



INTERNET
OF THINGS



IOT Smart Garden

MQTT

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Bluetooth™
4.0
Low Energy

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INTRODUCTION

- Many people like gardening, but unfortunately they don't have the time to do it for many reasons.
- An IoT smart garden system is the simplest way to take care of your garden even if you have no time.

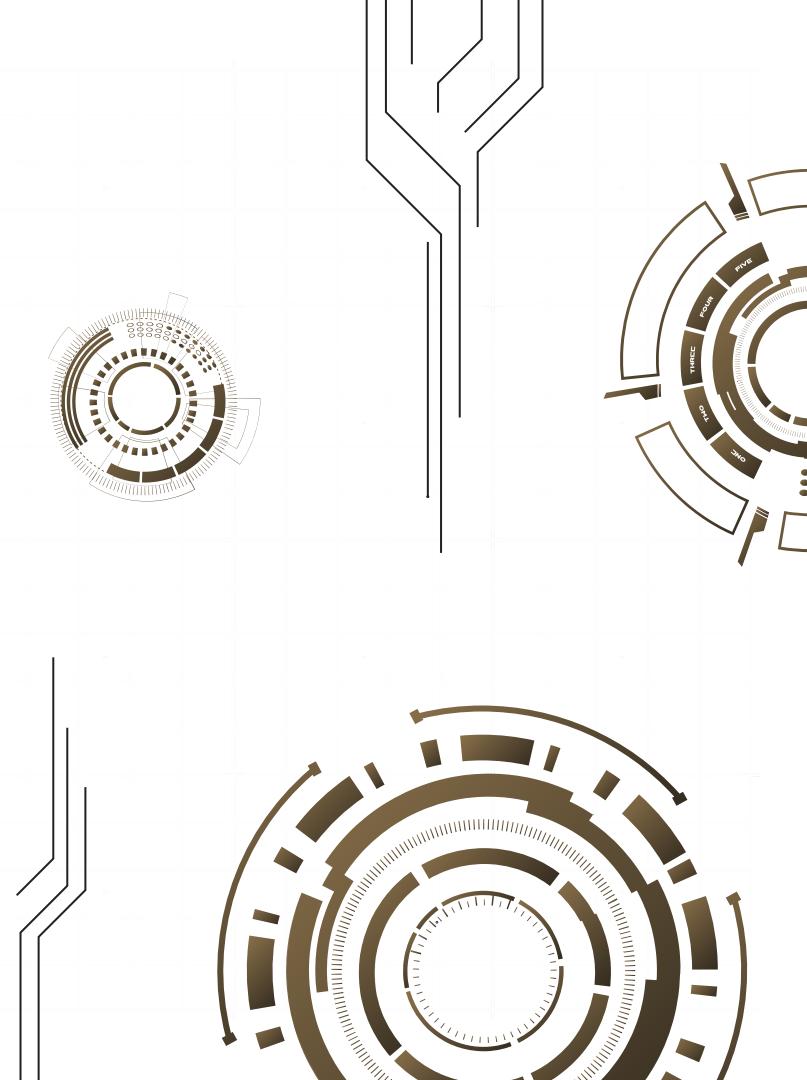


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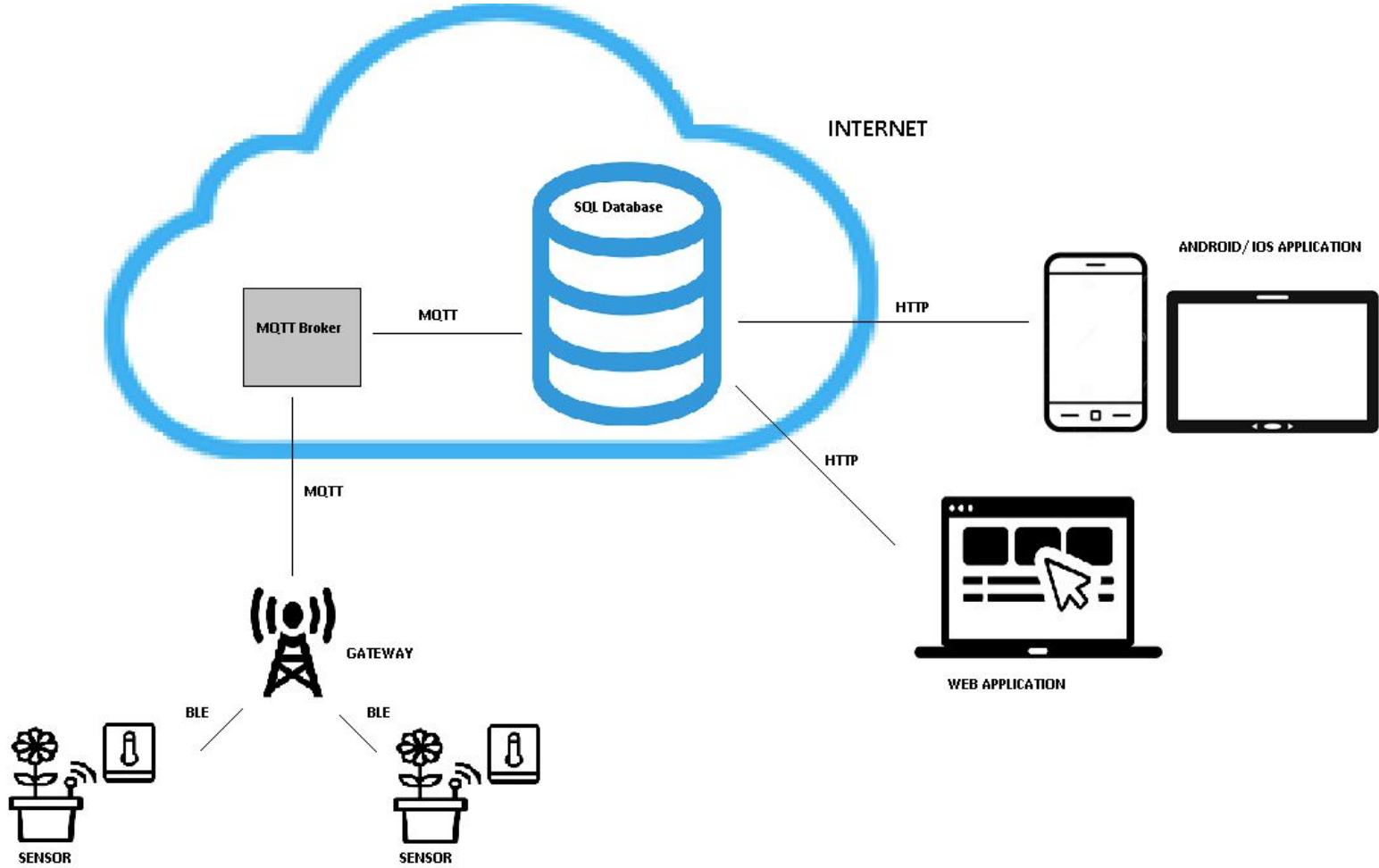
How data are saved and visualized



