Connected Device

Final Project

Name and Course

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- Course: Connected Devices
- Semester and Year: Spring 2019

Description

Description: A solution towards home safety and security using two motion detection sensors of SenseHat. When a magnetic field of the safe lock handle is changed in the wrong way it should trigger an alarm. Also motion detection capability will trigger a SOS alarm via SMS/EMAIL in case of emergency. Developed four application SOSStart , SOSAlert , AlarmStart, AlarmAlert that securely communicate with a remote cloud Ubidots IoT service and publishes updates to a Ubidots device variable at regular intervals using both MQTT ,HTTP and the Ubidots API. The actuator events on Ubidots trigger an alert which the Alert applications subscribe to and generate appropriate LED messages as well as publish email. It is implemented in python.

Code Repository

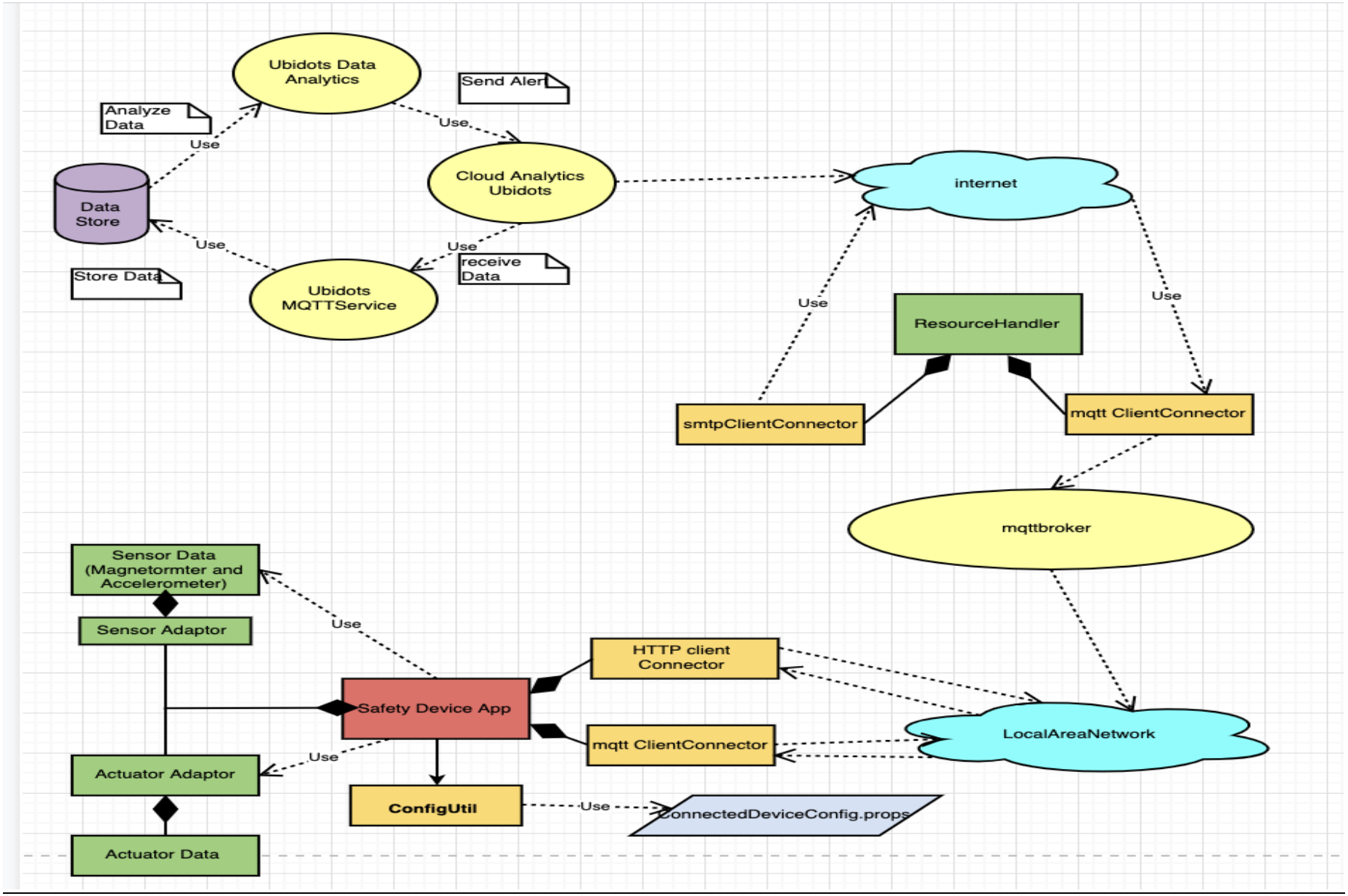
URL

- https://bitbucket.org/shivanibhalchandra/iot-device/src/master/apps/labs/module08/
- Videos are inside the same folder

