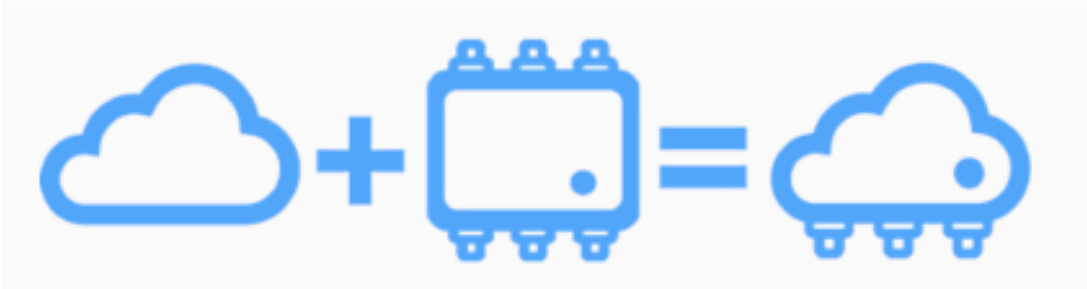
IOT Internet Of Things



GEDA :Grupo de electrónica digital aplicada

ITBA
INSTITUTO TECNOLOGICO DE BUENOS AIRES
·UNIVERSIDAD PRIVADA·

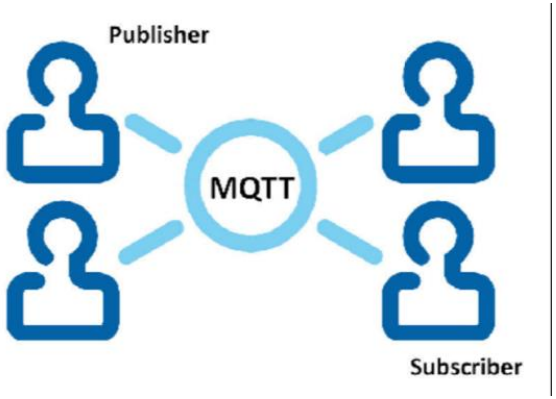
ESP8266 – Ready to use Modules

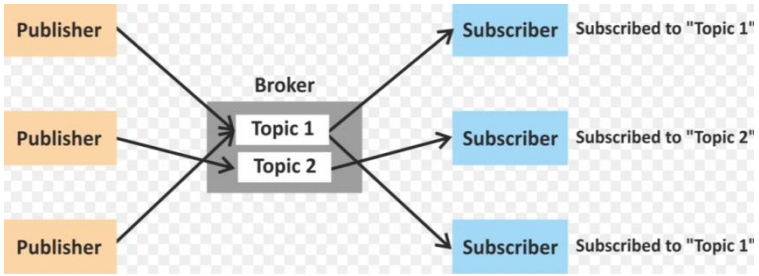
ESP8266 – Ready to use Modules

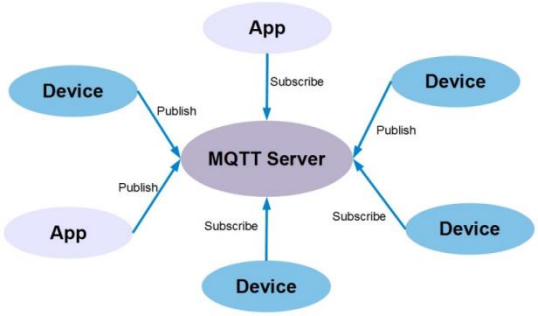
IOT Hardware

Como Habla IOT ?

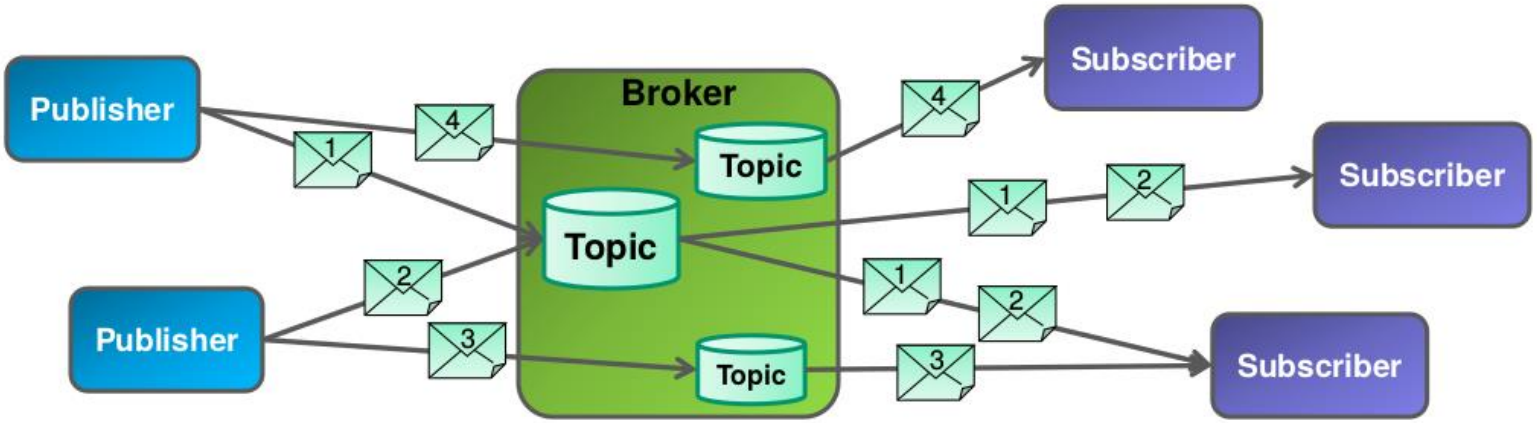
MQTT: Message Queue Telemetry Transport protocolo ideado por IBM y enfocado a la conectividad Machine-to-Machine (M2M)