MQTT

ARCHITECTURE





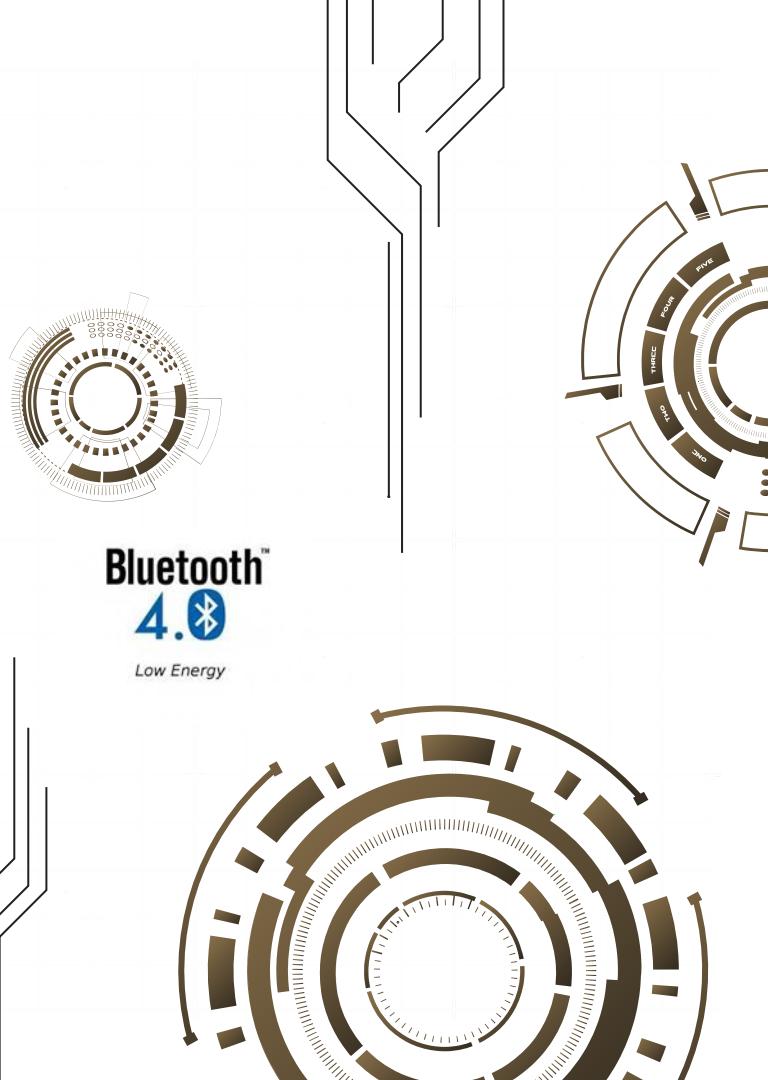
SENSORS



SENSORS



- Each sensor measures ph, temperature and humidity of the plants and of the ground;
- Each Garden has at least 2 sensors;
- Collected data is sent to a local gateway through BLE (Bluetooth Low Energy);
- Data contains also the unique ID of the sensor and a timestamp.

