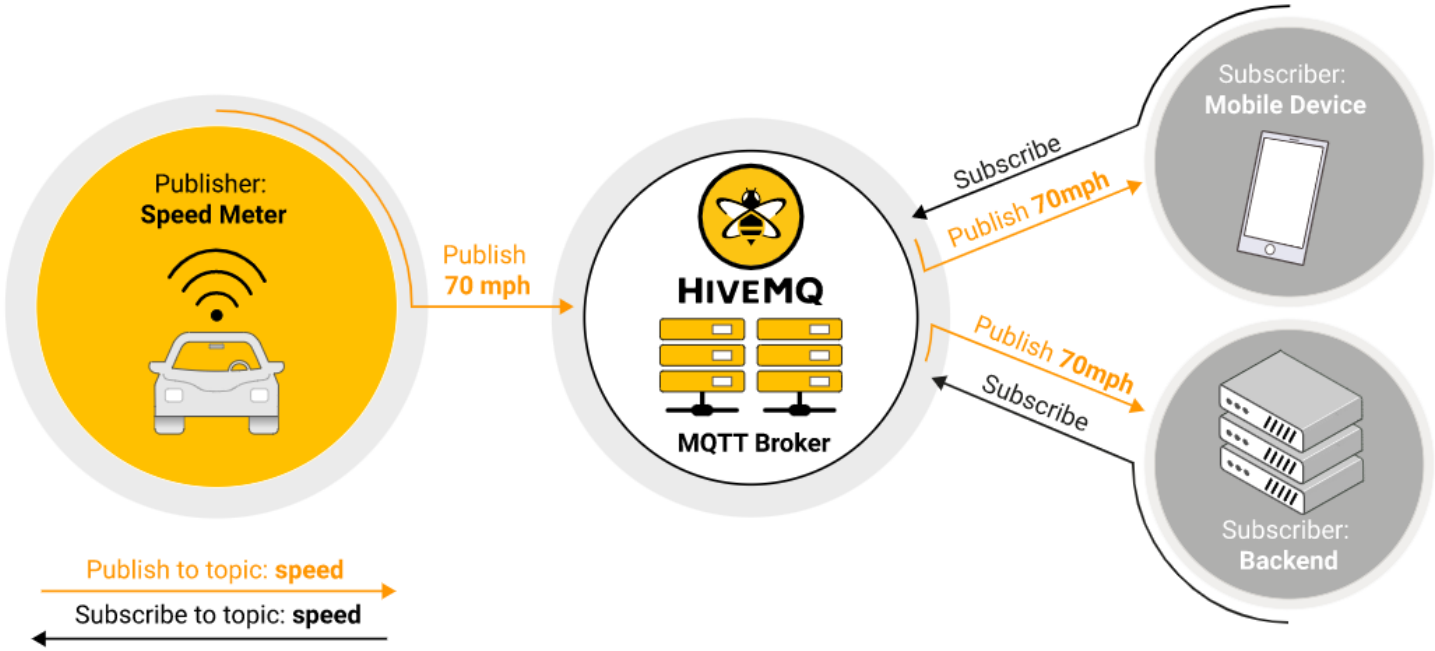
1.