The publish & subscribe game

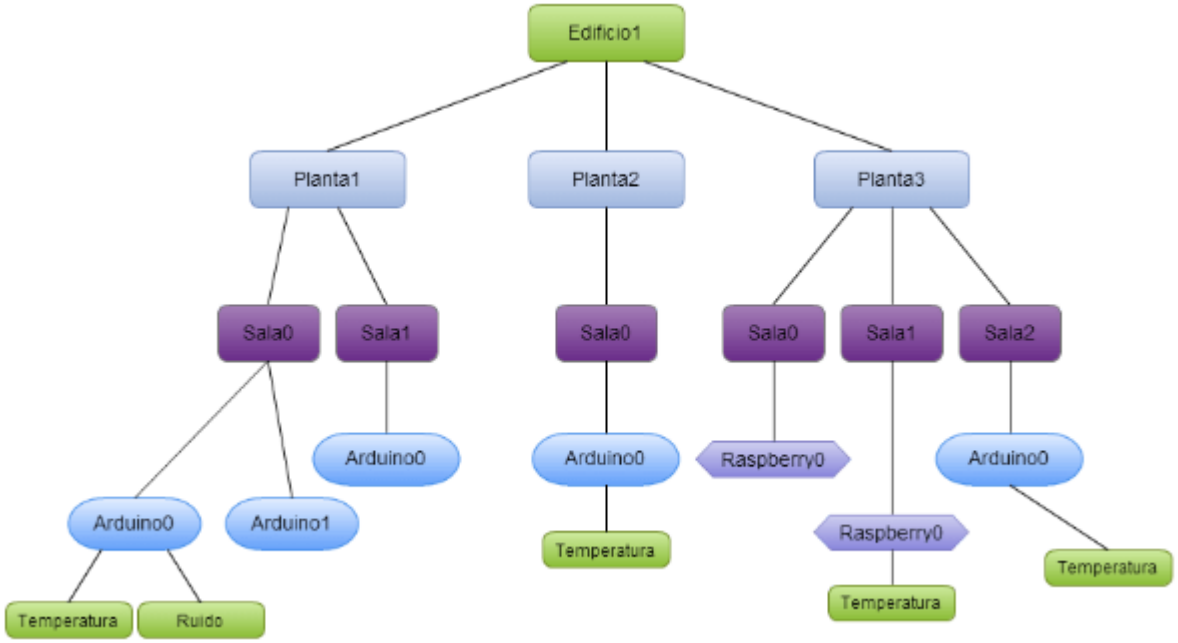


Mosquitto

An Open Source MQTT v3.1/v3.1.1 Broker

https://mosquitto.org/download/

Topicos



(“edificio1/planta2/sala0/arduino0/temperatura”)
o a varios (“edificio1/planta2/#”).

Test Moquitto installation

Mosquitto

An Open Source MQTT v3.1/v3.1.1 Broker

Open cmd window 1 Start Broker

```
> mosquitto
```

Open cmd window 2 Subscribe (“#” Listen to anything)

```
> mosquitto_sub -v -t "#"
untopico suvalor
```

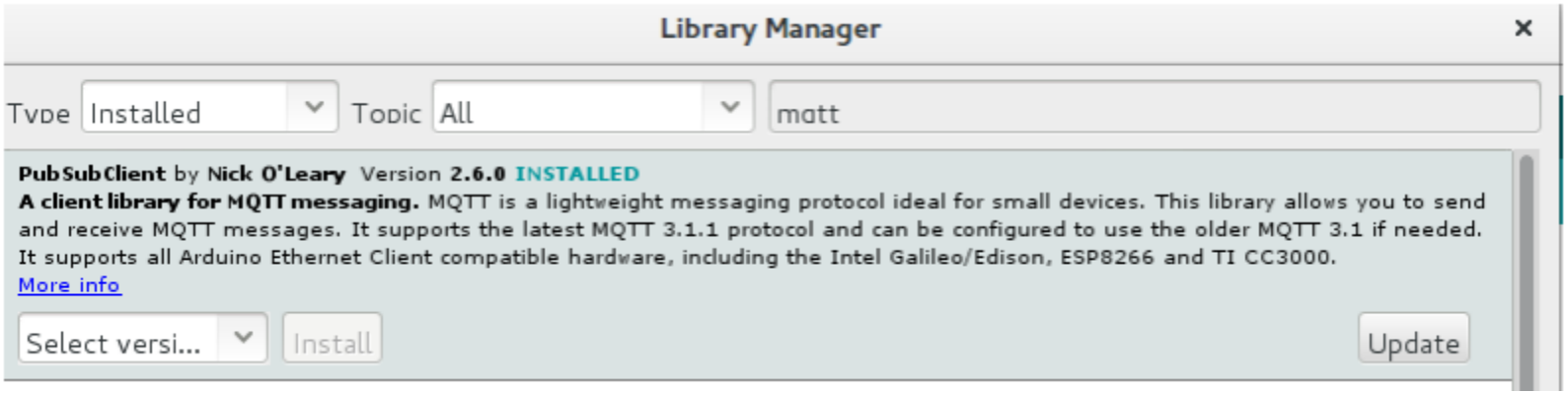
You Will see

Open cmd window 3 Publish

```
> mosquitto_pub -h localhost -t “untopico" -m “suvalor”
```