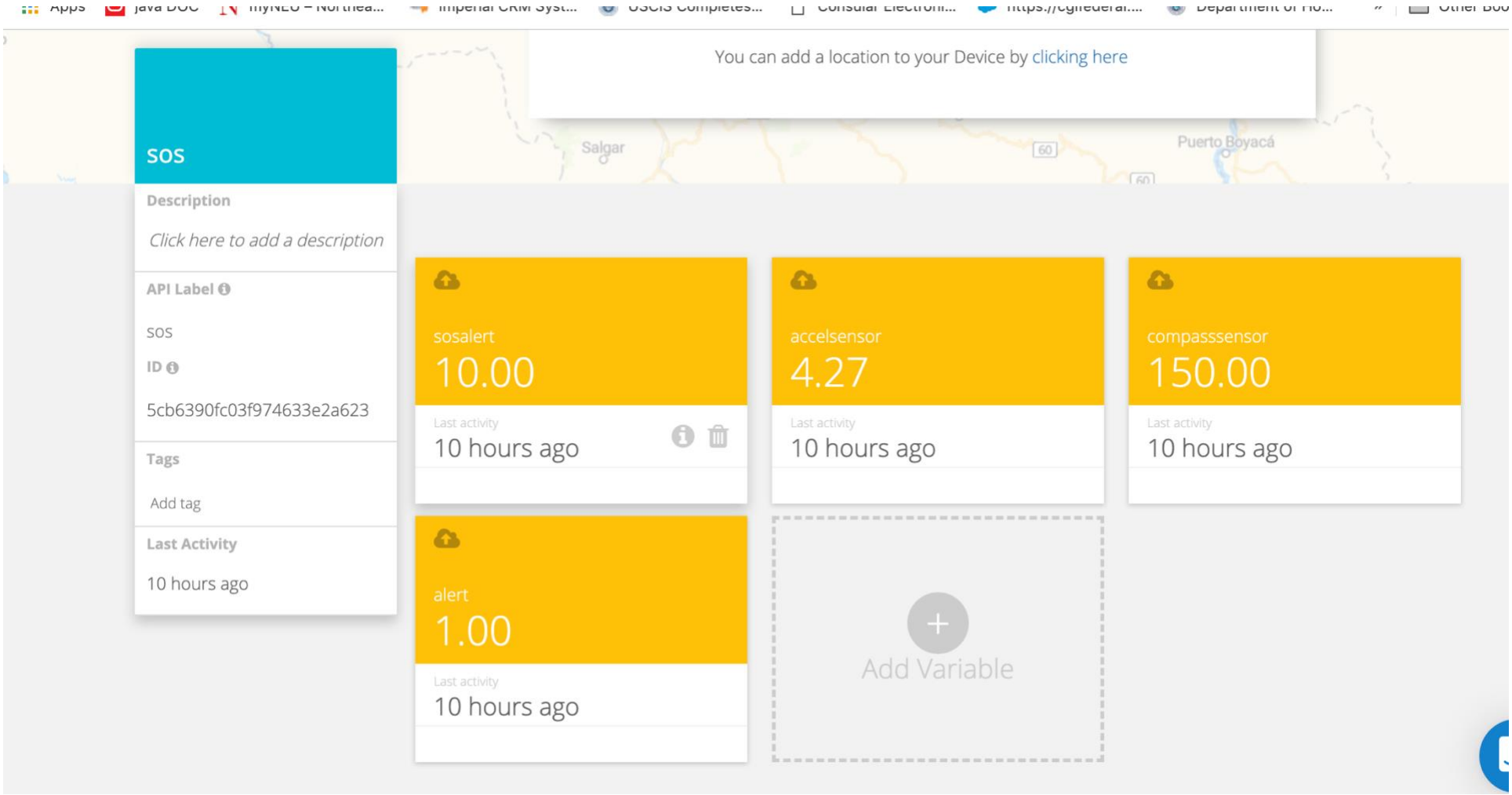
Listing of all modules (added or changed):

- module08(python)
- SOSStart.py
- AlarmStart.py
- SOSAlert.py
- AlarmAlert.py
- SOSActuator.py
- AlarmActuator.py
- SOSSensor.py
- AlarmSensor.py
- HTTPCompassPublisher.py
- MqttClientConnectorNew.py
- SmtpClientConnector.py
- ConfigUtil.py
- ConfigConst.py
- SOSLed.py

System Design Block Diagram:



Application Output for in Burglar Alarm python:



Variable compasssensor is less than ...

if compasssensor value is < than 180.0

Set alert to 1.0

Variable accelsensor is less or equal ...

if accelsensor value is <= than 5.0

Set sosalert to 10.0

Variable compasssensor is greater th...

