



Potamo team

App and Network
deployment to allow
messaging in crisis



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Agenda →

Problem definition

Timeline

What is MQTT

Our solution

Conclusion



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Problem definition →



The behavioral health of individuals and communities depends on their ability to prevent disasters and traumatic events, to respond to them, and to recover from them.





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Problem definition →

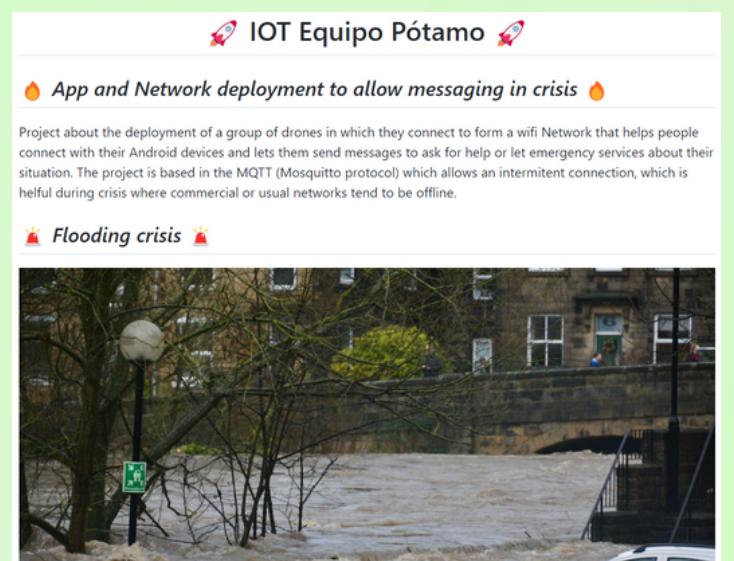


Floods, earthquakes and other
natural disasters
continue to affect on Mexican
and Brazilian people.

Timeline



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```
message read
color: 1, lat: 19.2720020939478, lon: -99.18331722278507
message read
color: 1, lat: 19.291824592121973, lon: -99.10242651088011
message read
color: 3, lat: 19.285326733827556, lon: -99.1042128316554
message read
color: 3, lat: 19.287560484835174, lon: -99.10613183444456
message read
color: 3, lat: 19.29284656248598, lon: -99.1039133326972
message read
color: 1, lat: 19.272778844460918, lon: -99.11003383415417
message read
color: 1, lat: 19.289992721128264, lon: -99.107193099278327
message read
color: 3, lat: 19.2846495601749, lon: -99.18978114658502
message read
color: 3, lat: 19.279406786775837, lon: -99.11435428239256
message read
color: 2, lat: 19.272801423922928, lon: -99.103874702339329
message read
color: 2, lat: 19.279142849330566, lon: -99.103948919781717
message read
color: 2, lat: 19.2715070997280539, lon: -99.11317170092532
message read
color: 3, lat: 19.2715070997280539, lon: -99.11317170092532
message read
color: 3, lat: 19.294562097380189, lon: -99.11826099635543
message read
color: 3, lat: 19.27882330209207, lon: -99.1091699525242
<C
root@iot-linux:/home/iot/mqtt/events# node sub.js
Connected to mqtt broker
Database ok!
message read
color: 3, lat: 19.289375795649484, lon: -99.11380338942793
message read
color: 3, lat: 19.276093794249706, lon: -99.12097191099071
```



