Boost my IoT potential

Live Objects

January 2023

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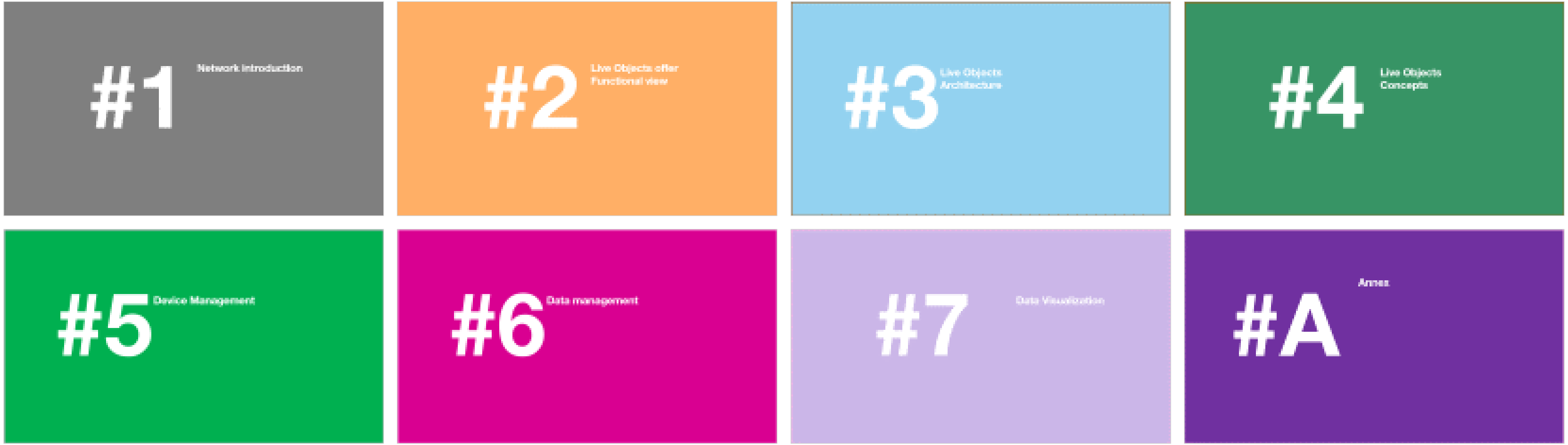


#1 Network introduction

#2 Live Objects offer Functional view

#3 Live Objects Architecture

#4 Live Objects Concepts

#5 Device Management

#6 Data management

#7 Data Visualization

#A Annex

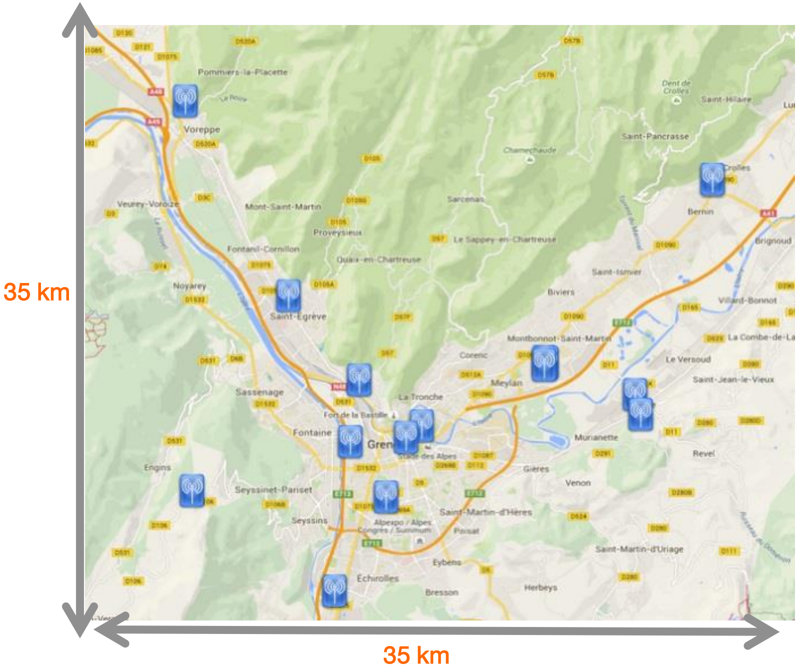
#1

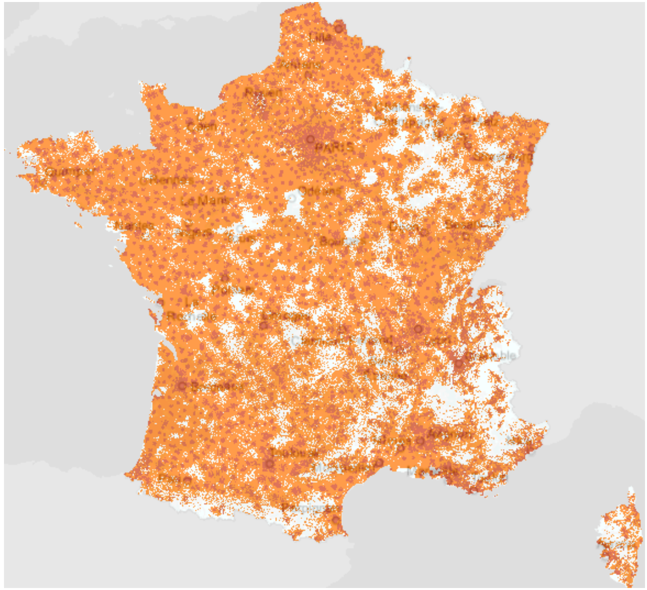
Network introduction

#1.1

LoRaWAN network

LoRa : a story starting in Grenoble, France


35 km
35 km
Pommiers-la-Placette
Voreppe
Veurey-Voroize
Mont-Saint-Martin
Proveysieux
Fontanil-Cornillon
Quaix-en-Chartreuse
Noyarey
Saint-Egrève
Sarcenas
Le Sappey-en-Chartreuse
Saint-Pancrasse
Crolles
Bernin
Saint-Ismier
Biviers
Montbonnot-Saint-Martin
Corenc
Meylan
La Tronche
Sassenage
Fontaine
Grenoble
Seyssinet-Pariset
Seyssins
Engins
Saint-Martin-d'Hères
Gières
Murianette
Venon
Le Versoud
Villard-Bonnot
Saint-Jean-le-Vieux
Revel
Saint-Martin-d'Uriage
Eybens
Echirolles
Bresson
Herbeys



May 2015 : Orange LoRa pilot is starting

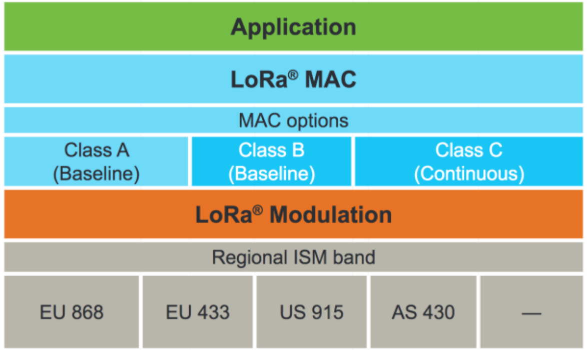
July 2016 : commercial offer is launched in France, for a global coverage

Dec 2024 : Bouygues Objenious network end-of-life

Orange network guaranteed at least until end of 2027

LoRa : introduction

- **LoRa® *(Long Range)* : wireless radio frequency technology**
- **LoRaWAN® : Low Power Wide Area Network protocol specification based on LoRa® dedicated to the Internet of Things (IoT)**
- **Allows devices to send data to an IoT platform so that customers can manage them (via business applications)**
- **Very short frames, only a few tens of bytes**
- **Bi-directional network (but mainly Uplink), asynchronous, and without acknowledgement by default**
- **Range : up to 15 km (rural environment)**



Application

LoRa® MAC

MAC options

Class A (Baseline) | Class B (Baseline) | Class C (Continuous)

LoRa® Modulation

Regional ISM band

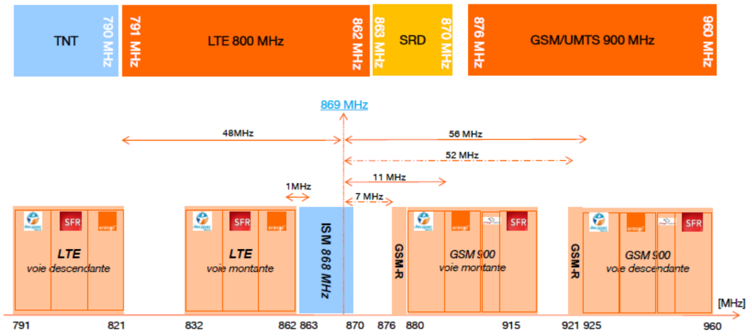
EU 868 | EU 433 | US 915 | AS 430 | —

LoRa : introduction

- Unlicensed Frequency, around 868 MHz in Europe / around 915 MHz in the US
- EU: Duty cycle to enforce (max 36 seconds of emission per hour per sub-band/device) + max 25mW of emission power ; 6min and 500mW for gateways

  USA: Emission power limited by FCC
- Low Power: devices only send a few messages per day
- Battery life duration estimation : up to 10 years
- Sensitivity down to -138 dBm
- Mainly 2 types of devices:
  - Class A: battery powered, listens to messages from the Network only when it sends an uplink message
  - Class C : external power supply, listens almost permanently to messages from the Network

868 MHz ISM band used by LoRa networks in Europe


TNT
790 MHz
791 MHz
LTE 800 MHz
862 MHz
863 MHz
SRD
870 MHz
876 MHz
GSM/UMTS 900 MHz
960 MHz
869 MHz
48MHz
56 MHz
52 MHz
11 MHz
1MHz
7 MHz
LTE
voie descendante
LTE
voie montante
ISM 868 MHz
GSM-R
GSM 900
voie montante
GSM-R
GSM 900
voie descendante
SFR
[MHz]
791
821
832
862
863
870
876
880
915
921
925
960

The ISM 868 MHz band used by LoRa networks is 1MHz from LTE 800 Orange uplink and 11MHz from 2G/3G 900 BYT uplink band

LoRa Alliance members

15 Sponsor Members

- actility Making Things Smart
- AUGTEK
- bouygues
- cisco
- ENDETEC HOMERIDER SYSTEMS
- IBM
- kerlink m2m technologies
- kpn
- M2M SPECTRUM NETWORKS
- proximus
- QOWISIO
- SAGEMCOM
- ST life.augmented
- SEMTECH
- orange

24 Contributor Members

- Adeunis RF
- ESPOTEL
- FastNet
- FLASHNET
- gemalto security to be free
- IMST
- Inmarsat
- irdeto
- LA POSTE
- LACE
- LinkLabs
- MICROCHIP
- MULTITECH
- myDevices
- OrbiWise
- senet the sensible network company
- SK telecom
- stream
- swisscom
- Vision valley
- m2B
- Selene Gruppo a2a
- inmarsat

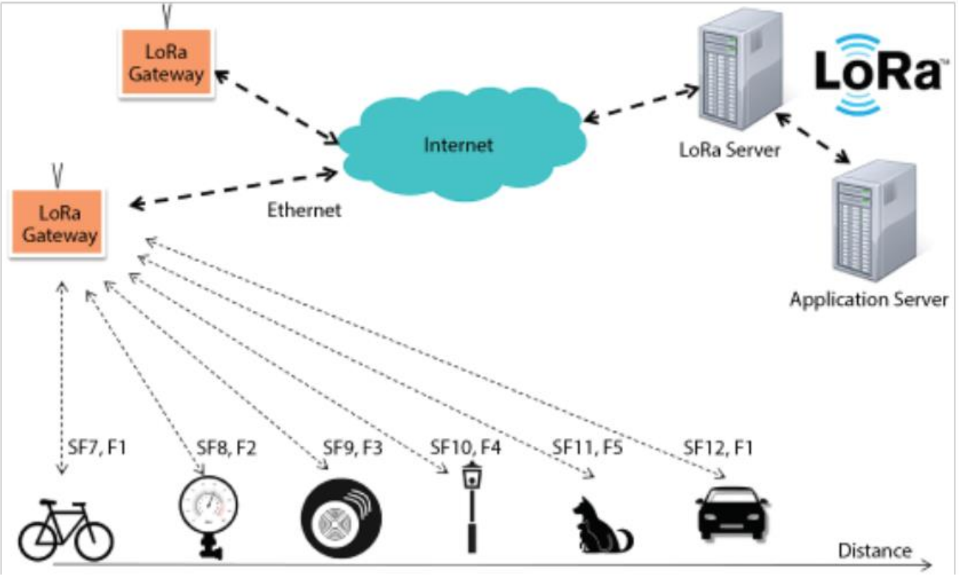
185 Adopter Members

- M2M
- abeeway
- ACN
- ALFLEX TECHNOLOGIES
- AMIHO technology intelligent wireless
- ANDREA
- arkessa
- ManThink
- 慧联无限 EasyLinkin
- eolane
- iSPHER
- GIMASI
- GORKE ELECTRONIC
- gupsy
- Hub One Une connexion d'avance
- INSIGMA Simplifying IT
- KEYSIGHT TECHNOLOGIES
- Electronics LACROIX
- Laird
- libelium
- NEMEUS
- nke WATTECO
- nuri TELECOM
- rfi engineering
- RFTech
- Schneider Electric
- 唯传科技
- SNEF Connect
- Solvera Lynx
- SF
- SYNOPSYS
- telog
- teltronic
- Webdyn
- Wi6Labs
- 智城云 MACHTALK

+ 148 autres membres

SF : Spreading Factor

ADR : Adaptive Data Rate


LoRa Gateway
Internet
LoRa Server
LoRa
LoRa Gateway
Ethernet
Application Server
SF7, F1
SF8, F2
SF9, F3
SF10, F4
SF11, F5
SF12, F1
Distance

SF impacts

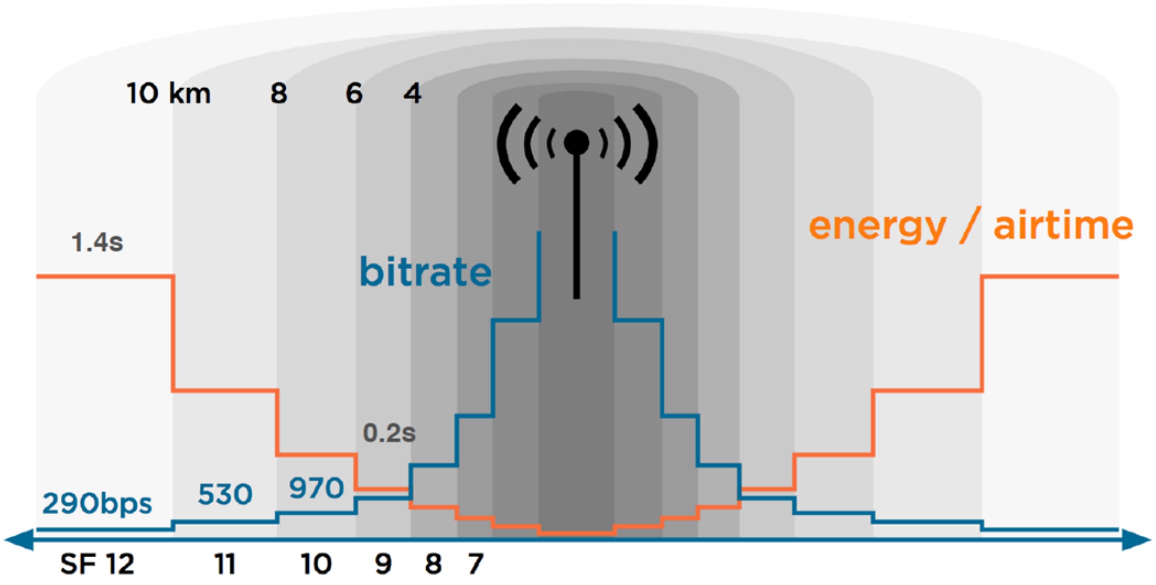
- Range
- Indoor penetration
- Throughput
- Payload size
- Power consumption
- Network capacity

Adaptive Data Rate (ADR) scheme is used by the LoRa network infrastructure to manage the data rate, number of transmissions and RF output power for each end-device individually. The goal is to maximize both battery life of the end-devices and overall network capacity.

SF : Spreading Factor

Data Rate	Modulation (EU)	SF	BW	bit/s	SNR (SoC SX1272/73)	Sensitivity (SoC SX1272/73)	Max payload size (North America)	Max payload size (Europe)
0	LoRa	12	125	250	-20 dB	-137 dBm		51 bytes
1	LoRa	11	125	440	-17,5 dB	-135 dBm		51 bytes
2	LoRa	10	125	980	-15 dB	-133 dBm	11 bytes	51 bytes
3	LoRa	9	125	1'760	-12,5 dB	-130 dBm	53 bytes	115 bytes
4	LoRa	8	125	3'125	-10 dB	-127 dBm	129 bytes	242 bytes
5	LoRa	7	125	5'470	-7,5 dB	-124 dBm	242 bytes	242 bytes
6	LoRa	7	250	11'000				
7	FSK 50 kbps			50'000				

Throughput / Range / Airtime


10 km
8
6
4
1.4s
bitrate
energy / airtime
0.2s
290bps
530
970
SF 12
11
10
9
8
7

Spreading factor (at 125 kHz)	Range (indicative value, depending on propagation conditions)	Time on Air (ms) For 10 Bytes app payload
SF7	2 km	56 ms
SF8	4 km	100 ms
SF9	6 km	200 ms
SF10	8 km	370 ms
SF11	11 km	740 ms
SF12	14 km	1400 ms

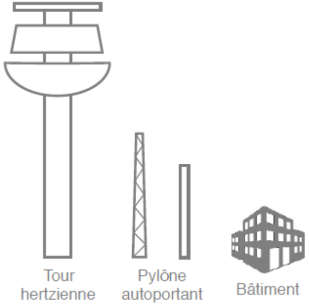
(with coding rate 4/5 ; bandwidth 125Khz ; Packet Error Rate (PER): 1%)

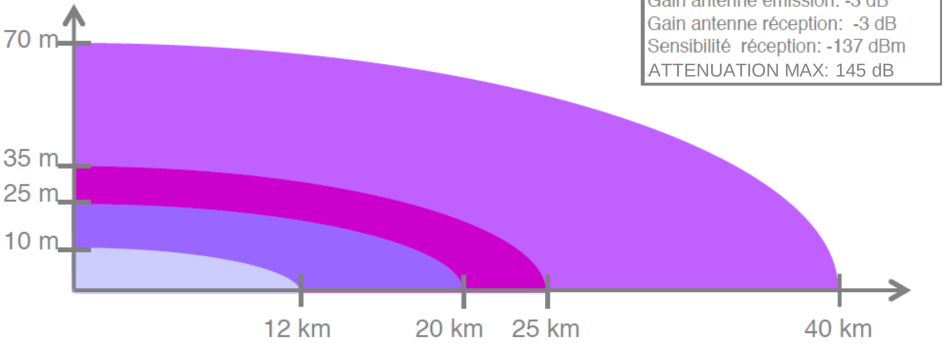
See airtime calculator : https://avbentem.github.io/airtime-calculator/ttn/eu868/50

The range of the radio signal depends on the height of the Gateway (antenna) implementation but also on the propagation environment.