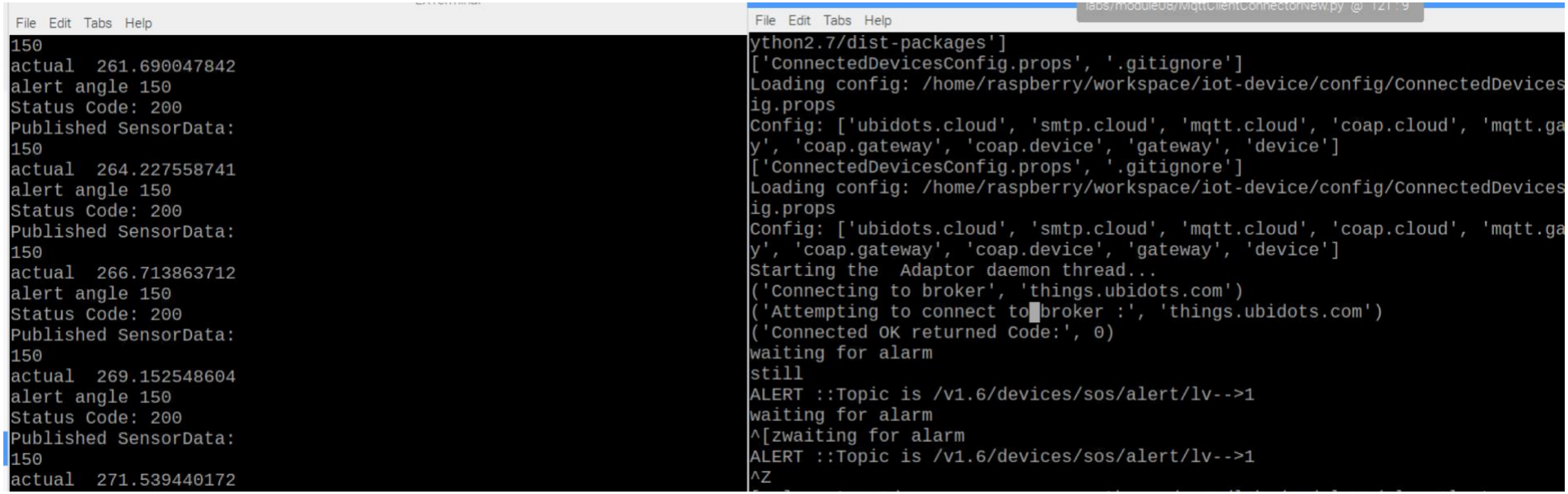
if compasssensor value is > than 180.0

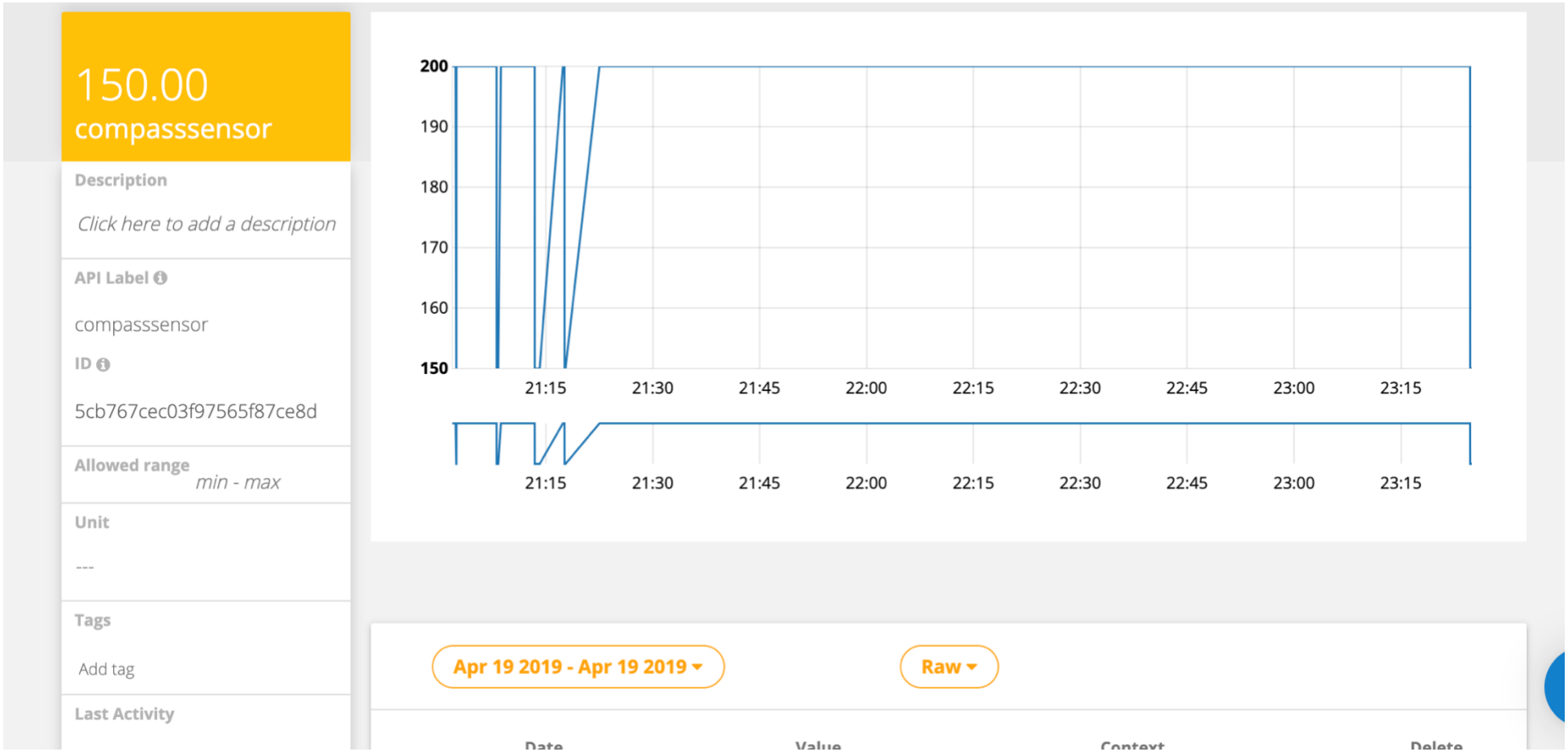
Set alert to 0.0

Variable accelsensor is greater or eq...