```
color: 3, lat: 19.29005043754724, lon: -99.1066436183831
data saved!
message read
color: 2, lat: 19.27872655593207, lon: -99.12014364886459
data saved!
data saved!
message read
color: 3, lat: 19.2873976510993684, lon: -99.1226614721871
data saved!
data saved!
message read
color: 3, lat: 19.28881593600367, lon: -99.1226614721871
data saved!
data saved!
message read
color: 1, lat: 19.29736438806256, lon: -99.16764135773564
data saved!
message read
color: 1, lat: 19.29647545841874, lon: -99.11282639569363
data saved!
data saved!
message read
color: 1, lat: 19.28267468316333, lon: -99.16292716375001
data saved!
data saved!
message read
color: 2, lat: 19.27064093299984, lon: -99.10529878247802
data saved!
data saved!
message read
color: 1, lat: 19.27400230076737, lon: -99.1096641436262
data saved!
data saved!
message read
color: 1, lat: 19.279888281356804, lon: -99.10541431715515
data saved!
data saved!
message read
color: 2, lat: 19.297027612368055, lon: -99.11478750627163
data saved!
data saved!
message read
color: 1, lat: 19.272184687876347, lon: -99.11584544886613
data saved!
data saved!
message read
color: 3, lat: 19.28721353619204, lon: -99.10212043969398
data saved!
data saved!
color: 2, lat: 19.29608922494314, lon: -99.1216331787159
data saved!
message read
color: 1, lat: 19.277391879446197, lon: -99.10789266259581
```

1st Sprint

Get to know each other,
generate Github repository
and create Readme

2nd Sprint

implementation of the
android client and broker

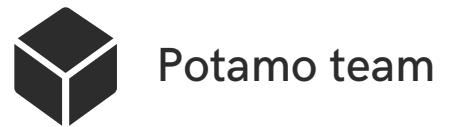
3rd Sprint

Broker in cloud, SQL and
Grafana dashboard

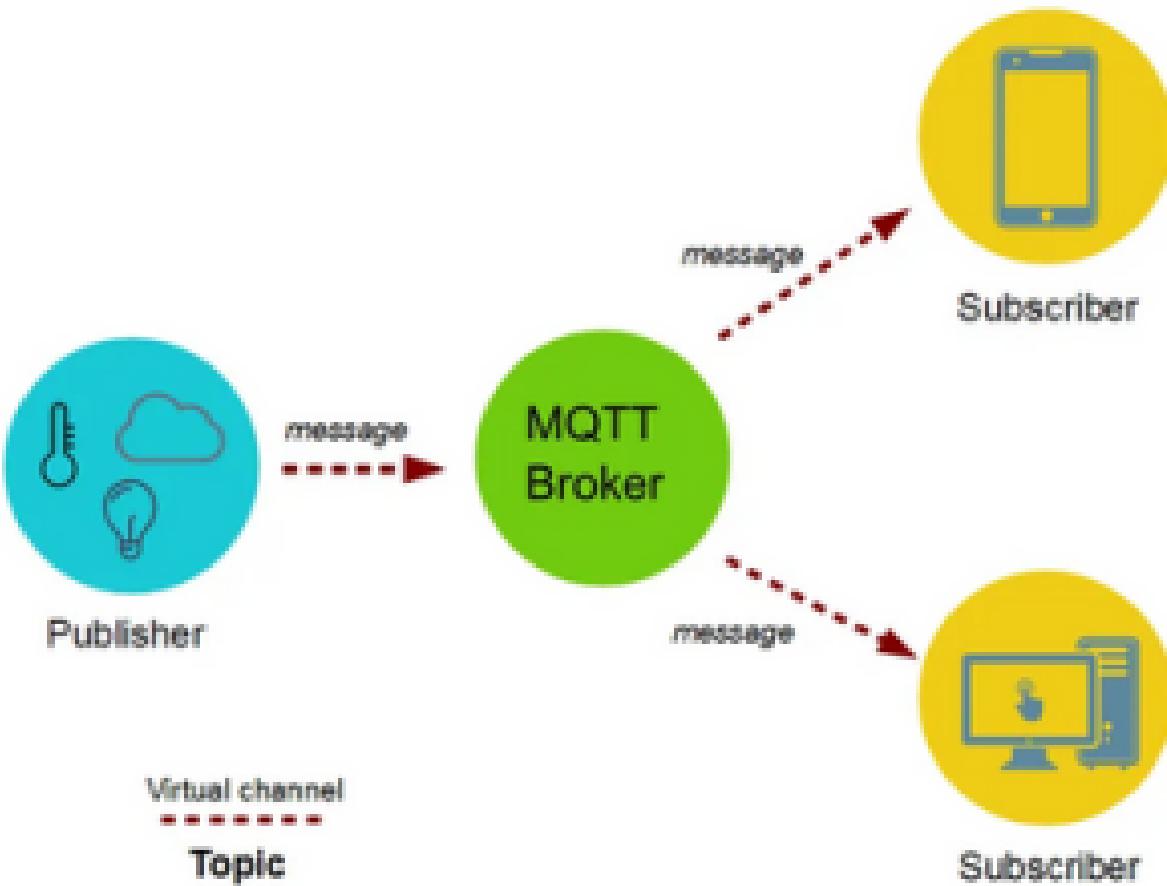
Presentation

System functionality
presented to stakeholders

What is MQTT?



- Machine to Machine protocol(M2M)
- Message-based and extraordinarily lightweight
- Supported by the majority of IoT platforms
- Uses publish-subscribe paradigm unlike HTTP
- Is an asynchronous protocol.
- The broker is a critical component in MQTT



Our Solution



Project about the deployment of a group of drones in which they connect to form a wifi Network that helps people connect with their Android devices and let them send messages to ask for help or let emergency services about their situation. The project is based in the MQTT (Mosquitto protocol) which allows an intermittent connection, which is helpful during crisis where commercial or usual networks tend to be offline.

Our Solution



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The screenshot shows a terminal window with two panes. The left pane displays log messages from a MQTT subscriber client, while the right pane shows log messages from a publisher client. Both clients are connected to a local MQTT broker running on port 1884.

Left Pane (Subscriber Client Log):

