SUP'COM
Higher School of Communication of Tunis

جامعة قرطاج
Université de Carthage

Smart Doorbell

Elaborated by :

Nada ZAHRA

Nada.zahra@supcom.tn

Aymen HOUIDI

Aymen.houidi@supcom.tn

Supervisor :

Dr. Mohamed Bécha KAANICHE

Medbecha.kaaniche@supcom.tn

Academic year: 2023 – 2024

1 General overview

In today's rapidly evolving digital age, traditional doorbell systems provide limited functionality, merely alerting homeowners of a visitor's presence without offering insights into the visitor's identity. This lack of information can pose security risks, especially in scenarios where unauthorized or malicious individuals approach residences. To address this challenge, the proposed solution is to integrate facial recognition technology and user-activated camera systems. By pressing a push button, visitors activate the camera, allowing the system to capture their image and subsequently identify them using face recognition techniques. If the visitor is not recognized, the system sends the captured image to the homeowner's mobile app, giving them the opportunity to visually verify the visitor. The owner can then decide to grant or deny access based on the image received. For recognized visitors, homeowners receive real-time notifications detailing their identity.

2 Use case diagram

The smart doorbell system has one actor a simple user. Figure 1 demonstrates the use case diagram for this actor:

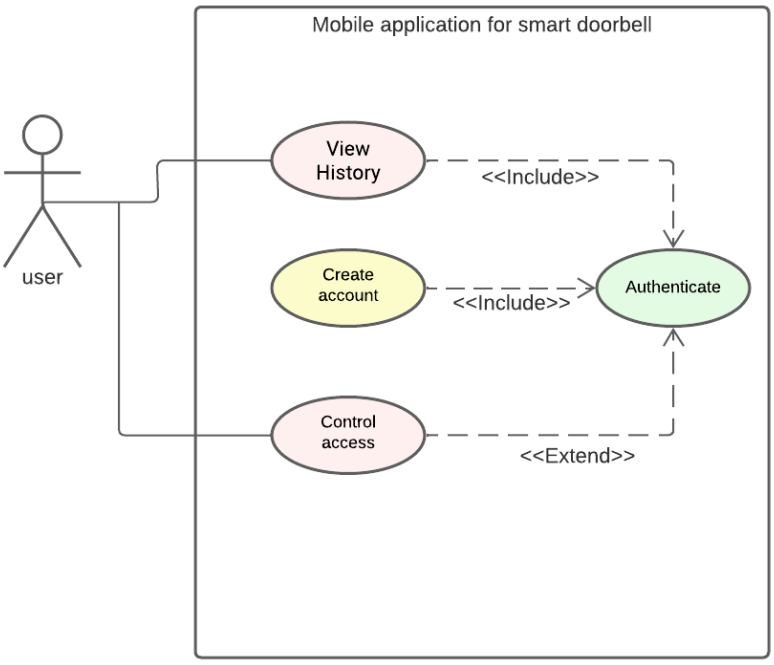

Figure 1: Smart garbage monitoring system use case diagram

• For the user, his role consists of creating an account and accessing the mobile application to visualize the visitors historic and control access to the door remotly.

3 Class diagram

A class diagram clearly represents the structure and different components of a system to help view the application. The figure below showcases the class diagram of the IOT system:

