

Exercise 2 - Docker advanced

Assignments

1. Create a Docker compose file which defines two services - toyota-data-feeder application and mosquitto broker.
 1. For toyota-data-feeder use the image you pushed to registry in exercise1.
 2. Use the official [eclipse-mosquitto](#) image.
 3. USE ONLY CHARACTERS a-z AND minus sign (-) IN SERVICE NAMES
2. Configure mosquitto broker with [correct configuration](#) - encrypted unauthenticated access.
 1. Broker should allow for anonymous access.
 2. Use ports 1883 and 8883.
 3. Use ca.crt, server.crt and server.key for enabling encrypted access.
3. Mount configuration files and certificates to mosquitto container
4. Connect toyota-data-feeder to use mosquitto broker.
 1. Create a custom network with the name of your studentid (studentXXX-net) in the docker compose file.
 2. For feeder url and port use the locally deployed mosquitto sub. Don't use mqtt-test.rahtiapp.fi:443.
5. Run docker compose to start up the services
6. Confirm you are receiving messages to your localhost with mosquitto_sub
7. Showcase that your containers work in a custom network.
 1. docker network inspect

Deliverables

1. Zip -file with following files (7z, rar, tar accepted as well).
 1. docker-compose.yml.
 2. mosquitto.conf and certificates.
 3. Other files needed for the deployment to work
2. Text report for describing each step. Also show your cli input's and output's.

My Text Report

INFO:

My name: Xinyuan Ma

CSC Rahti account: student297

STEPS:

1. Create a compose file named [docker-compose.yml](#)
 1. Defines two services

```
services:
  feeder:
```

```
...  
mosquitto:  
...
```

2. Use the official image

```
image: eclipse-mosquitto:latest
```

2. Create [correct configuration](#)

1. Broker should allow for anonymous access.

```
allow_anonymous true
```

2. Use ports 1883 and 8883.

```
listener 1883  
listener 8883
```

3. Use ca.crt, server.crt and server.key for enabling encrypted access.

```
certfile /mosquitto/config/certs/server.crt  
cafile /mosquitto/config/certs/ca.crt  
keyfile /mosquitto/config/certs/server.key
```

3. Mount configuration files and certificates to mosquitto container

```
volumes:  
- "./mosquitto.conf:/mosquitto/config/mosquitto.conf"  
- "./certs:/mosquitto/config/certs"
```

4. Connect toyota-data-feeder to use mosquitto broker.

1. Create a custom network with the name of your studentid (studentXXX-net) in the docker compose file.

```
networks:  
  studnet297-net:  
    name: studnet297-net
```

- For feeder url and port use the locally deployed mosquitto sub. Don't use mqtt-test.rahtiapp.fi:443.

```
services:
  feeder:
    networks:
      - studnet297-net
  mosquitto:
    networks:
      - studnet297-net
```

- Run docker compose to start up the services

```
docker compose up
```

```
(base) ericma@EricdeMacBook-Pro toyota-data-feeder % docker compose up
WARN[0000] Found orphan containers ([toyota-data-feeder toyota-data-feeder_run_a1d82c684758 toyota-data-feeder-toyota-data-feeder-1]) for this project. If you removed or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up.
[+] Running 2/0
  # Container toyota-data-feeder-mosquitto-1 Created                                0.0s
  # Container toyota-data-feeder-feeder-1 Created                                  0.0s
Attaching to toyota-data-feeder-feeder-1, toyota-data-feeder-mosquitto-1
toyota-data-feeder-mosquitto-1 | 1670165318: mosquitto version 2.0.15 starting
toyota-data-feeder-mosquitto-1 | 1670165318: Config loaded from /mosquitto/config/mosquitto.conf.
toyota-data-feeder-mosquitto-1 | 1670165318: Opening ipv4 listen socket on port 1883.
toyota-data-feeder-mosquitto-1 | 1670165318: Opening ipv6 listen socket on port 1883.
toyota-data-feeder-mosquitto-1 | 1670165318: Opening ipv4 listen socket on port 8883.
toyota-data-feeder-mosquitto-1 | 1670165318: Opening ipv6 listen socket on port 8883.
toyota-data-feeder-mosquitto-1 | 1670165318: mosquitto version 2.0.15 running
toyota-data-feeder-feeder-1 | Connecting...
toyota-data-feeder-feeder-1 | Connected to broker
toyota-data-feeder-feeder-1 | Msg id published: 1
toyota-data-feeder-feeder-1 | Msg id published: 2
toyota-data-feeder-feeder-1 | Msg id published: 3
toyota-data-feeder-feeder-1 | Msg id published: 4
toyota-data-feeder-feeder-1 | Msg id published: 5
toyota-data-feeder-feeder-1 | Msg id published: 6
toyota-data-feeder-feeder-1 | Msg id published: 7
toyota-data-feeder-feeder-1 | Msg id published: 8
toyota-data-feeder-feeder-1 | Msg id published: 9
toyota-data-feeder-feeder-1 | Msg id published: 10
toyota-data-feeder-feeder-1 | Msg id published: 11
toyota-data-feeder-feeder-1 | Msg id published: 12
toyota-data-feeder-feeder-1 | Msg id published: 13
toyota-data-feeder-feeder-1 | Msg id published: 14
toyota-data-feeder-feeder-1 | Msg id published: 15
```

- Confirm you are receiving messages to your localhost with mosquitto_sub
- Showcase that your containers work in a custom network.

- docker network inspect

```
docker network inspect studnet297-net
```

```

(base) ericma@EricdeMacBook-Pro SDS-New % docker network inspect studnet297-net
[
  {
    "Name": "studnet297-net",
    "Id": "168b165718be9afb4dcc21fd3afeec9ec2a39ce56cc048fe08356be361095c9a",
    "Created": "2022-11-19T19:11:55.173052138Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": null,
      "Config": [
        {
          "Subnet": "172.18.0.0/16",
          "Gateway": "172.18.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
      "474454b68b38ce06f062b20a9aab10f01dc9eb72794514b3ebc2b0ab1dfc35b6": {
        "Name": "toyota-data-feeder-feeder-1",
        "EndpointID": "f75fba4179bd1c965efc912f96253bd089d6a929686e87840f29ccf0f1b0d724",
        "MacAddress": "02:42:ac:12:00:02",
        "IPv4Address": "172.18.0.2/16",
        "IPv6Address": ""
      },
      "9468a2d3cbe5cc7692788aea0211d70d8c9298962b5173f0e823f6b30e7840fe": {
        "Name": "toyota-data-feeder-mosquitto-1",
        "EndpointID": "84a5595cb0f2216be0dd30c2b2880b53174cce1e9d6ce572c295ac2b244d5780",
        "MacAddress": "02:42:ac:12:00:03",
        "IPv4Address": "172.18.0.3/16",
        "IPv6Address": ""
      }
    },
    "Options": {},
    "Labels": {
      "com.docker.compose.network": "studnet297-net",
      "com.docker.compose.project": "toyota-data-feeder",
      "com.docker.compose.version": "2.10.2"
    }
  }
]

```