```
^[[B
1669078732: Received PINGREQ from iot-linux.local_to_remote
1669078732: Sending PINGRESP to iot-linux.local_to_remote
1669078737: New connection from 201.75.166.152 on port 1884.
1669078737: New client connected from 201.75.166.152 as python-mqtt-50 (c1, k60, u's1').
1669078737: Sending CONNACK to python-mqtt-50 (0, 0)
1669078737: Received SUBSCRIBE from python-mqtt-50
1669078737:     srv/temperature (QoS 0)
1669078737: python-mqtt-50 0 srv/temperature
1669078737: Sending SUBACK to python-mqtt-50
1669078784: Received PUBLISH from iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078784: Sending PUBLISH to python-mqtt-50 (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078792: Received PUBLISH from iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078792: Sending PUBLISH to python-mqtt-50 (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078792: Received PINGREQ from iot-linux.local_to_remote
1669078792: Sending PINGRESP to iot-linux.local_to_remote
1669078798: Received PINGREQ from python-mqtt-50
1669078798: Sending PINGRESP to python-mqtt-50
1669078800: Received PUBLISH from iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078800: Sending PUBLISH to python-mqtt-50 (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078808: Received PUBLISH from iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (36 bytes))
1669078808: Sending PUBLISH to python-mqtt-50 (d0, q0, r0, m0, 'srv/temperature', ... (36 bytes))
```

Right Pane (Publisher Client Log):

```
1669078673: Connecting bridge local_to_remote (127.0.0.1:1884)
1669078673: Bridge iot-linux.local_to_remote sending CONNECT
1669078673: Received CONNACK on connection local.iot-linux.local_to_remote.
1669078673: Bridge local.iot-linux.local_to_remote sending SUBSCRIBE (Mid: 2, Topic: #, QoS: 0)
1669078673: Received PUBACK from local.iot-linux.local_to_remote (Mid: 1)
1669078673: Received SUBACK from local.iot-linux.local_to_remote
^[[1;5D
1669078732: Sending PINGREQ to local.iot-linux.local_to_remote
1669078732: Received PINGRESP from local.iot-linux.local_to_remote
1669078783: New connection from 201.75.166.152 on port 1883.
1669078783: New client connected from 201.75.166.152 as python-mqtt-111 (c1, k60).
1669078783: Sending CONNACK to python-mqtt-111 (0, 0)
1669078784: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078784: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078792: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078792: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078792: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078792: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (33 bytes))
1669078798: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078798: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078800: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078800: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (35 bytes))
1669078808: Received PUBLISH from python-mqtt-111 (d0, q0, r0, m0, 'srv/temperature', ... (36 bytes))
1669078808: Sending PUBLISH to local.iot-linux.local_to_remote (d0, q0, r0, m0, 'srv/temperature', ... (36 bytes))
```

Bottom Left (Terminal Prompt):

