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Think Automation and beyond...

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MQTT Intro

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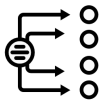
What is MQTT?

MQTT protocol is an extremely lightweight and efficient **publish/subscribe** messaging transport that is ideal for connecting industrial devices to the cloud

Requires minimal network bandwidth

MQTT allows for messaging between device to cloud and cloud to device

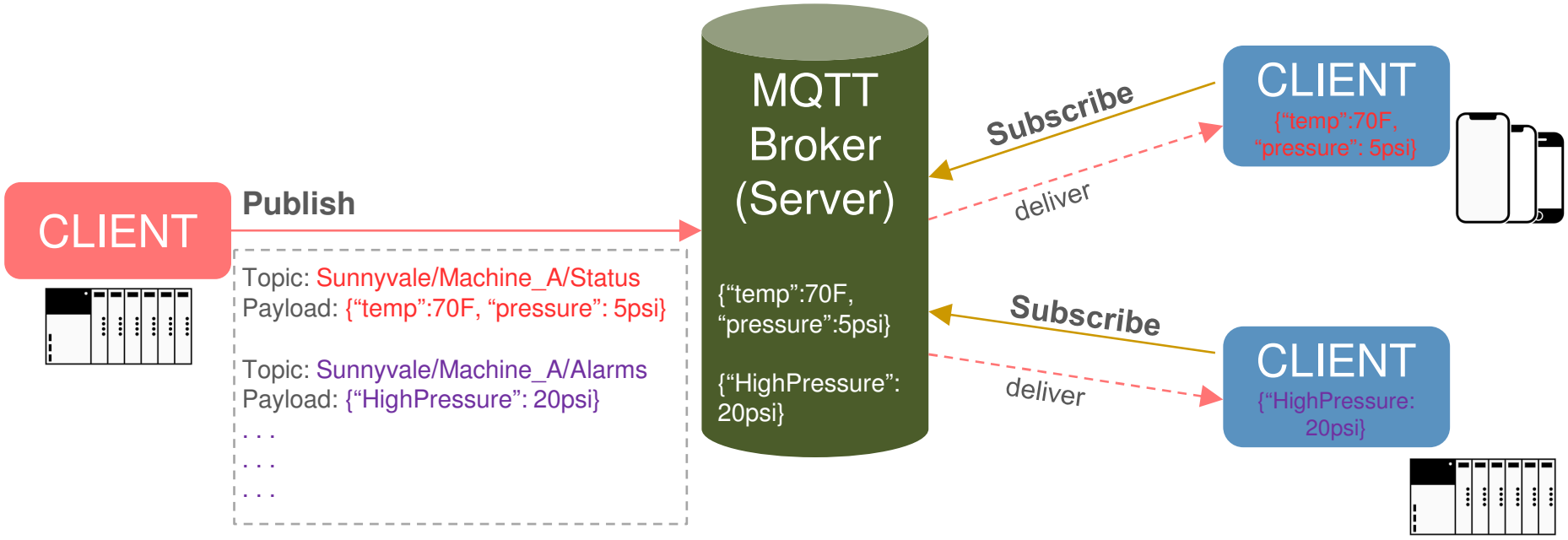


Easy broadcasting messages to groups of things

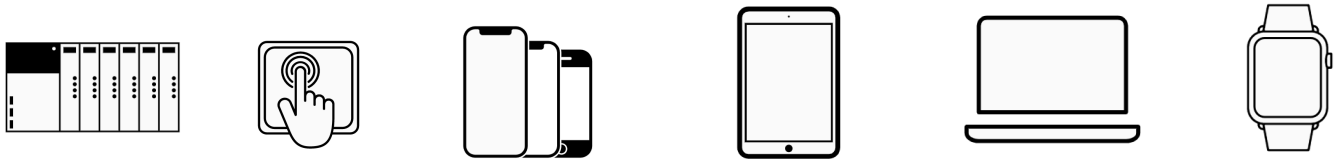
Very secured (messages encrypted)

