INTEGRATION OF SENSORS IN THE DOMUS PLATFORM

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SMART HOME

Smart Home has become increasingly prevalent in recent years, allowing homeowners to monitor and control various aspects of their homes remotely and automatically. The main benefits of living in a connected house are: comfort, security, energy savings, accessibility and entertainment. This concept of the smart home is based on the use of sensors which are installed in private homes. These sensors rely on a variety of wireless communication technologies, including Z-wave, LoRaWAN, WiFi, and Bluetooth, to transmit data to a central hub or a gateway.

THE PROJECT

The goal is to upgrade the Smart Home package that is available at Domus, by implementing some sensors into openHAB, the open source software that is used to monitor and control the apartment. The project also aims to produce documentation to facilitate future integrations of similar sensors or technologies.
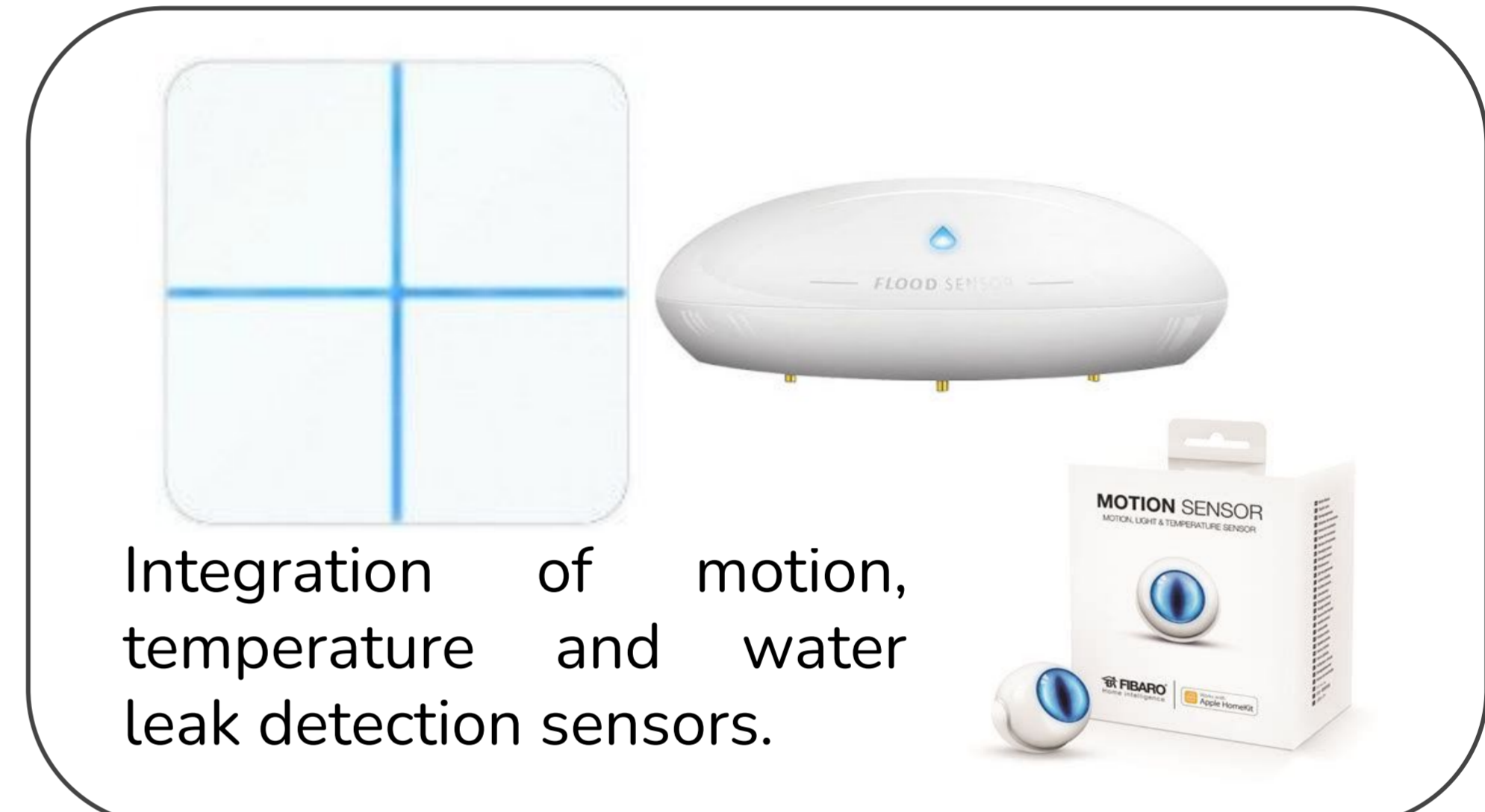
openHAB

openHAB is an open source home automation software designed to connect and control different smart devices in a home automation network. It provides a neutral platform for the integration of smart home devices from different manufacturers.