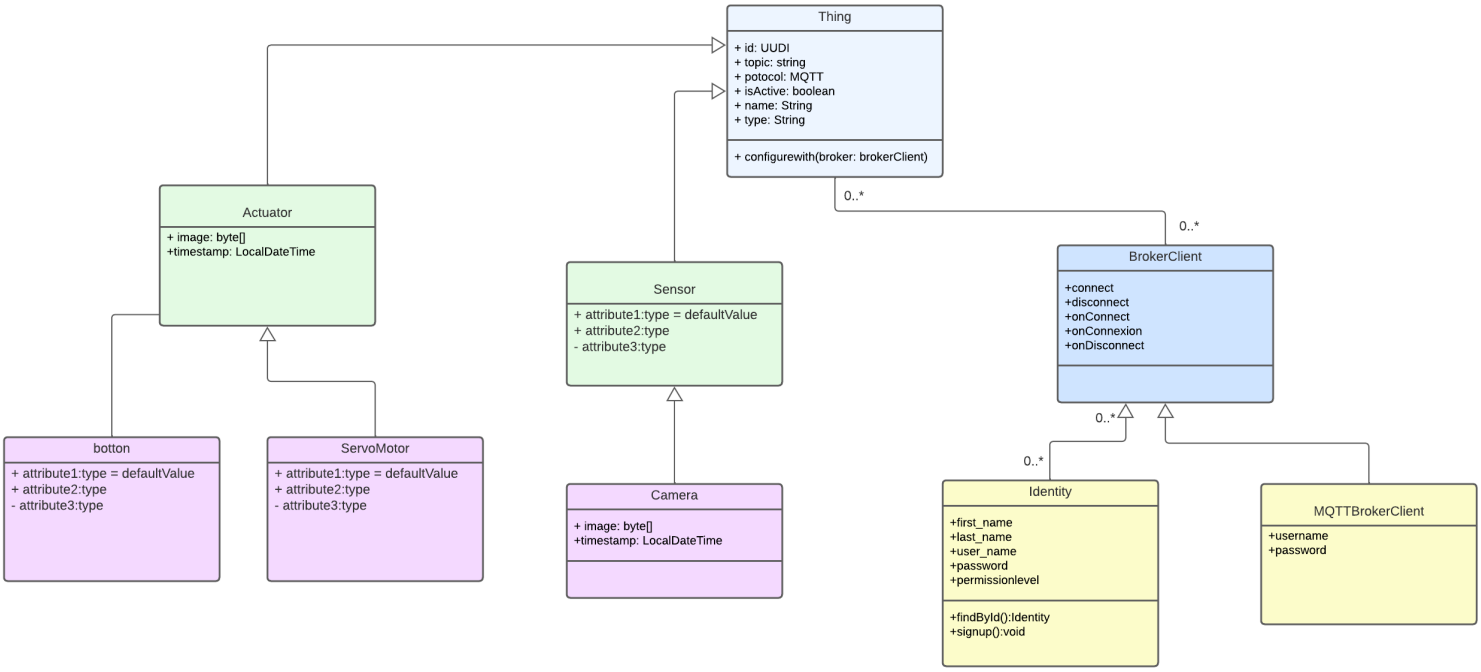

Figure 2: Class diagram

Sensor capture the information and communicate with actuator via the broker. Communication is established through topics using MQTT protocol publish and subscribe method.

4 Deployment diagram

A deployment diagram is an UML diagram for visualizing the hardware components and devices, the links of communication between these different components and the software files on 2 that hardware. Figure 3 highlights the deployment diagram for the smart doorbell system:

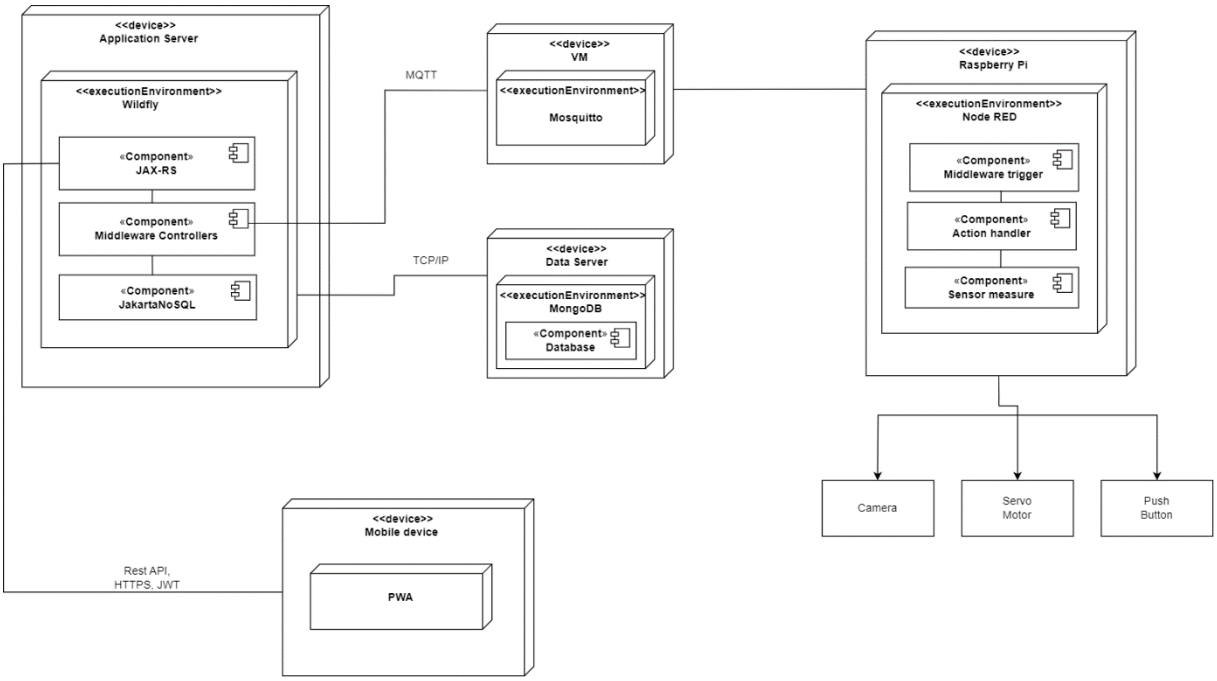

Figure 3: Smart doorbell system Deployment diagram

As illustrated by the diagram, the application server which is composed of Jakarta EE and Jax RS takes charge of all communications between the different components. The MQTT broker mosquitto, the database MongoDB and the application server will all be hosted on a virtual machine on cloud. The electronic card sends data to the server via the Mosquitto broker. Finally, Rest API and security mechanisms such as JSON web token, HSTS and Oauth2 will be used between the mobile device and the server.