MQTT Communications

- Publish, Subscribe, and Broker

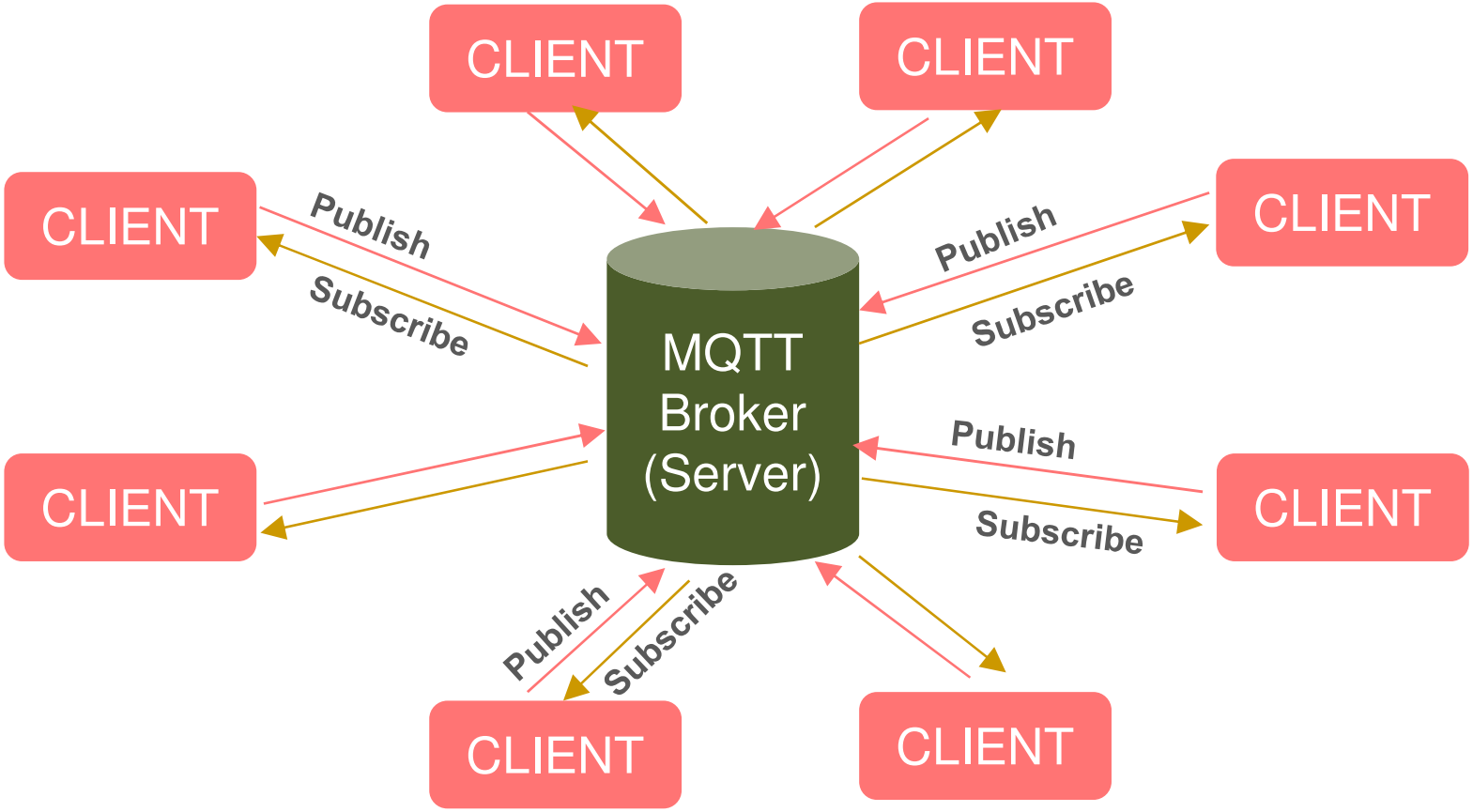


A client can be



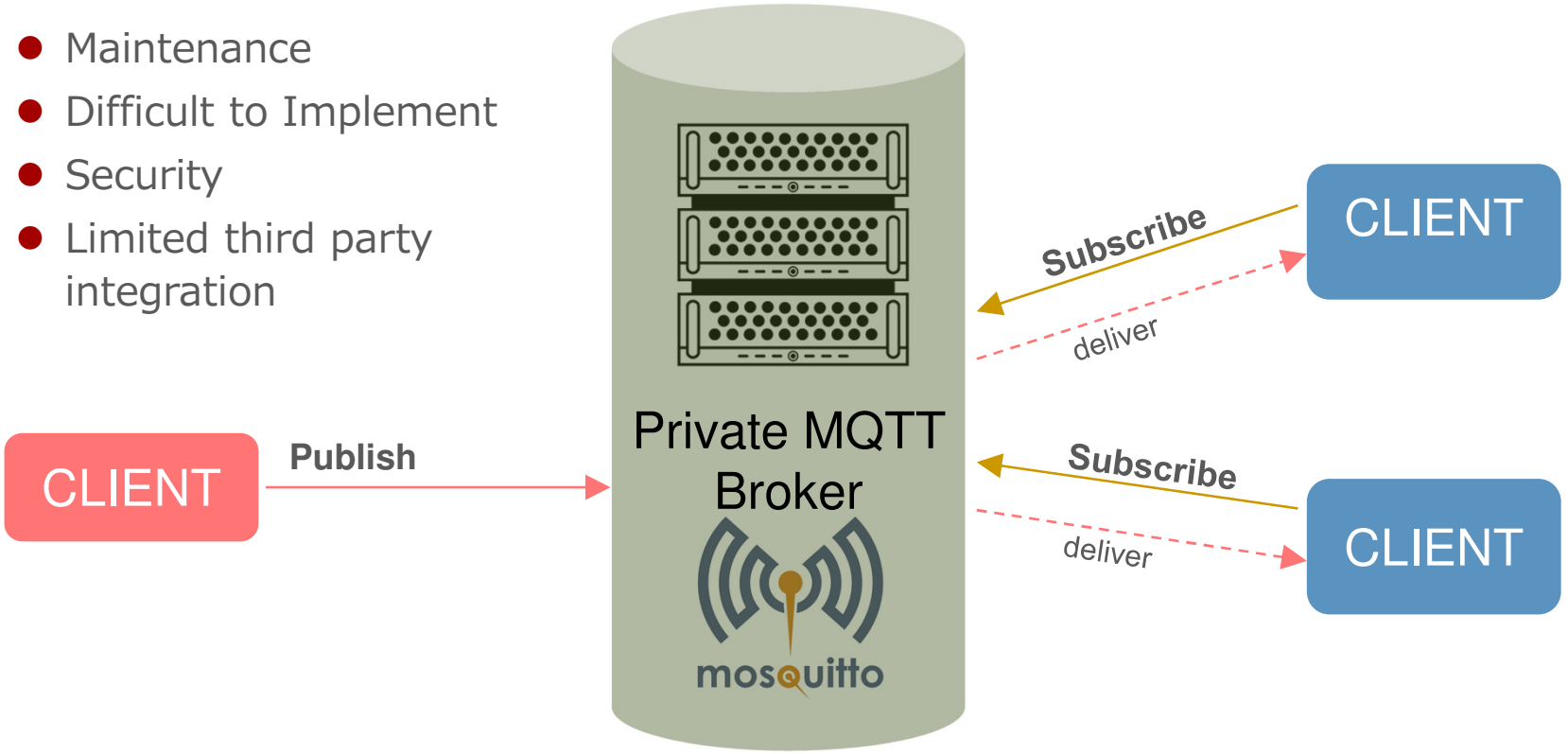
MQTT Communications

- Multiple clients (No limitation)
- A client can Publish and Subscribe simultaneously (Bi-directional)



MQTT Broker

- Private (Local)
  - Pro
    - No subscription fees
  - Con
    - Maintenance
    - Difficult to Implement
    - Security
    - Limited third party integration

