Create a Docker Image and Deploy It on a Swarm Cluster

Course-end Project 1

Description

# Project objective:

You are working as a DevOps engineer in an IT firm. You have been asked to create a Redis-based Docker image and deploy it on a Swarm cluster.

# Background of the problem statement:

Your organization wants to use Redis in a Swarm cluster for the data storage and caching purpose. The development team has asked you to create a Redis-based Docker image using a Dockerfile and deploy this image on a Swarm cluster.  
 You have also been asked to publish this image on your organization's Docker Hub account so that other team members can also access this image.

# You must use the following:

●Docker CLI: To create the Docker image and deploy it on Swarm cluster  
 ●Docker Hub: To publish the image

## Following requirements should be met:

●Follow the above-mentioned specifications  
 ●Make sure you create an account on Docker Hub to push the Docker image  
 ●Document the step-by-step process involved in completing this task

Steps required to follow in the project.

* Write a docker file for redis-server
* On Master build docker image using docker build
* Create docker hub account
* Docker push on docker hub account
* Initialize the swarm cluster.
* Join nodes from Master to node
* Create a service based on docker image using redis-server build at #2

## Step 1 Write a docker file for redis-server

### Create project directory and CD into it

| mkdir /root/project cd /root/project |
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### create dockerfile: /root/project/Dockerfile

| root@master:~/project# cat /root/project/Dockerfile # /root/project/Dockerfile  FROM ubuntu RUN apt update RUN apt install -y lsb-release curl gpg RUN curl -fsSL https://packages.redis.io/gpg | gpg --dearmor -o /usr/share/keyrings/redis-archive-keyring.gpg RUN echo "deb [signed-by=/usr/share/keyrings/redis-archive-keyring.gpg] https://packages.redis.io/deb $(lsb\_release -cs) main" | tee /etc/apt/sources.list.d/redis.list RUN apt-get update && apt-get -y install redis-server CMD redis-server EXPOSE 6379 |
| --- |

## Step 2 On Master build docker image using docker build

| docker build /root/project/ -t redis-simplilearn:1.0 |
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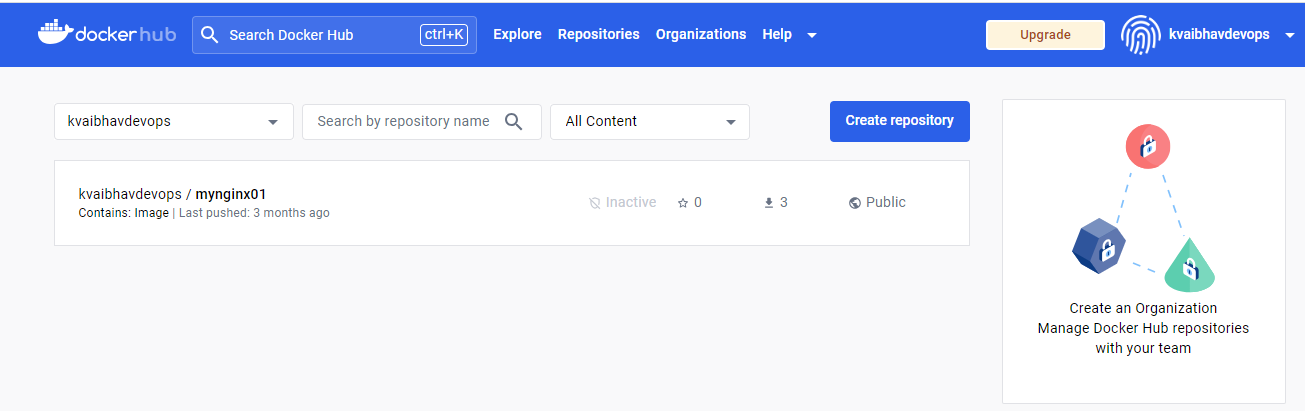
Out put of the above build

| root@master:~/project# docker images  REPOSITORY TAG IMAGE ID CREATED SIZE redis-simplilearn 1.0 49410959c973 22 seconds ago 177MB |
| --- |

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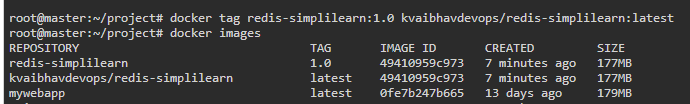
## Step 3 Create docker hub account