With openHAB, users can create rules and automate tasks based on events and conditions, such as motion detection, temperature changes or time of day. Thus, the main benefit of openhab is to allow various sensors, using different protocols, working together.
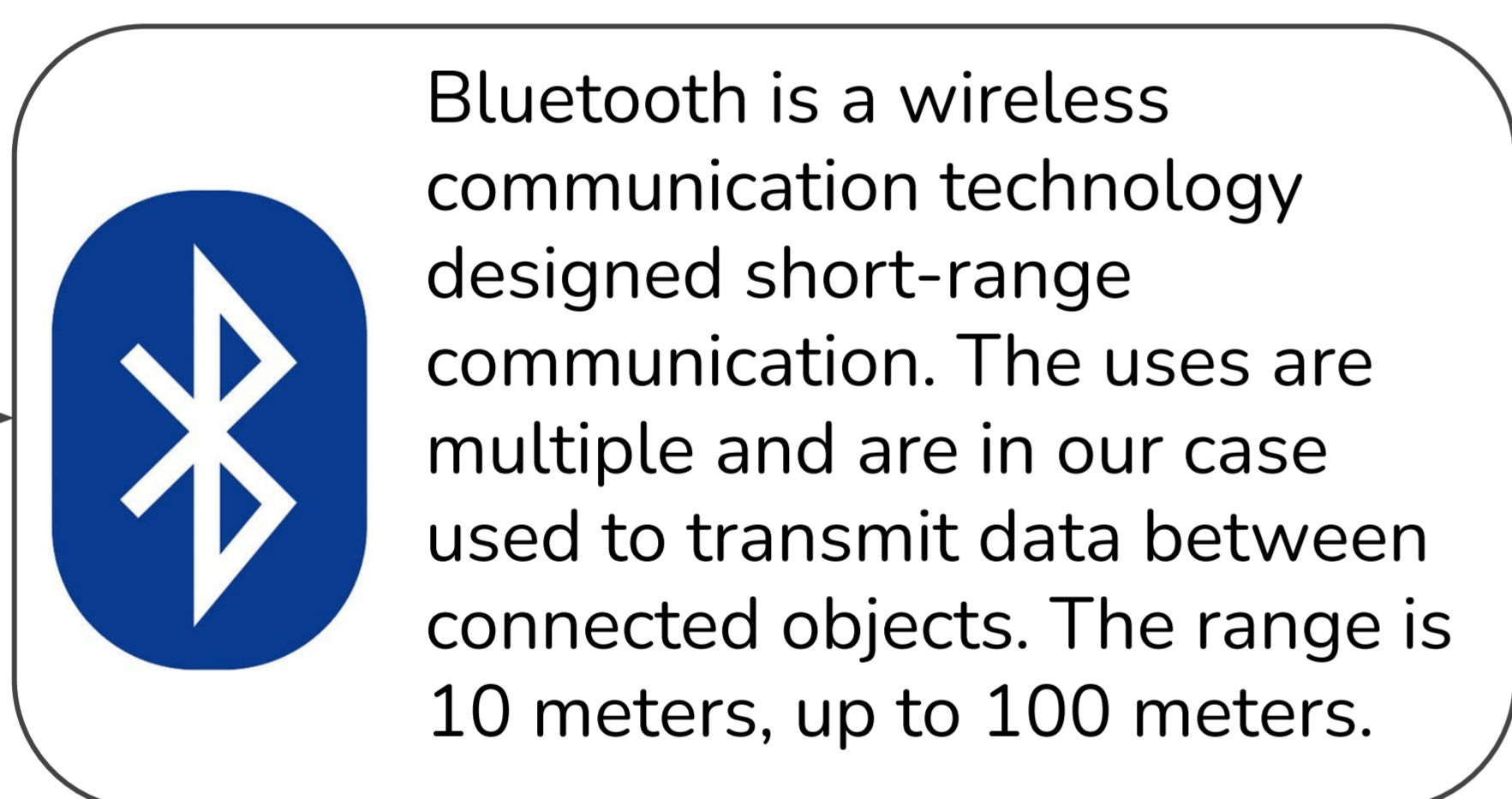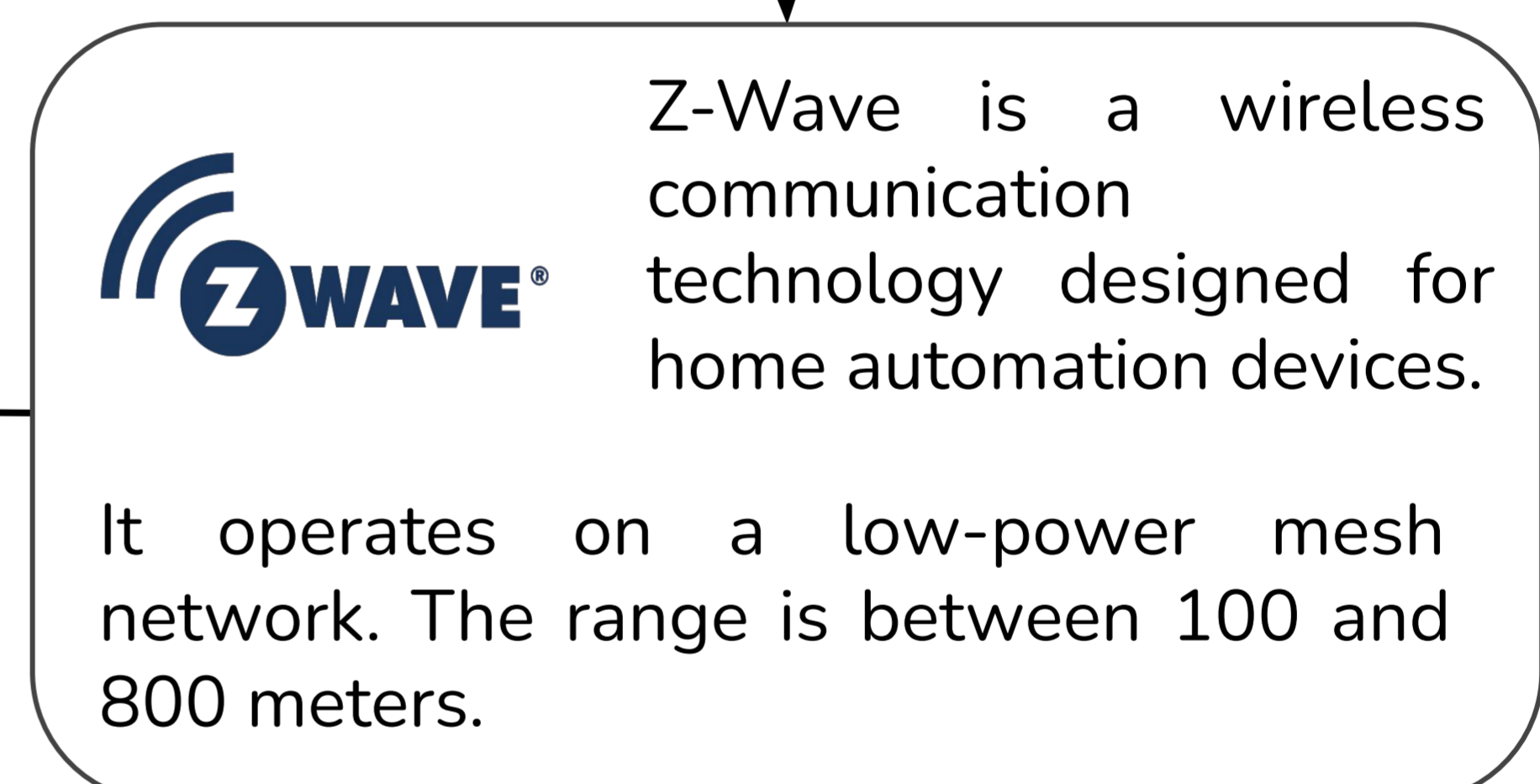
HOW DOES IT WORK ?