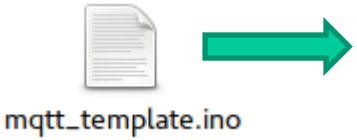
Testing MQTT Template

1- Install MQTT library for ESP8266 (if not already installed)



Testing MQTT Template

2- Open MQTT template sketch and change credentials




```
// WiFi credentials

char ssid[] = "my_router_ssid";
char password[] = "my_router password";    // Set password to "" for open networks
```

3- And Broker info

```
//============================================
#if CLOUD==CLOUD_DANY

IPAddress MqttServer(192,168,0,126);                // MQTT server URL or IP
const unsigned int MqttPort=1883;                   // MQTT port (default 1883)
const char MqttUser[]="itba.jacoby@gmail.com";      // user name
const char MqttPassword[]="password";               // user password
const char MqttClientID[]="aname";                  // Device ID (warning: must be unique)
```

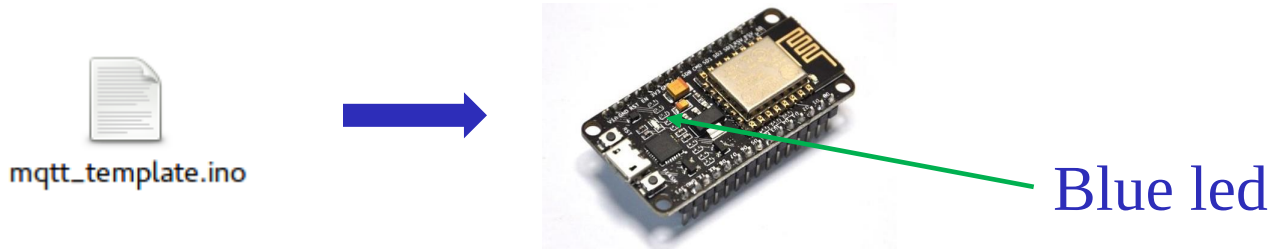
Broker IP (usually my laptop IP)

Must be unique

Anything (but not empty)

Testing MQTT Template

3- Program MQTT template sketch on ESP8266



Once Running:

Blue led Starts blinking fast until board is connected to WiFi Network

Once connected:

If blue led keeps blinking slow => MQTT Broker is not running

If blue led stays on the device is ready to operate !!!!

Testing MQTT Template

Make sure mosquito is running

```
> mosquitto
```

Run this command(**)

```
> mosquitto_sub -v -t "#"
```

You must see this

```
jacoby@jacoby-ThinkPad-P50:~$ mosquitto_sub -v -t "#"
light_box/ldrvalue 225
light_box/ldrvalue 226
light_box/ldrvalue 227
light_box/ldrvalue 228
```

(**) Or → **mosquitto_sub -v -t "light_box/ldrvalue"**

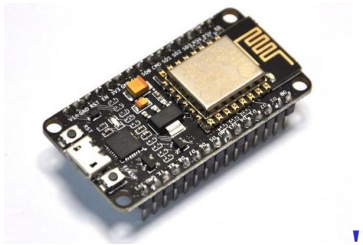
Testing MQTT Template

Open a **new** command window and change default LDR sample rate to 300 mseg

```
mosquitto_pub -h localhost -t "light_box/Set_ldr_Delay" -m “300"
```

Check mosquitto_sub command window you will see that output sample rate increases

Summary



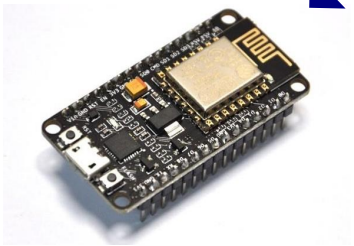
Publishes

"light_box/ldrvalue"

Subscribed to

"light_box/Set_ldr_Delay"

Mqtt Broker



Node-RED

Where runs the Broker?