```
(.env) samuel@nebuchadnezzar:~/Projects/IOT/python_client$ python3 mqtt_subscriber.py 4.228.89.17 1884
python3: can't open file 'mqtt_subscriber.py': [Errno 2] No such file or directory
(.env) samuel@nebuchadnezzar:~/Projects/IOT/python_client$ python3 mqtt_subscribe.py 4.228.89.17 1884
Connected to MQTT Broker!
Received `{"msg": "Help!", "loc": "(38, 45)}` from topic `srv/temperature` topic
Received `{"msg": "Help!", "loc": "(2, 3)`}` from topic `srv/temperature` topic
Received `{"msg": "Help!", "loc": "(39, 72)`}` from topic `srv/temperature` topic
Received `{"msg": "Help!", "loc": "(43, -17)`}` from topic `srv/temperature` topic
```

Bottom Right (Terminal Prompt):

```
(.env) samuel@nebuchadnezzar:~/Projects/IOT/python_client$ python3 mqtt_publish.py 4.228.89.17 1883
Connected to MQTT Broker!
Sent `{"msg": "Help!", "loc": "(38, 45)"}` to topic `srv/temperature`
Sent `{"msg": "Help!", "loc": "(2, 3)"}` to topic `srv/temperature`
Sent `{"msg": "Help!", "loc": "(39, 72)"}` to topic `srv/temperature`
Sent `{"msg": "Help!", "loc": "(43, -17)"}` to topic `srv/temperature`
```

Our Solution



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Broker

Our Solution

Publisher



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```
data saved!
message read
color: 3, lat: 19.29847545841874, lon: -99.11282639569363
data saved!
message read
color: 1, lat: 19.28267480316333, lon: -99.10292716375001
data saved!
message read
color: 2, lat: 19.270640493299084, lon: -99.10529078247802
data saved!
message read
color: 1, lat: 19.27469230076737, lon: -99.1096641436262
data saved!
message read
color: 1, lat: 19.279888281356804, lon: -99.10541431715515
data saved!
message read
color: 2, lat: 19.297027612368055, lon: -99.11478750027163
data saved!
message read
color: 1, lat: 19.272184087876347, lon: -99.11584544806013
data saved!
message read
color: 3, lat: 19.28721353619284, lon: -99.10212043989398
data saved!
message read
color: 2, lat: 19.29680922494314, lon: -99.1216331707159
data saved!
message read
color: 1, lat: 19.277391079446197, lon: -99.10789266259981
data saved!
^Xmessage read
color: 1, lat: 19.280716289746856, lon: -99.11011888240792
data saved!
message read
color: 3, lat: 19.296521033178276, lon: -99.11865204304897
data saved!
message read
color: 2, lat: 19.278981854983442, lon: -99.10599742057974
data saved!
^X^C
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# ^C
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT#
```

