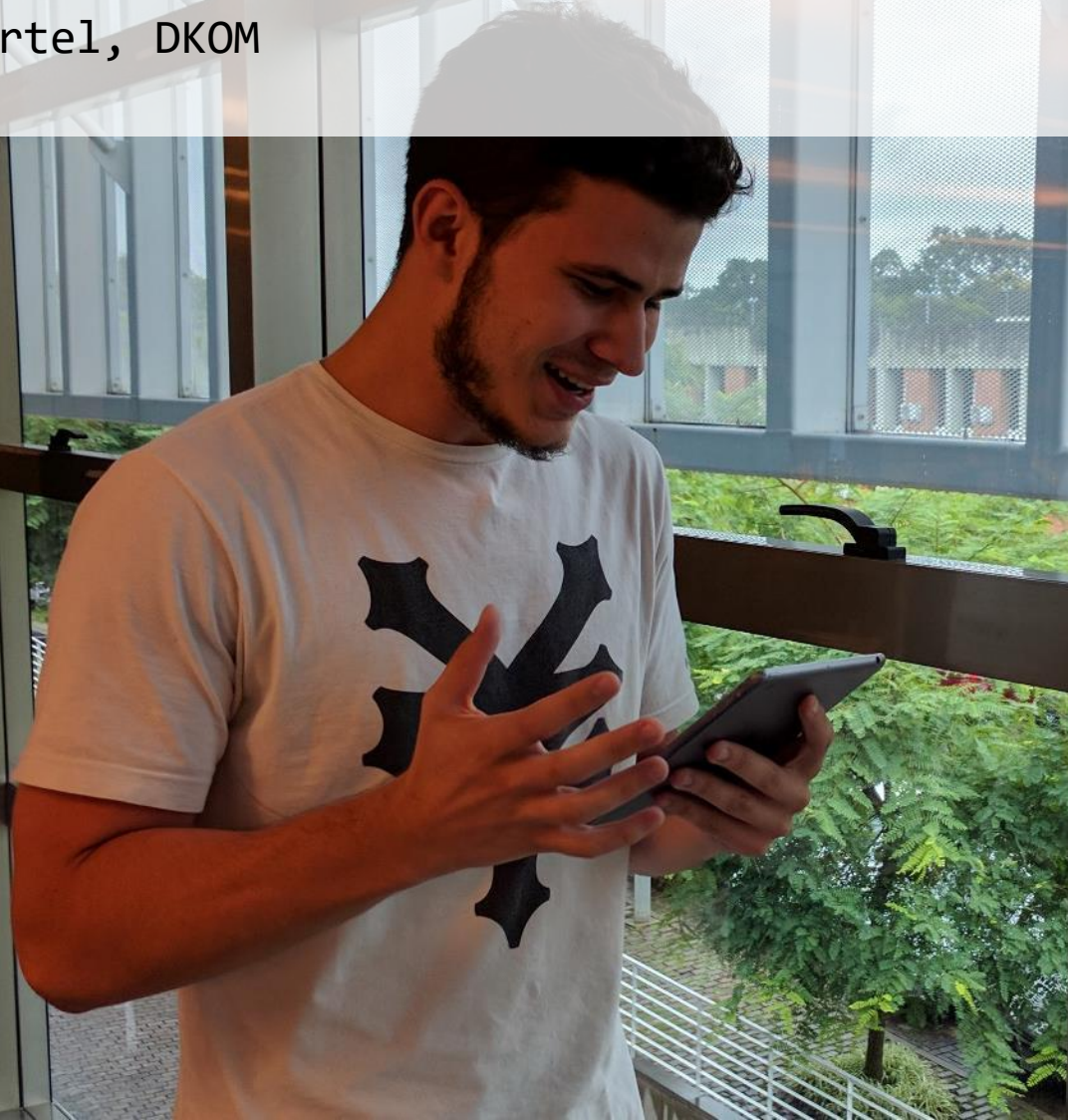


Internet of Things: SCP talking with the real worlds

Matias Schertel, DKOM
March, 2017



**THIS PRESENTATION
MIGHT FAIL!!!**



**“I want to connect my home
to the internet and be able
to control it remotely”**



Popular Protocols

Physical / Data

- Phone line
- Ethernet
- DSL
- Wifi
- GSM
- Bluetooth

Network / Transport

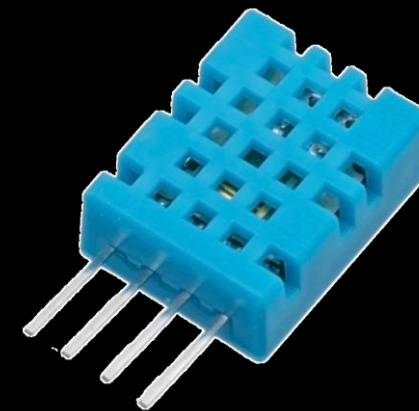
- ARP
- ICMP
- IPv4
- IPv6
- IPSec
- IPX
- TCP
- UDP

Application

- HTTP(s)
- SOAP
- ODATA
- SNMP
- Websocket
- AMQP
- MQTT
- XMPP

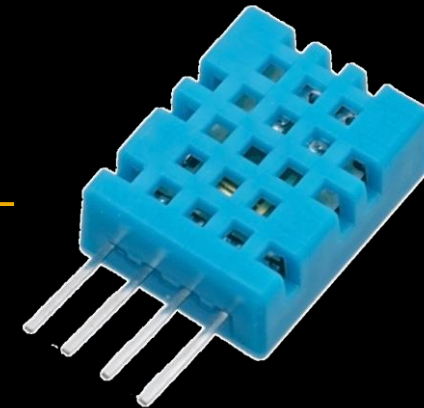


ODATA

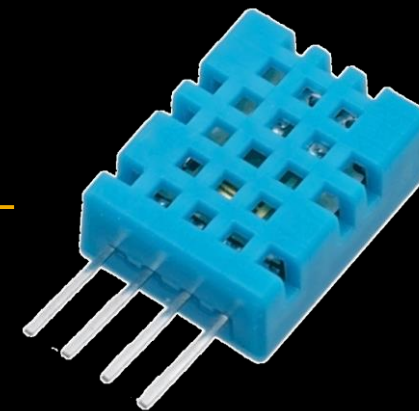
[illegible]



ODATA: HTTP Request
JSON



Registros de Temperatura		
Fecha	Dispositivo	Temperatura
9 de marzo de 2017 14:05:43 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 14:06:43 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:08:08 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 14:09:33 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:07:21 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 14:07:16 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:07:16 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 14:06:16 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:06:11 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 14:04:48 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:03:43 GMT-03:00	Lata	25.0 °C
9 de marzo de 2017 14:03:48 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 13:51:55 GMT-03:00	Lata	24.4 °C
9 de marzo de 2017 13:51:55 GMT-03:00	Lata	25.0 °C



ODATA: HTTP Request
JSON

HTML

Registros de Temperatura		
Fecha	Dispositivo	Temperatura
10 de marzo de 2017 14:05:43 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:06:43 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:08:08 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:09:33 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:07:21 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:07:16 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:07:11 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:06:16 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:06:11 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:04:48 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:03:43 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 14:03:48 GMT-03:00	Lata	25.0 °C
10 de marzo de 2017 13:51:55 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 13:51:50 GMT-03:00	Lata	25.0 °C




```
{  
  "odata.type":"ODataDemo.Product",  
  "Description":null,  
  "DiscontinuedDate":null,  
  "ID":200,  
  "Name":"Update name from leo",  
  "Price":"5.6",  
  "Rating":0,  
  "ReleaseDate":"0001-01-01T00:00:00"  
}
```

GET /tutorials/other/top-20-mysql-best-practices/ HTTP/1.1

Host: net.tutsplus.com

User-Agent: Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US; rv:1.9.1.5) Gecko/20091102 Firefox/3.5.5 (.NET CLR 3.5.30729)

