

The background of the slide is a light gray gradient. It is decorated with numerous realistic water droplets of various sizes. Some droplets are at the top left, some are scattered in the middle, and a larger cluster of droplets is on the right side, including a large, prominent one near the bottom right corner. The droplets have highlights and shadows, giving them a three-dimensional appearance.

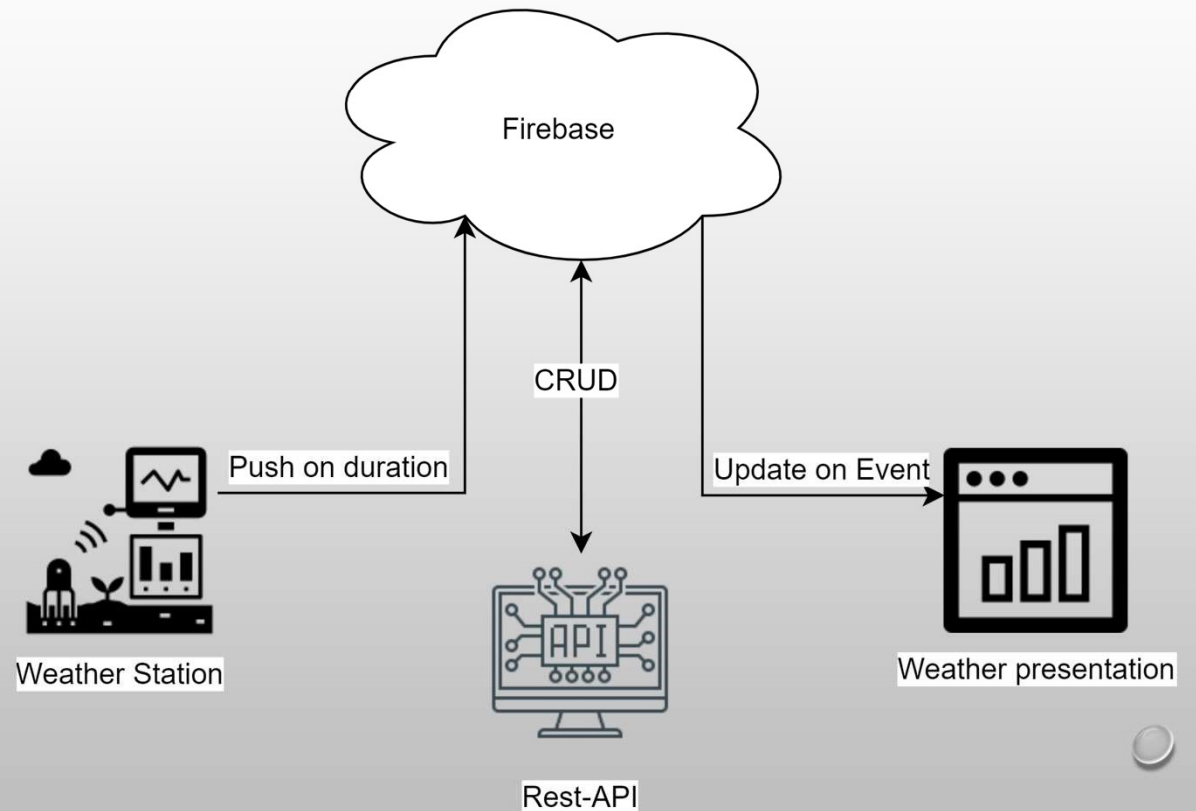
IOT WEATHER STATION

RASMUS ØLHOLM NIELSEN

KARSTEN WINTHER JOHANSEN

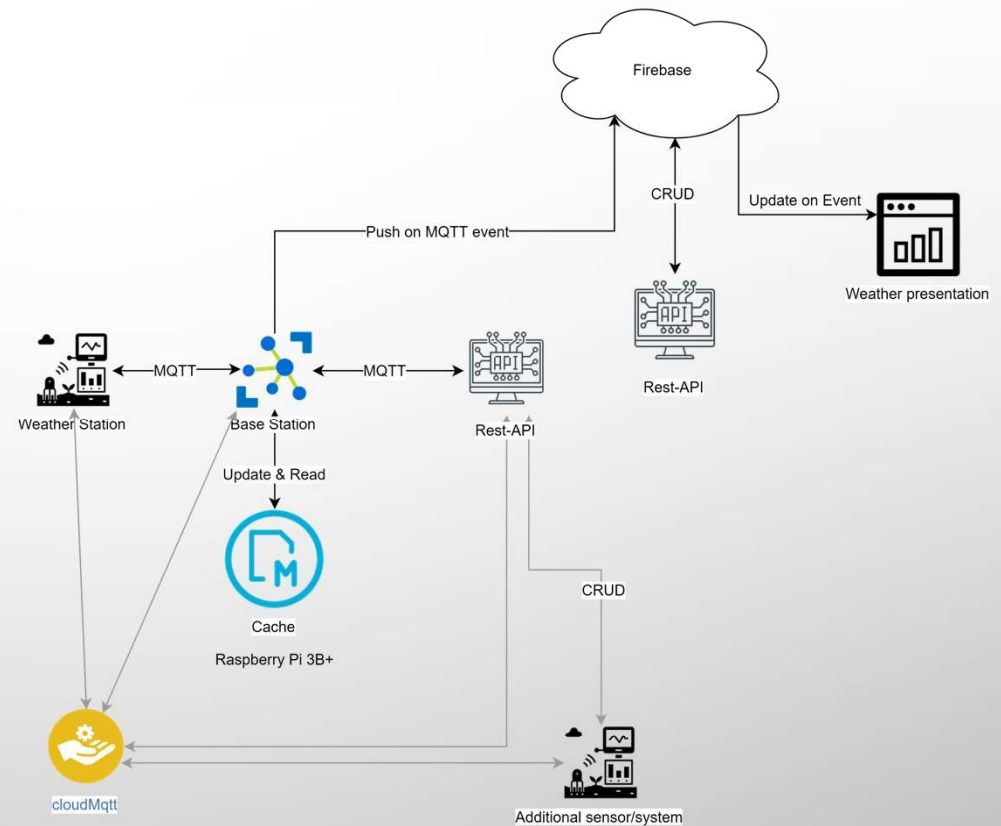
BASICS

- BUILD AN INTERNET-CONNECTED WEATHER STATION
- RPI WILL BE USED AS WEATHER STATION
- DATA SHOULD BE PROVIDED VIA WEB OF THINGS
- REPORTING SHOULD HAPPEN USING MOM SUCH AS MQTT OR REST



