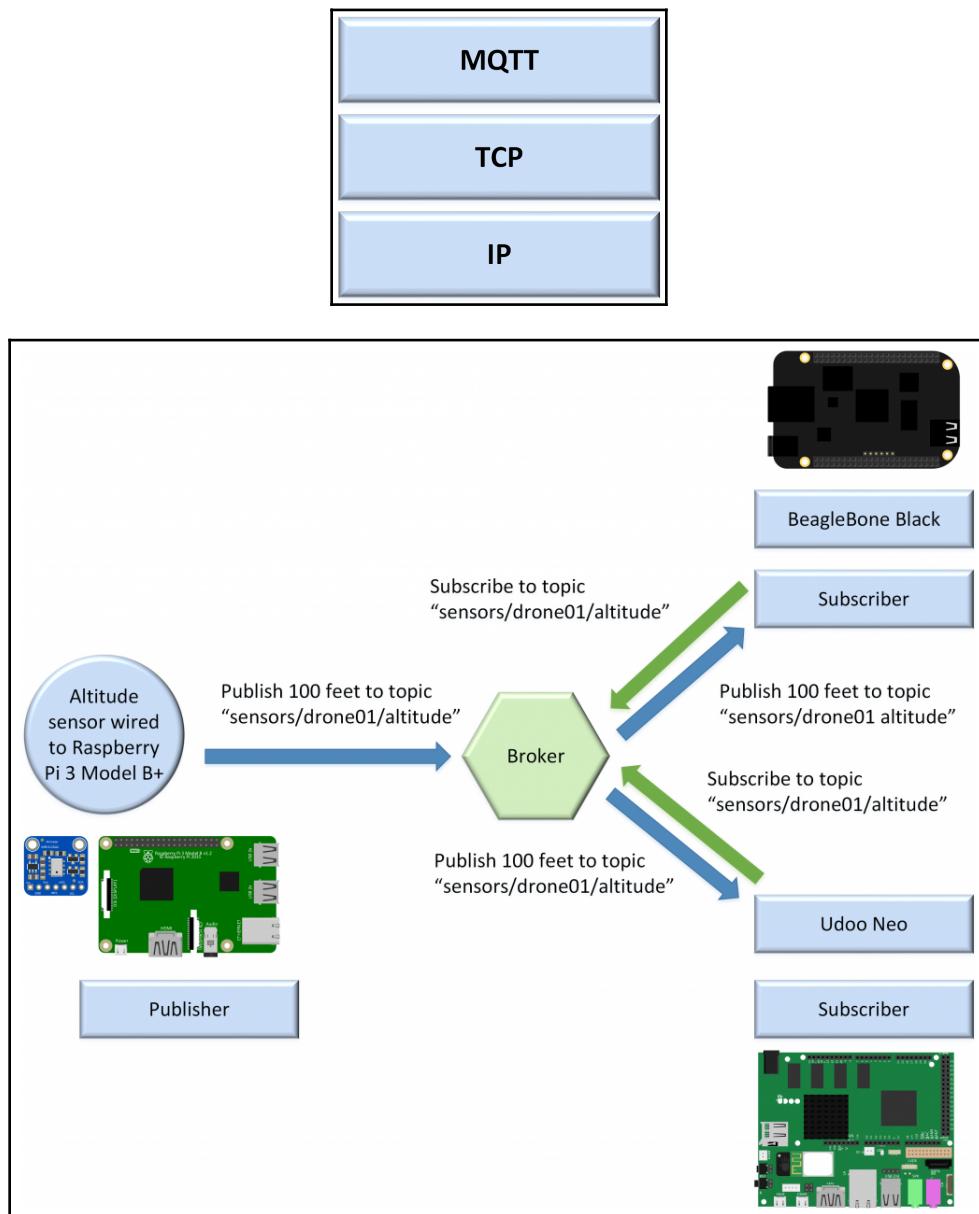
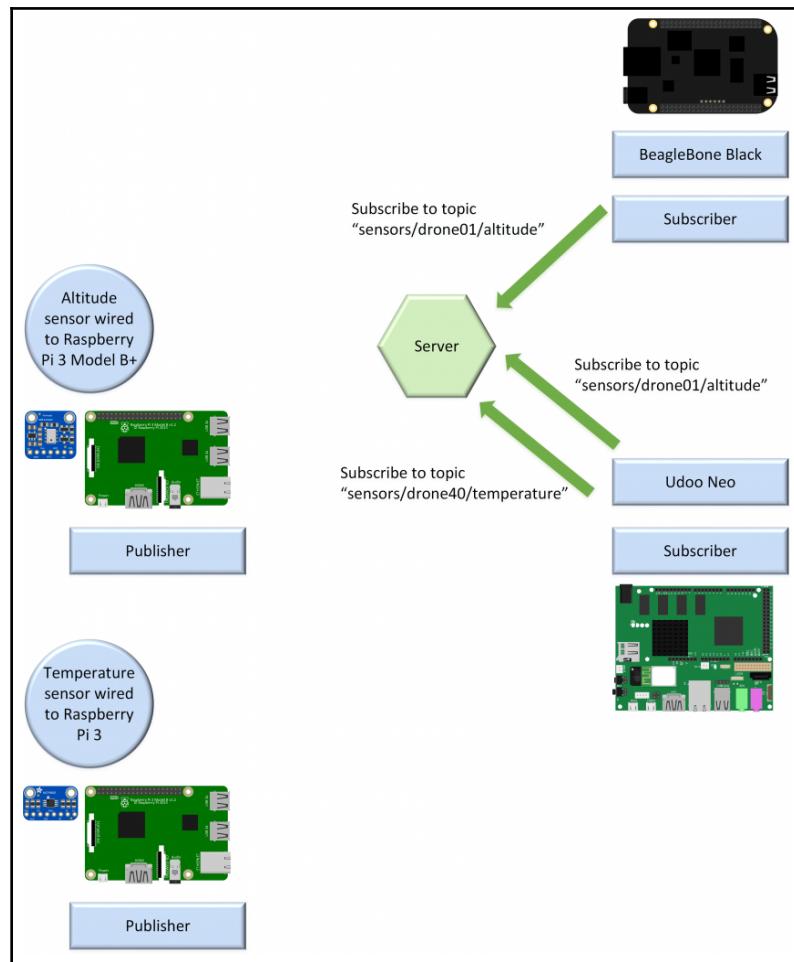
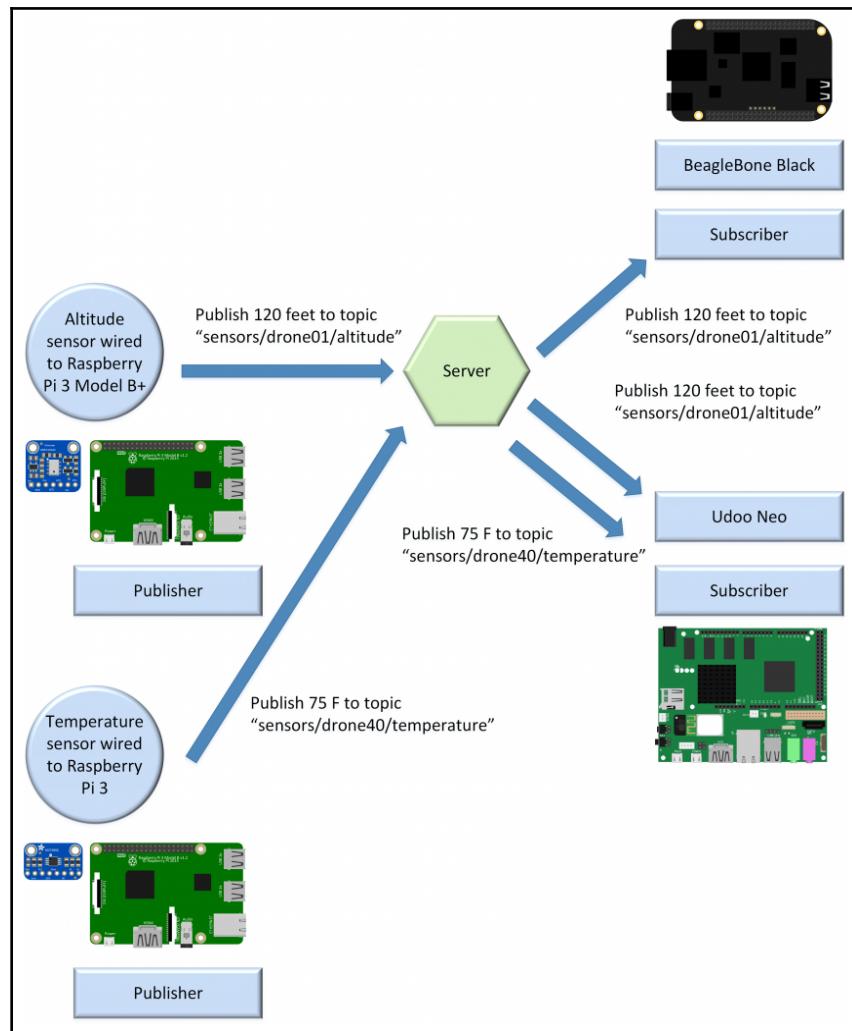