if accelsensor value is >= than 6.0

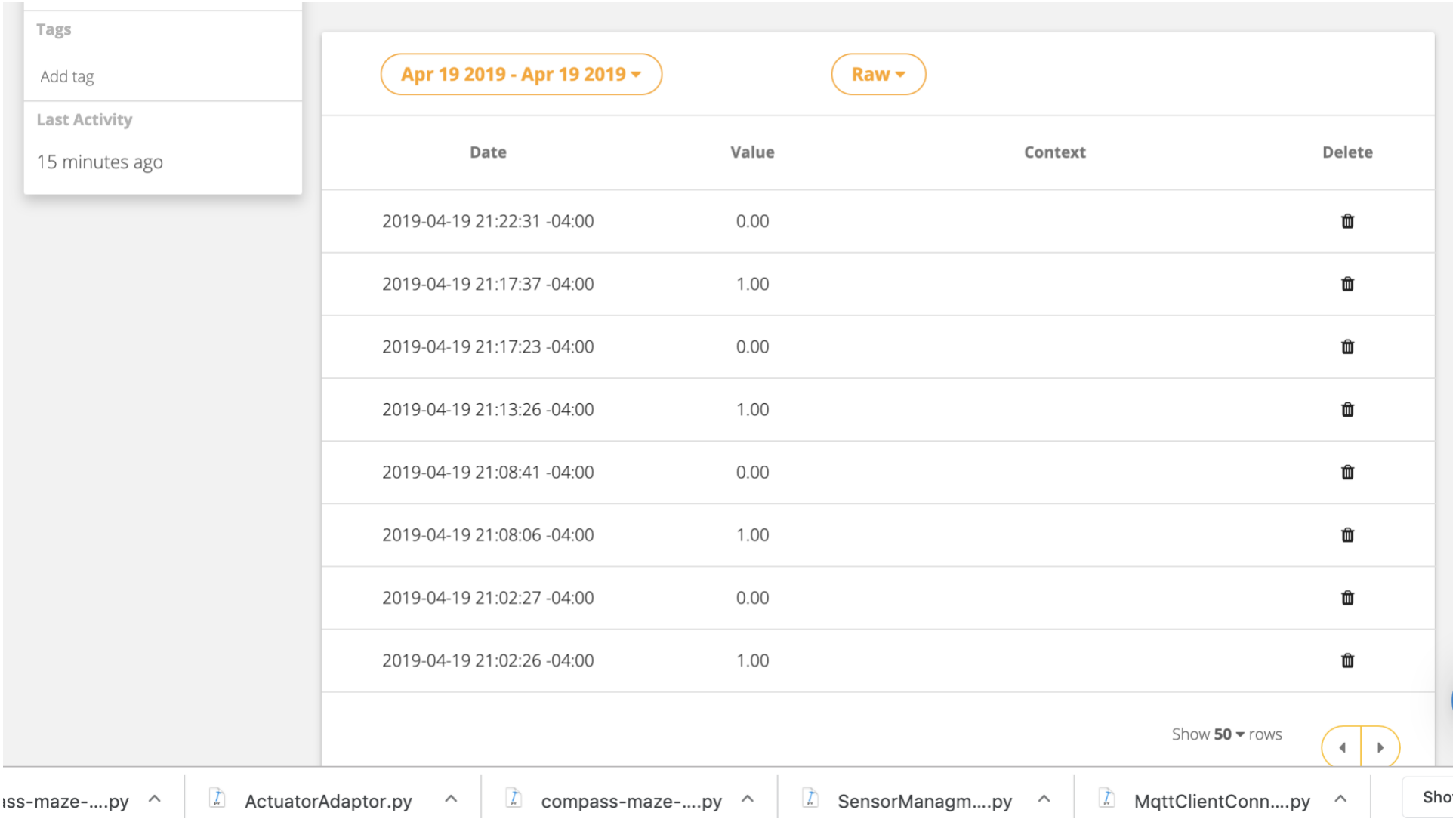
Set sosalert to 5.0

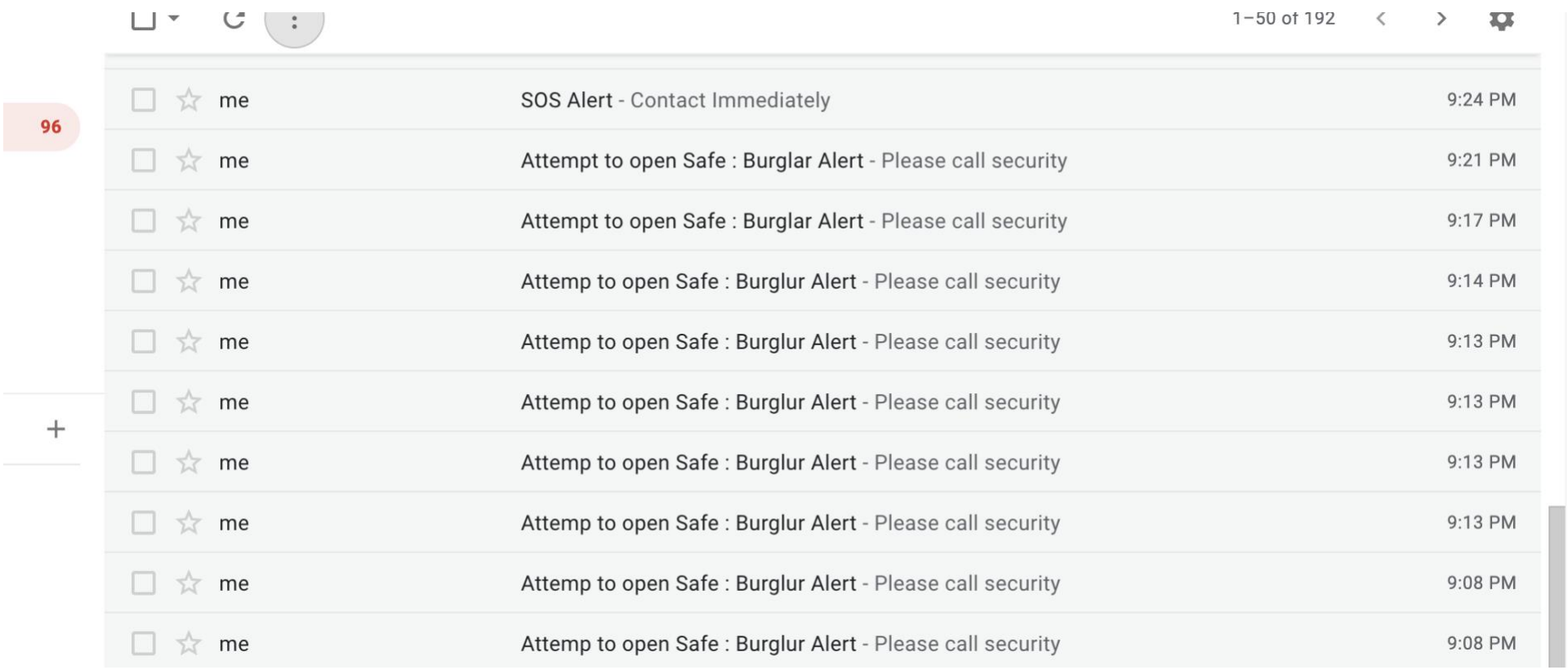

File Edit Tabs Help
150
actual 261.690047842
alert angle 150
Status Code: 200
Published SensorData:
150
actual 264.227558741
alert angle 150
Status Code: 200
Published SensorData:
150
actual 266.713863712
alert angle 150
Status Code: 200
Published SensorData:
150
actual 269.152548604
alert angle 150
Status Code: 200
Published SensorData:
150
actual 271.539440172
File Edit Tabs Help
ython2.7/dist-packages']
['ConnectedDevicesConfig.props', '.gitignore']
Loading config: /home/raspberry/workspace/iot-device/config/ConnectedDevices
ig.props
Config: ['ubidots.cloud', 'smtp.cloud', 'mqtt.cloud', 'coap.cloud', 'mqtt.ga
y', 'coap.gateway', 'coap.device', 'gateway', 'device']
['ConnectedDevicesConfig.props', '.gitignore']
Loading config: /home/raspberry/workspace/iot-device/config/ConnectedDevices
ig.props
Config: ['ubidots.cloud', 'smtp.cloud', 'mqtt.cloud', 'coap.cloud', 'mqtt.ga
y', 'coap.gateway', 'coap.device', 'gateway', 'device']
Starting the Adaptor daemon thread...
('Connecting to broker', 'things.ubidots.com')
('Attempting to connect to broker :', 'things.ubidots.com')
('Connected OK returned Code:', 0)
waiting for alarm
still
ALERT ::Topic is /v1.6/devices/sos/alert/lv-->1
waiting for alarm
^[zwaiting for alarm
ALERT ::Topic is /v1.6/devices/sos/alert/lv-->1
^Z