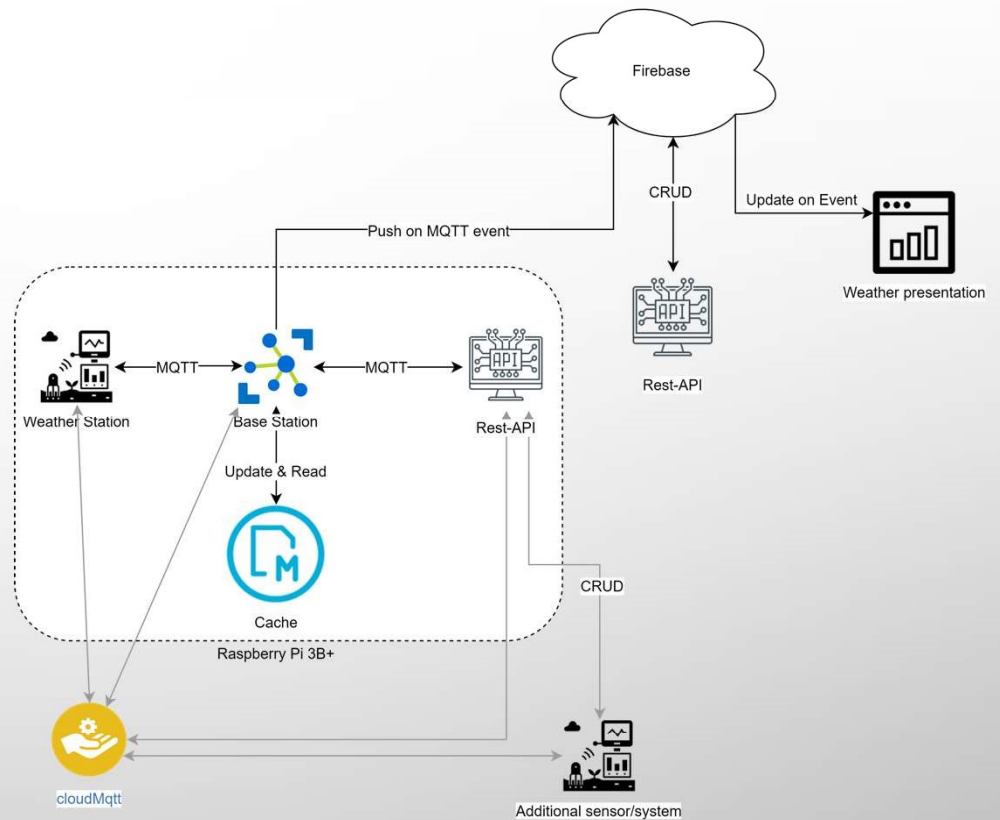
EXPERIMENTAL EXPLORATION EXPANSION

- SEPARATION OF CONCERNS
- MQTT AS INTER DEVICE COMMUNICATION
- CACHE RECENT DATA
- REST-API TO WEATHER STATION INTERACTION THROUGH MQTT
- POSSIBILITY OF EXTENSION



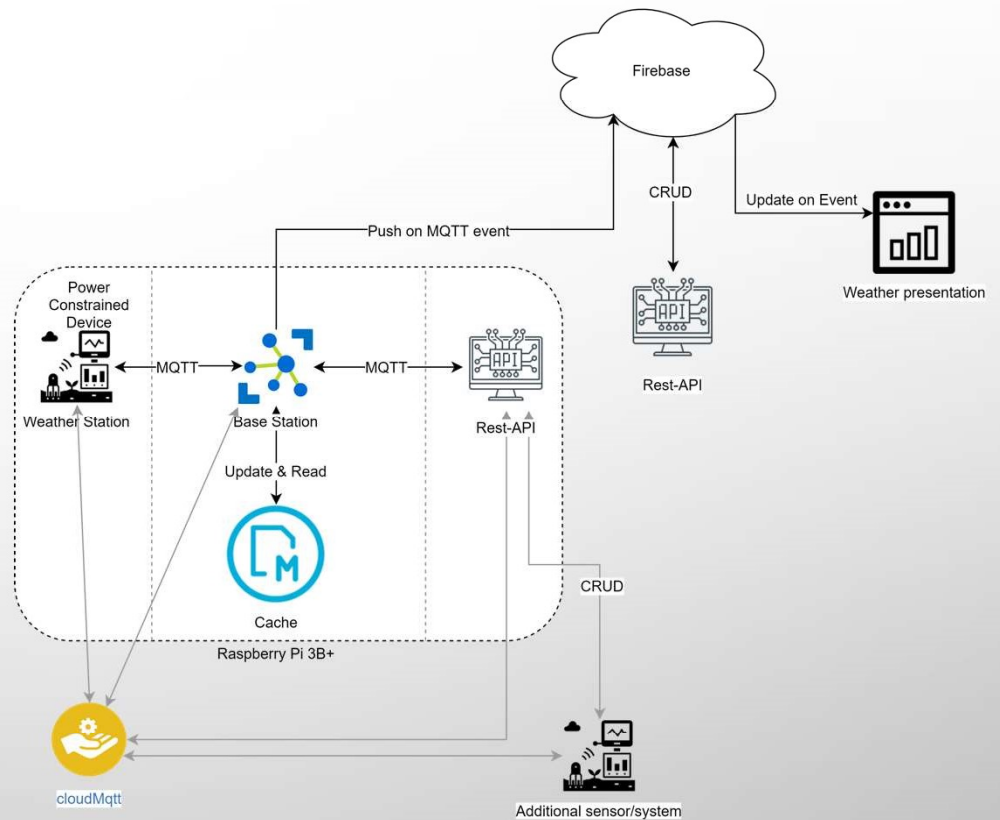
DESCRIPTION OF EXPANSION

- THREE PYTHON APPLICATIONS
 - WEATHERSTATION
 - BASE STATION
 - REST-API
- RUNNING ON SAME PLATFORM
- COMMUNICATION INTERFACES