Niveau d'émission: 14 dBm
Gain antenne émission: -3 dB
Gain antenne réception: -3 dB
Sensibilité réception: -137 dBm
ATTENUATION MAX: 145 dB

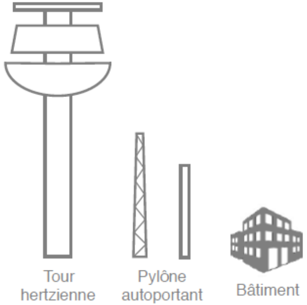
Milieu rural

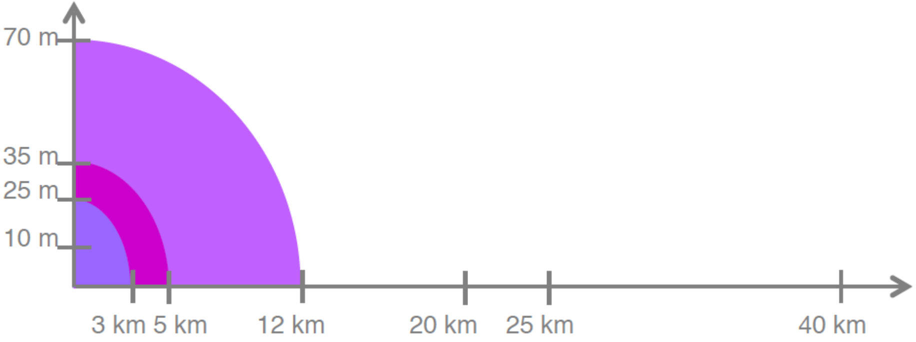

Tour hertzienne
Pylône autoportant
Bâtiment



Source : http://www.radioeng.cz/fulltexts/2003/03_03_16_19.pdf

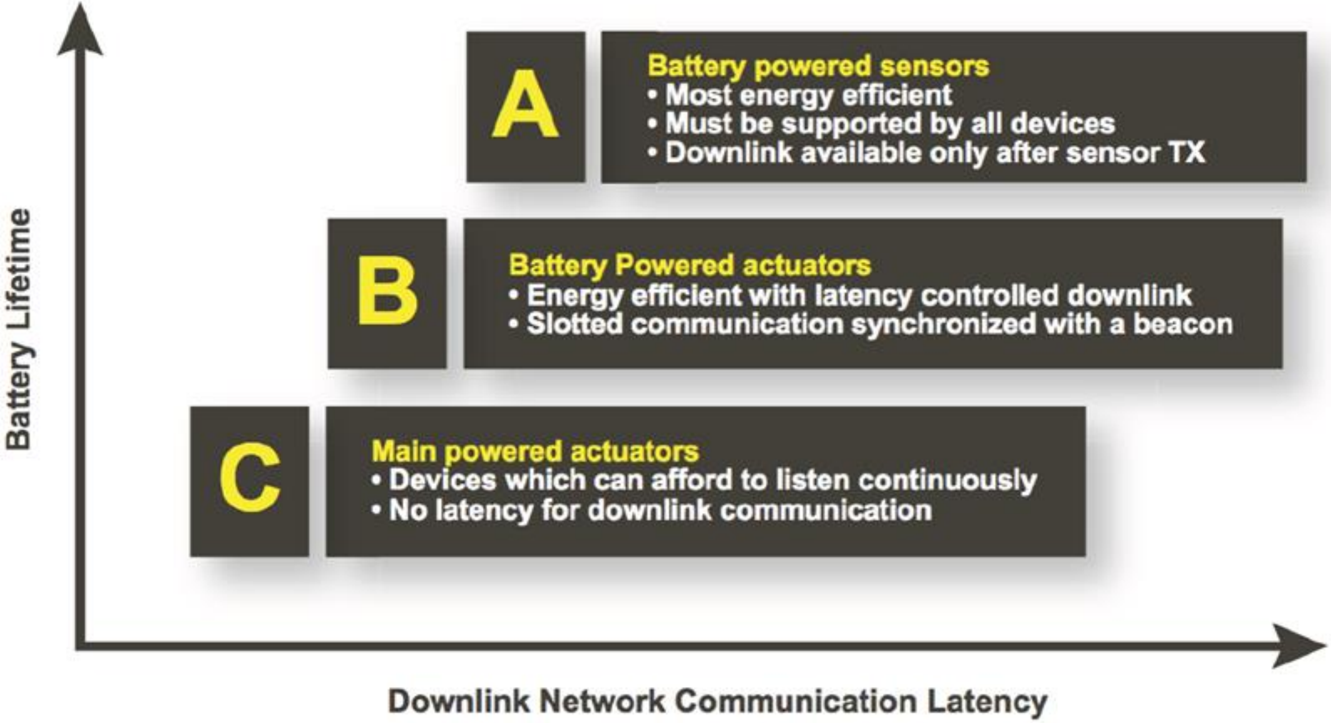
Milieu Urbain


Tour hertzienne
Pylône autoportant
Bâtiment



Source : 3GPP TR 25.942

LoRaWAN classes



Battery Lifetime
Downlink Network Communication Latency

A

Battery powered sensors

- Most energy efficient
- Must be supported by all devices
- Downlink available only after sensor TX

B

Battery Powered actuators

- Energy efficient with latency controlled downlink
- Slotted communication synchronized with a beacon

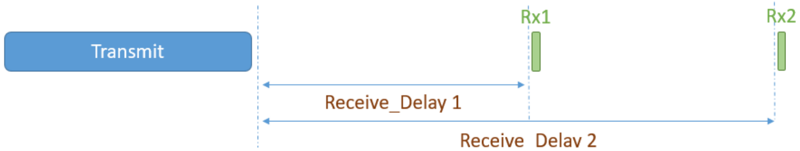
C

Main powered actuators

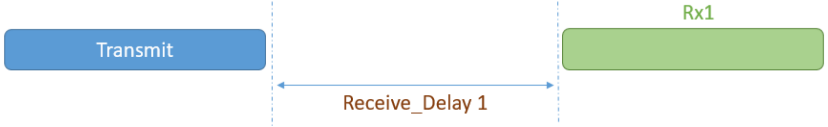
- Devices which can afford to listen continuously
- No latency for downlink communication

Channels and Downlinks

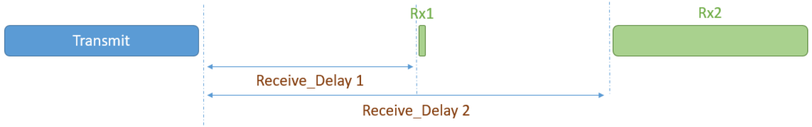
Receive Windows: Nothing is received


Transmit
Rx1
Rx2
Receive_Delay 1
Receive_Delay 2

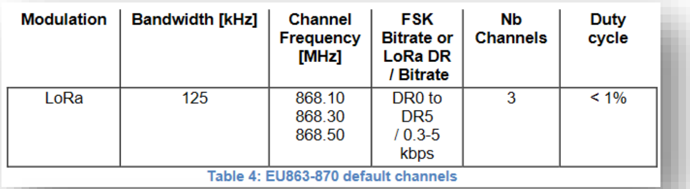
Receive Windows: Packet received in Rx1 window


Transmit
Rx1
Receive_Delay 1

Receive Windows: Packet is received in Rx2 window

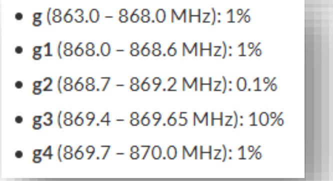

Transmit
Rx1
Rx2
Receive_Delay 1
Receive_Delay 2

Source: https://lora-developers.semtech.com/library/tech-papers-and-guides/lorawan-class-a-devices
https://lora-alliance.org/sites/default/files/2020-06/rp_2-1.0.1.pdf



Modulation	Bandwidth [kHz]	Channel Frequency [MHz]	FSK Bitrate or LoRa DR / Bitrate	Nb Channels	Duty cycle
LoRa	125	868.10 868.30 868.50	DR0 to DR5 / 0.3-5 kbps	3	< 1%

Table 4: EU863-870 default channels



- **g** (863.0 – 868.0 MHz): 1%
- **g1** (868.0 – 868.6 MHz): 1%
- **g2** (868.7 – 869.2 MHz): 0.1%
- **g3** (869.4 – 869.65 MHz): 10%
- **g4** (869.7 – 870.0 MHz): 1%

All parameters depend on regional parameters, but can be changed by the operator with MAC commands

Delays are usually 1 second for RX1, 1 more second for RX2

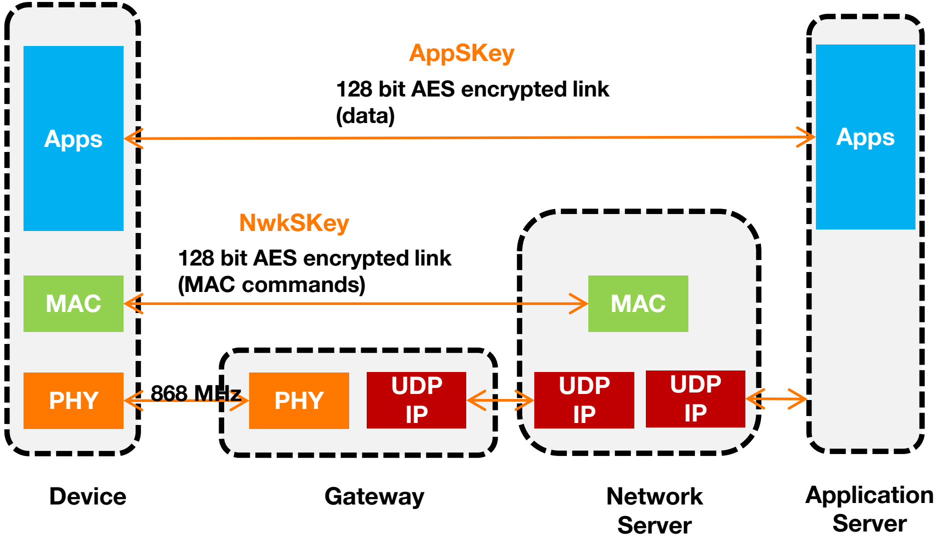
RX1 : frequency & SF depend on uplink ones

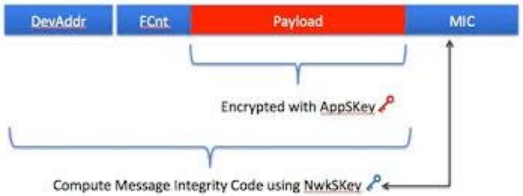
RX2 : frequency & SF are fixed

With ADR, ack on uplinks requested at least every ADR_ACK_LIMIT+ ADR_ACK_DELAY frames (=64+32 for Orange), or datarate lowered, or even re-join

Security

- Ciphering of data exchanged on the LoRaWAN network


AppSKey
128 bit AES encrypted link
(data)
Apps
Apps
NwkSKey
128 bit AES encrypted link
(MAC commands)
MAC
MAC
PHY
868 MHz
PHY
UDP
IP
UDP
IP
UDP
IP
Device
Gateway
Network
Server
Application
Server


DevAddr
FCnt
Payload
MIC
Encrypted with AppSKey
Compute Message Integrity Code using NwkSKey

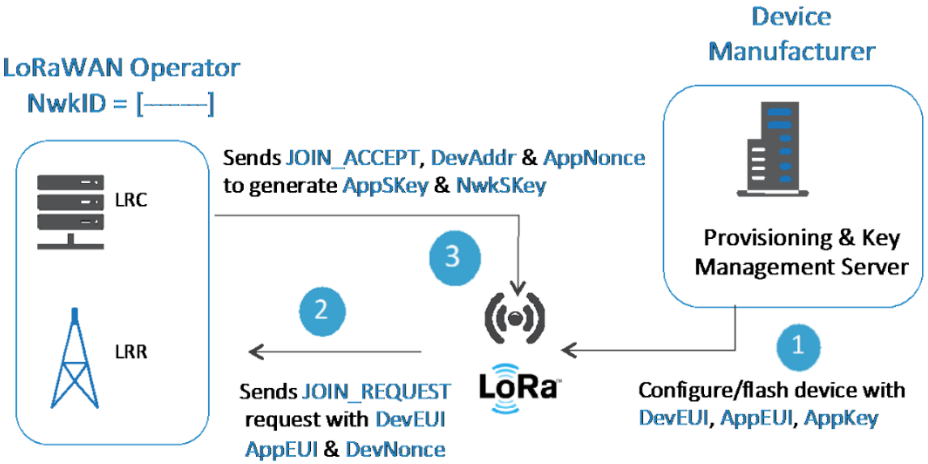
Data and Mac commands are ciphered by 2 different keys, so that the operator cannot see the application plain text

The 128-bit AppSKey is used to encrypt the payload from applications.

The 128-bit NwkSKey is used by the LoRaWAN network to check the authenticity and integrity of all exchanged messages.

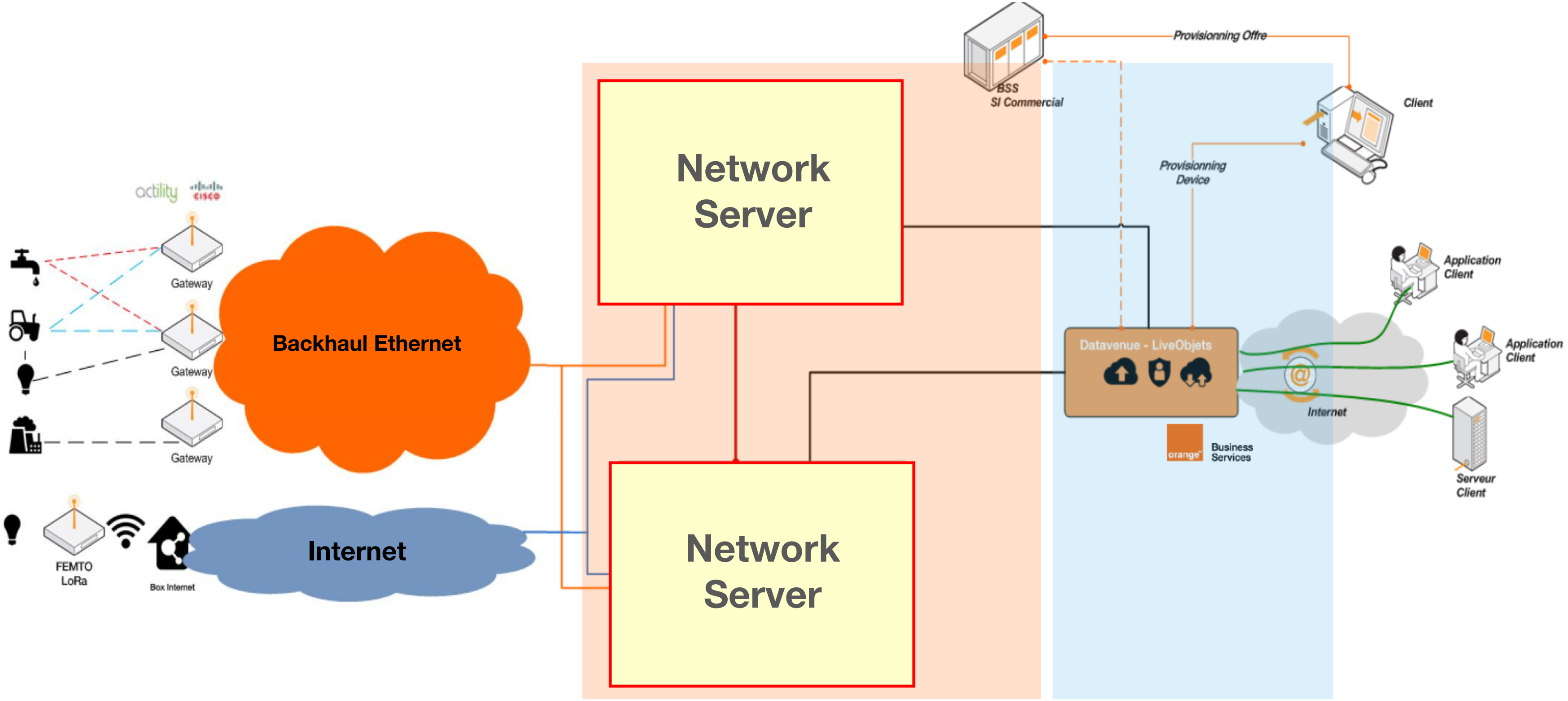
Security

- Over-the-air activation


Device Manufacturer
LoRaWAN Operator
NwkID = [———]
LRC
LRR
Sends JOIN_ACCEPT, DevAddr & AppNonce to generate AppSKey & NwkSKey
3
2
Sends JOIN_REQUEST request with DevEUI AppEUI & DevNonce
LoRa
Provisioning & Key Management Server
1
Configure/flash device with DevEUI, AppEUI, AppKey

- **OTA activation consists of join-request and join-accept exchanges between the device and the network, leading to the generation of session keys : AppSkey and NwkSKey.**
- **OTA activation provides a high level of security as its session keys are rebuilt on a regular basis.**
- **On the contrary, the "Activation By Personalization" procedure defines session keys statically in the devices, is less secure, and discouraged.**

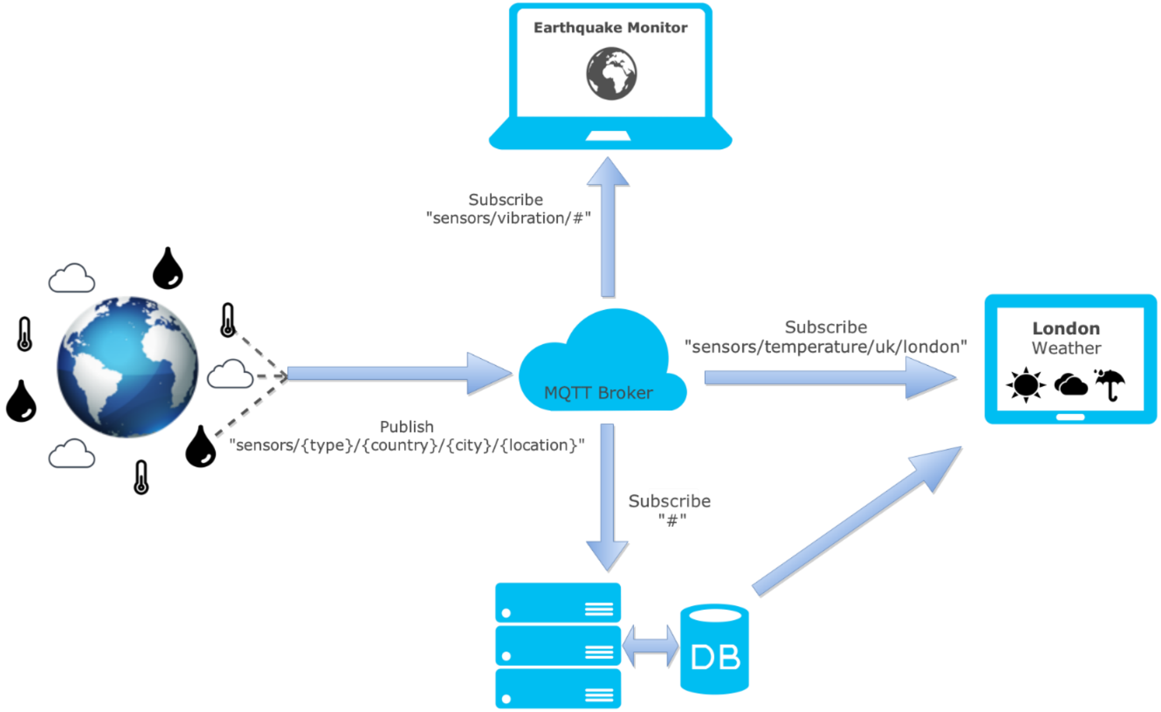
LoRaWAN Orange - architecture


Provisionning Offre
BSS
SI Commercial
Client
Provisionning
Device
actility
cisco
Gateway
Gateway
Gateway
Backhaul Ethernet
Network
Server
Application
Client
Application
Client
Datavenue - LiveObjets
Internet
orange
Business
Services
Serveur
Client
FEMTO
LoRa
Box Internet
Internet
Network
Server

#1.2

IP-based networks

IP / MQTT protocol


Earthquake Monitor
Subscribe
"sensors/vibration/#"
MQTT Broker
Subscribe
"sensors/temperature/uk/london"
London
Weather
Publish
"sensors/{type}/{country}/{city}/{location}"
Subscribe
"#"
DB

Source: zoetrope.io

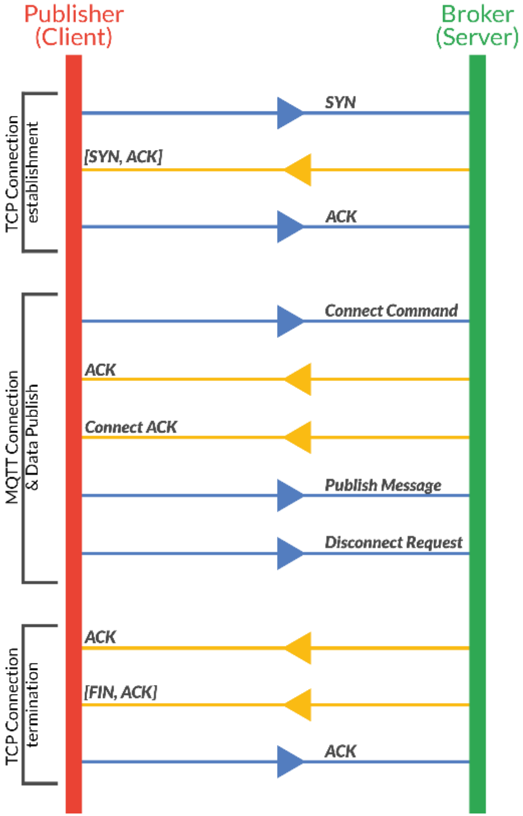
Bearer
TCP/IP
WebSockets/TCP/IP

Security
Authentication
Client ID
TLS
TLS with client auth.

