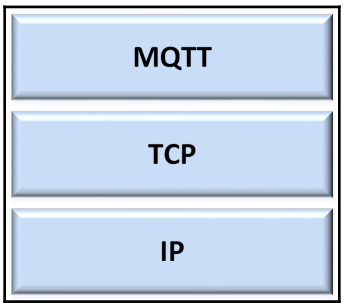
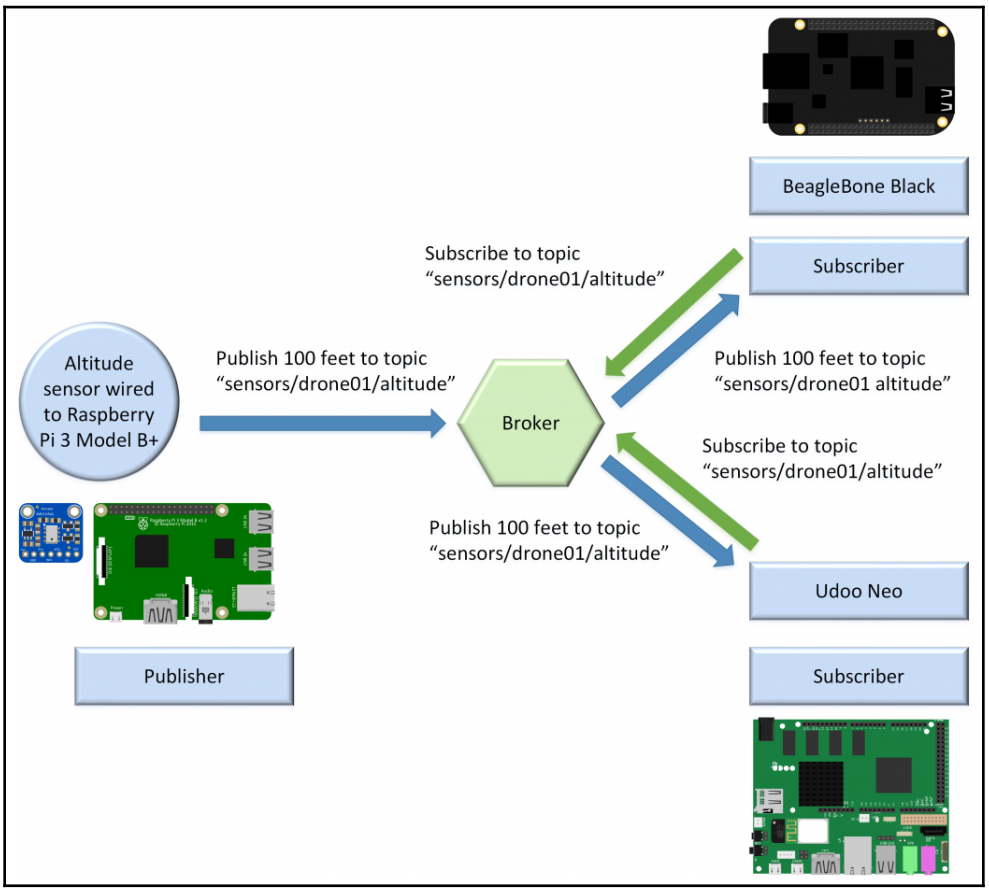
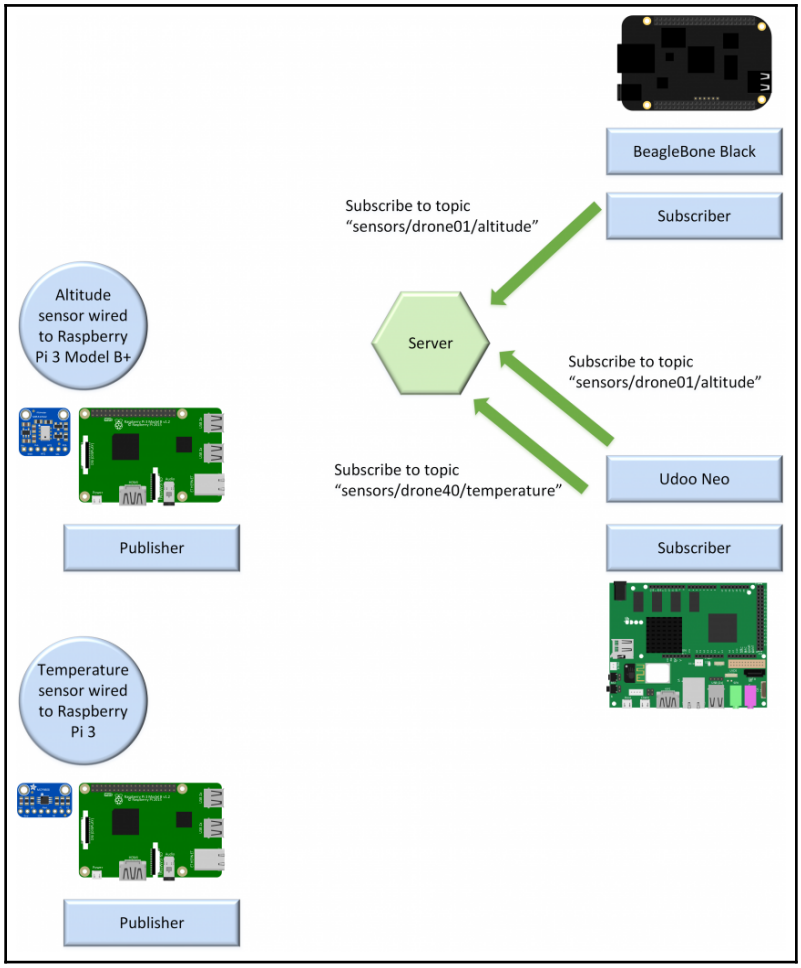
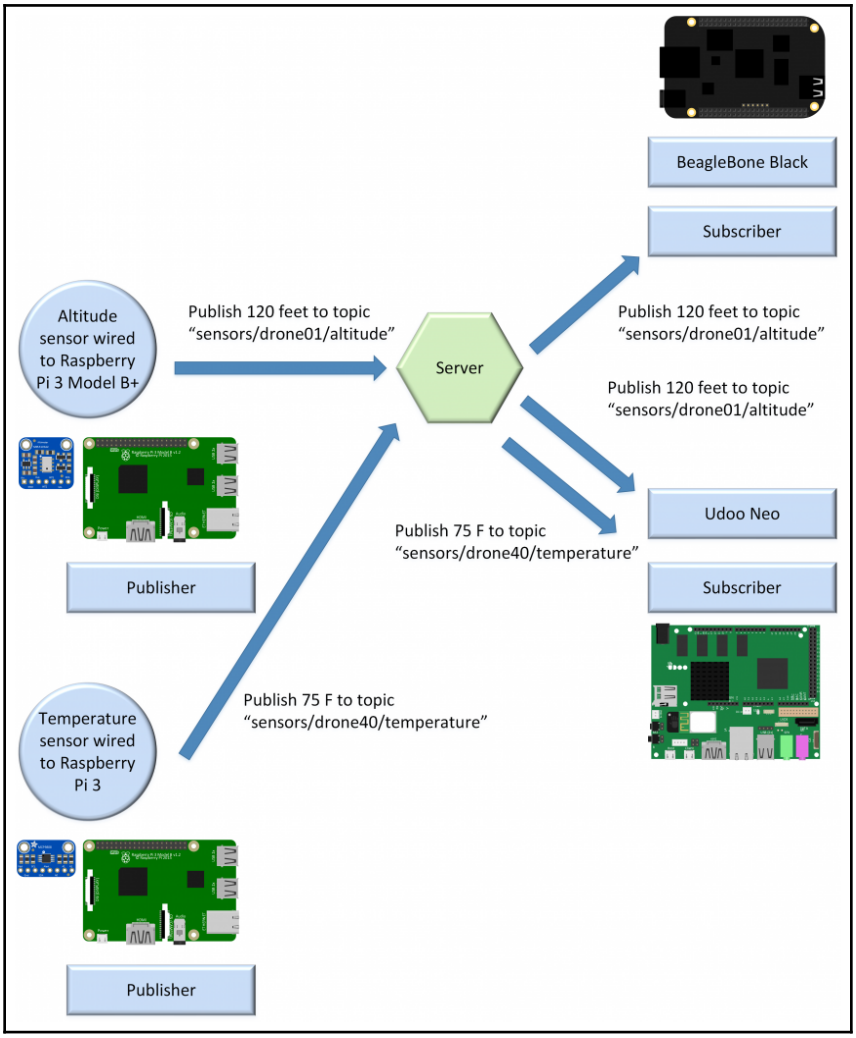
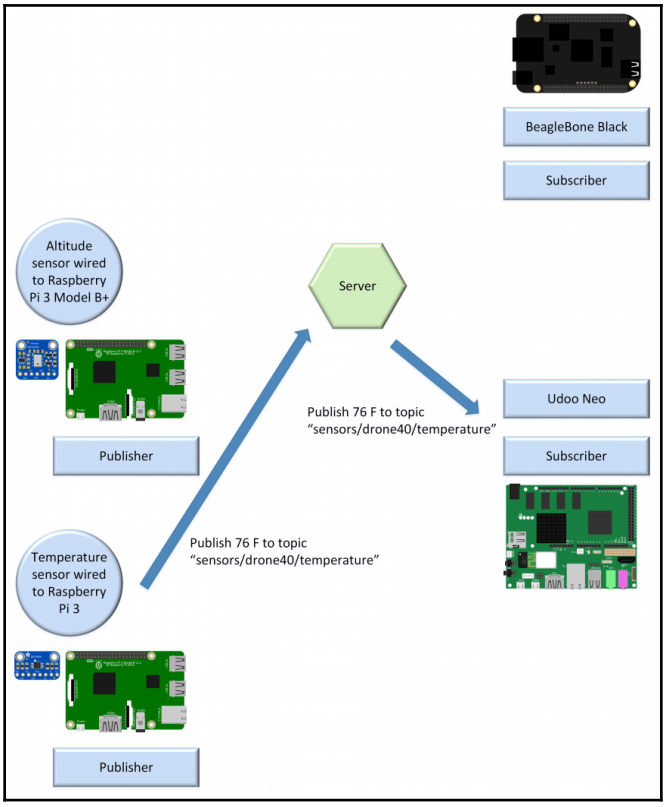
Chapter 1:
Installing an MQTT 3.1.1 Mosquitto Server