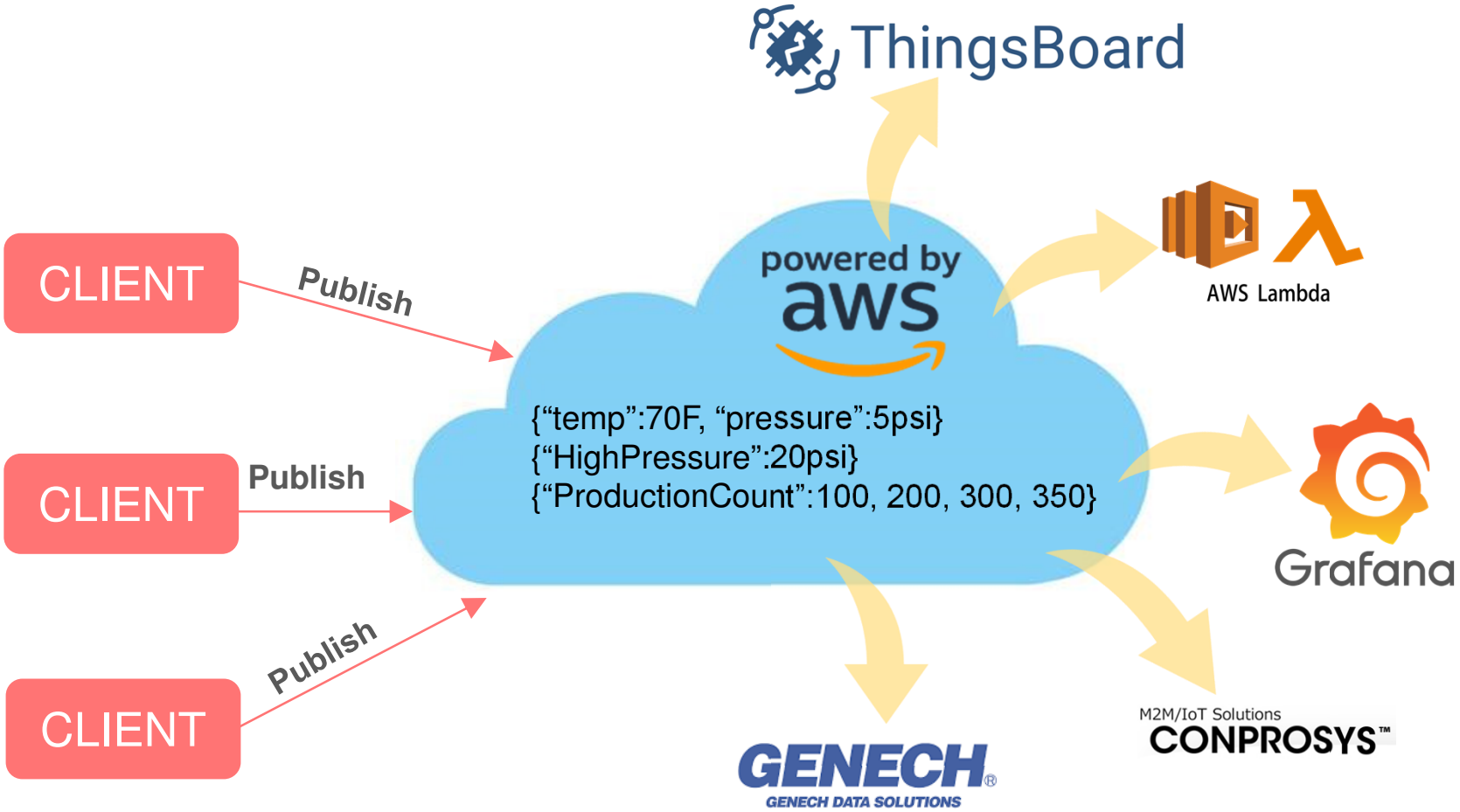


MQTT Broker

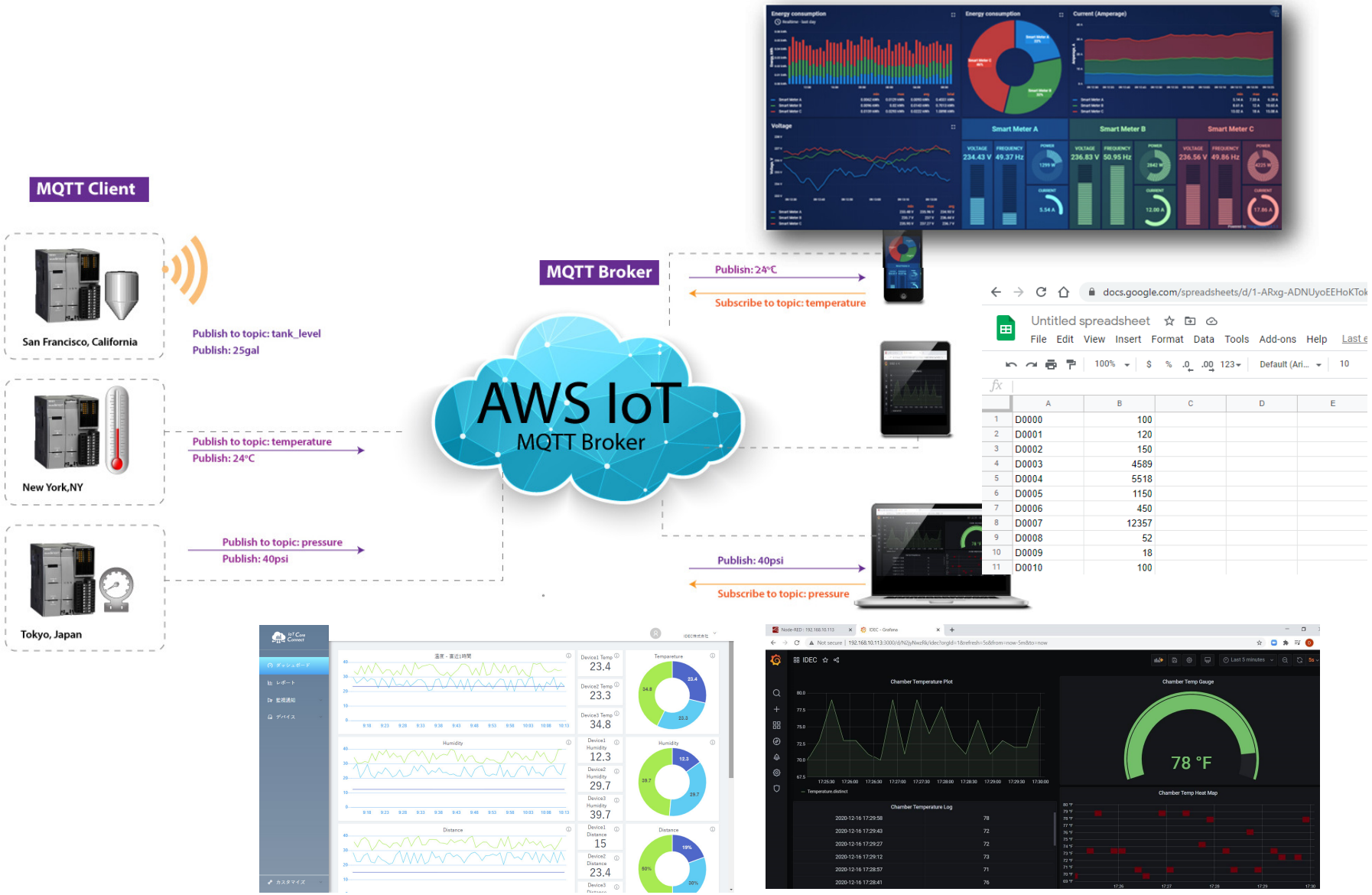
- Public (Cloud)
  - Pro
    - Maintenance free
    - Low cost
    - Easy to deploy
    - Secured
    - Third party integration widely available
  - Con
    - Subscription fees (minimal)

Data in the Cloud

- How to utilize raw data in the cloud



Data in the Cloud



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Data in the Cloud

- Industrial Internet of Things (IIoT) Protocol
  - Data is king
  - Analytic
  - Predictive Maintenance
  - Controls at your fingertip
  - Visualization
  - Alarms and Notifications
  - Endless Possibilities