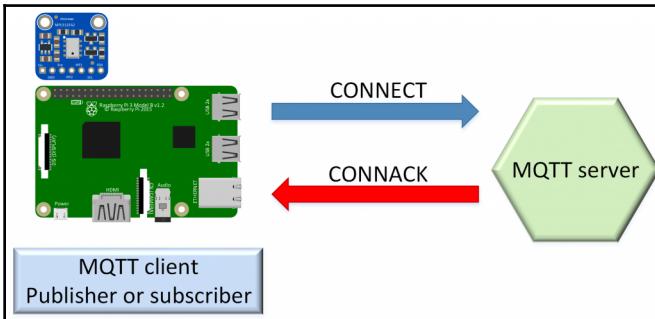
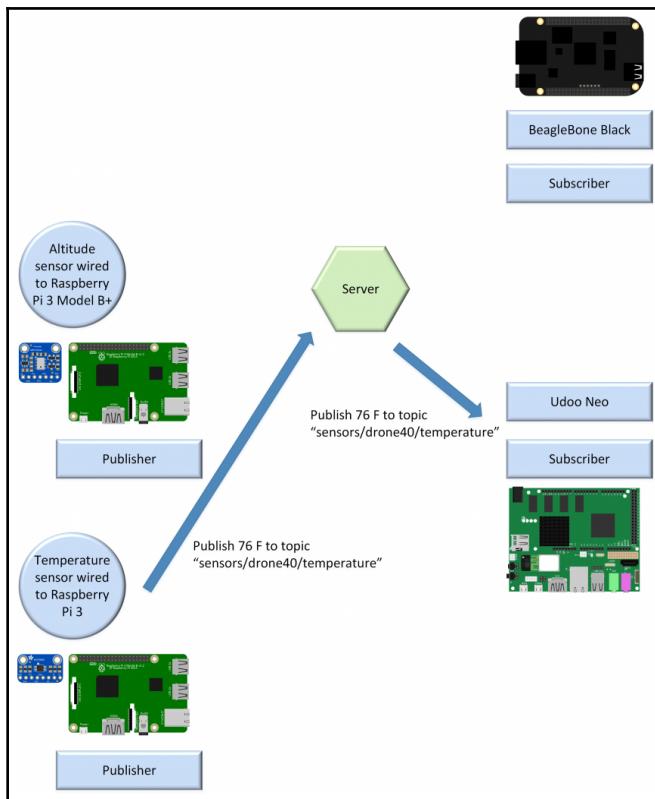
# Chapter 1:

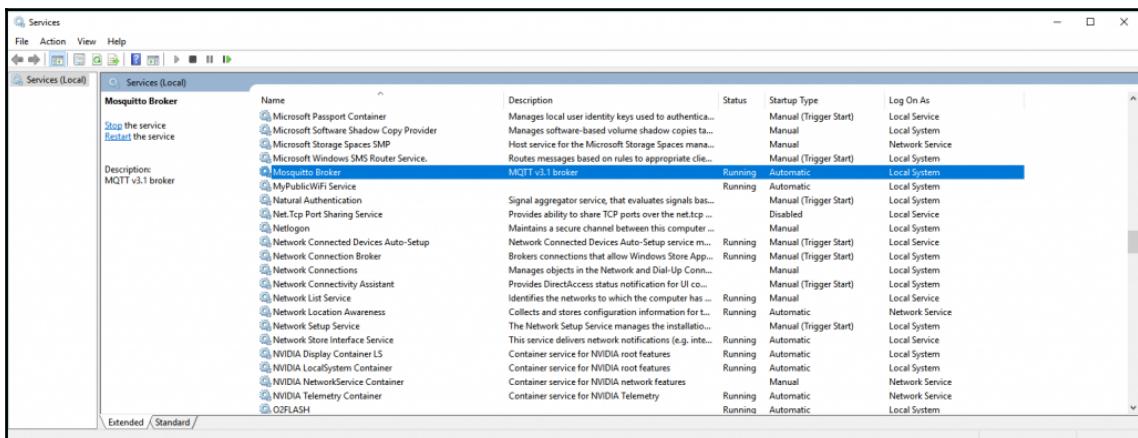
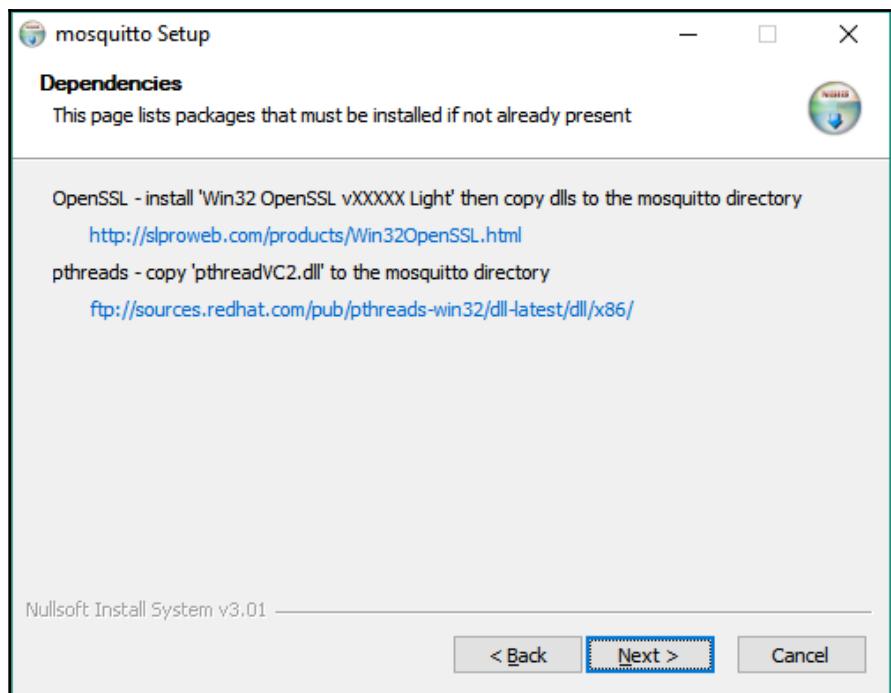
## Installing an MQTT 3.1.1 Mosquitto Server



