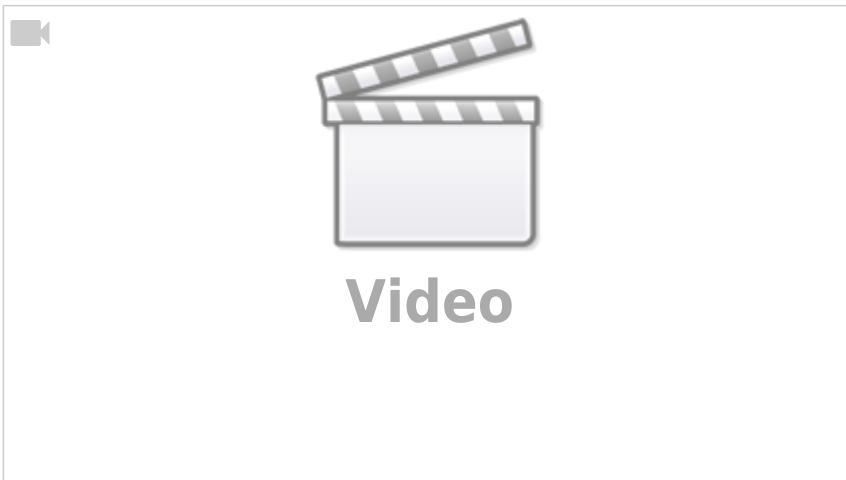


MQTT notes

PubSub protocol



Designed for constrained devices and low-bandwidth, high-latency, unreliable networks.