    Third party tools/applications and mobile App

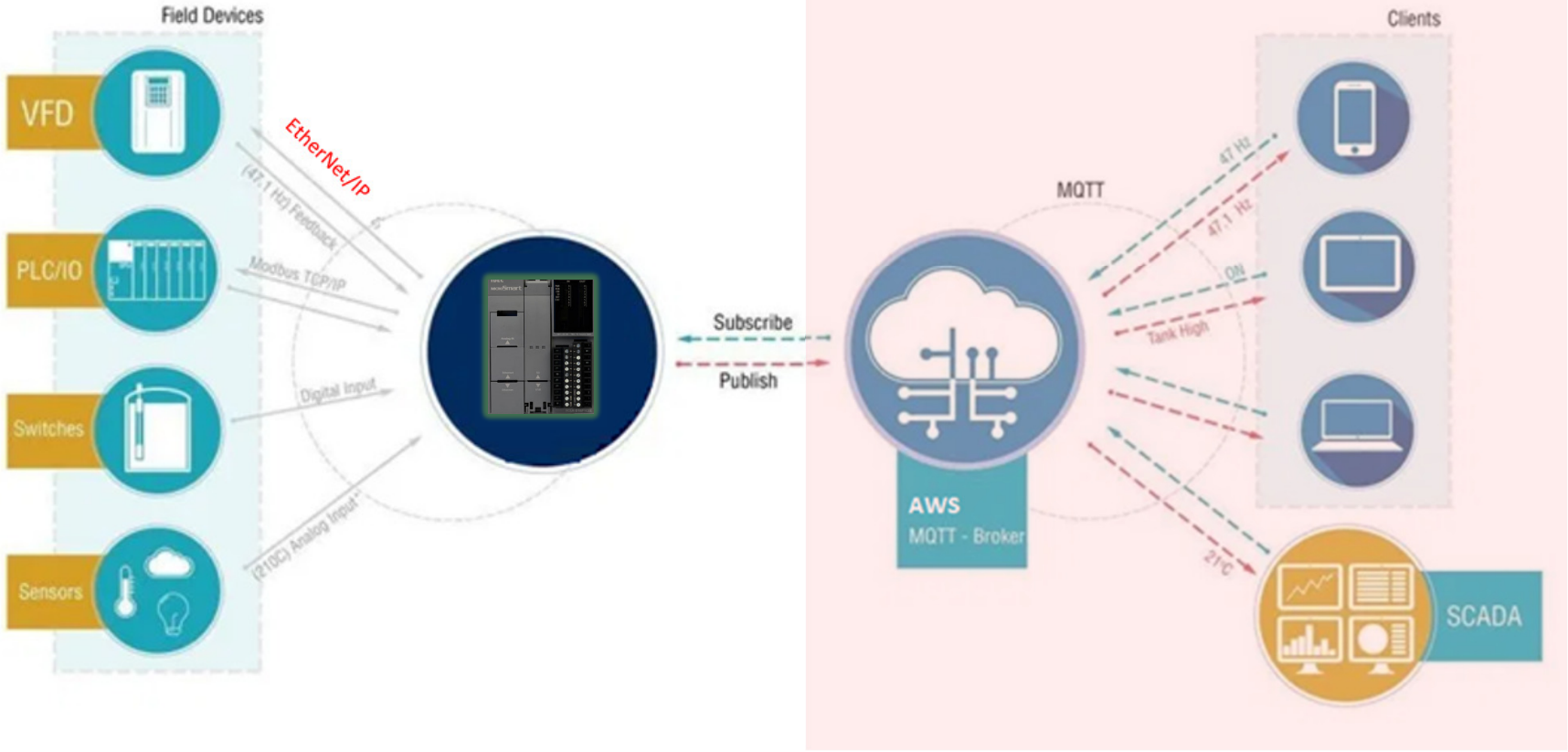
MQTT vs Industrial Protocols

Industrial Protocols

Modbus TCP
EtherNet/IP
CAN J1939
BACnet/IP

