

Operating Systems Lab

Docker Compose Task

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Task-1

in the first step we are going to run the mongo and mongo-express containers so we run the containers by writing the following commands

```
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker pull mongo
[sudo] password for reaper:
Using default tag: latest
latest: Pulling from library/mongo
Digest: sha256:a4f2db6f54aeabba562cd07e5cb758b55d6192dcc6f36322a334ba0b0120aaf1
Status: Image is up to date for mongo:latest
docker.io/library/mongo:latest
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker pull mongo-express
Using default tag: latest
latest: Pulling from library/mongo-express
Digest: sha256:dcfcf89bf91238ff129469a5a94523b3025913dcc41597d72d4d5f4a0339cc7d
Status: Image is up to date for mongo-express:latest
docker.io/library/mongo-express:latest
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker network create mongo-network
Error response from daemon: network with name mongo-network already exists
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker run -d \
> -p 27017:27017 \
> -e MONGO_INITDB_ROOT_USERNAME=admin \
> -e MONGO_INITDB_ROOT_PASSWORD=password \
> --net mongo-network \
> --name mongodb \
> mongo
b8e7d4c8aeab55e216f226ddf04d446a6e600fa5e6af86e8b1590ad0ceb12ef2
docker: Error response from daemon: driver failed programming external connectivity on endpoint mongod
a): Bind for 0.0.0.0:27017 failed: port is already allocated.
```

```
d). Bind for 0.0.0.0:27017 failed: port is already allocated.  
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker run -d \  
> -p 8081:8081 \  
> -e ME_CONFIG_MONGODB_ADMINUSERNAME=admin \  
> -e ME_CONFIG_MONGODB_ADMINPASSWORD=password \  
> -e ME_CONFIG_MONGODB_SERVER=mongodb \  
> --net mongo-network \  
> --name mongo-express \  
> mongo-express  
88e5bc0b3f8a853c898d95563500821c40dfcdcb670f6fcd4ae8768606211d6d  
docker: Error response from daemon: driver failed programming external connectivity on endpoint mongo-express (ba130f6ae9  
c0e245f): Bind for 0.0.0.0:8081 failed: port is already allocated.  
reaper@reaper-VirtualBox:~/Downloads/NodeApp$
```

so using these commands we can download and pull the mongo and mongo-express containers

```

reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker run -d -p 3000:3000 --net c
> myapp:latest
9edacf5c026c9e72fe825af2d71c1062dc883c3cfb7f7e25fb04405c1f98053f
docker: Error response from daemon: network dockercompose_default not found.
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS
9edacf5c026c        myapp:latest       "docker-entrypoin..." 19 seconds ago      Created
88e5bc0b3f8a        mongo-express      "tini -- /docker-ent..." 3 minutes ago       Created
s
b8e7d4c8aeab        mongo              "docker-entrypoin..." 4 minutes ago       Created
68520a2df64d        myapp              "docker-entrypoin..." 11 minutes ago      Exited
p_1
0eefd052c4e8        myapp-fixed:latest "docker-entrypoin..." 12 minutes ago      Exited
10f7ad771eb0        myapp:latest       "docker-entrypoin..." 16 minutes ago      Exited
y
cf8f223923e9        mongo              "docker-entrypoin..." 51 minutes ago      Up 39 m
odb_1
98cd3b94a8ef        mongo-express      "tini -- /docker-ent..." 51 minutes ago      Up 39 m
o-express_1
d6e2bd130b32        hello-world        "/hello"            29 hours ago        Exited
ard
92cc119e3aaa        hello-world        "/hello"            31 hours ago        Exited
_noyce
reaper@reaper-VirtualBox:~/Downloads/NodeApp$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
myapp-fixed          latest             ala8a9db41ab       14 minutes ago     121MB
myapp                latest             2e2580317ad6       17 minutes ago     120MB
mongo               latest             dcfda10b61c5       4 days ago         645MB
mongo-express        latest             2d2fb2cab8f        16 months ago     136MB
hello-world          latest             feb5d9fea6a5       17 months ago     13.3kB
node                 13-alpine          8216bf4583a5       2 years ago        114MB
reaper@reaper-VirtualBox:~/Downloads/NodeApp$