150.00
compasssensor
Description
Click here to add a description
API Label
compasssensor
ID
5cb767cec03f97565f87ce8d
Allowed range
min - max
Unit

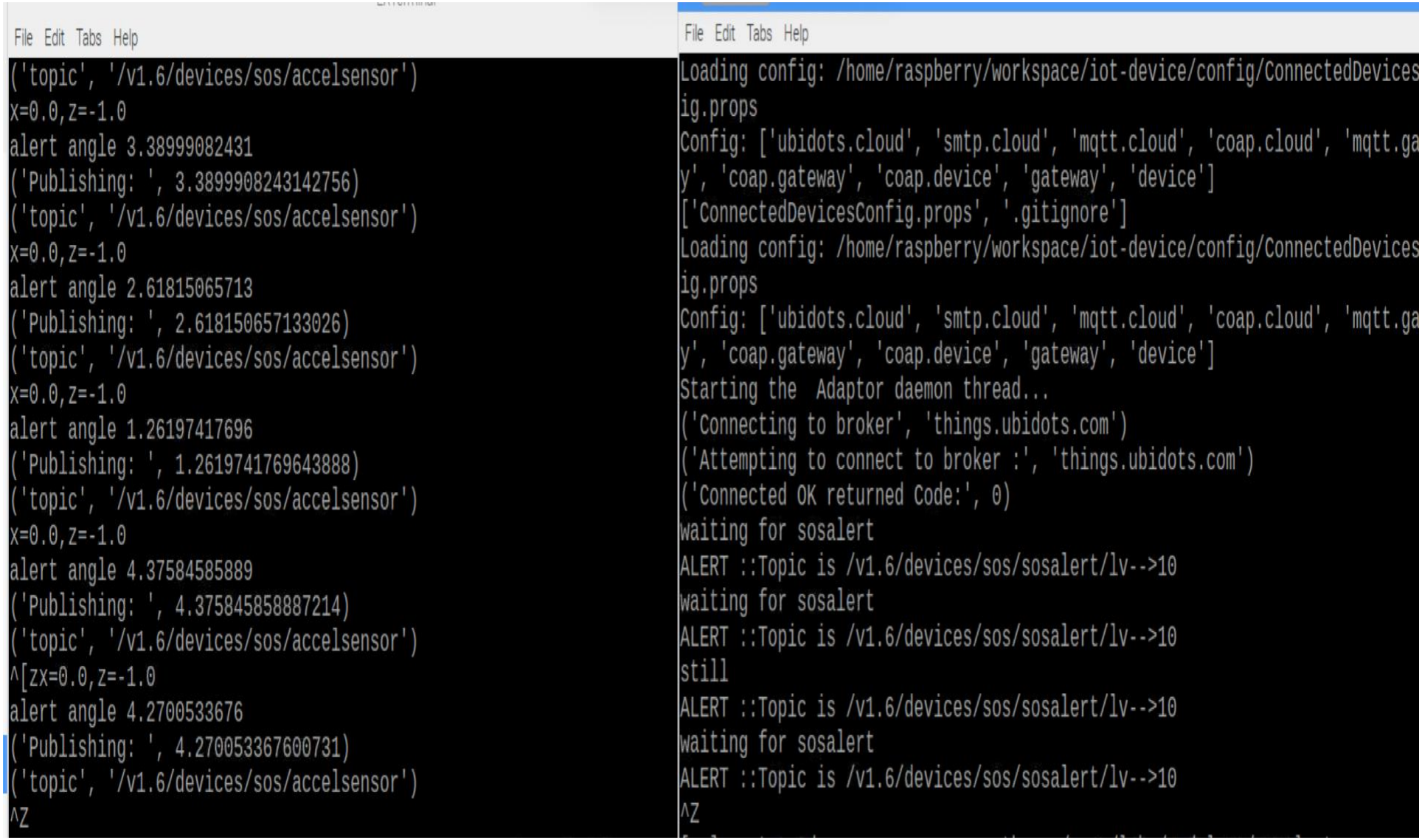
Tags
Add tag
Last Activity
200
190
180
170
160
150
21:15
21:30
21:45
22:00
22:15
22:30
22:45
23:00
23:15
Apr 19 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete

2019-04-19 23:24:46 -04:00	150.00	
2019-04-19 23:24:45 -04:00	150.00	
2019-04-19 23:24:45 -04:00	150.00	
2019-04-19 23:24:44 -04:00	150.00	
2019-04-19 23:24:43 -04:00	150.00	
2019-04-19 23:24:42 -04:00	150.00	
2019-04-19 23:24:41 -04:00	200.00	
2019-04-19 23:24:40 -04:00	200.00	
2019-04-19 23:24:39 -04:00	200.00	
2019-04-19 23:24:38 -04:00	200.00	
2019-04-19 23:24:37 -04:00	200.00	
2019-04-19 23:24:36 -04:00	200.00	


Tags
Add tag
Last Activity
15 minutes ago
Apr 19 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete
2019-04-19 21:22:31 -04:00
0.00
2019-04-19 21:17:37 -04:00
1.00
2019-04-19 21:17:23 -04:00
0.00
2019-04-19 21:13:26 -04:00
1.00
2019-04-19 21:08:41 -04:00
0.00
2019-04-19 21:08:06 -04:00
1.00
2019-04-19 21:02:27 -04:00
0.00
2019-04-19 21:02:26 -04:00
1.00
Show 50 rows
ass-maze-....py
ActuatorAdaptor.py
compass-maze-....py
SensorManagm....py
MqttClientConn....py

