User guide: how to use the dashboard

Rob Brew (rb602)
Nathanael Melouki (nmmm2)
Ilyas Semmaoui (irs20)
Baptiste Veyssiere (bv65)

CO838 Internet of Things and Mobile Devices

This guide is meant to help the user of our solution to understand how the project is structured. As a reminder, our project consists of a web application to help users to get information about the water level of the Great Stour river.
Our application is composed of 4 elements:

1. MQTT client
2. EA (Environment Agency) API crawler
3. Dashboard
4. MySQL database

1 MQTT client

The MQTT client is waiting for the records of the sensors placed by the university. Those results are send by an MQTT server.

2 EA crawler

A crawler has been developed to query the API of the Environment Agency. The queries are done every 15 minutes using a cron job.

3 Dashboard

The dashboard is the place where you can vizualize the data collected in our database. It is accessible from this url:
http://129.12.44.32:8080/baptiste/

On this page you can see a map generated using the Google Map API in javascript. On this map will be displayed the list of the stations monitoring the level of the river. If there is any flooding, the map will also display the areas that have been flooding with a specific color depending on the severity.

Monitoring stations:
The dashboard draws a marker at the location of each station. The marker will be black for the sensors from the university, and white if the sensors are from the environment agency. By clicking on a marker, additional data about this sensor will be displayed on the right side of the page. It

is also possible to select the station from the list in the lower right corner of the page. The data displayed contains the level of the water at this location, the time when the level was recorded, it's source (university or EA sensor), the name of the sensor and an alert level.
There are 4 alert levels:

1. pale green: the level is lower than the usual minimum level.
2. green: the level is between the usual minimum level and 30cm under the usual max level.
3. orange: the level is between 30cm under the usual max level and the usual max level.
4. red: the level is over the usual max level.

There is also a color scheme concerning the severity of the flooding:

1. red (Severe Flood Warning): Severe Flooding, Danger to Life.
2. orange (Flood Warning): Flooding is Expected, Immediate Action Required.
3. green (Flood Alert): Flooding is Possible, Be Prepared.
4. pale green (Warning no Longer in Force): The warning is no longer in force

Finally, a time slider is available to search for historic level of the river.

4 MySQL database

A mySQL database is used to store the data gathered by the MQTT client and the EA crawler. There are multiple tables:

1. monitoring_stations: contains the list of all the stations as well as the source of the sensor and its location.
2. levels: the list of the records containing the level of the river and the warning level if available.
3. flood_warnings: the list of the areas that are flooded, the time when it happened and the severity.
4. devices: contains information about the mbed registered.
5. subscriber: the list of the subscribers with their phone number, their location, their postcode and the code for the mbed if registered.