Project assignment task description summary:

Through infrastructure automation my organization is adding more of the DevOps methodology and is working on a Redis-based projects. Redise should be used in a Swarm cluster for data storage and caching purposes.

The following task is to create a Redis-based docker image and deploy it on a Swarm cluster.

Through extending its infrastracture automation with configuration management a standard installation procedure for WordPress and its components is set up.

Components to be used:
Docker, Docker Hub, Redis-based Docker image

Important Steps:
Create the docker image
Deploy it as a Swarm cluster (Service which has multiple containers)
Publish the image on my Docker Hub account

Introduction

For this assignment, the given Ubuntu Lab Environment is the basis workspace. There the Redis Containers Dockerswarm is set up step by step.

Environment Setup

Log in as Super User/ Root User, create folder

Code:
sudo su -
mkdir ridis_project
ls
cd redis_project

Terminal:

```
labsuser@ip-172-31-18-13:~$ sudo su -
root@ip-172-31-18-13:~# mkdir redis_project
root@ip-172-31-18-13:~# ls
docker  k8s_material  redis_project  snap  stackdemo
root@ip-172-31-18-13:~# cd redis_project
root@ip-172-31-18-13:~/redis_project#
```

Removing all docker services and containers

Removing all docker services

Code:
docker service ls
docker service rm registry
docker service rm stackdemo_redis stackdemo_web

Terminal:

```
root@ip-172-31-18-13:~# docker service ls
ID             NAME             MODE         REPLICAS   IMAGE                    PORTS
k0k6lbl0umcm   registry         replicated   1/1        registry:2               *:5000->5000/tcp
0ajgc3lggh0l   stackdemo_redis  replicated   2/2        redis:latest
new9vewcclzs   stackdemo_web    replicated   4/3        localhost:5000/web:1.0   *:5001->5000/tcp
root@ip-172-31-18-13:~# docker service rm registry
registry
root@ip-172-31-18-13:~# docker service rm stackdemo_redis stackdemo_web
stackdemo_redis
stackdemo_web
root@ip-172-31-18-13:~# docker service ls
ID        NAME      MODE      REPLICAS   IMAGE     PORTS
root@ip-172-31-18-13:~#
```

Removing all docker containers

docker rm <containername> command not necessary as there are no containers.
Code:
docker ps
Terminal:

```
root@ip-172-31-18-13:~# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
root@ip-172-31-18-13:~#
```

Pull Redis- image, upload to own Dockerhub

Pulling Redis- based Image

Code:
docker pull redis

Terminal:

```
root@ip-172-31-18-13:~# docker pull redis
Using default tag: latest
latest: Pulling from library/redis
578acb154839: Pull complete
536258f1438d: Pull complete
b2c17634dc83: Pull complete
0a9ed92f5eca: Pull complete
8e9838754832: Pull complete
4f4fb700ef54: Pull complete
8e7abba29a95: Pull complete
Digest: sha256:d2f4d823a498f366c540b81e6b69bce397062f980f2e42340482225af0d9b5ab
Status: Downloaded newer image for redis:latest
docker.io/library/redis:latest
root@ip-172-31-18-13:~#
```

Login to dockerhub

(username sebastiango and password are not necessary because they have been saved)

Code:
docker login

Terminal:

```
root@ip-172-31-18-13:~/redis_project# docker login
Authenticating with existing credentials...
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@ip-172-31-18-13:~/redis_project#
```

Tag and Push Redis based image

Code:
docker tag redis:latest sebastiango/redisdockerhub
docker push sebastiango/redisdockerhub

Terminal:

```
root@ip-172-31-18-13:~/redis_project# docker tag redis:latest sebastiango/redisdockerhub
root@ip-172-31-18-13:~/redis_project# docker push sebastiango/redisdockerhub
Using default tag: latest
The push refers to repository [docker.io/sebastiango/redisdockerhub]
a51f1d394661: Mounted from library/redis
5f70bf18a086: Mounted from library/redis
57fe7f7dc7d5: Mounted from library/redis
0adc6adbb7a4: Mounted from library/redis
4465d19c7e12: Mounted from library/redis
9a603daeb2a5: Mounted from library/redis
ec983b166360: Mounted from library/redis
latest: digest: sha256:f4ceb03aeaf9997ef872db68e1ebc79fc1a7b89606686061447cb84b7bf4f90b size: 1779
```

Create global mode Redis Swarm

Have Workers join the Docker Swarm (Service)

Host:
(Docker swarm init command not necessary as the docker swarm is already initialized)

Code:

docker swarm join-token worker

Terminal:

```
root@ip-172-31-18-13:~# docker swarm join-token worker
To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-1vffa9vl2e8wu472chw0wsgq0x4uabkhxyxr5igj0davypwo52-8tslxpkyccte234xbar5k1u7n 172.31.1
8.13:2377

root@ip-172-31-18-13:~#
```