QoS Level
0: no ack from subscribers
1: delivered at least once
2: delivered once

Wildcards
+ : one level
# : any level

IP / MQTT protocol



Publisher (Client)

Broker (Server)

TCP Connection establishment

SYN

[SYN, ACK]

ACK

MQTT Connection & Data Publish

Connect Command

ACK

Connect ACK

Publish Message

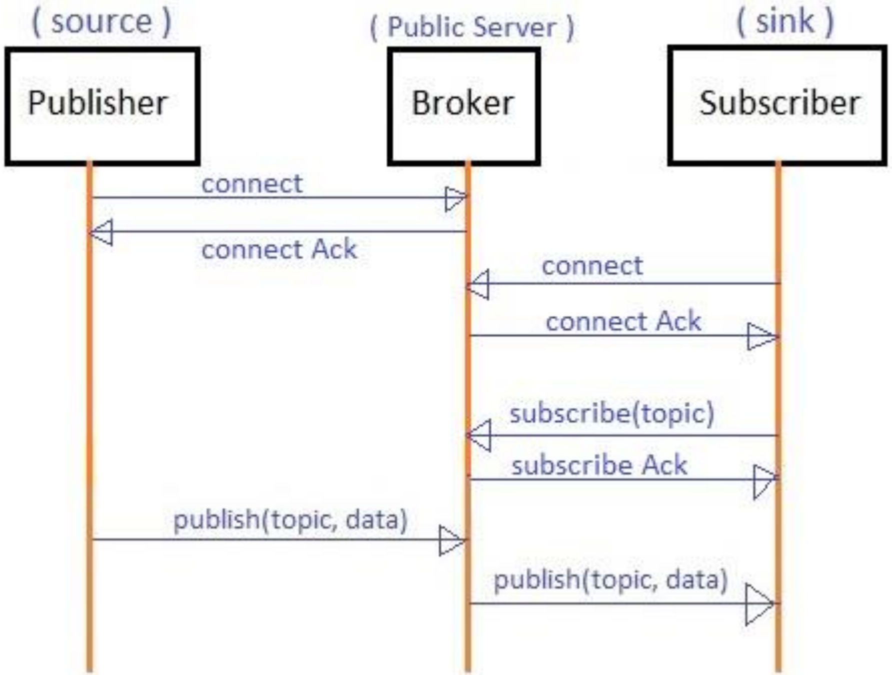
Disconnect Request

TCP Connection termination

ACK

[FIN, ACK]

ACK



(source) Publisher

(Public Server) Broker

(sink) Subscriber

connect

connect Ack

connect

connect Ack

subscribe(topic)

subscribe Ack

publish(topic, data)

publish(topic, data)

Source: bytesofgigabytes.com rfwireless-world.com

IP / Lightweight M2M (LwM2M)

- **Open Mobile Alliance standard**
  - Fully standard device management
  - Fully standard data management
- **Benefits**
  - Efficient on any cellular network: 2/3/4/5G, LTE-M, and preferred for NB-IoT, ready for NIDD (no IP)
  - Plug'n play devices & reversibility
    - Devices are switchable with no integration effort
    - Off the shelf cellular device catalog
    - Non-locking architecture
  - Bootstrap : automated '0 touch' provisioning for more secured and massive deployments
- **Premium feature**
  - LwM2M is today a scarce resource among hyperscalers

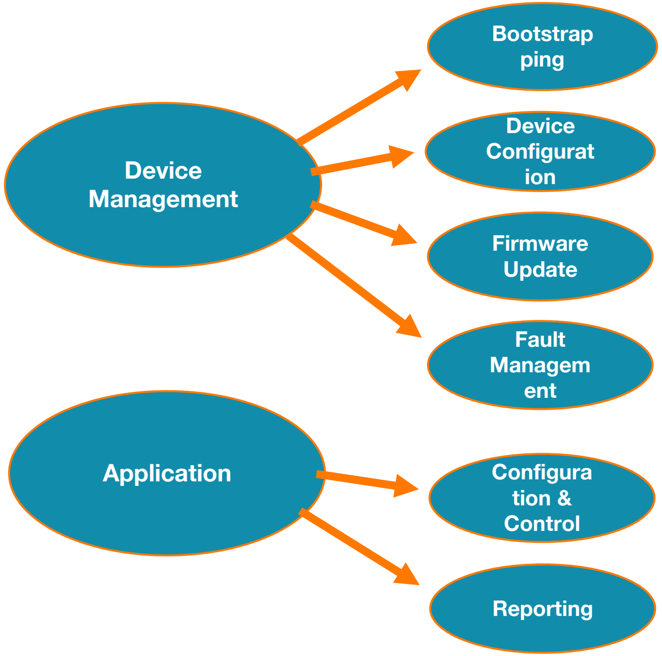
IP / LwM2M

designed with performance and the constraints of M2M devices in mind

well defined resource and data model

built on top of the standardized CoAP (Constrained Application Protocol) as a variation of the HTTP protocol

DTLS security with TLS-PSK



Device Management

Bootstrapping

Device Configuration

Firmware Update

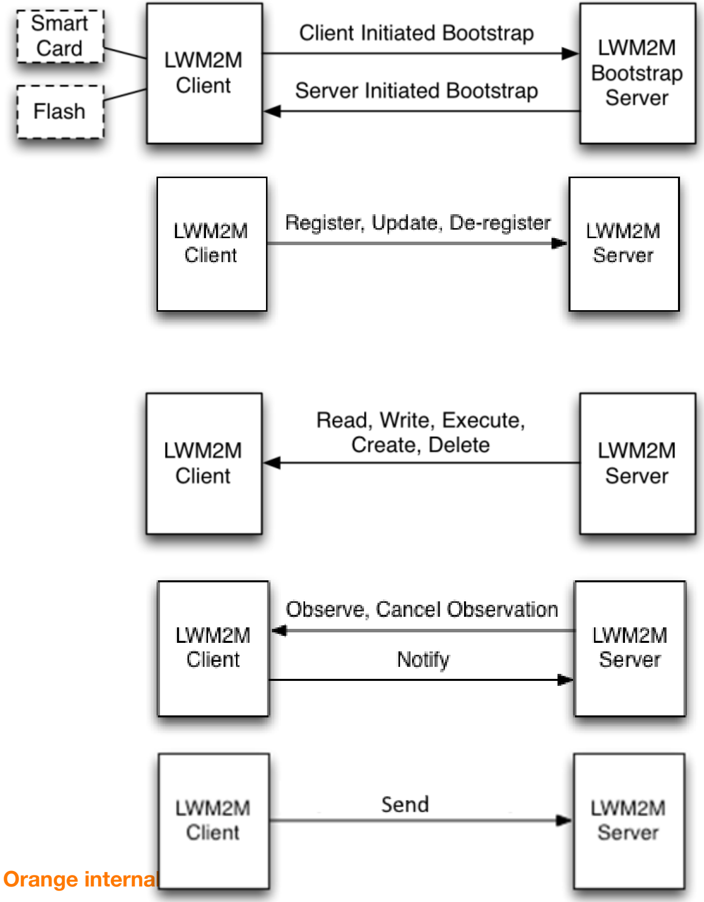
Fault Management

Application

Configuration & Control

Reporting

IP / LwM2M

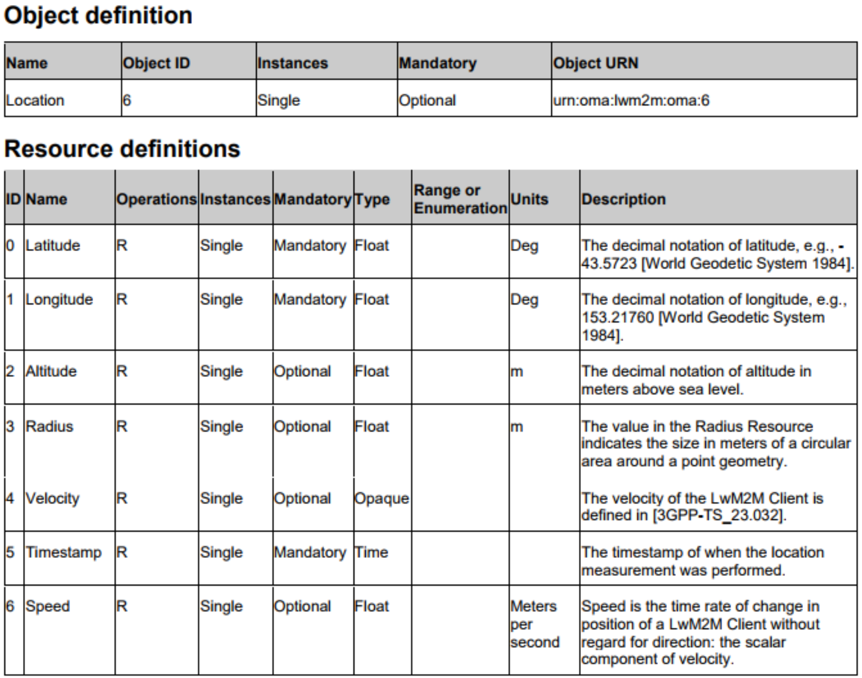

Smart Card
Flash
LWM2M Client
Client Initiated Bootstrap
Server Initiated Bootstrap
LWM2M Bootstrap Server
LWM2M Client
Register, Update, De-register
LWM2M Server
LWM2M Client
Read, Write, Execute, Create, Delete
LWM2M Server
LWM2M Client
Observe, Cancel Observation
Notify
LWM2M Server
LWM2M Client
Send
LWM2M Server

IPSO:

LwM2M object and resource registry (data normalization)

http://openmobilealliance.org/wp/OMNA/LwM2M/LwM2MRegistry.html

Example with location object:



Object definition

Name	Object ID	Instances	Mandatory	Object URN
Location	6	Single	Optional	urn:oma:lwm2m:oma:6

Resource definitions

ID	Name	Operations	Instances	Mandatory	Type	Range or Enumeration	Units	Description
0	Latitude	R	Single	Mandatory	Float		Deg	The decimal notation of latitude, e.g., -43.5723 [World Geodetic System 1984].
1	Longitude	R	Single	Mandatory	Float		Deg	The decimal notation of longitude, e.g., 153.21760 [World Geodetic System 1984].
2	Altitude	R	Single	Optional	Float		m	The decimal notation of altitude in meters above sea level.
3	Radius	R	Single	Optional	Float		m	The value in the Radius Resource indicates the size in meters of a circular area around a point geometry.
4	Velocity	R	Single	Optional	Opaque			The velocity of the LwM2M Client is defined in [3GPP-TS_23.032].
5	Timestamp	R	Single	Mandatory	Time			The timestamp of when the location measurement was performed.
6	Speed	R	Single	Optional	Float		Meters per second	Speed is the time rate of change in position of a LwM2M Client without regard for direction: the scalar component of velocity.

NB-IoT

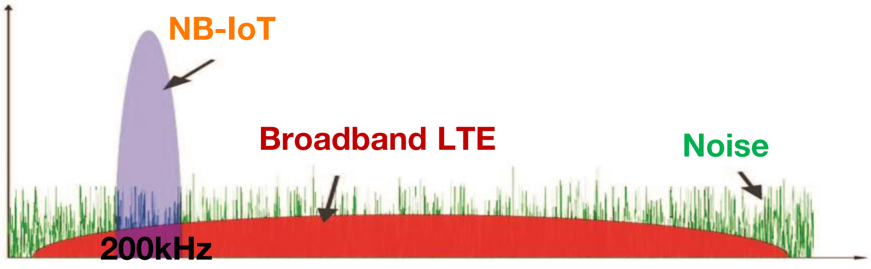
3GPP standard, IP based, secured by SIM card, can fallback to 2G

up to 20dB coverage extension compared to GSM or broadband LTE
corresponds to a 7x increase in coverage area for an open environment, or roughly the loss that occurs when a signal penetrates the outer wall of a building

Mainly UDP-compatible
some modems/networks are TCP-compatibles

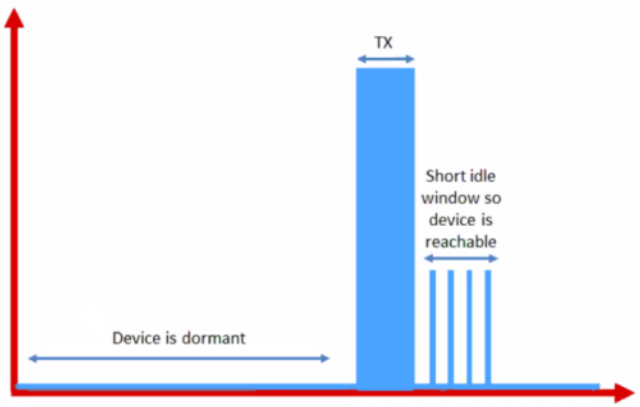
NB-IoT

optimized for low cost
and low power,
low-throughput (<20kbps)
slowly moving devices

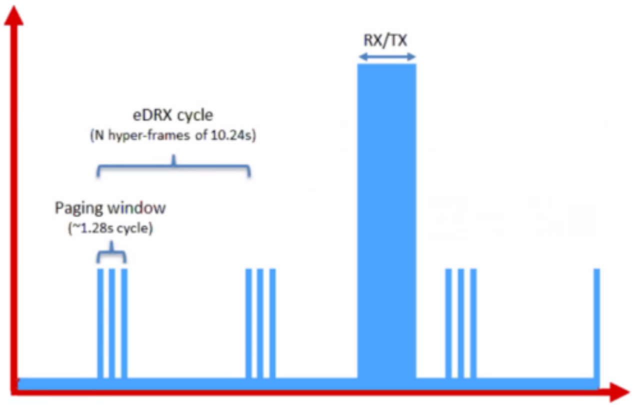


Power saving modes

PSM


TX
Short idle window so device is reachable
Device is dormant

eDRX


RX/TX
eDRX cycle
(N hyper-frames of 10.24s)
Paging window
(~1.28s cycle)

LTE-M capabilities

LTE-M basic features (LPWA)

Low power
Up to 10 years (1msg/day)

Long Range
Up to 10 km (+15dB)

Low cost
Target cost module ~ 5$

LTE-M specific features

Bidirectional
Uplink & Downlink

Fast mobility
Up to 300 Km/h (connected HO)

Low latency
Down to 200ms

Roaming
Roaming worldwide (3GPP)

Throughputs
Up to 1 Mbps (Full duplex)

4G evolution
4G Network Software upgrade

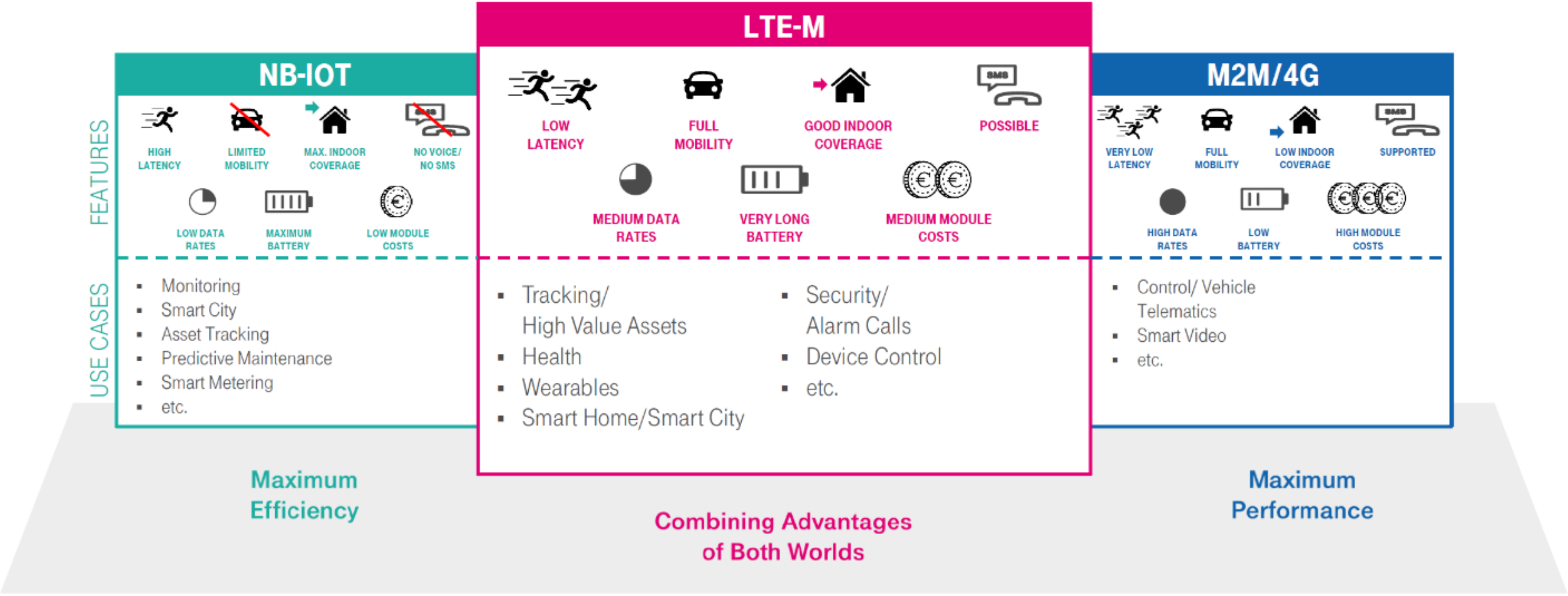
Voice
VoLTE support

Secure
(e)SIM encryption/authentication

Source: GSMA.com

LTE-M

LTE-M: BRIDGES THE GAP BETWEEN NB-IOT AND M2M/4G



FEATURES

USE CASES

NB-IOT

HIGH LATENCY

LIMITED MOBILITY

MAX. INDOOR COVERAGE

NO VOICE/ NO SMS

LOW DATA RATES

MAXIMUM BATTERY

LOW MODULE COSTS

- Monitoring
- Smart City
- Asset Tracking
- Predictive Maintenance
- Smart Metering
- etc.

Maximum Efficiency

LTE-M

LOW LATENCY

FULL MOBILITY

GOOD INDOOR COVERAGE

POSSIBLE

MEDIUM DATA RATES

VERY LONG BATTERY

MEDIUM MODULE COSTS

- Tracking/ High Value Assets
- Health
- Wearables
- Smart Home/Smart City
- Security/ Alarm Calls
- Device Control
- etc.

Combining Advantages of Both Worlds

M2M/4G

VERY LOW LATENCY

FULL MOBILITY

LOW INDOOR COVERAGE

SUPPORTED

HIGH DATA RATES

LOW BATTERY

HIGH MODULE COSTS

- Control/ Vehicle Telematics
- Smart Video
- etc.

Maximum Performance

Source: GSMA.com

LTE-M

Cat-M1

In Europe: 800 MHz and 1800 MHz bands
1.08 MHz channel (LTE : 5, 10, 15 or 20 MHz)
Half-duplex @ 350 kbps or full-duplex @1Mbps

Power Saving Mode (PSM) allows devices to enter scheduled deep sleep.
Extended Discontinuous Reception (eDRX) extends the modem's reception inactivity window, while listening for transmissions at set intervals.

Latency in normal coverage mode, ranging from a few hundred milliseconds in normal mode to a few dozen seconds in extension mode.