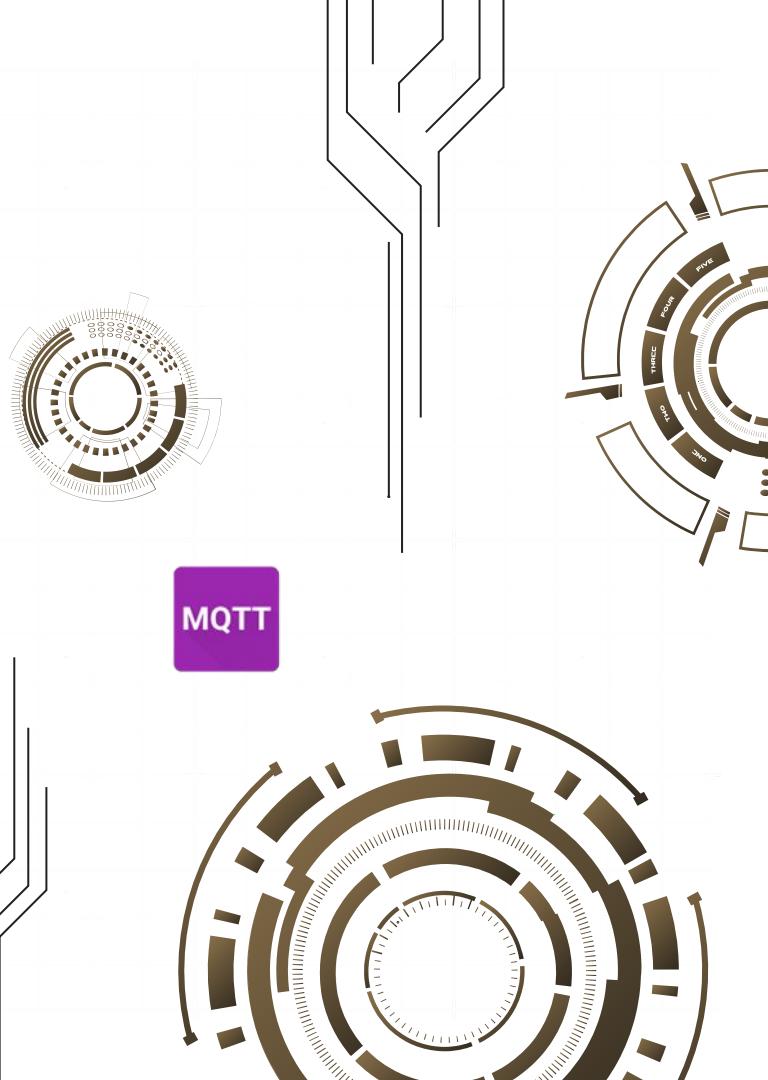


COMMUNICATION



COMMUNICATION

- Gateway receives data from sensors through BLE;
- Gateway forwards data to a MQTT Broker;
- MQTT communication with qos=2;
- MQTT broker sends data to a SQL database;
- The mobile application can get the aggregated data through HTTP protocol.



DATA STORAGE AND VISUALIZATION



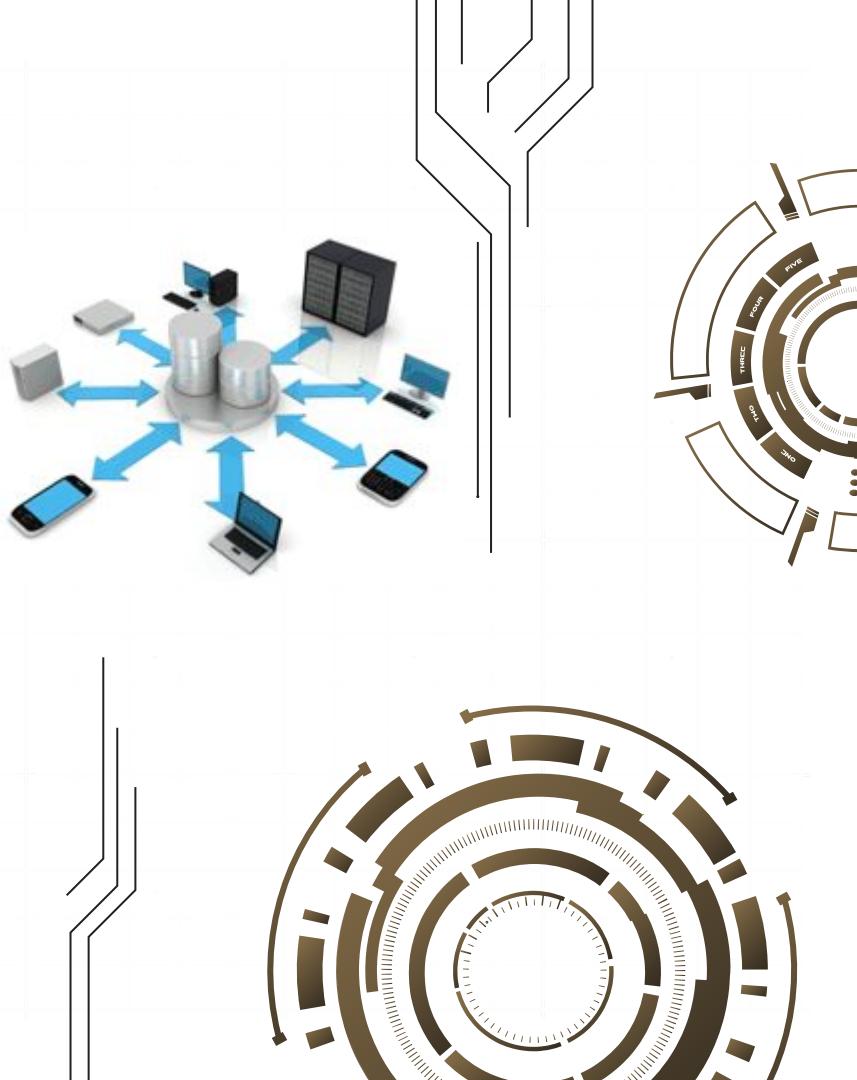
DATA STORAGE

- Data is saved on a SQL database;
- Saved data can have historical relevance since each record has its own timestamp;
- Tables containing data are normalized;
- Saved data can be aggregated and used to provide a visual sum up of the situation.