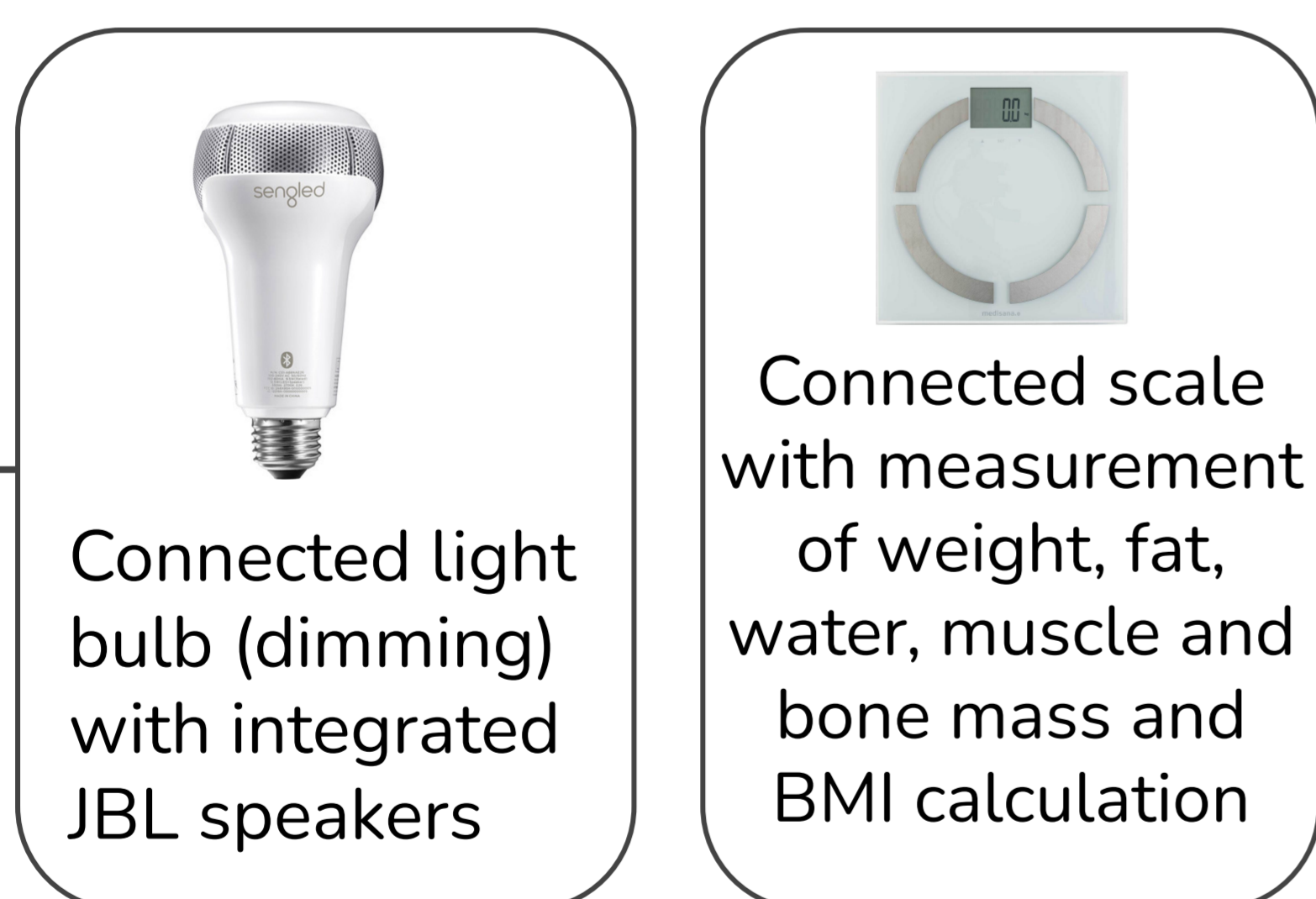**Netatmo / meross / WiFi** — Sensor for air quality measurement, electric outlet
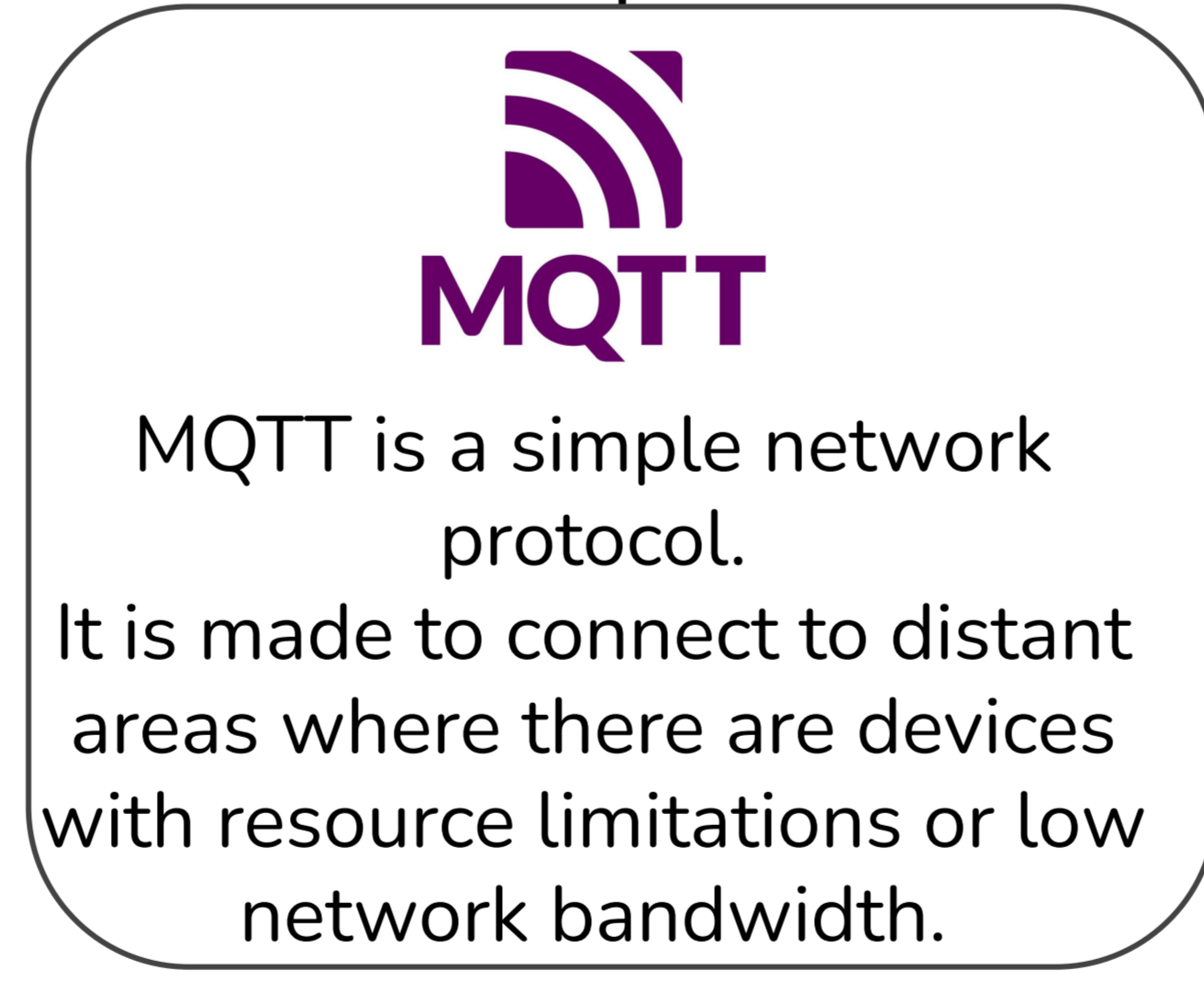
Bluetooth is a wireless communication technology designed short-range