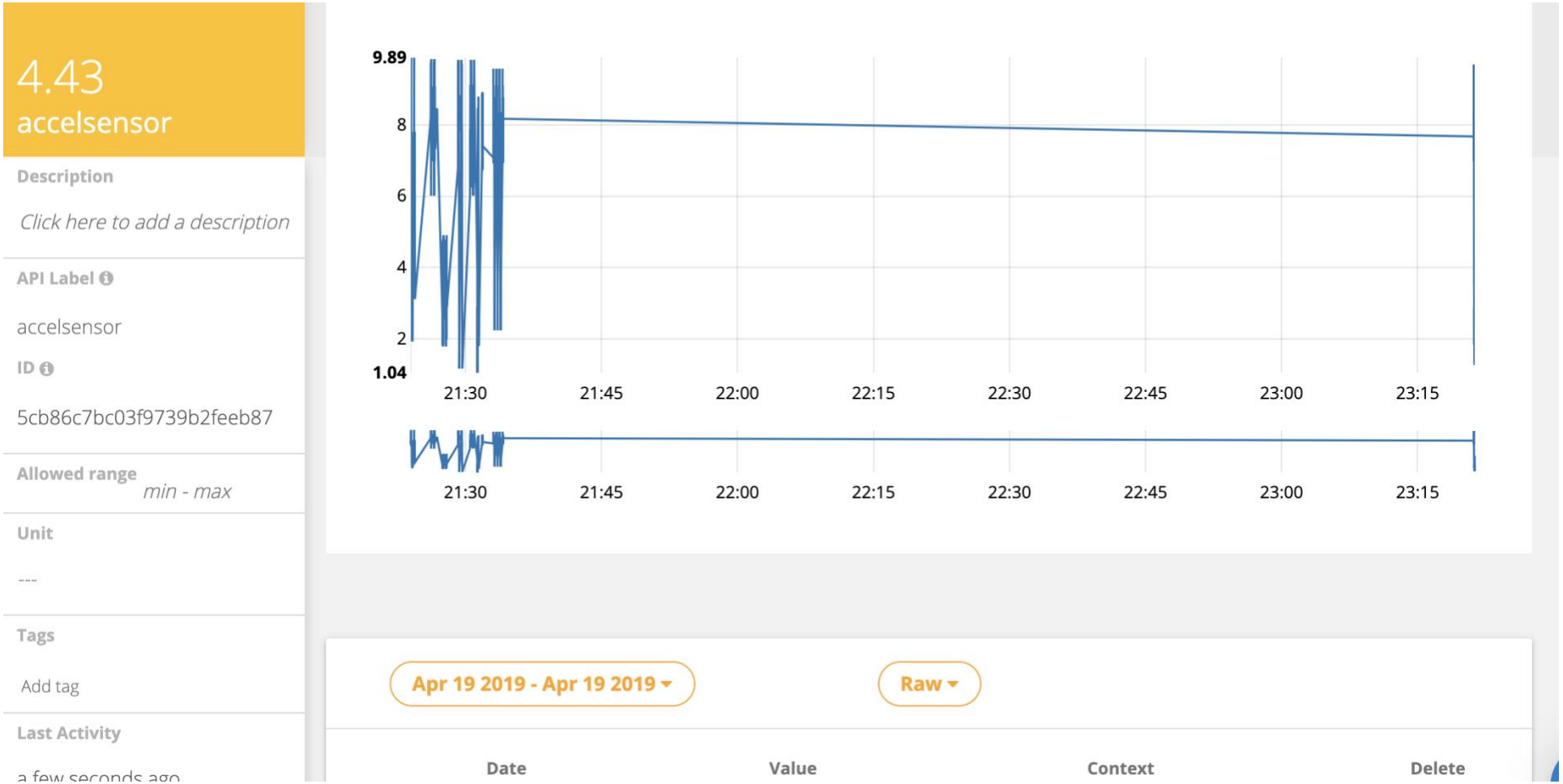

1–50 of 192
96
me SOS Alert - Contact Immediately 9:24 PM
me Attempt to open Safe : Burglar Alert - Please call security 9:21 PM
me Attempt to open Safe : Burglar Alert - Please call security 9:17 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:14 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:13 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:13 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:13 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:13 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:08 PM
me Attemp to open Safe : Burglur Alert - Please call security 9:08 PM

