Cloud-based Home Automation System

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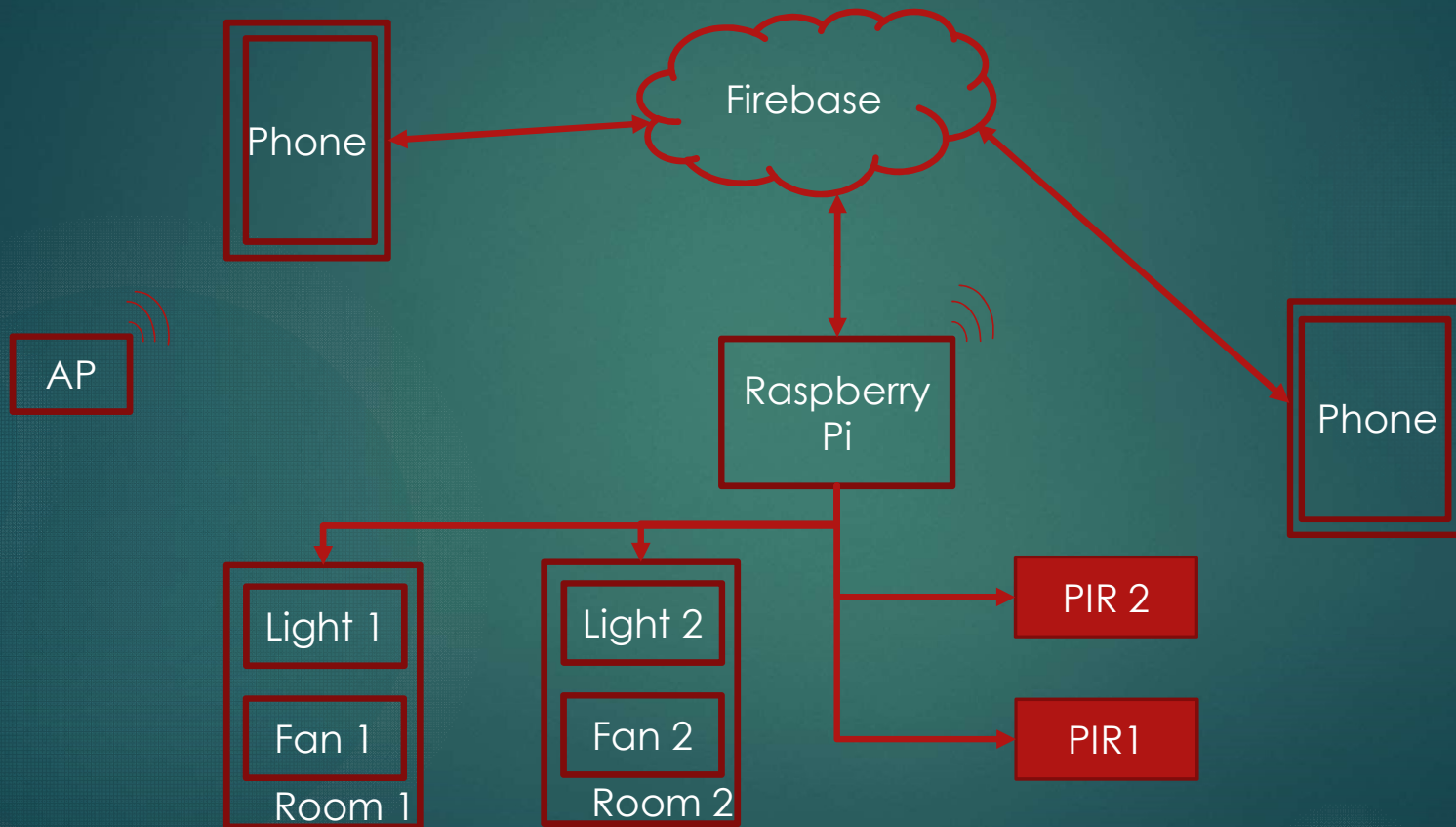
Home Automation

- Remote Monitoring and Control
- Automatic activities
- Improve energy efficiency
- Security
- Ease of use

Features

- Remote monitoring using Android Application
- Intruder detection
- Autonomous control of peripherals
- Cloud based user authentication and location awareness

