

Architectural Design

Product Description

Autolock is an IoT based digital locking system designed to automate and digitize the action of locking a door. The product consists of both hardware and software components. The hardware components include an ESP32 module, jumper cables, and a servo motor. The software components include an app built in the arduino IDE and deployed locally on the ESP32, and a backend and frontend deployed across the Blynk IoT framework.

Use Cases

UC-1

The client should be able remotely lock a door using the client frontend.

UC-2

The client should be able to access the state of the lock using the logs function

UC-3

The client should be able to disconnect the application remotely.

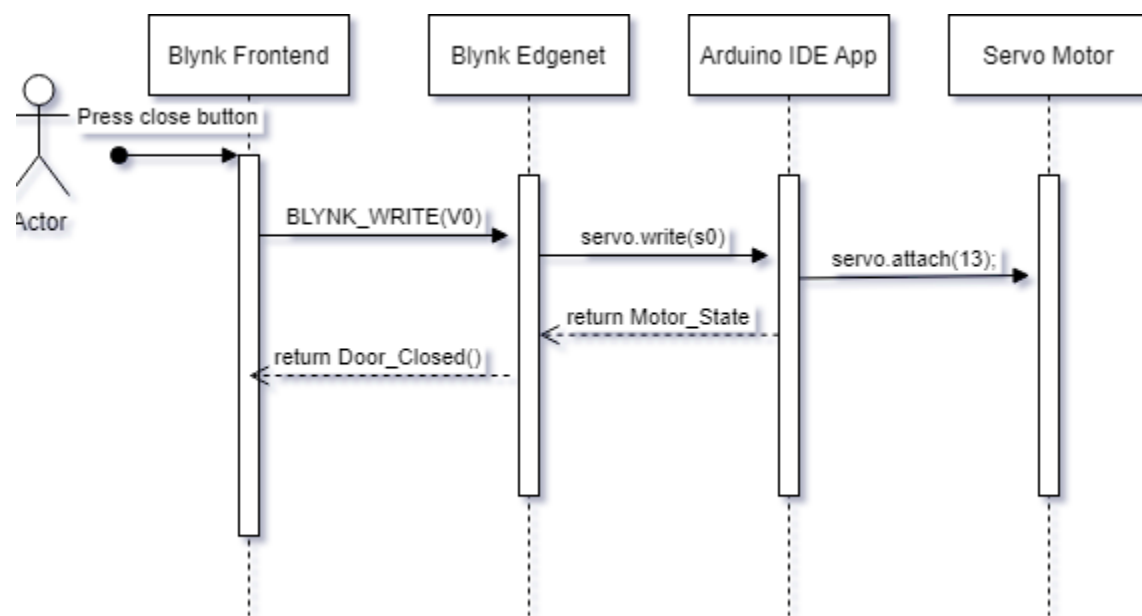


Fig 1: Sequence Diagram : Button function