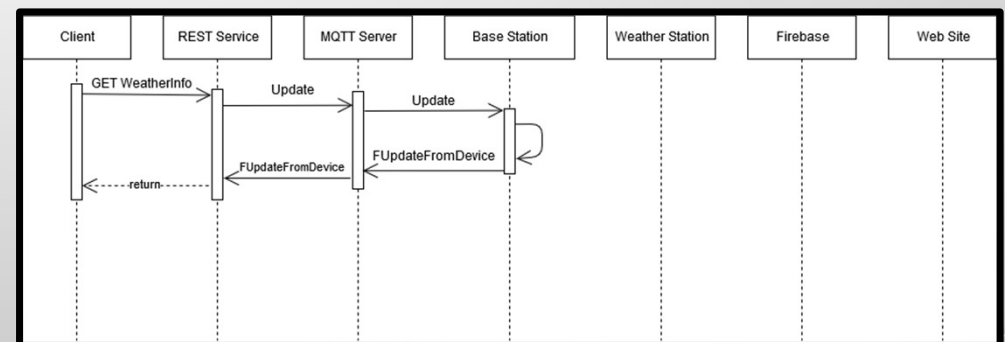
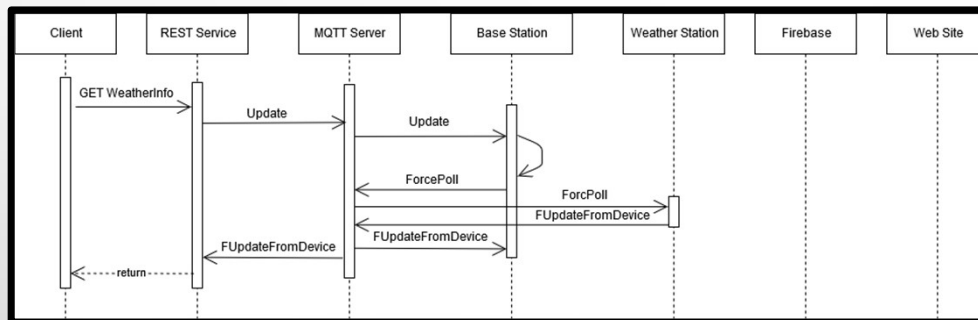
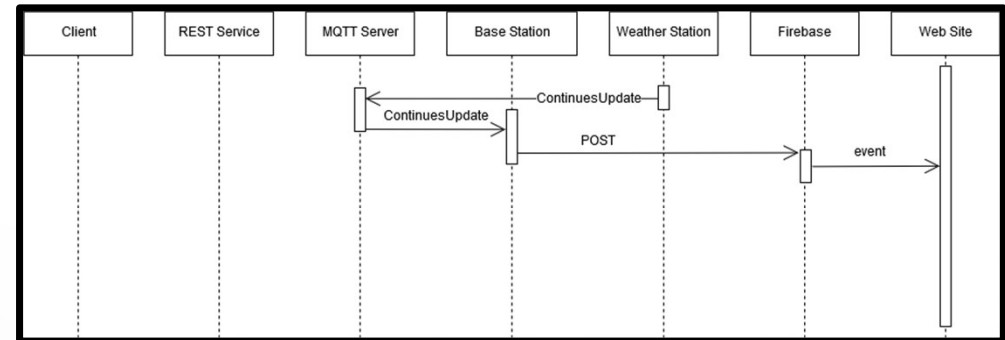


