Agranimo challenge - Senior backend

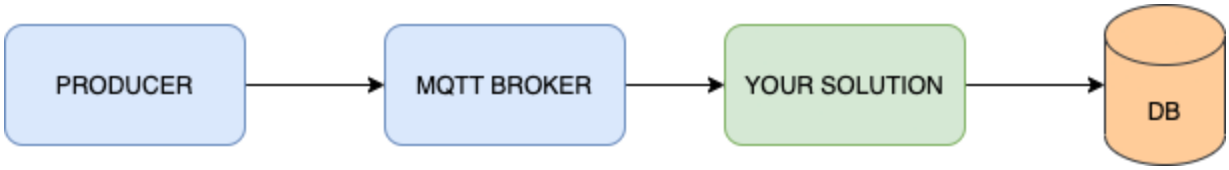
Francisco Abalán O.

Overview

The following challenge consists of 4 parts:

- Subscribing to MQTT broker.
- Storing data in a NoSQL Database.
- Processing data.

The following diagram shows how the data should flow from producers to the database.



Subscribing to MQTT broker.

In order to connect to the Broker you have to use the following credentials. Please note you can also use sockets.

- **Connect Address**: v2509608.en.emqx.cloud
- **Connect Ports**: 12133(mqtt), 11912(mqtts), 8083(ws), 8084(wss)

We provide you access to a MongoDB instance where all the events created by devices installed in different areas should be stored. Each event might content the following attributes:

- **DID**: Unique Device Identifier
- **FMW**: Firmware version.
- **TMS**: Timestamp in seconds from 00:00 Jan 1 1970.
- **bvol**: Battery voltage ([V]) of the origin device (device that sent the data).
- **tem1**: Temperature of air sensor 1 ([°C]).

- **hum1**: Humidity of air sensor 1 ([%]).
- **solr**: Solar radiation [W/m^2].
- **stm1**: Soil temperature of sensor 1 ([°C]).
- **smo1**: Soil moisture voltage of sensor 1 ([V]).
- among other attributes for hardware debugging, please discard them.

The content of any event will depend on the type of device that is sending data. We configure the following devices to send data.

- 1_65500:
    - DID
    - FMW
    - TMS
    - bvol
    - tem1
    - hum1
    - solr
- 2_65500
    - DID
    - FMW
    - TMS
    - bvol
    - stm1
    - smo1
- 18_65500
    - DID
    - FMW
    - TMS
    - bvol
    - tem1
    - hum1
    - solr
    - lwet

Storing data in a NoSQL Database.
Whenever a event is received from the broker, it should be store as it is in the in the Historical collection; in the NoSQL database MongoDb

In order to connect to the MongoDb database you have to use the following credentials.

- **user**: agranimo-challenge
- **password**: d2VsY29tZSB0byBhZ3JhbmltbW==
- **database**: agranimo-challenge

ex. connection

mongo "mongodb+srv://cluster0.bbhso.mongodb.net/agranimo-challenge" --username agranimo-challenge

Processing data.

The following logic has to be implemented. Whenever the device 1_65500 or 18_65500 emit an event, your solution should perform a request to the Openweather API.

As soon as the response is received, you should store this result in the **Openweather collection**, linking the result with the event that triggered the request. From the request you must collect the following information:

- pressure
- temperature
- humidity
- sunset
- sunrise
- wind speed
- wind deg

and add the following attributes

- TMS (the TMS from the event)
- event_id (from the Historical collection)

It is important to notice that you should be able to link the **Openweather document** with the **Historical document**.

In order to connect to the Openweather API you have to use the following credentials. Note the url is already configured with the API KEY and location.

- **URL**: api.openweathermap.org/data/2.5/weather?lat=51.5750611029945&lon=11.730333915341257&appid=6a5ad7d297c59e9f2a166e5b2a04249f

ex. of response

{"coord":{"lon":11.7303,"lat":51.5751},"weather":[{"id":601,"main":"Snow","description":"snow","icon":"13d"}],"base":"stations","main":{"temp":275,"feels_like":273.75,"temp_min":274.82,"temp_max":275.37,"pressure":1002,"humidity":83},"visibility":10000,"wind":{"speed":1.34,"deg":109,"gust":2.68},"snow":{"1h":1.27},"clouds":{"all":100},"dt":1617620045,"sys":{"type":3,"id":2011115,"country":"DE","sunrise":1617597537,"sunset":1617645130},"timezone":7200,"id":2951531,"name":"Beesenstedt","cod":200}

Note: if you reach the limit quota of the Openweather API (max. 60 calls/minute), your solution will skip the process and continue without error.

Evaluation

We will evaluate your solution in terms of robustness and scalability. meaning that your solution should include testing, it doesn't crash and most importantly and can handle with no problem an increase of double the amount of events per hour.

Deadline

Please upload the code to the gitlab repository that you've been assigned . The challenge is meant to be finished by **April 12th 2021** at the latest. Feel free to ask questions during the challenge - it will give us an indication of how you think and get a feeling for working together as a team.

Good luck!