IoT in practice

Smart Building

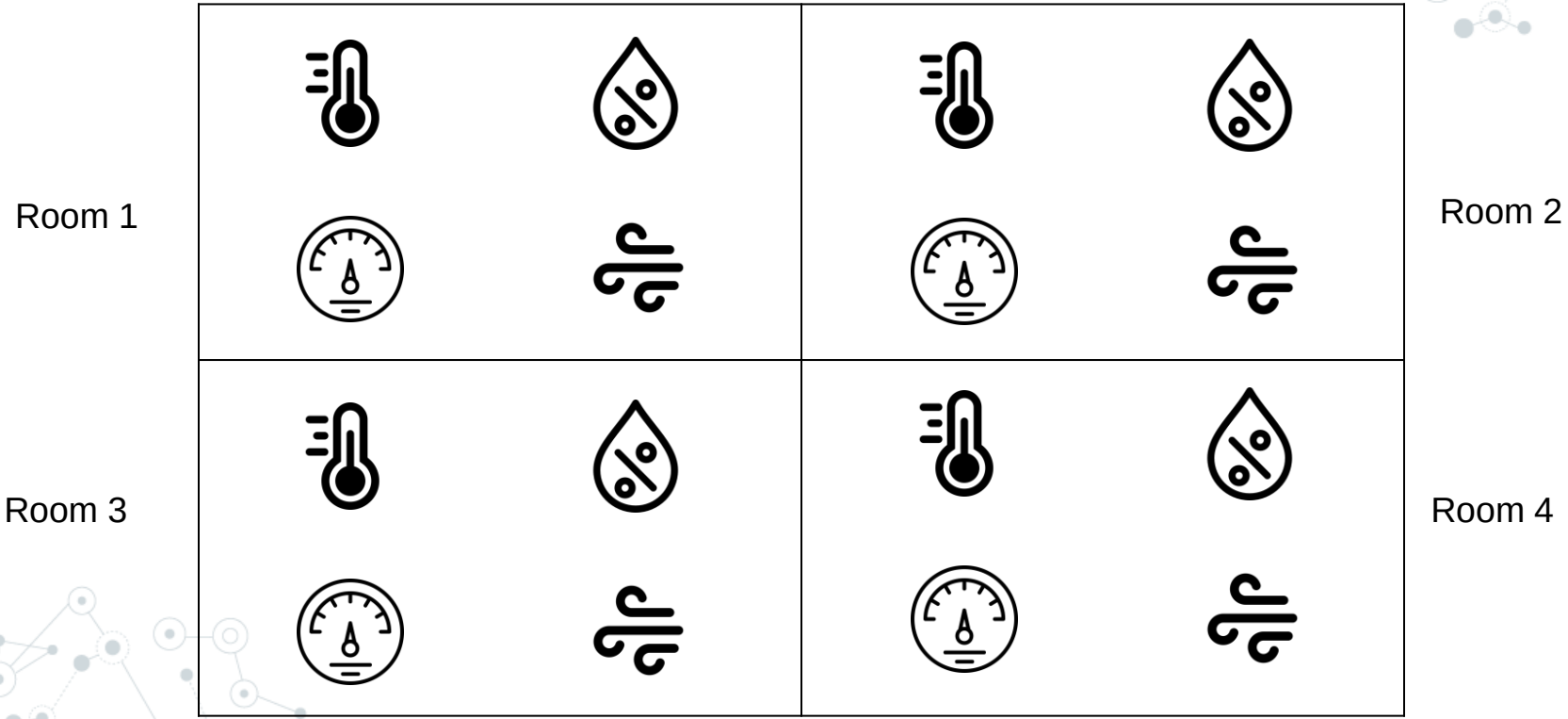
MQTT – What we've already seen



- Topic
- Publish
- Subscribe

MQTT – What we've already seen

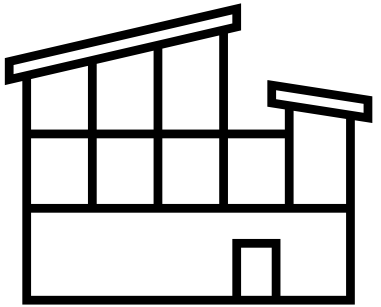
Smart Building - Overview



Smart Buiding - Overview

Get environment data:
- Temp
- Humidity
- Pressure
- Air quality

MQTT Subscribe



Smart Buiding - Topics

- esgitech/room/1/temp
- esgitech/room/1/humidity
- esgitech/room/1/pressure
- esgitech/room/1/air

- esgitech/room/2/temp
- esgitech/room/2/humidity
- esgitech/room/2/pressure
- esgitech/room/2/air

- esgitech/room/3/temp
- esgitech/room/3/humidity
- esgitech/room/3/pressure
- esgitech/room/3/air

- esgitech/room/4/temp
- esgitech/room/4/humidity
- esgitech/room/4/pressure
- esgitech/room/4/air

Smart Building - Steps

1. Install python 3.x: https://www.python.org/downloads/
2. Install pip: https://bootstrap.pypa.io/get-pip.py
3. Install paho-mqtt: https://pypi.org/project/paho-mqtt/
4. Read the docs: https://pypi.org/project/paho-mqtt/
5. Test the official example: https://pypi.org/project/paho-mqtt/ (Getting Started)
6. Follow the instructions

Smart Building – Instruction 1

- Team 1:
  - One single subscription to temperature topic from room 1
- Team 2:
  - One single subscription to temperature topic from room 2
- Team 3:
  - One single subscription to temperature topic from room 3
- Team 4:
  - One single subscription to temperature topic from room 4

Smart Building – Instruction 2

- Team 1:
  - One single subscription to all topics from room 1
- Team 2:
  - One single subscription to all topics from room 2
- Team 3:
  - One single subscription to all topics from room 3
- Team 4:
  - One single subscription to all topics from room 4

Smart Building – Instruction 3

- Team 1:
  - One single subscription to all temperature topics from all rooms
- Team 2:
  - One single subscription to all humidity topics from all rooms
- Team 3:
  - One single subscription to all pressure topics from all rooms
- Team 4:
  - One single subscription to all air topics from all rooms

Smart Building – Instruction 4

- All teams:
  - One single subscription to all topics from all rooms

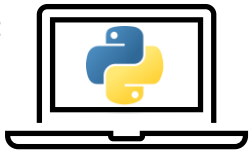
2.

IoT in practice

Weather Station

Weather Station - Overview

Weather Station:
- Temp
- Humidity
- Pressure



MQTT Publish

ThingsBoard

Weather Station - Steps

1. Install python 3.x: https://www.python.org/downloads/
2. Install pip: https://bootstrap.pypa.io/get-pip.py
3. Install paho-mqtt: https://pypi.org/project/paho-mqtt/
4. Read the docs: https://pypi.org/project/paho-mqtt/
5. Test the official example: https://pypi.org/project/paho-mqtt/ (Getting Started)
6. Implement the solution according to specifications

Weather Station - Specifications

- Get weather data (temperature, humidity and pressure) by generating random values or from an online weather service (API). This is used to simulate the sensors.
- Connect and publish weather data to the Cloud IoT Platform (ThingsBoard) periodically (few seconds).
- Create a ThingsBoard dashboard to display measurements charts and data history table.
- Bonus: Add action buttons to enable/disable weather station sensors while running.

Weather Station - Specifications

- IoT protocol: MQTT
- Programming language: Python
- IoT Platform: ThingsBoard (free cloud version) using MQTT Device API