Our Solution



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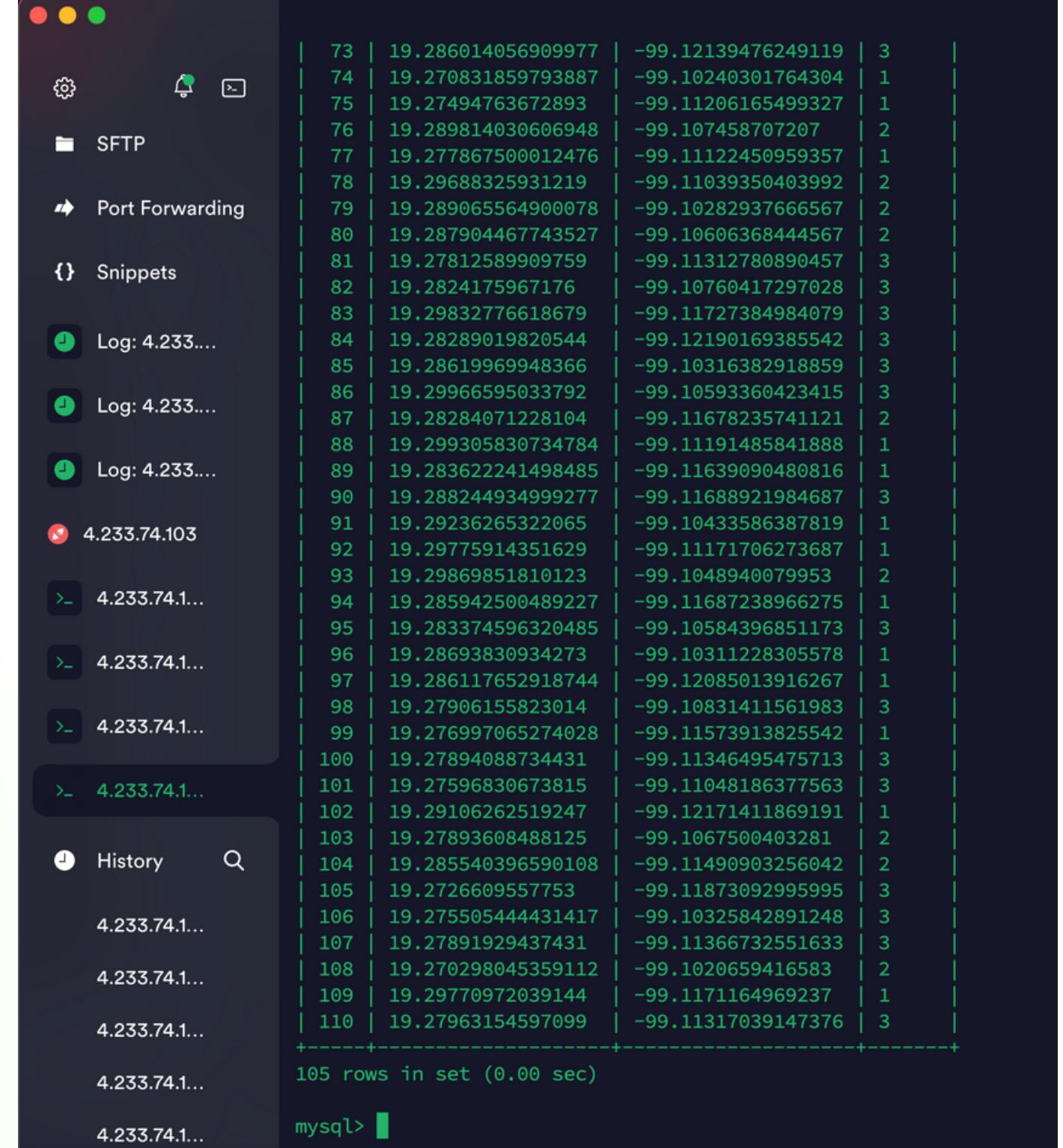
Subscriber

