

Multi-Node Docker Swarm Cluster for High Availability

Step 1: Initialize Docker Swarm, Check the cluster

Step 2: Create a Docker Compose File

```
master@master-vm:~$ docker swarm init --advertise-addr 192.168.219.137
Swarm initialized: current node (m5n7ln8k1lmism69uo4mqvgzv) is now a manager.

To add a worker to this swarm, run the following command:

    docker swarm join --token SWMTKN-1-1xz5s3jyweo4dlnhrhwjffjulgxef83lx1277uyaa3ky3ejrnw3k-a9px9h85pld31d5957g7pmtj7 192.168.219.137:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.
master@master-vm:~$ docker node ls
ID                HOSTNAME        STATUS    AVAILABILITY    MANAGER STATUS    ENGINE VERSION
m5n7ln8k1lmism69uo4mqvgzv *  master-vm      Ready     Active           Leader             28.0.1
4zvd78y6a4rh2ne7n2le13yhd  node1-vm       Ready     Active           -                 26.1.3
bnp1a2fultplkr5dkvu9au2y7  node2-vm       Ready     Active           -                 26.1.3
master@master-vm:~$ ls
compose-test  Documents  Music      Public  Videos
Desktop       Downloads  nginx_project  snap
doc_swarm     Flask-Docker  Pictures    Templates
master@master-vm:~$ mkdir doc_swarm
mkdir: cannot create directory 'doc_swarm': File exists
master@master-vm:~$ rm -R doc_swarm
master@master-vm:~$ mkdir doc_swarm
master@master-vm:~$ cd doc_swarm
master@master-vm:~/doc_swarm$ ls
master@master-vm:~/doc_swarm$ nano docker_compose.yml
```

Docker_compose.yml file

```
GNU nano 6.2 docker_compose.yml
nginx:
  image: nginx:latest
  ports:
    - "80:80"
  deploy:
    replicas: 3
    restart_policy:
      condition: on-failure
  networks:
    - my_network

redis:
  image: redis:alpine
  deploy:
    replicas: 2
    restart_policy:
      condition: on-failure
  networks:
    - my_network

postgres:
  image: postgres:13
  environment:
    POSTGRES_USER: admin
    POSTGRES_PASSWORD: password
  volumes:
    - postgres_data:/var/lib/postgresql/data
  networks:
    - my_network

networks:
  my_network:

volumes:
  postgres_data:
```

Step 3: Deploy the Application on Swarm

```
master@master-vm:~/doc_swarm$ docker stack deploy -c docker_compose.yml myapp
Since --detach=false was not specified, tasks will be created in the background.
In a future release, --detach=false will become the default.
Creating network myapp_my_network
Creating service myapp_nginx
Creating service myapp_redis
Creating service myapp_postgres
```

Check service status

```
master@master-vm:~/doc_swarm$ docker service ls
ID                NAME                MODE                REPLICAS    IMAGE                PORTS
7gypkw9nnerz     myapp_nginx         replicated          3/3         nginx:latest        *:80->80/tcp
w5o1s8vl2sv6     myapp_postgres      replicated          1/1         postgres:13
ty44n2ztzstx     myapp_redis         replicated          2/2         redis:alpine
```

Copy the join token and add worker node-1

```
node1@node1-vm:~$ sudo docker swarm join --token SWMTKN-1-1xz5s3jyweo4dlnhrhwjffjulgxef83lx1277uyaa3ky3ejrnw3k-a9px9h85p1d31d5957g7pmt
j7 192.168.219.137:2377
[sudo] password for node1:
This node joined a swarm as a worker.

node1@node1-vm:~$ sudo docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
af881f975b89   redis:alpine "docker-entrypoint.s..." 23 minutes ago Up 23 minutes 6379/tcp     myapp_redis.1.ry6l81yk5f4fcjrcn0j
z83tr7        nginx:latest "/docker-entrypoint..." 23 minutes ago Up 23 minutes 80/tcp       myapp_nginx.3.pszunoq57tt20ligw4
r91ols
```

Copy the join token and add worker node-2

```
node2@node2-vm:~$ sudo docker swarm join --token SWMTKN-1-1xz5s3jyweo4dlnhrhwjffjulgxef83lx1277uyaa3ky3ejrnw3k-a9px9h85p1d31d5957g7pmt
j7 192.168.219.137:2377
[sudo] password for node2:
This node joined a swarm as a worker.
```

Pulled the Postgres

```
node2@node2-vm:~$ docker pull postgres
Using default tag: latest
latest: Pulling from library/postgres
7cf63256a31a: Already exists
543c6dea2e39: Pull complete
dc87fb4dbc03: Pull complete
55c54708c8e7: Pull complete
878a40f56a67: Pull complete
6424ae1ae883: Pull complete
600e770d797e: Pull complete
a21a08dbca2c: Pull complete
783086ffbe8e: Pull complete
42e76ffa3e07: Pull complete
fccc4fd45a4d: Pull complete
420a047e4570: Pull complete
553d1749e29f: Pull complete
bc13f9b1d80d: Pull complete
Digest: sha256:81f32a88ec561664634637dd446487efd5f9d90996304b96210078e90e5c8b21
Status: Downloaded newer image for postgres:latest
docker.io/library/postgres:latest

node2@node2-vm:~$ sudo docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
a0b6869a0070   postgres   "docker-entrypoint.s..." 2 minutes ago Up 2 minutes 5432/tcp     myapp_postgres
abc8deabd5b6   nginx:latest "/docker-entrypoint..." 35 minutes ago Up 35 minutes 80/tcp       myapp_nginx.2.tqo5dsqpp2dlyxwftb
qm8f5l
```