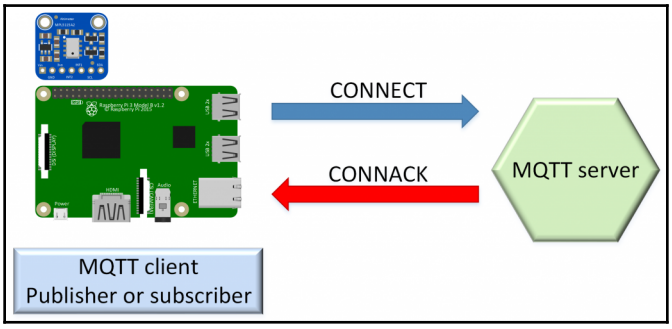


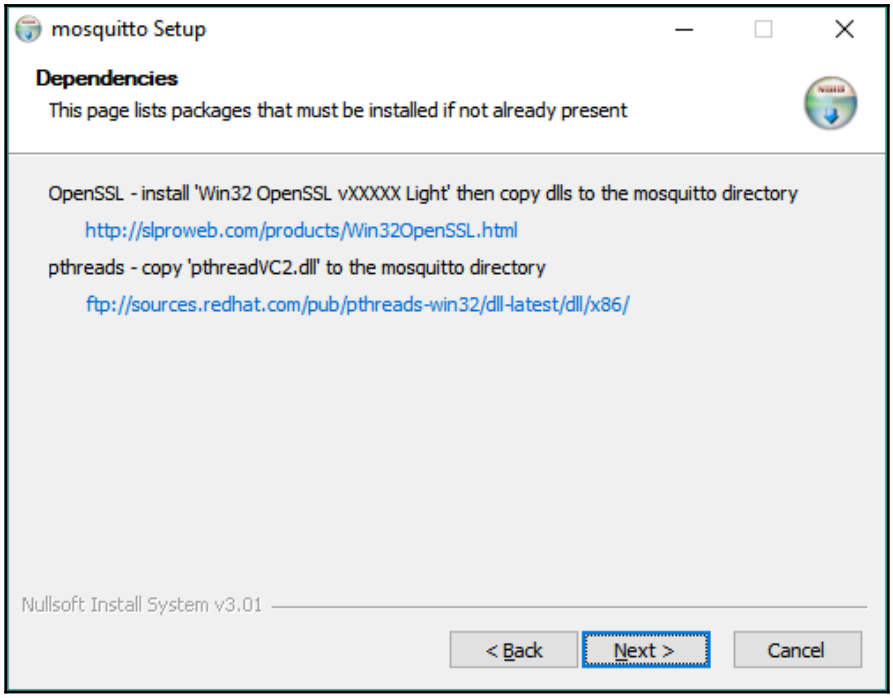


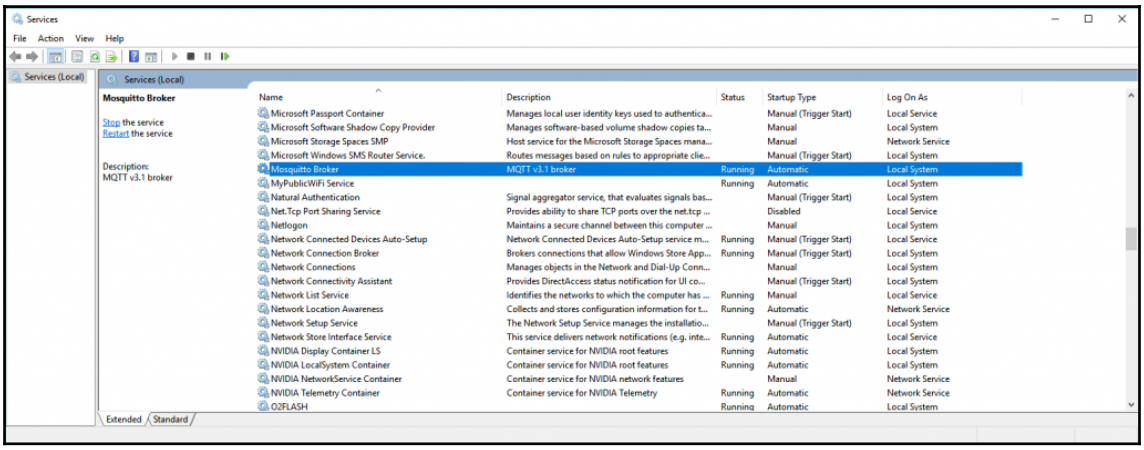

BeagleBone Black
Subscriber
Subscribe to topic
“sensors/drone01/altitude”
Server
Subscribe to topic
“sensors/drone01/altitude”
Udoo Neo
Subscribe to topic
“sensors/drone40/temperature”
Subscriber
Altitude sensor wired to Raspberry Pi 3 Model B+
Publisher
Temperature sensor wired to Raspberry Pi 3
Publisher


BeagleBone Black
Subscriber
Altitude sensor wired to Raspberry Pi 3 Model B+
Publish 120 feet to topic "sensors/drone01/altitude"
Server
Publish 120 feet to topic "sensors/drone01/altitude"
Publish 120 feet to topic "sensors/drone01/altitude"
Udoo Neo
Publish 75 F to topic "sensors/drone40/temperature"
Subscriber
Publisher
Temperature sensor wired to Raspberry Pi 3
Publish 75 F to topic "sensors/drone40/temperature"
Publisher

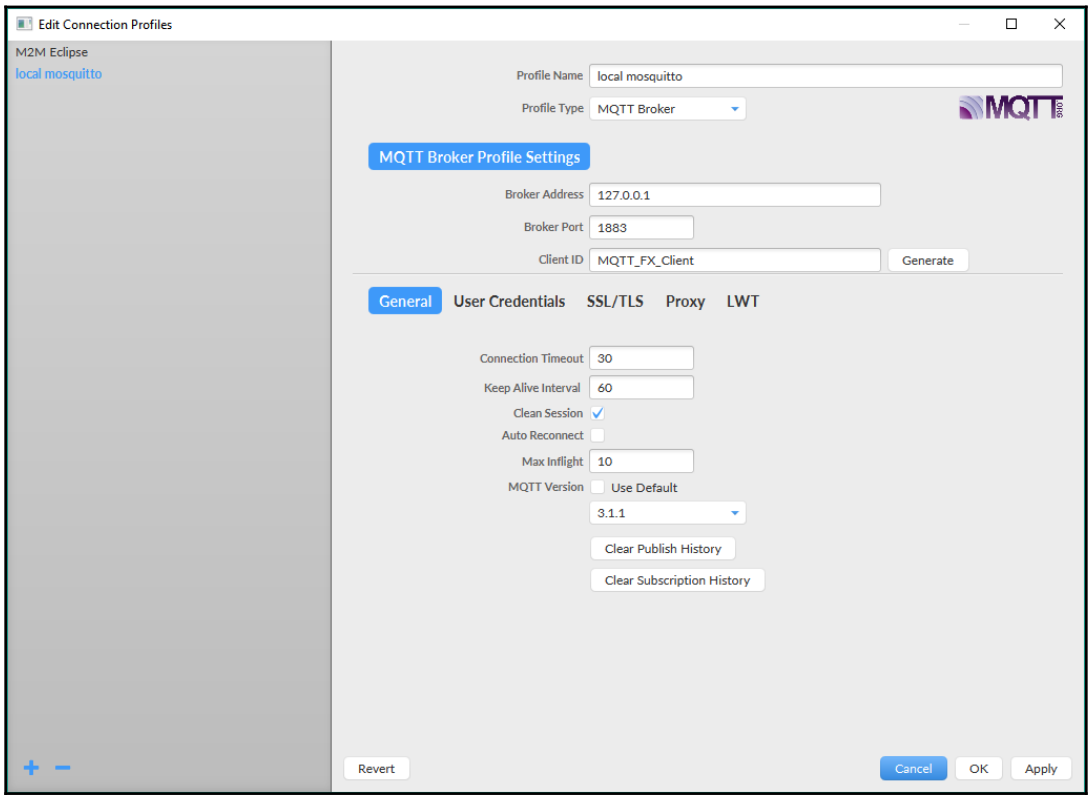

BeagleBone Black
Subscriber
Altitude sensor wired to Raspberry Pi 3 Model B+
Server
Publisher
Publish 76 F to topic "sensors/drone40/temperature"
Udoo Neo
Subscriber
Temperature sensor wired to Raspberry Pi 3
Publish 76 F to topic "sensors/drone40/temperature"
Publisher

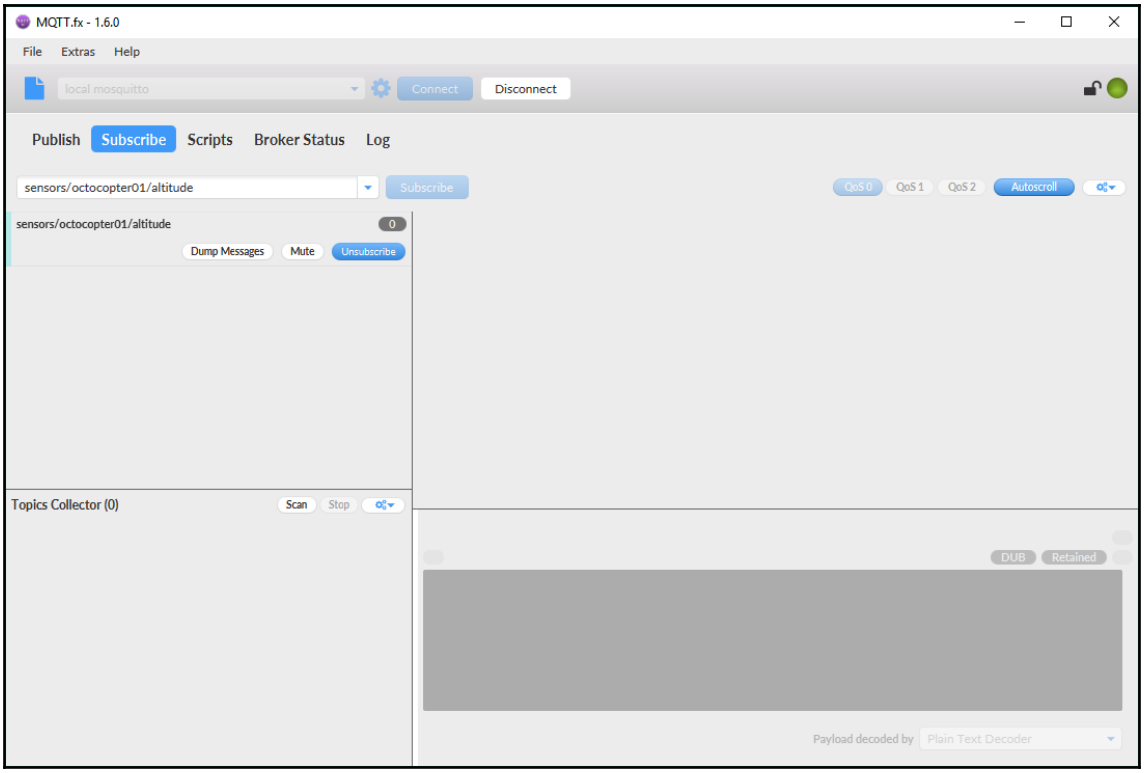

CONNECT
CONNACK
MQTT server
MQTT client
Publisher or subscriber

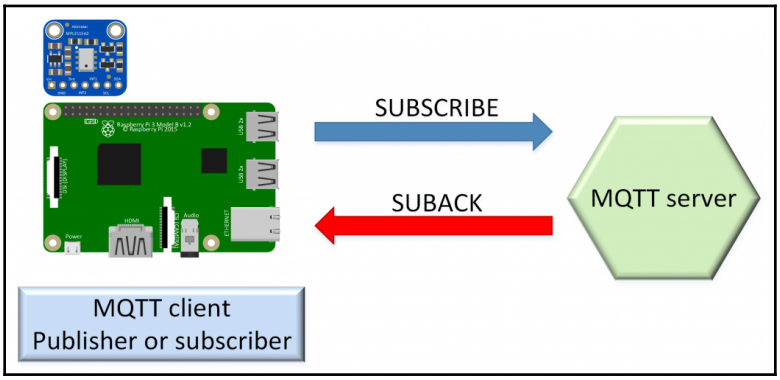

mosquitto Setup
Dependencies
This page lists packages that must be installed if not already present
OpenSSL - install 'Win32 OpenSSL vXXXXX Light' then copy dlls to the mosquitto directory
http://slproweb.com/products/Win32OpenSSL.html
pthreads - copy 'pthreadVC2.dll' to the mosquitto directory
ftp://sources.redhat.com/pub/pthreads-win32/dll-latest/dll/x86/
Nullsoft Install System v3.01
< Back
Next >
Cancel

