TP Docker Swarm

Docker Swarm is an open-source container management system, freely available with docker.

In this pratical class, we are going to:

- setup multi-node docker swarm Cluster on Ubuntu 20.20 server;

- deploy an application and manage it on our deployed docker swarm;

Prerequisites

- Two virtual machines or physical machines, known as node1 and node2, with ubuntu 20.20 server installed.
- Minimum 4 GB RAM and 2 vCPU per node.
- root password is setup on each node "toto".

Connection to your nodes

You must be connected to N7 with the VPN and be connected to a N7 machine with your studenID. Use the following commands to access your nodes :

```
ssh <your enseeiht user name>@<an enseeiht machine>.enseeiht.fr
```

Type your enseeiht password

Node1 port is 130XX and the node2 port 130XX+1

```
ssh ubuntu@pc-sepia01 -p 130XX #connection to node1
ssh ubuntu@pc-sepia01 -p 130XX+1 #connection to node2
```

Where XX=01-40. This will give you acces to a VM with IP address 192.168.27.**(XX+10)** and the password is "*toto*"

```
sudo bash
apt-get update -y # On both node
```

Docker installation on both nodes

Docker must be installed on both node1 and node2. You start by installing all the required packages.

```
wget -qO- https://get.docker.com/ | sh
```

Swarm installation on node1 (Swarm manager)

Init swarm on node1

```
docker swarm init
```

Save the join command on your terminal.

Type this command to get the list of nodes

```
docker node ls
```

To get the list of running service

```
docker service ls
```

Node2 configuration

Add the node2 to the cluster

```
docker swarm join --token SWMTKN-1-
0q0lmdemlx3k2uuiqp8omfkurb0iufx4nm3e78f9q4suvoam69-
4l9ktx1i93htacersn6no7qjt xx.xx.xx.xx:xxx
```

On node1 check the number of nodes

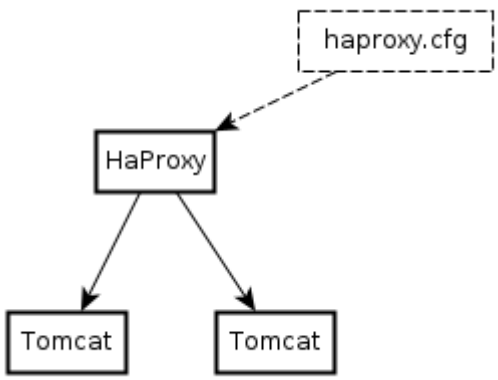
```
docker node ls
```

Tomcat deployment **

We will deploy a Tomcat (as during the last class) in our swarm cluster. Create a new directory named 'tomcat' and move to the directory.

```
mkdir -p tomcat/
cd tomcat/
```

We will use the tomcat:v1 image of the last class and implement the same architecture as last class



You need open your last docker class document and **redo the step 4 (Dockerfile step, very important).** This is to create the tomcat:v1 image.

We need to create a network mynet

```
docker network create -d overlay mynet
```

Create a docker compose file named 'tomcat.yml' and paste the following content.

```
version: '3'
services:
  tc1:
    image: tomcat:v1
    ports:
      - 8080:8080
    networks:
     - mynet
 networks:
  mynet:
    external:
      name: mynet
```

Start your tomcat service with

```
docker stack deploy -c tomcat.yml tomcatDeploy1
```

You can check on which node the container is started by using

```
docker service ls
```

Get the serviceID and

```
docker service ps <serviceID>
```

Connect to the node and check if a container is running

```
docker ps
```

Check if the tomcat is available (wait for the container to start)

```
wget localhost:8080/Hello/Hello
```

Stop the service

```
docker service ls # Get the service ID and
docker service rm <serviceID>
```

We will create a basic architecture with a single tomcat and single haproxy. You have to download haprox_backup.cfg file and modify it to add "tc1" in the server list **(step 5 of docker class)**

Create a file named architecture.yml with this content (this is a docker-compose syntax)

```
version: '3'
services:
  tc1:
   image: tomcat:v1
   hostname: tc1
   ports:
     - 8080
   networks:
     - mynet
  myhaproxy:
    image: haproxy
    depends_on:
      - tc1
    volumes:
      - <absolute path to
haprox_backup.cfg>:/usr/local/etc/haproxy/haproxy.cfg
    ports:
      - 80:80
    networks:
      - mynet
networks:
  mynet:
    external:
      name: mynet
```

Now we can start the service

```
docker stack deploy -c architecture.yml tomcatDeploy1
```

You can test your deployment (wait for all containers to start)

```
wget localhost:80/Hello/Hello
```

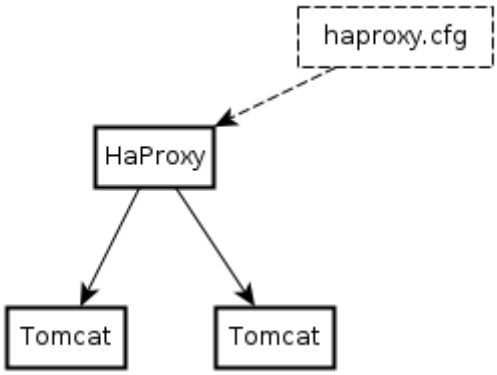
Stop the services

```
docker service ls
docker service rm <service ID> #Both services
```

Tomcat Deployment

You will demonstrate that you followed the session by deploying the tomcat architecture of last class in your swarm cluster (2 tomcats instance and 1 haproxy with the configuration).

Modify the architecture.yml file for that.



Good luck!