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: en-us,en;q=0.5

Accept-Encoding: gzip,deflate

Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7

Keep-Alive: 300

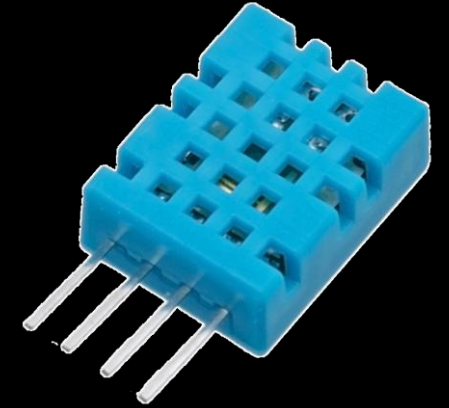
Connection: keep-alive

Cookie: PHPSESSID=r2t5uvjq435r4q7ib3vtdjq120

Pragma: no-cache

Cache-Control: no-cache



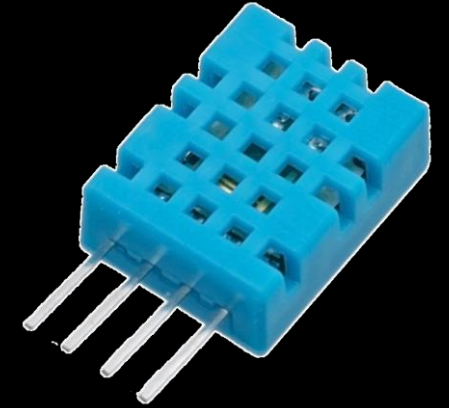


Google Chrome

unimelb.edu.au

Registros de Temperatura

Fecha	Dispositivo	Temperatura
9 de marzo de 2017 14:00:41 GMT-03:00	Lento	24.6 °C
9 de marzo de 2017 14:00:41 GMT-03:00	Lento	25.0 °C
9 de marzo de 2017 14:00:39 GMT-03:00	Lento	24.6 °C
9 de marzo de 2017 14:00:33 GMT-03:00	Lento	25.0 °C
9 de marzo de 2017 14:00:21 GMT-03:00	Lento	24.6 °C
9 de marzo de 2017 14:00:16 GMT-03:00	Lento	25.0 °C
9 de marzo de 2017 14:00:11 GMT-03:00	Lento	24.6 °C
9 de marzo de 2017 14:00:05 GMT-03:00	Lento	25.0 °C
9 de marzo de 2017 14:00:00 GMT-03:00	Lento	24.6 °C
9 de marzo de 2017 14:00:00 GMT-03:00	Lento	25.0 °C

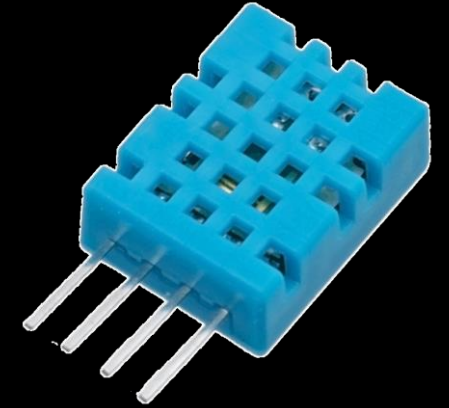


Registros de Temperatura		
Fecha	Dispositivo	Temperatura
10 de marzo de 2017 14:05:43 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:06:43 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 14:08:08 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:09:33 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 14:07:21 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:07:16 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 14:07:11 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:06:16 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 14:06:11 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:04:48 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 14:03:53 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 14:03:48 GMT-03:00	Lata	25.8 °C
10 de marzo de 2017 13:51:55 GMT-03:00	Lata	24.4 °C
10 de marzo de 2017 13:51:50 GMT-03:00	Lata	25.8 °C



**ODATA: HTTP Pooling
JSON**





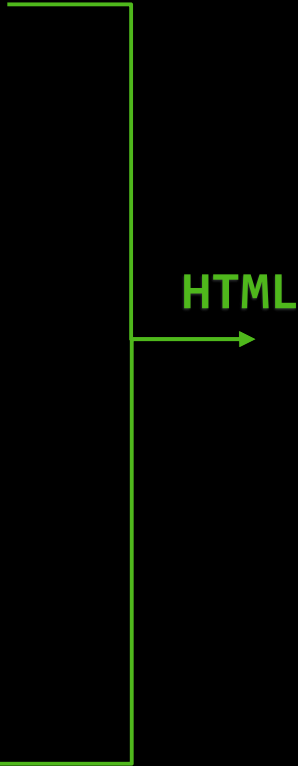
HTML

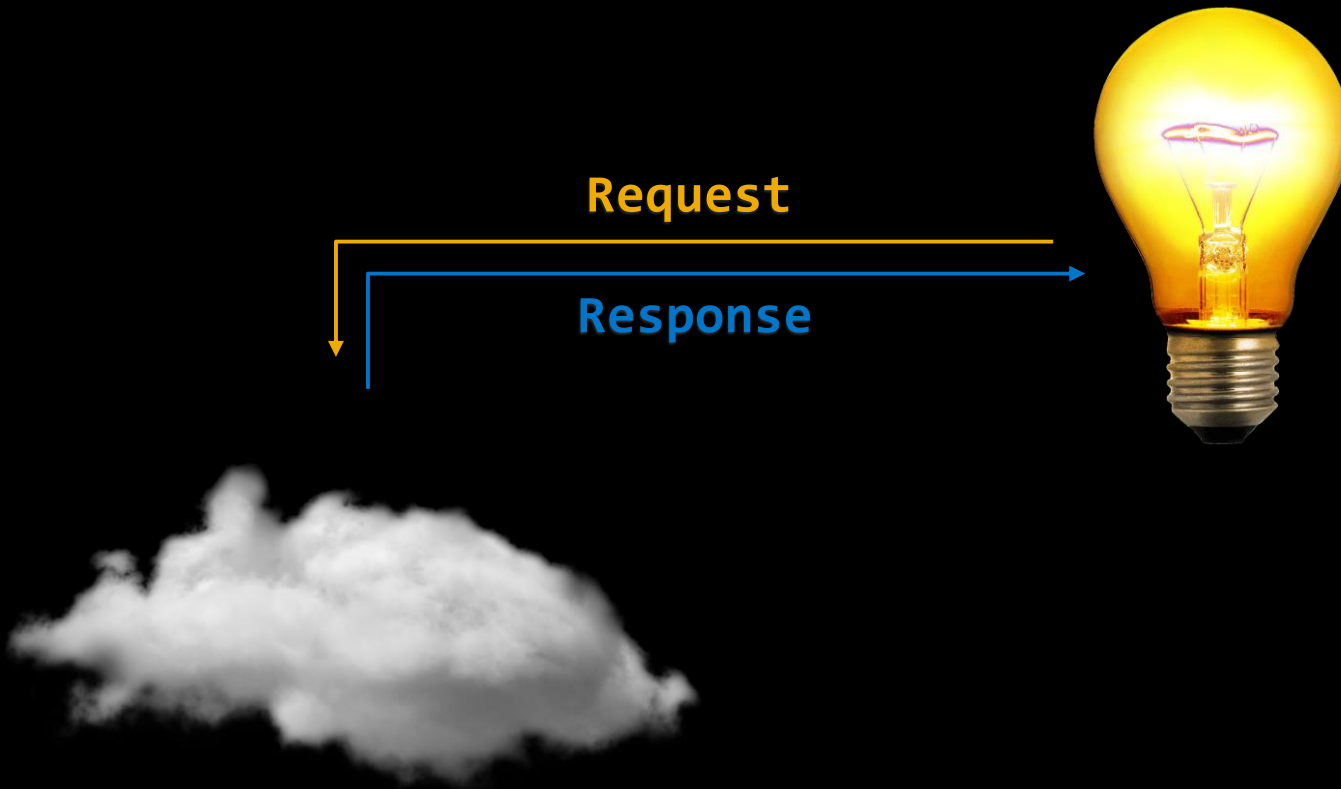


Registros de Temperatura		
Código	Dispositivo	Temperatura
0 de Março de 2017 14:05:43 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 14:06:43 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:08:08 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 14:09:33 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:07:21 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:07:16 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 14:07:16 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:07:16 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 14:06:16 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:06:11 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 14:04:48 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:03:53 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 14:03:48 GMT-03:00	Linha	25.6 °C
0 de Março de 2017 13:51:55 GMT-03:00	Linha	24.4 °C
0 de Março de 2017 13:51:55 GMT-03:00	Linha	25.6 °C