Mqtt Broker

AMAZON EC2

amazon web services

MQTT Broker

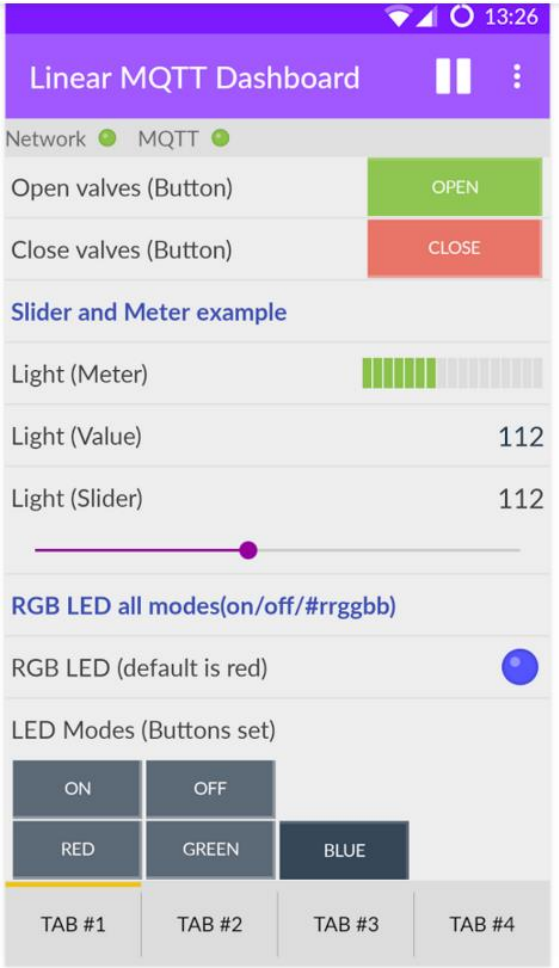
CLOUD MQTT BROKER

DigitalOcean

mosquitto

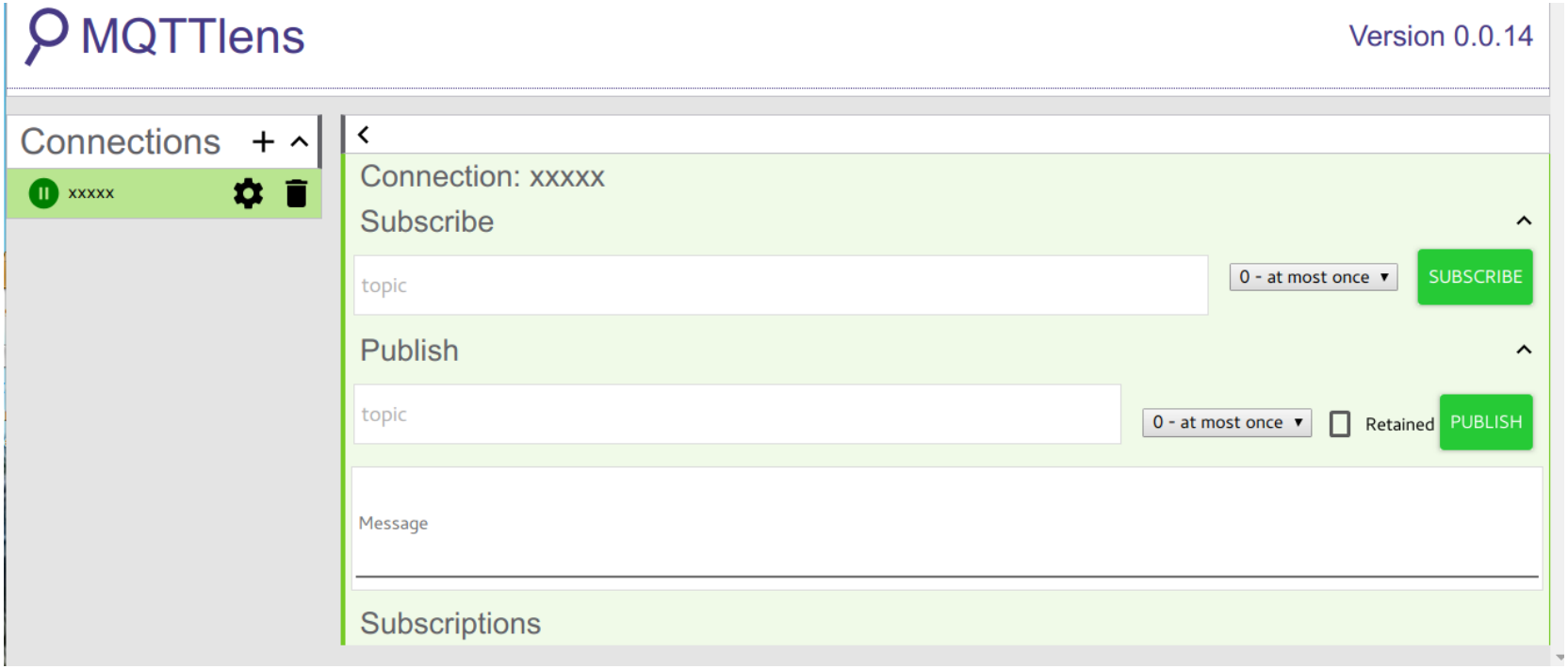
IOT Clouds

Clients on android



Clients on PC: MQTTLens (Google Apps)