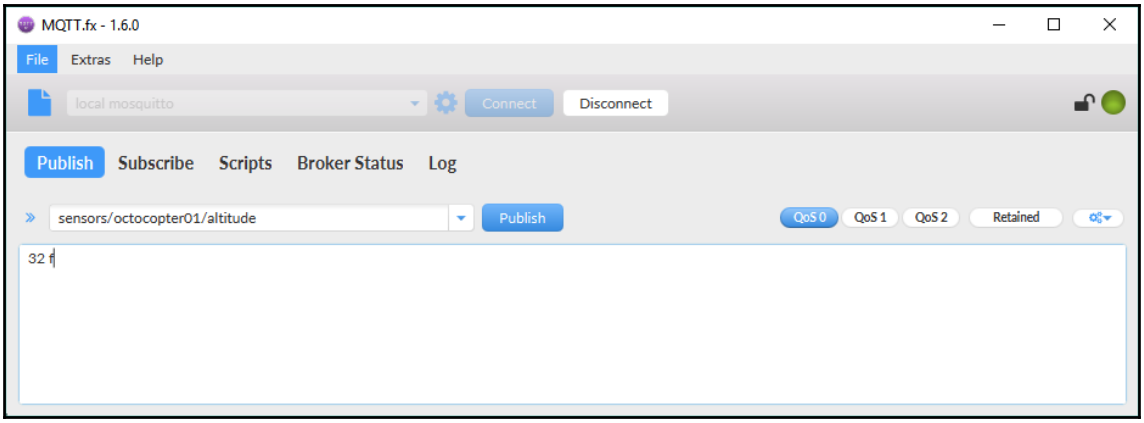

Services
File Action View Help
Services (Local)
Mosquitto Broker
Stop the service
Restart the service
Description:
MQTT v3.1 broker
Name
Description
Status
Startup Type
Log On As
Microsoft Passport Container
Manages local user identity keys used to authentica...
Manual (Trigger Start)
Local Service
Microsoft Software Shadow Copy Provider
Manages software-based volume shadow copies ta...
Manual
Local System
Microsoft Storage Spaces SMP
Host service for the Microsoft Storage Spaces mana...
Manual
Network Service
Microsoft Windows SMS Router Service.
Routes messages based on rules to appropriate clie...
Manual (Trigger Start)
Local System
Mosquitto Broker
MQTT v3.1 broker
Running
Automatic
Local System
MyPublicWiFi Service
Running
Automatic
Local System
Natural Authentication
Signal aggregator service, that evaluates signals bas...
Manual (Trigger Start)
Local System
Net.Tcp Port Sharing Service
Provides ability to share TCP ports over the net.tcp ...
Disabled
Local Service
Netlogon
Maintains a secure channel between this computer ...
Manual
Local System
Network Connected Devices Auto-Setup
Network Connected Devices Auto-Setup service m...
Running
Manual (Trigger Start)
Local Service
Network Connection Broker
Brokers connections that allow Windows Store App...
Running
Manual (Trigger Start)
Local System
Network Connections
Manages objects in the Network and Dial-Up Conn...
Manual
Local System
Network Connectivity Assistant
Provides DirectAccess status notification for UI co...
Manual (Trigger Start)
Local System
Network List Service
Identifies the networks to which the computer has ...
Running
Manual
Local Service
Network Location Awareness
Collects and stores configuration information for t...
Running
Automatic
Network Service
Network Setup Service
The Network Setup Service manages the installatio...
Manual (Trigger Start)
Local System
Network Store Interface Service
This service delivers network notifications (e.g. inte...
Running
Automatic
Local Service
NVIDIA Display Container LS
Container service for NVIDIA root features
Running
Automatic
Local System
NVIDIA LocalSystem Container
Container service for NVIDIA root features
Running
Automatic
Local System
NVIDIA NetworkService Container
Container service for NVIDIA network features
Manual
Network Service
NVIDIA Telemetry Container
Container service for NVIDIA Telemetry
Running
Automatic
Network Service
O2FLASH
Running
Automatic
Local System
Extended
Standard

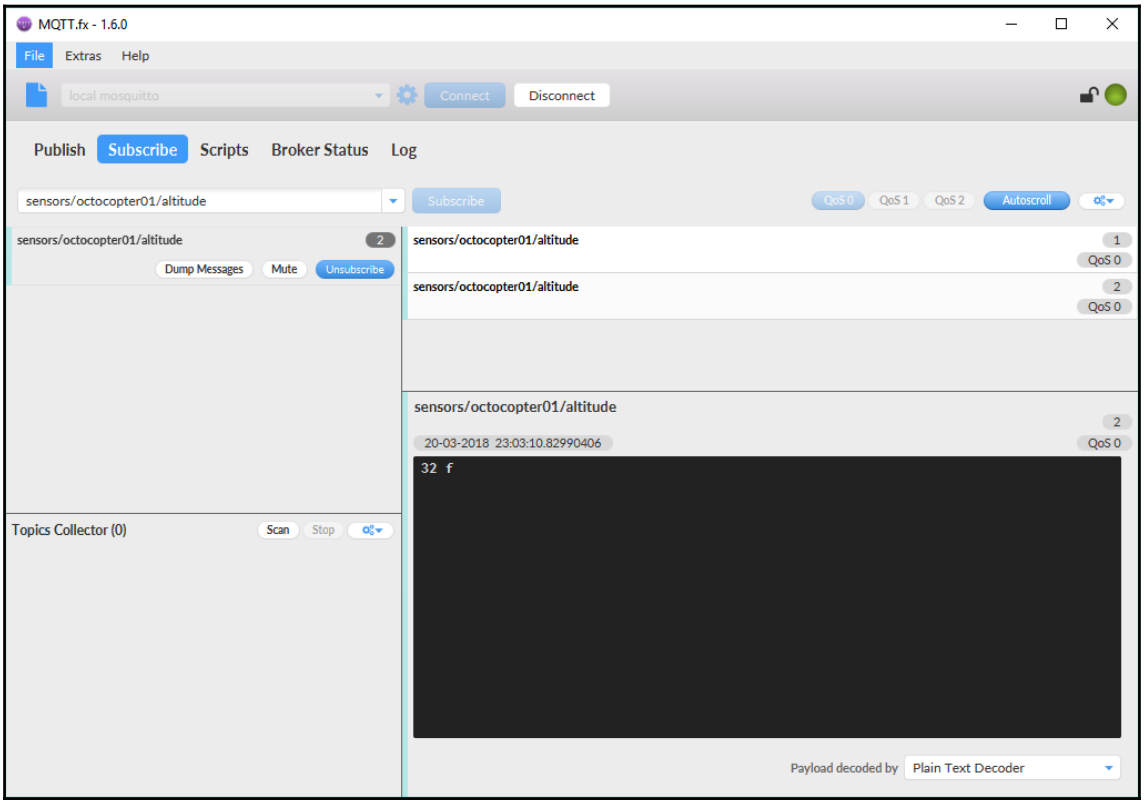
Chapter 2: Using Command-Line and GUI Tools to Learn How MQTT Works

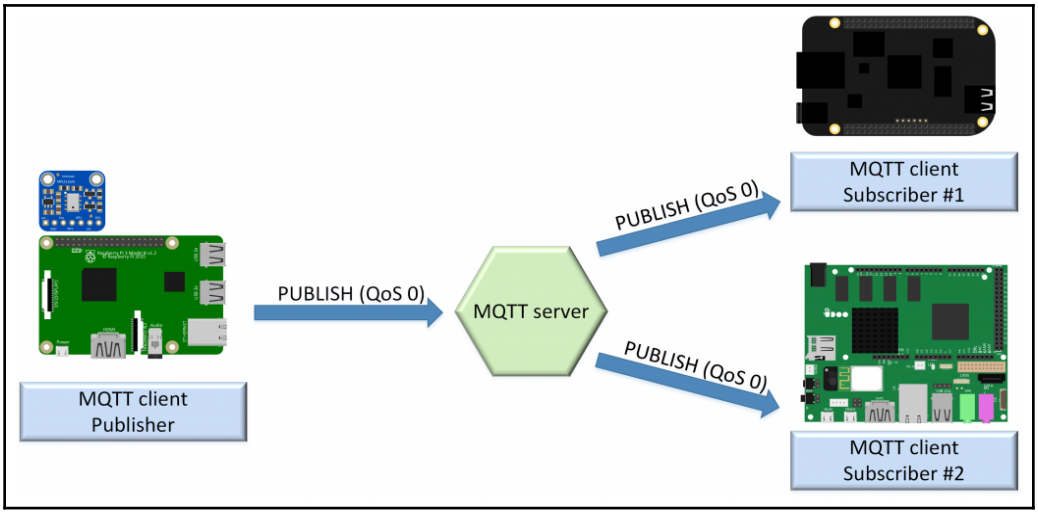


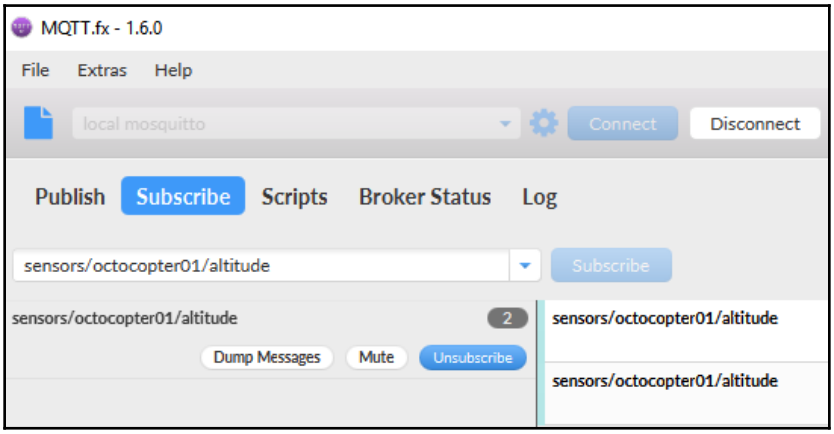

MQTT.fx - 1.6.0
File
Extras
Help
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/octocopter01/altitude
Subscribe
QoS 0
QoS 1
QoS 2
Autoscroll
sensors/octocopter01/altitude
0
Dump Messages
Mute
Unsubscribe
Topics Collector (0)
Scan
Stop
DUB
Retained
Payload decoded by
Plain Text Decoder

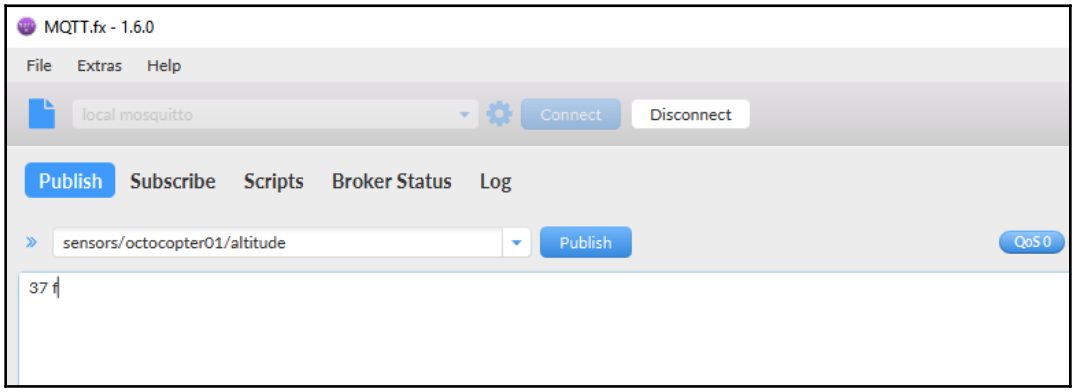

SUBSCRIBE
SUBACK
MQTT server
MQTT client
Publisher or subscriber

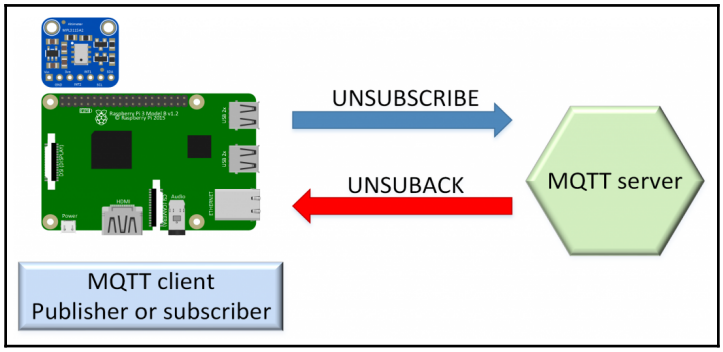

MQTT.fx - 1.6.0
File
Extras
Help
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/octocopter01/altitude
Publish
QoS 0
QoS 1
QoS 2
Retained
32 f

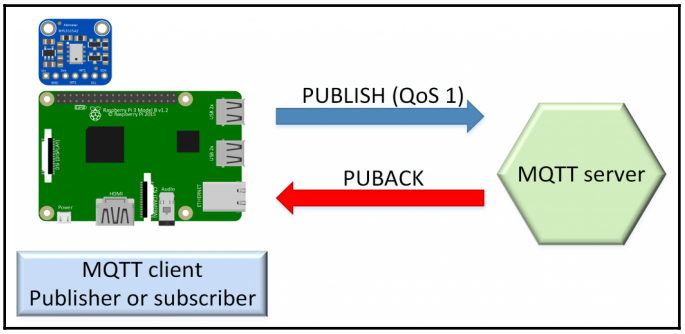

MQTT.fx - 1.6.0
File
Extras
Help
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/octocopter01/altitude
Subscribe
QoS 0
QoS 1
QoS 2
Autoscroll
sensors/octocopter01/altitude
2
Dump Messages
Mute
Unsubscribe
sensors/octocopter01/altitude
1
QoS 0
sensors/octocopter01/altitude
2
QoS 0
sensors/octocopter01/altitude
2
20-03-2018 23:03:10.82990406
QoS 0
32 f
Topics Collector (0)
Scan
Stop
Payload decoded by
Plain Text Decoder