ODATA: HTTP Pooling
JSON



[illegible]

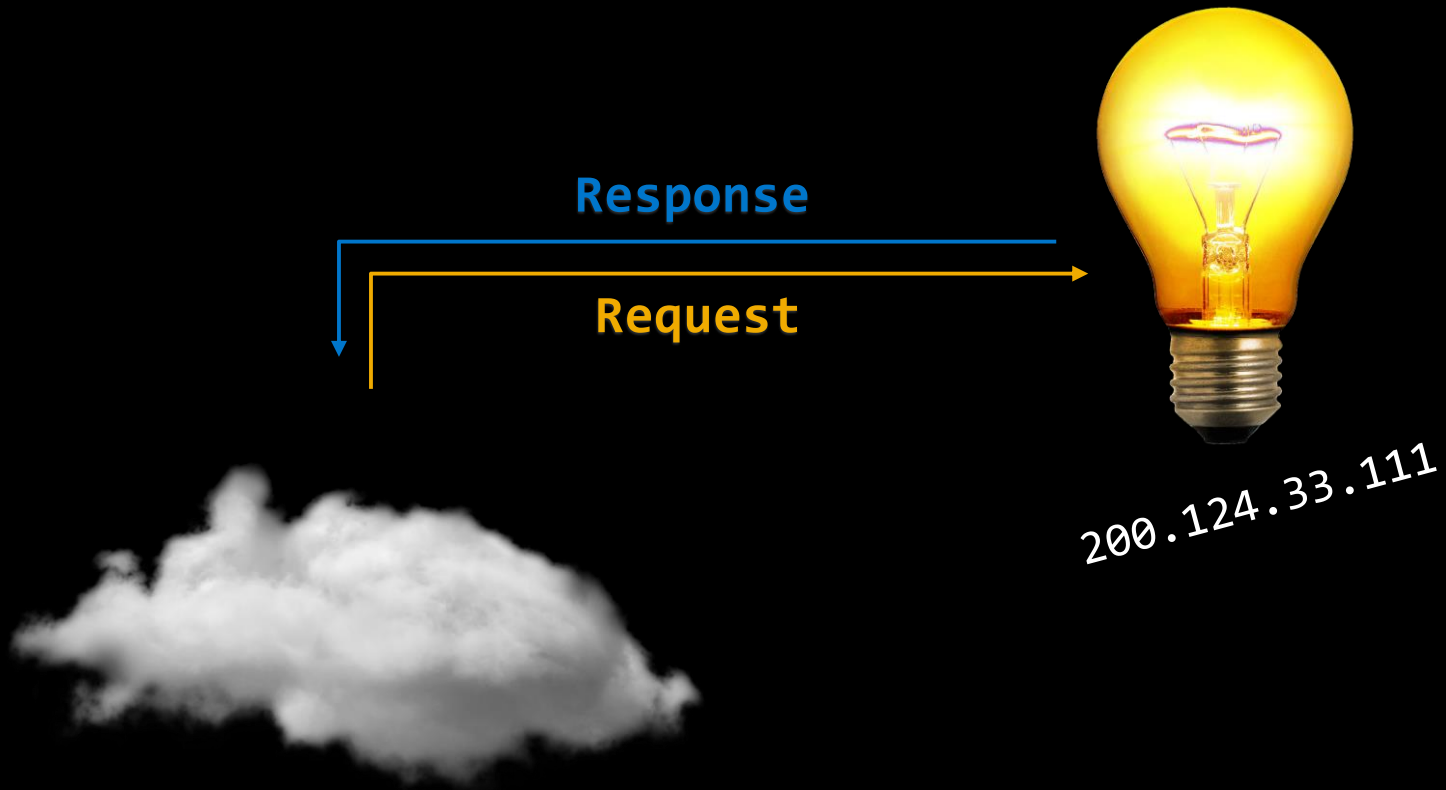


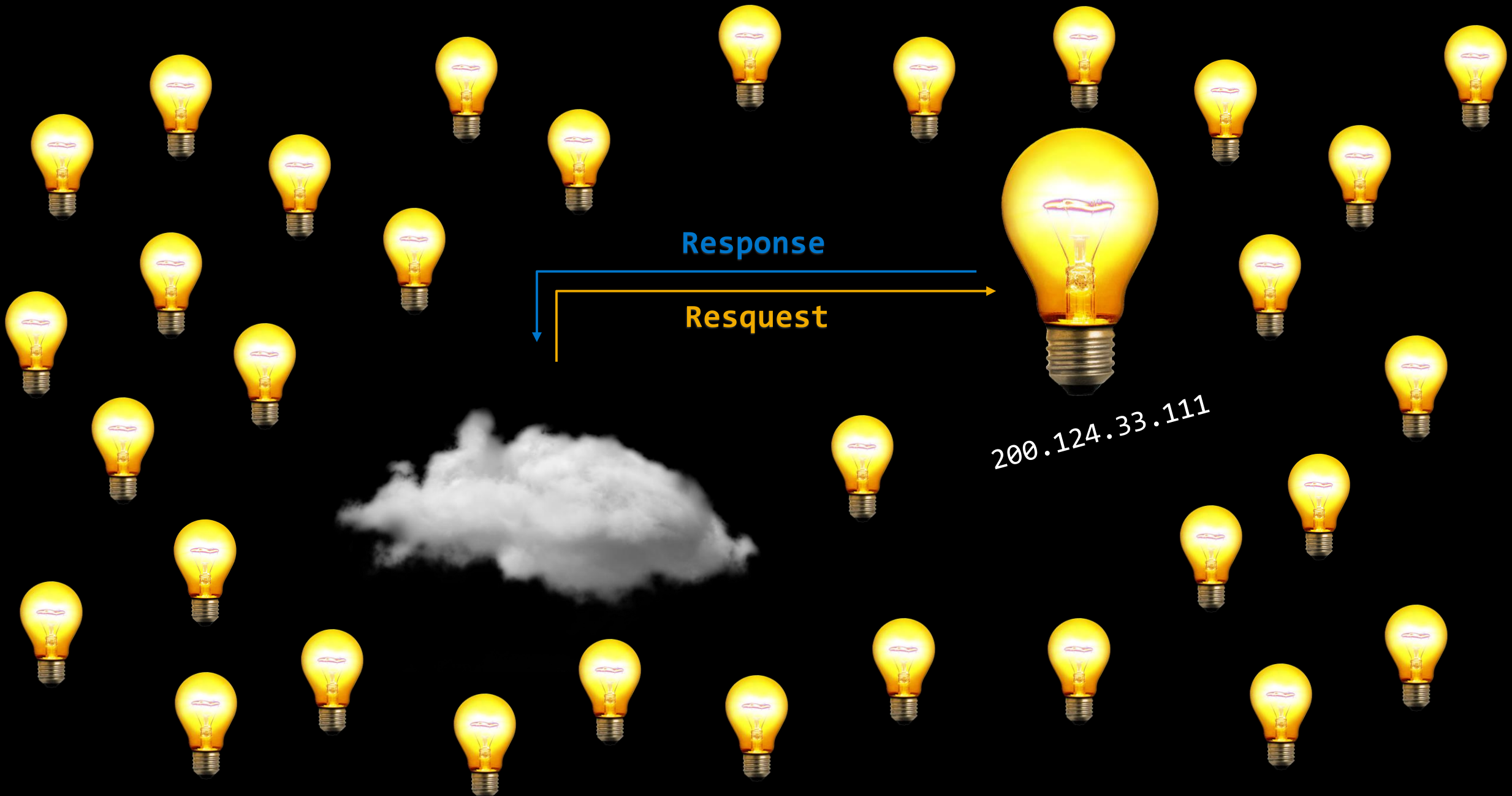




AMC

ReactionGIFS.me





That's the sound of failure

LIFE
ON A WIRE
56:23



Issues

**HUGE
PAYLOAD**

Issues



**HUGE
PAYLOAD**

**Header
Overhead**

Issues

**HUGE
PAYLOAD**

**Header
Overhead**

**Request / Response
Model**

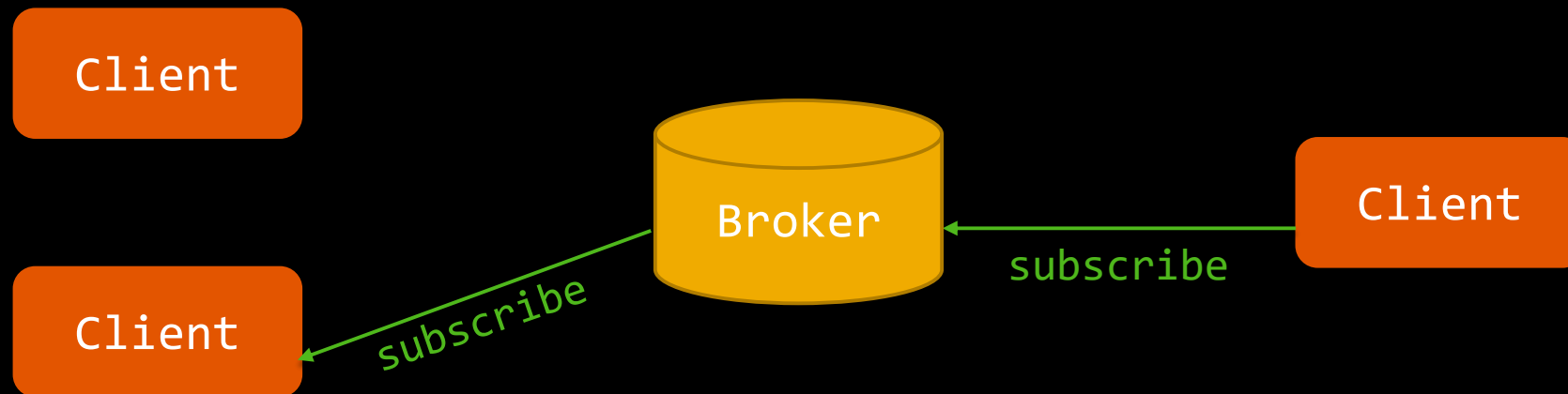


MQTT + IoT Services

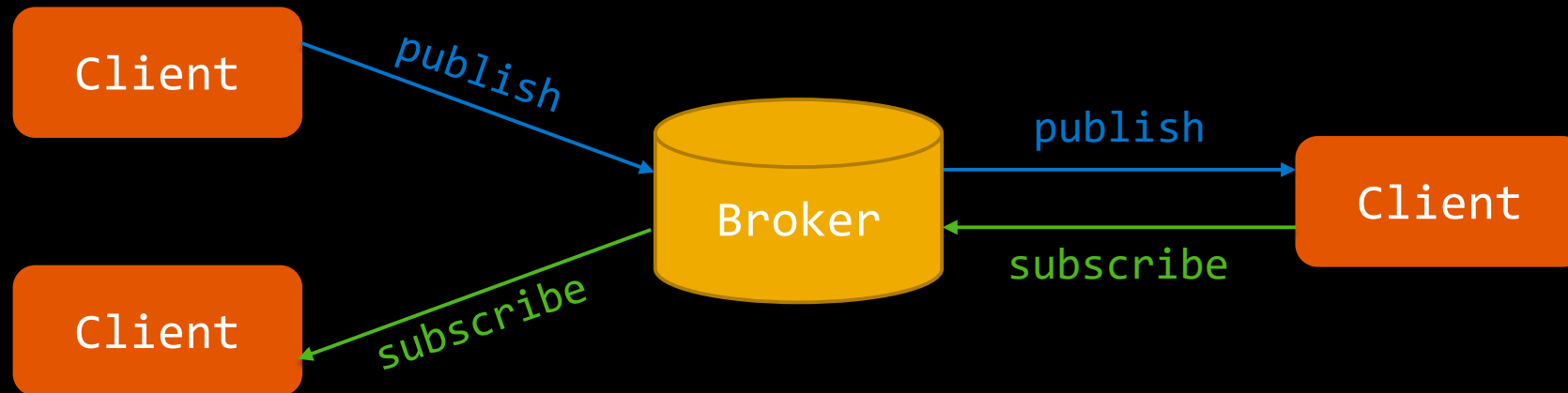
/topic/to/publish/(payload)

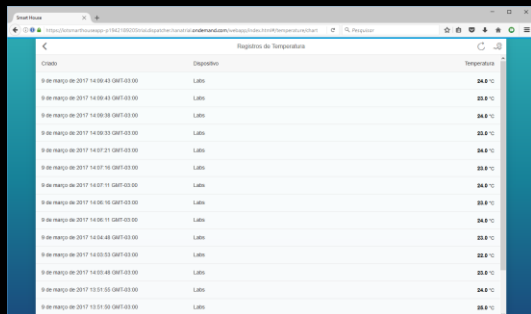
0	1	2	3	4	5	6	7
Message Type				Duplicate?	QoS		Retain?
Remaining Fixed Header							
Variable Header							
Payload							

PUBLISH <> SUBSCRIBE

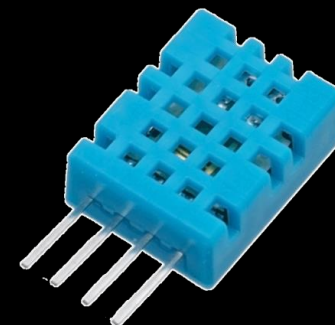


PUBLISH <> SUBSCRIBE

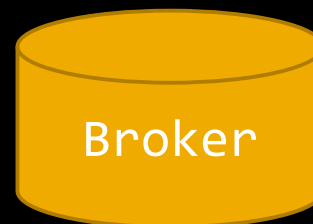


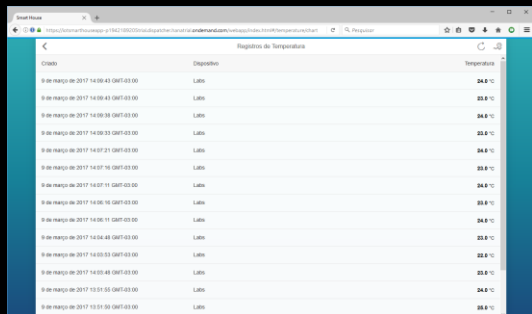


Estado	Descripcion	Temperatura
01 de marzo de 2017 14:00:43 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:43 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:38 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:33 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:21 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:16 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:11 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:06 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:01 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:53 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 14:00:48 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luzes	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luzes	24.8 °C

