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Smart Home

Team 5 :
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Introduction

Problem Statement

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Problem Statement

- Remote control **Limitations**
- Lack of **Centralized** Management
- **Real-time** feedback on device states
- Waste of energy

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Solution Highlights

Centralized Control Platform

Remote Access & Automation (**IoT Hub**)

Real-time device control through **SignalR**

Secure user **authentication** provided by **MongoDB**

Electricity costs savings

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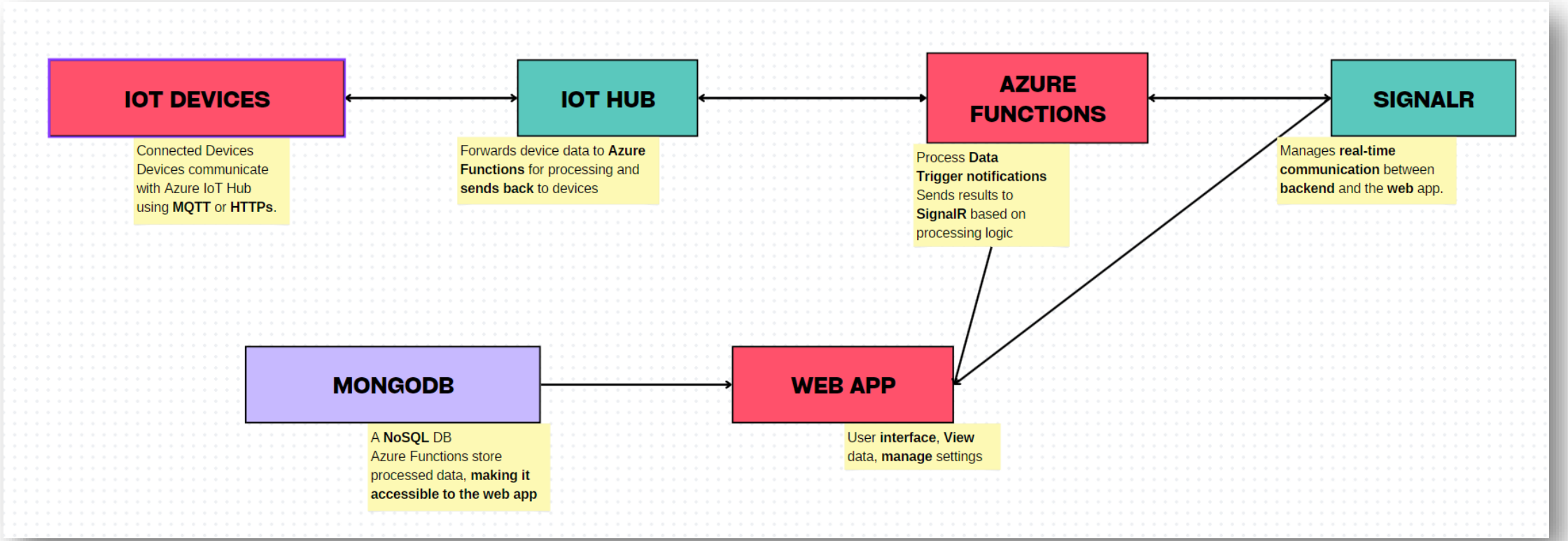
Context Diagram



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Methodology & Approach

Development Methodology

Collaborative Development

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Development Methodology

Agile development with 3 sprints

- **Sprint 1 (Oct 22 nd):**
  Azure Function, HTTP Trigger, MongoDB setup
- **Sprint 2 (Nov 12 th):**
  Angular Web App, Authentication, SignalR implementation
- **Final Sprint (Dec 10 th):**
  QA and deployment

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Collaborative Development

Tools Used

- GitHub for version control
- JIRA for project management
- Visual Studio for development
- Discord for communication within the Teams
- MS Teams for communications from the professors

Team organization

- Elie Kheirallah (Backend - Frontend)
- Farouk Ait Oujkal (Frontend)
- Jamal Assou (Frontend)
- Alain Nitunga (Backend)
- Léo Calvo Castaño (Backend)

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Achievements

- Completed features
- Known issues
- Testing instructions
- LIVE DEMO

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Completed Features

- ✅ User Authentication
- ✅ Multi-home, Room and device Management in the Web App
- ✅ Real-time Device Control with the Web App and the Arduino
- ✅ Azure IoT Hub Integration

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Known Issues

SIGNALR CONNECTION STABILITY IN CERTAIN NETWORK CONDITIONS

DEVICE STATE SYNCHRONIZATION DELAYS

MISSING PASSWORD ENCRYPTION FOR USERS

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Testing Instructions

1. Access web application locally at https://127.0.0.1:4200/register
2. Register a new account and login
3. Add home and rooms
4. Add IoT devices
5. Link added homes/rooms/devices and their ID's in the IoT Hub
6. Toggle buttons in the Web App and receive messages in the Arduino
7. Toggle buttons in the Arduino and receive messages in the Web App

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Retrospective

Biggest Challenges

- Sending and receiving messages from/to the IoT Hub.
- Deploying the web application's frontend.
- Synchronizing with the Arduino simulator.

Future Improvements

- Updating Arduino data correctly in MongoDB.
- Adding JWT token-based authentication.
- Implementing a password reset feature.
- Allow users to get and edit their ID's to register in the IoT Hub.

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