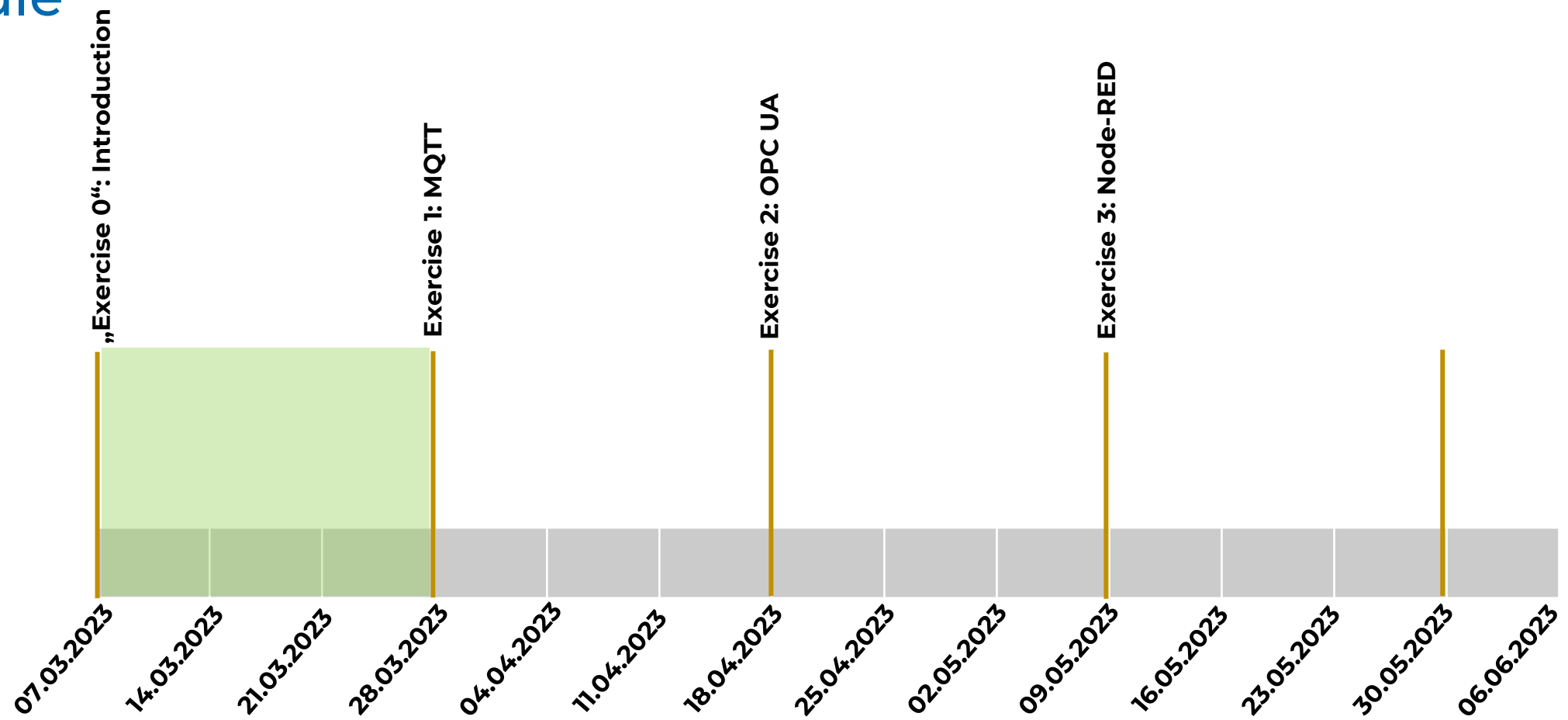
Exercise 1

Implementation of an MQTT client which publishes information to a message broker

Schedule

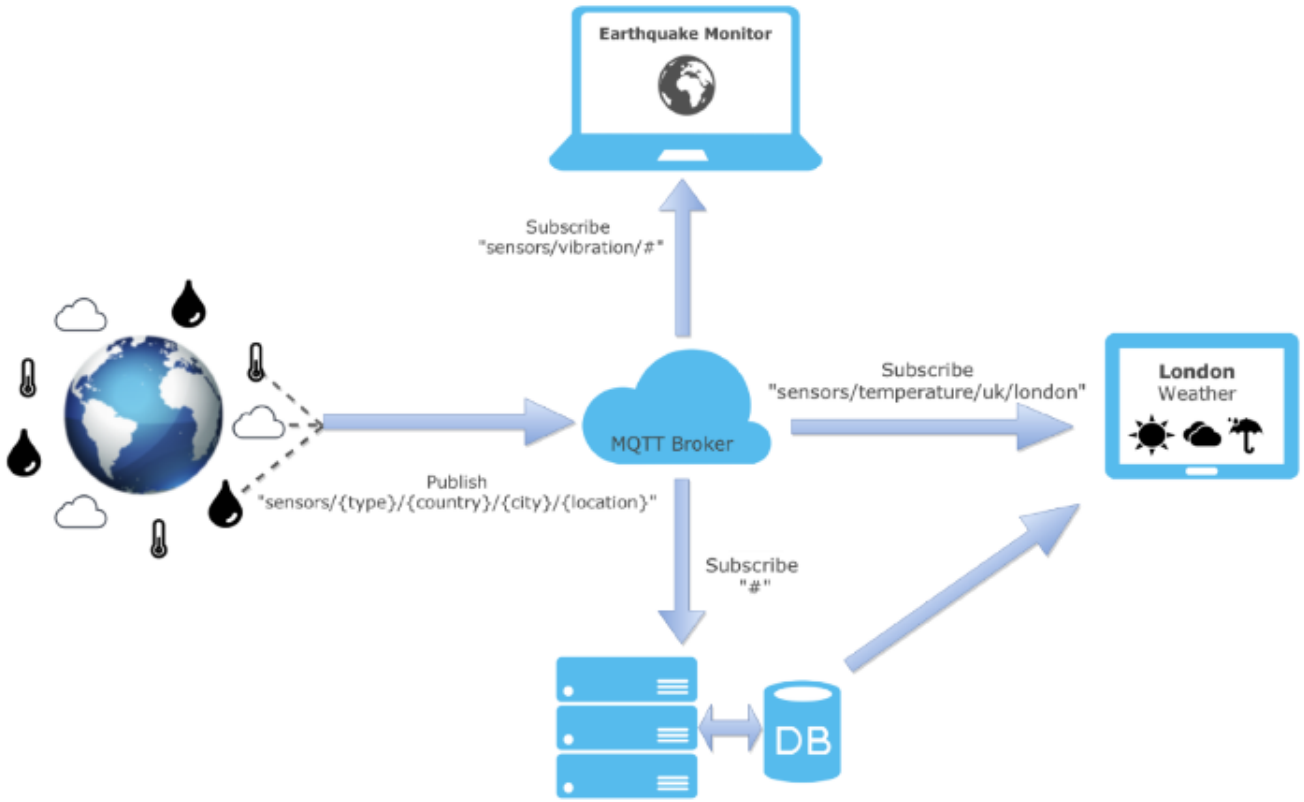

„Exercise 0“: Introduction
Exercise 1: MQTT
Exercise 2: OPC UA
Exercise 3: Node-RED
07.03.2023
14.03.2023
21.03.2023
28.03.2023
04.04.2023
11.04.2023
18.04.2023
25.04.2023
02.05.2023
09.05.2023
16.05.2023
23.05.2023
30.05.2023
06.06.2023

Requirements for Exercise 1

- Knowledge
  - Basic Python programming skills
  - Basic understanding about the concept of message brokers
  - Basic understanding about the MQTT protocol

- Installed Libraries/Tools
  - MQTT Client library: Eclipse Paho for Python
  - (MQTT Client: MQTT Explorer)

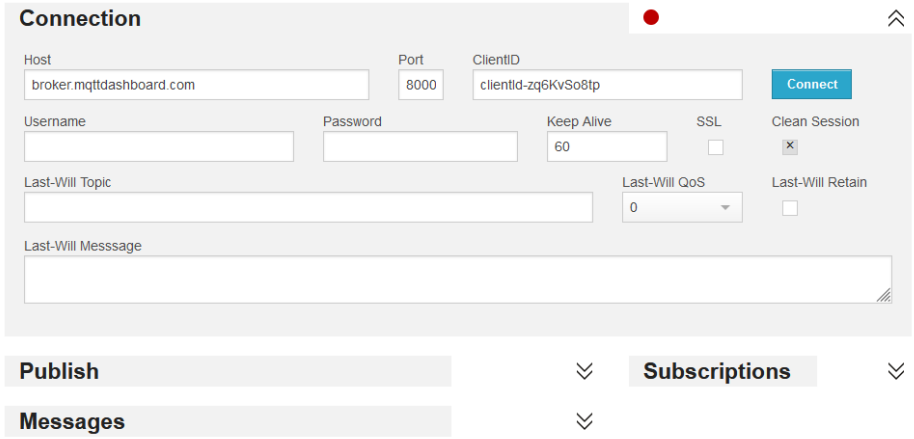
MQTT



- **Wildcards**
  - + matches any topic on the specified level
  - # matches any number levels

MQTT example with public HiveMQ test broker

- See: https://www.hivemq.com/public-mqtt-broker/
- Web-Client: http://www.hivemq.com/demos/websocket-client/



Task Description

1. Think about **information** that could be published from your specific system
2. Create a concept for suitable **MQTT topics** to publish your information to
3. Think about proper ways the information which is sent to the topics is **formatted** (e.g. JSON)
4. Program an **MQTT client** application in Python, which publishes the envisioned information to the MQTT broker
5. Use the things you got familiar with in Exercise 0 to get **real information** from the modules
6. Test your application by subscribing to the topics using e.g. MQTT Explorer
7. Try to also **subscribe** in use information from topics from other groups

Eclipse Mosquitto

- Lightweight Open Source message broker
- Implements MQTT 3.1, 3.1.1 and 5.0
- Download and Documentation: https://mosquitto.org/

- Our local Broker:
  - Address: 192.168.200.161:1883

MQTT Explorer

- Simple Client application
- Useful for testing purposes
- Download and Documentation: http://mqtt-explorer.com/

Eclipse Paho

- MQTT client library
- MQTT 3.1, **3.1.1** and 5.0 support
- Allows Publishing and Subscribing
- Available in many programming languages: Java, **Python**, Java Script, C/C++, Rust, C#, …
- Download and Documentation: https://www.eclipse.org/paho/
- Examples: https://github.com/eclipse/paho.mqtt.python/tree/master/examples

Questions?