0ef0-9935-46ee-a01a-280
c89d203e2","connectionId":1,"connectionCount":2}}
```

4b. 3 python application writes and reads from MongoDB after scaling the python application

```
ame":"PyMongo","version":"4.0.1"},"os":{"type":"Linux","name":"Linux","architecture":"aarch64","version":
"5.10.76-linuxkit"},"platform":"CPython 3.10.2.final.0"}}}
pycode_1   | Inserted into the MongoDB database!
pycode_1   | Fecthed from MongoDB: {'_id': ObjectId('62132e7dee69daeac81ca467'), 'Name:': 'Abhishek Adit
ya BS', 'SRN': 'PES1UG19CS019'}
mongodb_1  | {"t":{"$date":"2022-02-21T06:18:52.345+00:00"},"s":"I",  "c":"-",       "id":20883,  "ctx"
:"conn1","msg":"Interrupted operation as its client disconnected","attr":{"opId":15}}
mongodb_1  | {"t":{"$date":"2022-02-21T06:18:52.349+00:00"},"s":"I",  "c":"NETWORK",  "id":22944,  "ctx"
:"conn1","msg":"Connection ended","attr":{"remote":"172.19.0.4:46294","uuid":"c51c293e-794f-40f2-86df-27b
c2b7ccbbc","connectionId":1,"connectionCount":8}}
mongodb_1  | {"t":{"$date":"2022-02-21T06:18:52.354+00:00"},"s":"I",   "c":"-",       "id":20883,  "ctx"
:"conn6","msg":"client metadata","attr":{"remote":"172.19.0.3:49558","client":"conn6","doc":{"driver":{"n
ame":"PyMongo","version":"4.0.1"},"os":{"type":"Linux","name":"Linux","architecture":"aarch64","version":
"5.10.76-linuxkit"},"platform":"CPython 3.10.2.final.0"}}}
pycode_3   | Inserted into the MongoDB database!
pycode_3   | Fecthed from MongoDB: {'_id': ObjectId('62132e7dee69daeac81ca467'), 'Name:': 'Abhishek Adit
ya BS', 'SRN': 'PES1UG19CS019'}
pycode_2   | Inserted into the MongoDB database!
pycode_2   | Fecthed from MongoDB: {'_id': ObjectId('62132e7dee69daeac81ca467'), 'Name:': 'Abhishek Adit
ya BS', 'SRN': 'PES1UG19CS019'}
mongodb_1  | {"t":{"$date":"2022-02-21T06:18:51.888+00:00"},"s":"I",  "c":"NETWORK",  "id":22943,  "ctx"
:"listener","msg":"Connection accepted","attr":{"remote":"172.19.0.3:43466","uuid":"b56af4d4-9533-41be-a7
```