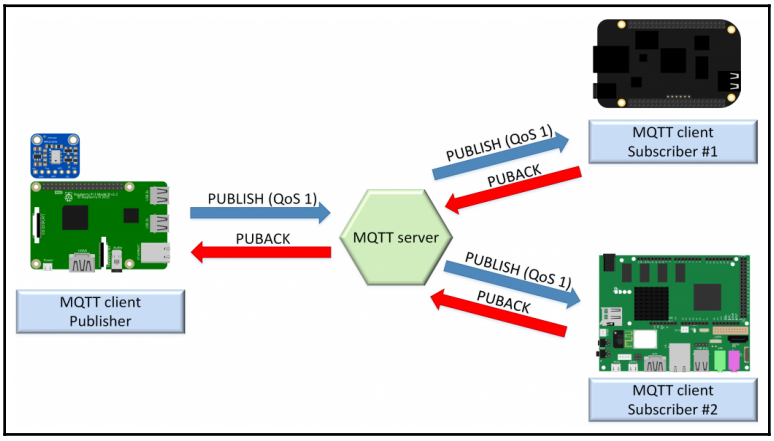

MQTT client
Publisher
PUBLISH (QoS 0)
MQTT server
PUBLISH (QoS 0)
PUBLISH (QoS 0)
MQTT client
Subscriber #1
MQTT client
Subscriber #2

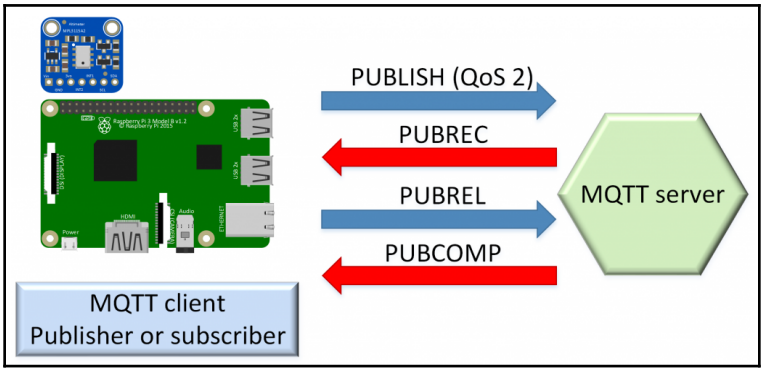

MQTT.fx - 1.6.0
File
Extras
Help
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/octocopter01/altitude
Subscribe
sensors/octocopter01/altitude
2
Dump Messages
Mute
Unsubscribe
sensors/octocopter01/altitude
sensors/octocopter01/altitude

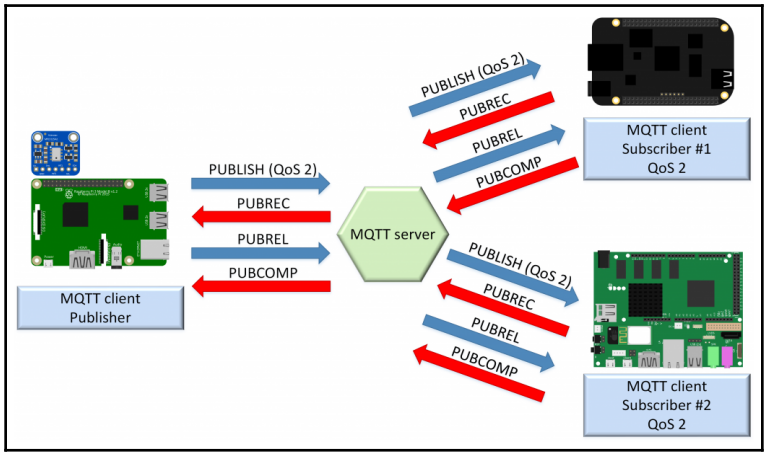

MQTT.fx - 1.6.0
File
Extras
Help
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/octocopter01/altitude
Publish
QoS 0
37 f

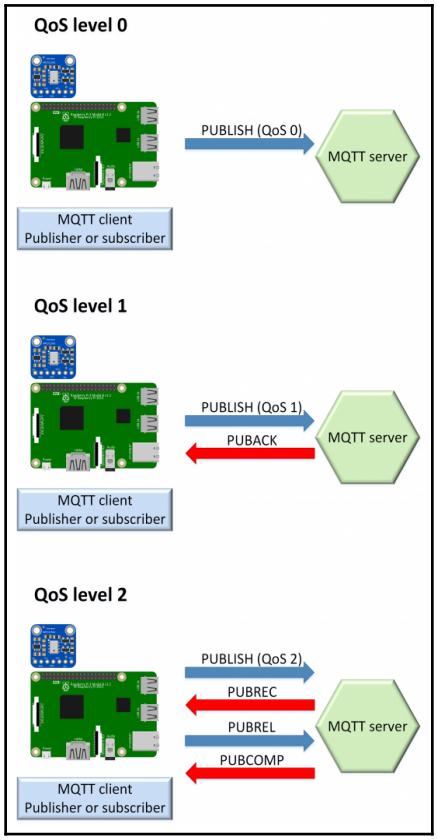

UNSUBSCRIBE
UNSUBACK
MQTT server
MQTT client
Publisher or subscriber


PUBLISH (QoS 1)
PUBACK
MQTT server
MQTT client
Publisher or subscriber

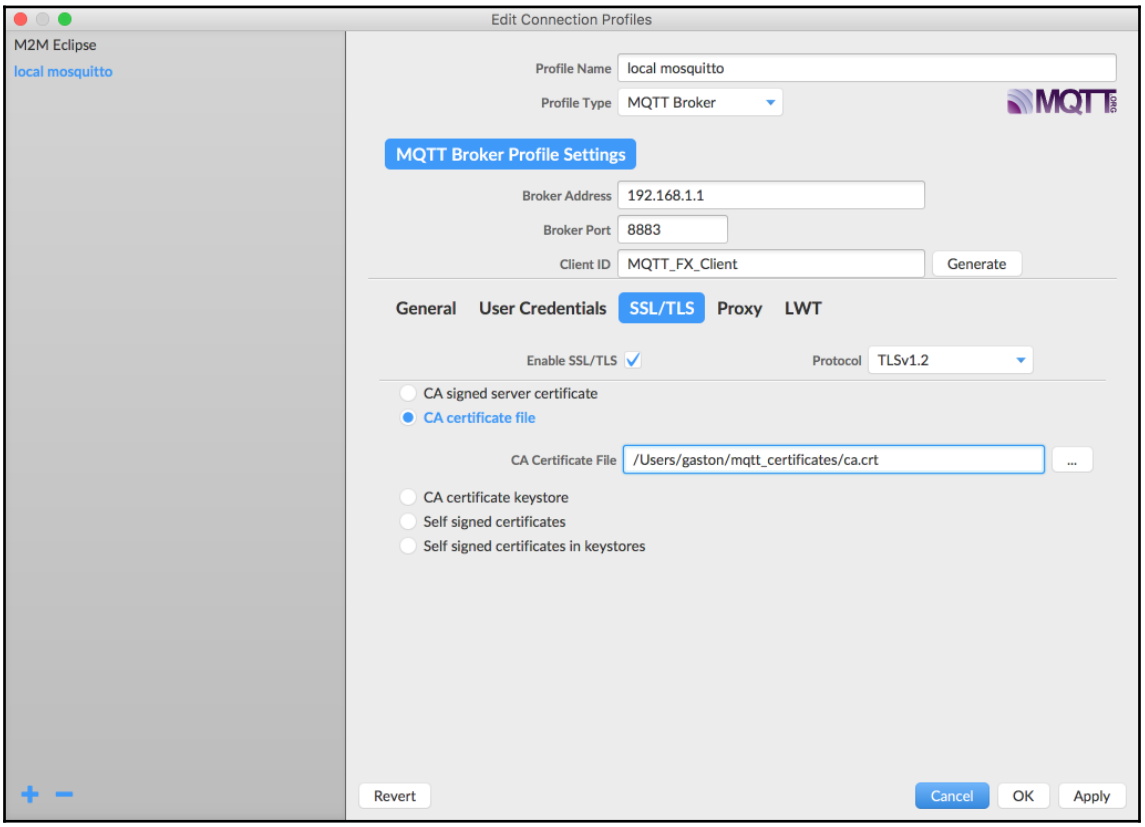

PUBLISH (QoS 1)
PUBACK
MQTT server
MQTT client
Publisher
PUBLISH (QoS 1)
PUBACK
MQTT client
Subscriber #1
PUBLISH (QoS 1)
PUBACK
MQTT client
Subscriber #2

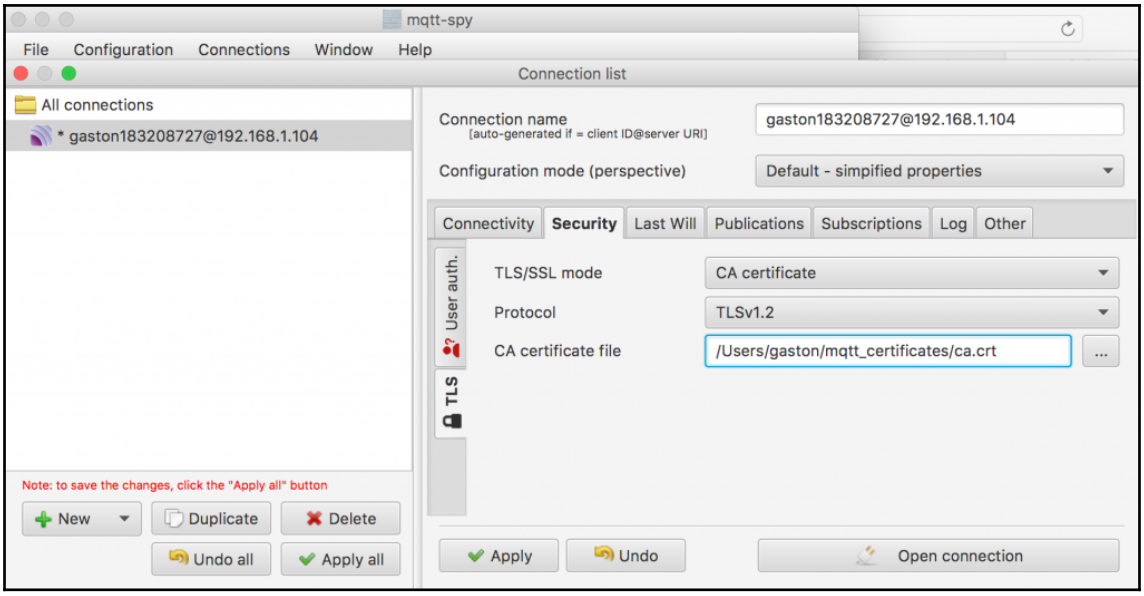

PUBLISH (QoS 2)
PUBREC
PUBREL
PUBCOMP
MQTT server
MQTT client
Publisher or subscriber