Mobility between cells in idle and connected mode ; high-speed (300 km/h)

IP for data, VoLTE for voice, SMS

LTE-M's range : better than LTE network by repetition and Extended Coverage modes A (+9dB) and B (+18dB)

#1.3

Wireless technologies comparison

Focus on wireless technologies

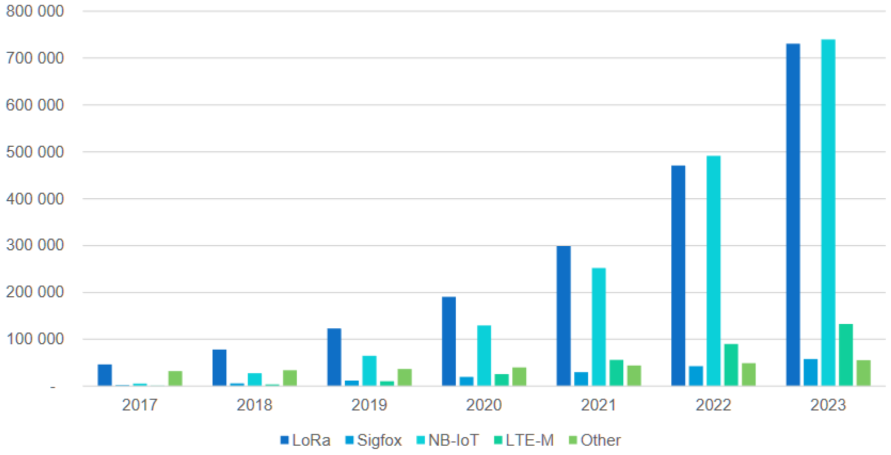
LoRaWAN and cellular IoT lead massive IoT market

Today, LoRaWAN-based deployments are:

- 157 countries**
- 145M+ end nodes*
- 137+ operators**
- 800K+ Gateways*
- 500+ LoRa Alliance® members**

*Semtech Q1 FY21 Earnings Call
**LoRa Alliance Report, April 2020

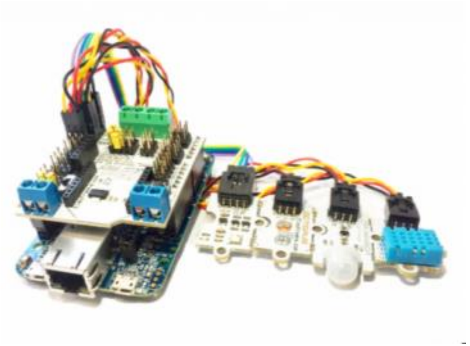
IHS Report 2019 - LPWA Total Connections by Technology - 2017-2023
(thousands of connections)

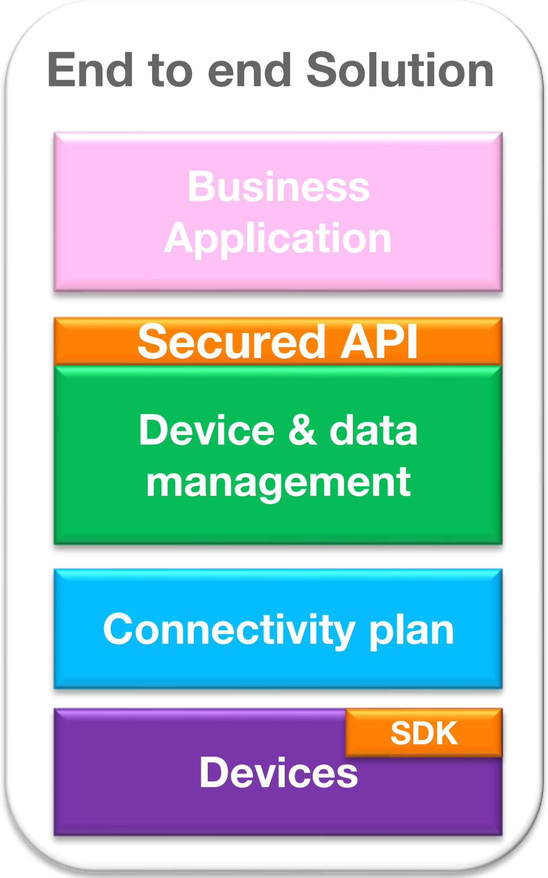


#2

Live Objects offer Functional view

Whatever the IoT service





End to end Solution

Business Application

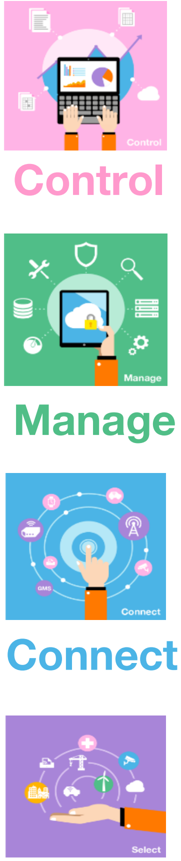
Secured API

Device & data management

Connectivity plan

SDK

Devices


Control
Manage
Connect
Select

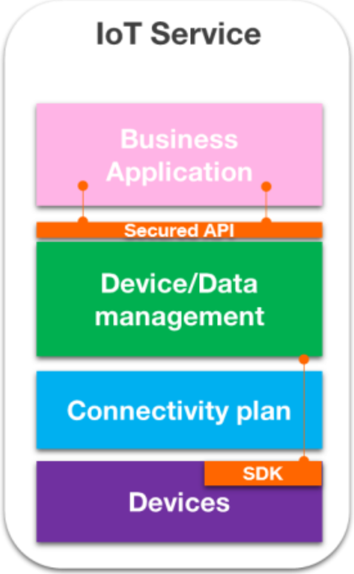
Control

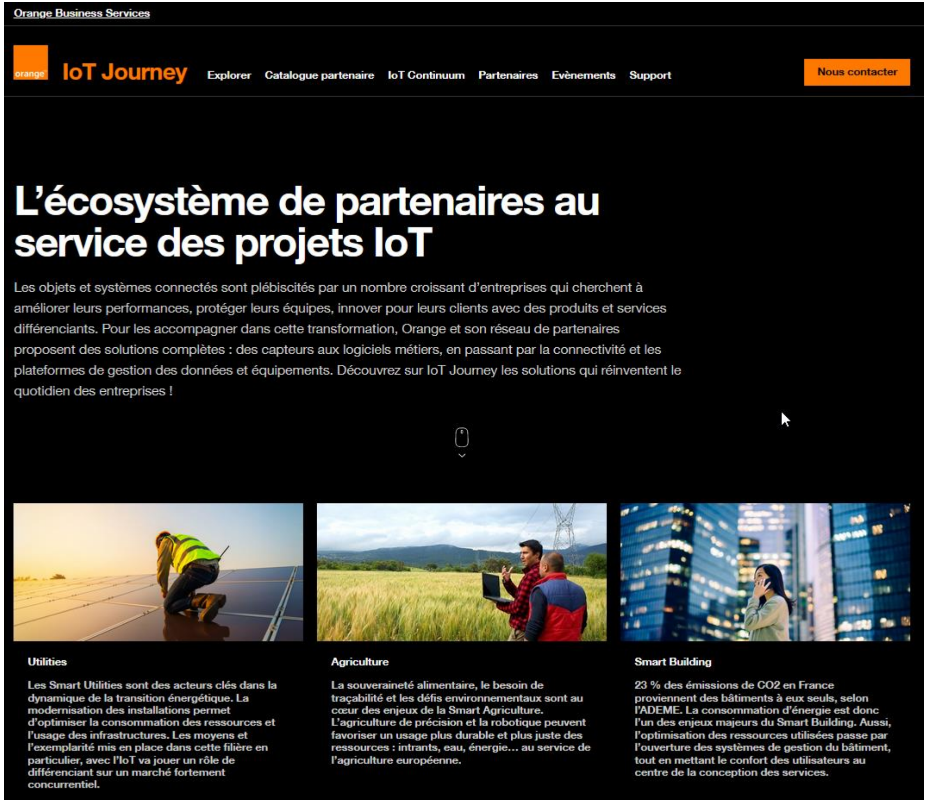
Manage

Connect

Select

Simplify and secure the equipment selection


IoT Service
Business Application
Secured API
Device/Data management
Connectivity plan
SDK
Devices


Orange Business Services
orange
IoT Journey
Explorer
Catalogue partenaire
IoT Continuum
Partenaires
Evènements
Support
Nous contacter

L'écosystème de partenaires au service des projets IoT

Les objets et systèmes connectés sont plébiscités par un nombre croissant d'entreprises qui cherchent à améliorer leurs performances, protéger leurs équipes, innover pour leurs clients avec des produits et services différenciants. Pour les accompagner dans cette transformation, Orange et son réseau de partenaires proposent des solutions complètes : des capteurs aux logiciels métiers, en passant par la connectivité et les plateformes de gestion des données et équipements. Découvrez sur IoT Journey les solutions qui réinventent le quotidien des entreprises !

Utilities

Les Smart Utilities sont des acteurs clés dans la dynamique de la transition énergétique. La modernisation des installations permet d'optimiser la consommation des ressources et l'usage des infrastructures. Les moyens et l'exemplarité mis en place dans cette filière en particulier, avec l'IoT va jouer un rôle de différenciant sur un marché fortement concurrentiel.

Agriculture

La souveraineté alimentaire, le besoin de traçabilité et les défis environnementaux sont au cœur des enjeux de la Smart Agriculture. L'agriculture de précision et la robotique peuvent favoriser un usage plus durable et plus juste des ressources : intrants, eau, énergie… au service de l'agriculture européenne.

Smart Building

23 % des émissions de CO2 en France proviennent des bâtiments à eux seuls, selon l'ADEME. La consommation d'énergie est donc l'un des enjeux majeurs du Smart Building. Aussi, l'optimisation des ressources utilisées passe par l'ouverture des systèmes de gestion du bâtiment, tout en mettant le confort des utilisateurs au centre de la conception des services.

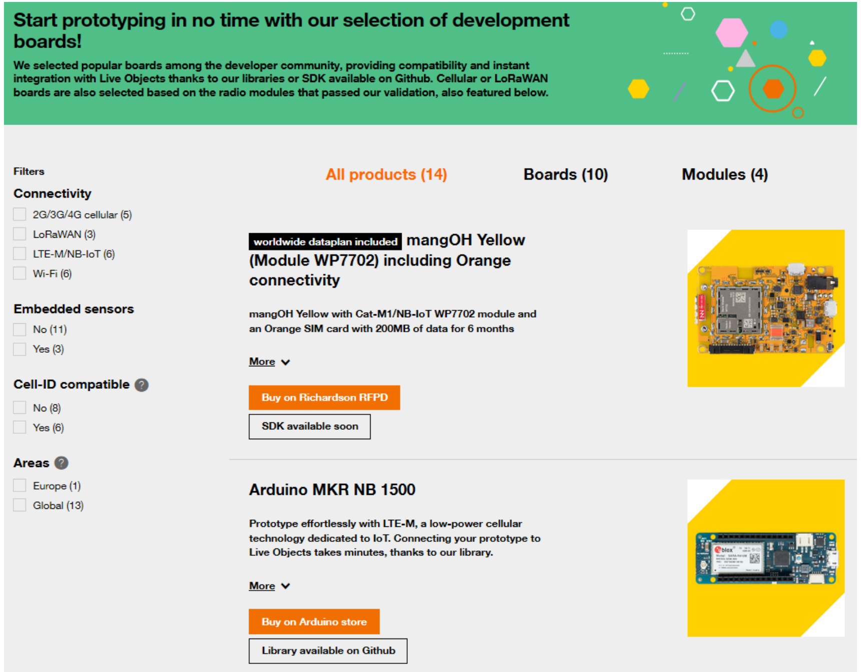
https://iotjourney.orange.com

Select – device ecosystem

Available : partner dev-kits

- LTE-M starter kits
- LoRa starter kits
- Arduino Wifi / GSM kits
- ESP32 MicroPython kits
- Wireless modules
- Corresponding SDKs

QUECTEL
BG95



Start prototyping in no time with our selection of development boards!

We selected popular boards among the developer community, providing compatibility and instant integration with Live Objects thanks to our libraries or SDK available on Github. Cellular or LoRaWAN boards are also selected based on the radio modules that passed our validation, also featured below.

Filters

Connectivity

☐ 2G/3G/4G cellular (5)
☐ LoRaWAN (3)
☐ LTE-M/NB-IoT (6)
☐ Wi-Fi (6)

Embedded sensors

☐ No (11)
☐ Yes (3)

Cell-ID compatible ?

☐ No (8)
☐ Yes (6)

Areas ?

☐ Europe (1)
☐ Global (13)

All products (14) | Boards (10) | Modules (4)

worldwide dataplan included **mangOH Yellow (Module WP7702) including Orange connectivity**

mangOH Yellow with Cat-M1/NB-IoT WP7702 module and an Orange SIM card with 200MB of data for 6 months

More ⌄

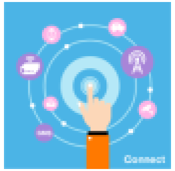
Arduino MKR NB 1500

Prototype effortlessly with LTE-M, a low-power cellular technology dedicated to IoT. Connecting your prototype to Live Objects takes minutes, thanks to our library.

More ⌄

https://liveobjects.orange-business.com/#/hardware

Connect – a full range of connectivity options



Combining state of the art connectivity solutions to meet your specific needs
Live Objects manages seamlessly any kind of connectivity

Fixed line & satellite broadband

- High speed data transmission
- Worldwide Secure and reliable network
- Ideal for delivering large amount of data to your data centers
- Satellite adapted for uncovered locations

Cellular & LTE-M

- IP and SMS
- Global coverage through Orange mobile network and roaming partners
- Ideal for mobile embedded IoT systems
- Wide array of usages from small to large amount of data transmission
- Secure network

LoRa LPWA* network

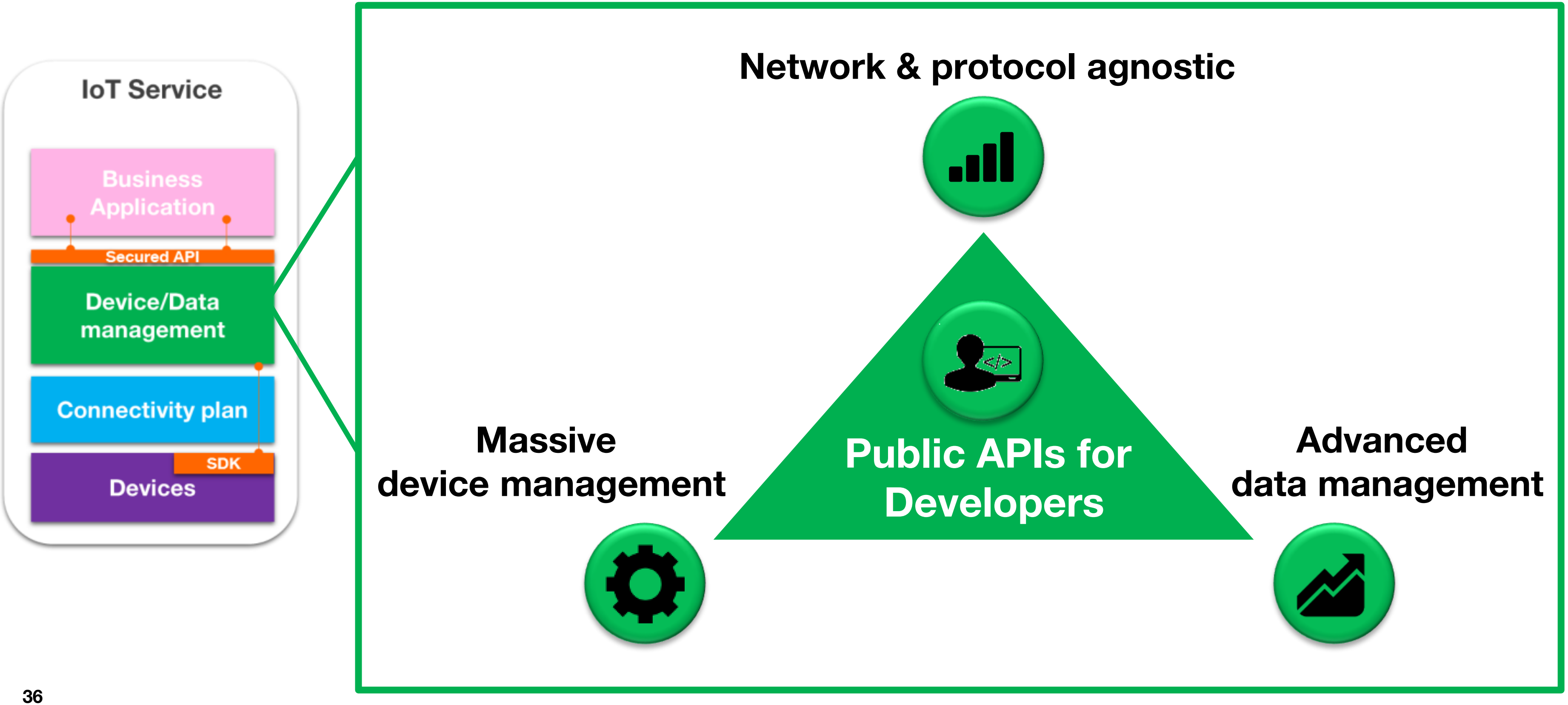
- Longer battery life (up to 10 years) & reduced battery related costs.
- Adapted to areas with poor cellular network coverage
- Adapted for long life, low cost objects

Local wireless solutions

- Adapted to short range wireless transmission
- Multiple connection protocols: ZigBee, Z-Wave, Bluetooth, WiFi…
- For smart home devices, wearables…

***Low Power Wide Area**

Live Objects - overview


IoT Service
Business Application
Secured API
Device/Data management
Connectivity plan
SDK
Devices

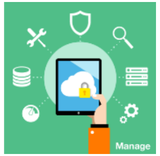
Network & protocol agnostic

Massive device management

Public APIs for Developers

Advanced data management

Secured advanced data collection & IoT fleet management



A secured and resilient, cloud-based, protocols agnostic IoT platform

Protocols/Gateways

Protocol agnostic solution

- MQTT/S
- MQTT over Websocket/S
- REST/HTTPS
- SMS
- LoRaWAN
- COAP/LwM2M
- Geolocation enrichments
  - Lora Macro
  - Cellular
  - Wifi (soon)
- Private LoRa Gateways
- API for external connectors

Advanced collect

Ensure real time messages management

- Ensure message collection, delivery, filtering & routing :
  - Real-time messaging
  - FIFO, HTTP-Push
  - Hosted connectors to public clouds
- Event triggering & routing
- Multi-interface decoder
- Metadata enrichments
- Pipelines for transformation/enrichments
- SIM/network info & events
- Edge extensions for industry & smart buildings

IoT fleet management

Manage massive device fleets

- Inventory: hierarchical Group, Tags, Properties, advanced filters
- Commands/Configuration
- Firmware Upgrade
- Events: device/command status
- Campaign management
- Activity/error log
- Silent devices alarms
- Analytics & Suspect devices
- Bootstrap

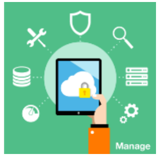
- Live Objects Sensor: open source Android app for field Technicians

Data Management

Store and manage Data

- Generic and configurable data model
- 2 levels of storage
  - Time stamped
  - Indexed structured data
- Multi criteria complex search requests
- Public API

… Ease developers life



Ready for Developers, open to Partners
Connectors and Advanced features to reduce development costs

End to end Security

- Device certificate authentication support (X509)
- APN/VPN (bespoke)
- User activity logs

Developers

- Activity Log
- Free Discover offer
- LoRa/LTE-M Starter kit
- C SDK for ARM, Arduino
- C/Python/µPython for Raspberry
- Business data Widgets
- 3rd party Application enablers : Node red, Kheiron

Orange Assets/partners bundling

- Vendor management
- KPIs for Billing API
- Codeless application development
    - Orange Node red Saas
    - Iothink – Kheiron
- Cloud Connectors: Azure Event hub, Iot hub, AWS SGS, Google Cloud, Flexible Engine
- Source connectors: Kerlink (Private Lora), Sigfox

Other advanced features

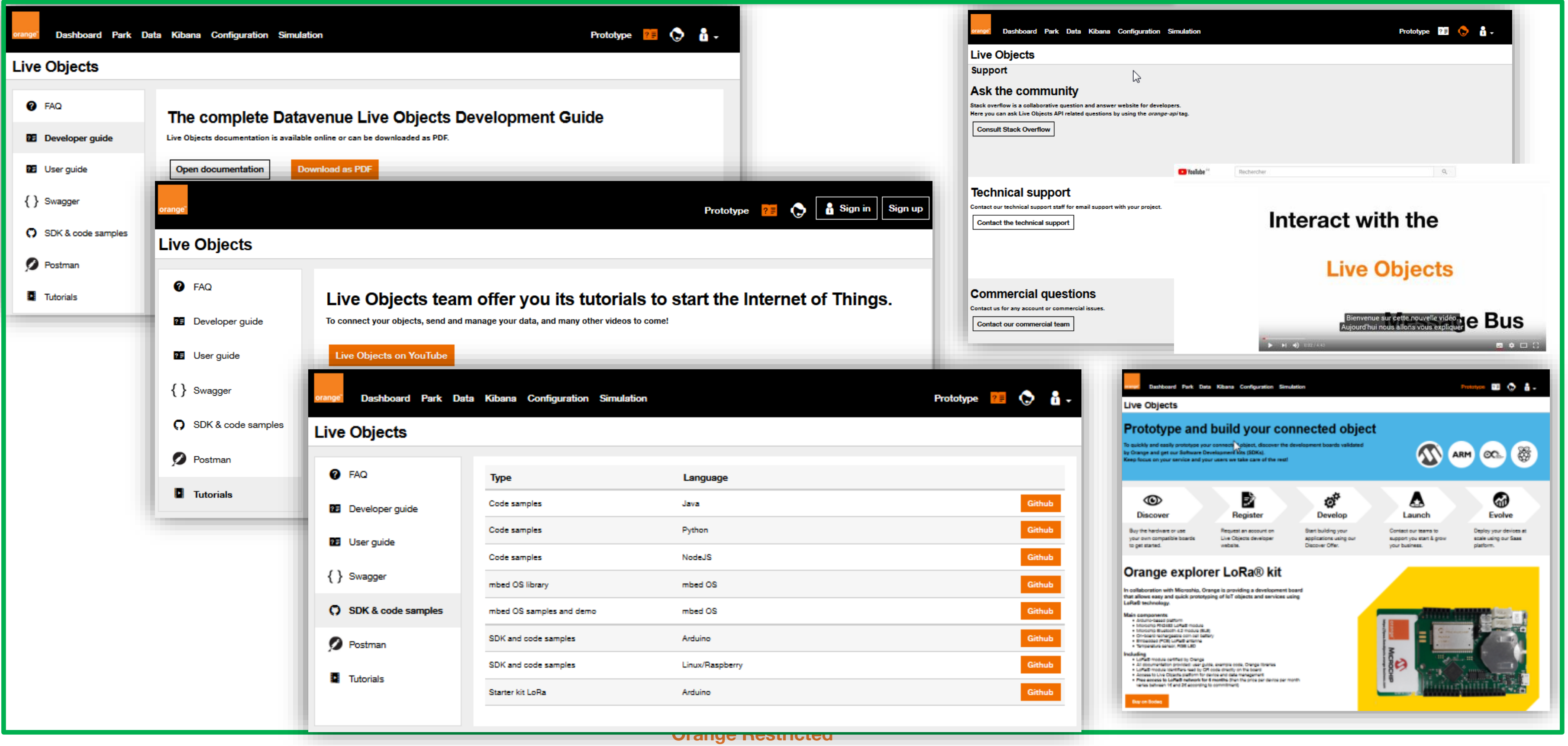
- Rule engine : Event/state processing + actions on Mail/SMS/HTTP-Push/FiFo
- Geozone management
- NodeRed as a service

Architecture

- On premises, Localized SaaS

developers ecosystem

Fully documented APIs, Code, SDK, Youtube channel, technical support


orange
Dashboard
Park
Data
Kibana
Configuration
Simulation
Prototype
Sign in
Sign up
FAQ
Developer guide
User guide
Swagger
SDK & code samples
Postman
Tutorials
Open documentation
Download as PDF
Live Objects on YouTube
Github
Consult Stack Overflow
Contact the technical support
Contact our commercial team
YouTube
Rechercher
ARM
Discover
Register
Develop
Launch
Evolve
Buy on Sodaq
MICROCHIP

Live Objects

The complete Datavenue Live Objects Development Guide

Live Objects documentation is available online or can be downloaded as PDF.