DESCRIPTION OF SEPARATION

- DEPLOYMENT TO DIFFERENT PLATFORMS



SEQUENCES IN THE SYSTEM

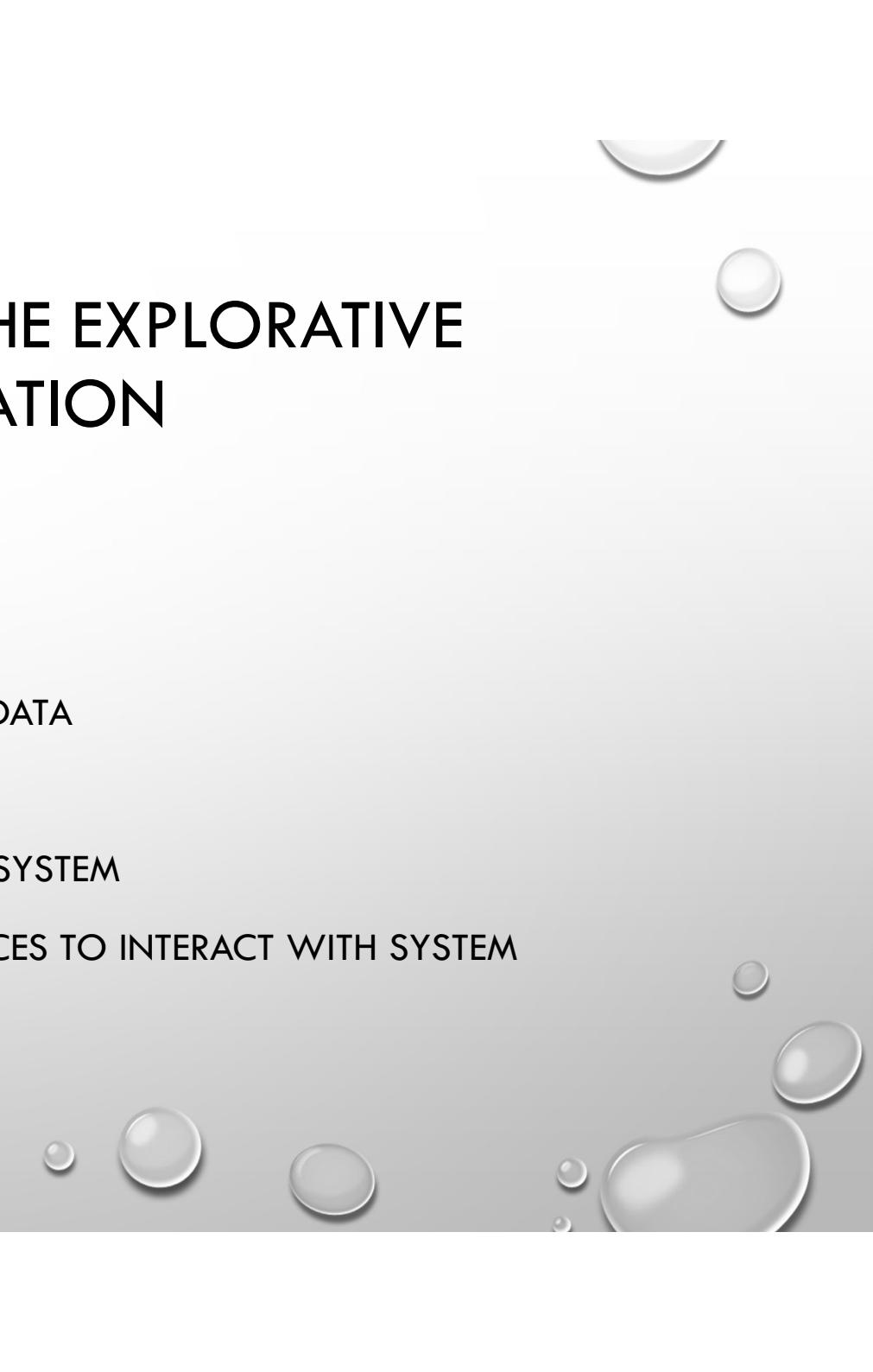


MOTIVATION OF CHOOSING MQTT

| MQTT | HTTP |
|---|--|
| Data-centric | Document centric |
| Publish/subscribe using a broker | Request/response |
| Simple | More complex |
| Small with a compact binary header (just 2 bytes) | Larger, because status details are text-based |
| Three quality of service settings | All messages get the same level of service |
| Libraries for C (30 KB), Java (100 KB), Python | Depends on the application - typically not small |
| Supports 1-to-zero; 1-to-1 and 1-to-N. | 1-to-1 only |



FINDINGS DONE IN THE EXPLORATIVE IMPLEMENTATION

- MQTT LESS OVERHEAD
 - MQTT OFFERS ENCRYPTED CONNECTION
 - MQTT IS SUITABLE FOR COMMUNICATING SENSOR DATA
 - MQTT 1:N COMMUNICATION
 - MQTT ENABLES OTHER DEVICES TO INTERACT WITH SYSTEM
 - REST TO DEVICE USING MQTT ENABLES OTHER DEVICES TO INTERACT WITH SYSTEM
 - SEPARATION OF CONCERNS IS POSSIBLE
- 

DEMO

The image features a light gray background with a subtle gradient. In the top-left and top-right corners, there are several realistic water droplets of varying sizes, some partially cut off by the edge. In the bottom-right corner, there is a larger, more complex arrangement of droplets, including a large one and several smaller ones. The word "QUESTIONS?" is centered in the upper half of the image in a bold, black, sans-serif font.

QUESTIONS?