MQTT Support in TINE

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DESY.

Background

What is MQTT?

- Efficient publish/subscribe messaging protocol.
- Designed for resource-limited devices and low-bandwidth networks
- Decouples the sender and receiver via asynchronous communication

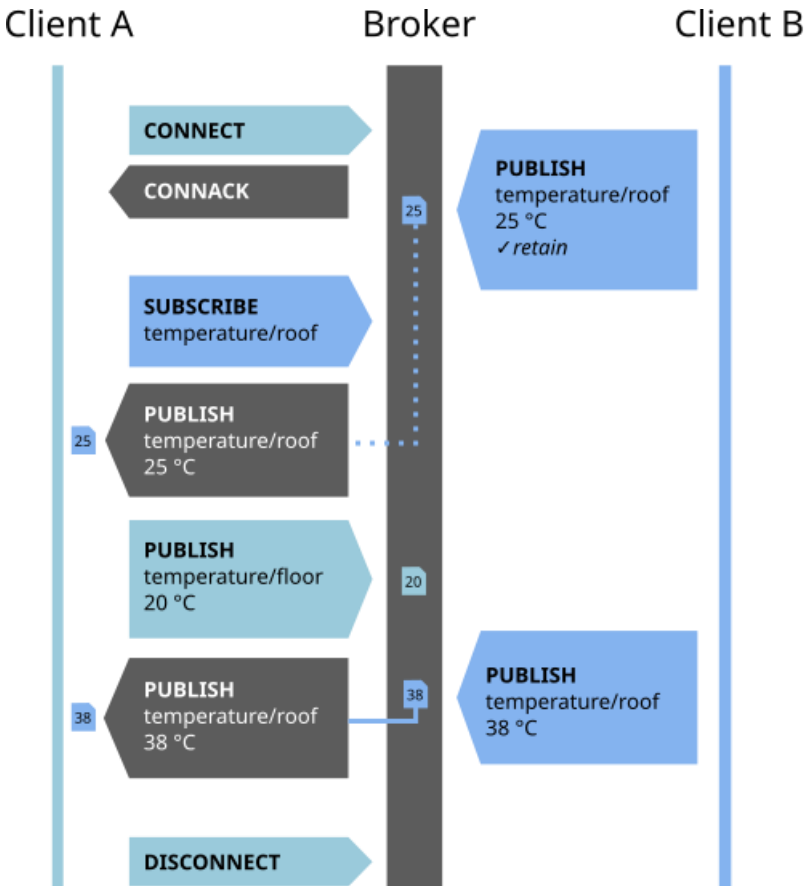
History and Purpose:

- Origin: Developed in 1999 by IBM and Arcom.
- Purpose: Data collection from multiple remotely distributed nodes.
- Growth: Became OASIS standard in 2013, in 2019 version 5.0 was released, became de-facto main IoT protocol.

Rationale for incorporating it into TINE:

- New devices and software often support MQTT out-of-the-box.
- In many scenarios simpler, more efficient alternative to OPC UA
- Scalability - from embedded devices to complex systems, future-proof

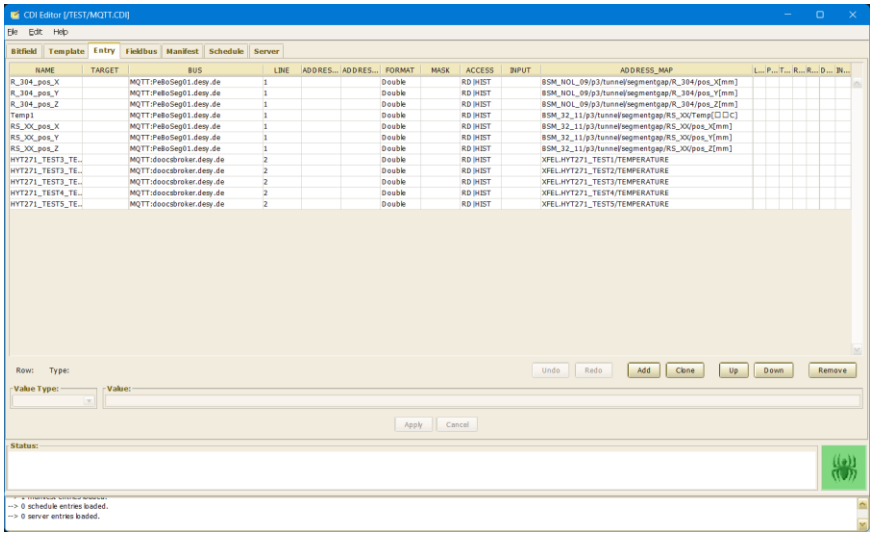
Example with QoS 0



* Source: Wikipedia.org

New MQTT Bus Plug for CDI

- Support for multiple brokers
- Familiar configuration process
- Easy mapping of MQTT topics to TINE properties
- Native archiving can be easily enabled with the “|HIST” access flag

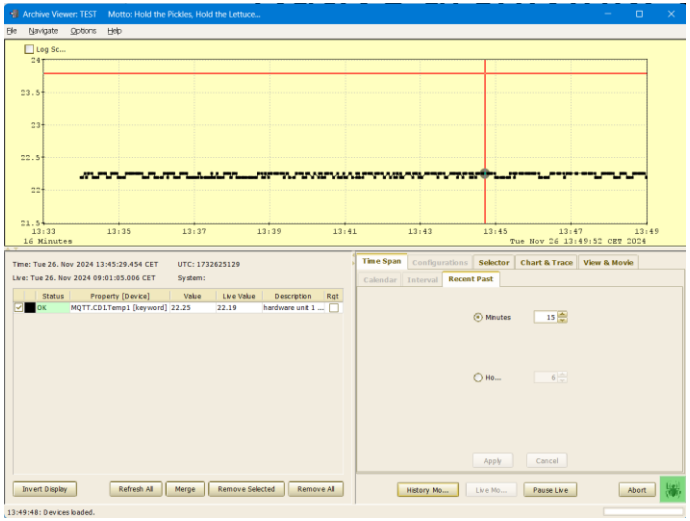


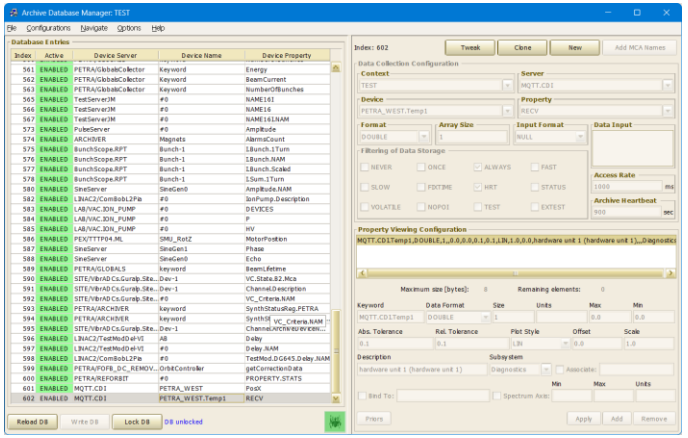
Operational highlights

- Data is collected in real-time and buffered(retained) within the CDI server

- Historical trend archiving

  can be performed using standard TINE services, either locally or centrally





Future directions:

- Releases for other platforms: Linux, embedded hardware platforms and OSs(Ubuntu Core, Raspberry Pi, Intel NUC)
- Enhanced JSON schemas support for better data structuring
- New models to consider:

  - Brokerless MQTT, can TINE do broker's job?

  - MQTT over QUIC?