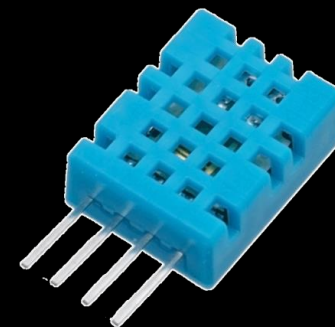


sub: /temperature
sub: /humidity

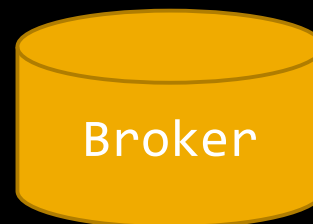




Fecha	Temperatura	Humedad
01 de marzo de 2017 14:00:43 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:43 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:38 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:33 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:28 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:23 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:18 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:13 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:08 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:03 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:58 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:53 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:48 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:43 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:38 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:33 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:28 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:23 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:18 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:13 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:08 GMT-03:00	24.8 °C	70%
01 de marzo de 2017 14:00:03 GMT-03:00	24.8 °C	70%



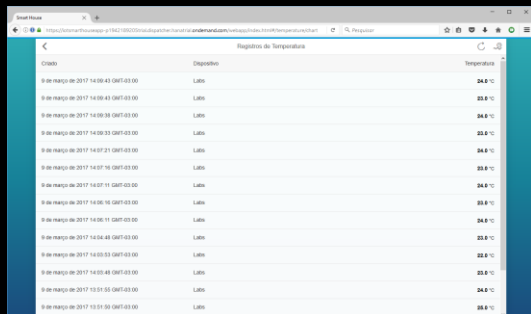
sub: /temperature
sub: /humidity



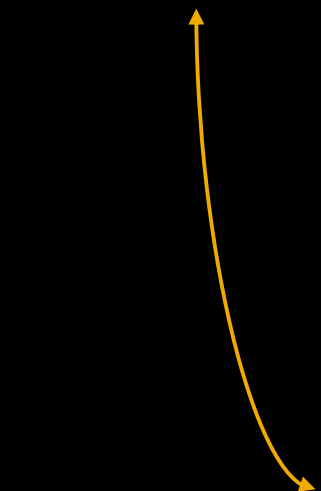
IoT
Services

sub: /light



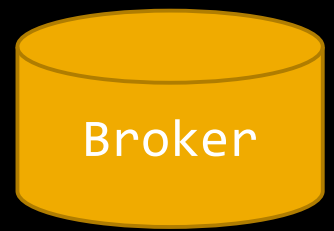
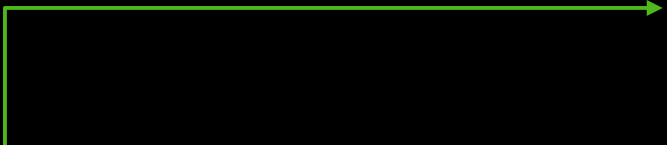


Estado	Descripcion	Temperatura
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:38 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:33 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:23 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:18 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:11 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:06 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:01 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:53 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:48 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luz	24.8 °C



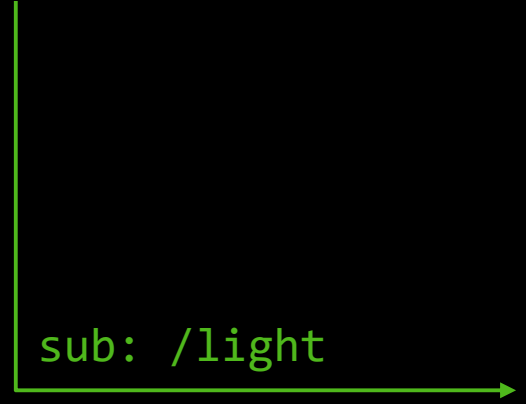
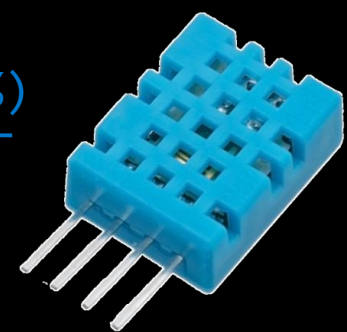
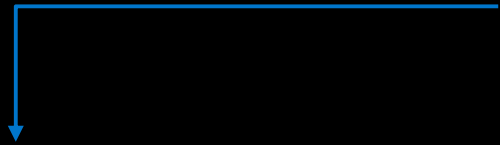
IoT
Services

sub: /temperature
sub: /humidity



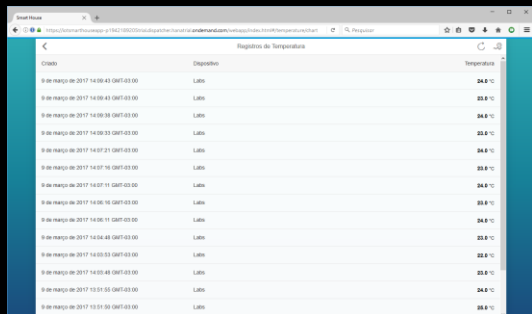
Broker

pub: /humidity(45%)