communication. The uses are multiple and are in our case used to transmit data between connected objects. The range is 10 meters, up to 100 meters.
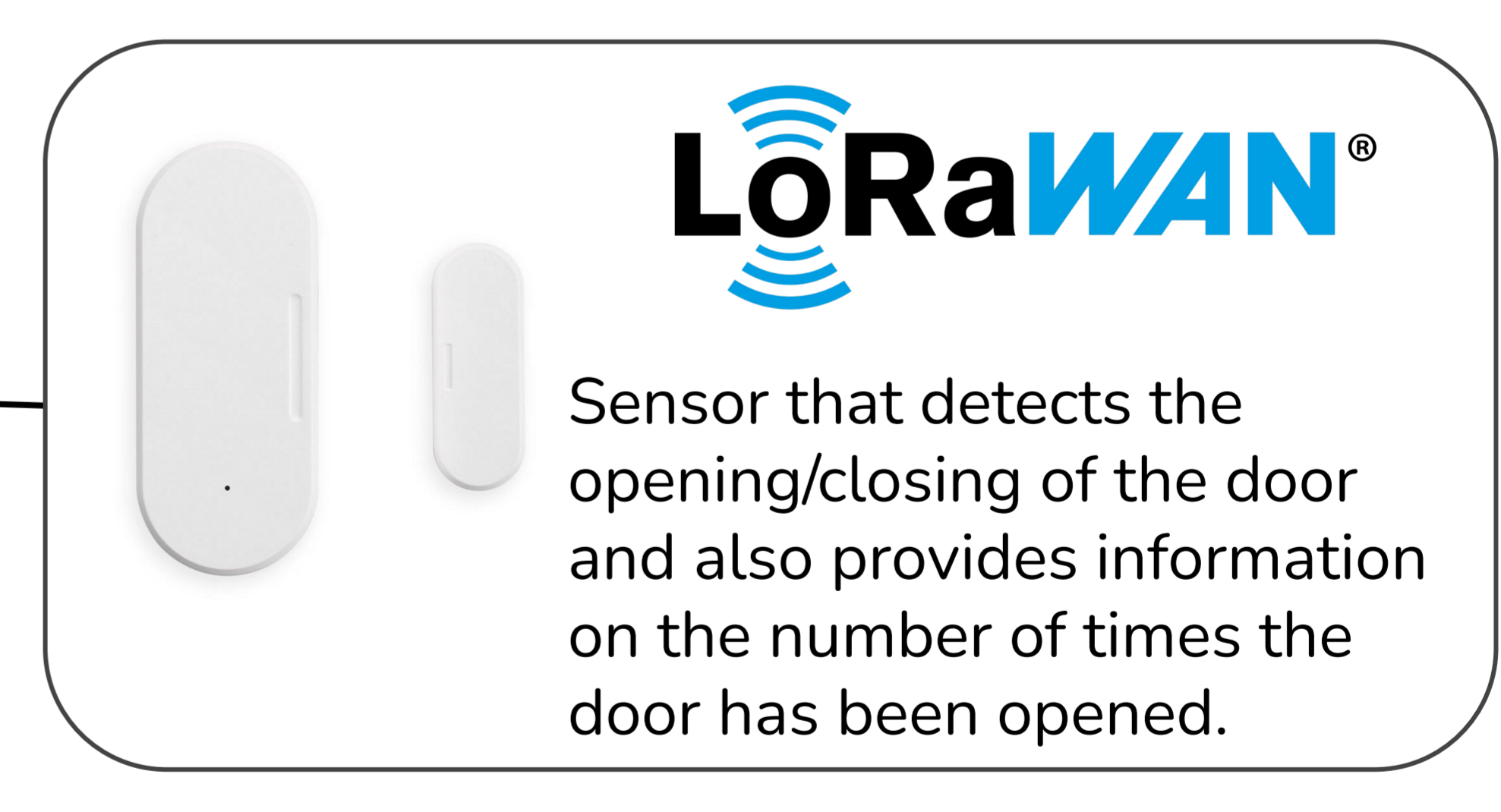
Connected light bulb (dimming) with integrated JBL speakers