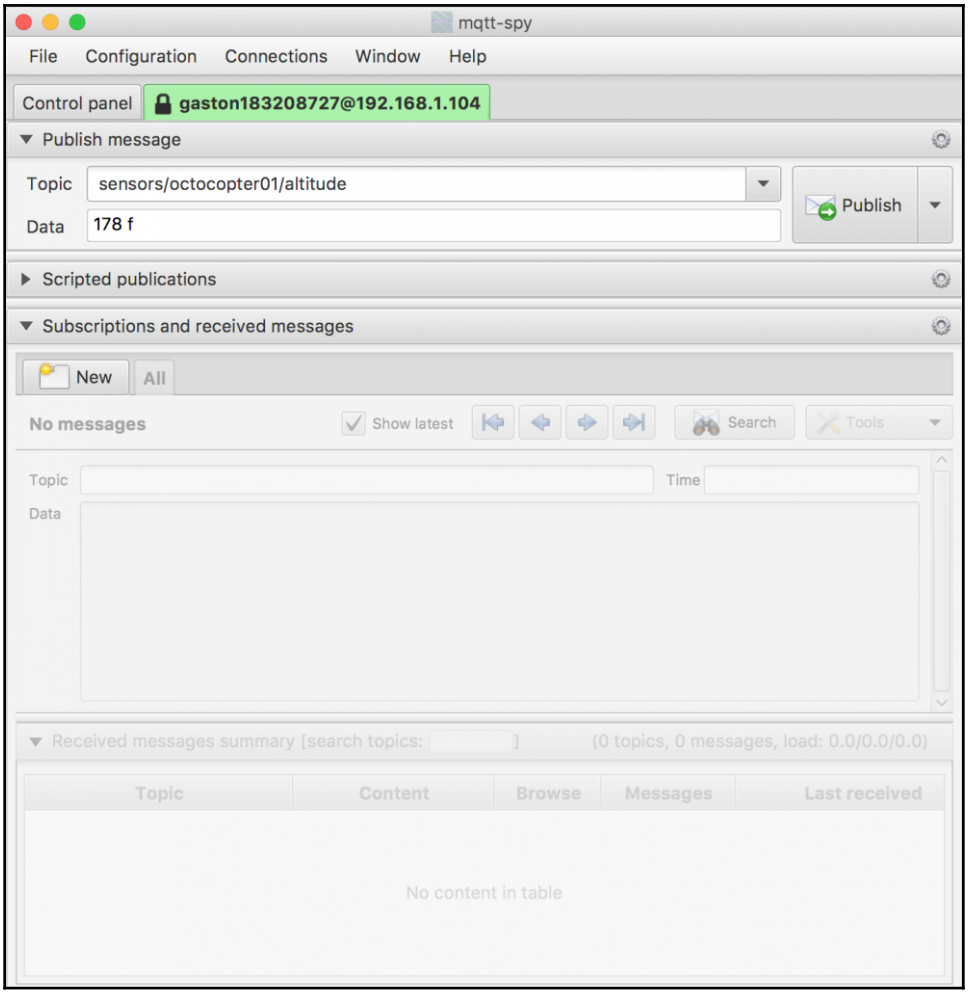

PUBLISH (QoS 2)
PUBREC
PUBREL
PUBCOMP
MQTT server
MQTT client
Publisher
PUBLISH (QoS 2)
PUBREC
PUBREL
PUBCOMP
MQTT client
Subscriber #1
QoS 2
PUBLISH (QoS 2)
PUBREC
PUBREL
PUBCOMP
MQTT client
Subscriber #2
QoS 2

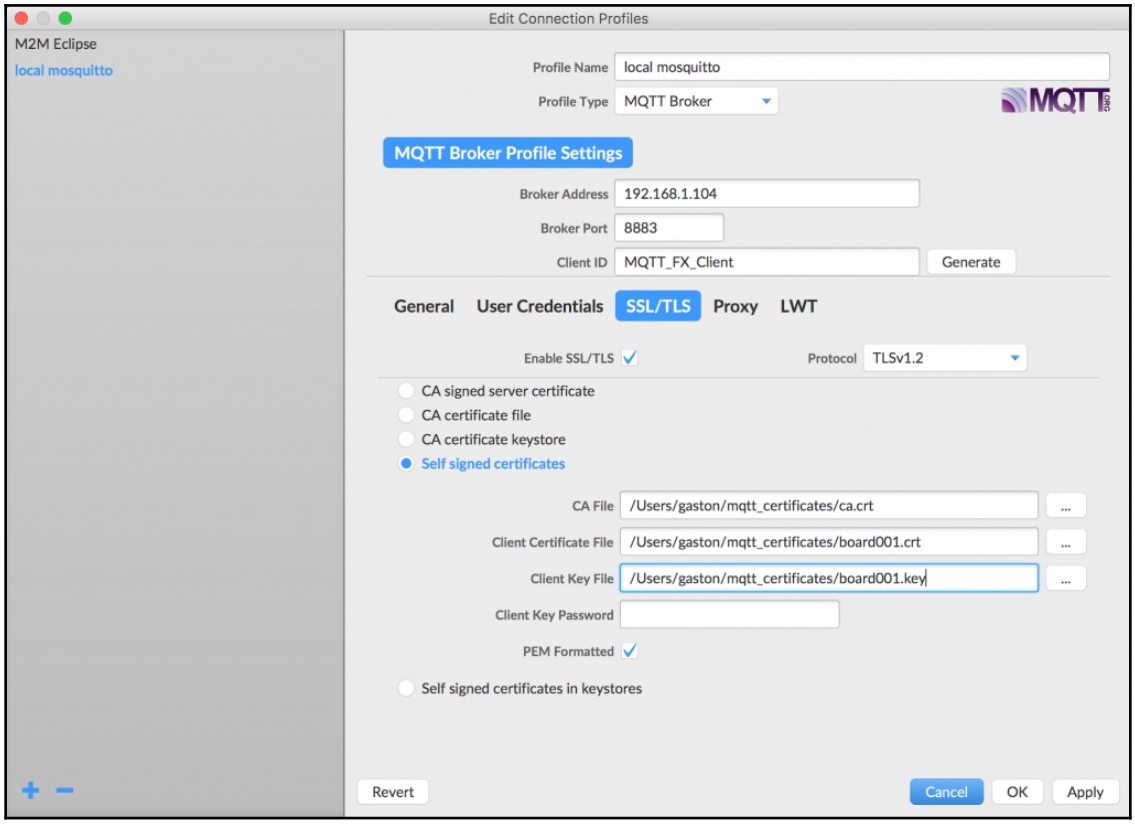

QoS level 0
PUBLISH (QoS 0)
MQTT server
MQTT client
Publisher or subscriber
QoS level 1
PUBLISH (QoS 1)
PUBACK
MQTT server
MQTT client
Publisher or subscriber
QoS level 2
PUBLISH (QoS 2)
PUBREC
PUBREL
PUBCOMP
MQTT server
MQTT client
Publisher or subscriber

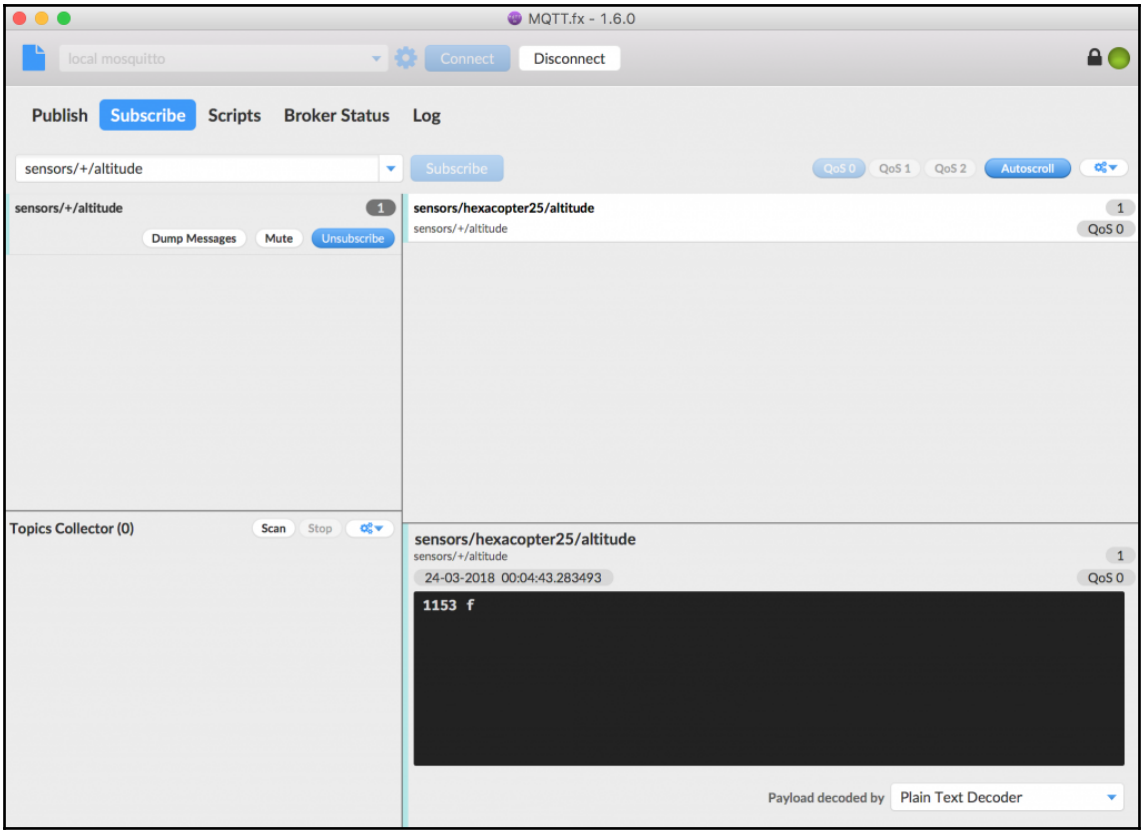
Chapter 3:
Securing an MQTT 3.1.1 Mosquitto Server

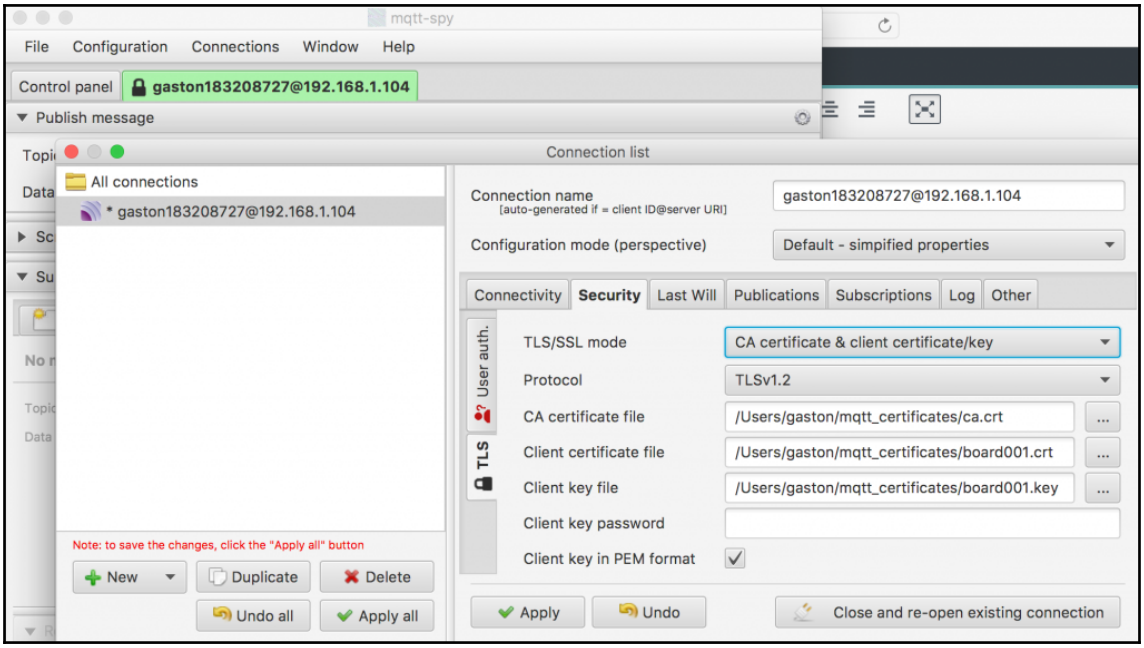



mqtt-spy
File
Configuration
Connections
Window
Help
Connection list
All connections
* gaston183208727@192.168.1.104
Note: to save the changes, click the "Apply all" button
New
Duplicate
Delete
Undo all
Apply all
Connection name
[auto-generated if = client ID@server URI]
gaston183208727@192.168.1.104
Configuration mode (perspective)
Default - simpified properties
Connectivity
Security
Last Will
Publications
Subscriptions
Log
Other
User auth.
TLS
TLS/SSL mode
CA certificate
Protocol
TLSv1.2
CA certificate file
/Users/gaston/mqtt_certificates/ca.crt
...
Apply
Undo
Open connection

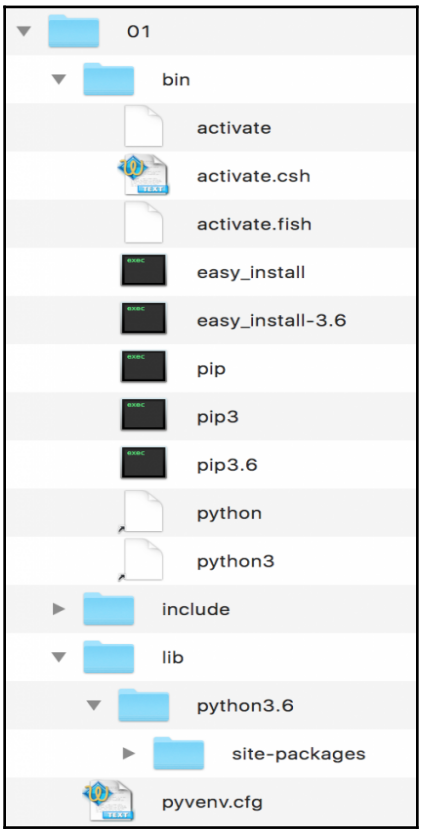

mqtt-spy
File
Configuration
Connections
Window
Help
Control panel
gaston183208727@192.168.1.104
Publish message
Topic
sensors/octocopter01/altitude
Data
178 f
Publish
Scripted publications
Subscriptions and received messages
New
All
No messages
Show latest
Search
Tools
Topic
Time
Data
Received messages summary [search topics:]
(0 topics, 0 messages, load: 0.0/0.0/0.0)
Topic
Content
Browse
Messages
Last received
No content in table