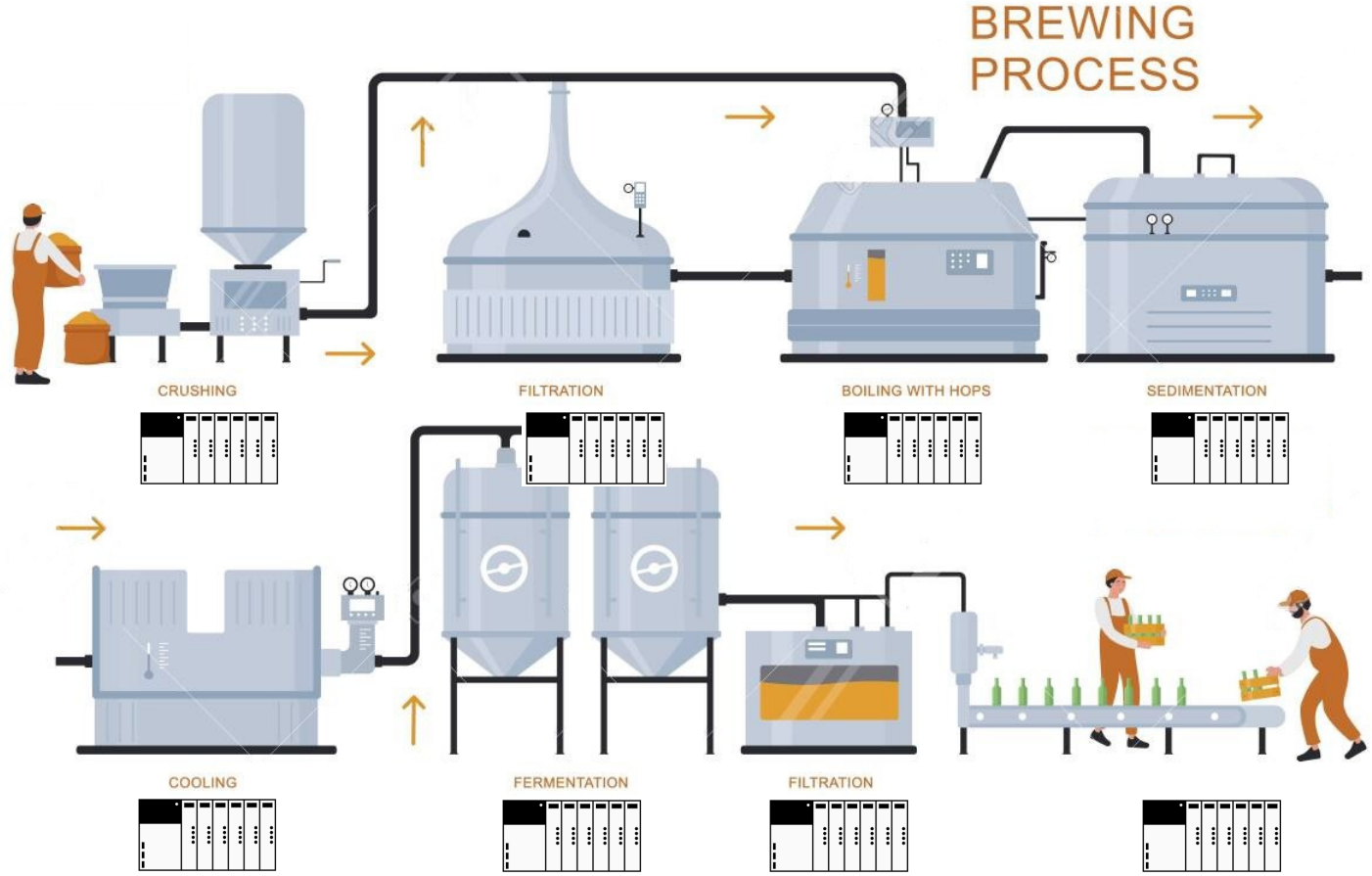
IIoT Protocol

MQTT

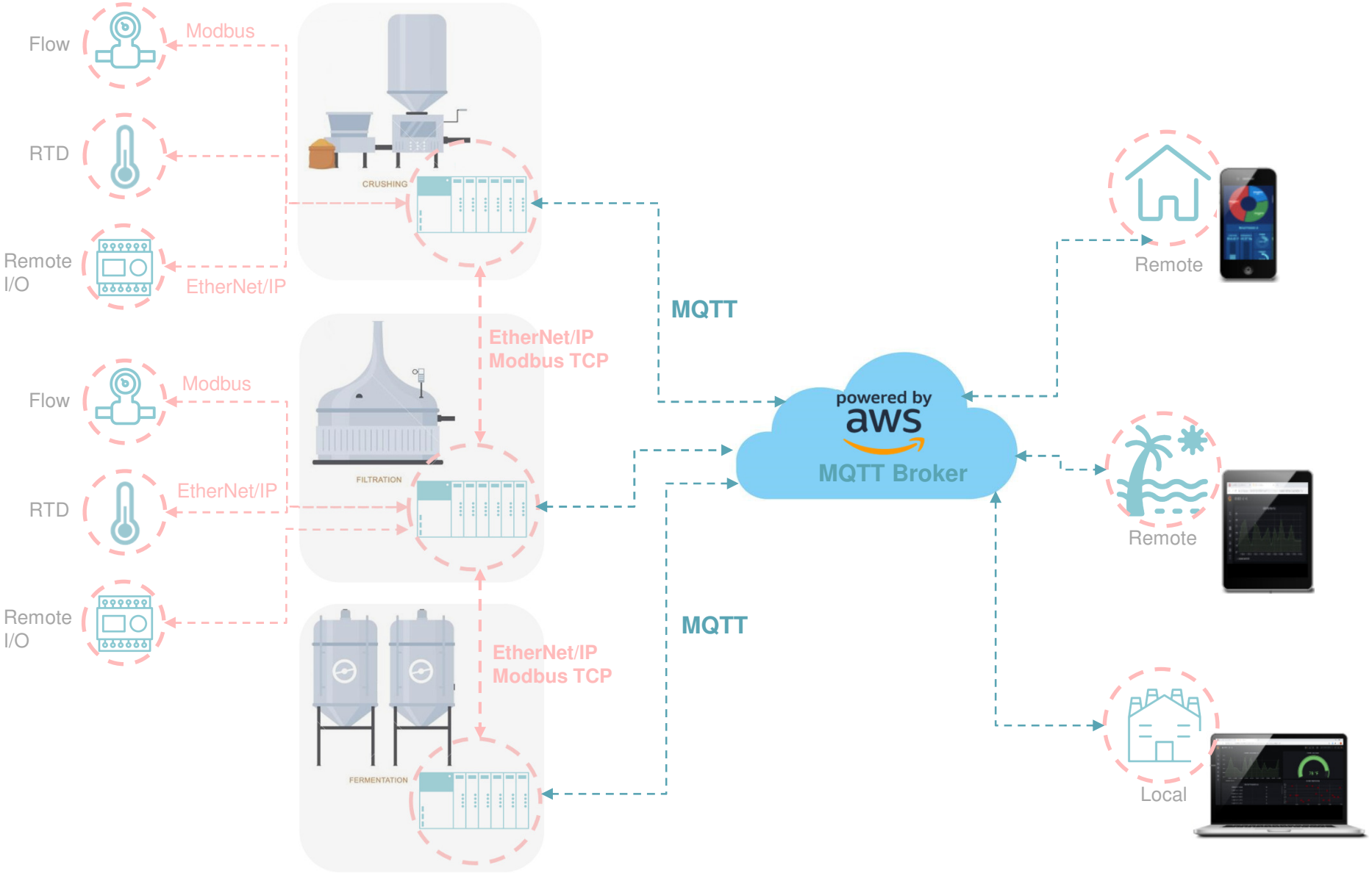


Applications

- Micro Brewery – single location
  - Separate controllers for each process