The screenshot shows a terminal window with a dark theme. On the left, there's a sidebar with icons for Hosts, SFTP, Port Forwarding, Snippets, and a list of hosts: 4.233.74.103 (1), 4.233.74.103 (2), and 4.233.74.103 (3). Below the hosts is a History section with entries for 4.233.74.103 and 4.233.74.103. The main pane displays a log of MQTT messages. The log starts with some directory navigation and file listing commands. It then shows the execution of a Node.js script named 'sub.js' which connects to an MQTT broker. The script reads data from the broker and saves it to a database. The log entries include timestamped messages like 'message read', 'color: 3, lat: 19.292633765908096, lon: -99.11230758749969', and 'data saved!'. There are also error messages such as 'node: /lib/x86_64-linux-gnu/libm.so.6: version `GLIBC_2.27' not found (required by node)' and 'node: /lib/x86_64-linux-gnu/libc.so.6: version `GLIBC_2.25' not found (required by node)'.

```
events.sql grafana
root@iot-linux:/home/iot/eventsDB# cd /home/iot/mqtt/eventsDB/NodeMQTT/
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# ls
broker.js  node_modules  package.json  package-lock.json  pub.js  readme.md  sub.js
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# ls
broker.js  node_modules  package.json  package-lock.json  pub.js  readme.md  sub.js
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# sub.js
sub.js: command not found
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# node sub.js
node: /lib/x86_64-linux-gnu/libm.so.6: version `GLIBC_2.27' not found (required by node)
node: /lib/x86_64-linux-gnu/libc.so.6: version `GLIBC_2.25' not found (required by node)
node: /lib/x86_64-linux-gnu/libc.so.6: version `GLIBC_2.28' not found (required by node)
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# nvm install 16
v16.18.1 is already installed.
Now using node v16.18.1 (npm v8.19.2)
root@iot-linux:/home/iot/mqtt/eventsDB/NodeMQTT# node sub.js
Connected to mqtt broker
Database ok!
message read
color: 3, lat: 19.292633765908096, lon: -99.11230758749969
data saved!
message read
color: 1, lat: 19.271892772978447, lon: -99.12171098228382
data saved!
message read
color: 2, lat: 19.27107405401362, lon: -99.10950684058928
data saved!
message read
color: 3, lat: 19.29005043754724, lon: -99.1086436183031
data saved!
message read
color: 2, lat: 19.270726855353207, lon: -99.12014304886459
data saved!
message read
color: 3, lat: 19.287307651093684, lon: -99.11279858212141
data saved!
message read
color: 3, lat: 19.278881593600367, lon: -99.1216614721071
data saved!
message read
color: 1, lat: 19.29716418280256, lon: -99.10780735273654
data saved!
message read
```

Our Solution

SQL



```
73 | 19.286014056909977 | -99.12139476249119 | 3
74 | 19.270831859793887 | -99.10240301764304 | 1
75 | 19.27494763672893 | -99.11206165499327 | 1
76 | 19.289814030606948 | -99.107458707207 | 2
77 | 19.277867500012476 | -99.11122450959357 | 1
78 | 19.29688325931219 | -99.11039350403992 | 2
79 | 19.289065564900078 | -99.10282937666567 | 2
80 | 19.287904467743527 | -99.10606368444567 | 2
81 | 19.27812589909759 | -99.11312780890457 | 3
82 | 19.2824175967176 | -99.10760417297028 | 3
83 | 19.29832776618679 | -99.11727384984079 | 3
84 | 19.28289019820544 | -99.12190169385542 | 3
85 | 19.28619969948366 | -99.10316382918859 | 3
86 | 19.29966595033792 | -99.10593360423415 | 3
87 | 19.28284071228104 | -99.11678235741121 | 2
88 | 19.299305830734784 | -99.11191485841888 | 1
89 | 19.283622241498485 | -99.11639090480816 | 1
90 | 19.288244934999277 | -99.11688921984687 | 3
91 | 19.29236265322065 | -99.10433586387819 | 1
92 | 19.29775914351629 | -99.11171706273687 | 1
93 | 19.29869851810123 | -99.1048940079953 | 2
94 | 19.285942500489227 | -99.11687238966275 | 1
95 | 19.283374596320485 | -99.10584396851173 | 3
96 | 19.28693830934273 | -99.10311228305578 | 1
97 | 19.286117652918744 | -99.12085013916267 | 1
98 | 19.27906155823014 | -99.10831411561983 | 3
99 | 19.276997065274028 | -99.11573913825542 | 1
100 | 19.27894088734431 | -99.11346495475713 | 3
101 | 19.27596830673815 | -99.11048186377563 | 3
102 | 19.29106262519247 | -99.12171411869191 | 1
103 | 19.27893608488125 | -99.1067500403281 | 2
104 | 19.285540396590108 | -99.11490903256042 | 2
105 | 19.2726609557753 | -99.11873092995995 | 3
106 | 19.275505444431417 | -99.10325842891248 | 3
107 | 19.27891929437431 | -99.11366732551633 | 3
108 | 19.270298045359112 | -99.1020659416583 | 2
109 | 19.29770972039144 | -99.1171164969237 | 1
110 | 19.27963154597099 | -99.11317039147376 | 3
+-----+
105 rows in set (0.00 sec)

mysql> 4.233.74.1...
4.233.74.1...
4.233.74.1...
4.233.74.1...
```