```

Databases		Database Name	+ Create Database
<div> View</div>	admin	<div> Del</div>	
<div> View</div>	config	<div> Del</div>	
<div> View</div>	local	<div> Del</div>	

Server Status

Turn on admin in config.js to view server stats!

now we create a database name user-account and make a collection of users

Mongo Express

Viewing Database: user-account

Collections

View

Export

[JSON]

Import

users

+ Create collection

Del

Collection Name

Collection names must begin with a letter, underscore, hyphen or slash, and can contain only letters, underscores, hyphens, numbers, dots or slashes

Database Stats

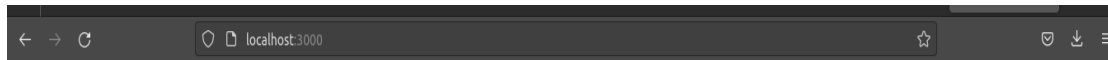
Collections (incl. system.namespaces)	1
Data Size	0 Byte
Storage Size	4.10 KB
Avg Obj Size #	0 Byte
Indexes #	1

Now we build image for node app using the dockerfile we have in the folder

```
reaper@reaper-VirtualBox:~/NodeApp$ ls
app  app-compose.yaml  docker-commands.md  Dockerfile  mongo-docker-compose.yaml
reaper@reaper-VirtualBox:~/NodeApp$ sudo docker build -t myapp .
[sudo] password for reaper:
Sending build context to Docker daemon 6.525MB
Step 1/7 : FROM node:13-alpine
--> 8216bf4583a5
Step 2/7 : ENV MONGO_DB_USERNAME=admin      MONGO_DB_PWD=password
--> Using cache
--> 8f542048e204
Step 3/7 : RUN mkdir -p /home/app
--> Using cache
--> 0db1629b674e
Step 4/7 : COPY ./app /home/app
--> Using cache
--> 65c4073a3503
Step 5/7 : WORKDIR /home/app
--> Using cache
--> ff9f377517a8
Step 6/7 : RUN npm install
--> Using cache
--> 4717830b432e
Step 7/7 : CMD ["node", "server.js"]
--> Using cache
--> 2e2580317ad6
Successfully built 2e2580317ad6
Successfully tagged myapp:latest
reaper@reaper-VirtualBox:~/NodeApp$
```

now we run using docker compose file


```
reaper@reaper-VirtualBox:~/NodeApp$ sudo docker-compose -f app-compose.yaml up
WARNING: Found orphan containers (nodeapp_mongodb_1, nodeapp_mongo-express_1) for this project.
You can remove them with this command with the --remove-orphans flag to clean it up.
Starting nodeapp_myapp_1 ... done
Attaching to nodeapp_myapp_1
myapp_1 | App is ready and running on port 3000!
```

but nothing is being displayed

```
Starting nodeapp_myapp_1 ... done
Attaching to nodeapp_myapp_1
myapp_1 | App is ready and running on port 3000!
myapp_1 | Rendering html template...
myapp_1 | Getting profile picture...
myapp_1 | Rendering html template...
myapp_1 | Getting profile picture...
myapp_1 | /home/app/server.js:67
myapp_1 |     if (err) throw err;
myapp_1 |     ^
myapp_1 |
myapp_1 | MongoTimeoutError: Server selection timed out after 30000 ms
myapp_1 |     at Timeout.<anonymous> (/home/app/node_modules/mongodb/lib/c
myapp_1 |     at listOnTimeout (internal/timers.js:549:17)
myapp_1 |     at processTimers (internal/timers.js:492:7) {
myapp_1 |   reason: Error: connect ECONNREFUSED 127.0.0.1:27017
myapp_1 |     at TCPConnectWrap.afterConnect [as oncomplete] (net.js:114
myapp_1 |     name: 'MongoNetworkError',
myapp_1 |     errorLabels: [ 'TransientTransactionError' ],
myapp_1 |     [Symbol(mongoErrorContextSymbol)]: {}
myapp_1 |   },
myapp_1 |   [Symbol(mongoErrorContextSymbol)]: {}
myapp_1 | }
nodeapp_myapp_1 exited with code 1
reaper@reaper-VirtualBox:~/NodeApp$
```

this error is displayed

 Mongo Express Database: user-account > Collection: users

New Document

New Index

Simple

Advanced

Key

Value

String

No documents found.