MQTTLens



IOT Clouds

Brokers

Mosquitto Download Page

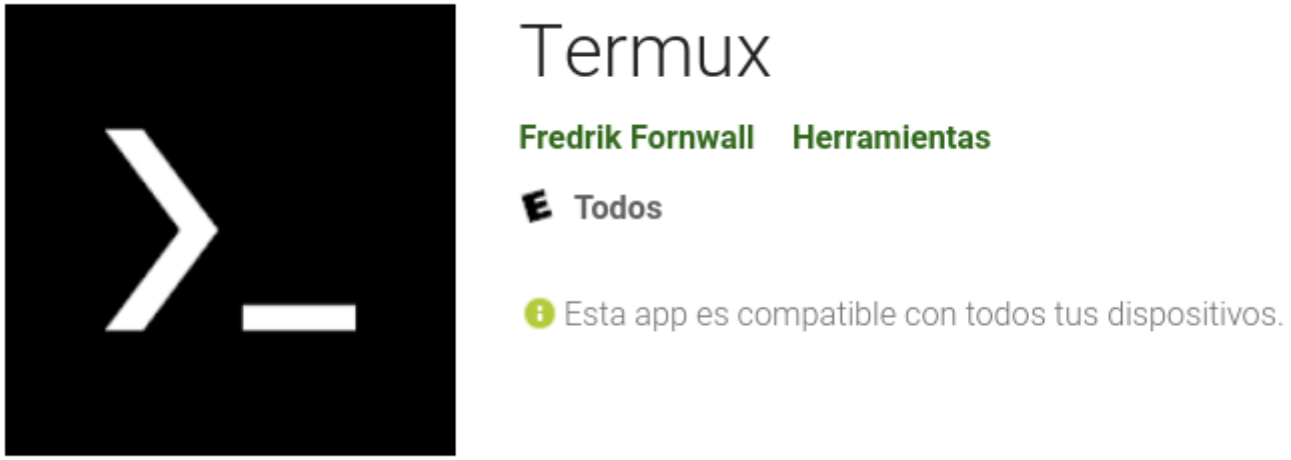
https://mosquitto.org/download/

Acá encontraran instaladores para:

- Windows
- Linux
- Mac

Mosquitto Android

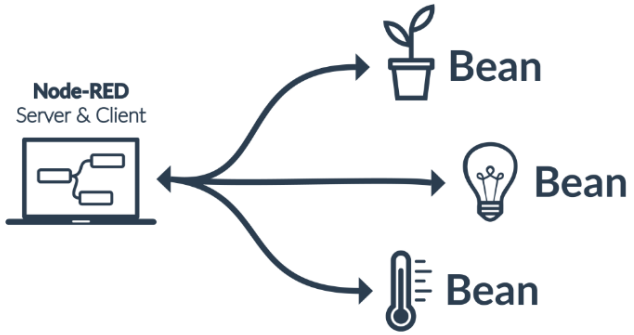
Existe la posibilidad de instalar MQTT (y Node-Red) en Android utilizando una App llamada **Termux** que emula Linux en Android.