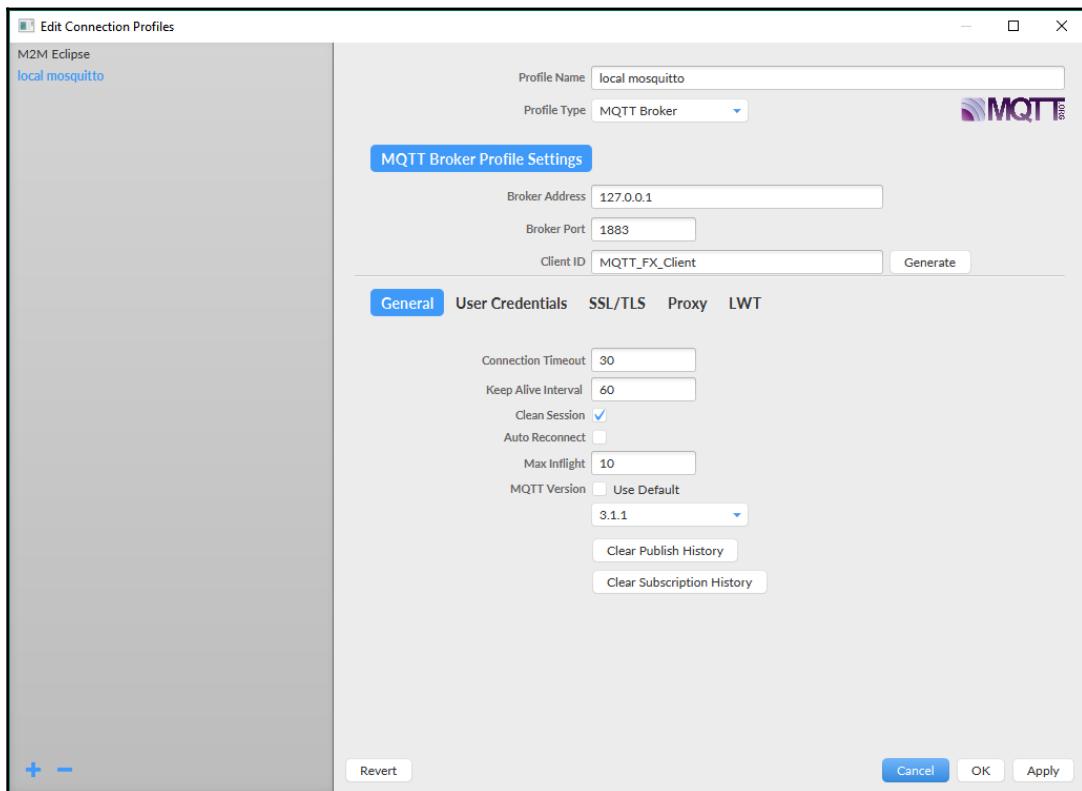


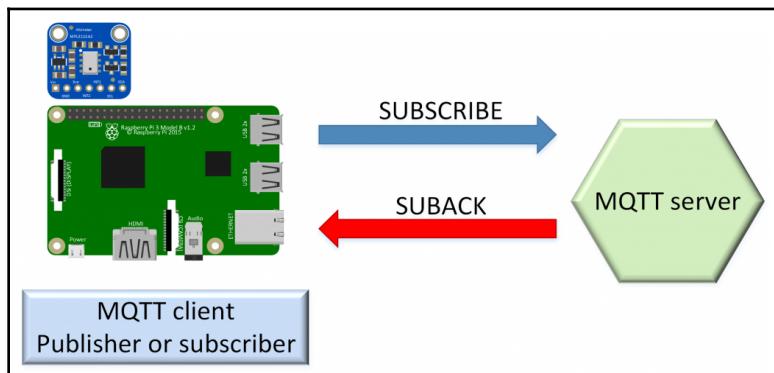
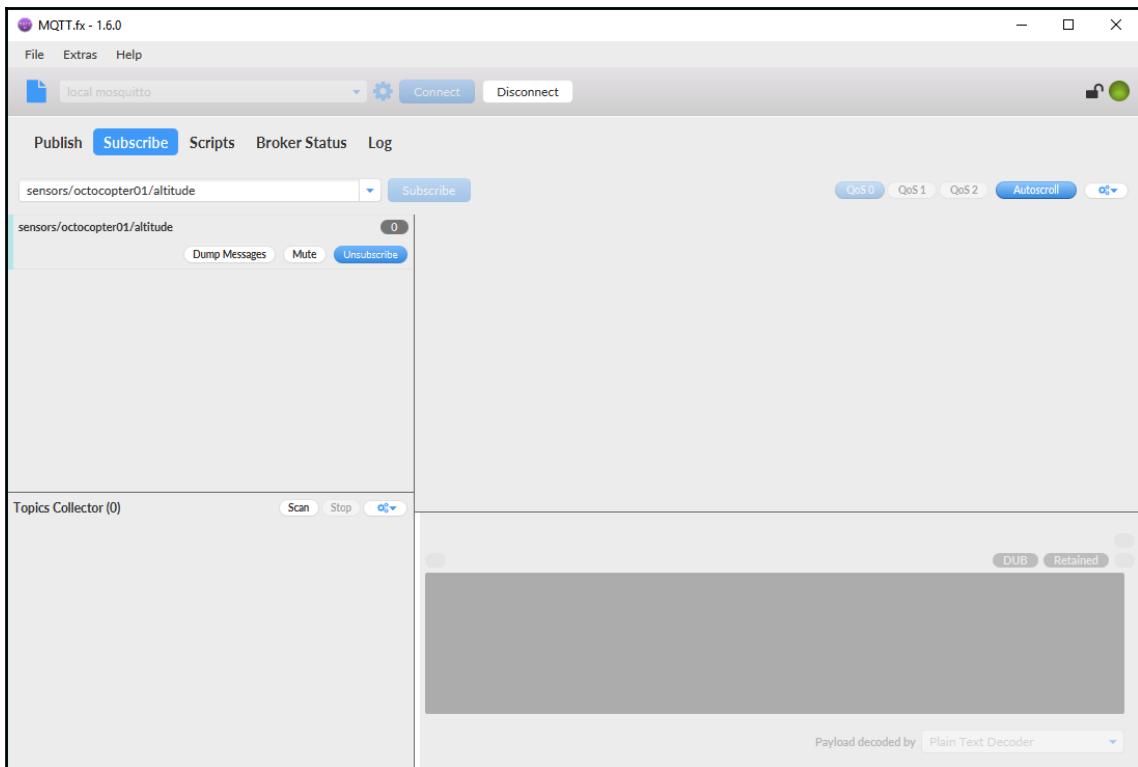


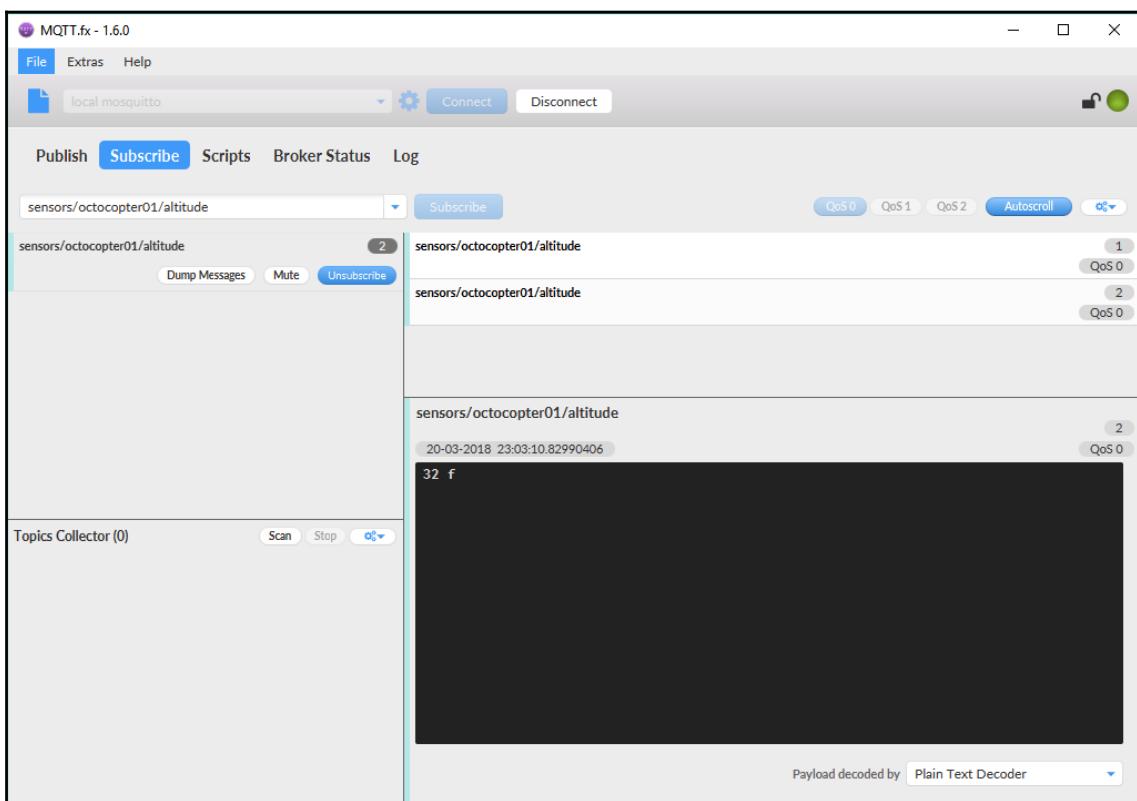
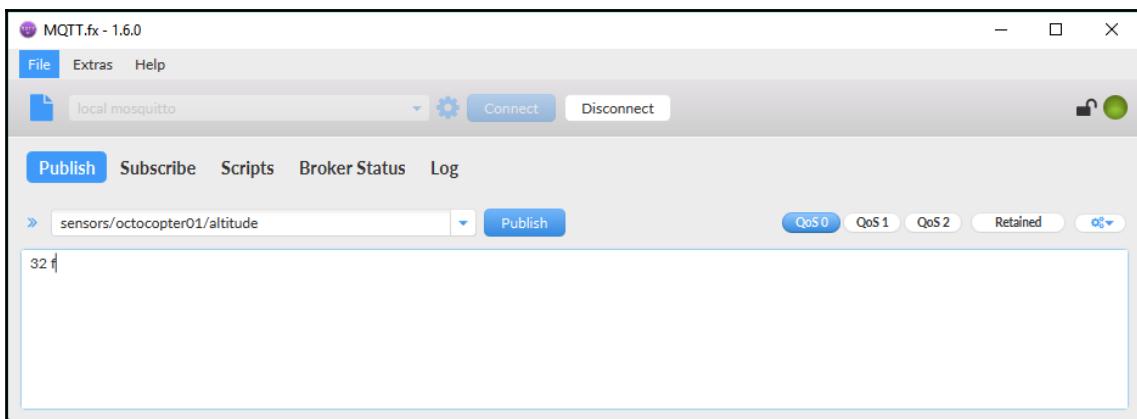