Worker 1 and 2:

Code:

docker swarm join - -token
SWMTKN-1-1vffa9vl2e8wu472chw0wsgq0x4uabkhxyxr5igj0davypwo52-8tslxpkyccte234xbar5k1u7n
172.31.18.13:2377

Terminal:

```
root@ip-172-31-19-140:~# docker swarm join --token SWMTKN-1-1vffa9vl2e8wu472chw0wsgq0x4uabkhxyxr5igj0davypwo52-8tslxpkyccte2
34xbar5k1u7n 172.31.18.13:2377
This node joined a swarm as a worker.
root@ip-172-31-19-140:~#
```

Create Redis Docker Swarm (global service)

Code:
docker service create - - name redisswarm - - mode global sebastiango/redisdockerhub:latest

Terminal:

```
root@ip-172-31-18-13:~/dockerrecap# docker service create --name redisswarm --mode global sebastiango/redisdockerhub:latest
ew2xgoc1gvlysrxqepjeww00v
overall progress: 3 out of 3 tasks
k6423m3htrd1: running   [==================================================>]
lxavzk8w9239: running   [==================================================>]
evuudmudt5dy: running   [==================================================>]
verify: Waiting 5 seconds to verify that tasks are stable...
```

Verify Redis Swarm containers

Container started on host
Code: docker ps
Terminal:

```
root@ip-172-31-18-13:~/dockerrecap# docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED         STATUS         PORTS      NAMES
692c11859f48   sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   2 minutes ago   Up 2 minutes   6379/tcp   redisswarm.evuud
mudt5dyavnbbmx4lonq9.vnqkbcb71o6ohw6krsjfh3lp2
root@ip-172-31-18-13:~/dockerrecap#
```

Container started on worker 1
Code: docker ps -a
Terminal:

```
root@ip-172-31-19-140:~# docker ps -a
CONTAINER ID        IMAGE                                COMMAND                  CREATED              STATUS                          PORTS
        NAMES
e1507001bf53        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   2 seconds ago        Created
        redisswarm.lxavzk8w923916tp9u7bwsw6x.zj2odfpagz23b1znzqtayesi5
5245e77748af        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   8 seconds ago        Exited (1) 2 seconds ago
        redisswarm.lxavzk8w923916tp9u7bwsw6x.mo78iljn10vhr0dc6o4q2bz38
9f319b0fd09e        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   14 seconds ago       Exited (1) 8 seconds ago
        redisswarm.lxavzk8w923916tp9u7bwsw6x.jqo1lenckofjbtgz9mh48f14p
e8b9c47d6d4b        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   20 seconds ago       Exited (1) 14 seconds ago
        redisswarm.lxavzk8w923916tp9u7bwsw6x.y45ggy6t38n29wmflyrfw19zg
2a8b4ef99a4d        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   26 seconds ago       Exited (1) 20 seconds ago
        redisswarm.lxavzk8w923916tp9u7bwsw6x.8wzi0zg83sjxasn0natye8zd6
root@ip-172-31-19-140:~#
```

Container started on worker 2
Code: docker ps -a
Terminal:

```
root@ip-172-31-17-152:~# docker ps -a
CONTAINER ID        IMAGE                                COMMAND                  CREATED              STATUS                          PORTS
        NAMES
368a4a98a6e3        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   2 seconds ago        Created
        redisswarm.k6423m3htrd1jwc9009xw6eq3.k448gd2n8c6tb9md5cz3f1whx
b3b1d8904f71        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   8 seconds ago        Exited (1) 1 second ago
        redisswarm.k6423m3htrd1jwc9009xw6eq3.k8xnh3oa794fwtt3g4o9myqf3
24c9ea4d41e8        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   14 seconds ago       Exited (1) 7 seconds ago
        redisswarm.k6423m3htrd1jwc9009xw6eq3.l98u1hlyniugbhusiijiff5d5
b234fc6a18b6        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   20 seconds ago       Exited (1) 13 seconds ago
        redisswarm.k6423m3htrd1jwc9009xw6eq3.396z29jrwmu1li12k8j2lcnso
cc5a5ca789c7        sebastiango/redisdockerhub:latest    "docker-entrypoint.s…"   26 seconds ago       Exited (1) 19 seconds ago
        redisswarm.k6423m3htrd1jwc9009xw6eq3.unjhmz4v9bylt1fuehtjaw7g5
root@ip-172-31-17-152:~#
```

Summary

The redis image has been pulled and published to my Docker Hub account.
Afterwards the workers joined the docker swarm.
The next step was to create the global docker swarm service which creates the redis based images on the host and the worker 1 and worker 2.