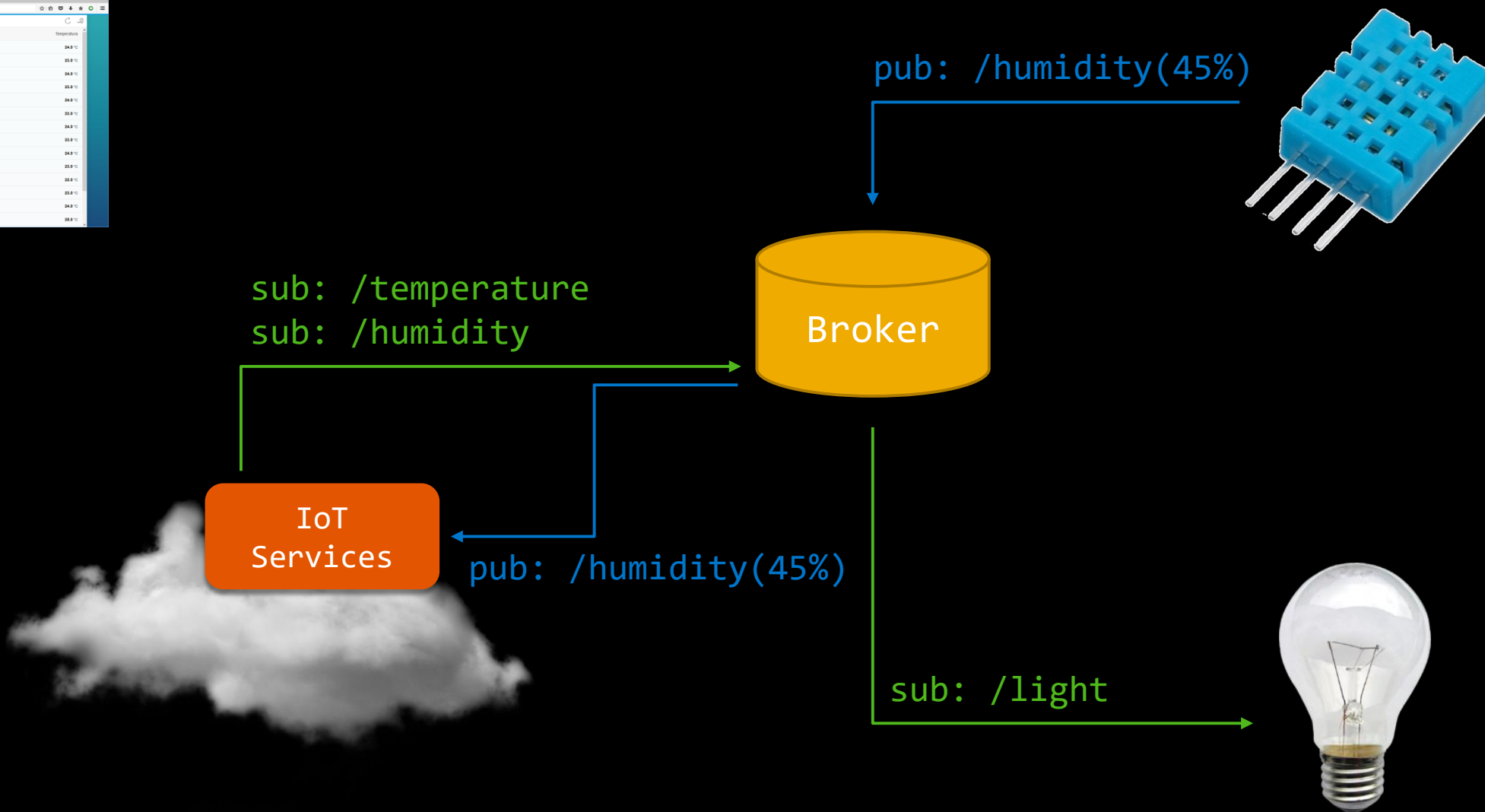
sub: /light

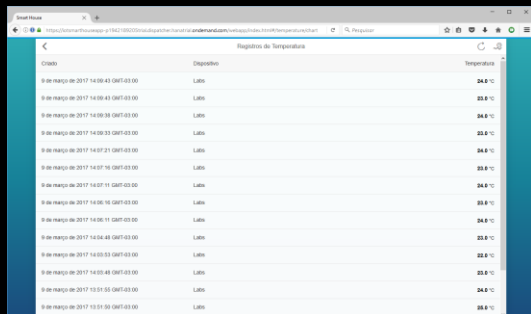




Registro de Temperatura

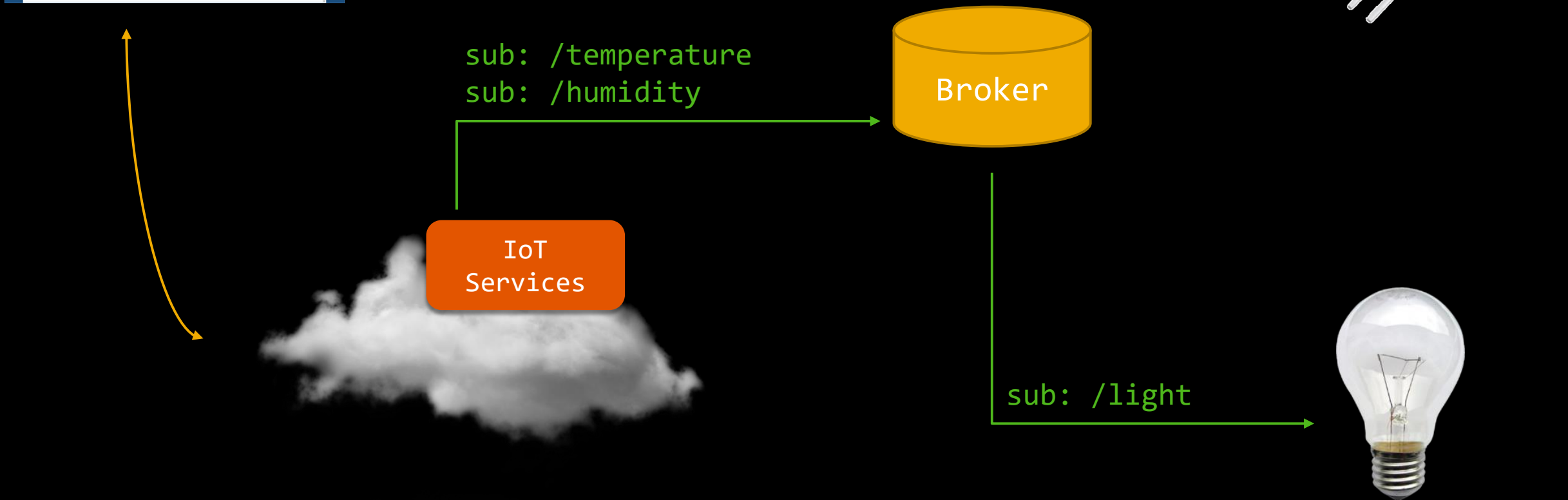
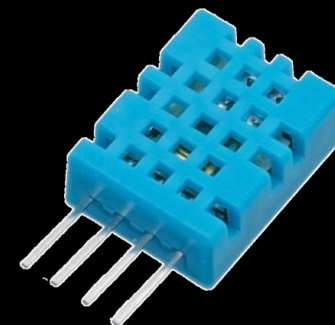
Estado	Operacion	Temperatura
01 de marzo de 2017 14:00:43 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:43 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:38 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:33 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:23 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:18 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:16 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:11 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:10 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:06 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:05 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:03 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 14:00:00 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 13:59:55 GMT-03:00	Labor	24.8 °C
01 de marzo de 2017 13:59:53 GMT-03:00	Labor	24.8 °C

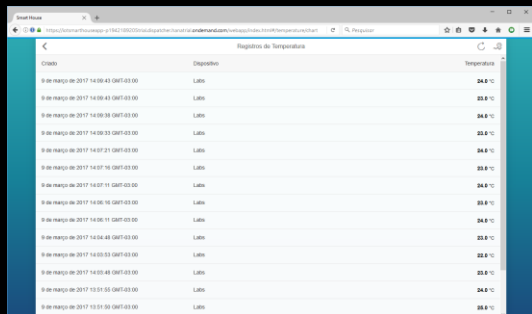




Registro de Temperatura

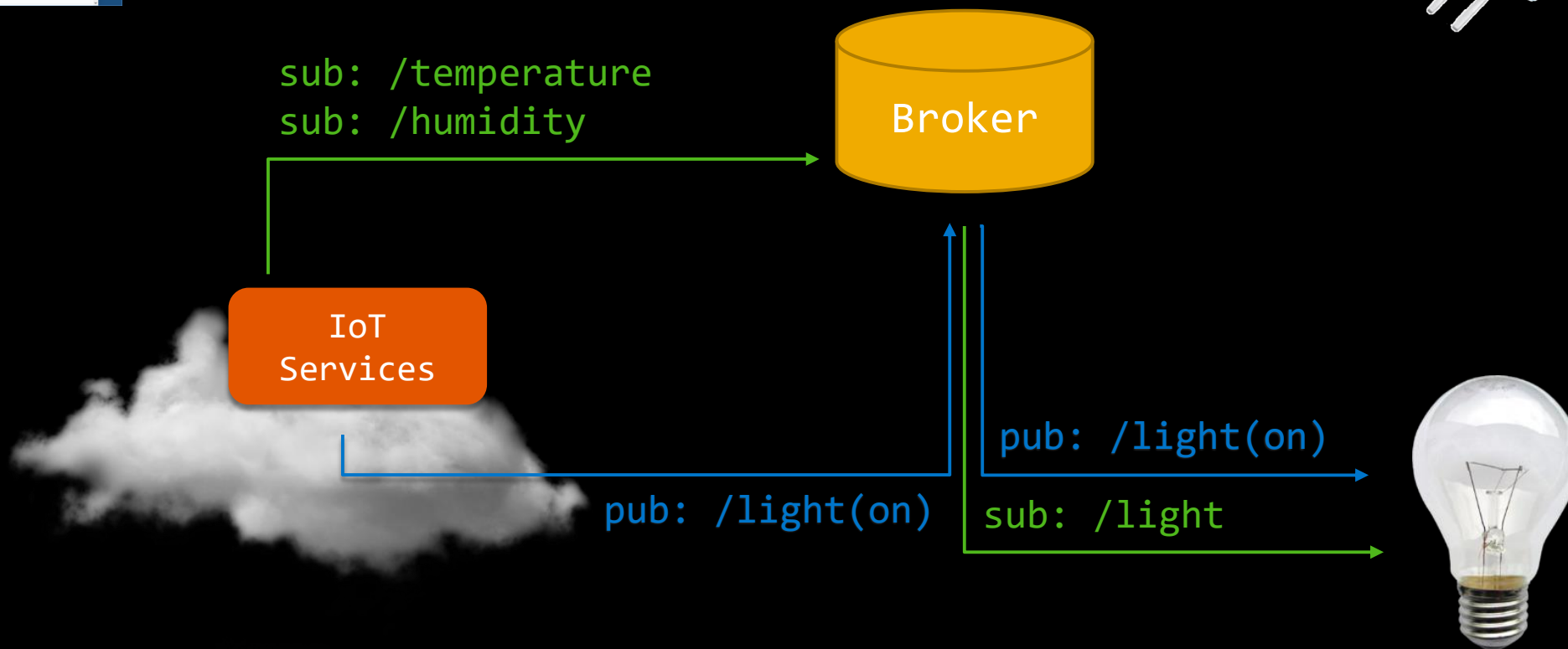
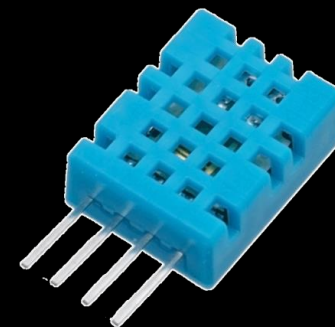
Código	Descripcion	Temperatura
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:38 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:33 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:21 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:16 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:11 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:06 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:01 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:53 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:48 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:01:53 GMT-03:00	Luz	24.8 °C

