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## **EXPERIMENT-5**

### **Multi-container setup using Docker Compose**

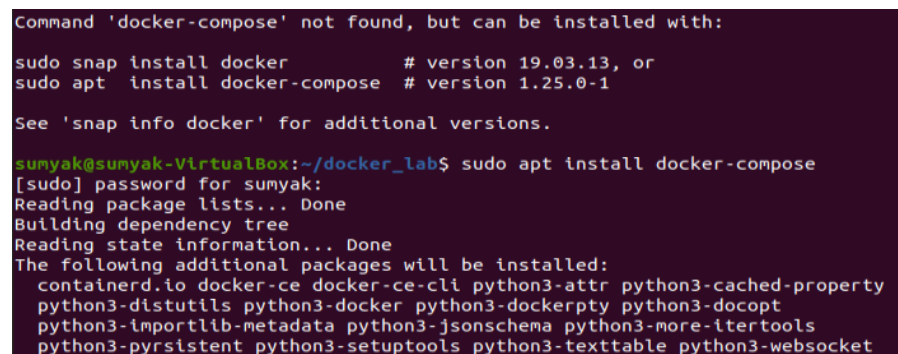
Docker Compose is a tool used to create a Docker application that will run on multiple containers. A YAML configuration file is used where the configuration of the containers is given.

In this experiment, we will create a two-service configuration with MySQL as database and Nginx image as web server.

The steps that need to be followed are:

1. Make sure that docker-compose is installed in your machine. If not, then install it as follows:

Command: `sudo apt install docker compose`



```
Command 'docker-compose' not found, but can be installed with:
sudo snap install docker          # version 19.03.13, or
sudo apt install docker-compose  # version 1.25.0-1
See 'snap info docker' for additional versions.

sumyak@sumyak-VirtualBox:~/docker_lab$ sudo apt install docker-compose
[sudo] password for sumyak:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  containerd.io docker-ce docker-ce-cli python3-attr python3-cached-property
  python3-distutils python3-docker python3-dockerpty python3-docopt
  python3-importlib-metadata python3-jjsonschema python3-more-itertools
  python3-pyrsistent python3-setuptools python3-texttable python3-websocket
```

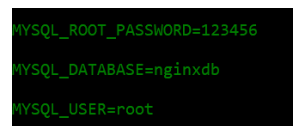
2. Make a .env file with the value of environment variables of MySQL as follows:

`MYSQL_ROOT_PASSWORD=<password>`

`MYSQL_DATABASE=<database-name>`

`MYSQL_USER=<username>`

Provide the values of these variables in the file.



```
MYSQL_ROOT_PASSWORD=123456
MYSQL_DATABASE=nginxdb
MYSQL_USER=root
```

As shown above, the values of environment variables is provided in the file.

This file will be used to refer to the value of specified variables.

3. Make a YAML configuration file with the name “docker-compose.yml” and provide the configuration of containers in this file.

Here, we are defining two services namely databases and web. Databases service uses mysql image container and port 3307 of the container is bind to port 3306 of the machine. The environment file created in the previous step is specified for the value of environment variables.

Web service uses nginx image container and port 80 of the container is bind to the port 80 of the machine. The web service depends on the databases service.

```
version: '3'
services:

  databases:
    image: mysql
    ports:
      - "3307:3306"
    env_file:
      - mysql.env

  web:
    image: nginx
    ports:
      - "80:80"
    depends_on:
      - databases
```

4. Run the services specified in the above files as follows:

Command: docker-compose up

You will see a similar output:

```
sumyak@sumyak-VirtualBox: ~/docker_lab
sumyak@sumyak-VirtualBox:~/docker_lab$ docker-compose up
Creating network "docker_lab_default" with the default driver
Pulling databases (mysql:latest)...
latest: Pulling from library/mysql
45b42c59be33: Pull complete
b4f790bd91da: Pull complete
325ae51788e9: Pull complete
adcb9439d751: Pull complete
174cf7f61c7b: Pull complete
698058ef136c: Pull complete
4690143a669e: Pull complete
77599a246fde: Pull complete
33a55bf0c196: Pull complete
790ac54f4c47: Pull complete
18602acc97e1: Pull complete
365ca3580dd0: Pull complete
Digest: sha256:b1cc887ed32cc6c2f217b12703bd05f503f2037892c8bb226047fe5dfff85a109
Status: Downloaded newer image for mysql:latest
Pulling web (nginx:latest)...
latest: Pulling from library/nginx
45b42c59be33: Already exists
8acc495f1d91: Pull complete
ec3bd7de90d7: Pull complete
19e24418eeab: Pull complete
f5a38c5f8d4e: Pull complete
83500d851118: Pull complete
```

```
sumyak@sumyak-VirtualBox: ~/docker_lab
databases_1 | 2021-02-22T10:28:58.724165Z 0 [System] [MY-013169] [Server] /usr/sbin/mysqld (mysqld 8.0.23) Initiall
zing of server in progress as process 43
databases_1 | 2021-02-22T10:28:58.742955Z 1 [System] [MY-013576] [InnoDB] InnoDB Initialization has started.
databases_1 | 2021-02-22T10:28:59.244737Z 1 [Warning] [MY-012637] [InnoDB] 1048576 bytes should have been written.
Only 548864 bytes written. Retrying for the remaining bytes.
databases_1 | 2021-02-22T10:28:59.244959Z 1 [Warning] [MY-012638] [InnoDB] Retry attempts for writing partial data
failed.
databases_1 | 2021-02-22T10:28:59.245136Z 1 [ERROR] [MY-012639] [InnoDB] Write to file ./undo_002 failed at offset
0, 1048576 bytes should have been written, only 548864 were written. Operating system error number 28. Check that yo
ur OS and file system support files of this size. Check also that the disk is not full or a disk quota exceeded.
databases_1 | 2021-02-22T10:28:59.245300Z 1 [ERROR] [MY-012640] [InnoDB] Error number 28 means 'No space left on de
vice'
databases_1 | 2021-02-22T10:28:59.246520Z 1 [ERROR] [MY-012929] [InnoDB] InnoDB Database creation was aborted with
error out of disk space. You may need to delete the ibdata1 file before trying to start up again.
databases_1 | 2021-02-22T10:28:59.291357Z 0 [ERROR] [MY-010020] [Server] Data Dictionary initialization failed.
databases_1 | 2021-02-22T10:28:59.291591Z 0 [ERROR] [MY-013236] [Server] The designated data directory /var/lib/mys
ql/ is unusable. You can remove all files that the server added to it.
databases_1 | 2021-02-22T10:28:59.291871Z 0 [ERROR] [MY-010119] [Server] Aborting
databases_1 | 2021-02-22T10:28:59.292253Z 0 [System] [MY-010910] [Server] /usr/sbin/mysqld: Shutdown complete (mysq
ld 8.0.23) MySQL Community Server - GPL.
web_1 | /docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
web_1 | /docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
web_1 | /docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
web_1 | 10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
web_1 | 10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
web_1 | /docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
web_1 | /docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
```

5. you can check your container using “docker ps -a”

```
sumyak@sumyak-VirtualBox:~/docker_lab$ docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS
2b3b7036a7e5   nginx         "/docker-entrypoint..." 5 minutes ago  Up 5 minutes  0.0.0.0:80->80/tcp
4dcae3c91bf1   docker_lab_w... "docker-entrypoint.s..." 5 minutes ago  Exited (1) 5 minutes ago
db9c054982ab   sumyakjain/nginx:1.0 "nginx -g 'daemon of..." 7 days ago    Exited (255) 43 minutes ago
c000fy fermat
```