  - Controller-controller communication is critical



Applications



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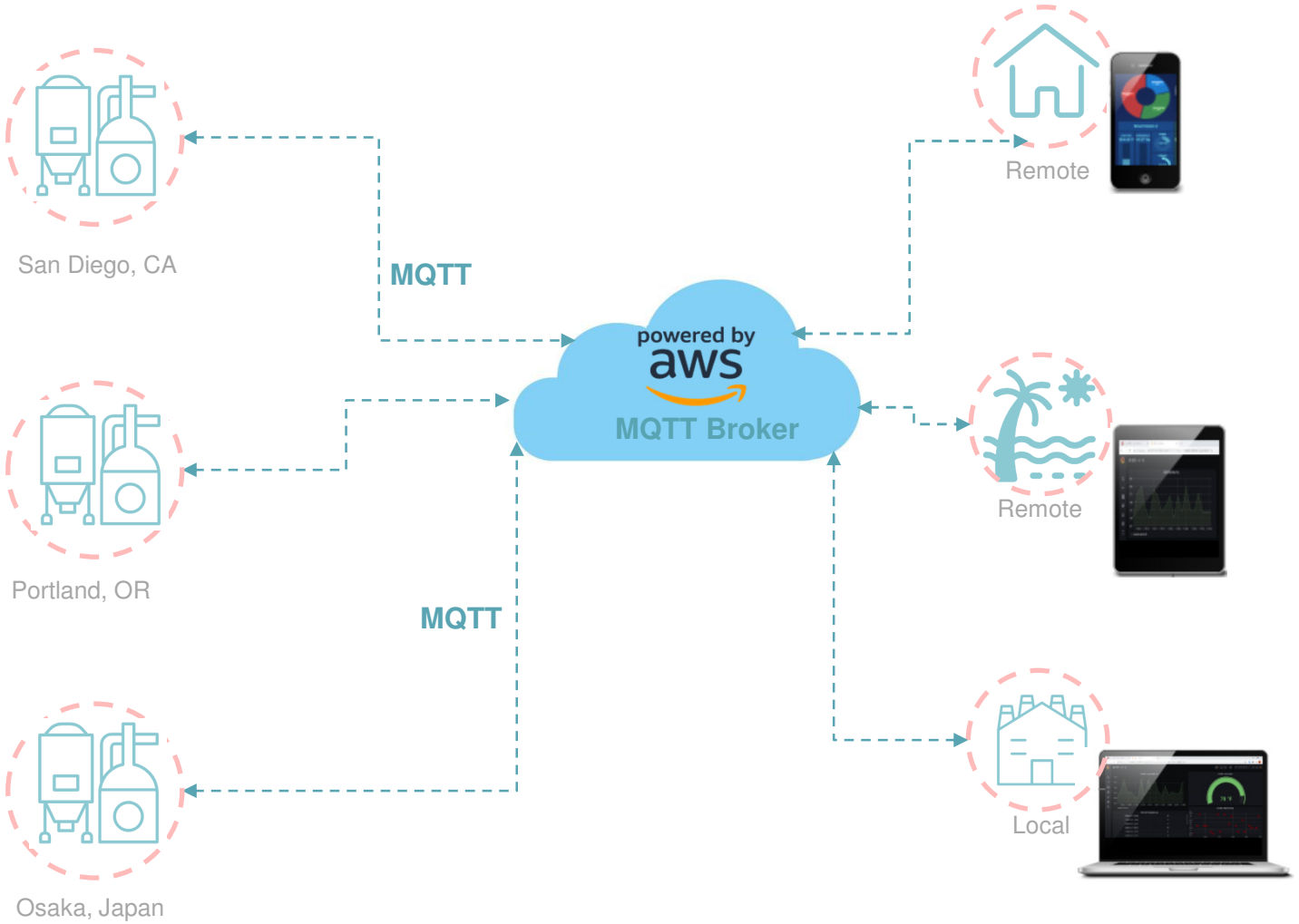
Applications

