Setting Up Docker Swarm

1. **Install Docker**: Make sure Docker is installed on all the machines you want to include in your Docker Swarm cluster. You can follow the official Docker installation guide for your specific operating system.
2. **Initialize Swarm Mode**: Run the following command on the machine you want to designate as the manager node:

   ```
   docker swarm init --advertise-addr <MANAGER-IP>
   ```

   Replace `<MANAGER-IP>` with the IP address of the manager node.

3. **Join Worker Nodes**: After initializing the swarm, you will receive a command to join worker nodes to the swarm. Run this command on each machine you want to add as a worker node.
4. **Deploy Services**: You can deploy services to the Docker Swarm cluster using Docker Compose or the `docker service` command. Here is an example of deploying a service:

   ```
   docker service create --replicas 3 --name my-web-app -p 8080:80 my-web-app-image
   ```

   This command deploys a service named `my-web-app` with 3 replicas, mapping port 8080 on the host to port 80 in the container.

Create a swarm

5. Open a terminal and ssh into the machine where you want to run your manager node. This tutorial uses a machine named `manager1`.
6. Run the following command to create a new swarm:

docker swarm init --advertise-addr <MANAGER-IP>

the following command creates a swarm on the `manager1` machine:

docker swarm init --advertise-addr 192.168.99.100

Swarm initialized: current node s now a manager.

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

**docker swarm join **

--token SWMTKN-1-49nj1cmql0jkz5s954yi3oex3nedyz0fb0xx14ie39trti4wxv-8vxv8rssmk743ojnwacrr2e7c \

192.168.99.100:2377

To add a manager to this swarm, run 'docker swarm join-token manager' and follow the instructions.

7. The `--advertise-addr` flag configures the manager node to publish its address as `192.168.99.100`. The other nodes in the swarm must be able to access the manager at the IP address.

The output includes the commands to join new nodes to the swarm. Nodes will join as managers or workers depending on the value for the `--token` flag.

Run the `docker node ls` command to view information about nodes:

Deploy a service to the swarm

```
docker service create --replicas 1 --name helloworld alpine ping docker.com
```

- The `docker service create` command creates the service.
- The `--name` flag names the service `helloworld`.
- The `--replicas` flag specifies the desired state of 1 running instance.

- The arguments `alpine ping docker.com` define the service as an Alpine Linux container that executes the command `ping docker.com`.

Run `docker service ls` to see the list of running services:

Inspect a service on the swarm

```
docker service inspect --pretty <SERVICE-ID>
```

Scale the service in the swarm

```
docker service scale <SERVICE-ID>=<NUMBER-OF-TASKS>
```

Delete the service running on the swarm

```
docker service rm helloworld
```

Apply rolling updates to a service

```
docker service create \
  --replicas 3 \
  --name redis \
  --update-delay 10s \
  redis:3.0.6
```

Drain a node on the swarm

```
docker node update --availability drain worker1
```

Use Swarm mode routing mesh

```
docker service create \
  --name <SERVICE-NAME> \
  --publish published=<PUBLISHED-PORT>,target=<CONTAINER-PORT> \
```