Integrated Energy Management System

Name: Usuc Alexandru

Group: 30244

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Project specifications

The project activity involves creating an integrated system by connecting the microservices developed during laboratory assignments, deploying them on a virtualized infrastructure, and ensuring security features are in place.

Functional requirements

The user will be able to manage his user account through the "Sign up" and "Log in" functionalities.

When the website is accessed by the client, he will be able to see his personal data and the devices assigned to him. He is able to edit his personal data and also his devices. When connected, the client cannot access the admin URLs.

When the admin is connected, he has multiple functionalities at his disposal, such as viewing a list of all users, adding a new user, viewing a list of devices, adding a device that will also be mapped to a specific user. Basically, the admin has full control over the user and devices. He can perform all CRUD operations on users, and also devices.

Non-Functional requirements

- The graphical interface will be intuitive and easy to use by the user.
- The application will be secure, regarding the fact that a client can’t access the admin URLs.
- The application will be reliable and trustworthy. To achieve high reliability, they will be removed all bugs that can affect code safety and component problems the system.
- High performance. Optimal algorithms will be used to improve the experience the user.

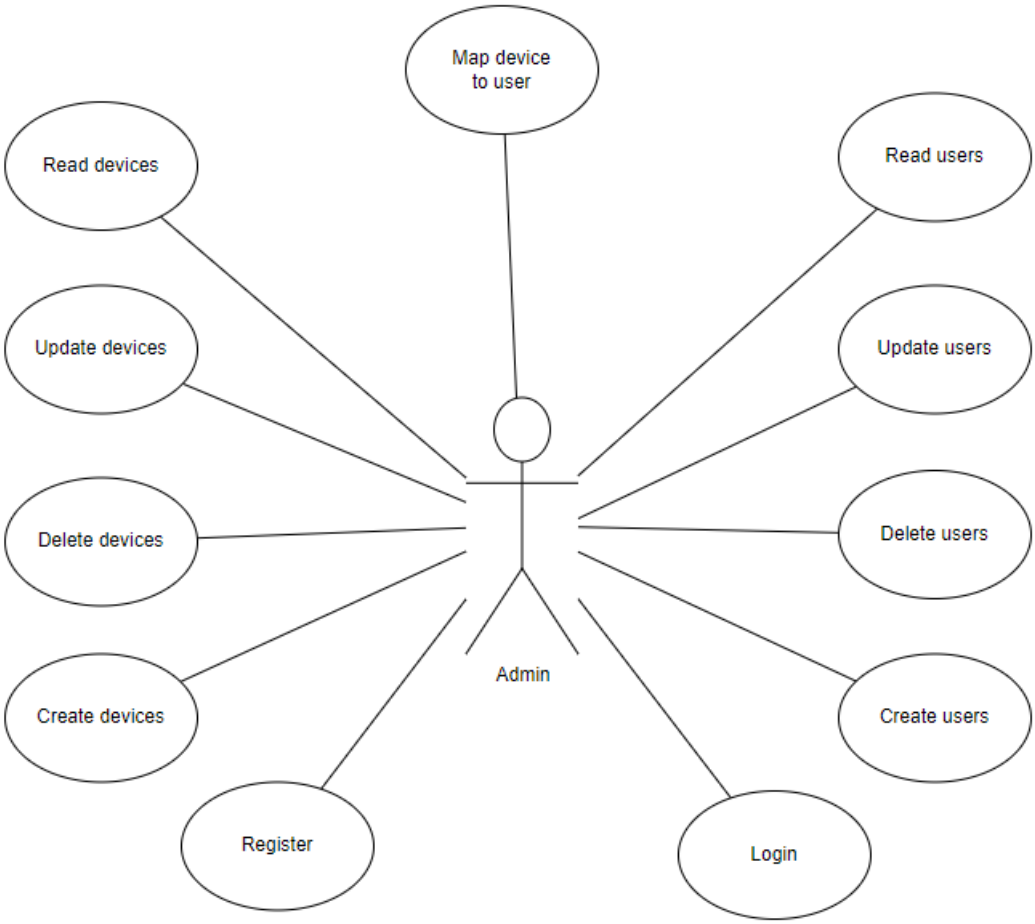
Implementation techniques

The application will be implemented in the Java programming language using the Spring framework, and all data from the application will be saved in the MySql database. The Intellij IDEA will be used as a development environment.