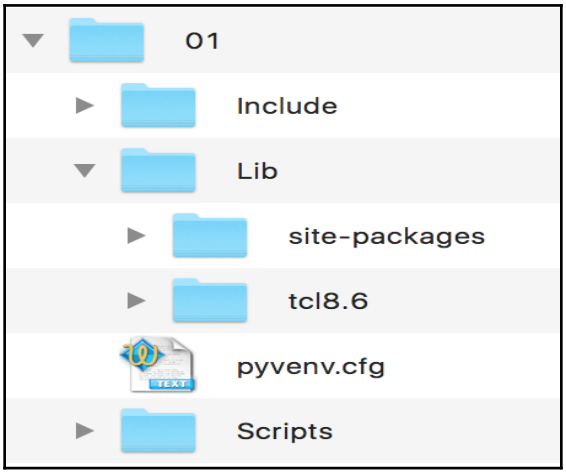

Edit Connection Profiles
M2M Eclipse
local mosquitto
Profile Name
local mosquitto
Profile Type
MQTT Broker
MQTT Broker Profile Settings
Broker Address
192.168.1.104
Broker Port
8883
Client ID
MQTT_FX_Client
Generate
General
User Credentials
SSL/TLS
Proxy
LWT
Enable SSL/TLS
Protocol
TLSv1.2
CA signed server certificate
CA certificate file
CA certificate keystore
Self signed certificates
CA File
/Users/gaston/mqtt_certificates/ca.crt
Client Certificate File
/Users/gaston/mqtt_certificates/board001.crt
Client Key File
/Users/gaston/mqtt_certificates/board001.key
Client Key Password
PEM Formatted
Self signed certificates in keystores
Revert
Cancel
OK
Apply


MQTT.fx - 1.6.0
local mosquitto
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
sensors/+/altitude
Subscribe
QoS 0
QoS 1
QoS 2
Autoscroll
sensors/+/altitude
1
Dump Messages
Mute
Unsubscribe
sensors/hexacopter25/altitude
1
sensors/+/altitude
QoS 0
Topics Collector (0)
Scan
Stop
sensors/hexacopter25/altitude
sensors/+/altitude
1
24-03-2018 00:04:43.283493
QoS 0
1153 f
Payload decoded by
Plain Text Decoder


mqtt-spy
File
Configuration
Connections
Window
Help
Control panel
gaston183208727@192.168.1.104
Publish message
Connection list
All connections
* gaston183208727@192.168.1.104
Note: to save the changes, click the "Apply all" button
New
Duplicate
Delete
Undo all
Apply all
Connection name
[auto-generated if = client ID@server URI]
gaston183208727@192.168.1.104
Configuration mode (perspective)
Default - simpified properties
Connectivity
Security
Last Will
Publications
Subscriptions
Log
Other
User auth.
TLS
TLS/SSL mode
CA certificate & client certificate/key
Protocol
TLSv1.2
CA certificate file
/Users/gaston/mqtt_certificates/ca.crt
Client certificate file
/Users/gaston/mqtt_certificates/board001.crt
Client key file
/Users/gaston/mqtt_certificates/board001.key
Client key password
Client key in PEM format
Apply
Undo
Close and re-open existing connection

Chapter 4:
Writing Code to Control a Vehicle with Python and MQTT Messages



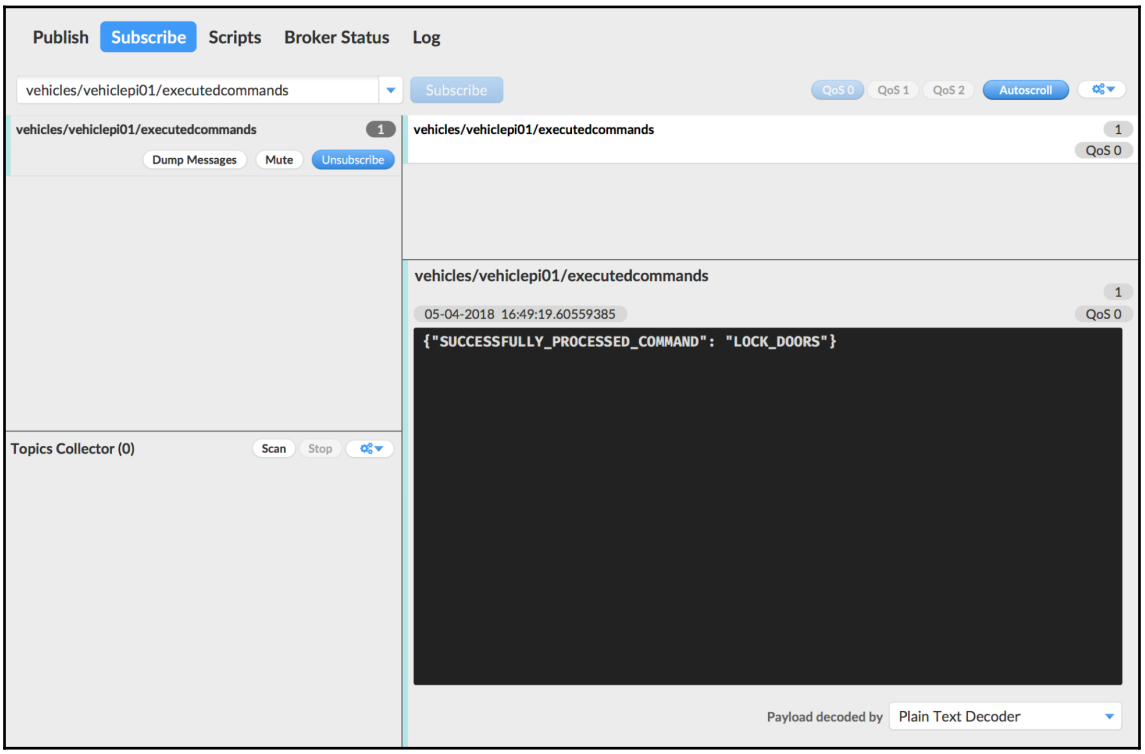


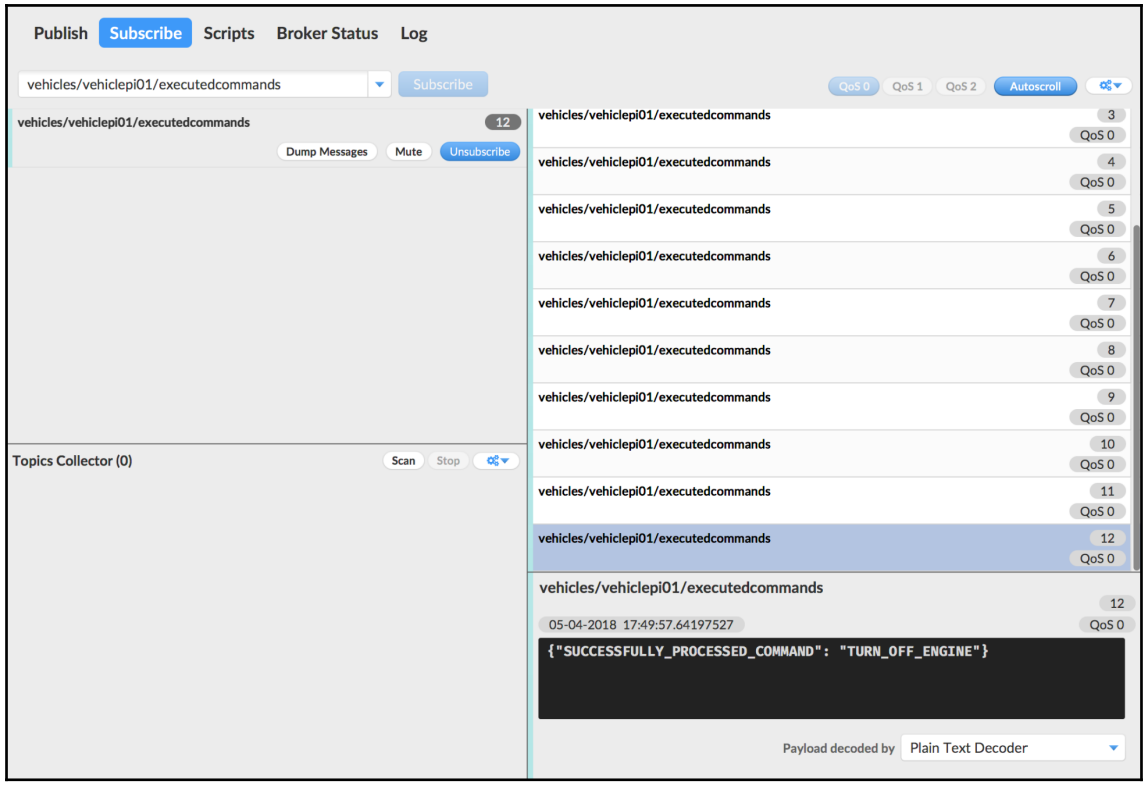

```
gaston — -bash — 80×24
Gastons-MacBook-Pro:~ gaston$ python3 -m venv ~/HillarMQTT/010
Gastons-MacBook-Pro:~ gaston$ echo $SHELL
/bin/bash
Gastons-MacBook-Pro:~ gaston$ source ~/HillarMQTT/01/bin/activate
(01) Gastons-MacBook-Pro:~ gaston$
```

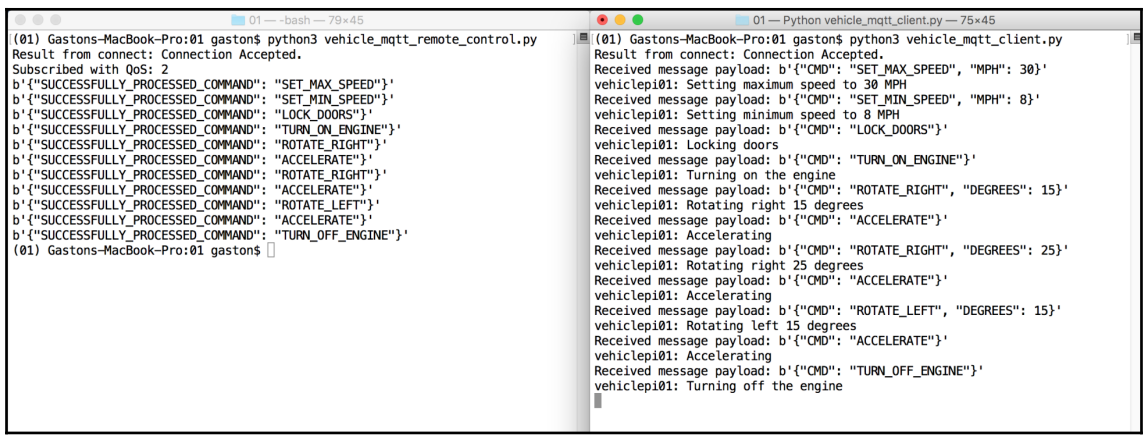
```
Command Prompt

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

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

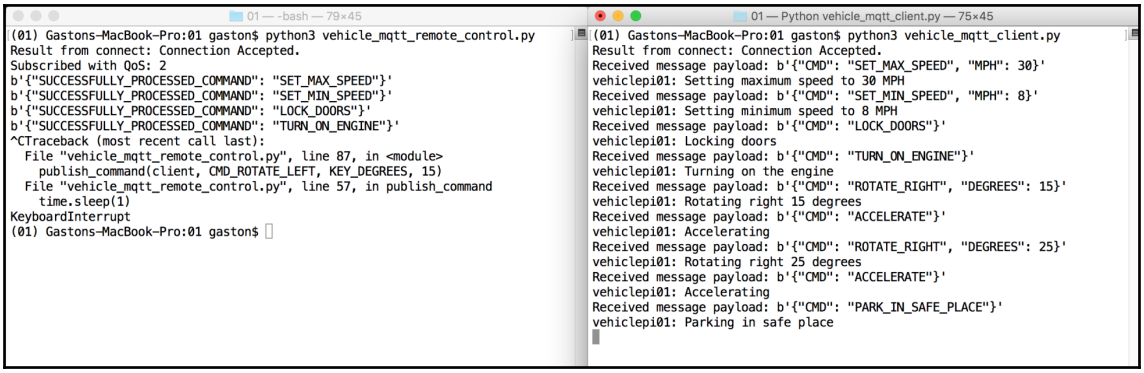
Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
PS C:\Users\gaston> python -m venv $env:userprofile\HillarMQTT\01
PS C:\Users\gaston> cd $env:USERPROFILE
PS C:\Users\gaston> .\HillarMQTT\01\Scripts\Activate.ps1
(01) PS C:\Users\gaston>

Chapter 5:
Testing and Improving Our Vehicle Control Solution in Python




Publish
Subscribe
Scripts
Broker Status
Log
vehicles/vehiclepi01/executedcommands
Subscribe
QoS 0
QoS 1
QoS 2
Autoscroll
vehicles/vehiclepi01/executedcommands
12
Dump Messages
Mute
Unsubscribe
Topics Collector (0)
Scan
Stop
vehicles/vehiclepi01/executedcommands 3 QoS 0
vehicles/vehiclepi01/executedcommands 4 QoS 0
vehicles/vehiclepi01/executedcommands 5 QoS 0
vehicles/vehiclepi01/executedcommands 6 QoS 0
vehicles/vehiclepi01/executedcommands 7 QoS 0
vehicles/vehiclepi01/executedcommands 8 QoS 0
vehicles/vehiclepi01/executedcommands 9 QoS 0
vehicles/vehiclepi01/executedcommands 10 QoS 0
vehicles/vehiclepi01/executedcommands 11 QoS 0
vehicles/vehiclepi01/executedcommands 12 QoS 0
vehicles/vehiclepi01/executedcommands
12
05-04-2018 17:49:57.64197527
QoS 0
{"SUCCESSFULLY_PROCESSED_COMMAND": "TURN_OFF_ENGINE"}
Payload decoded by
Plain Text Decoder


01 — -bash — 79×45
(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 — Python vehicle_mqtt_client.py — 75×45
(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



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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$
```