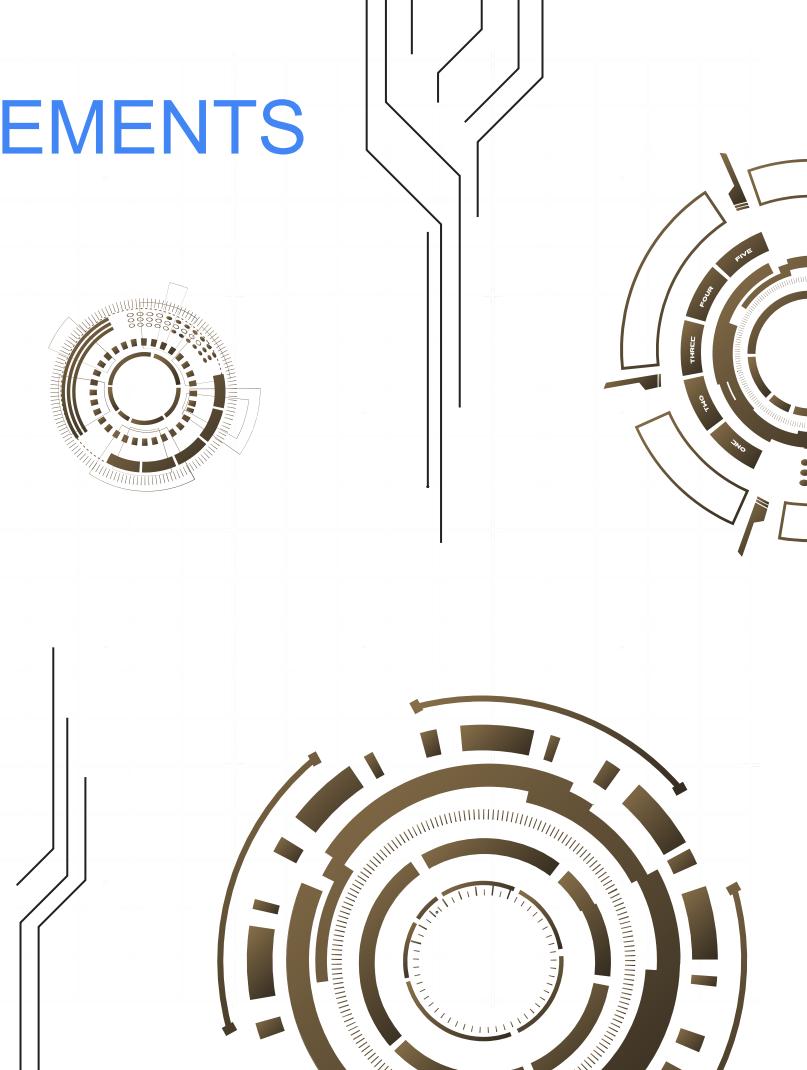
DATA VISUALIZATION

- Web, iOS and Android applications to show aggregated data;
- Applications provide a simple user interface;
- App registration and internet connection are required.
- Data are automatically updated every ten minutes;
- Visualized data can be filtered according to the sensor ID, garden ID, timestamp or measured values;
- Speaking functionality to describe data to blind people.



FURTHER POSSIBLE IMPROVEMENTS

- Functionalities for monitoring automatic irrigators and grass trimmer robots;
- Smart umbrellas to protect plants from too much rain or too much sun.



Thank you for your attention



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