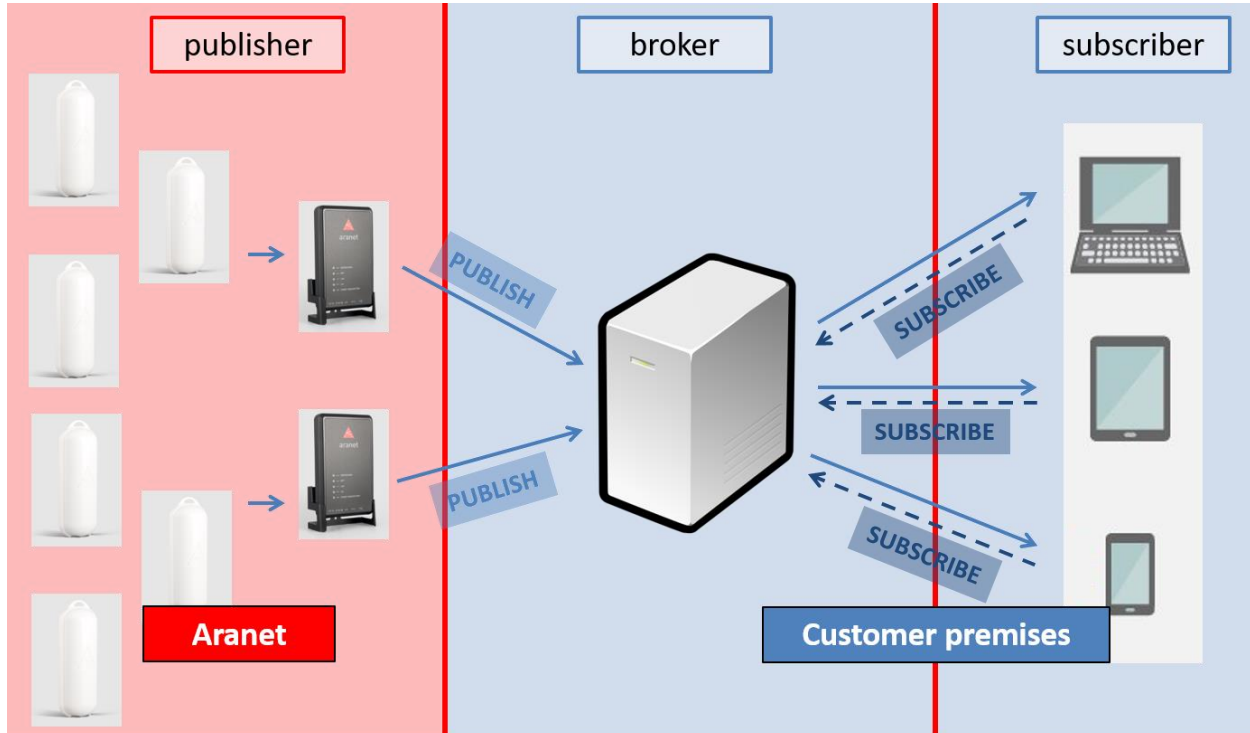


Aranet PRO base MQTT functionality

1. General MQTT network structure:



2. MQTT message format

Sensor measurement data messages from PRO base is published on the MQTT broker in following hierarchy(format): `<root topic name>/<PRO base serial number>/sensors/<sensor ID>/measurements/<measurement type>` where

- 1) `<root topic name>` - Aranet PRO base station MQTT message identification name which should be configured on the base. For details see *Aranet PRO base station configuration interface*
- 2) `<PRO base serial number>` - serial number of PRO base station
- 3) `<sensor ID>` - 6 HEX digit sensor ID where first digit is sensor segment (for details see Segments for sensors document) and remaining 5 digits are from sensor marking from physical label on the sensor body which can be seen also in PRO base station;
- 4) `<measurement type>` can be one of following:
 - a. temperature – data is given in degrees Celsius
 - b. battery – battery charge level which is given in ratio to one
 - c. humidity – relative humidity data is given in percentage %RH
 - d. rssi – received signal strength data given in dBm
 - e. time – measurement time in Unix epoch format:

<https://www.freeformatter.com/epoch-timestamp-to-date-converter.html>

- f. co2 – carbon dioxide data given in ppm(parts per million)
- g. atmosphericpressure – atmospheric pressure data given in Pa(pascal)
- h. distance – data given in m(meters)
- i. voltage – data given in V(volts)
- j. current – electric current data given in A (ampere)
- k. weight – data given in kg (kilogram)
- l. illuminance – data from LUX sensor given in lx (lux)
- m. bec – bulk electric conductivity data given in S/m (siemens per meter)
- n. pec - pore water electrical conductivity data given in S/m (siemens per meter)
- o. dp - dielectric permittivity data given in absolute numbers
- p. vwc - volumetric water content of soil or substrate data given in absolute numbers
- q. ppfd - photosynthetic photon flux density data given in mikromol/(m²S) (mikromol per siemens multiplied by square meters)
- r. contact_pulses_cumulative – cumulative pulses in absolute numbers

```

▼ 127.0.0.1
  ▼ Aranet
    ▼ 394261000902
      ▼ sensors
        ▼ 100511
          name = 100511
          ▼ measurements
            battery = 0.89
            humidity = 41.0
            temperature = 20.350
            rssi = -69
            time = 1587460239
  
```

Sensor alarm messages from PRO base is published on the MQTT broker in following hierarchy(format):
 <root topic name>/<PRO base serial number>/sensors/<sensor ID>/alarms

```

▼ alarms
  ▼ distance
    value
  ▼ errorflags
    value = 18
    activesince = 1587460086
  
```

3. Aranet PRO base station configuration interface

MQTT broker configuration for MQTT connection can be configured in PRO base station section Services → MQTT. In example below we will use config for Hivemq public MQTT broker *broker.hivemq.com*:

- 1) **Host address** – allows configuring IP address or host name for the MQTT broker;
- 2) **Port** – allows selecting TCP port for the connection with MQTT broker. In our example, 1883;
- 3) **Protocol version** – allows configuring MQTT protocol version for connection with MQTT broker. Broker should support this version;
- 4) **Authentication** - allows enabling authentication for the connection with MQTT broker;
- 5) **Encryption** - allows selecting additional encryption on the connection with MQTT broker;

- 5) **QoS level** can be chosen as necessary <http://www.steves-internet-guide.com/understanding-mqtt-qos-levels-part-1/> and <http://www.steves-internet-guide.com/understanding-mqtt-qos-2/>
- 6) **Root topic** – allows selecting root topic name for MQTT messages published by Aranet PRO base station. In our example, we will use name “Aranet”;
- 7) When parameters are entered they should be saved with corresponding blue save icon. If configured MQTT connection is successful, then success message will be shown on the top of the page indication also time when connection was established:

