52north

exploring horizons

Internet of Things Technologies for the Efficient Collection of Hydrological Measurement Data

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CHALLENGES

- Collecting sensor measurement data of a huge amount of unknown IoT devices
  - Plug-and-play integration of new devices is required
- Transmission of raw data from low resource devices to a central data server
  - Communication overheads should be avoided
- Interoperable transmission of measurement data
  - Standardized interfaces ensures the interconnection between IoT devices and users via the web

OGC SensorThings API

- Interconnection of IoT sensing devices over the web
  - Open, geospatial-enabled and standardized
  - Based on OGC Observations and Measurements model (JSON encoding)
  - REST principles for creating and accessing observation data
 - MQTT extension for publish/subscribe patterns
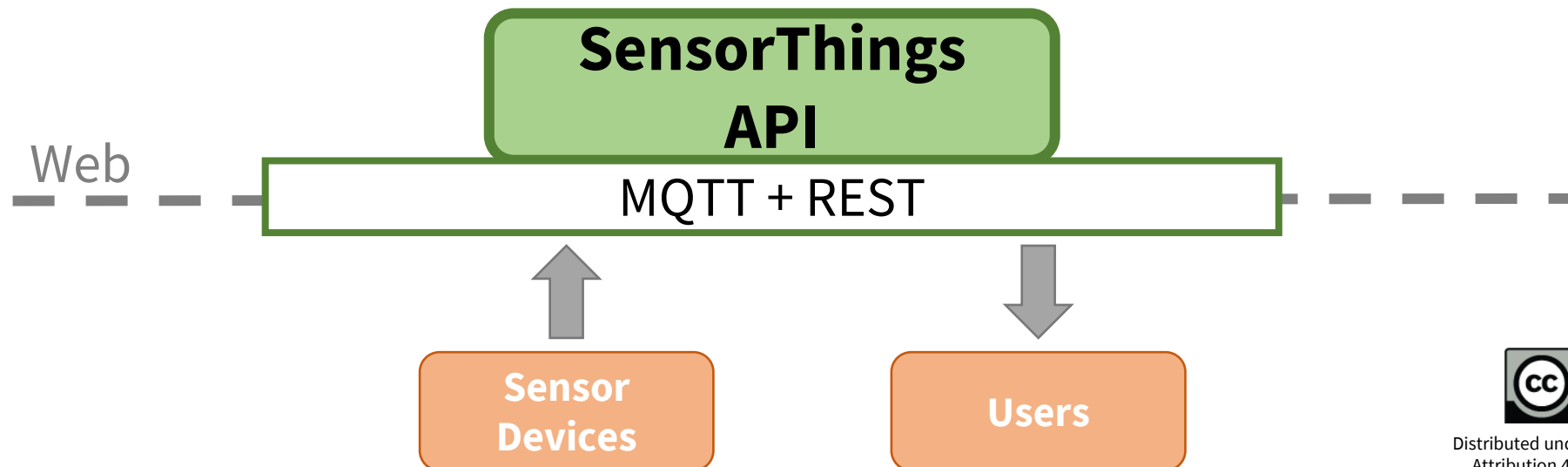
52°NORTH SENSORTHINGS API MODULE

- Sensor Things API module extends the 52N Sensor Web Server
  - Common management and storage functionalities

- Interlinking between Sensor Observation Service, SensorThings API and REST API
  - Observation data can be published via MQTT and is accessible via SOS and REST
  - Shared model for observation data following O&M