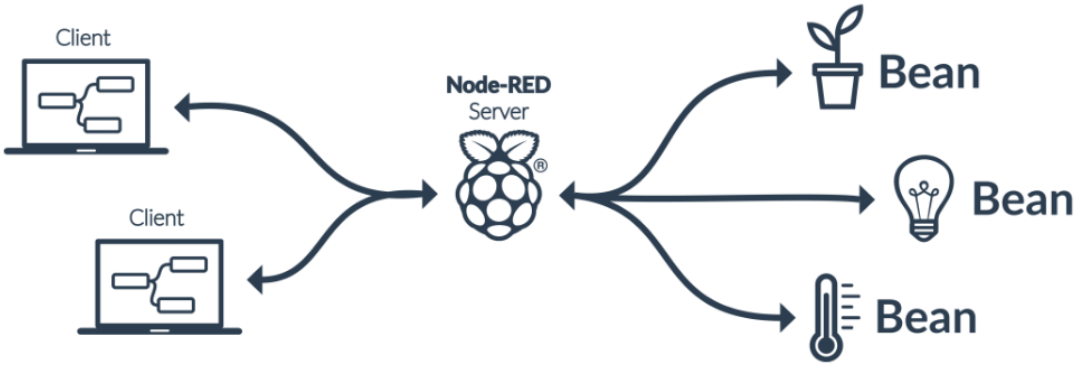


IOT Clouds

Node-RED

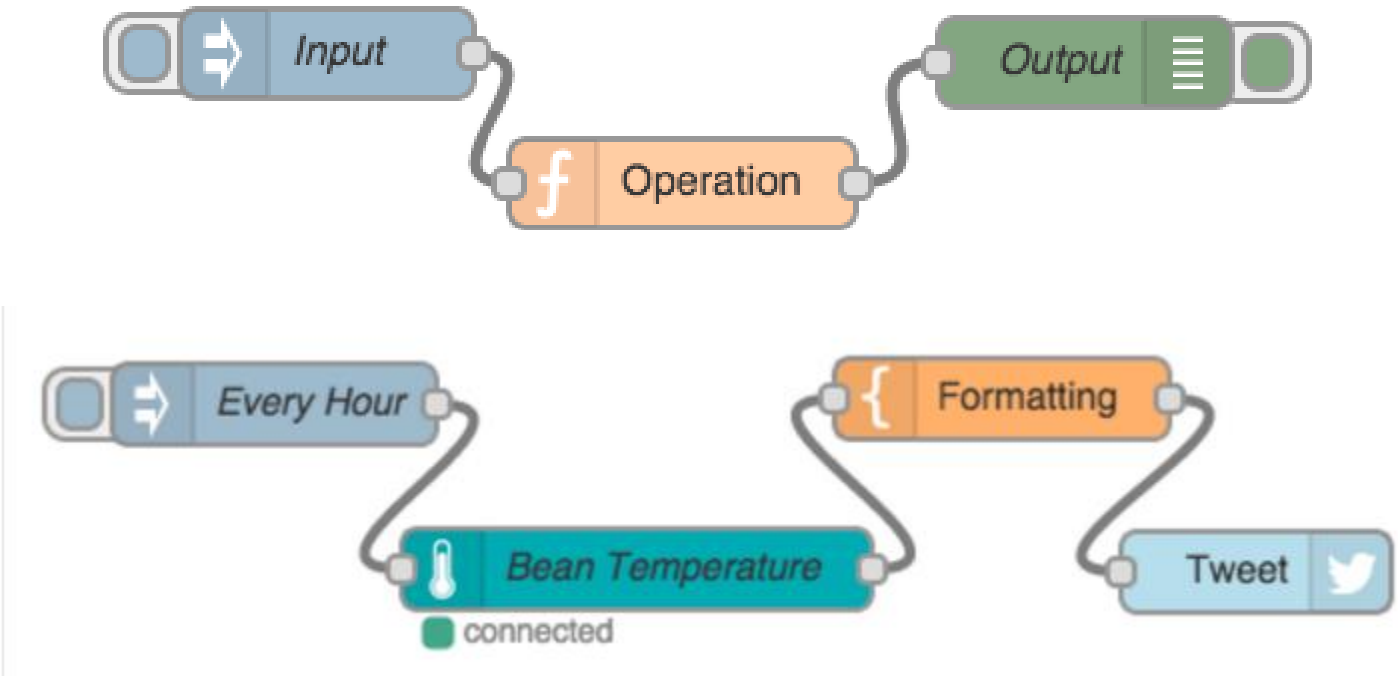
Flow-based programming for the Internet of Things