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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
```

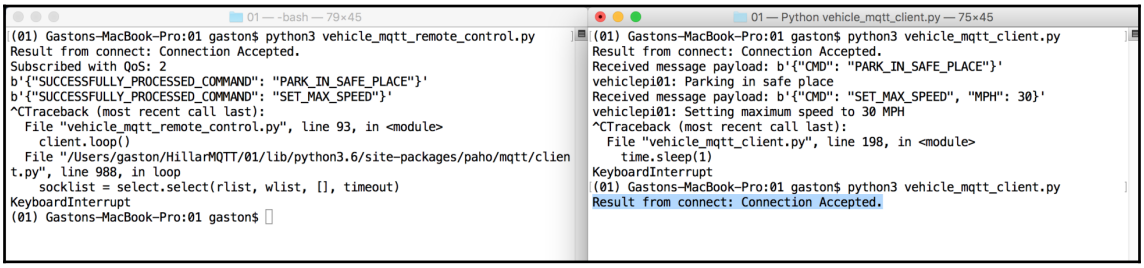

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Result from connect: Connection Accepted.
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b'{"SUCCESSFULLY_PROCESSED_COMMAND": "PARK_IN_SAFE_PLACE"}'
b'{"SUCCESSFULLY_PROCESSED_COMMAND": "SET_MAX_SPEED"}'
^CTraceback (most recent call last):
  File "vehicle_mqtt_remote_control.py", line 93, in <module>
    client.loop()
  File "/Users/gaston/HillarMQTT/01/lib/python3.6/site-packages/paho/mqtt/clien
t.py", line 988, in loop
    socklist = select.select(rlist, wlist, [], timeout)
KeyboardInterrupt
(01) Gastons-MacBook-Pro:01 gaston$
```

01 — Python vehicle_mqtt_client.py — 75×45

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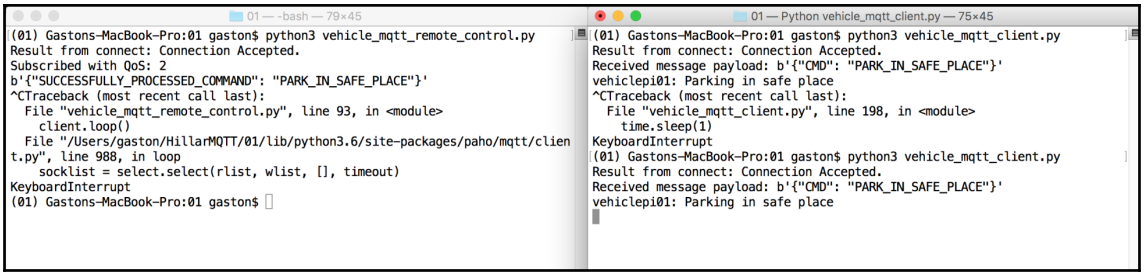
Result from connect: Connection Accepted.
Received message payload: b'{"CMD": "PARK_IN_SAFE_PLACE"}'
vehiclepi01: Parking in safe place
Received message payload: b'{"CMD": "SET_MAX_SPEED", "MPH": 30}'
vehiclepi01: Setting maximum speed to 30 MPH
^CTraceback (most recent call last):
  File "vehicle_mqtt_client.py",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