- Open source implementation available on GitHub: https://github.com/52North/sensorweb-server-sta
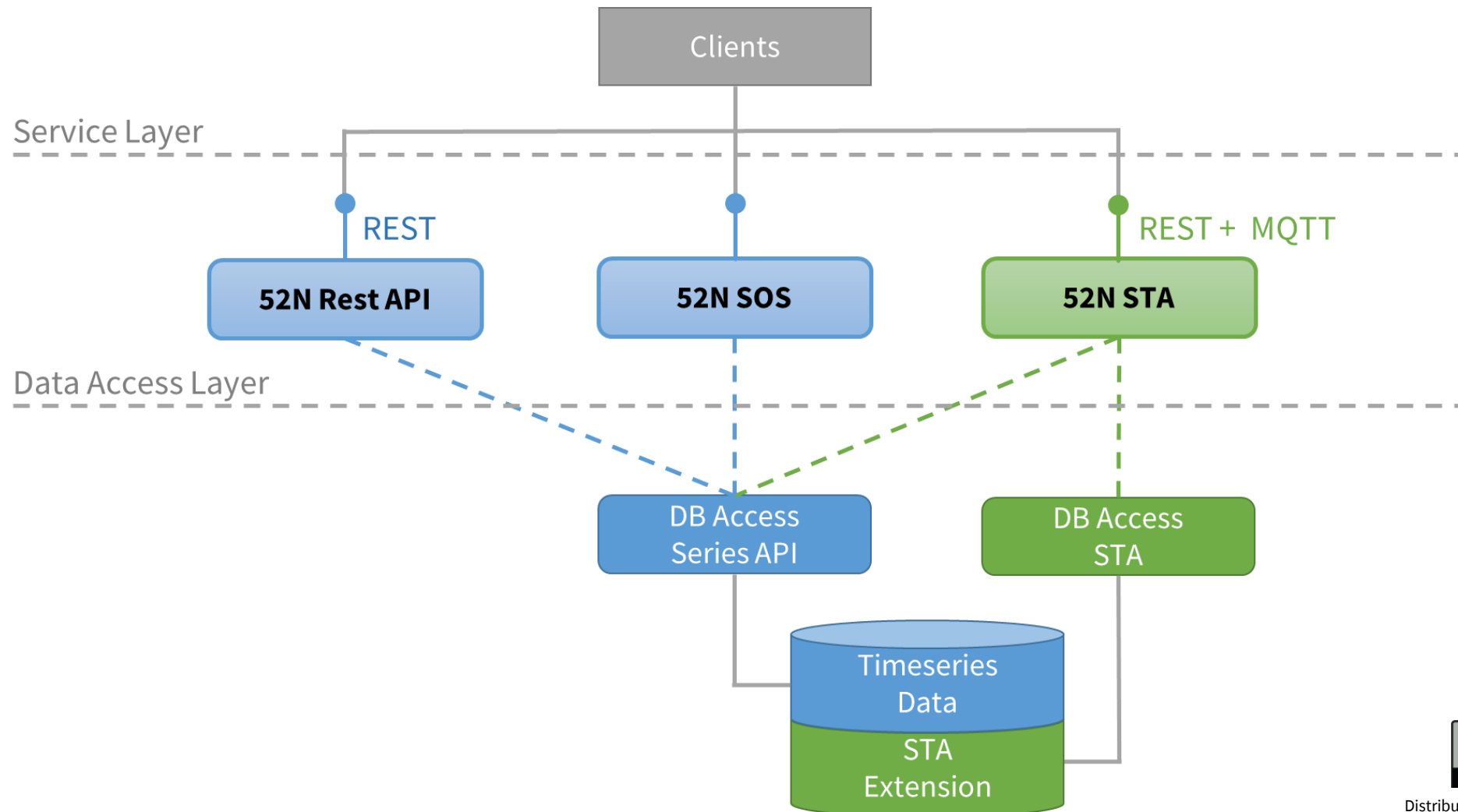
# 52°NORTH SENSORTHINGS API MODULE

PRE-OPERATIONAL DEPLOYMENT

- Area of study: Wupper region in North-Rhine Westfalia (Germany)
  - Wupperverband as responsible water authority
  - Operates several river dams and sewage treatment plants

- Successful evaluation: feasibility demonstrated

- Lightweight and robust integration with low overhead
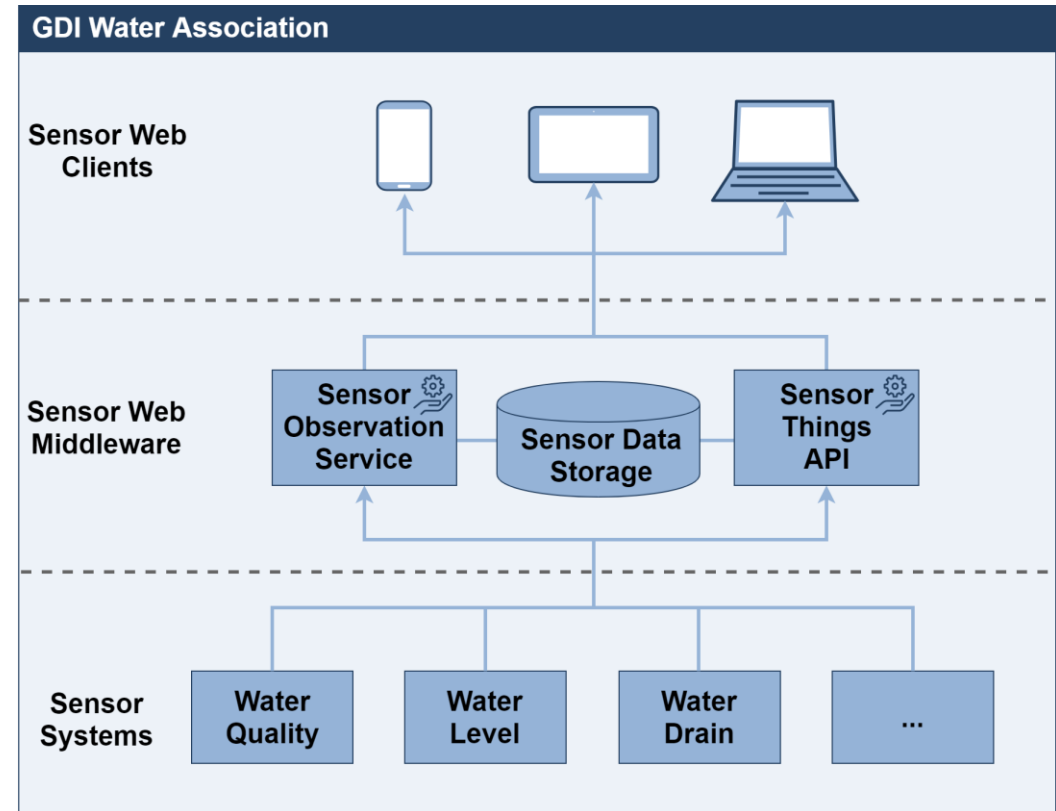
VISUALIZATION