Simple

Light Weight

Publish-Subscribe

Reliable Delivery

Key Concepts

01 Publish-Subscribe

02 Client & Server

03 Topic

04 QoS

05 Session

QoS 0

 Sensor Reading

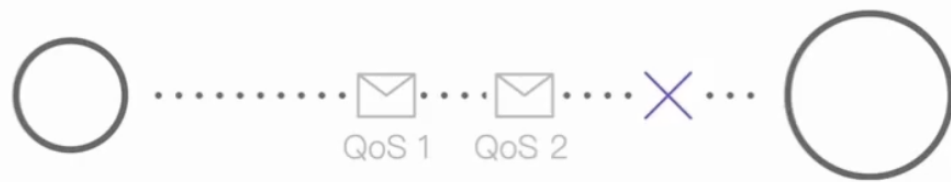
QoS 1

 Status Update

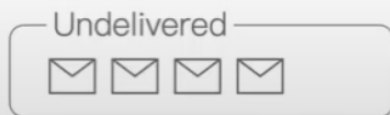
QoS 2

 Control Command

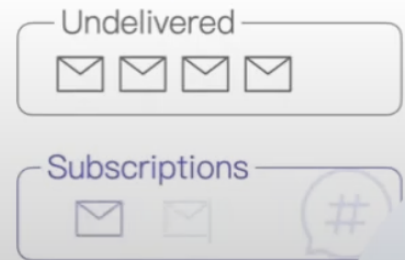
Session



Session in Client



Session in Server



Client

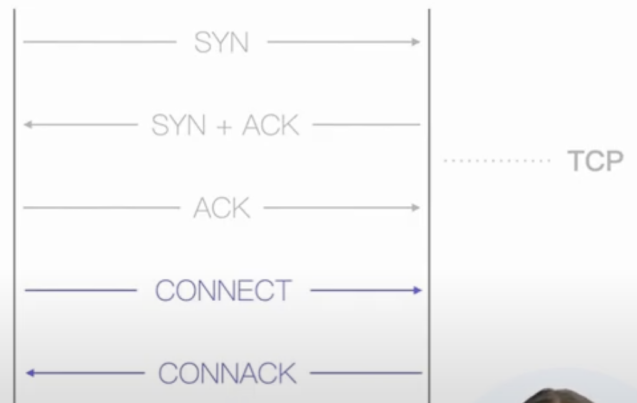
Server

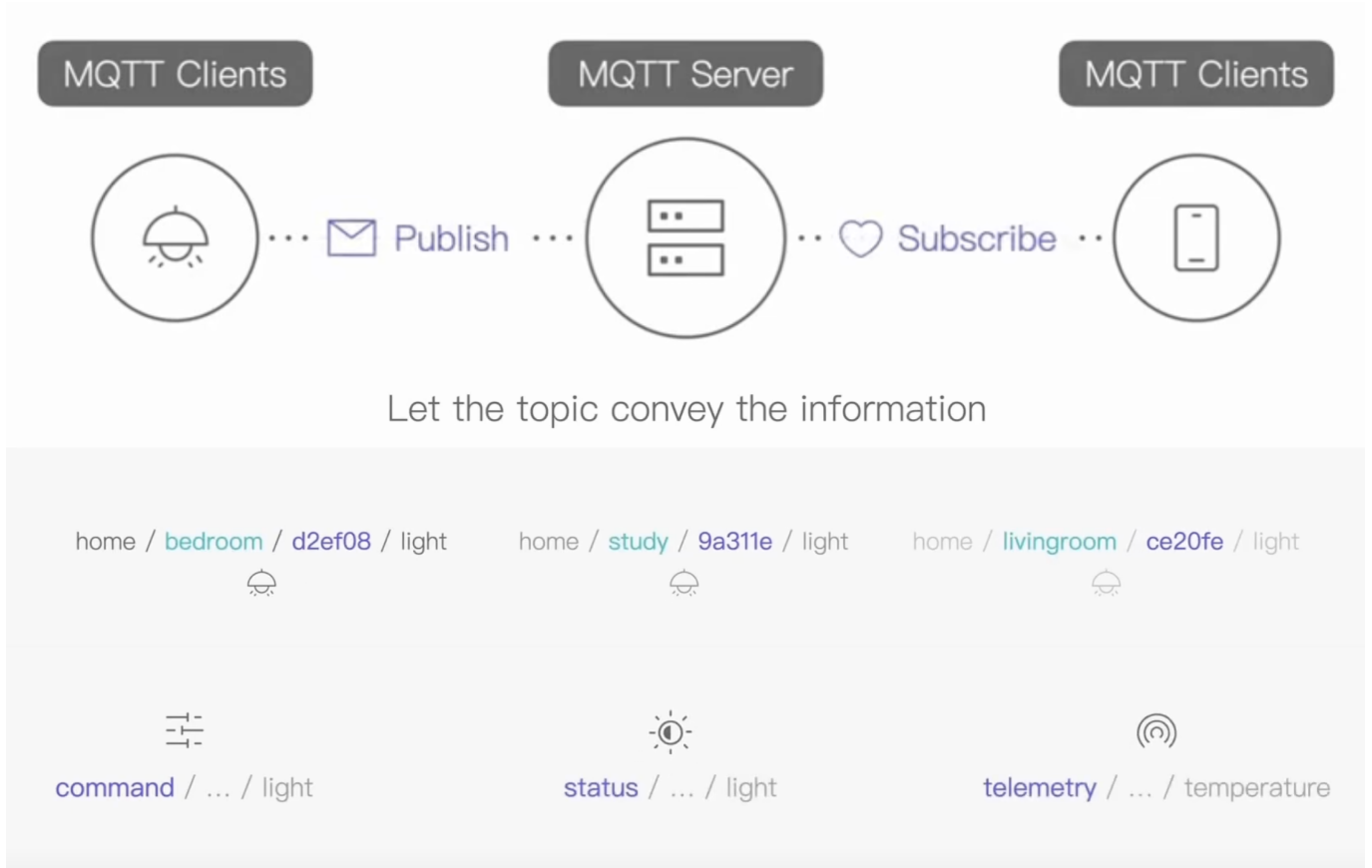
STEP 1

Transport Protocol

STEP 2

MQTT





EMQX ports

Type	Bind
ssl	0.0.0.0:8883
tcp	0.0.0.0:1883
ws	0.0.0.0:8083
wss	0.0.0.0:8084

Mqtt template to write to Influxdb

```
{
  "devices/+/messages": {
    "measurement": "devices",
    "tags": {
      "client_id": "$client_id"
    },
    "fields": {
      "temperature": ["$payload", "temperature"],
      "humidity": ["$payload", "humidity"]
    },
    "timestamp": "$timestamp"
  }
}
```

InfluxDB

Data organization

The InfluxDB data model organizes time series data into buckets and measurements. A bucket can contain multiple measurements. Measurements contain multiple tags and fields.

- **Bucket:** Named location where time series data is stored. A bucket can contain multiple *measurements*.
- **Measurement:** Logical grouping for time series data. All *points* in a given measurement should have the same *tags*. A measurement contains multiple *tags* and *fields*.
 - **Tags:** Key-value pairs with values that differ, but do not change often. Tags are meant for storing metadata for each point—for example, something to identify the source of the data like host, location, station, etc.
 - **Fields:** Key-value pairs with values that change over time—for example: temperature, pressure, stock price, etc.
 - **Timestamp:** Timestamp associated with the data. When stored on disk and queried, all data is ordered by time.

Fields aren't indexed: Fields are required in InfluxDB data and are not indexed. Queries that filter field values must scan all field values to match query conditions. As a result, queries on tags > are more performant than queries on fields. **Store commonly queried metadata in tags.**

Tags containing highly variable information like UUIDs, hashes, and random strings will lead to a large number of unique series in the database, known as **high series cardinality**. High series cardinality is a primary driver of high memory usage for many database workloads. See [series cardinality](#) for more information.

