

## Day 18 Task: Docker for DevOps Engineers

### Task-1

Learn how to use the docker-compose.yml file, to set up the environment, configure the services and links between different containers, and also to use environment variables in the docker-compose.yml file.

#### Sample docker-compose.yml file

```
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ ls
docker-compose.yml
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NA
MES
2fb51d53a004   simple-todo                         "docker-entrypoint.s..." 5 hours ago    Up 5 hours    0.0.0.0:3000->3000/tcp, :::3000->3000/tcp  sh
arp_chatterjee
6ee75a598784   multistage:latest                  "python app.py"           7 hours ago    Up 7 hours    0.0.0.0:5000->5000/tcp, :::5000->5000/tcp  fl
ask-app
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker-compose up -d
Creating network "sample_default" with the default driver
Pulling web (nginx:latest)...
latest: Pulling from library/nginx
e4fff0779e6d: Already exists
9c4e4e507b08: Pull complete
85664e7b25d6: Pull complete
e9d00ba15cc0: Pull complete
ca3474dd2ca6: Pull complete
472851929ad7: Pull complete
ed60582f2661: Pull complete
Digest: sha256:93db6ea665b5485e59f0b35e506456b5055925d43011bdcc459d556332d231a2
Status: Downloaded newer image for nginx:latest
Pulling db (mysql:...)...
latest: Pulling from library/mysql
d9a40b27c30f: Pull complete
fe4b01031aab: Pull complete
aa72c34c4347: Pull complete
473ade985fa2: Pull complete
cc168a9482de: Pull complete
3ca3786815dd: Pull complete
3e3fac98ea83: Pull complete
10e5505c3ae4: Pull complete
a79ade39aab9: Pull complete
3e3fac98ea83: Pull complete
10e5505c3ae4: Pull complete
a79ade39aab9: Pull complete
ae34d51c6da2: Pull complete
Digest: sha256:d8df069848906979fd7511db00dc22efeb0a33a990d87c3c6d3fcda6d6fc6123
Status: Downloaded newer image for mysql:latest
Creating sample_web_1 ... done
Creating sample_db_1 ... done
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NA
MES
9a9adecalb52   nginx:latest                         "/docker-entrypoint..." About a minute ago    Up About a minute    0.0.0.0:80->80/tcp, :::80->80/tcp  p
692be9e2e1fd   mysql                                "docker-entrypoint.s..." About a minute ago    Up About a minute    0.0.0.0:3306->3306/tcp, :::3306->3306/tcp  33060/tcp
2fb51d53a004   simple-todo                         "docker-entrypoint.s..." 5 hours ago        Up 5 hours          0.0.0.0:3000->3000/tcp, :::3000->3000/tcp  sharp_chatterjee
6ee75a598784   multistage:latest                  "python app.py"           7 hours ago        Up 7 hours          0.0.0.0:5000->5000/tcp, :::5000->5000/tcp  flask-app
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ |
```

← ↻ ⚠ Not secure | 3.17.142.119

## Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](https://nginx.org).  
Commercial support is available at [nginx.com](https://nginx.com).

