

A decorative network diagram in the top-left corner, featuring a cluster of interconnected nodes. Some nodes are solid grey circles, while others are hollow circles with a grey border. They are connected by thin grey lines, forming a complex web-like structure.

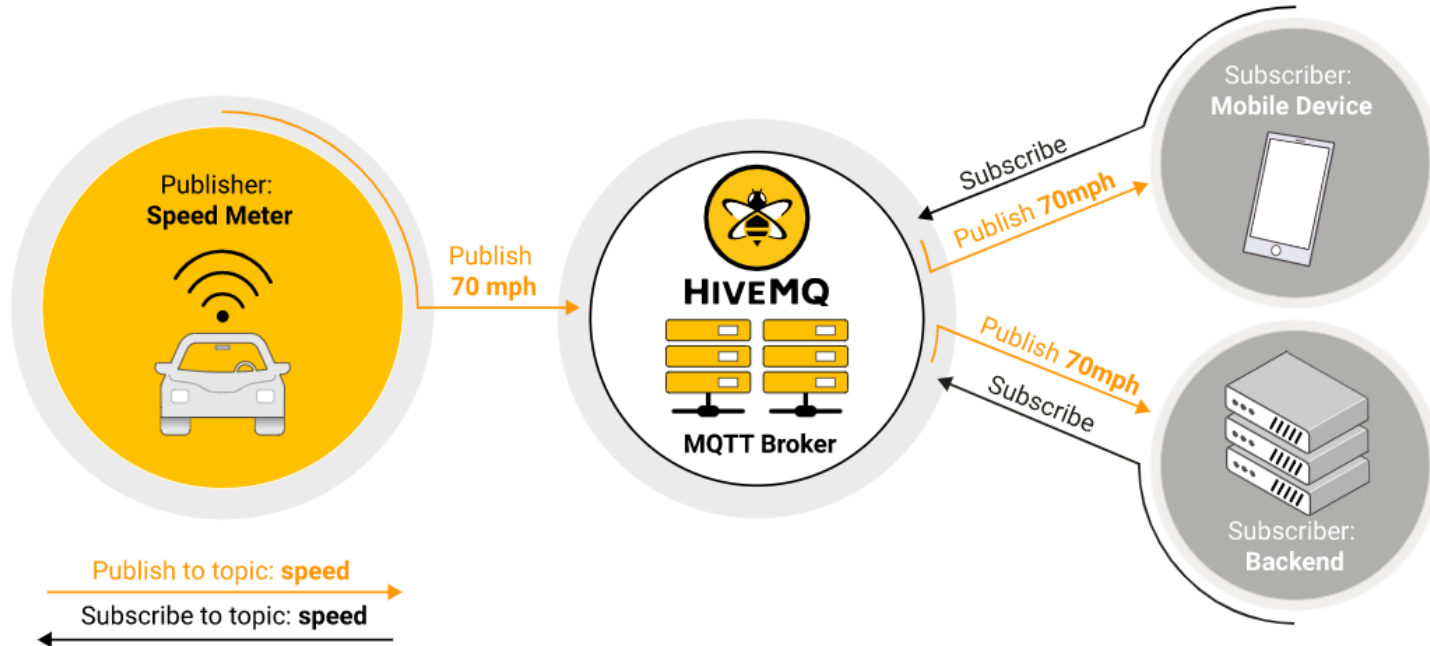
1.

# IoT in practice

Smart Building

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It shows a cluster of interconnected nodes, some solid grey and some hollow with grey borders, connected by thin grey lines.

# MQTT – What we've already seen



Topic  
Publish  
Subscribe

## MQTT – What we've already seen



# Smart Building - Overview

Room 1



Room 2



Room 3



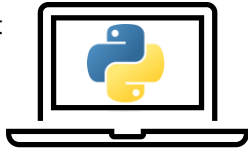
Room 4



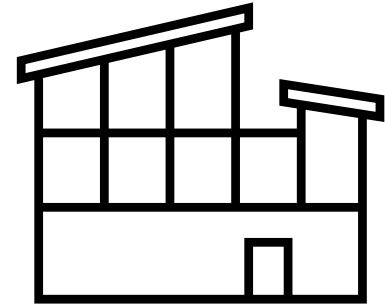
# Smart Buiding - Overview

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

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some solid and some hollow, connected by thin lines. The overall structure is a dense, branching network.

# 2.

# IoT in practice

Weather Station





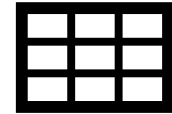
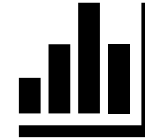
# Weather Station - Overview

Weather Station:

- Temp
- Humidity
- Pressure



MQTT Publish



## Weather Station - Steps

1. Install python 3.x: <https://www.python.org/downloads/>
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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