Live Objects

Live Objects team offer you its tutorials to start the Internet of Things.

To connect your objects, send and manage your data, and many other videos to come!

Live Objects

Type	Language
Code samples	Java
Code samples	Python
Code samples	NodeJS
mbed OS library	mbed OS
mbed OS samples and demo	mbed OS
SDK and code samples	Arduino
SDK and code samples	Linux/Raspberry
Starter kit LoRa	Arduino

Live Objects

Support

Ask the community

Stack overflow is a collaborative question and answer website for developers.
Here you can ask Live Objects API related questions by using the *orange-api* tag.

Technical support

Contact our technical support staff for email support with your project.

Commercial questions

Contact us for any account or commercial issues.

Interact with the

Live Objects

Message Bus

Bienvenue sur cette nouvelle vidéo.
Aujourd'hui nous allons vous expliquer

Live Objects

Prototype and build your connected object

To quickly and easily prototype your connected object, discover the development boards validated by Orange and get our Software Development Kits (SDKs).
Keep focus on your service and your users we take care of the rest!

Discover: Buy the hardware or use your own compatible boards to get started.

Register: Request an account on Live Objects developer website.

Develop: Start building your applications using our Discover Offer.

Launch: Contact our teams to support you start & grow your business.

Evolve: Deploy your devices at scale using our Saas platform.

Orange explorer LoRa® kit

In collaboration with Microchip, Orange is providing a development board that allows easy and quick prototyping of IoT objects and services using LoRa® technology.

Main components

Including

#3

Live Objects Architecture

Live Objects will simplify your IoT service life cycle

Devices & Sources

Devices catalog for your business use cases

Hardware modules, boards & SDK to design you own sensor

3rd party sources

sigfox

Private Lora

kerlink

“Edge” extensions

Everyware IoT
ESF
EC

TECHNILOG

Lora local coverage extensions & satellite

kinéis

Simulator mobile app for your tests

Live Objects

Managed connectors
Live Objects Sensor Android App
Codeless tools

Equipment agnostic management

Multi-connectivity
Multi-sources

« Lora, 2/3/4/5G, SMS, LTE-M/Nb-IoT, MQTT, LwM2M… »

Filter, transform, enrich, route business data to Clouds

IoT Fleet management

Proactive monitoring, advanced diagnostics, Command/config/FOTA

Drag & drop Dashboard Web

Codeless tools

Node-RED

Kheiron IoT Suite

Live Object Sensor App
For field Technicians

Cloud Services, Data Analytics & Business Applications

Azure

AWS

IBM Cloud

Flexible Engine

Proprietary IT

splunk>

Product Security & SLA

SERIVCE

Live Objects

Identity and authorization management and role based access control

API Keys mechanism, x509 certificates, mobile security network support to authenticate the objects fleet and the platform

Regular security audits

Security policies (GDPR)

Redundancy on site at the applicative level

Availability rate: > 99,9%

CLOUD

Secured and strong authentication connection

Administration portal security: customers are provided with portals allowing them to manage their Cloud services. Access control to these portals(personal accounts, logged actions, protected and encrypted data flows. Portal regular security intrusion tests.

Personal Data protection processing (GDPR Compliancy)

INFRA

Tier III+IV Datacenters (France)

Video and Biometrical control access

Electrical chain highly redundant

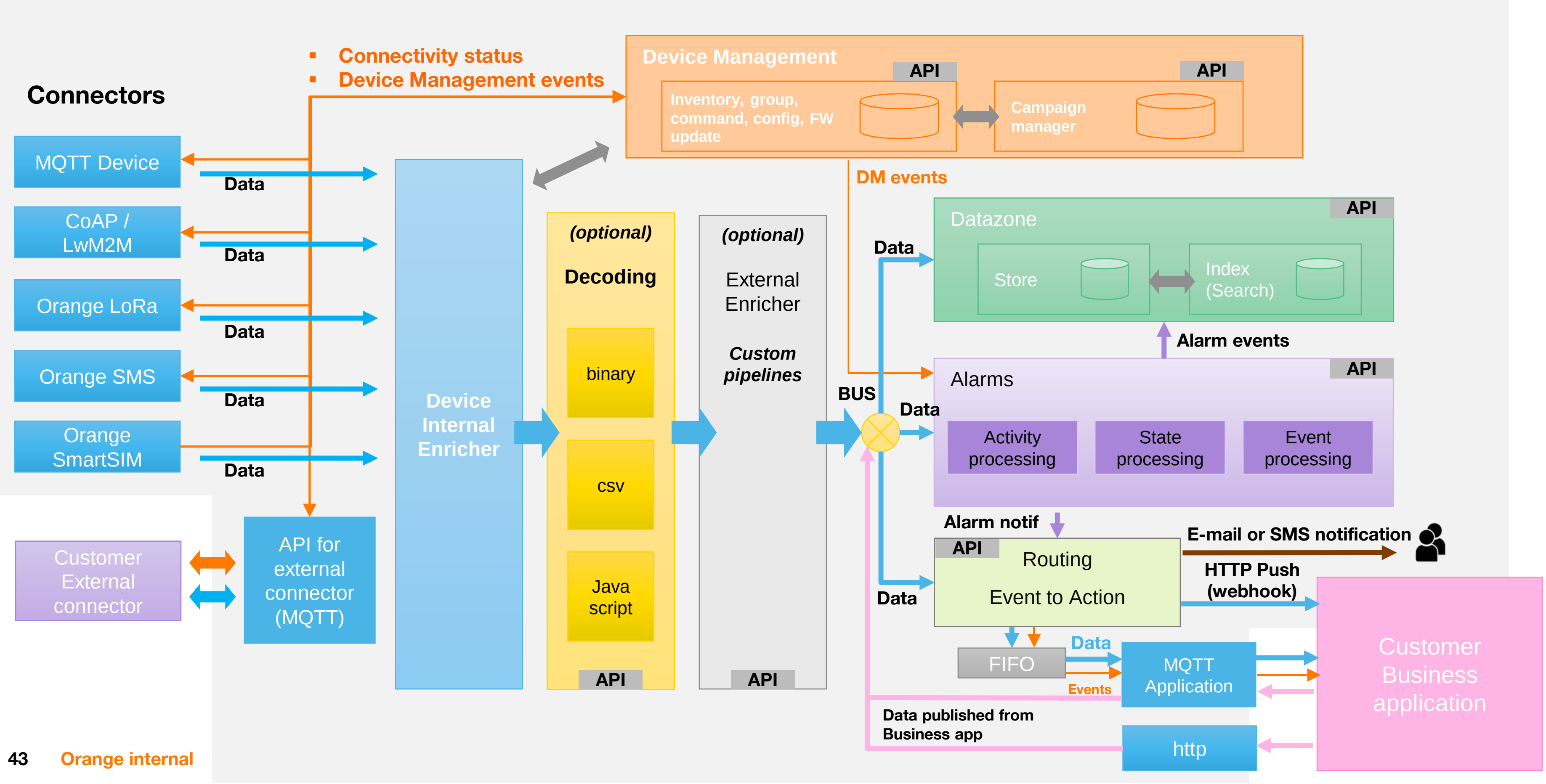
Redundancy 2 datacenters (3 datacenters on track)

Flexible Engine Data Center

ISAE3402 SOC-1 TypeII, MTCS Niv3, ISO 27001, ISO27017, ISO27018,ISO 9001,ISO20000

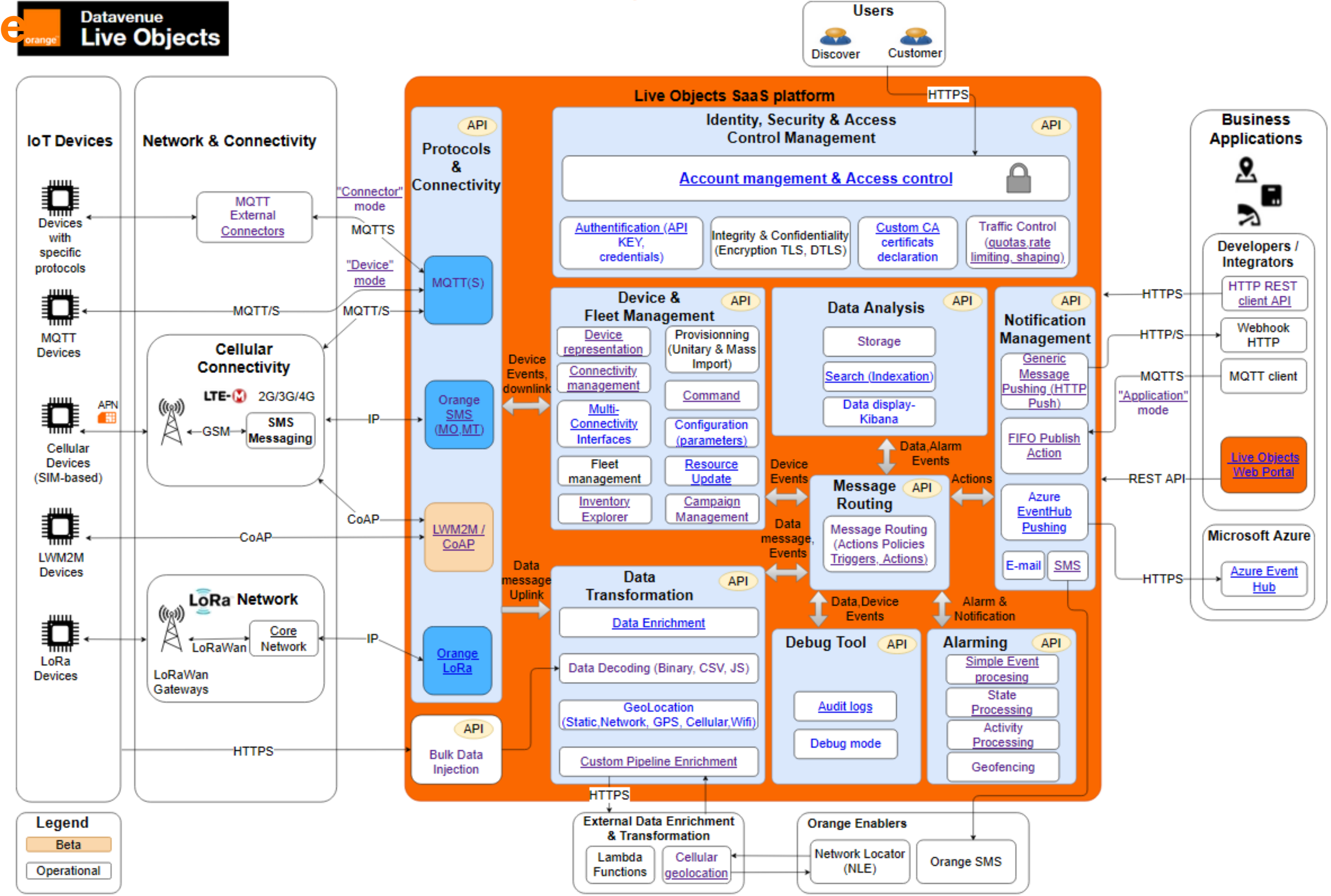
Availability rate: 99.99%

Architecture


Connectivity status
Device Management events
Connectors
MQTT Device
Data
CoAP / LwM2M
Data
Orange LoRa
Data
Orange SMS
Data
Orange SmartSIM
Data
Customer External connector
API for external connector (MQTT)
Device Internal Enricher
(optional)
Decoding
binary
csv
Java script
API
(optional)
External Enricher
Custom pipelines
API
Device Management
API
Inventory, group, command, config, FW update
API
Campaign manager
DM events
Data
Datazone
API
Store
Index (Search)
Alarm events
Alarms
API
BUS
Data
Activity processing
State processing
Event processing
Alarm notif
E-mail or SMS notification
API
Routing
Event to Action
HTTP Push (webhook)
Data
Data
FIFO
Events
MQTT Application
Customer Business application
Data published from Business app
http

Architecture

Datavenue Live Objects



Users
Discover
Customer
HTTPS

IoT Devices

Devices with specific protocols

MQTT Devices

APN

Cellular Devices (SIM-based)

LWM2M Devices

LoRa Devices

Network & Connectivity

MQTT External Connectors

"Connector" mode

MQTTS

"Device" mode

MQTT/S

MQTT/S

Cellular Connectivity

LTE-M 2G/3G/4G

GSM

SMS Messaging

IP

CoAP

CoAP

LoRa Network

LoRaWan

Core Network

LoRaWan Gateways

IP

HTTPS

Live Objects SaaS platform

Protocols & Connectivity API

- MQTT(S)
- Orange SMS (MO,MT)
- LWM2M / CoAP
- Orange LoRa

Bulk Data Injection API

Device Events, downlink

Data message Uplink

Identity, Security & Access Control Management API

- Account mangement & Access control
- Authentification (API KEY, credentials)
- Integrity & Confidentiality (Encryption TLS, DTLS)
- Custom CA certificats declaration
- Traffic Control (quotas,rate limiting, shaping)

Device & Fleet Management API

- Device representation
- Provisionning (Unitary & Mass Import)
- Connectivity management
- Command
- Multi-Connectivity Interfaces
- Configuration (parameters)
- Fleet management
- Resource Update
- Inventory Explorer
- Campaign Management

Data Analysis API

- Storage
- Search (Indexation)
- Data display- Kibana

Data,Alarm Events

Device Events

Actions

Message Routing API

- Message Routing (Actions Policies Triggers, Actions)

Data message, Events

Data,Device Events

Alarm & Notification

Notification Management API

- Generic Message Pushing (HTTP Push)
- FIFO Publish Action
- Azure EventHub Pushing
- E-mail
- SMS

Data Transformation API

- Data Enrichment
- Data Decoding (Binary, CSV, JS)
- GeoLocation (Static,Network, GPS, Cellular,Wifi)
- Custom Pipeline Enrichment

Debug Tool API

- Audit logs
- Debug mode

Alarming API

- Simple Event procesing
- State Processing
- Activity Processing
- Geofencing

HTTPS

External Data Enrichment & Transformation

- Lambda Functions
- Cellular geolocation

Orange Enablers

- Network Locator (NLE)
- Orange SMS

Business Applications

Developers / Integrators

- HTTP REST client API
- Webhook HTTP
- MQTT client
- Live Objects Web Portal

HTTPS

HTTP/S

MQTTS

"Application" mode

REST API

Microsoft Azure

- Azure Event Hub

HTTPS

Legend

Beta
Operational

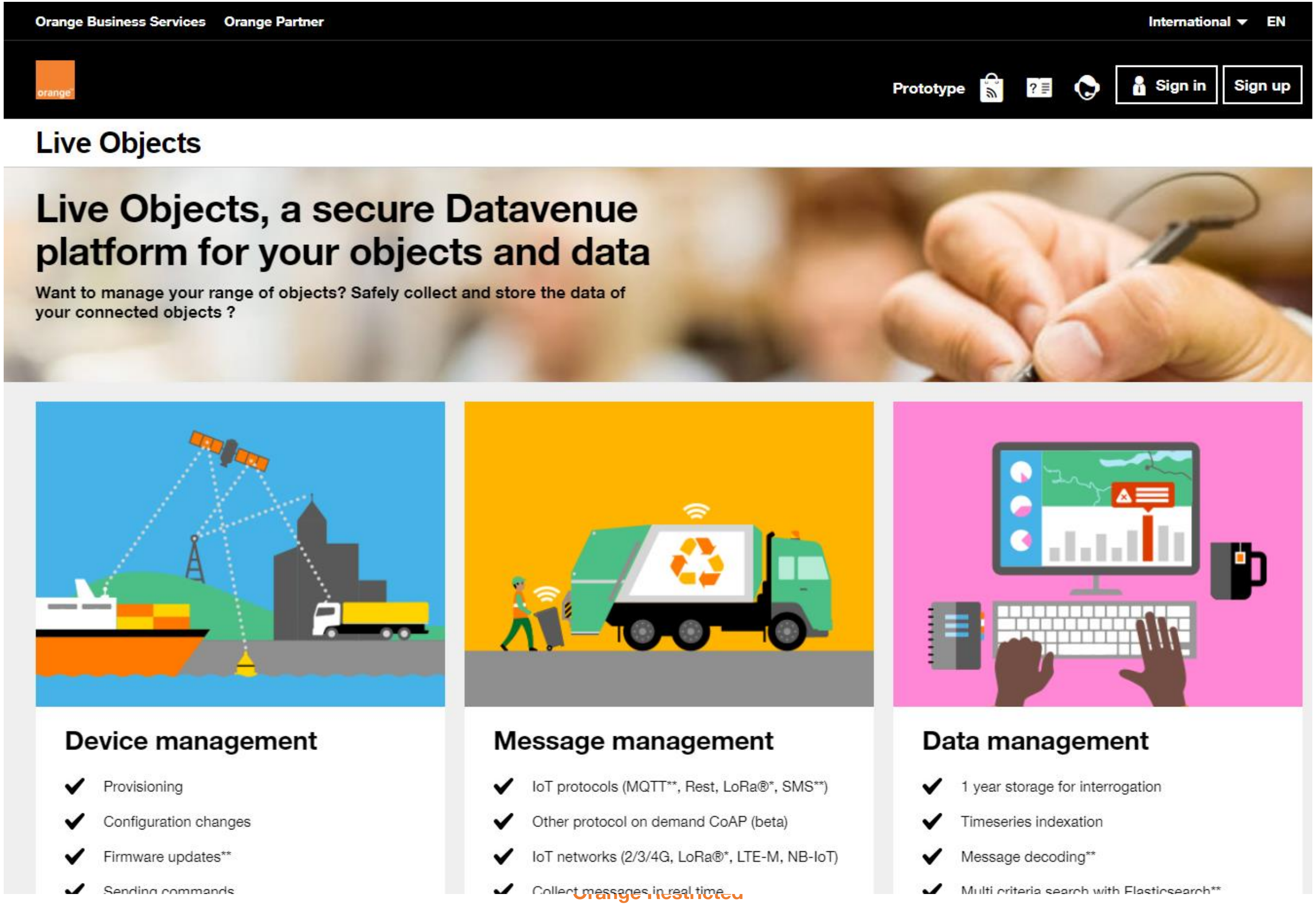
#4

Live Objects Concepts

#4.1

Live Objects
Portal

Go to https://liveobjects.orange-business.com/



Orange Business Services
Orange Partner
International
EN
orange
Prototype
Sign in
Sign up

Live Objects

Live Objects, a secure Datavenue platform for your objects and data

Want to manage your range of objects? Safely collect and store the data of your connected objects ?