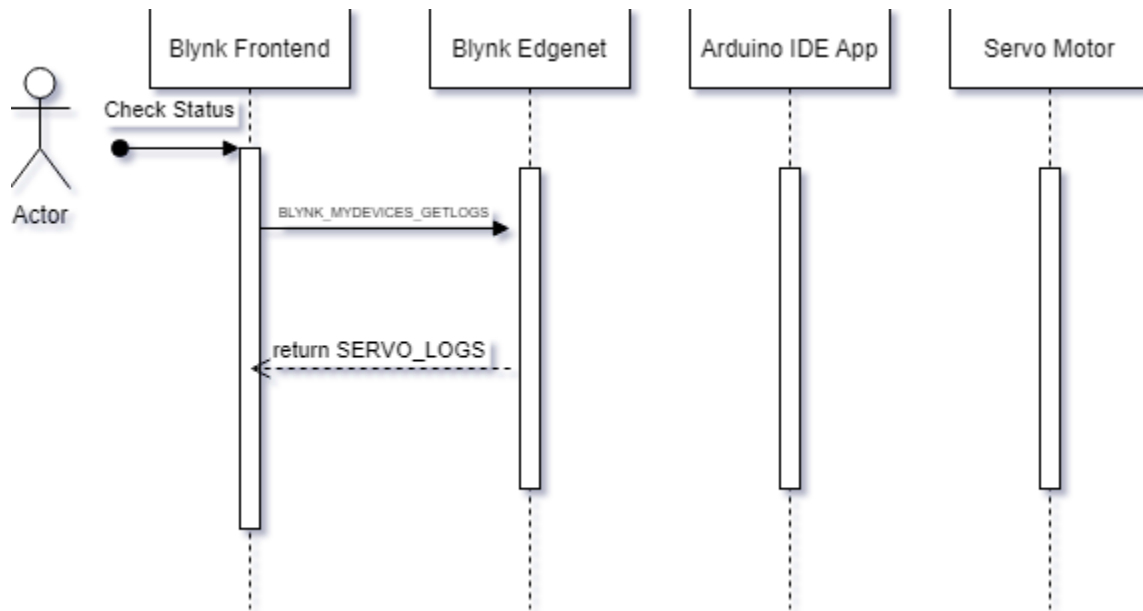


Fig 2: Sequence Diagram : Status

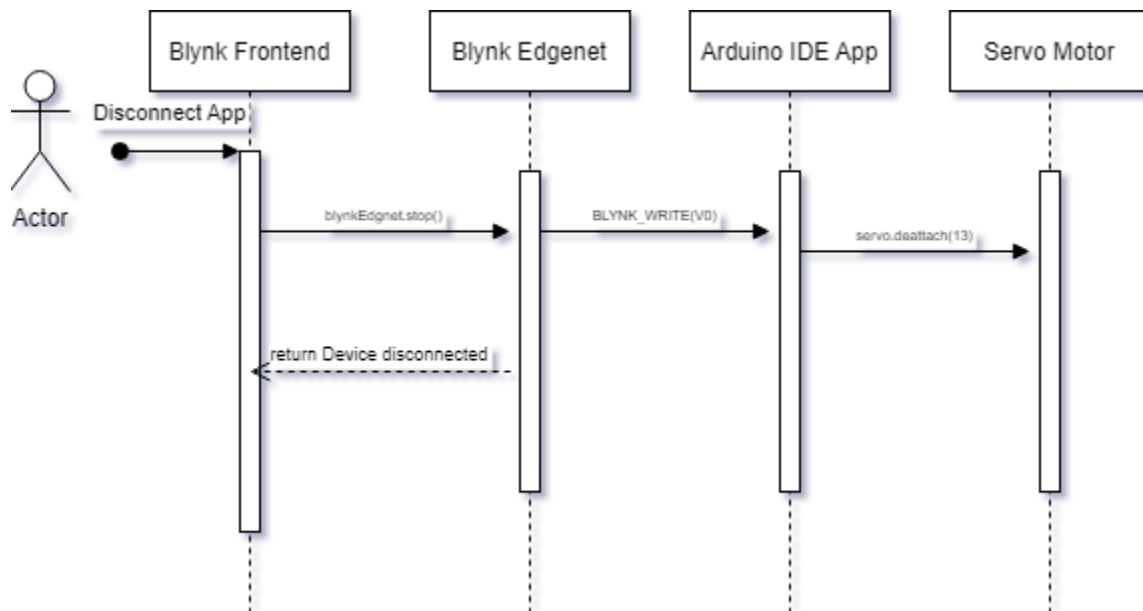


Fig 3: Sequence Diagram : App Disconnect

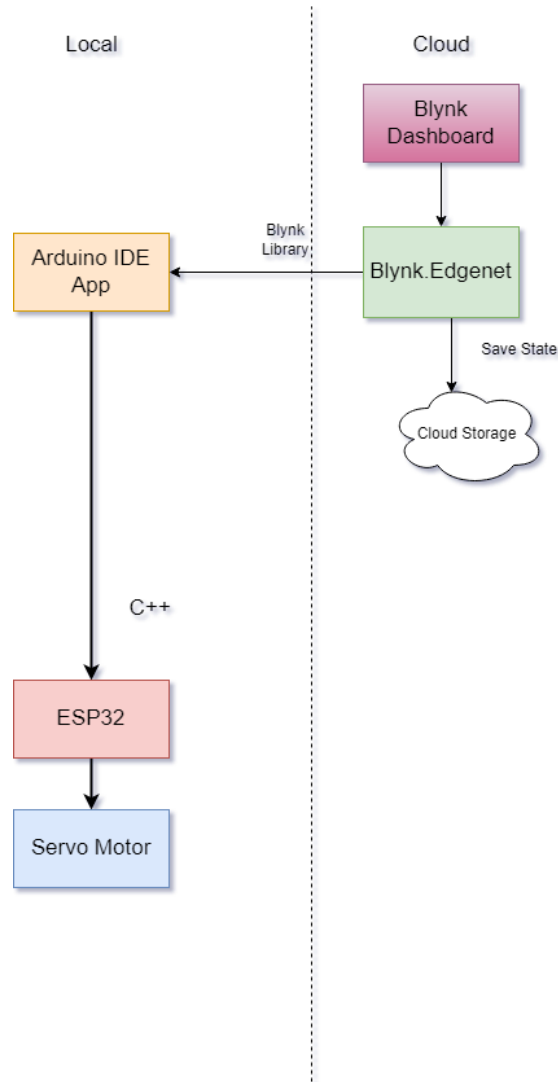


Fig 4: IoT Level Specification Architecture Diagram

Description of Components

- **Arduino IDE App:** Application written in C++ that holds the main logic of the program. It is responsible for communicating with Blynk (through the blynk edgenet library) as well as controlling the servo motor
- **ESP32:** A wifi module where the Arduino IDE App is deployed and run.
- **Servo motor:** A motor which generates the force to lock and unlock a door.
- **Blynk.Edgenet:** Library responsible for facilitating communication between the IoT framework and the app deployed on the ESP32