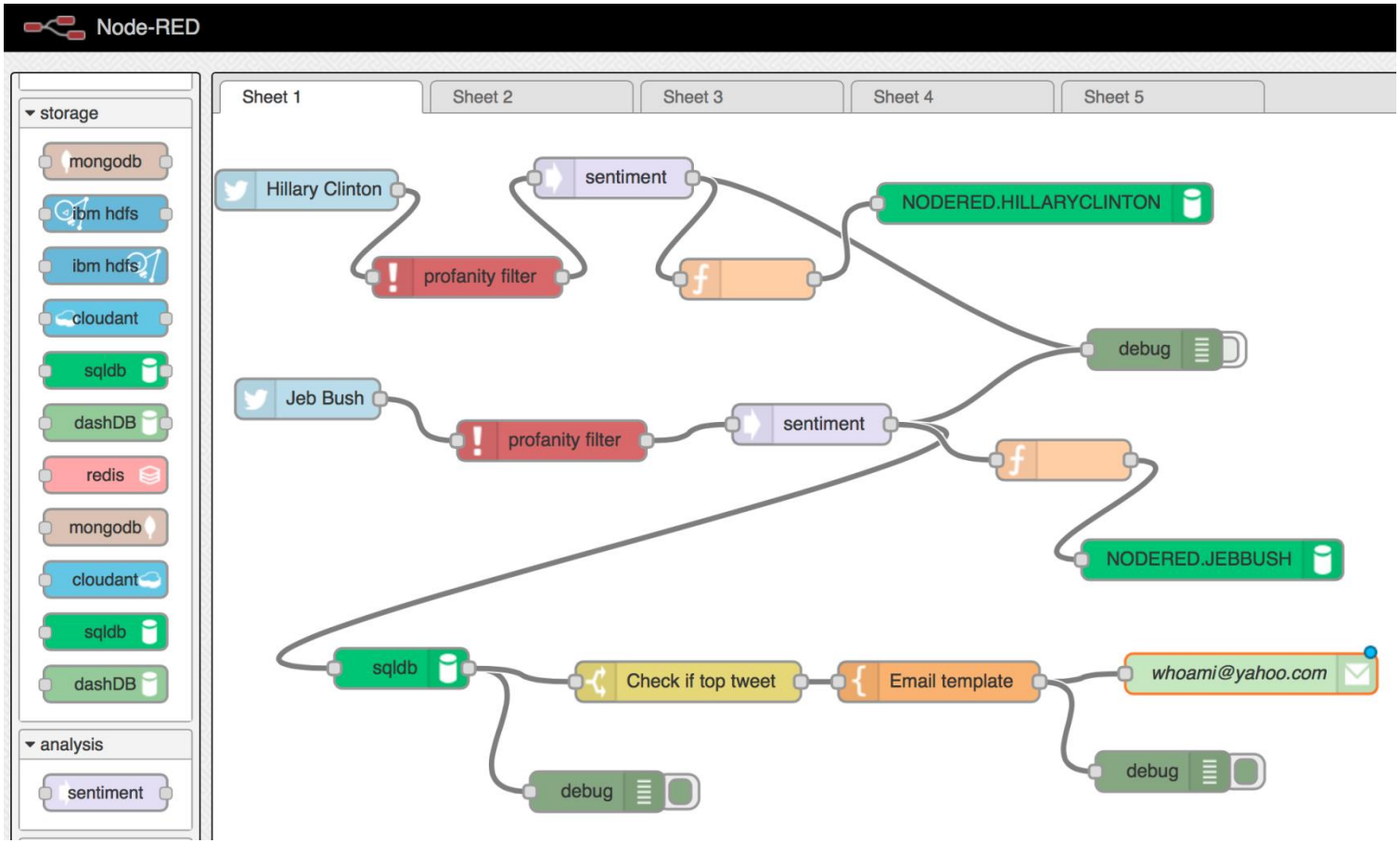


IOT Clouds

Brokers Node-Red

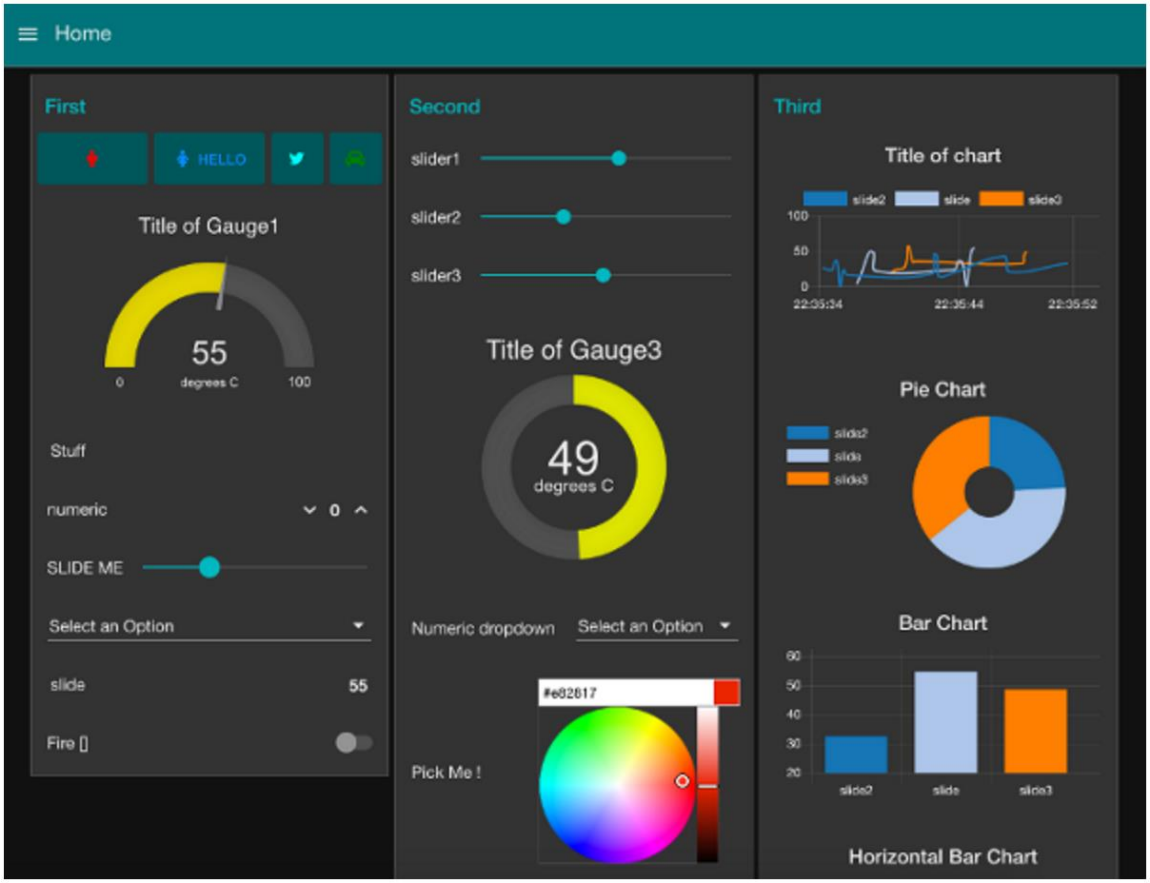


Node-Red Flow Diagram



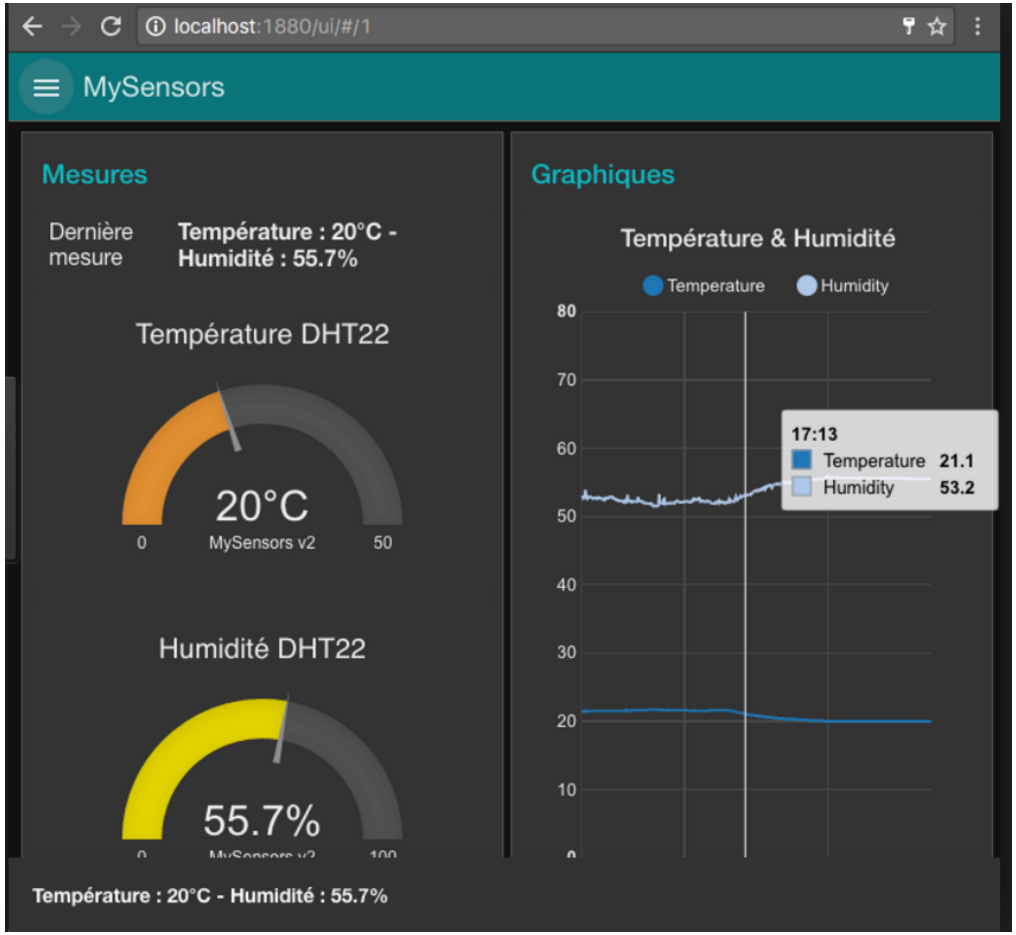
IOT Clouds