## Step 4 Docker push on docker hub account

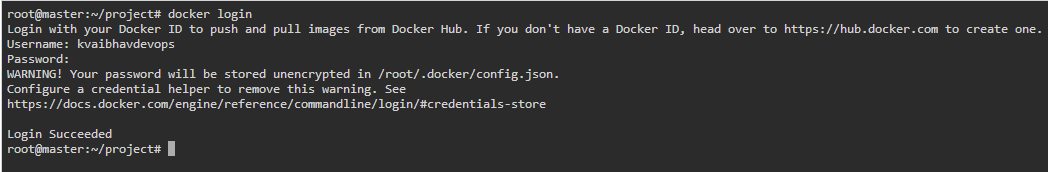
### Tag the image with your account name

| docker tag redis-simplilearn:1.0 kvaibhavdevops/redis-simplilearn:latest |
| --- |



| root@master:~/project# docker tag redis-simplilearn:1.0 kvaibhavdevops/redis-simplilearn:latest root@master:~/project# docker images  REPOSITORY TAG IMAGE ID CREATED SIZE redis-simplilearn 1.0 49410959c973 7 minutes ago 177MB kvaibhavdevops/redis-simplilearn latest 49410959c973 7 minutes ago 177MB mywebapp latest 0fe7b247b665 13 days ago 179MB |
| --- |

### Login to dockerhub



| root@master:~/project# docker login Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one. Username: kvaibhavdevops Password:  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 |
| --- |

### Push the image on docker hub

| docker push kvaibhavdevops/redis-simplilearn:latest |
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| root@master:~/project# docker push kvaibhavdevops/redis-simplilearn:latest The push refers to repository [docker.io/kvaibhavdevops/redis-simplilearn] 2cedb1d0e0c3: Pushed  06d94216f377: Pushed  84ae910ba5de: Pushed  4352741f0a67: Pushed  4cc5cfeaa61c: Pushed  256d88da4185: Mounted from library/ubuntu  latest: digest: sha256:13d79e56f6f84c0386e92c9e13becb2d9b4597c3dd46bd73443f48147924a323 size: 1580 |
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## Step 5 Initialize the swarm cluster.

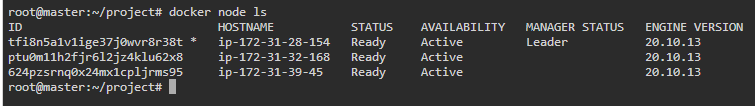
| root@master:~/project# docker swarm init Swarm initialized: current node (tfi8n5a1v1ige37j0wvr8r38t) is now a manager. To add a worker to this swarm, run the following command:   docker swarm join --token SWMTKN-1-0mp2lyw7x07m48rmhy8ajy8cdcqpr86bq01nz9e88obwrj1b83-akfktl1vbdy6kgac2l2ka8qfw 172.31.28.154:2377  To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions. |
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## Step 6 Join nodes from Master to node

| root@master:~/project# docker node ls ID HOSTNAME STATUS AVAILABILITY MANAGER STATUS ENGINE VERSION tfi8n5a1v1ige37j0wvr8r38t \* ip-172-31-28-154 Ready Active Leader 20.10.13 ptu0m11h2fjr6l2jz4klu62x8 ip-172-31-32-168 Ready Active 20.10.13 624pzsrnq0x24mx1cpljrms95 ip-172-31-39-45 Ready Active 20.10.13 root@master:~/project# |
| --- |

## 

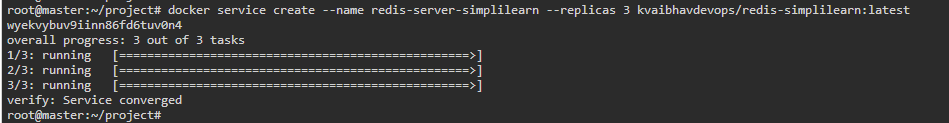


## Step 7 Create a service based on docker image using redis-server build at #2

| docker service create --name redis-server-simplilearn --replicas 3 kvaibhavdevops/redis-simplilearn:latest |
| --- |

Out put of the above command

| root@master:~/project# docker service create --name redis-server-simplilearn --replicas 3 kvaibhavdevops/redis-simplilearn:latest wyekvybuv9iinn86fd6tuv0n4 overall progress: 3 out of 3 tasks  1/3: running [==================================================>]  2/3: running [==================================================>]  3/3: running [==================================================>]  verify: Service converged  root@master:~/project# |
| --- |



### Verify and explore the service

| root@master:~/project# docker service ls ID NAME MODE REPLICAS IMAGE PORTS wyekvybuv9ii redis-server-simplilearn replicated 3/3 kvaibhavdevops/redis-simplilearn:latest  root@master:~/project# |
| --- |

| root@master:~/project# docker service ps redis-server-simplilearn ID NAME IMAGE NODE DESIRED STATE CURRENT STATE ERROR PORTS ffoqyh2hwq8j redis-server-simplilearn.1 kvaibhavdevops/redis-simplilearn:latest ip-172-31-28-154 Running Running 2 minutes ago  u396u9fv79co redis-server-simplilearn.2 kvaibhavdevops/redis-simplilearn:latest ip-172-31-32-168 Running Running 2 minutes ago  ytl29m7rxkyv redis-server-simplilearn.3 kvaibhavdevops/redis-simplilearn:latest ip-172-31-39-45 Running Running 2 minutes ago  root@master:~/project# |
| --- |