Device management

- ✓ Provisioning
- ✓ Configuration changes
- ✓ Firmware updates**
- ✓ Sending commands

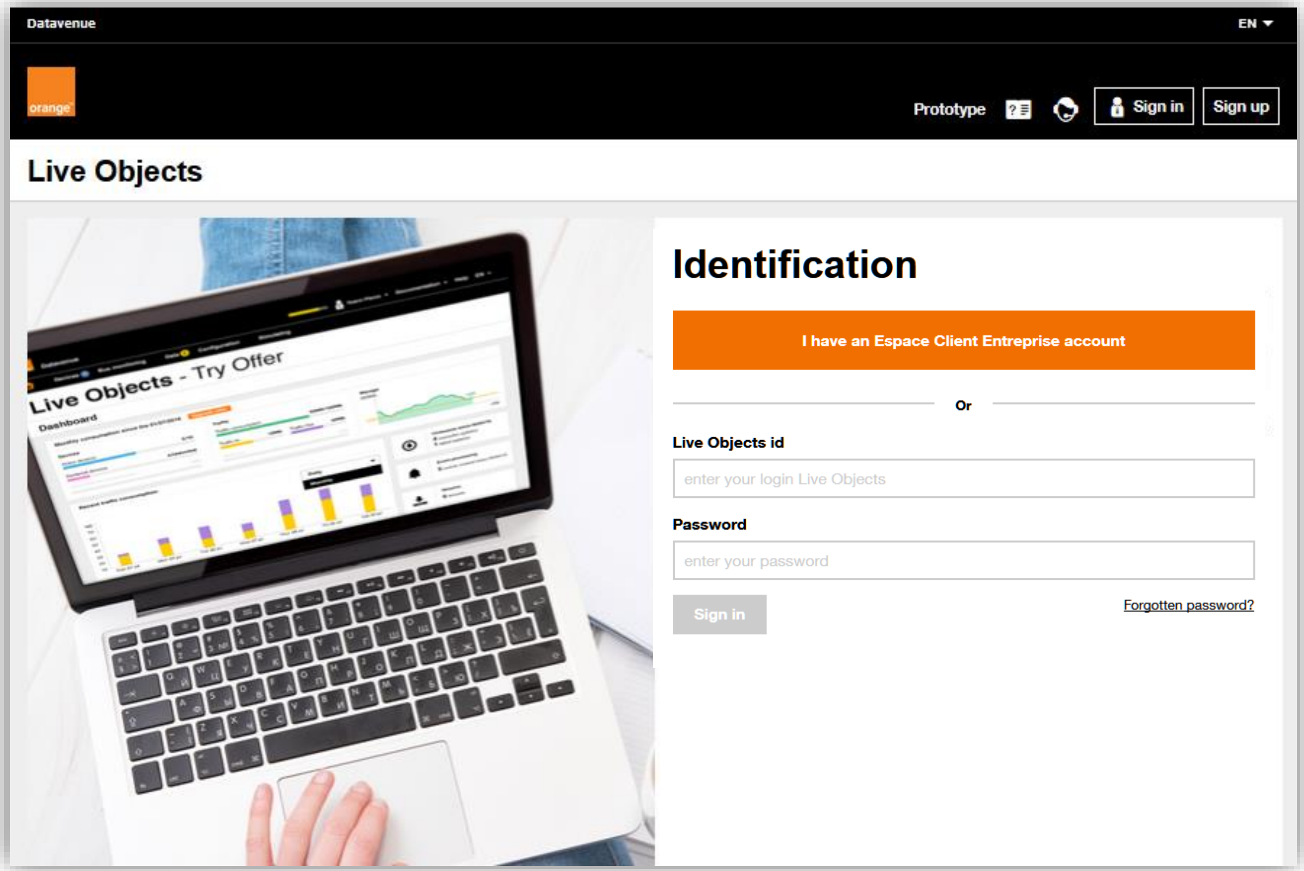
Message management

- ✓ IoT protocols (MQTT**, Rest, LoRa®*, SMS**)
- ✓ Other protocol on demand CoAP (beta)
- ✓ IoT networks (2/3/4G, LoRa®*, LTE-M, NB-IoT)
- ✓ Collect messages in real time

Data management

- ✓ 1 year storage for interrogation
- ✓ Timeseries indexation
- ✓ Message decoding**
- ✓ Multi criteria search with Elasticsearch**

Login page : standard or country-SSO


Datavenue
EN
orange
Prototype
Sign in
Sign up
Live Objects
I have an Espace Client Entreprise account
Or
Sign in
Forgotten password?

Identification

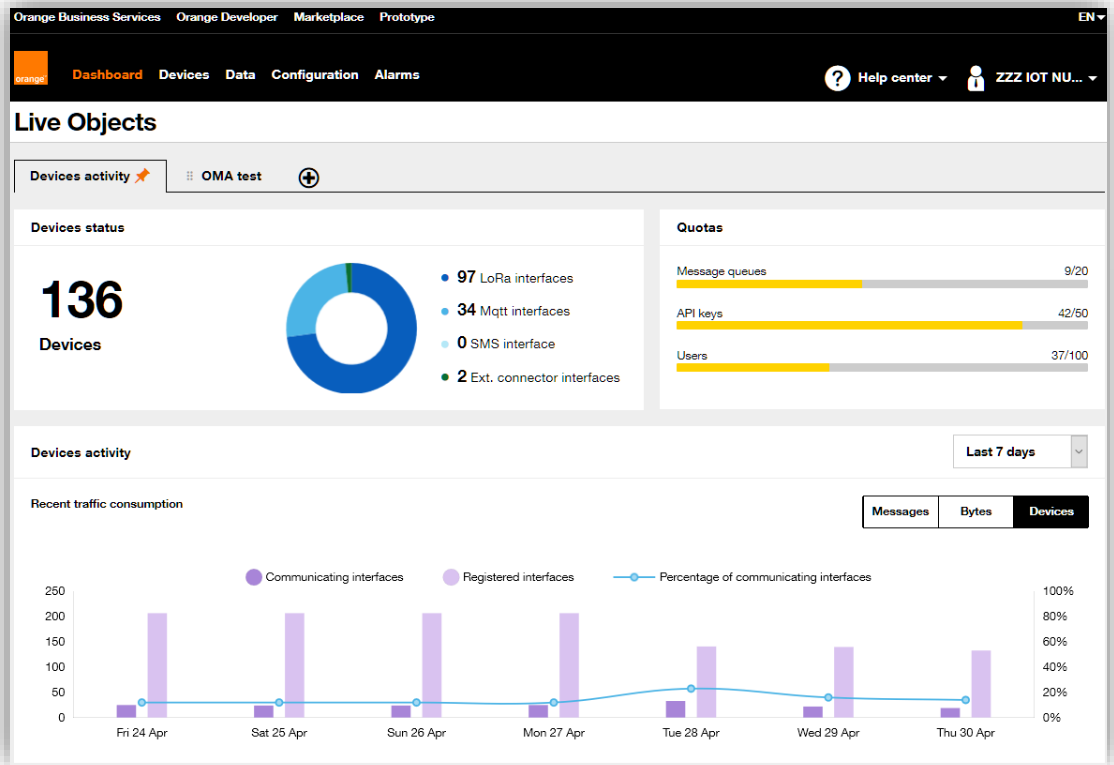
Live Objects id

enter your login Live Objects

Password

enter your password

Dashboard – home page


Orange Business Services
Orange Developer
Marketplace
Prototype
EN
orange
Dashboard
Devices
Data
Configuration
Alarms
Help center
ZZZ IOT NU...
Live Objects
Devices activity
OMA test
Devices status
Quotas
Devices activity
Last 7 days
Recent traffic consumption
Messages
Bytes
Devices
Communicating interfaces
Registered interfaces
Percentage of communicating interfaces
250
200
150
100
50
0
100%
80%
60%
40%
20%
0%
Fri 24 Apr
Sat 25 Apr
Sun 26 Apr
Mon 27 Apr
Tue 28 Apr
Wed 29 Apr
Thu 30 Apr

Devices status

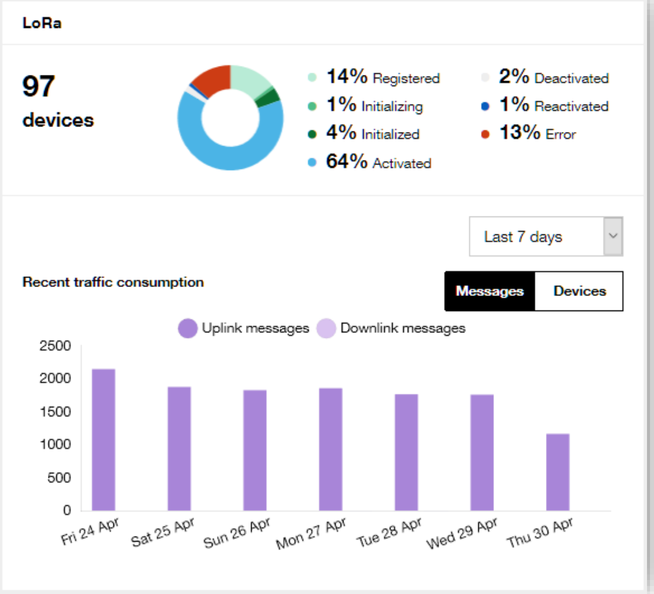
136 Devices

- 97 LoRa interfaces
- 34 Mqtt interfaces
- 0 SMS interface
- 2 Ext. connector interfaces

Quotas

Message queues	9/20
API keys	42/50
Users	37/100

■ ■ ■

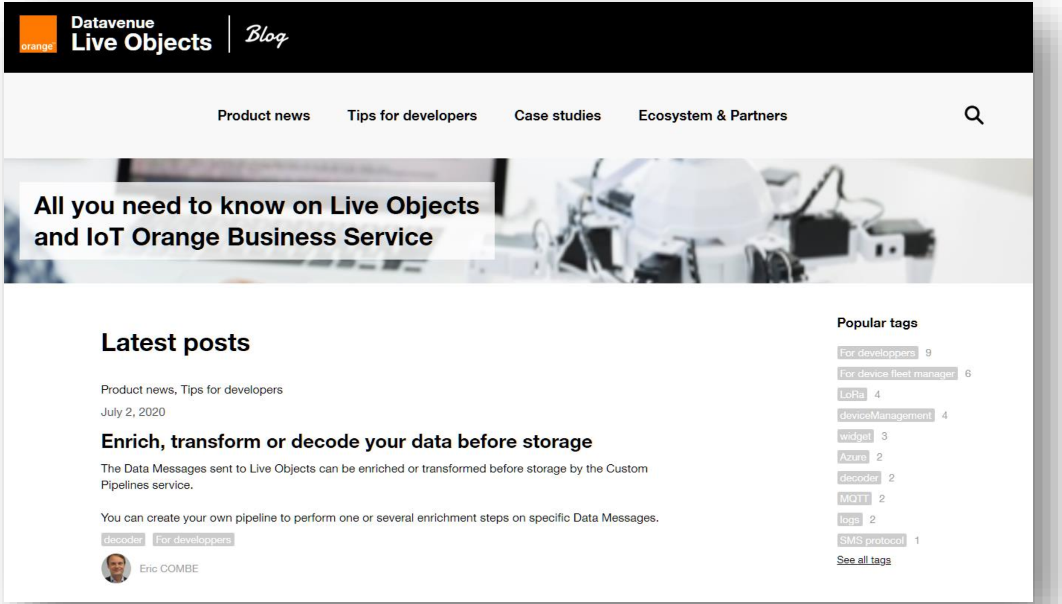

LoRa
Last 7 days
Recent traffic consumption
Messages
Devices
Uplink messages
Downlink messages
2500
2000
1500
1000
500
0
Fri 24 Apr
Sat 25 Apr
Sun 26 Apr
Mon 27 Apr
Tue 28 Apr
Wed 29 Apr
Thu 30 Apr

97 devices

- 14% Registered
- 1% Initializing
- 4% Initialized
- 64% Activated
- 2% Deactivated
- 1% Reactivated
- 13% Error

Blog & Help Center

https://blog.liveobjects.orange-business.com/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Datavenue
Live Objects
Blog
Product news
Tips for developers
Case studies
Ecosystem & Partners

All you need to know on Live Objects and IoT Orange Business Service

Latest posts

Product news, Tips for developers

July 2, 2020

Enrich, transform or decode your data before storage

The Data Messages sent to Live Objects can be enriched or transformed before storage by the Custom Pipelines service.

You can create your own pipeline to perform one or several enrichment steps on specific Data Messages.

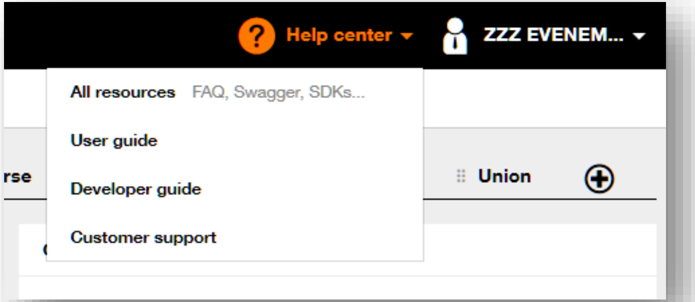
decoder For developpers

Eric COMBE

Popular tags

For developpers	9
For device fleet manager	6
LoRa	4
deviceManagement	4
widget	3
Azure	2
decoder	2
MQTT	2
logs	2
SMS protocol	1

See all tags


Help center
ZZZ EVENEM...
rse
Union

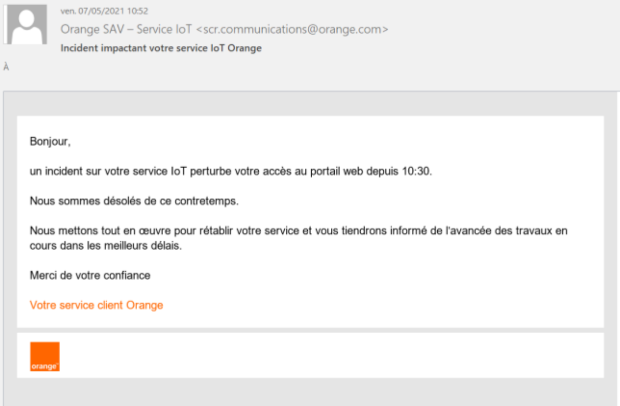
All resources FAQ, Swagger, SDKs...

User guide

Developer guide

Customer support

Possibility to subscribe to incident notifications by email/SMS



ven. 07/05/2021 10:52

Orange SAV – Service IoT <scr.communications@orange.com>

Incident impactant votre service IoT Orange

À

Bonjour,

un incident sur votre service IoT perturbe votre accès au portail web depuis 10:30.

Nous sommes désolés de ce contretemps.

Nous mettons tout en œuvre pour rétablir votre service et vous tiendrons informé de l'avancée des travaux en cours dans les meilleurs délais.

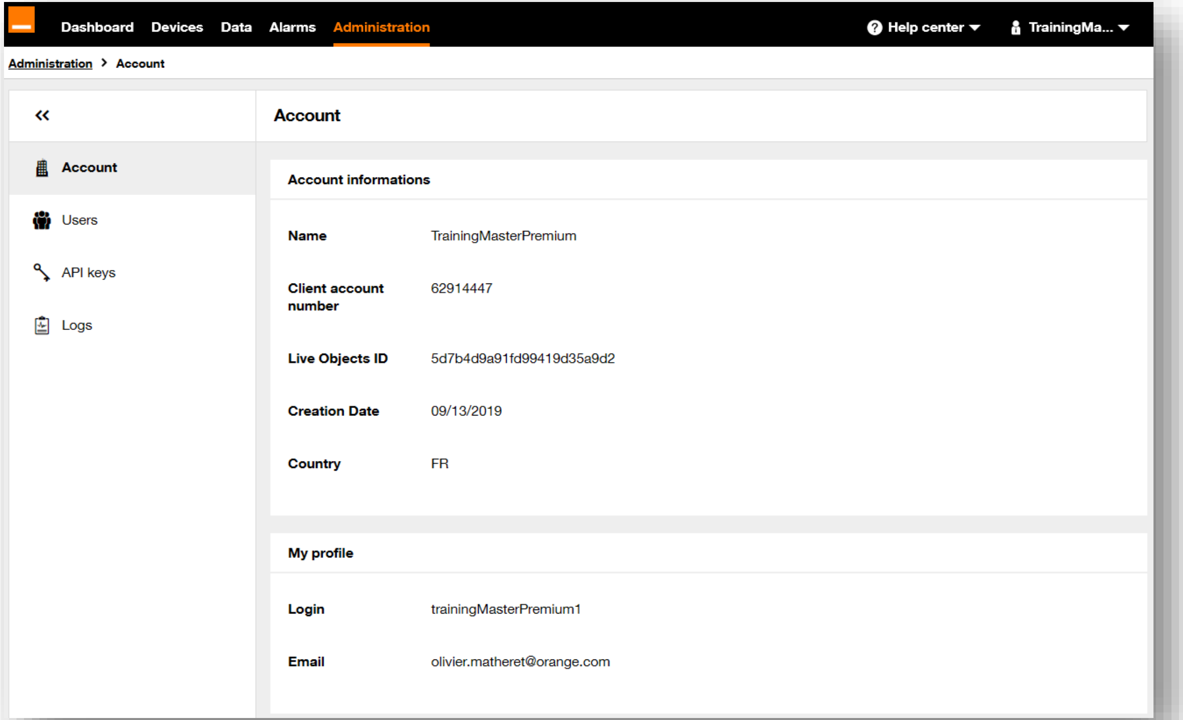
Merci de votre confiance

Votre service client Orange

#4.2

Live Objects
user profiles

Account / tenant view


Dashboard
Devices
Data
Alarms
Administration
Help center
TrainingMa...
Administration > Account
Account
Users
API keys
Logs

Account

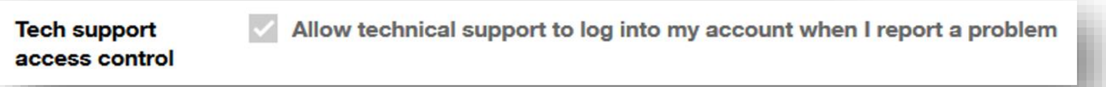
Account informations

Name	TrainingMasterPremium
Client account number	62914447
Live Objects ID	5d7b4d9a91fd99419d35a9d2
Creation Date	09/13/2019
Country	FR

My profile

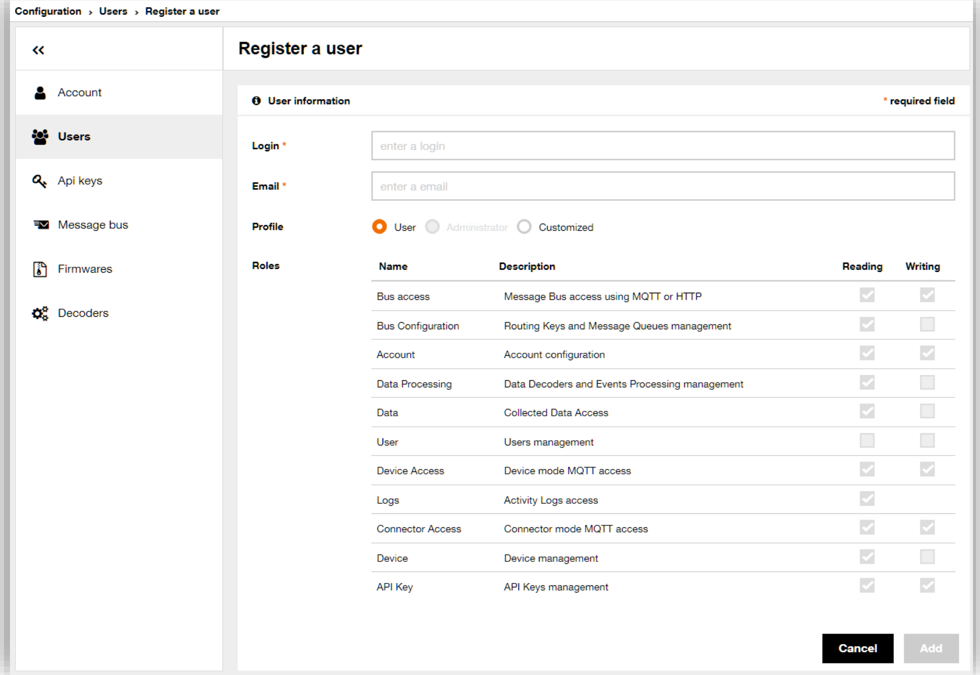
Login	trainingMasterPremium1
Email	olivier.matheret@orange.com

Confidentiality required ?