Node-Red-dashboard



IOT Clouds

Node-Red-dashboard

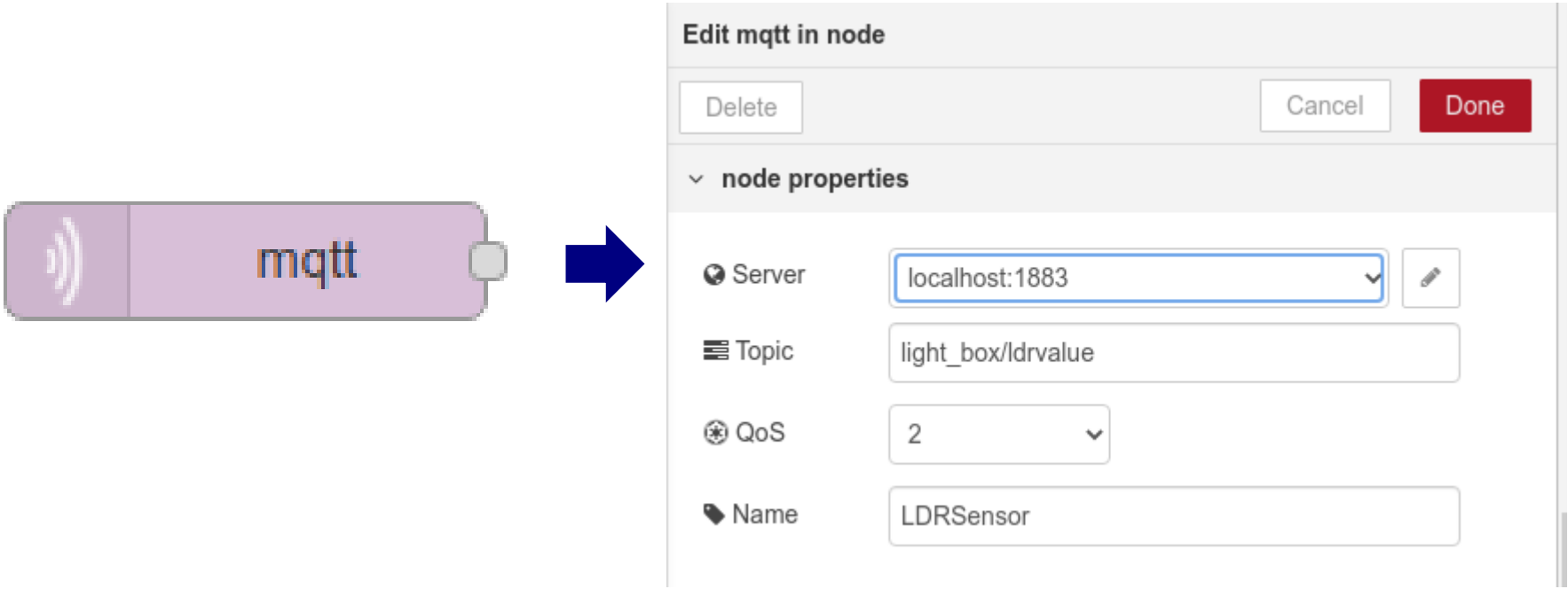


Node red Basics

Flows → http://localhost:1880/

Dashboard → http://localhost:1880/ui/

Node red Basics



Preguntas