System Overview

Solution Overview

▶ Android Things

▶ Android application

▶ Network services

▶ Location services

▶ Firebase backend

▶ Raspberry Pi

▶ Sensors

▶ Peripherals

Mobile Application

- Firebase authentication & Database services

- Geo location services and Network information services

- Fragments

Mobile Application
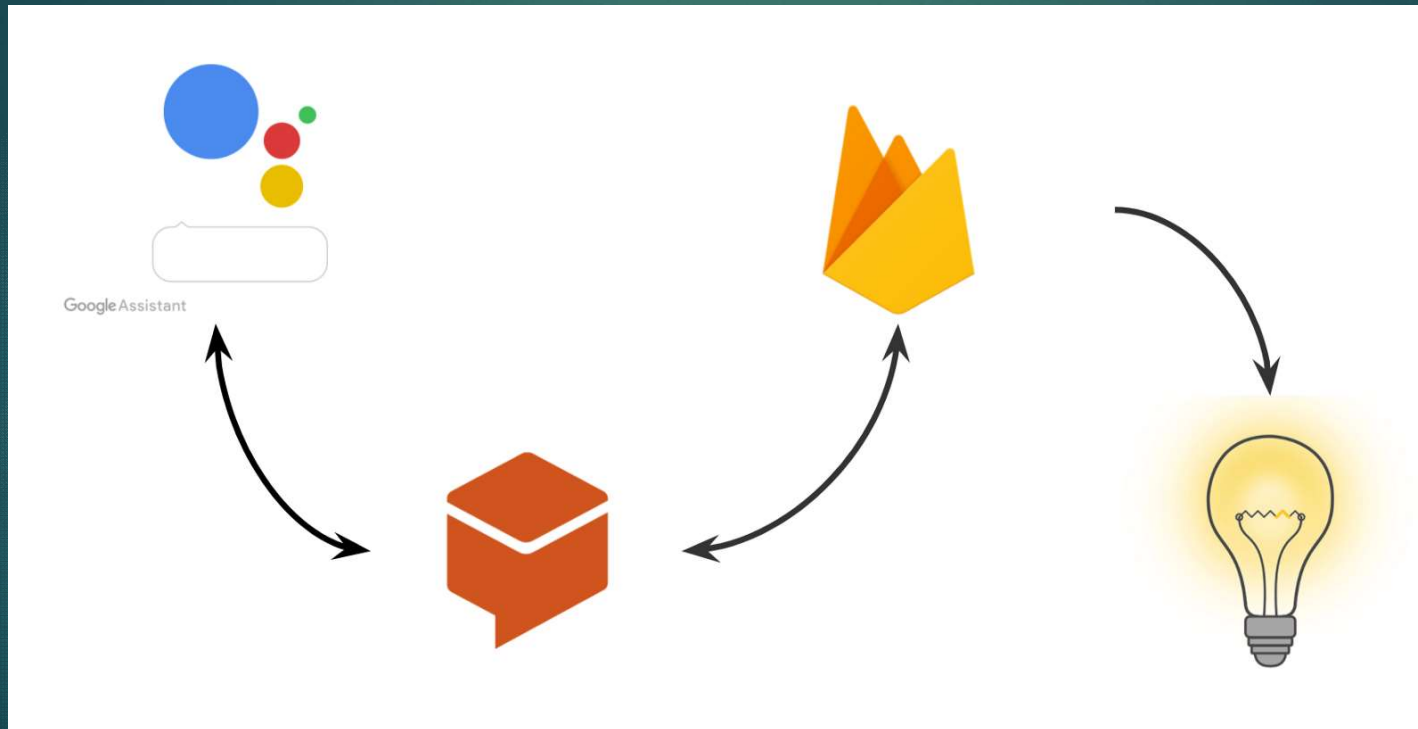
Android Things Application

- Firebase Database

- UART & I2C protocols

- GPIOs

- Interfacing of Motor, LEDs & PIR, LDR, Temperature sensors

Google Assistant Integration

Challenges

- Software
  - Network and location services took a while to start working as expected
  - Google assistant integration
    - The current implementation is resetting everything before it turns ON/OFF one peripheral
- Hardware
  - Issues faced with sensors not behaving as expected
  - Original plan included the use of Arduino
    - Dropped because of hardware limitation

Demo

Future Scope

- ▶ Tracking individual User's locations to create multi user system.

- ▶ Giving option of Network based location detection.

- ▶ Complete integration with Google Assistant.

- ▶ Performing Analytics on Power consumption of all peripherals.

References

- https://developer.android.com/index.html

- https://www.firebase.com/

- Stackoverflow.com

- https://androidthings.withgoogle.com

THANK YOU