Tech support access control ☑ Allow technical support to log into my account when I report a problem

Create a user



Configuration › Users › Register a user

Register a user

User information * required field

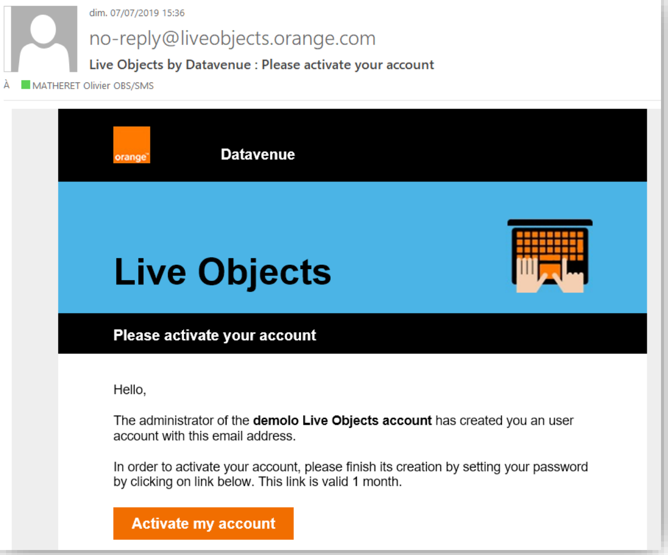
Login * enter a login

Email * enter a email

Profile ● User ○ Administrator ○ Customized

Roles

Name	Description	Reading	Writing
Bus access	Message Bus access using MQTT or HTTP	☑	☑
Bus Configuration	Routing Keys and Message Queues management	☑	☐
Account	Account configuration	☑	☑
Data Processing	Data Decoders and Events Processing management	☑	☐
Data	Collected Data Access	☑	☐
User	Users management	☐	☐
Device Access	Device mode MQTT access	☑	☑
Logs	Activity Logs access	☑	
Connector Access	Connector mode MQTT access	☑	☑
Device	Device management	☑	☐
API Key	API Keys management	☑	☑



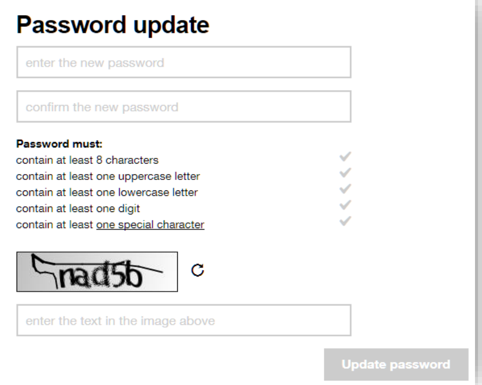
dim. 07/07/2019 15:36
no-reply@liveobjects.orange.com
Live Objects by Datavenue : Please activate your account
À MATHERET Olivier OBS/SMS

Please activate your account

Hello,

The administrator of the **demolo Live Objects account** has created you an user account with this email address.

In order to activate your account, please finish its creation by setting your password by clicking on link below. This link is valid 1 month.



Password update

enter the new password

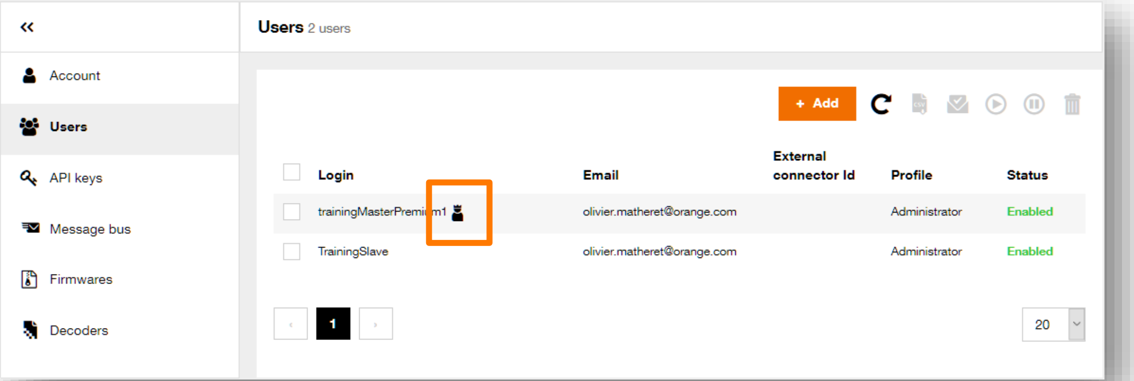
confirm the new password

Password must:

- contain at least 8 characters ✓
- contain at least one uppercase letter ✓
- contain at least one lowercase letter ✓
- contain at least one digit ✓
- contain at least one special character ✓

enter the text in the image above

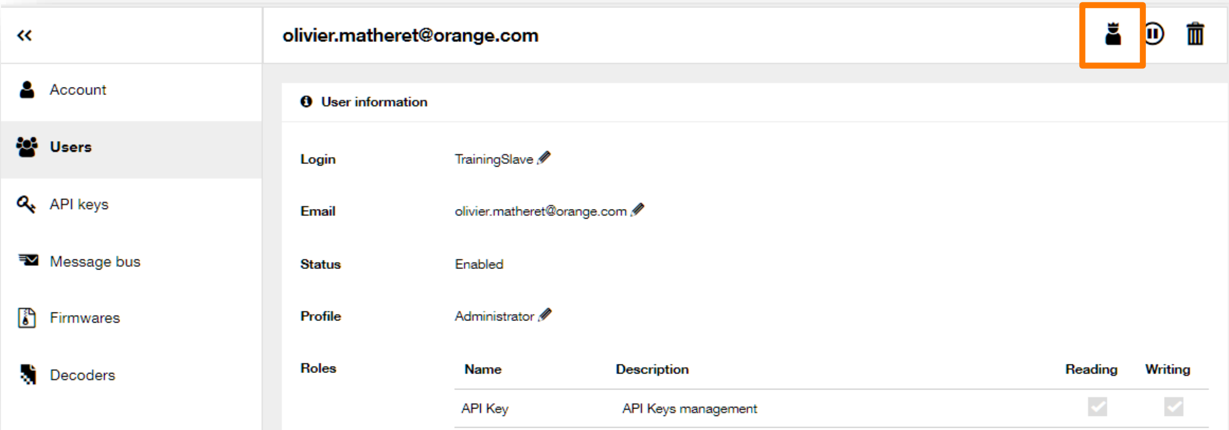
Main user


«
Account
Users
API keys
Message bus
Firmwares
Decoders
+ Add
‹
1
›
20

Users 2 users

☐	Login	Email	External connector Id	Profile	Status
☐	trainingMasterPremi m1	olivier.matheret@orange.com		Administrator	Enabled
☐	TrainingSlave	olivier.matheret@orange.com		Administrator	Enabled

Main user cannot be removed: increased access security !


«
Account
Users
API keys
Message bus
Firmwares
Decoders

olivier.matheret@orange.com

User information

Login: TrainingSlave

Email: olivier.matheret@orange.com

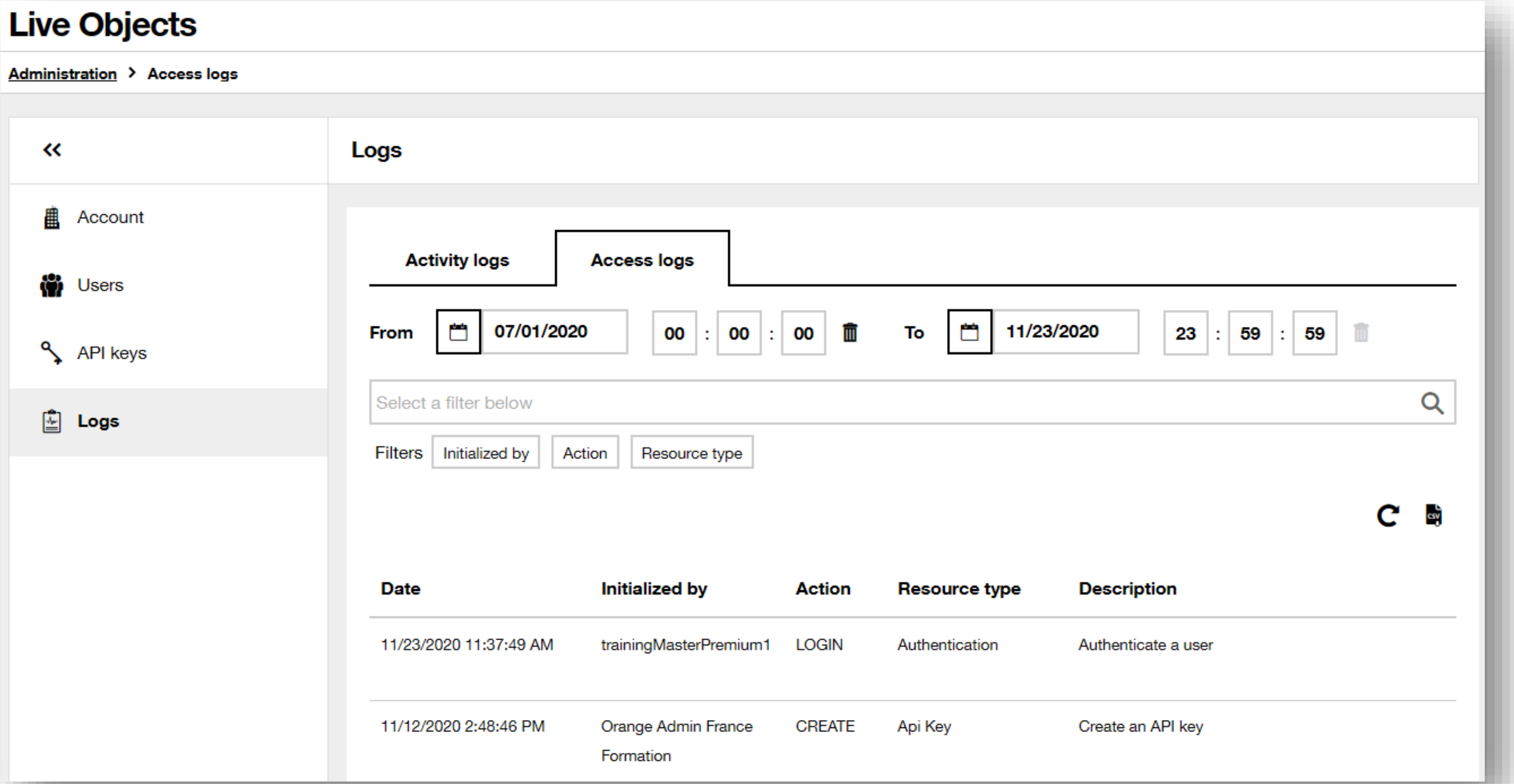
Status: Enabled

Profile: Administrator

Roles:

Name	Description	Reading	Writing
API Key	API Keys management	☑	☑

Access log


Live Objects
Administration > Access logs
«
Account
Users
API keys
Logs
Logs
Activity logs
Access logs
Select a filter below
Filters
Initialized by
Action
Resource type

From 07/01/2020 00 : 00 : 00 To 11/23/2020 23 : 59 : 59

Date	Initialized by	Action	Resource type	Description
11/23/2020 11:37:49 AM	trainingMasterPremium1	LOGIN	Authentication	Authenticate a user
11/12/2020 2:48:46 PM	Orange Admin France Formation	CREATE	Api Key	Create an API key

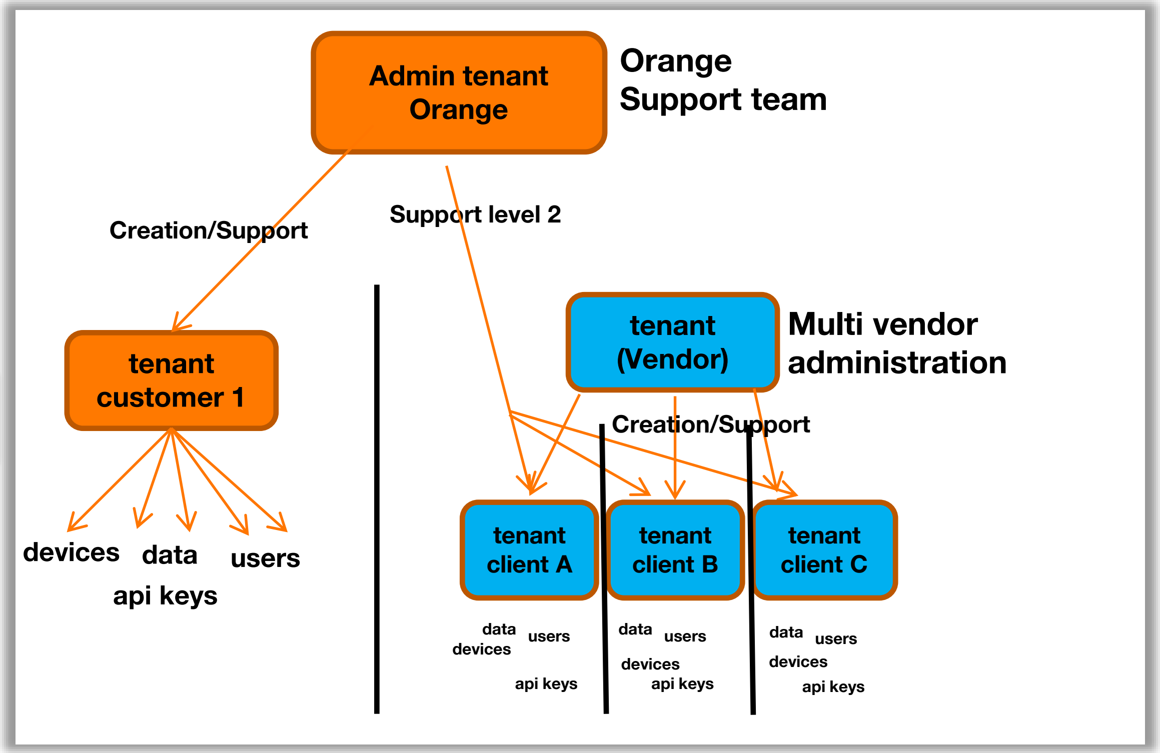
Multi-fleet / Vendor management

Goal of vendor : Allow companies offering solutions based on Orange assets (Live Objects + connectivity), to manage their own customers and resell connectivity + Live Objects in their offers.

Types :
- multi-tenant : each tenant contracts with Orange
- reseller : only the vendor contracts with Orange. Tenant-management emails can be customized.

https://liveobjects.orange-business.com/swagger-ui-vendor/index.html

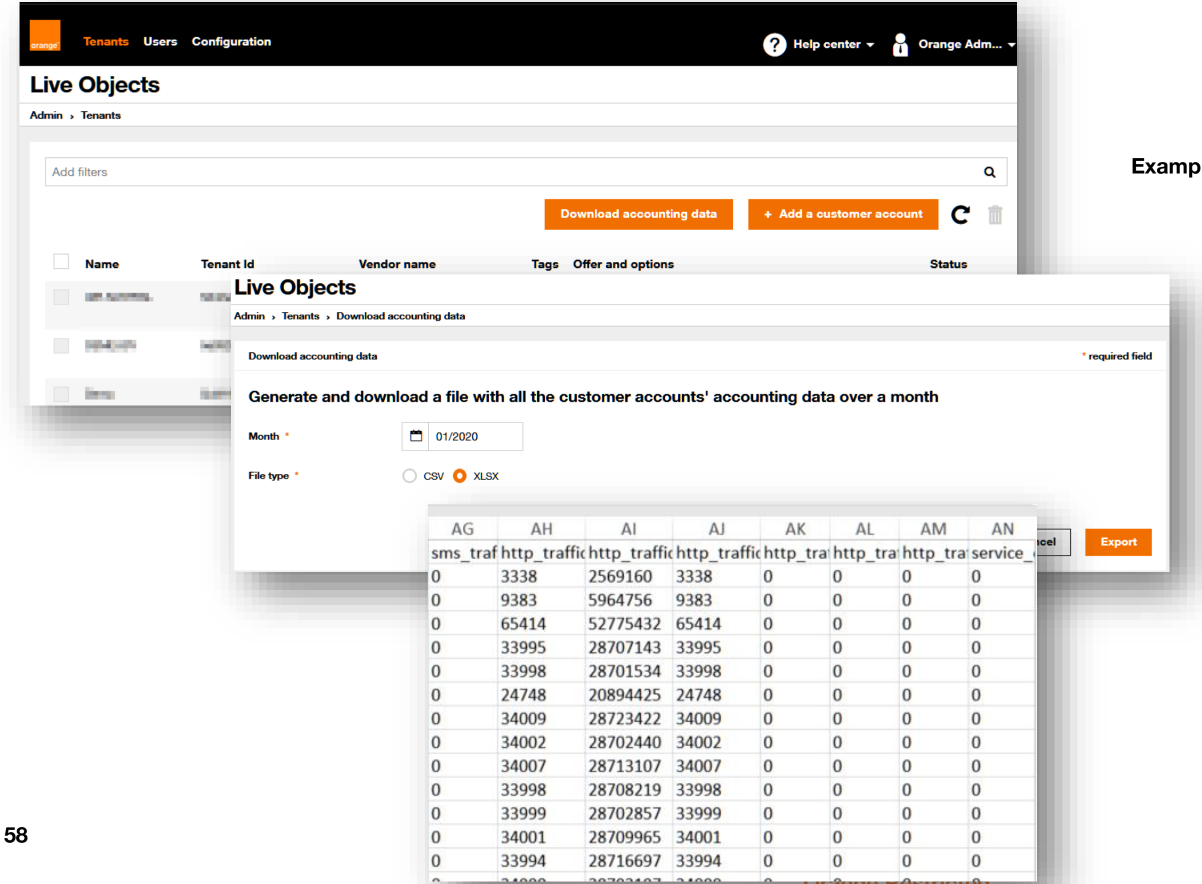
Architecture with vendor customers


Admin tenant Orange
Orange Support team
Creation/Support
Support level 2
tenant customer 1
devices
data
users
api keys
tenant (Vendor)
Multi vendor administration
Creation/Support
tenant client A
tenant client B
tenant client C
data
users
devices
api keys
data
users
devices
api keys
data
users
devices
api keys

Vendor mode

Command/Order	The reseller can create end-customer accounts in his administration portal in complete autonomy
Support	Level 1 support by the reseller Level 2 support by Orange
Billing Statistics	Overall invoicing of the reseller from Orange Usage statistics of each end customer
Management of end customer accounts	Deleting an end customer account Suspension / Reactivation of an end customer account

Vendor mode: statistics



Live Objects

Admin › Tenants

Add filters

☐	Name	Tenant Id	Vendor name	Tags	Offer and options	Status
☐	[redacted]	[redacted]				
☐	[redacted]	[redacted]				
☐	[redacted]	[redacted]				

Live Objects

Admin › Tenants › Download accounting data

Download accounting data

* required field

Generate and download a file with all the customer accounts' accounting data over a month

Month * 01/2020

File type * ○ CSV ● XLSX

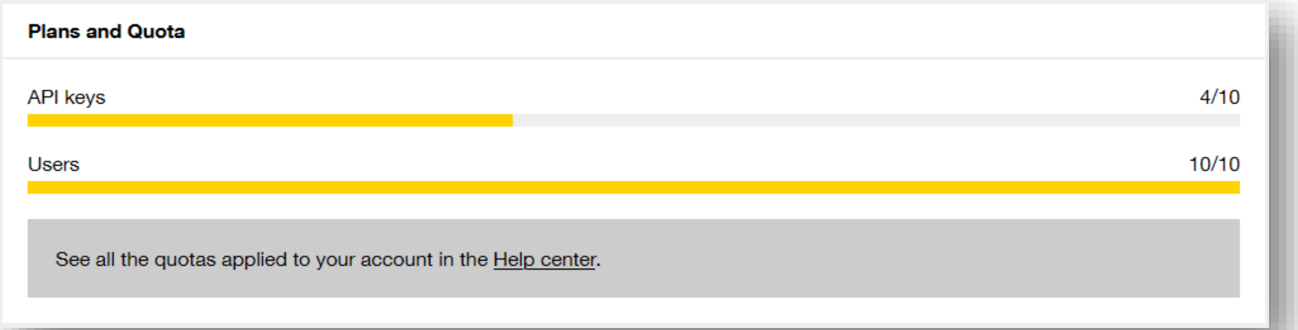
AG	AH	AI	AJ	AK	AL	AM	AN
sms_traf	http_traffic	http_traffic	http_traffic	http_tra	http_tra	http_tra	service_
0	3338	2569160	3338	0	0	0	0
0	9383	5964756	9383	0	0	0	0
0	65414	52775432	65414	0	0	0	0
0	33995	28707143	33995	0	0	0	0
0	33998	28701534	33998	0	0	0	0
0	24748	20894425	24748	0	0	0	0
0	34009	28723422	34009	0	0	0	0
0	34002	28702440	34002	0	0	0	0
0	34007	28713107	34007	0	0	0	0
0	33998	28708219	33998	0	0	0	0
0	33999	28702857	33999	0	0	0	0
0	34001	28709965	34001	0	0	0	0
0	33994	28716697	33994	0	0	0	0

tenant_name
tenant_id
tenant_properties_*
tenant_offer
tenant_options
tenant_tags
vendor_id
vendor_name
vendor_businessUnit
vendor_country
vendor_supportVendorIds
tenant_month

Example of counters:

- lora_traffic_in_msg
- lora_traffic_in_bytes
- lora_traffic_in_virtualMsg
- lora_traffic_in_msgAckRequest
- lora_traffic_out_msg
- lora_traffic_out_bytes
- lora_traffic_out_virtualMsg
- lora_traffic_out_msgAckRequest
- lora_inventory_numberOfActivatedNodes
- mqtt_traffic_in_msg
- mqtt_traffic_in_bytes
- mqtt_traffic_in_virtualMsg
- mqtt_traffic_out_msg
- mqtt_traffic_out_bytes
- mqtt_traffic_out_virtualMsg
- http_traffic_in_msg
- http_traffic_in_bytes
- http_traffic_in_virtualMsg
- http_traffic_out_msg
- http_traffic_out_bytes
- http_traffic_out_virtualMsg
- service_deviceManagement_numberOfSuccessfulDownloads
- service_storage_storedDataMessagesInMB

Vendor mode: quotas



Plans and Quota

API keys 4/10

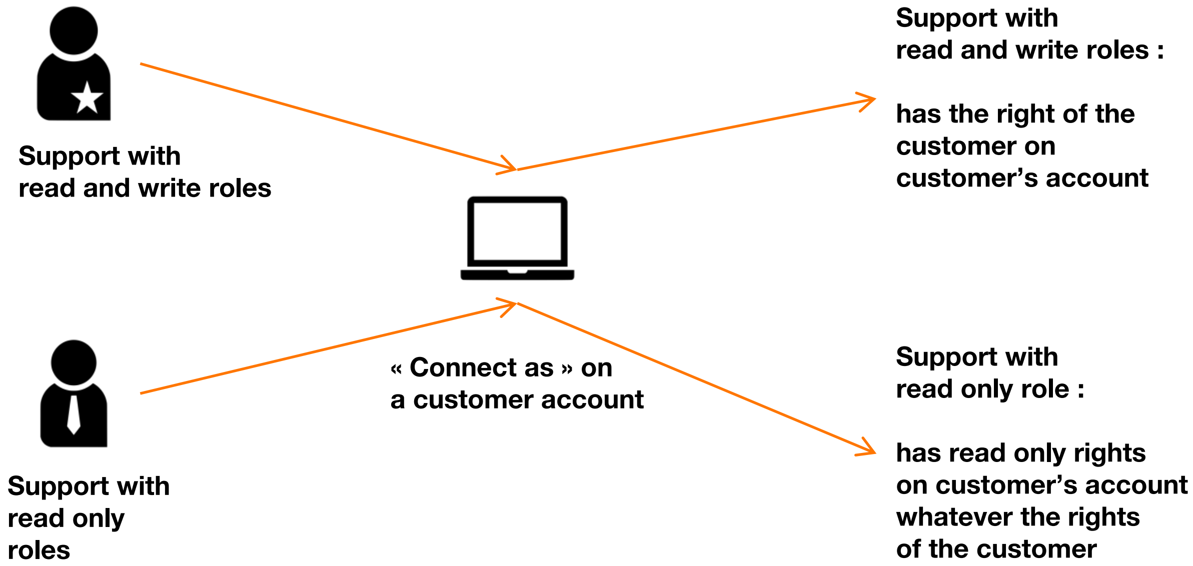
Users 10/10

See all the quotas applied to your account in the Help center.

