

# Online Energy Utility Platform

## Laboratory 2, Project 2

Avram Andrei-Alexandru

30444

The clients of the energy distributor have installed smart meters for each device registered to measure its energy consumption. Each sensor sends data to a server periodically, in the form *(timestamp, sensor\_id, measurement\_value)*, where *timestamp* is the time instance when the measurement was made and *measurement\_value* is the value of the energy counter measuring the total energy consumed by the device in kWh since the sensor was installed.

Implement a system based on a message broker middleware that gathers data from the sensors and pre-processes them before storing them in the database. If the queue consumer application that preprocesses the data detects a measurement power peak that exceeds the sensor maximum threshold (i.e. sensor *maximum value* measure in kW defined in Assignment 1) it notifies asynchronously the client on its web interface. To compute a power peak, the instantaneous power in a measurement interval is computed by averaging the energy consumption and dividing the value to the time interval.

Problems that I came across during the implementation of this assignment:

1. Entity framework caching. When retrieving a device from the database the returned device gets cached and the updated maximum energy consumption will not be seen in the messaging service. This was fixed by forcing entity framework to reload the object in memory.
2. SignalR connection problem because the JWT token authentication was enabled. Startup class was updated to support SignalR.
3. CI/CD of the frontend Angular 11 application. Documentation for GitHub YAML file for Angular deployment using docker containers was hard to find online.
4. Kendo Angular library current version required licensing.