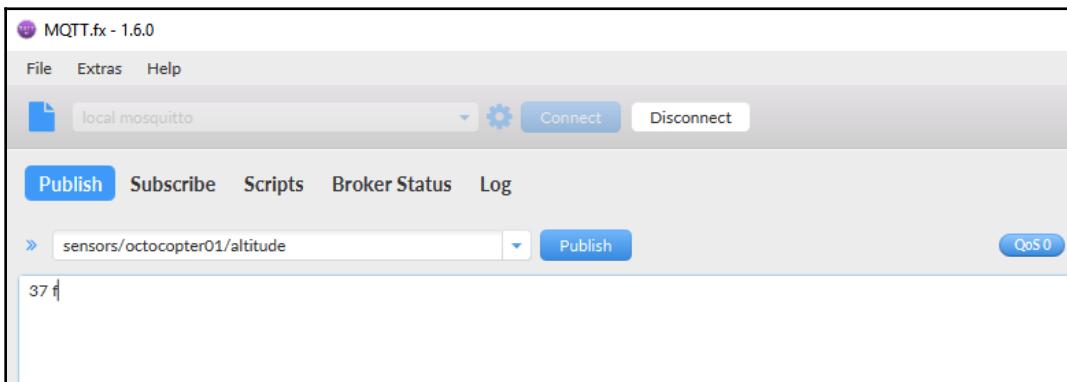
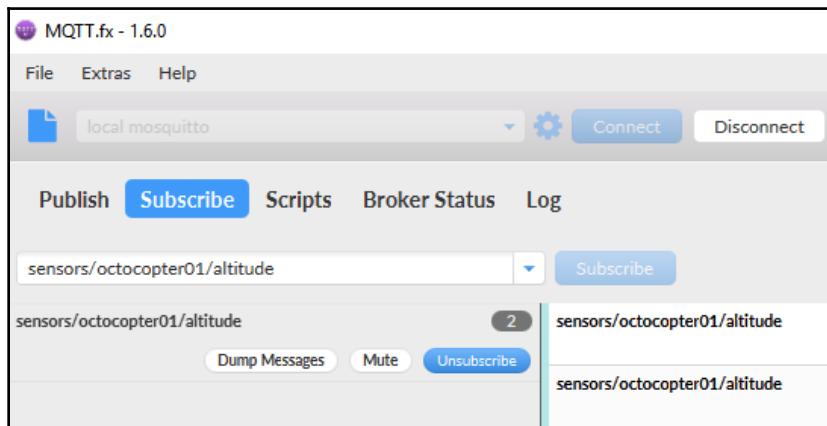
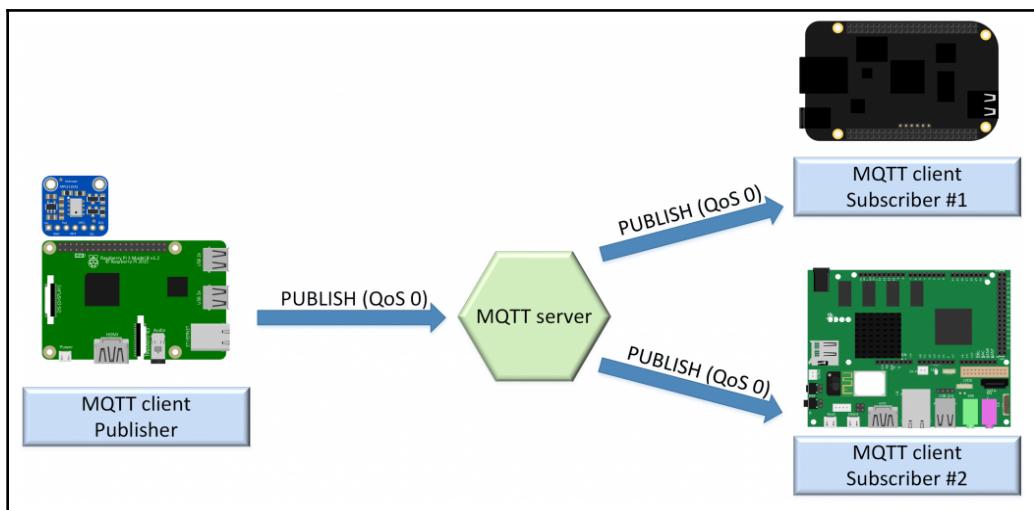


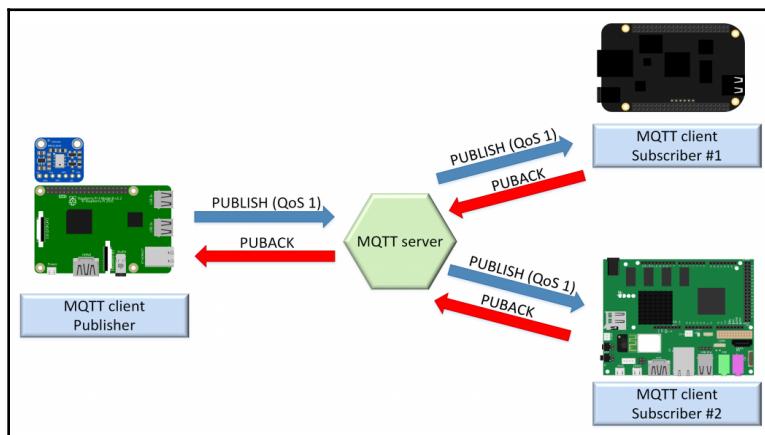
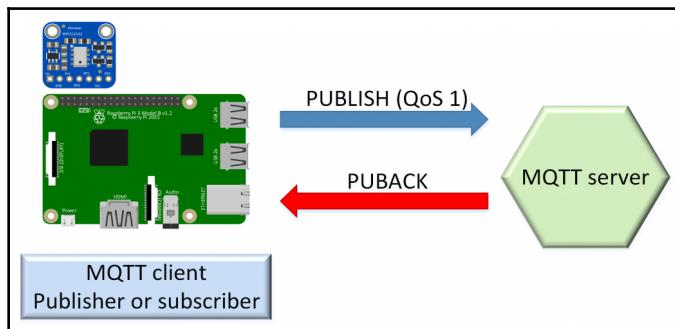
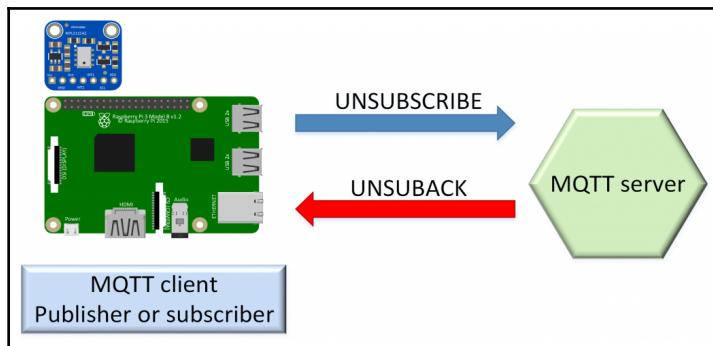
# Chapter 2: Using Command-Line and GUI Tools to Learn How MQTT Works

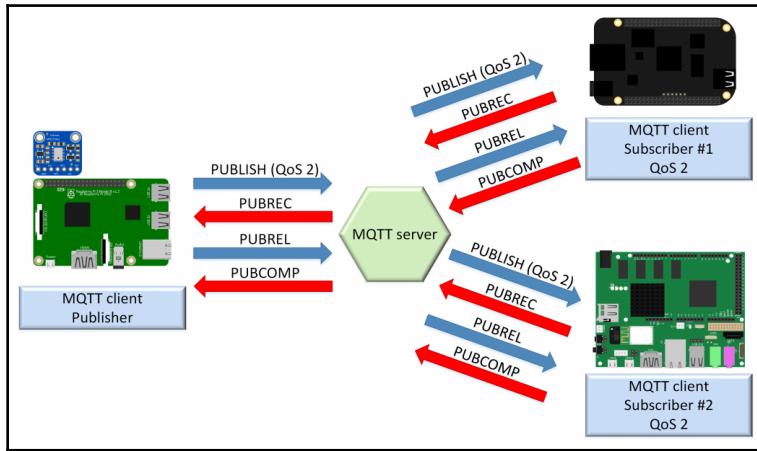
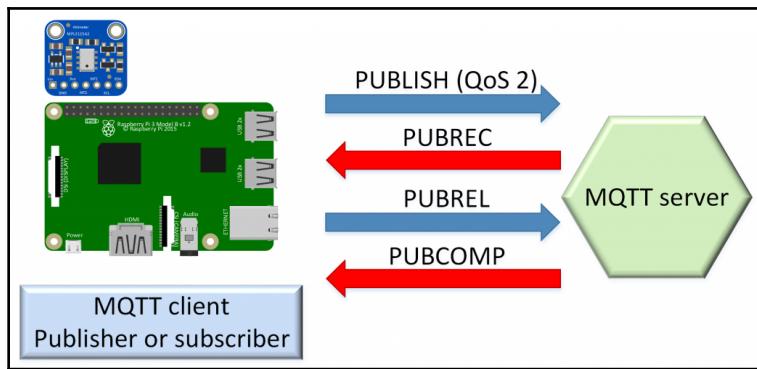