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vehiclepi01: Parking in safe place
```
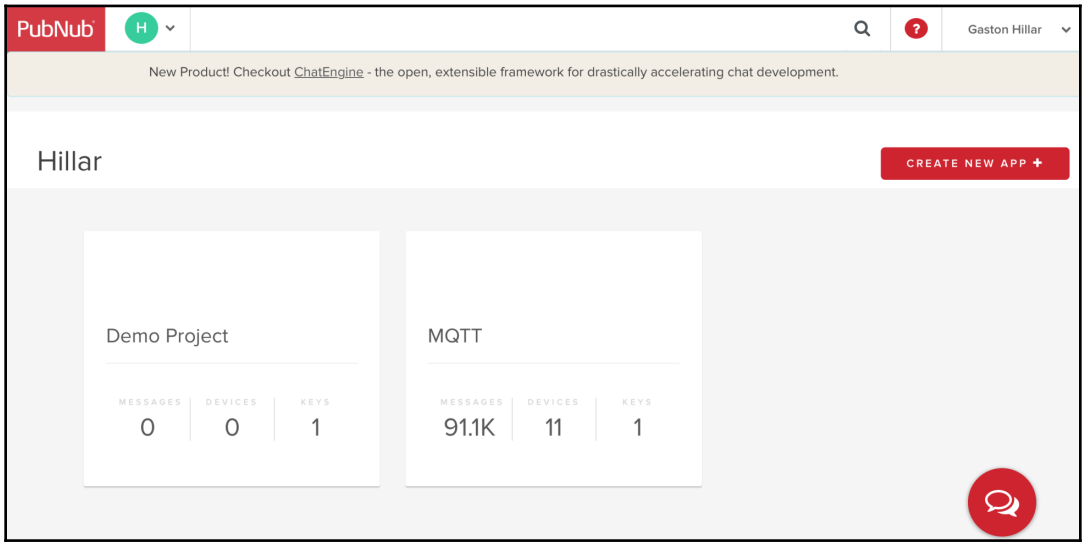
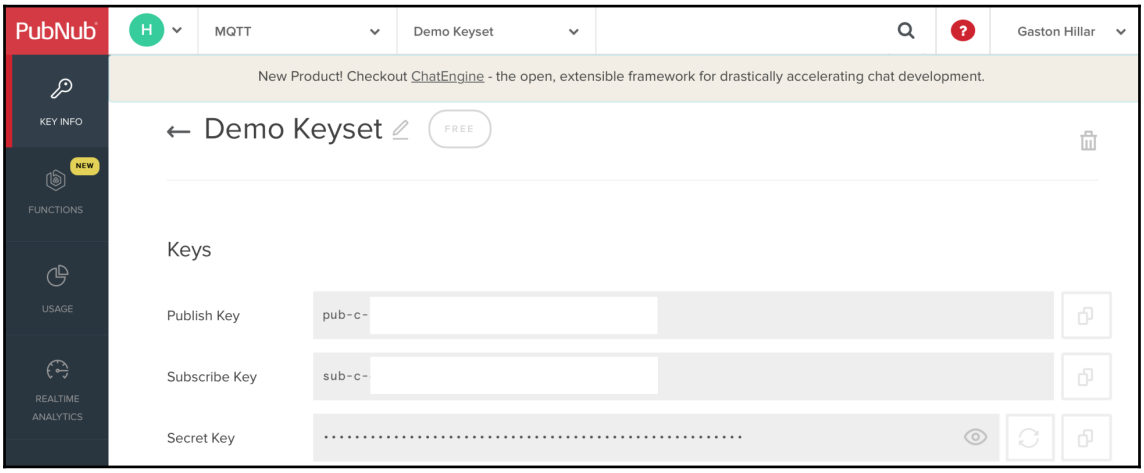
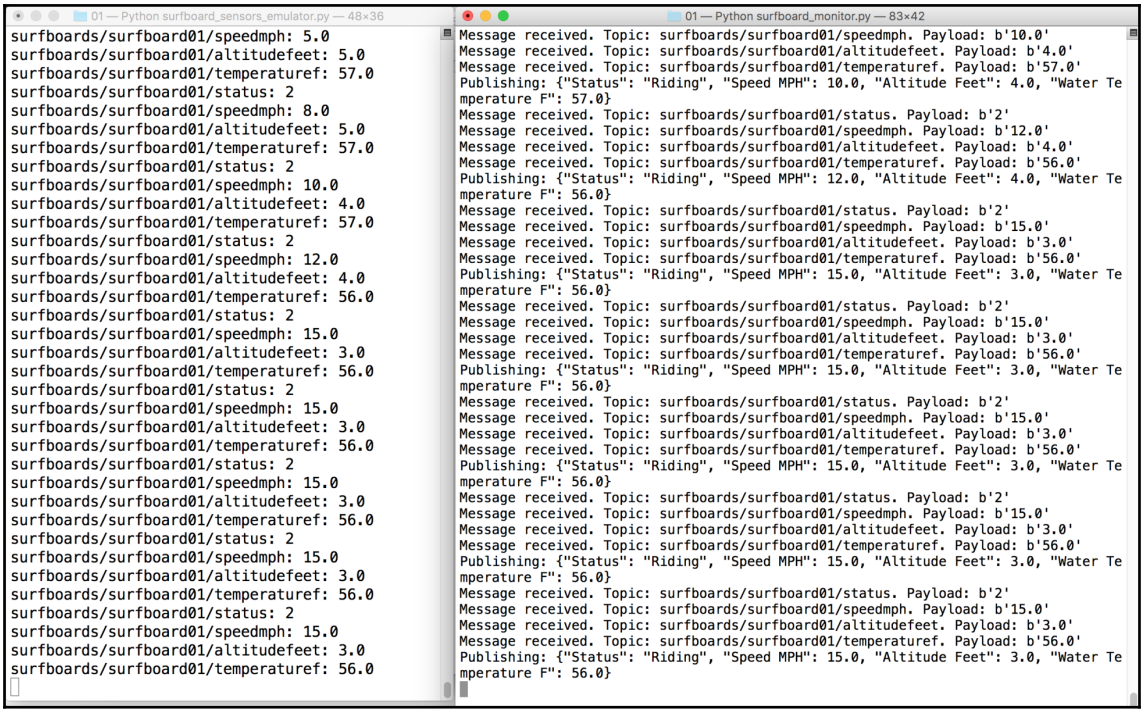
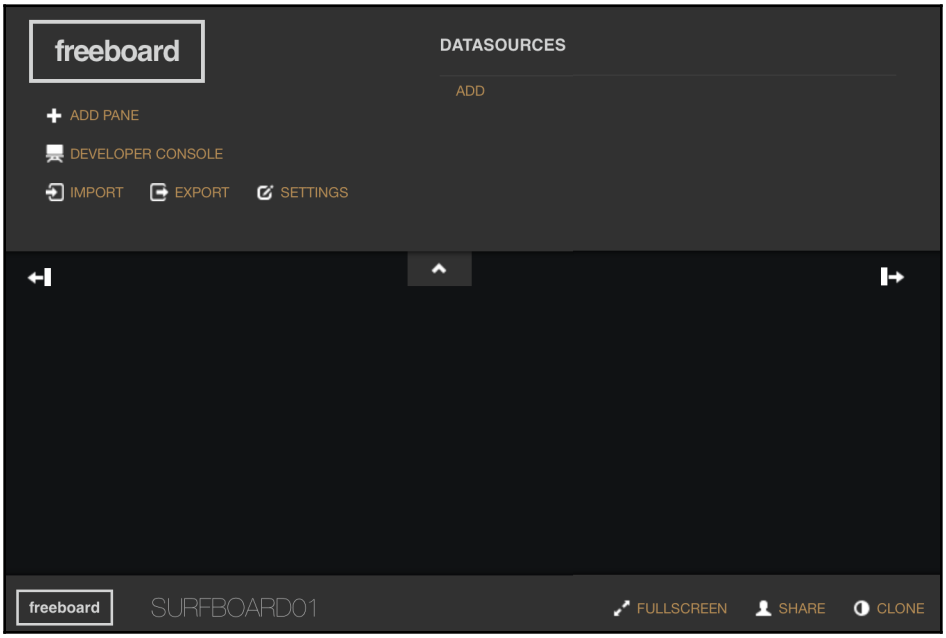

Chapter 6:
Monitoring a Surfing Competition with Cloud -Based Real-Time MQTT Providers and Python

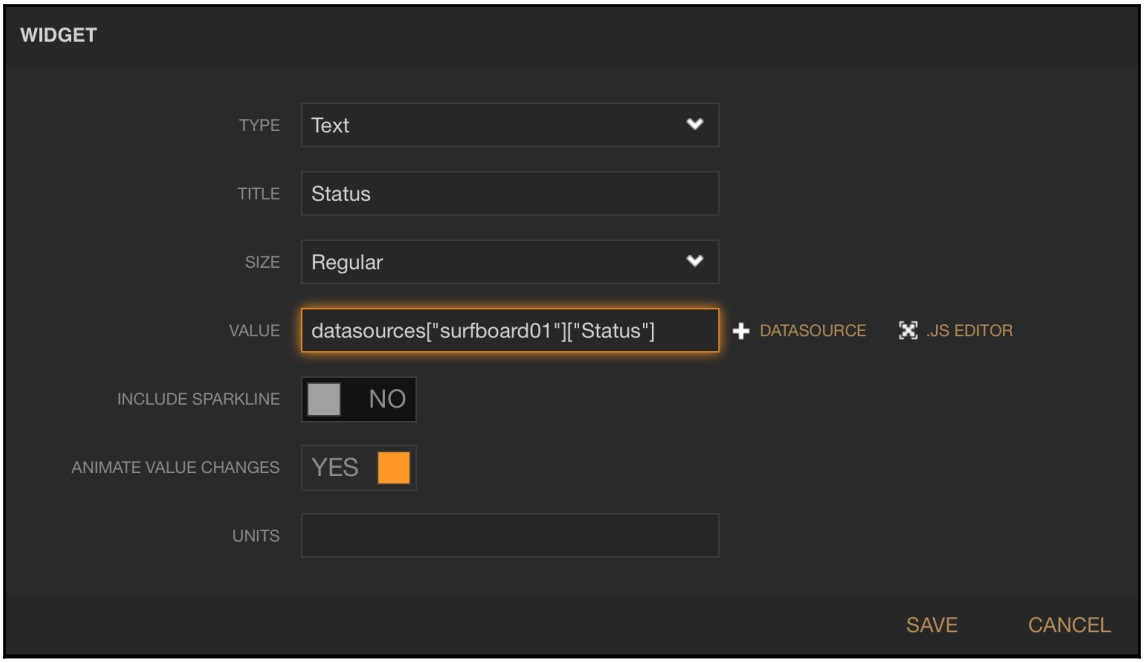


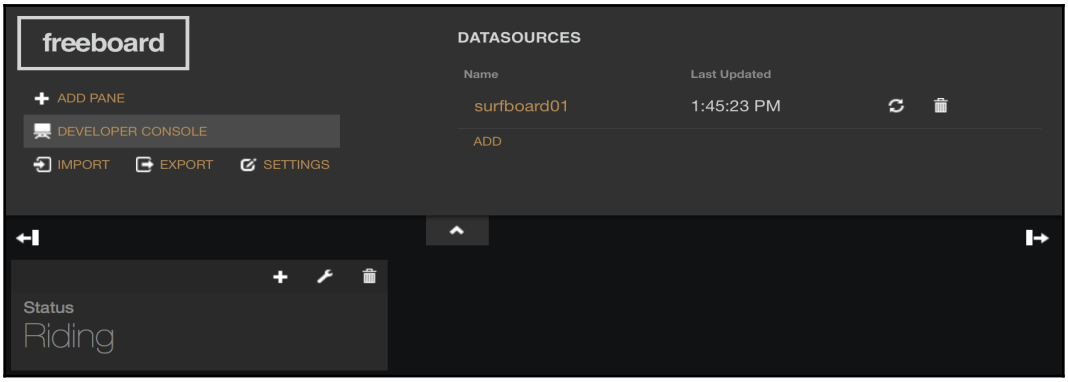


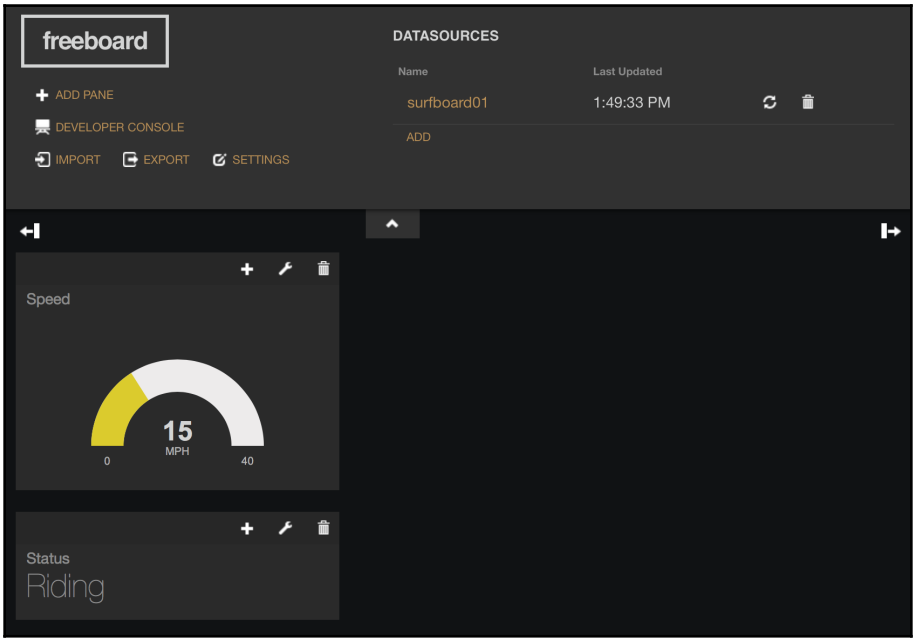

01 — Python surfboard_sensors_emulator.py — 48×36
surfboards/surfboard01/speedmph: 5.0
surfboards/surfboard01/altitudefeet: 5.0
surfboards/surfboard01/temperaturef: 57.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 8.0
surfboards/surfboard01/altitudefeet: 5.0
surfboards/surfboard01/temperaturef: 57.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 10.0
surfboards/surfboard01/altitudefeet: 4.0
surfboards/surfboard01/temperaturef: 57.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 12.0
surfboards/surfboard01/altitudefeet: 4.0
surfboards/surfboard01/temperaturef: 56.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 15.0
surfboards/surfboard01/altitudefeet: 3.0
surfboards/surfboard01/temperaturef: 56.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 15.0
surfboards/surfboard01/altitudefeet: 3.0
surfboards/surfboard01/temperaturef: 56.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 15.0
surfboards/surfboard01/altitudefeet: 3.0
surfboards/surfboard01/temperaturef: 56.0
surfboards/surfboard01/status: 2
surfboards/surfboard01/speedmph: 15.0
surfboards/surfboard01/altitudefeet: 3.0
surfboards/surfboard01/temperaturef: 56.0
01 — Python surfboard_monitor.py — 83×42
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'10.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'4.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'57.0'
Publishing: {"Status": "Riding", "Speed MPH": 10.0, "Altitude Feet": 4.0, "Water Temperature F": 57.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'12.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'4.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 12.0, "Altitude Feet": 4.0, "Water Temperature F": 56.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'15.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'3.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 15.0, "Altitude Feet": 3.0, "Water Temperature F": 56.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'15.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'3.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 15.0, "Altitude Feet": 3.0, "Water Temperature F": 56.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'15.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'3.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 15.0, "Altitude Feet": 3.0, "Water Temperature F": 56.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'15.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'3.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 15.0, "Altitude Feet": 3.0, "Water Temperature F": 56.0}
Message received. Topic: surfboards/surfboard01/status. Payload: b'2'
Message received. Topic: surfboards/surfboard01/speedmph. Payload: b'15.0'
Message received. Topic: surfboards/surfboard01/altitudefeet. Payload: b'3.0'
Message received. Topic: surfboards/surfboard01/temperaturef. Payload: b'56.0'
Publishing: {"Status": "Riding", "Speed MPH": 15.0, "Altitude Feet": 3.0, "Water Temperature F": 56.0}

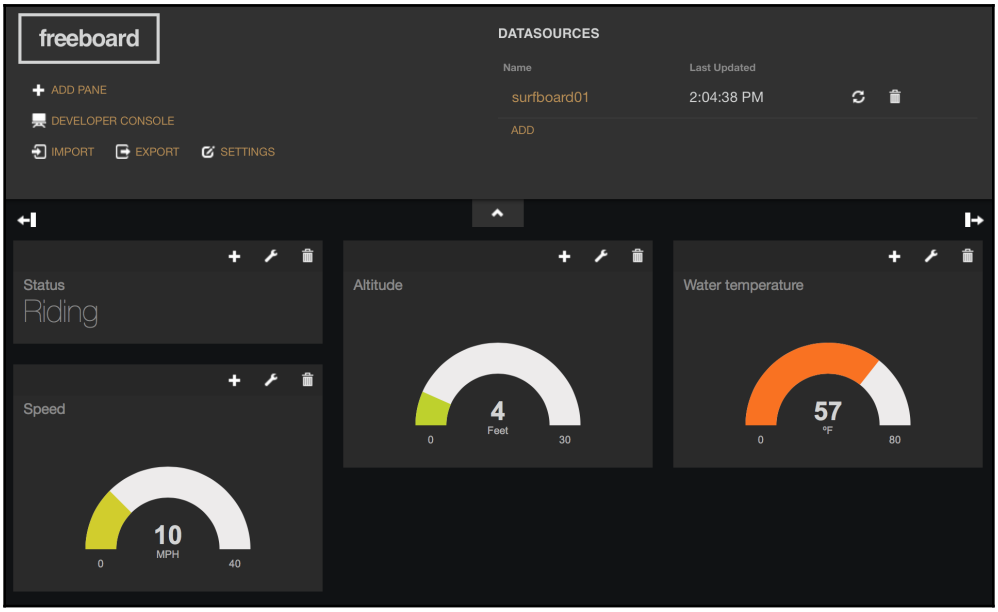

freeboard
DATASOURCES
ADD
ADD PANE
DEVELOPER CONSOLE
IMPORT
EXPORT
SETTINGS
freeboard
SURFBOARD01
FULLSCREEN
SHARE
CLONE

DATASOURCE
PubNub is a realtime messaging network. See http://www.pubnub.com for more details.
TYPE
PubNub
NAME
surfboard01
SUBSCRIBE KEY
sub-c-
CHANNEL
surfboard01
SAVE
CANCEL


WIDGET
TYPE
Text
TITLE
Status
SIZE
Regular
VALUE
datasources["surfboard01"]["Status"]
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


freeboard
ADD PANE
DEVELOPER CONSOLE
IMPORT
EXPORT
SETTINGS
DATASOURCES
Name
Last Updated
surfboard01
1:49:33 PM
ADD
Speed
15
MPH
0
40
Status
Riding


freeboard
ADD PANE
DEVELOPER CONSOLE
IMPORT
EXPORT
SETTINGS
DATASOURCES
Name
Last Updated
surfboard01
2:04:38 PM
ADD
Status
Riding
Speed
10
MPH
0
40
Altitude
4
Feet
0
30
Water temperature
57
°F
0
80