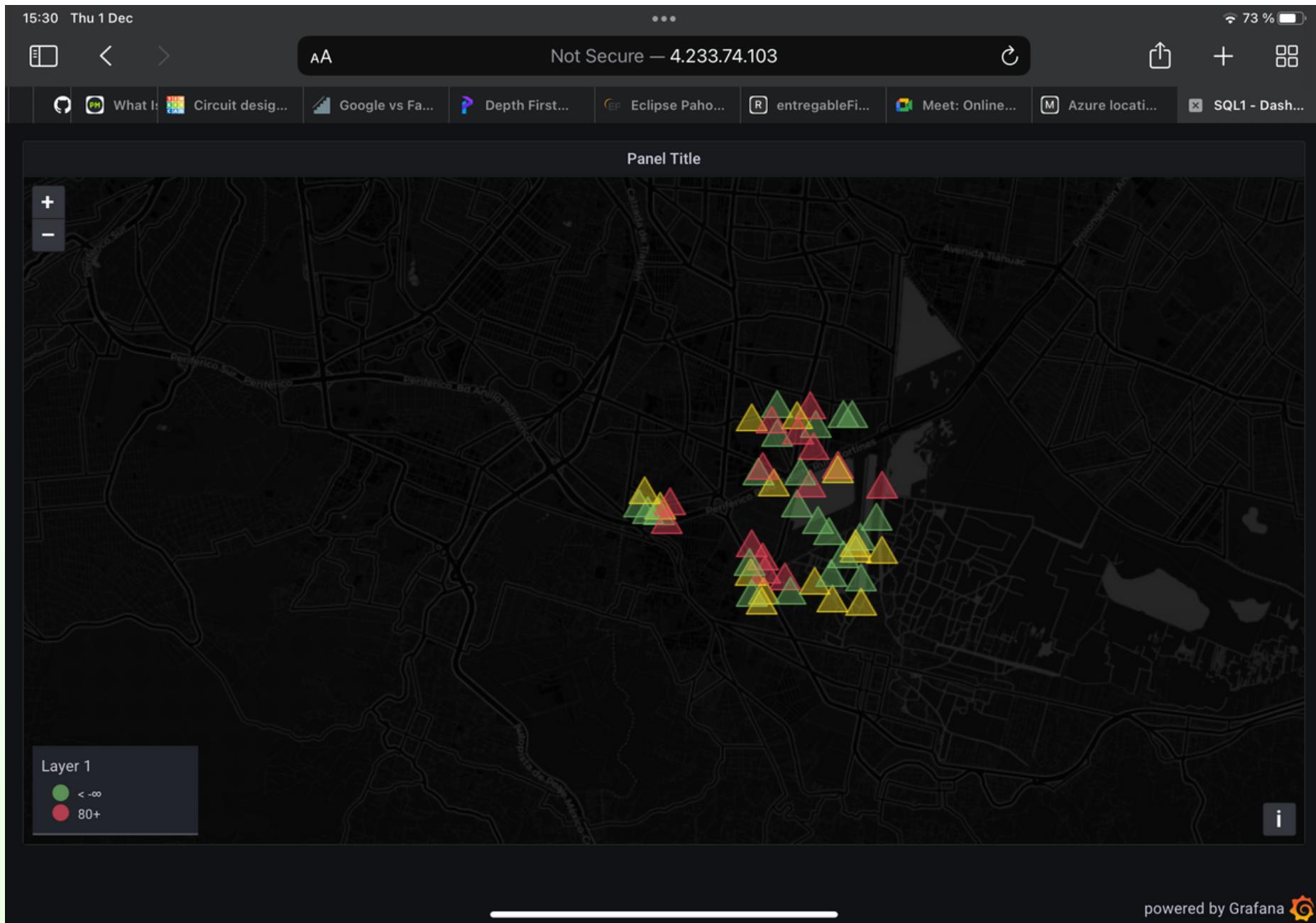
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Our Solution

Public Dashboard



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<http://4.233.74.103/public-dashboards/9219f52dfa4a17a4ddb643013dd3e2>

The Team →

[Back to Agenda Page](#)

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Thank you for your time!
Reach out to us for questions.