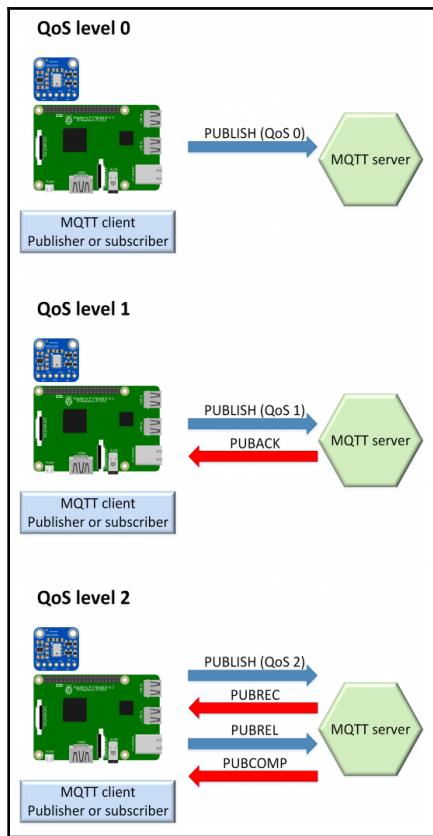






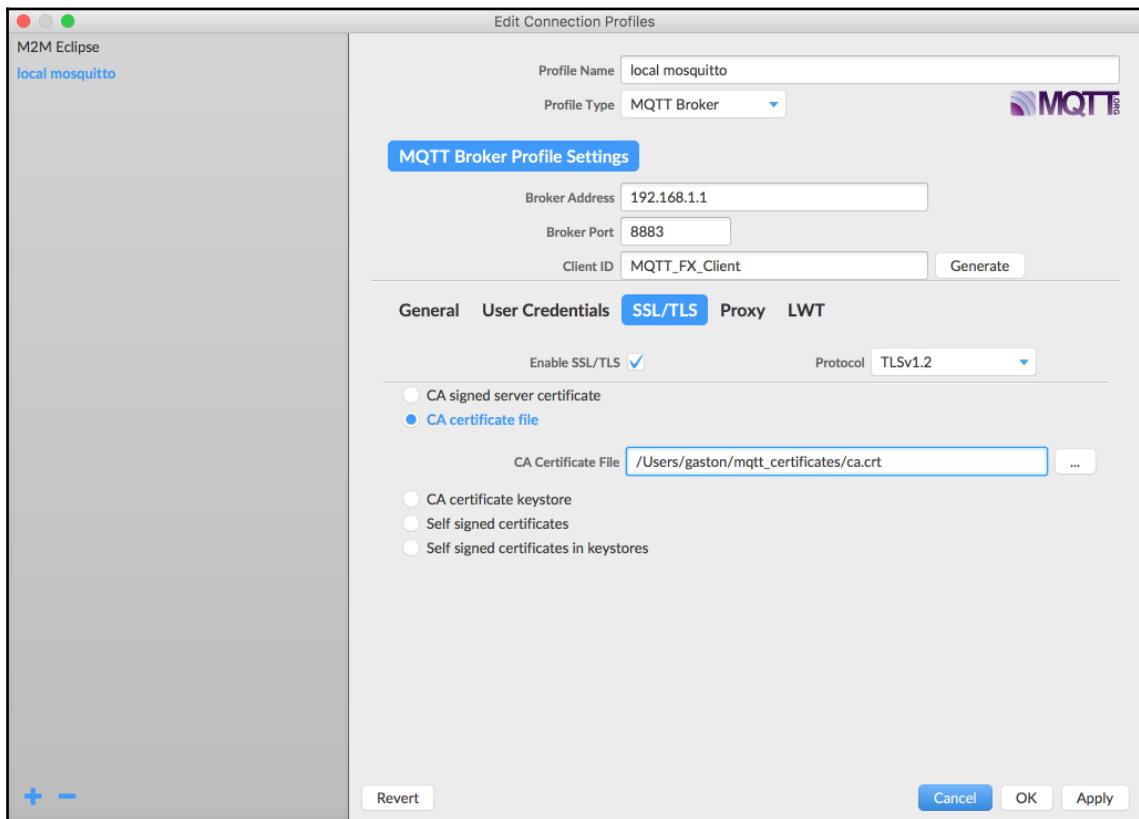


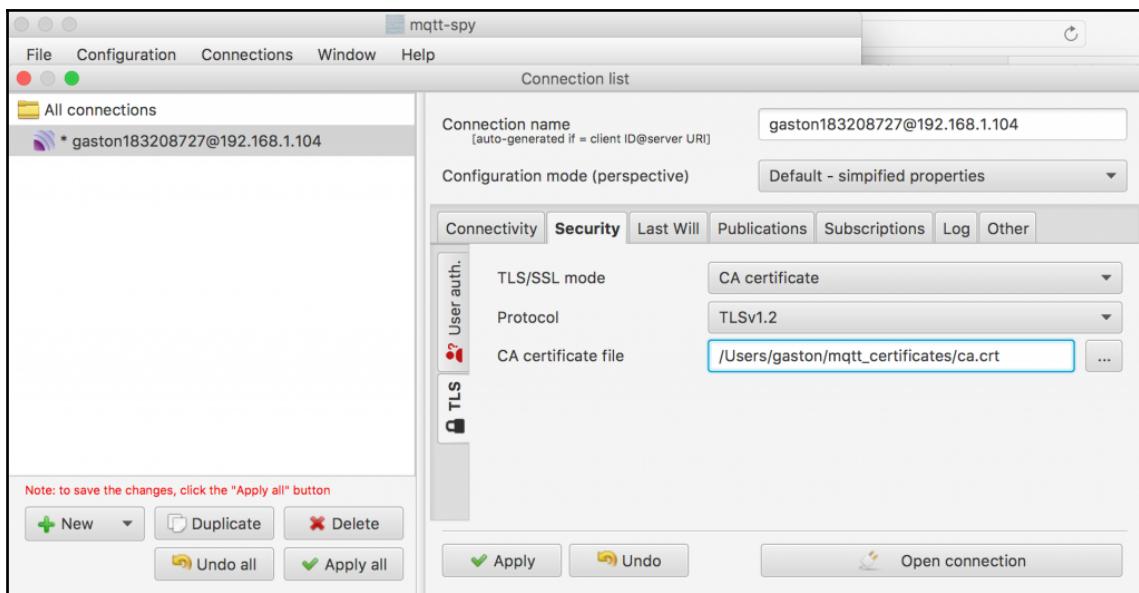


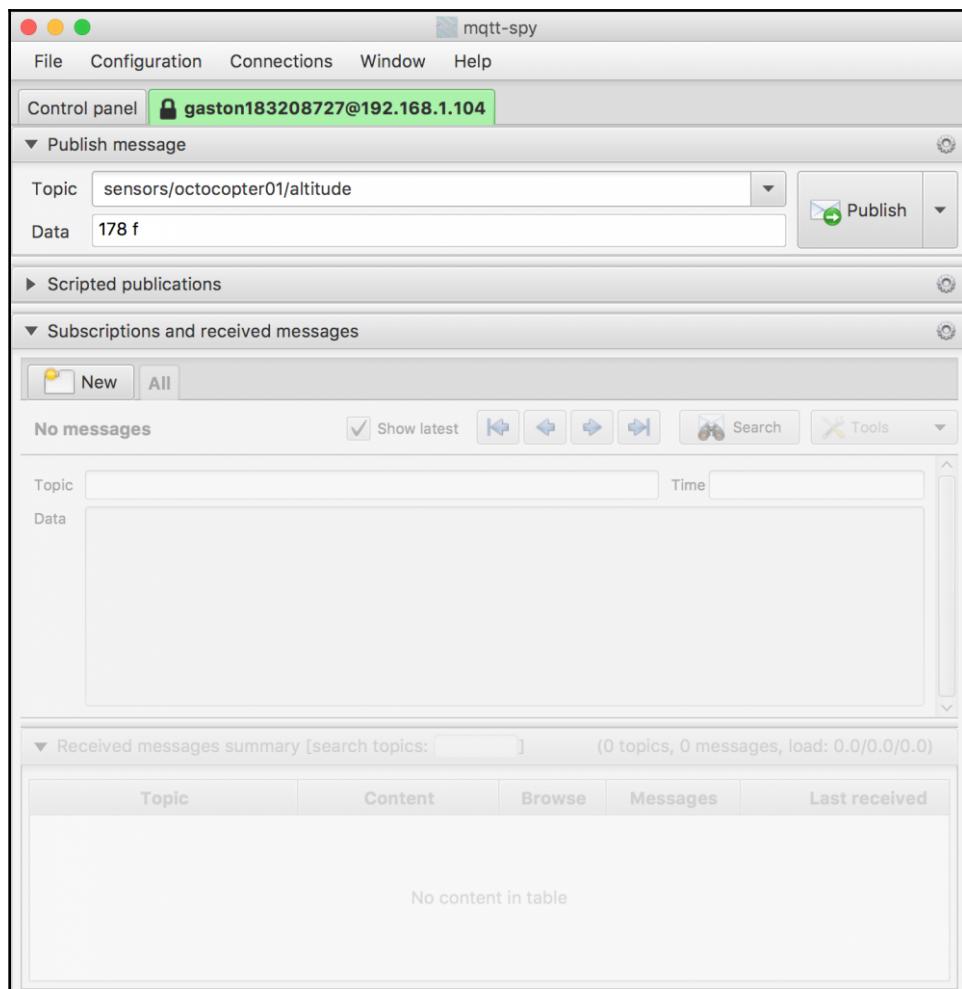