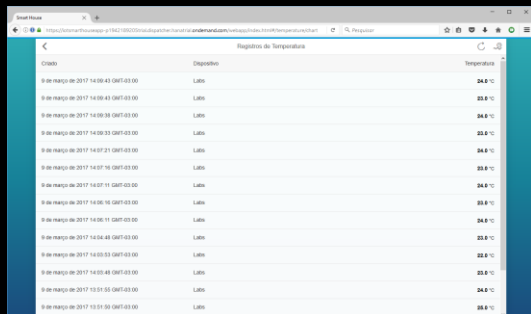




Registro de Temperatura

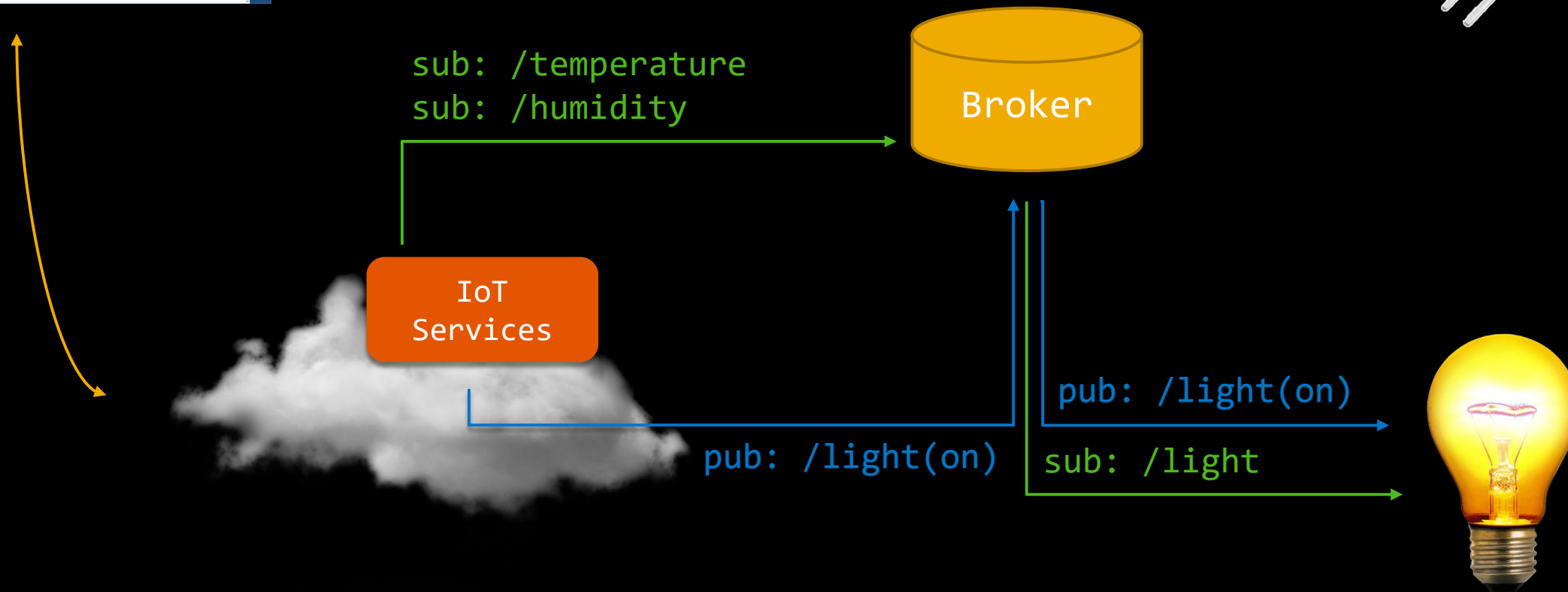
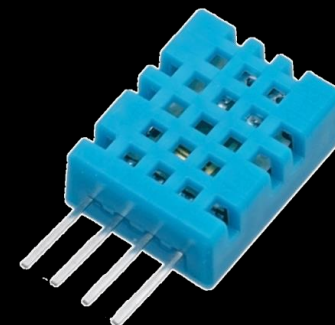
Código	Descripcion	Temperatura
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:43 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:38 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:33 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:23 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:18 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:16 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:11 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:10 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:06 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:03 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 14:00:00 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:59:55 GMT-03:00	Luz	24.8 °C
01 de marzo de 2017 13:59:50 GMT-03:00	Luz	24.8 °C





Registro de Temperatura

Idade	Operação	Temperatura
01 de março de 2017 14:00:43 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:43 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:38 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:33 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:23 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:18 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:16 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:11 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:10 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:05 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:03 GMT-03:00	Linha	24.8 °C
01 de março de 2017 14:00:00 GMT-03:00	Linha	24.8 °C
01 de março de 2017 13:59:55 GMT-03:00	Linha	24.8 °C
01 de março de 2017 13:59:50 GMT-03:00	Linha	24.8 °C





IoT Services?

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https://account.hanatrial.ondemand.com/cockpit#/acc/p1942189205trial/accountdashboard

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SAP Cloud Platform Cockpit

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Applications

Services

Persistence

Connectivity

Security

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System Status

JAVA

Overall Health

1 Application

1 Started

🟢

OK

HTML5

Overall Health

1 Application

1 Started

🟢

OK

DATABASE SYSTEMS

Overall Health

0 Databases

🔷

N/A

Favorite Applications

You have not yet defined any favorite applications. You can add them from the [Java Applications list](#)

Account Information

Account

Display Name

p1942189205trial

Account Name

p1942189205trial

Subscriptions

Subscribed

●●●

Services

available

●●●

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Integration

API Management

Not enabled


Expose your data and processes as APIs for omni-channel consumption and manage the lifecycle of those APIs.

Cloud Integration

Facilitates the integration of business processes.


Connectivity

Enabled

Establishes secure and reliable connectivity between cloud applications and on-premise systems.


OData Provisioning

Not enabled

Provides REST/OData services based on SAP Gateway content in the Application Server ABAP.

SAP API Business Hub


Enabled

Discover, explore and test the APIs offered by SAP.

Internet of Things

Internet of Things Service


Enabled

Enables customers and partners to develop, customize, and operate IoT business applications in the cloud.

Mobile Services


App & Device Management

Not enabled

Manage and secure mobile apps and devices.


Development & Operations

Not enabled

Build and run new mobile apps or extend existing on-premise or cloud solutions with a mobile user experience.

Fiori Mobile


Not enabled

Optimize, build, manage and monitor SAP Fiori apps on mobile devices.


Runtimes & Containers

Starter Edition for Cloud Fo... BETA

Enabled

Provides access to the Cloud Foundry services of SAP Cloud Platform to develop, deploy and run applications.

Virtual Machines BETA


Virtualized hardware resources (CPU, RAM, disk space, installed OS) to install and maintain your own Linux-based software.