Application Output for SOS APP in python



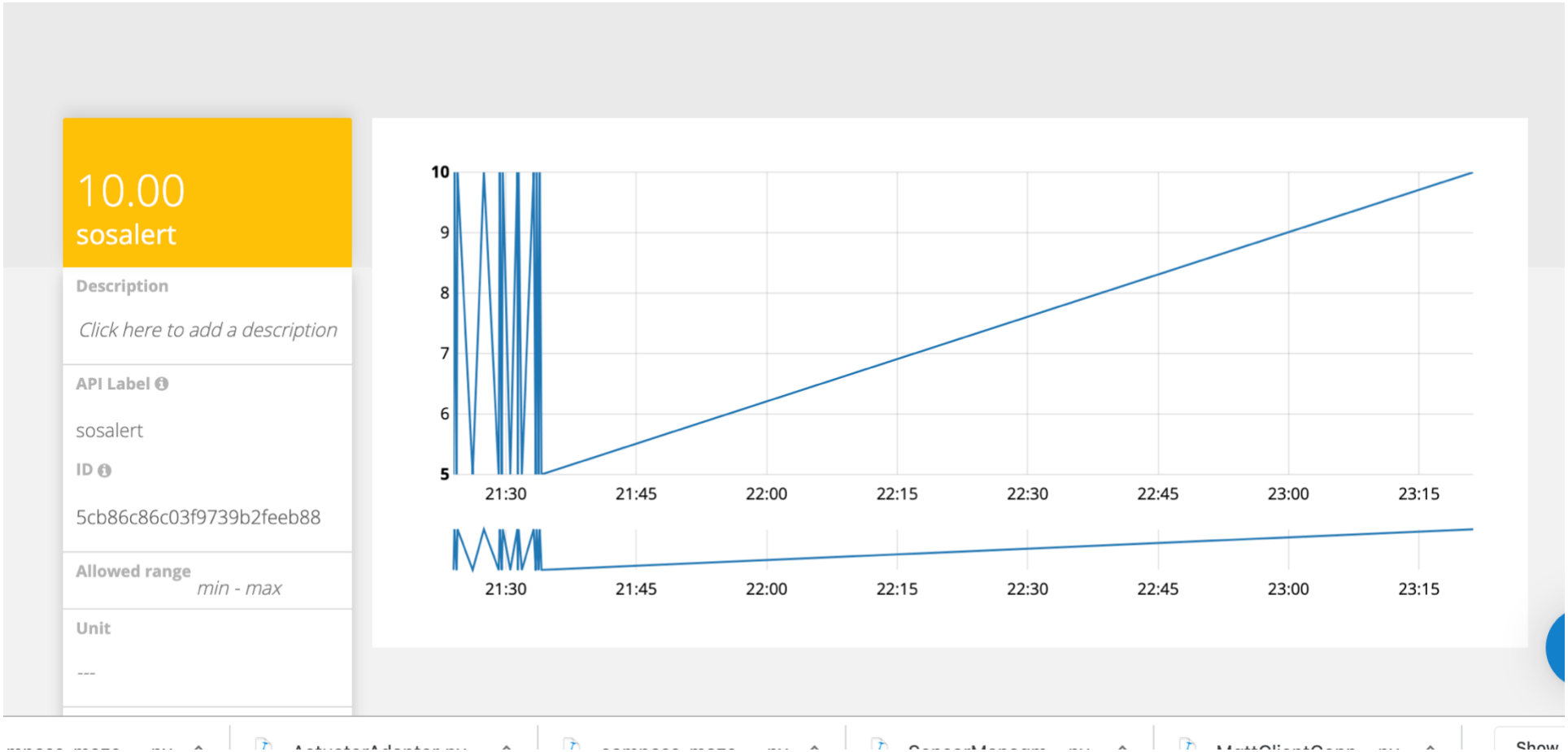
```
File  Edit  Tabs  Help
('topic', '/v1.6/devices/sos/accelsensor')
x=0.0,z=-1.0
alert angle 3.38999082431
('Publishing: ', 3.3899908243142756)
('topic', '/v1.6/devices/sos/accelsensor')
x=0.0,z=-1.0
alert angle 2.61815065713
('Publishing: ', 2.618150657133026)
('topic', '/v1.6/devices/sos/accelsensor')
x=0.0,z=-1.0
alert angle 1.26197417696
('Publishing: ', 1.2619741769643888)
('topic', '/v1.6/devices/sos/accelsensor')
x=0.0,z=-1.0
alert angle 4.37584585889
('Publishing: ', 4.375845858887214)
('topic', '/v1.6/devices/sos/accelsensor')
^[zx=0.0,z=-1.0
alert angle 4.2700533676
('Publishing: ', 4.270053367600731)
('topic', '/v1.6/devices/sos/accelsensor')
^Z
```

```
File  Edit  Tabs  Help
Loading config: /home/raspberry/workspace/iot-device/config/ConnectedDevices
ig.props
Config: ['ubidots.cloud', 'smtp.cloud', 'mqtt.cloud', 'coap.cloud', 'mqtt.ga
y', 'coap.gateway', 'coap.device', 'gateway', 'device']
['ConnectedDevicesConfig.props', '.gitignore']
Loading config: /home/raspberry/workspace/iot-device/config/ConnectedDevices
ig.props
Config: ['ubidots.cloud', 'smtp.cloud', 'mqtt.cloud', 'coap.cloud', 'mqtt.ga
y', 'coap.gateway', 'coap.device', 'gateway', 'device']
Starting the  Adaptor daemon thread...
('Connecting to broker', 'things.ubidots.com')
('Attempting to connect to broker :', 'things.ubidots.com')
('Connected OK returned Code:', 0)
waiting for sosalert
ALERT ::Topic is /v1.6/devices/sos/sosalert/lv-->10
waiting for sosalert
ALERT ::Topic is /v1.6/devices/sos/sosalert/lv-->10
still
ALERT ::Topic is /v1.6/devices/sos/sosalert/lv-->10
waiting for sosalert
ALERT ::Topic is /v1.6/devices/sos/sosalert/lv-->10
^Z
```


4.43
accelsensor
Description
Click here to add a description
API Label
accelsensor
ID
5cb86c7bc03f9739b2feeb87
Allowed range
min - max
Unit

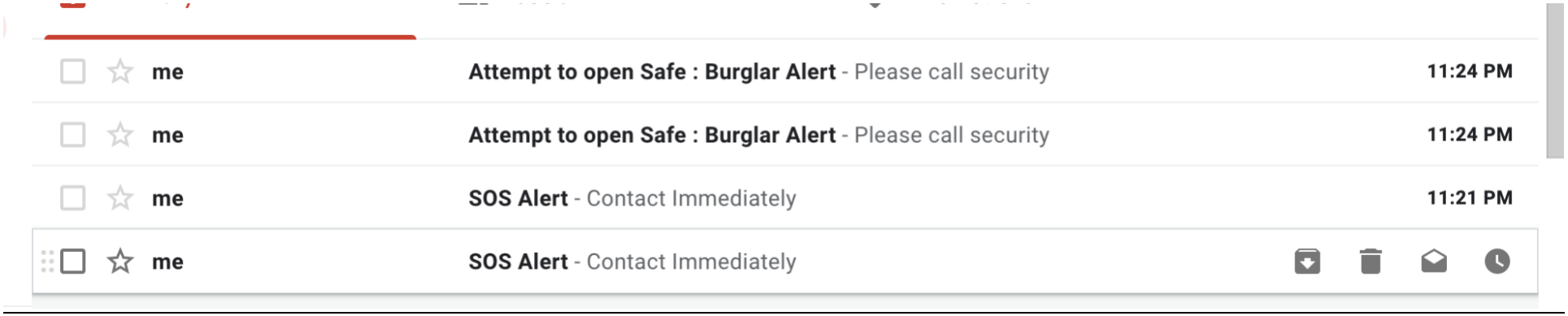
Tags
Add tag
Last Activity
a few seconds ago
9.89
8
6
4
2
1.04
21:30
21:45
22:00
22:15
22:30
22:45
23:00
23:15
Apr 19 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete

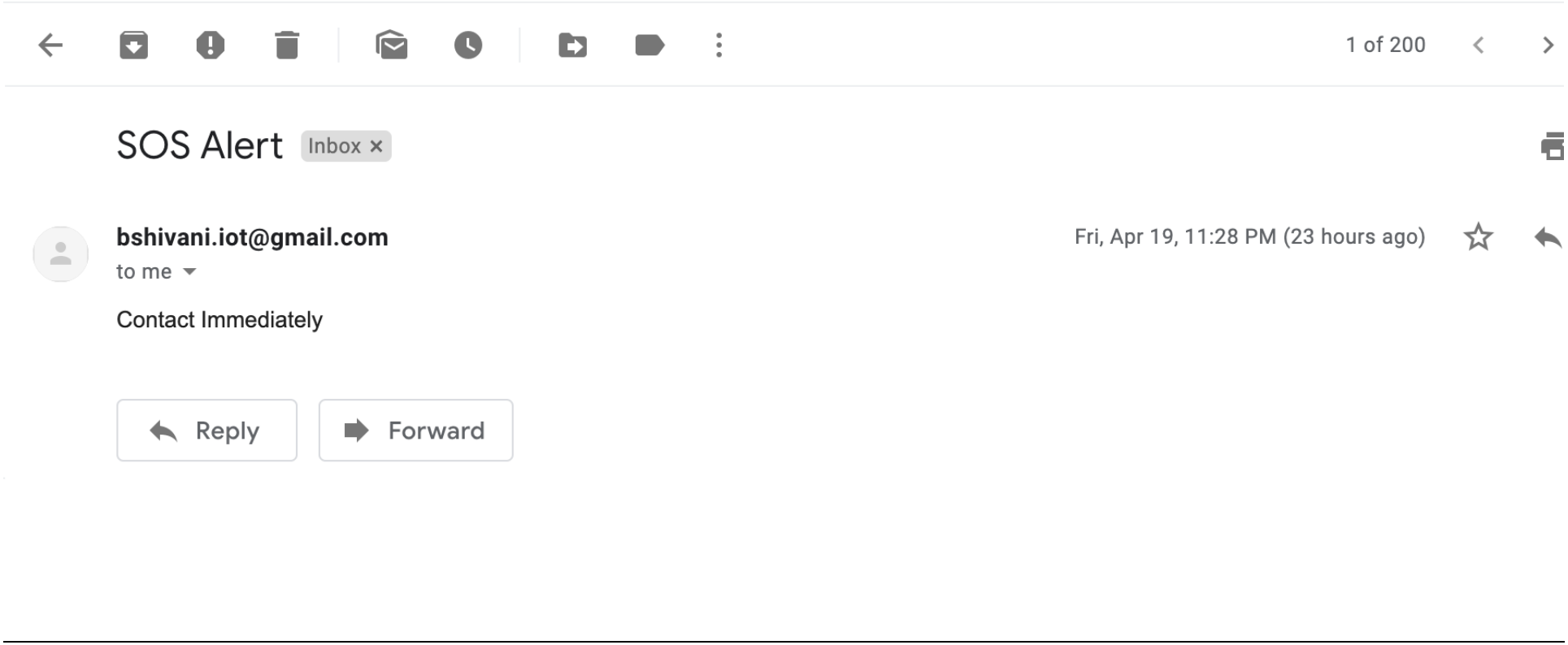
Date	Value	Context	Delete
2019-04-19 23:21:17 -04:00	4.43		
2019-04-19 23:21:16 -04:00	1.27		
2019-04-19 23:21:15 -04:00	3.07		
2019-04-19 23:21:15 -04:00	1.68		
2019-04-19 23:21:14 -04:00	2.87		
2019-04-19 23:21:14 -04:00	1.83		
2019-04-19 23:21:13 -04:00	3.49		
2019-04-19 23:21:13 -04:00	3.53		
2019-04-19 23:21:12 -04:00	6.31		
2019-04-19 23:21:12 -04:00	9.70		


10.00
sosalert
Description
Click here to add a description
API Label
sosalert
ID
5cb86c86c03f9739b2feeb88
Allowed range
min - max
Unit

10
9
8
7
6
5
21:30
21:45
22:00
22:15
22:30
22:45
23:00
23:15
21:30
21:45
22:00
22:15
22:30
22:45
23:00
23:15

Date	Value	Context	Delete
2019-04-19 23:21:17 -04:00	4.43		
2019-04-19 23:21:16 -04:00	1.27		
2019-04-19 23:21:15 -04:00	3.07		
2019-04-19 23:21:15 -04:00	1.68		
2019-04-19 23:21:14 -04:00	2.87		
2019-04-19 23:21:14 -04:00	1.83		
2019-04-19 23:21:13 -04:00	3.49		
2019-04-19 23:21:13 -04:00	3.53		
2019-04-19 23:21:12 -04:00	6.31		
2019-04-19 23:21:12 -04:00	9.70		


me
Attempt to open Safe : Burglar Alert - Please call security
11:24 PM
me
Attempt to open Safe : Burglar Alert - Please call security
11:24 PM
me
SOS Alert - Contact Immediately
11:21 PM
me
SOS Alert - Contact Immediately


1 of 200
SOS Alert
Inbox ×
bshivani.iot@gmail.com
to me
Fri, Apr 19, 11:28 PM (23 hours ago)
Contact Immediately
Reply
Forward