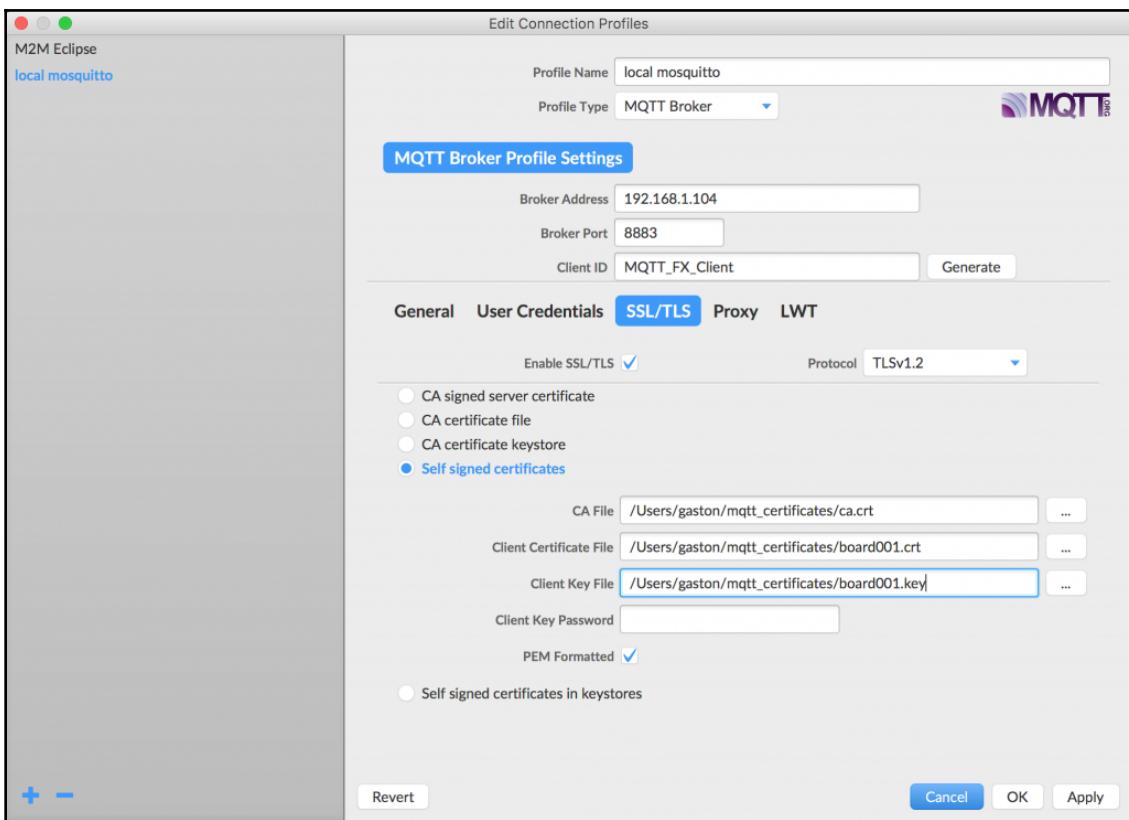
# Chapter 3:

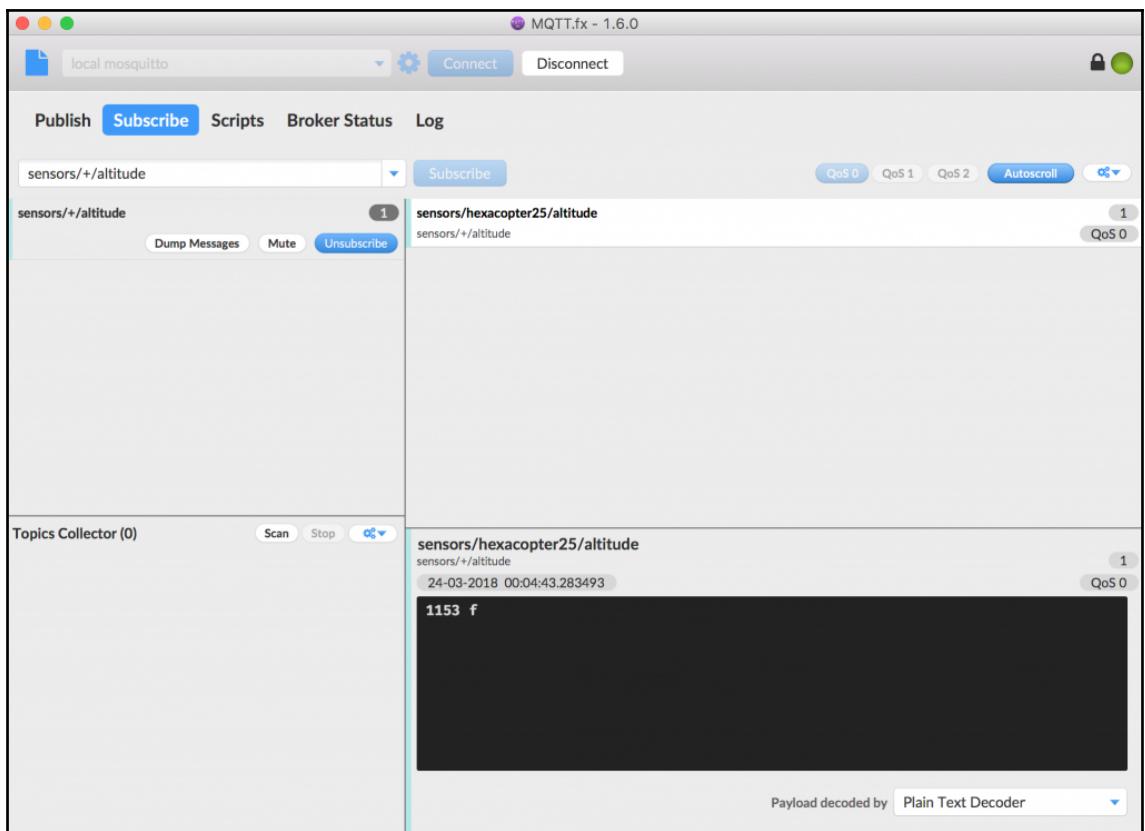
## Securing an MQTT 3.1.1 Mosquitto Server

