No Fear Fire

An outdoor fire detection system

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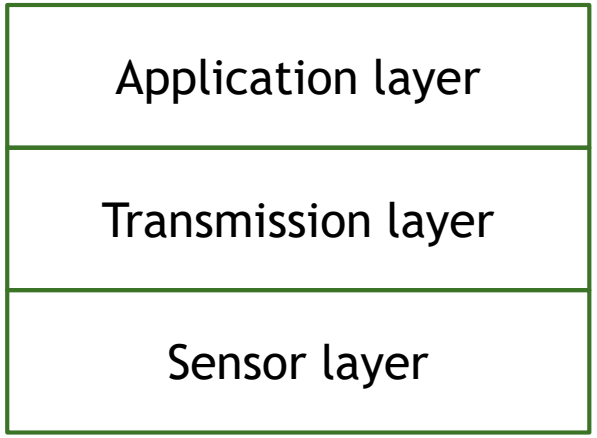
The Problem

- Outdoor fires are extremely dangerous, especially if don’t detected rapidly.
- Italy is one of the most affected countries in Europe.
- It is necessary to rapidly detect fires and alarm the authorities to help them to handle the situation in the best way.

Our Objectives

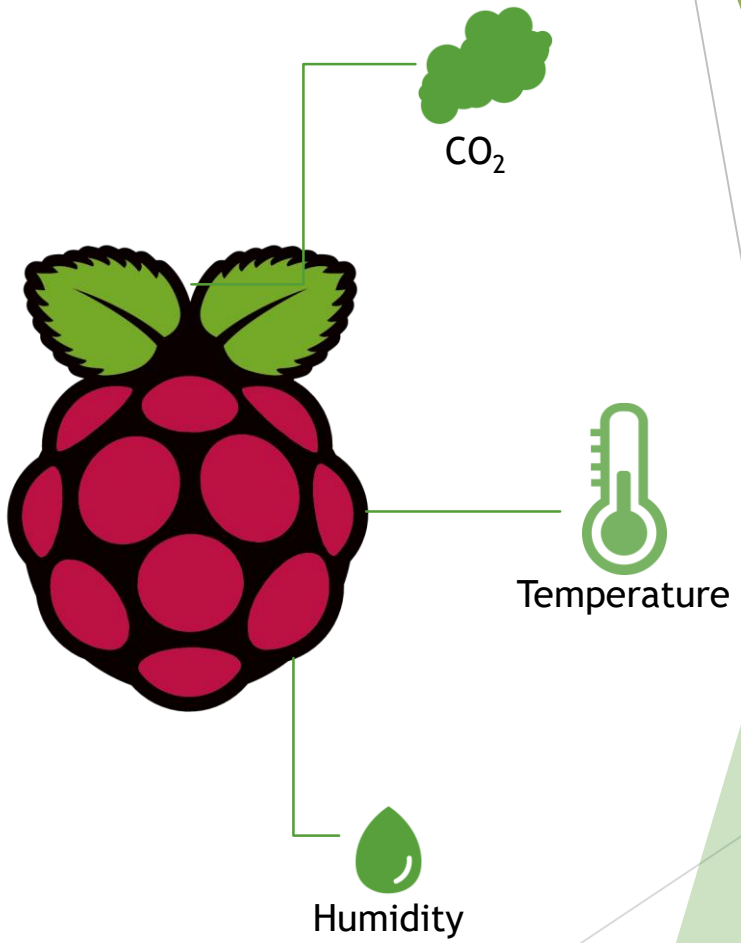
- Rapidly detect fires
- Alarm the authorities
- Store information in order to perform studies

Architecture



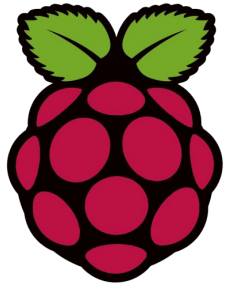
Architecture

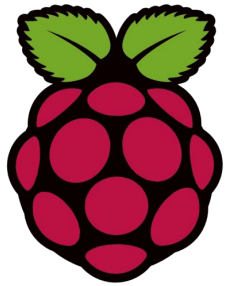
Application layer
Transmission layer
SENSOR LAYER



Architecture

Application layer
TRANSMISSION LAYER
Sensor layer





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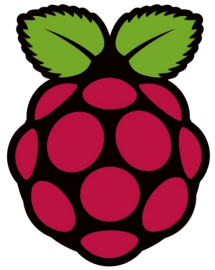

APPLICATION LAYER
Transmission layer
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Architecture

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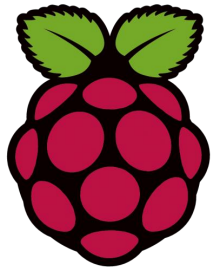

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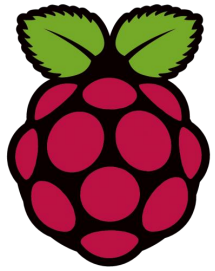

LoRaServer

influxdb

Architecture

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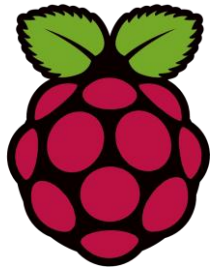

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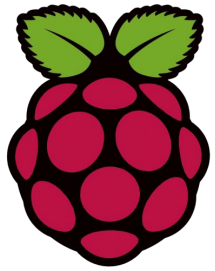

Demo

Prototype simulation

Setup Demo

- Devices:
  - Raspberry Pi 3 – Sensor node
  - Raspberry Pi 2 – Gateway node

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C++ Program

Libraries:

- DHT
- Custom CCS811
- LoRaWAN

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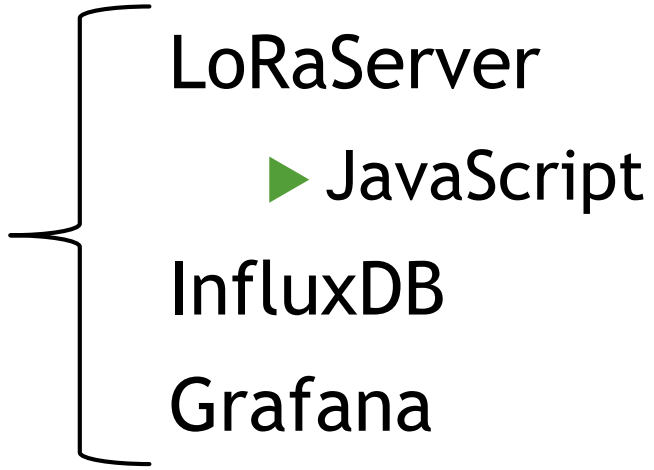

Setup Demo

- Devices:
  - Raspberry Pi 3 – Sensor node
  - Raspberry Pi 2 – Gateway node
- Sensors:
  - DHT11
  - CCS811
- Data communication technologies:
  - Ethernet
  - LoRaWAN

Usage

- Sensing values
- Transmitting values
- Receiving
- Storing
- Display values on grafana
- Alerting by Telegram

Prospectives & Conclusions

- The system could be implemented
  But it needs
  - a very accurate sensor
  - some actuators (eventually)

- Acknowledgments:
  - Prof. Pietro Cassarà of Pisa CNR
  - Michele Andreoli

Thanks

Any questions?