- Micro Brewery – multiple locations



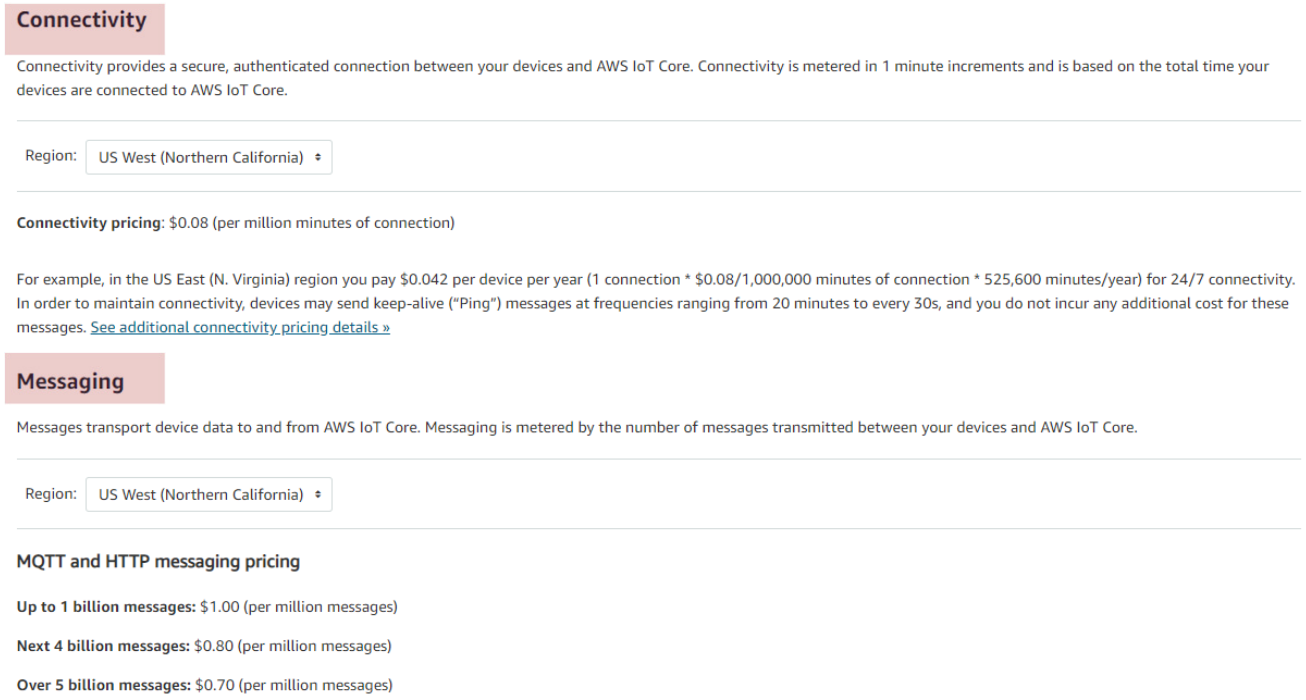
FC6A with MQTT

How MQTT is supported

- MQTT is supported on ethernet port 1 of the FC6A Plus CPU (FC6A-D%)
- Available as firmware upgrade
  - No extra cost
  - No additional hardware
  - Existing system already deployed in the fields can be upgraded
- Firmware available in AO version 3.21.0 or later (WindLDR 8.17.0)
- Support
  - **AWS IoT Core**
- Future support
  - Microsoft Azure
  - Google Cloud

AWS IoT Core Account

- Sign up for AWS account
  - https://aws.amazon.com/resources/create-account/
  - Require credit card
- Cost
  - https://aws.amazon.com/iot-core/pricing/



Connectivity

Connectivity provides a secure, authenticated connection between your devices and AWS IoT Core. Connectivity is metered in 1 minute increments and is based on the total time your devices are connected to AWS IoT Core.

Region: US West (Northern California)

Connectivity pricing: $0.08 (per million minutes of connection)

For example, in the US East (N. Virginia) region you pay $0.042 per device per year (1 connection * $0.08/1,000,000 minutes of connection * 525,600 minutes/year) for 24/7 connectivity. In order to maintain connectivity, devices may send keep-alive ("Ping") messages at frequencies ranging from 20 minutes to every 30s, and you do not incur any additional cost for these messages. See additional connectivity pricing details »

Messaging

Messages transport device data to and from AWS IoT Core. Messaging is metered by the number of messages transmitted between your devices and AWS IoT Core.

Region: US West (Northern California)

MQTT and HTTP messaging pricing

Up to 1 billion messages: $1.00 (per million messages)

Next 4 billion messages: $0.80 (per million messages)

Over 5 billion messages: $0.70 (per million messages)