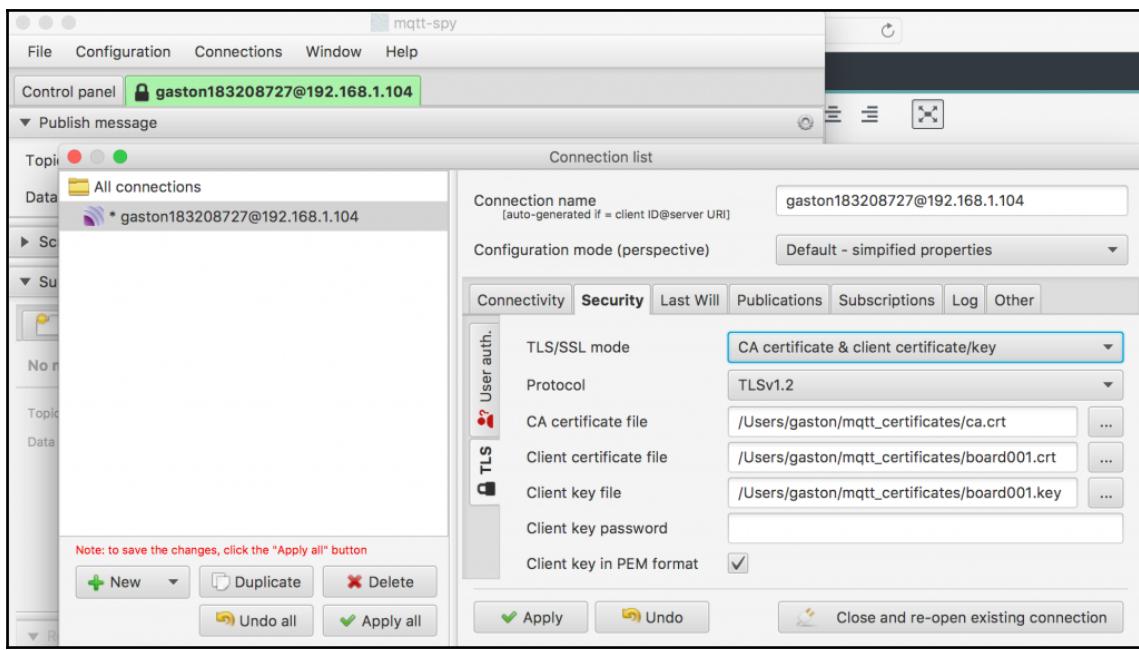






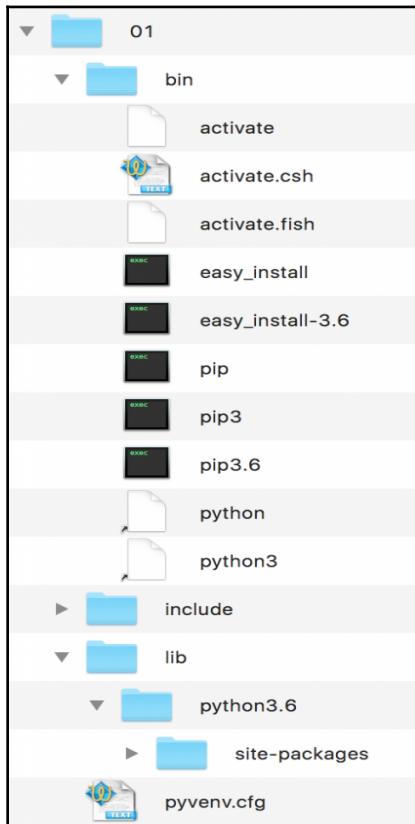


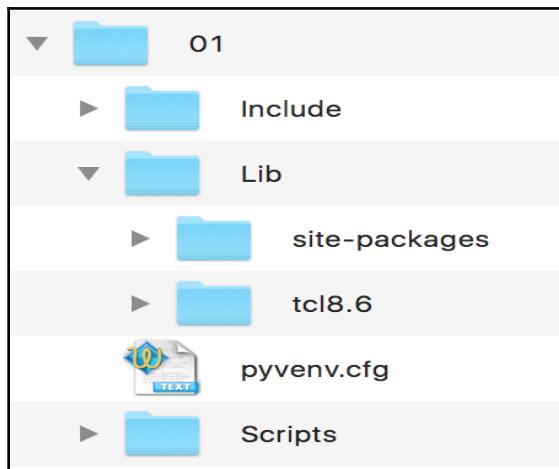




# Chapter 4:

## Writing Code to Control a Vehicle with Python and MQTT Messages





```
gastons-MacBook-Pro:~ gaston$ python3 -m venv ~/HillarMQTT/01
Gastons-MacBook-Pro:~ gaston$ echo $SHELL
/bin/bash
Gastons-MacBook-Pro:~ gaston$ source ~/HillarMQTT/01/bin/activate
(01) Gastons-MacBook-Pro:~ gaston$
```

```
Command Prompt

C:\Users\gaston>python -m venv %USERPROFILE%\HillarMQTT\01

C:\Users\gaston>%USERPROFILE%\HillarMQTT\01\Scripts\activate.bat
(01) C:\Users\gaston>
```

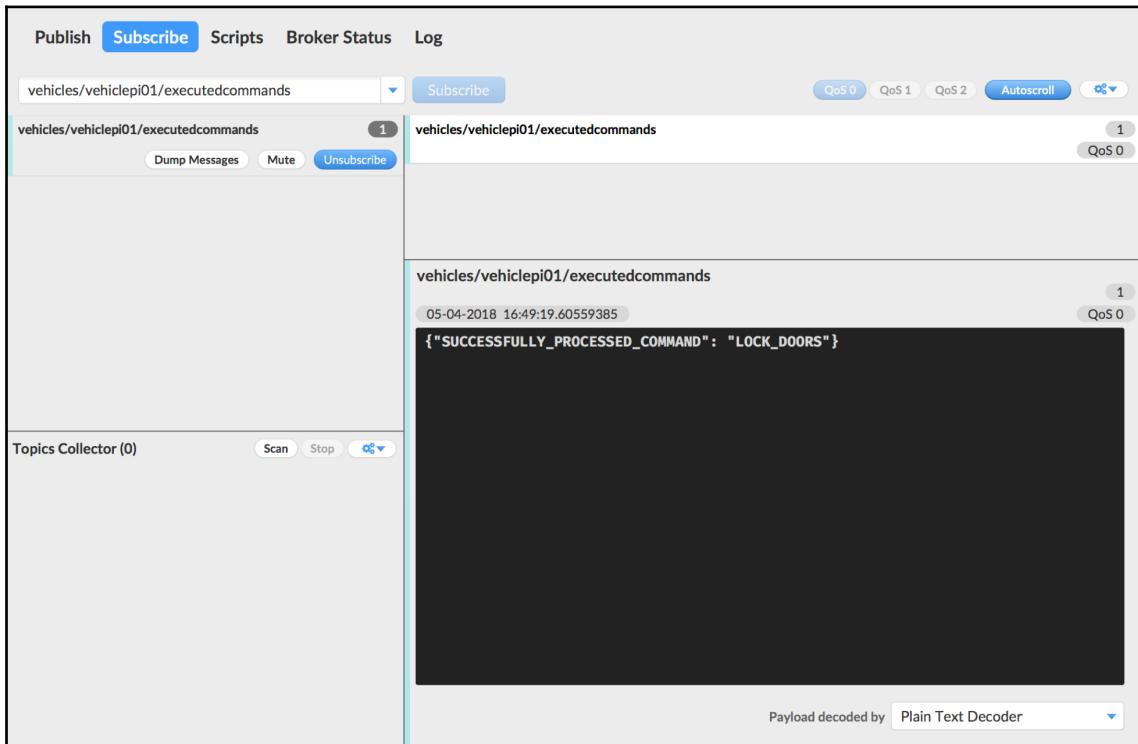
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

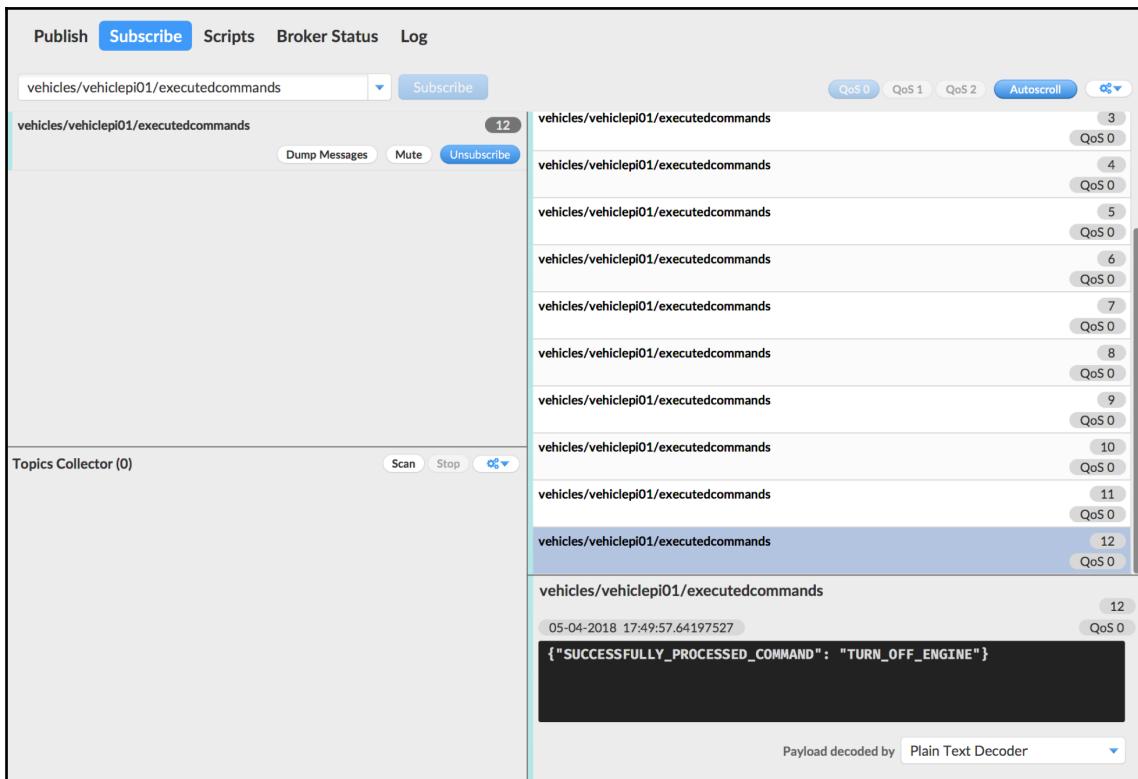
PS C:\Users\gaston> python -m venv $env:UserProfile\HillarMQTT\01
PS C:\Users\gaston> cd $env:USERPROFILE
PS C:\Users\gaston> .\HillarMQTT\01\Scripts\Activate.ps1
(01) PS C:\Users\gaston>
```

T.me/Library\_Sec  
T.me/offensive\_01

# Chapter 5:

## Testing and Improving Our Vehicle Control Solution in Python





```
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_remote_control.py
Result from connect: Connection Accepted.
Subscribed with QoS: 2
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MAX_SPEED"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MIN_SPEED"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "LOCK_DOORS"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "TURN_ON_ENGINE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ROTATE_RIGHT"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ACCELERATE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ROTATE_RIGHT"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ACCELERATE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ROTATE_LEFT"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "ACCELERATE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "TURN_OFF_ENGINE"}'
(01) Gastons-MacBook-Pro:01 gaston$
```

```
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "SET_MAX_SPEED", "MPH": 30}'
vehiclepi01: Setting maximum speed to 30 MPH
Received message payload: b'{"CMD": "SET_MIN_SPEED", "MPH": 8}'
vehiclepi01: Setting minimum speed to 8 MPH
Received message payload: b'{"CMD": "LOCK_DOORS"}'
vehiclepi01: Locking doors
Received message payload: b'{"CMD": "TURN_ON_ENGINE"}'
vehiclepi01: Turning on the engine
Received message payload: b'{"CMD": "ROTATE_RIGHT", "DEGREES": 15}'
vehiclepi01: Rotating right 15 degrees
Received message payload: b'{"CMD": "ACCELERATE"}'
vehiclepi01: Accelerating
Received message payload: b'{"CMD": "ROTATE_RIGHT", "DEGREES": 25}'
vehiclepi01: Rotating right 25 degrees
Received message payload: b'{"CMD": "ACCELERATE"}'
vehiclepi01: Accelerating
Received message payload: b'{"CMD": "ROTATE_LEFT", "DEGREES": 15}'
vehiclepi01: Rotating left 15 degrees
Received message payload: b'{"CMD": "ACCELERATE"}'
vehiclepi01: Accelerating
Received message payload: b'{"CMD": "TURN_OFF_ENGINE"}'
vehiclepi01: Turning off the engine
```