- Helgoland Sensor Web Viewer
  - Lightweight web app for exploration, analysis and visualization of sensor data
  - GitHub repository: https://github.com/52North/helgoland
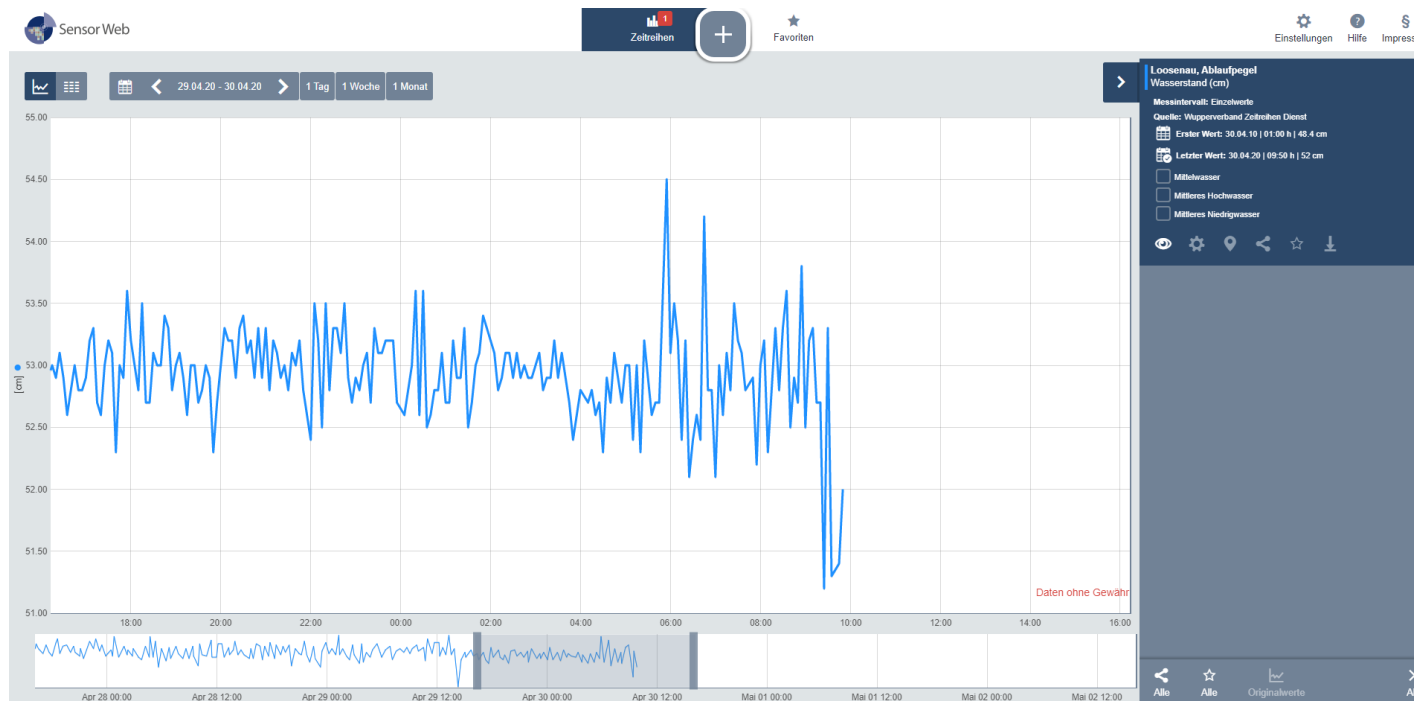
FUTURE CHALLENGES

- Handling more complex data types
  - E.g. profiles, data collected by mobile sensors
  - High volume data streams

- Improving semantic interoperability
  - Vocabularies
    - Important: names of observed parameters
  - Sensor metadata

- Interoperability testing between different software packages

ANY QUESTIONS OR SUGGESTIONS?

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