Rename Collection

user-account . users

Rename

Task2

first we build using docker build


```
reaper@reaper-VirtualBox:~/Downloads/PythonApp$ sudo docker build -t my
[sudo] password for reaper:
Sending build context to Docker daemon 5.632kB
Step 1/9 : FROM python:3.7-alpine
3.7-alpine: Pulling from library/python
63b65145d645: Pull complete
781eddb6f342: Pull complete
44f2ff56c8b9: Pull complete
8e162bf950d5: Pull complete
c2d5952eece0: Pull complete
Digest: sha256:c9c2d6f97a00b211def3818830883495417e3b1fd34783ce6135c5fc
Status: Downloaded newer image for python:3.7-alpine
--> 0dc56e7f283d
Step 2/9 : WORKDIR /code
--> Running in 267ae8bcbe73
Removing intermediate container 267ae8bcbe73
--> bba382ed0653
Step 3/9 : ENV FLASK_APP app.py
--> Running in 935ee3e243d5
Removing intermediate container 935ee3e243d5
--> 12fbeatc671d1
Step 4/9 : ENV FLASK_RUN_HOST 0.0.0.0
--> Running in c9d44f1d1bbe
Removing intermediate container c9d44f1d1bbe
--> 57ccfdfla553
Step 5/9 : RUN apk add --no-cache gcc musl-dev linux-headers
--> Running in e5b509e350a7
fetch https://dl-cdn.alpinelinux.org/alpine/v3.17/main/x86_64/APKINDEX.
fetch https://dl-cdn.alpinelinux.org/alpine/v3.17/community/x86_64/APKI
(1/12) Installing libgcc (12.2.1_git20220924-r4)
(2/12) Installing libstdc++ (12.2.1_git20220924-r4)
(3/12) Installing binutils (2.39-r2)
(4/12) Installing libgomp (12.2.1_git20220924-r4)
(5/12) Installing libatomic (12.2.1_git20220924-r4)
(6/12) Installing gmp (6.2.1-r2)
```

```
(9/12) Installing mpcl (1.2.1-r1)
(10/12) Installing gcc (12.2.1_git20220924-r4)
(11/12) Installing linux-headers (5.19.5-r0)
(12/12) Installing musl-dev (1.2.3-r4)
Executing busybox-1.35.0-r29.trigger
OK: 168 MiB in 49 packages
Removing intermediate container e5b509e350a7
--> 7f05e60404e7
Step 6/9 : COPY requirements.txt requirements.txt
--> 2b2cf257629d
Step 7/9 : RUN pip install -r requirements.txt
--> Running in fe2b2c574e8c
Collecting flask
  Downloading Flask-2.2.3-py3-none-any.whl (101 kB)
  101.8/101.8 KB 1.1 MB/s eta 0:00:00
Collecting redis
  Downloading redis-4.5.1-py3-none-any.whl (238 kB)
  238.5/238.5 KB 2.4 MB/s eta 0:00:00
Collecting Jinja2>=3.0
  Downloading Jinja2-3.1.2-py3-none-any.whl (133 kB)
  133.1/133.1 KB 2.3 MB/s eta 0:00:00
Collecting itsdangerous>=2.0
  Downloading itsdangerous-2.1.2-py3-none-any.whl (15 kB)
Collecting importlib-metadata>=3.6.0
  Downloading importlib_metadata-6.0.0-py3-none-any.whl (21 kB)
Collecting Werkzeug>=2.2.2
  Downloading Werkzeug-2.2.3-py3-none-any.whl (233 kB)
  233.6/233.6 KB 2.5 MB/s eta 0:00:00
Collecting click>=8.0
  Downloading click-8.1.3-py3-none-any.whl (96 kB)
  96.6/96.6 KB 4.1 MB/s eta 0:00:00
Collecting async-timeout>=4.0.2
  Downloading async_timeout-4.0.2-py3-none-any.whl (5.8 kB)
Collecting typing-extensions
  Downloading typing_extensions-4.5.0-py3-none-any.whl (27 kB)
Collecting zipp>=0.5
```

```

Collecting async-timeout<=4.0.2
  Downloading async_timeout-4.0.2-py3-none-any.whl (5.8 kB)
Collecting typing-extensions
  Downloading typing_extensions-4.5.0-py3-none-any.whl (27 kB)
Collecting zipp<=0.5
  Downloading zipp-3.15.0-py3-none-any.whl (6.8 kB)
Collecting MarkupSafe<=2.0
  Downloading MarkupSafe-2.1.2-cp37-cp37m-muslinux1.1_x86_64.whl (30 kB)
Installing collected packages: zipp, typing-extensions, MarkupSafe, itsdangerous, Werkzeug, Jinja2, importlib-metadata, async-timeout, redis, click, flask
Successfully installed Jinja2-3.1.2 MarkupSafe-2.1.2 Werkzeug-2.2.3 async-timeout-4.0.2 click-8.1.3 flask-2.2.3 importlib-metadata-6.0.0 itsdangerous-2.1.2 redis-4.5
typing-extensions-4.5.0 zipp-3.15.0
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual
environment instead: https://pip.pyppa.io/warnings/venv
WARNING: You are using pip version 22.0.4; however, version 23.0.1 is available.
You should consider upgrading via the '/usr/local/bin/python -m pip install --upgrade pip' command.
Removing intermediate container fefb2c574e8c
--> 333d98e64001
Step 8/9 : COPY . .
--> c1516ee50d79
Step 9/9 : CMD ["flask", "run"]
--> Running in a8d280374d76
Removing intermediate container a8d280374d76
--> 66060ccaab0a
Successfully built 66060ccaab0a
Successfully tagged my-python-app:latest