```

01 — bash — 79x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_remote_control.py
Result from connect: Connection Accepted.
Subscribed with QoS: 2
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MAX_SPEED"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MIN_SPEED"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "LOCK_DOORS"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "TURN_ON_ENGINE"}'
^CTraceback (most recent call last):
  File "vehicle_mqtt_remote_control.py", line 87, in <module>
    publish_command(client, CMD_ROTATE_LEFT, KEY_DEGREES, 15)
  File "vehicle_mqtt_remote_control.py", line 57, in publish_command
    time.sleep(1)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$ □

01 — Python vehicle_mqtt_client.py — 75x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "SET_MAX_SPEED", "MPH": 30}'
vehiclepi01: Setting maximum speed to 30 MPH
Received message payload: b'{"CMD": "SET_MIN_SPEED", "MPH": 8}'
vehiclepi01: Setting minimum speed to 8 MPH
Received message payload: b'{"CMD": "LOCK_DOORS"}'
vehiclepi01: Locking doors
Received message payload: b'{"CMD": "TURN_ON_ENGINE"}'
vehiclepi01: Turning on the engine
Received message payload: b'{"CMD": "ROTATE_RIGHT", "DEGREES": 15}'
vehiclepi01: Rotating right 15 degrees
Received message payload: b'{"CMD": "ACCELERATE"}'
vehiclepi01: Accelerating
Received message payload: b'{"CMD": "ROTATE_RIGHT", "DEGREES": 25}'
vehiclepi01: Rotating right 25 degrees
Received message payload: b'{"CMD": "ACCELERATE"}'
vehiclepi01: Accelerating
Received message payload: b'{"CMD": "PARK_IN_SAFE_PLACE"}'
vehiclepi01: Parking in safe place

```

```

01 — bash — 79x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_remote_control.py
Result from connect: Connection Accepted.
Subscribed with QoS: 2
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "PARK_IN_SAFE_PLACE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MAX_SPEED"}'
^CTraceback (most recent call last):
  File "vehicle_mqtt_remote_control.py", line 93, in <module>
    client.loop()
  File "/Users/gaston/HilliarMQTT/01/lib/python3.6/site-packages/paho/mqtt/client.py", line 988, in loop
    socklist = select.select(rlist, wlist, [], timeout)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$ □

01 — Python vehicle_mqtt_client.py — 75x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "PARK_IN_SAFE_PLACE"}'
vehiclepi01: Parking in safe place
Received message payload: b'{"CMD": "SET_MAX_SPEED", "MPH": 30}'
vehiclepi01: Setting maximum speed to 30 MPH
^CTraceback (most recent call last):
  File "vehicle_mqtt_client.py", line 198, in <module>
    time.sleep(1)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.

```

```

01 — bash — 79x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_remote_control.py
Result from connect: Connection Accepted.
Subscribed with QoS: 2
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "PARK_IN_SAFE_PLACE"}'
^CTraceback (most recent call last):
  File "vehicle_mqtt_remote_control.py", line 93, in <module>
    client.loop()
  File "/Users/gaston/HilliarMQTT/01/lib/python3.6/site-packages/paho/mqtt/client.py", line 988, in loop
    socklist = select.select(rlist, wlist, [], timeout)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$ □

01 — Python vehicle_mqtt_client.py — 75x45
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "PARK_IN_SAFE_PLACE"}'
vehiclepi01: Parking in safe place
^CTraceback (most recent call last):
  File "vehicle_mqtt_client.py", line 198, in <module>
    time.sleep(1)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$ python3 vehicle_mqtt_client.py
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "PARK_IN_SAFE_PLACE"}'
vehiclepi01: Parking in safe place

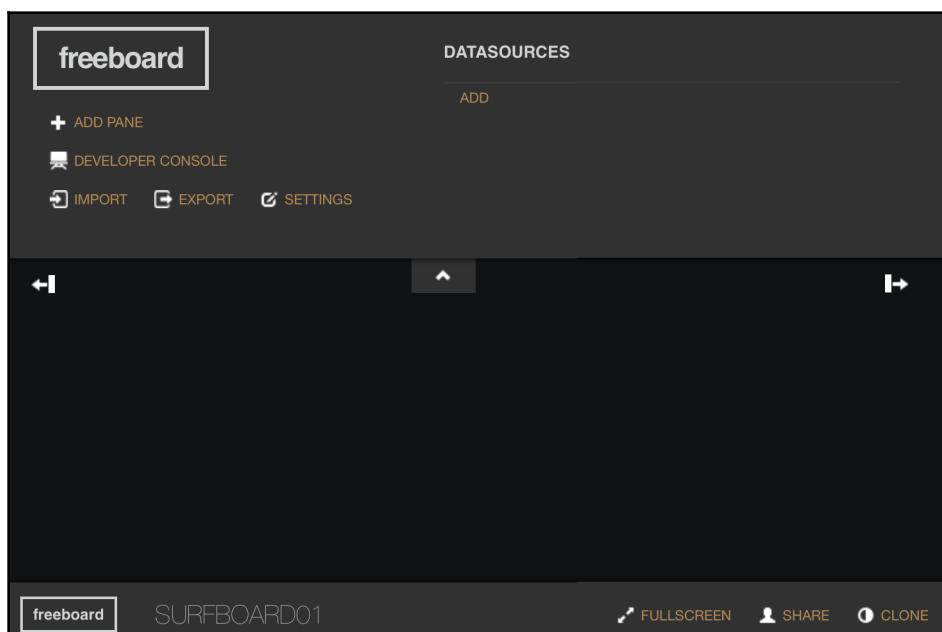
```

# Chapter 6:

## Monitoring a Surfing Competition with Cloud-Based Real-Time MQTT Providers and Python

The screenshot shows the PubNub dashboard interface. At the top, there's a red header bar with the PubNub logo and a dropdown menu. Below it is a navigation bar with a search icon, a help icon, and a user profile for Gaston Hillar. A banner at the top of the main content area says "New Product! Checkout ChatEngine - the open, extensible framework for drastically accelerating chat development." The main content area has a light gray background. It displays two projects: "Demo Project" and "MQTT".  
**Demo Project**  
MESSAGES: 0 | DEVICES: 0 | KEYS: 1  
**MQTT**  
MESSAGES: 91.1K | DEVICES: 11 | KEYS: 1

This screenshot shows the "Demo Keyset" configuration screen in the PubNub dashboard. On the left, there's a sidebar with icons for KEY INFO (highlighted), FUNCTIONS, USAGE, and REALTIME ANALYTICS. The main area has a header with "MQTT" selected in the dropdown and "Demo Keyset" in another dropdown. A banner at the top says "New Product! Checkout ChatEngine - the open, extensible framework for drastically accelerating chat development." The main content area is titled "Keys" and contains three fields:  
Publish Key: pub-c-  
Subscribe Key: sub-c-  
Secret Key: .....  
Each field has a copy icon to its right.



## DATASOURCE

PubNub is a realtime messaging network. See <http://www.pubnub.com> for more details.

TYPE

NAME

SUBSCRIBE KEY

CHANNEL

[SAVE](#)

[CANCEL](#)

## WIDGET

TYPE

TITLE

SIZE

VALUE  [+ DATASOURCE](#) [JS EDITOR](#)

INCLUDE SPARKLINE  NO

ANIMATE VALUE CHANGES  YES

UNITS

[SAVE](#)

[CANCEL](#)

**freeboard**

+ ADD PANE

DEVELOPER CONSOLE

IMPORT EXPORT SETTINGS

DATASOURCES

Name	Last Updated
surfboard01	1:45:23 PM

ADD

Status  
Riding

This screenshot shows the Freeboard interface with a dark theme. At the top left is the 'freeboard' logo. Below it are buttons for '+ ADD PANE', 'DEVELOPER CONSOLE', 'IMPORT', 'EXPORT', and 'SETTINGS'. On the right is a 'DATASOURCES' section with a table showing one entry: 'surfboard01' last updated at '1:45:23 PM'. Below this is an 'ADD' button. The main area contains a single panel titled 'Status' with the value 'Riding'. There are three small icons above the panel: a plus sign, a pencil, and a trash can.

**freeboard**

+ ADD PANE

DEVELOPER CONSOLE

IMPORT EXPORT SETTINGS

DATASOURCES

Name	Last Updated
Surfboard01	1:49:33 PM

ADD

Status  
Riding

Speed

This screenshot shows the Freeboard interface with a dark theme. It features a speed gauge in the center with a yellow arc, a white needle pointing to '15 MPH', and a black background. The gauge has numerical markings at 0, 15, and 40. Above the gauge is the word 'Speed'. To the left of the gauge is a panel titled 'Status' with the value 'Riding'. There are three small icons above the panel: a plus sign, a pencil, and a trash can.