Influxdb config

Set up InfluxDB

The initial setup process for an InfluxDB instance creates the following:

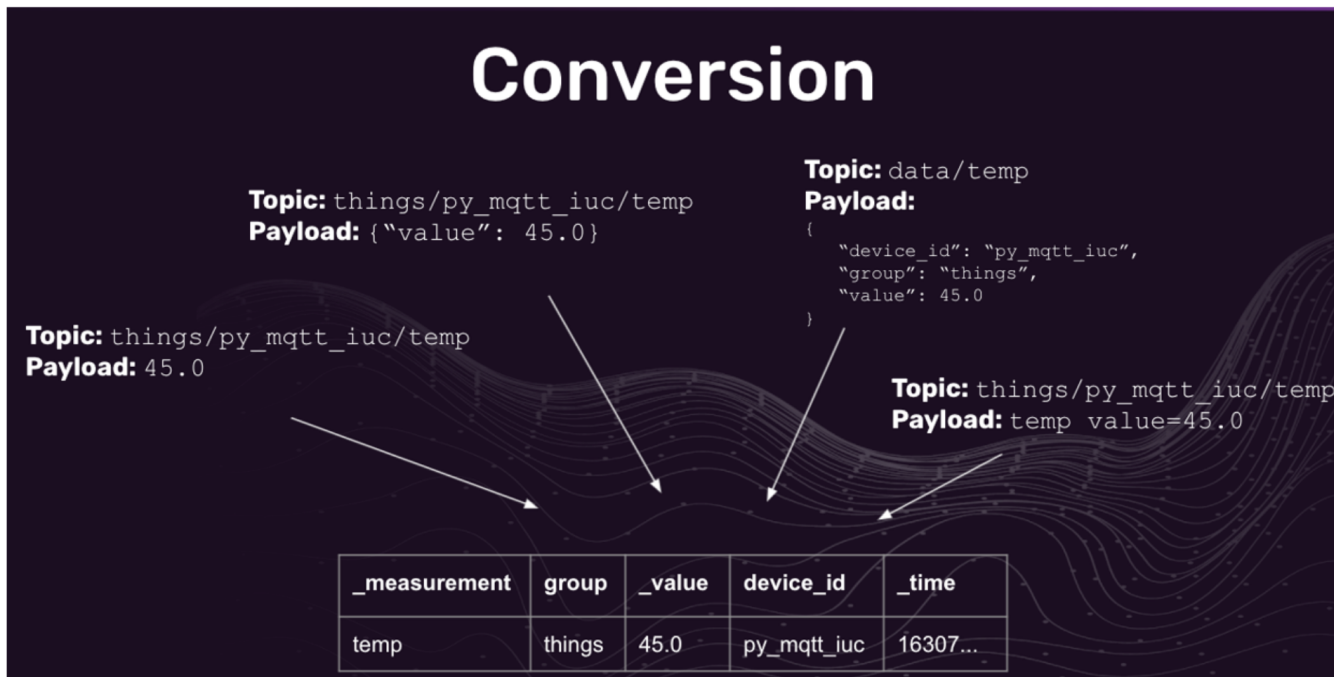
- An organization with the name you provide.
- A primary bucket with the name you provide.
- An admin [authorization](#) with the following properties:
 - The username and password that you provide.
 - An API token ([operator token](#)).
 - Read-write permissions for all resources in the InfluxDB instance.

To run an interactive setup that prompts you for the required information, use the InfluxDB user interface (UI) or the `influx` command line interface (CLI).

To automate the setup—for example, with a script that you write— use the `influx` command line interface (CLI) or the InfluxDB `/api/v2` API.

Telegraf parsing

<https://www.influxdata.com/blog/mqtt-topic-payload-parsing-telegraf/>
<https://www.influxdata.com/blog/how-parse-json-telegraf-influxdb-cloud/>



Flux query

Basic Flux query

Like treating water, a Flux query does the following:

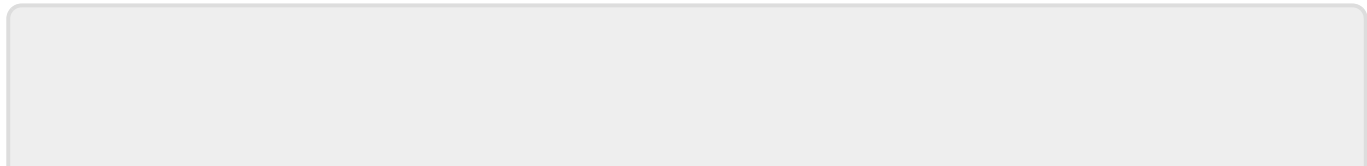
1. Retrieves a specified amount of data from a source.
2. Filters data based on time or column values.
3. Processes and shapes data into expected results.
4. Returns the result.

To see how to retrieve data from a source, select the data source: InfluxDB, CSV, or PostgreSQL.

InfluxDB
CSV
PostgreSQL

```

from(bucket: "example-bucket")
  |> range(start: -1d)
  |> filter(fn: (r) => r._measurement == "example-measurement")
  |> mean()
  |> yield(name: "_results")
  
```



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