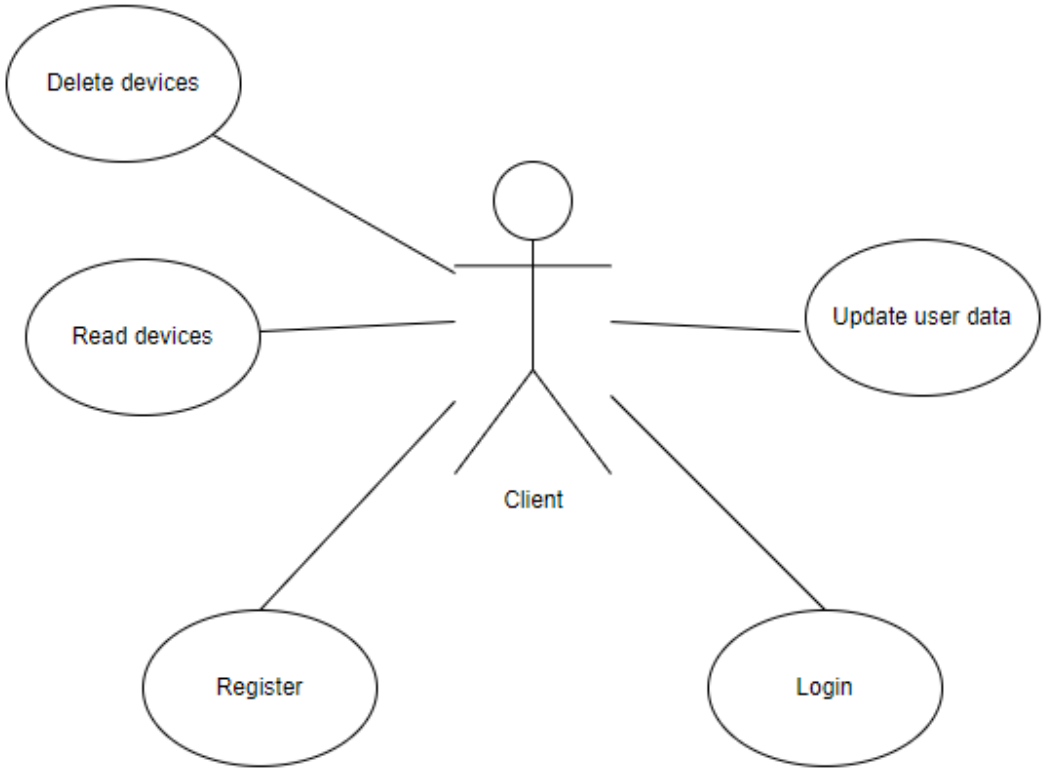
The graphical interface will be made using HTML, CSS and JavaSript using the React framework having Visual Studio Code as a development environment.

Use case diagrams

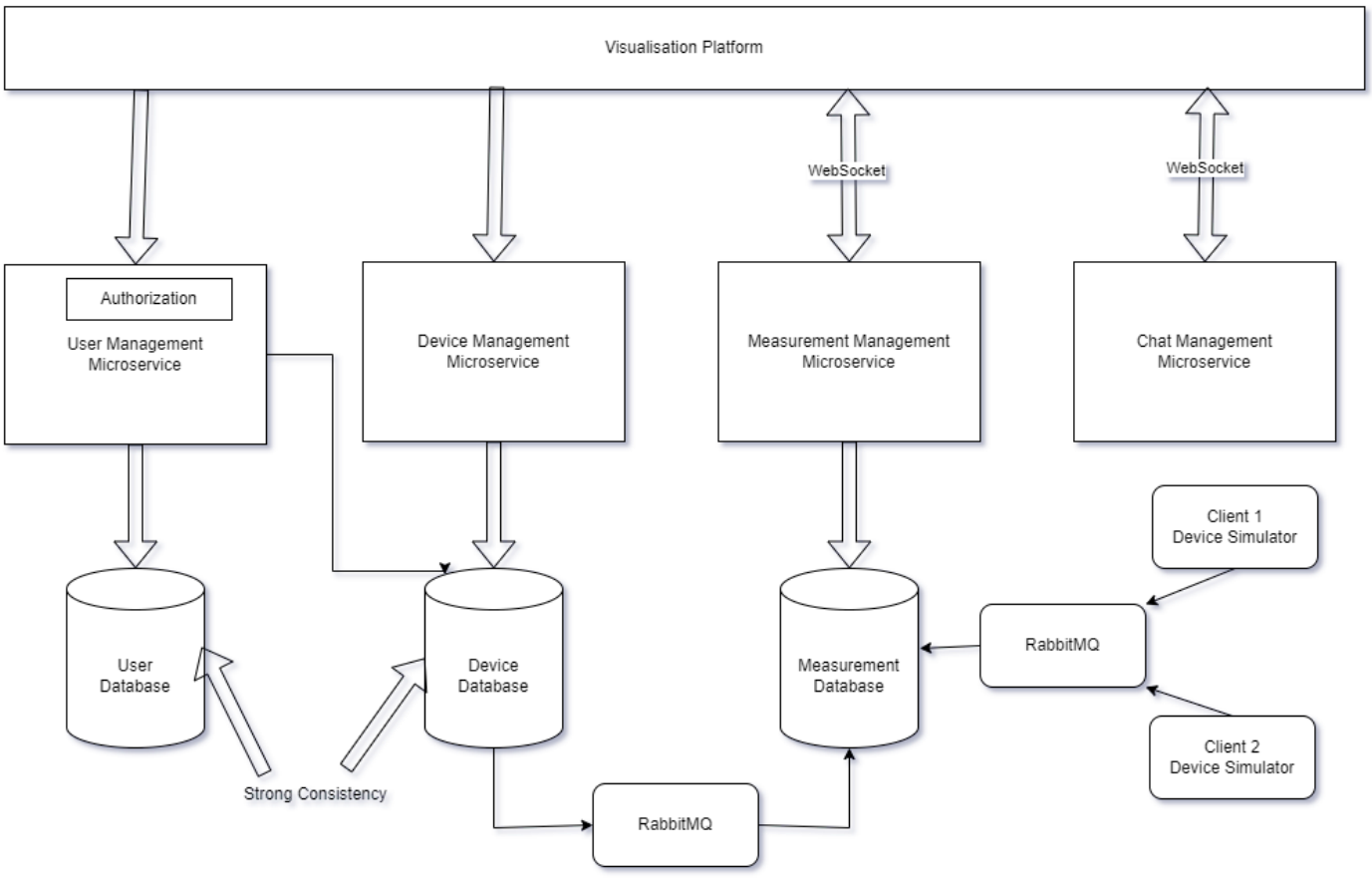
Admin



Client



Conceptual architecture of the distributed system



Deployment

The deployment was made with Docker according to the following diagram. The application consists of 5 containers (user, device, measurement, frontend and mysql). These containers work independently similar to production. The network to which they connect is the same and was created by docker-compose.