Device Energy Monitoring Platform

.Net Core

The goal of the application is to offer users the possibility to overview the energy consumption of their devices, on a daily basis and hourly. A regular user can only see its own devices, while the administrator of the platform can create, update, and delete users, and also map them to new devices.

Architecture of the platform

The application is structured on 3 main layers: Repository Layer, Logic Layer, and Presentation Layer.

Backend

In the repository layer, the connection with the database is established, and data manipulation operations are performed.

The logic layer transforms the data received from the repository layer and sends it to the presentation layer.

On the presentation layer, the controllers are defined, along with the views. The authorization part of the application is handled by Identity, which I have used to manage the claims of the logged in user.

The claims contain the id of the logged in user and its role, used for authorization on the pages.

Frontend

The Frontend of the application is created using HTML and Javascript.

The admin can visualize all the users, create new ones, edit and delete them. It can also map users to devices. A regular user can only visualize its devices and the consumptions, by selecting a day in the calendar.

User page

Graphical user interface

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated

Producer & Consumer

For this part, I have built a new application that reads data from a csv file and sends it to a RabbitMq queue every 10 minutes. The main application has a connection to the same queue, from which it retrieves data as a JSON every 10 minutes. The message is then processed and mapped into a Consumption type object that is inserted into the database. At the same time, the data reading is translated into an event and sent to the frontend, using SignalR, which works with websockets. The user is notified every time a new message is received.

Deployment Diagram

Diagram

Description automatically generated

Conceptual Diagram

Diagram

Description automatically generated