*Thank you for using nginx.*

## Task-2

- Pull a pre-existing Docker image from a public repository (e.g. Docker Hub) and run it on your local machine. Run the container as a non-root user (Hint- Use `usermod` command to give user permission to docker). Make sure you reboot instance after giving permission to user.
- Inspect the container's running processes and exposed ports using the `docker inspect` command.
- Use the `docker logs` command to view the container's log output.
- Use the `docker stop` and `docker start` commands to stop and start the container.
- Use the `docker rm` command to remove the container when you're done.
- A. Pull a pre-existing Docker image from a public repository (e.g. Docker Hub) and run it on your local machine. Run the container as a non-root user (Hint- Use `usermod` command to give user permission to docker). Make sure you reboot instance after giving permission to user.

```
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker pull mysql:5.7
5.7: Pulling from library/mysql
20e4dcae4c69: Pull complete
1c56c3d4ce74: Pull complete
e9f03a1c24ce: Pull complete
68c3898c2015: Pull complete
6b95a940e7b6: Pull complete
90986bb8de6e: Pull complete
ae71319cb779: Pull complete
ffc89e9dfd88: Pull complete
43d05e938198: Pull complete
064b2d298fba: Pull complete
df9a4d85569b: Pull complete
Digest: sha256:4bc6bc963e6d8443453676cae56536f4b8156d78bae03c0145cbe47c2aad73bb
Status: Downloaded newer image for mysql:5.7
docker.io/library/mysql:5.7
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
mysql 5.7 5107333e08a8 8 months ago 501MB
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker run -d -p 3306:3306 --name mysql -e MYSQL_ROOT_PASSWORD=ROOT -e MYSQL_USER=
ubuntu -e MYSQL_PASSWORD=Vardhan@123 mysql
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
9c704ecd0c69: Pull complete
Digest: sha256:2e863c44b718727c860746568e1d54afd13b2fa71b160f5cd9058fc436217b30
Status: Downloaded newer image for ubuntu:latest
6cdc9e08010ea9d5b717c6a9f6aad30bae417d0028645531f2d71b5704df54e2
docker: Error response from daemon: failed to create task for container: failed to create shim task: OCI runtime create failed: runc
create failed: unable to start container process: exec: "-e": executable file not found in $PATH: unknown.
```

```

docker: Error response from daemon: failed to create task for container: failed to create shim task: OCI runtime create failed: runc
create failed: unable to start container process: exec: "-e": executable file not found in $PATH: unknown.
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED      STATUS      PORTS      NAMES
6cdc9e08010e   ubuntu   "-e MYSQL_PASSWORD=V..." 38 seconds ago    Created    0.0.0.0:3306->3306/tcp, :::3306->3306/tcp    mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker remove 6cd
6cd
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED      STATUS      PORTS      NAMES
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker run -d -p 3306:3306 --name mysql \
-e MYSQL_ROOT_PASSWORD=ROOT \
-e MYSQL_USER=ubuntu \
-e MYSQL_PASSWORD=Vardhan@123 \
mysql:latest
Unable to find image 'mysql:latest' locally
latest: Pulling from library/mysql
d9a40b27c30f: Pull complete
fe4b01031aab: Pull complete
aa72c34c4347: Pull complete
473ade985fa2: Pull complete
cc168a9482de: Pull complete
3ca3786815dd: Pull complete
3e3fac98ea83: Pull complete
10e5505c3ae4: Pull complete
a79ade39aab9: Pull complete
ae34d51c6da2: Pull complete
Digest: sha256:d8df069848906979fd7511db00dc22efeb0a33a990d87c3c6d3fcdaf6fc6123
Status: Downloaded newer image for mysql:latest
98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED      STATUS      PORTS
NAMES
98e3a45d5955   mysql:latest   "docker-entrypoint.s..." 31 seconds ago    Up 29 seconds    0.0.0.0:3306->3306/tcp, :::3306->3306/tcp, 33

```

After installing the docker I already added ubuntu in the docker group.

Sudo usermod -aG docker \$USER

After making this changes , reboot the system to reflect the changes.

- Inspect the container's running processes and exposed ports using the docker inspect command.

```

ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED      STATUS      PORTS
NAMES
98e3a45d5955   mysql:latest   "docker-entrypoint.s..." 15 minutes ago    Up 15 minutes    0.0.0.0:3306->3306/tcp, :::3306->3306/tcp, 33
060/tcp    mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker inspect 98e
[
  {
    "Id": "98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc",
    "Created": "2024-08-13T20:29:06.51607797Z",
    "Path": "docker-entrypoint.sh",
    "Args": [
      "mysqld"
    ],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 6751,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2024-08-13T20:29:07.057750009Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    },
    "Image": "sha256:7ce93a845a8a98c89bd58a5e45fe71277ca5f52177c88046858a6a0af969ba74",
    "ResolvConfPath": "/var/lib/docker/containers/98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc/resolv.conf",
    "HostnamePath": "/var/lib/docker/containers/98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc/hostname",
    "HostsPath": "/var/lib/docker/containers/98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc/hosts",
    "LogPath": "/var/lib/docker/containers/98e3a45d595578dcf993bbc7bf9ddff2c671973fb68dce9f50871573182c15dc/98e3a45d595578dcf993b
bc7bf9ddff2c671973fb68dce9f50871573182c15dc-json.log"
  }
]