```

now we will compose our file

```

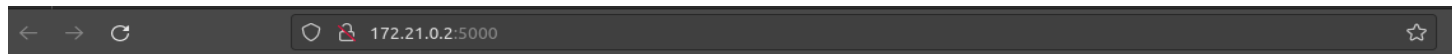
Successfully tagged my-python-app:latest
reaper@reaper-VirtualBox:~/Downloads/PythonApp$ sudo docker-compose up
Creating network "pythonapp_default" with the default driver
Building web
Sending build context to Docker daemon  5.632kB
Step 1/9 : FROM python:3.7-alpine
--> 0dc56e7f283d
Step 2/9 : WORKDIR /code
--> Using cache
--> bba382ed0653
Step 3/9 : ENV FLASK_APP app.py
--> Using cache
--> 12f5eac671d1
Step 4/9 : ENV FLASK_RUN_HOST 0.0.0.0
--> Using cache
--> 57ccfdfla553
Step 5/9 : RUN apk add --no-cache gcc musl-dev linux-headers
--> Using cache
--> 7f05e60404e7
Step 6/9 : COPY requirements.txt requirements.txt
--> Using cache
--> 2b2cf257629d
Step 7/9 : RUN pip install -r requirements.txt
--> Using cache
--> 333d98e64001
Step 8/9 : COPY . .
--> Using cache
--> c1516ee50d79
Step 9/9 : CMD ["flask", "run"]
--> Using cache
--> 66060ccaab0a
Successfully built 66060ccaab0a
Successfully tagged pythonapp_web:latest
WARNING: Image for service web was built because it did not already exist. To
pulling redis (redis:alpine)

```

now in our web browser



Hello OS-Lab Again! I have been seen 1 times.



Hello OS-Lab Again! I have been seen 8 times.