Security

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Internet of Things Service Cockpit

Matias Schertel (P1942189205) ▾


Device Management



3

Message Types


All Message Types



1

Device Types

All Device Types




1

Devices

All Registered Devices


Message Management



Version
UP TO DATE

Redeploy the
Message
Management Service

MMS Deployment



Send and view
messages, or perform
other actions

MMS Cockpit

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<Message Types

Procurar🔍🔄

Humidity (%)

Temperature (°C)

Toggle Light

+

Message Type

Humidity (%)

Information

Fields

Position	Name	Type	Optional Settings
1	humidity	float	

Delete

Device Types

Procurar 🔍 ↺

Smart House Controller

+

Device Type

Smart House Controller

Information

Msg. Types

Authentication

Assignment Name	Message Type	Direction
Humidity (%)	Humidity (%)	From Device >
Temperature (°C)	Temperature (°C)	From Device >
Toggle Light	Toggle Light	To Device >

+

Delete

< Devices

Procurar 🔍 ↺

Labs

📦 +

Device

Labs

i

Information

🛡️

Authentication

ID: c66e6224-b5f6-45bf-9708-cd24522cd2d4



Device Type: **Smart House Controller**

Authentication Type: OAuth


Open Chart


Edit


Delete

 Internet of Things Service Cockpit  Matias Schertel (P1942189205) ▾


Device Management


 3
Message Types
All Message Types

 1
Device Types
All Device Types

 1
Devices
All Registered Devices

Message Management

 Version
UP TO DATE
Redeploy the Message Management Service
MMS Deployment

 Send and view messages, or perform other actions
MMS Cockpit

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Message Management Ser...

+

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📦 p1942189205trial - Java Applications

All: 1

⬆️ Deploy Application

All States


Search

State	Name	Processes	Start Time	Actions
Started	iotmms	1	9 Mar 2017, 12:59:58	▶️ ⏸️ 🗑️ ☆


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 Message Management Service Cockpit Matias Schertel (P1942189205) ▾

Core Services




Display Stored Messages

Application Data




Push Messages to Devices

Push Service




Configure the Message Management Service

Configuration



Configure Processing Service Mappings


Configuration



View Registered Devices And Device Types


IoT Service Cockpit

Data Services




Messaging through HTTP

HTTP API




Messaging through MQTT over TCP

MQTT TCP API



Messaging through WebSockets

WebSocket API



Messaging through MQTT over WS


MQTT WebSocket API

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Core Services




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MQTT WebSocket API

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Application Data

ATUALIZAR Last updated on 10/03/2017 11:19:58

5 Tables

OData API

<div></div> <div>T_IOT_3E350B643794BFA2FB5D</div> <div>NEO_0AVG9REPEQN3C9KC95UPVG5IM</div> <div>27 ></div>
<div></div> <div>T_IOT_ACKSTORE</div> <div>NEO_0AVG9REPEQN3C9KC95UPVG5IM</div> <div>></div>
<div></div> <div>T_IOT_CONFIG</div> <div>NEO_0AVG9REPEQN3C9KC95UPVG5IM</div> <div>66 ></div>
<div></div> <div>T_IOT_F7A21B819054C93F4EE2</div> <div>NEO_0AVG9REPEQN3C9KC95UPVG5IM</div> <div>262 ></div>
<div></div> <div>T_IOT_MONITOR_LOG</div> <div>NEO_0AVG9REPEQN3C9KC95UPVG5IM</div> <div>114951 ></div>



Push Service

Description

This client can be used to test the Push API. It can send messages to registered devices by sending HTTP POST requests to the push service endpoint. Messages can be pushed by means of various data services (HTTP, WebSockets, MQTT over WebSockets or MQTT over TCP).

Push Message

Device ID: d000-e000-v000-i000-c000-e001

Method: [http](#)

Sender: IoT App

```
Message: {"messageType": "m0t0y0p0e3", "messages": [{"opcode": "switch on", "operand": "led 1"}]}
```



Push

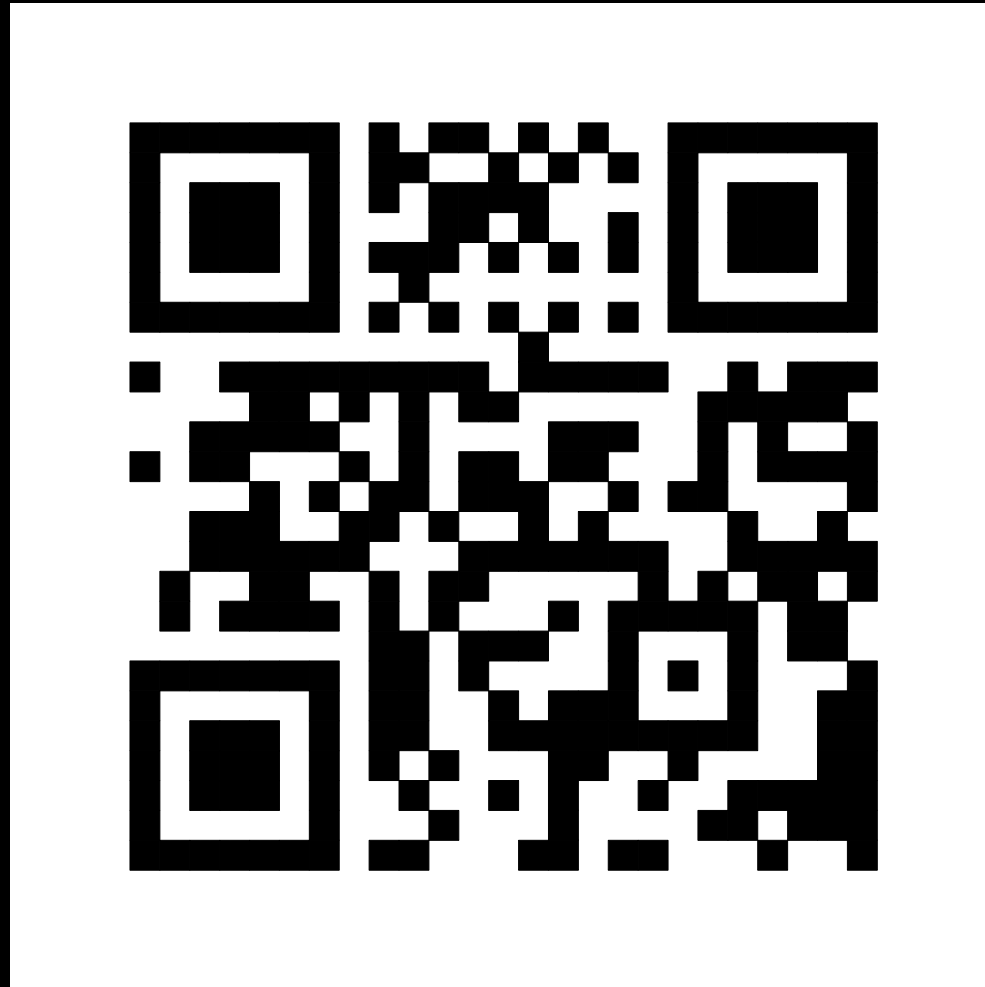
Reply from Server

 Clear Table

Code	Message
Sem dados	




Demo



goo.gl/AgRaQU



Global 

References

- **Smart House**, <https://github.com/flatlining/iot.smarthouse>
- **SAP HANA Cloud Platform Internet of Things Services**,
<https://help.hana.ondemand.com/iot/>
- **IoT Starterkit**, <https://github.com/SAP/iot-starterkit>
- **MQTT**, <http://mqtt.org/>
- **Eclipse PAHO**, <https://eclipse.org/paho/>
- **PlatformIO**, <http://platformio.org/>
- **ESP8266**, <https://espressif.com/en/products/hardware/esp8266ex/overview>



Questions?

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<https://github.com/flatlining>