```

```

    },
    "NetworkSettings": {
      "Bridge": "",
      "SandboxID": "9452efaa42138dd935e60db1ef8f83f419b2a23f2fad03b4bf93004fe6802f8e",
      "HairpinMode": false,
      "LinkLocalIPv6Address": "",
      "LinkLocalIPv6PrefixLen": 0,
      "Ports": {
        "3306/tcp": [
          {
            "HostIp": "0.0.0.0",
            "HostPort": "3306"
          },
          {
            "HostIp": "::",
            "HostPort": "3306"
          }
        ],
        "33060/tcp": null
      },
      "SandboxKey": "/var/run/docker/netns/9452efaa4213",
      "SecondaryIPAddresses": null,
      "SecondaryIPv6Addresses": null,
      "EndpointID": "38381b35a7c968cf7b2b50ad972775fb83973522ab888b300f25a094d09208a4",
      "Gateway": "172.17.0.1",
      "GlobalIPv6Address": "",
      "GlobalIPv6PrefixLen": 0,
      "IPAddress": "172.17.0.2",
      "IPPrefixLen": 16,
      "IPv6Gateway": "",
      "MacAddress": "02:42:ac:11:00:02",
      "Networks": {
        "bridge": {

```

```

ubuntu0ip-172-31-24-155:~/docker-projects/sample$ docker logs mysql
2024-08-13 20:29:07+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 9.0.1-1.el9 started.
2024-08-13 20:29:07+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2024-08-13 20:29:07+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 9.0.1-1.el9 started.
2024-08-13 20:29:08+00:00 [Note] [Entrypoint]: Initializing database files
2024-08-13T20:29:08.123187Z 0 [System] [MY-015017] [Server] MySQL Server Initialization - start.
2024-08-13T20:29:08.126123Z 0 [System] [MY-013169] [Server] /usr/sbin/mysqld (mysqld 9.0.1) initializing of server in progress as process 78
2024-08-13T20:29:08.147999Z 1 [System] [MY-013576] [InnoDB] InnoDB initialization has started.
2024-08-13T20:29:08.908196Z 1 [System] [MY-013577] [InnoDB] InnoDB initialization has ended.
2024-08-13T20:29:11.837286Z 6 [Warning] [MY-010453] [Server] root@localhost is created with an empty password ! Please consider switching off the --initialize-insecure option.
2024-08-13T20:29:14.866370Z 0 [System] [MY-015018] [Server] MySQL Server Initialization - end.
2024-08-13 20:29:14+00:00 [Note] [Entrypoint]: Database files initialized
2024-08-13 20:29:14+00:00 [Note] [Entrypoint]: Starting temporary server
2024-08-13T20:29:14.905935Z 0 [System] [MY-015015] [Server] MySQL Server - start.
2024-08-13T20:29:15.289546Z 0 [System] [MY-010116] [Server] /usr/sbin/mysqld (mysqld 9.0.1) starting as process 115
2024-08-13T20:29:15.311562Z 1 [System] [MY-013576] [InnoDB] InnoDB initialization has started.
2024-08-13T20:29:16.148308Z 1 [System] [MY-013577] [InnoDB] InnoDB initialization has ended.
2024-08-13T20:29:16.663023Z 0 [Warning] [MY-010068] [Server] CA certificate ca.pem is self signed.
2024-08-13T20:29:16.663313Z 0 [System] [MY-013602] [Server] Channel mysql_main configured to support TLS. Encrypted connections are now supported for this channel.
2024-08-13T20:29:16.672242Z 0 [Warning] [MY-011810] [Server] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the path is accessible to all OS users. Consider choosing a different directory.
2024-08-13T20:29:16.727651Z 0 [System] [MY-011323] [Server] X Plugin ready for connections. Socket: /var/run/mysqld/mysqlx.sock
2024-08-13T20:29:16.728092Z 0 [System] [MY-010931] [Server] /usr/sbin/mysqld: ready for connections. Version: '9.0.1' socket: '/var/run/mysqld/mysql.sock' port: 0 MySQL Community Server - GPL.
2024-08-13 20:29:16+00:00 [Note] [Entrypoint]: Temporary server started.

```

```

ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS
98e3a45d5955   mysql:latest  "docker-entrypoint.s..."  37 minutes ago  Up 37 minutes  0.0.0.0:3306->3306/tcp, :::3306->3306/tcp, 33060/tcp
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker stop mysql
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker start mysql
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS
98e3a45d5955   mysql:latest  "docker-entrypoint.s..."  38 minutes ago  Up 6 seconds  0.0.0.0:3306->3306/tcp, :::3306->3306/tcp, 33060/tcp
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker stop mysql
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker remove mysql
mysql
ubuntu@ip-172-31-24-155:~/docker-projects/sample$ docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
ubuntu@ip-172-31-24-155:~/docker-projects/sample$

```