Connected scale with measurement of weight, fat, water, muscle and bone mass and BMI calculation

Integration of motion, temperature and water leak detection sensors.

Z-WAVE — Z-Wave is a wireless communication technology designed for home automation devices.

It operates on a low-power mesh network. The range is between 100 and 800 meters.

MQTT is a simple network protocol.
It is made to connect to distant areas where there are devices with resource limitations or low network bandwidth.

LoRaWAN — Sensor that detects the opening/closing of the door and also provides information on the number of times the door has been opened.

Each sensors and protocols were provided by manufacturers. Our goal was to allow communication between sensors and the openHab software, despite the protocol they rely on.

CONCLUSION

- Our team managed to connect the vast majority of the sensors entrusted to us and our AGILE organization allowed us to adapt successfully to time constraints.
- We were also able to deduce that the advantage of OpenHab is the centralization of the different solutions used by connected objects. The different technologies make it possible to respond to the constraints that such a kind of communication imposes. Thus, the software allows a diversity of sensor manufacturers to avoid having to be limited to one technology.
- It is also important to see the range of possibilities offered by this type of technology, it then becomes easier to manage your home, management can therefore become more accessible to people with disabilities, for instance.

References : orpenhab.org   fibaro.com   netatmo.com   sengled.comliglab.fr/fr/recherche/plateformes/domus