- **Blynk Dashboard:** Client front end where the UI to manipulate the servo motor exists, as well as the backend where the state of the motor is saved.

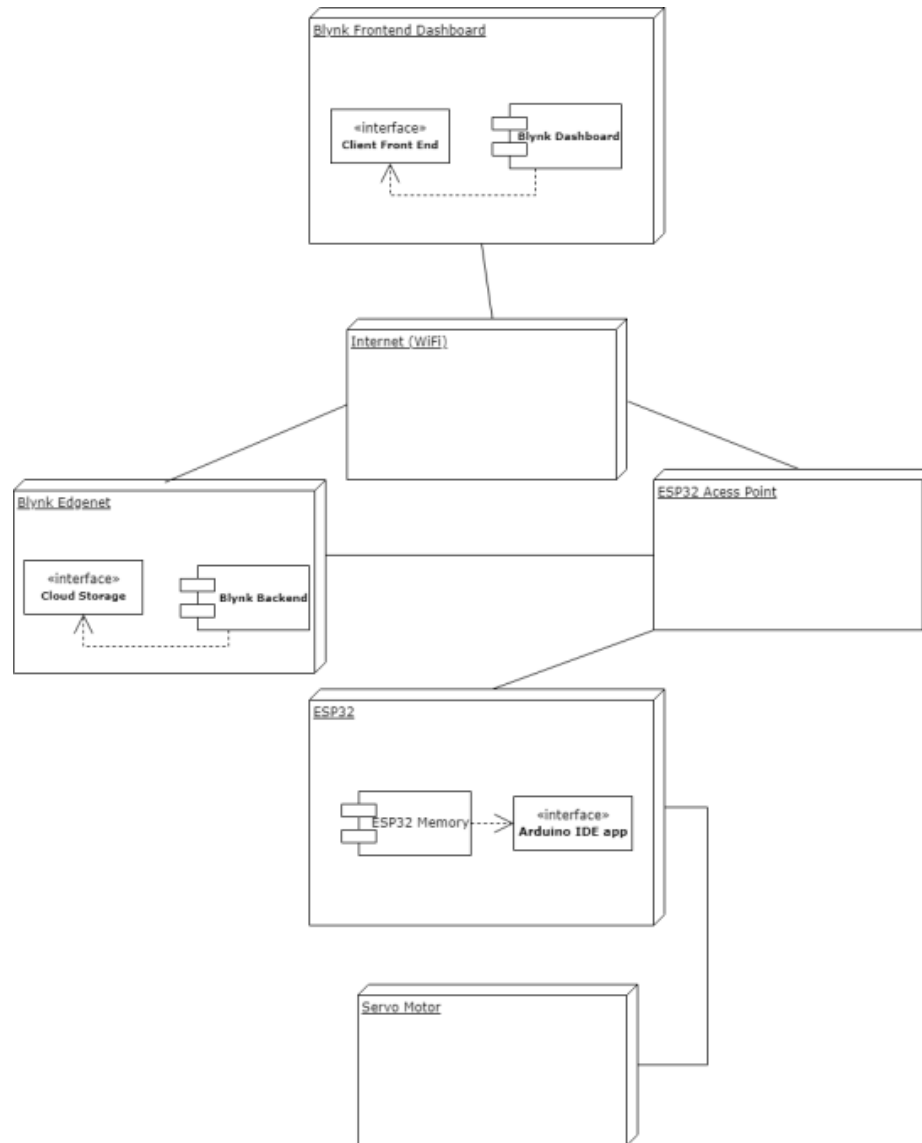


Fig 5: Deployment Diagram

Acceptance Tests

1. Motor is working

In terms of the acceptance tests, the motor was functional and the acceptance test passed.

2. Blynk app is connecting to our ESP32

In terms of the acceptance tests, the Blynk app was functional and was effectively connecting to our ESP32 and so the acceptance test has passed.

3. The UI is working on the dashboard

In terms of the acceptance tests, the User Interface is working on the dashboard and essentially, the acceptance test has passed.

Code

Code Repository:

<https://github.com/faraazmohsin/AutoLockIoTDoorLockProject>