Can include LoRa downlinks for same-DISE-children-accounts, if *downlinkMsgByNumberOfActivatedNodes* > 0

➔ LoRa downlink quota may be exceeded, but messages will be billed as such

Vendor mode: connect-as management



Support with
read and write roles

Support with
read only
roles

« Connect as » on
a customer account

Support with
read and write roles :

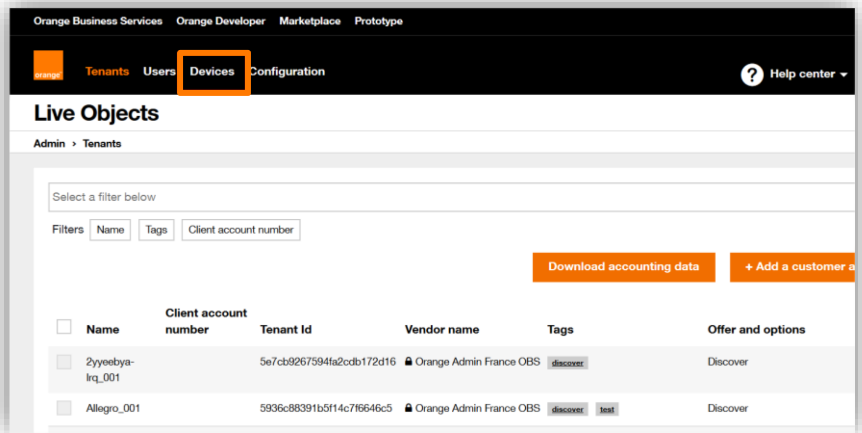
has the right of the
customer on
customer’s account

Support with
read only role :

has read only rights
on customer’s account
whatever the rights
of the customer

Support cannot exceed the
user rights.

Vendor mode: device search



Orange Business Services
Orange Developer
Marketplace
Prototype
orange
Tenants
Users
Devices
Configuration
Help center

Live Objects

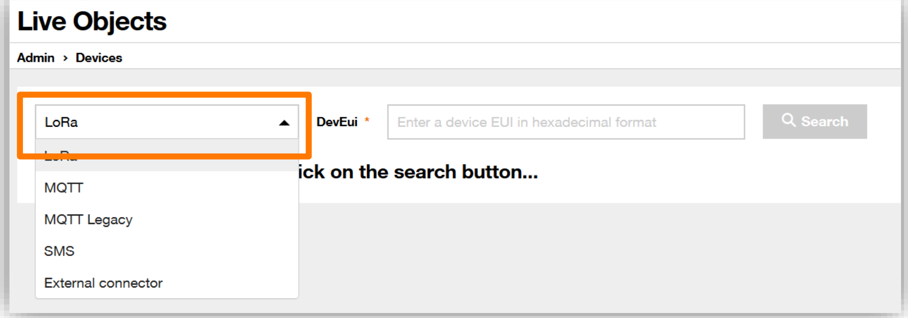
Admin › Tenants

Select a filter below

Filters: Name | Tags | Client account number

Download accounting data
+ Add a customer a

☐	Name	Client account number	Tenant Id	Vendor name	Tags	Offer and options
☐	2yyeebya-lrq_001		5e7cb9267594fa2cdb172d16	Orange Admin France OBS	discover	Discover
☐	Allegro_001		5936c88391b5f14c7f6646c5	Orange Admin France OBS	discover test	Discover



Live Objects

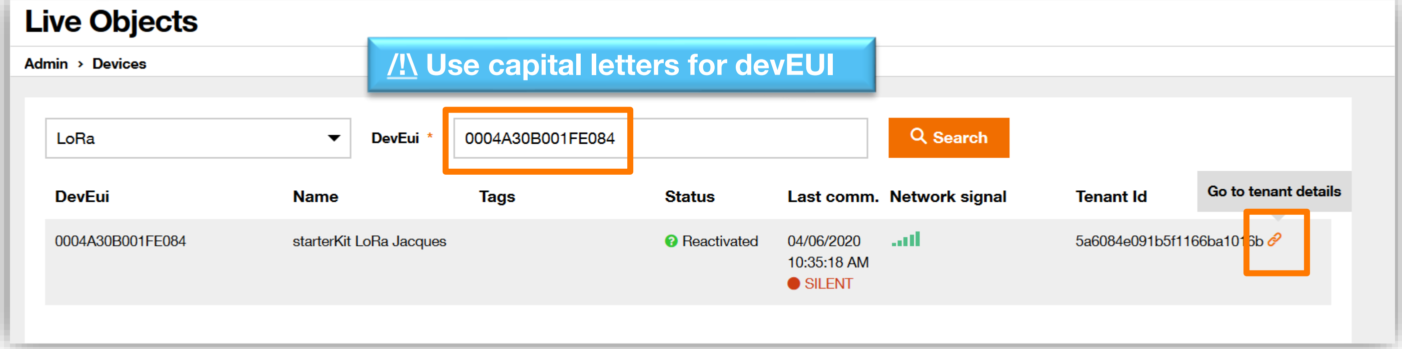
Admin › Devices

LoRa

DevEui *: Enter a device EUI in hexadecimal format

Search
LoRa
MQTT
MQTT Legacy
SMS
External connector

ick on the search button...



Live Objects

Admin › Devices

/!\ Use capital letters for devEUI

LoRa

DevEui *: 0004A30B001FE084

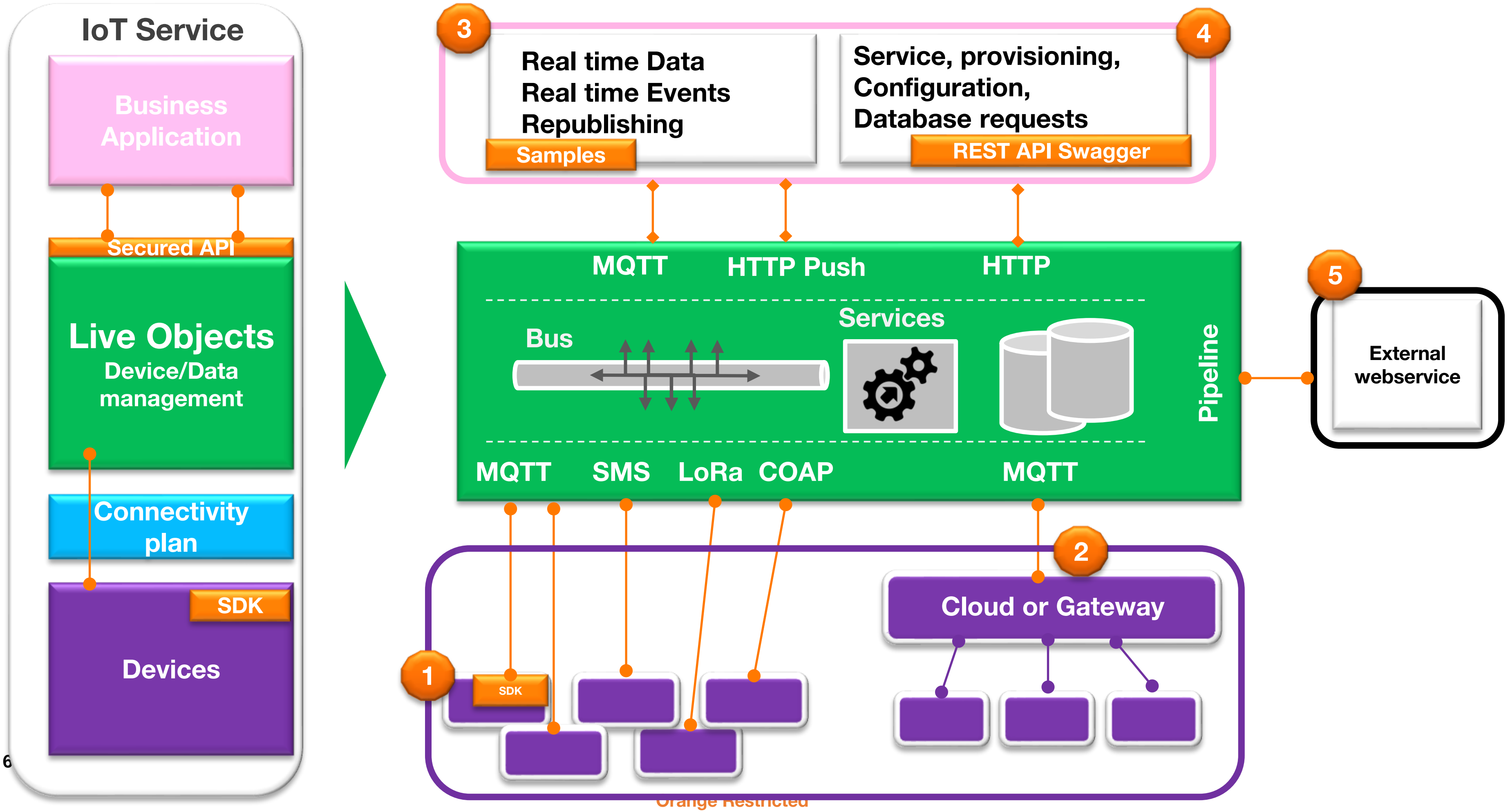
Search
Go to tenant details

DevEui	Name	Tags	Status	Last comm.	Network signal	Tenant Id
0004A30B001FE084	starterKit LoRa Jacques		Reactivated	04/06/2020 10:35:18 AM ● SILENT		5a6084e091b5f1166ba1016b

#4.3

Live Objects
API

Live Objects APIs : 5 types



IoT Service

Business Application

Secured API

Live Objects
Device/Data management

Connectivity plan

SDK

Devices

3

Real time Data
Real time Events
Republishing

Samples

4

Service, provisioning,
Configuration,
Database requests

REST API Swagger

MQTT
HTTP Push
HTTP

Bus
Services

Pipeline

MQTT
SMS
LoRa
COAP
MQTT

5

External webservice

2

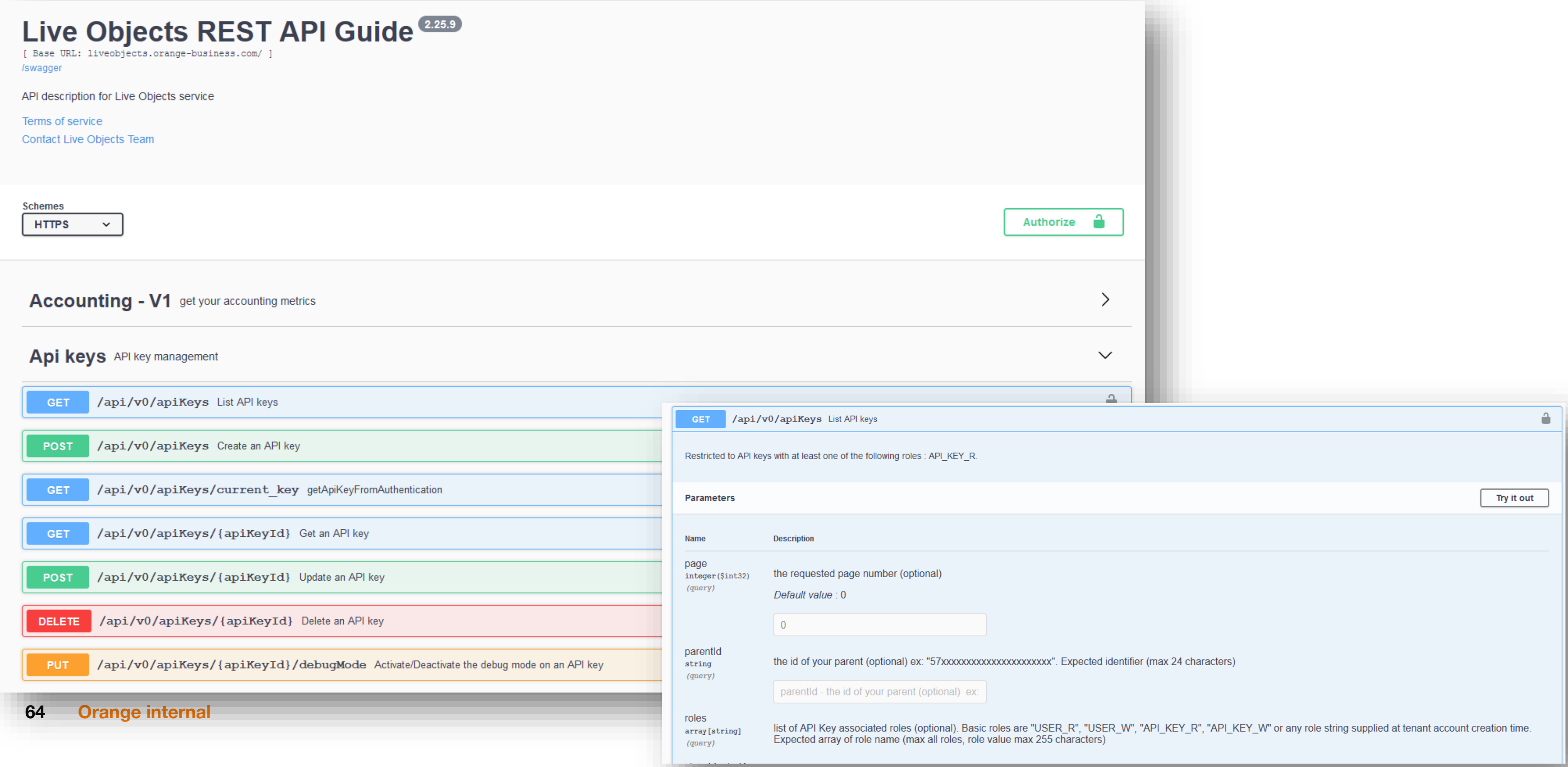
Cloud or Gateway

1

SDK

HTTP APIs : Swagger

https://liveobjects.orange-business.com/swagger-ui/index.html



Live Objects REST API Guide 2.25.9

[Base URL: liveobjects.orange-business.com/]

/swagger

API description for Live Objects service

Terms of service

Contact Live Objects Team

Schemes

HTTPS

Accounting - V1 get your accounting metrics

Api keys API key management

- GET `/api/v0/apiKeys` List API keys
- POST `/api/v0/apiKeys` Create an API key
- GET `/api/v0/apiKeys/current_key` getApiKeyFromAuthentication
- GET `/api/v0/apiKeys/{apiKeyId}` Get an API key
- POST `/api/v0/apiKeys/{apiKeyId}` Update an API key
- DELETE `/api/v0/apiKeys/{apiKeyId}` Delete an API key
- PUT `/api/v0/apiKeys/{apiKeyId}/debugMode` Activate/Deactivate the debug mode on an API key

GET `/api/v0/apiKeys` List API keys

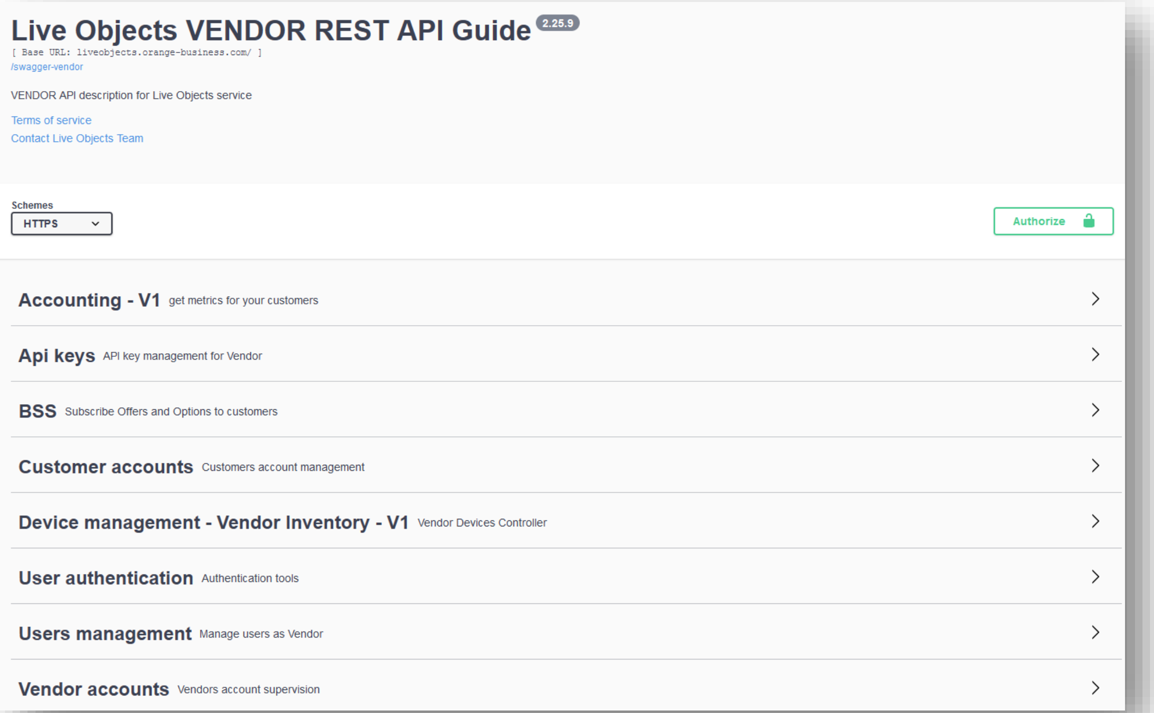
Restricted to API keys with at least one of the following roles : API_KEY_R.

Parameters

Name	Description
page integer($int32) *(query)*	the requested page number (optional) *Default value* : 0 0
parentId string *(query)*	the id of your parent (optional) ex: "57xxxxxxxxxxxxxxxxxxxxxx". Expected identifier (max 24 characters) parentId - the id of your parent (optional) ex:
roles array[string] *(query)*	list of API Key associated roles (optional). Basic roles are "USER_R", "USER_W", "API_KEY_R", "API_KEY_W" or any role string supplied at tenant account creation time. Expected array of role name (max all roles, role value max 255 characters)

Vendor HTTP APIs : Swagger

https://liveobjects.orange-business.com/swagger-ui-vendor/index.html



Live Objects VENDOR REST API Guide 2.25.9

`[ Base URL: liveobjects.orange-business.com/ ]`

/swagger-vendor

VENDOR API description for Live Objects service

Terms of service

Contact Live Objects Team

- **Accounting - V1** get metrics for your customers
- **Api keys** API key management for Vendor
- **BSS** Subscribe Offers and Options to customers
- **Customer accounts** Customers account management
- **Device management - Vendor Inventory - V1** Vendor Devices Controller
- **User authentication** Authentication tools
- **Users management** Manage users as Vendor
- **Vendor accounts** Vendors account supervision

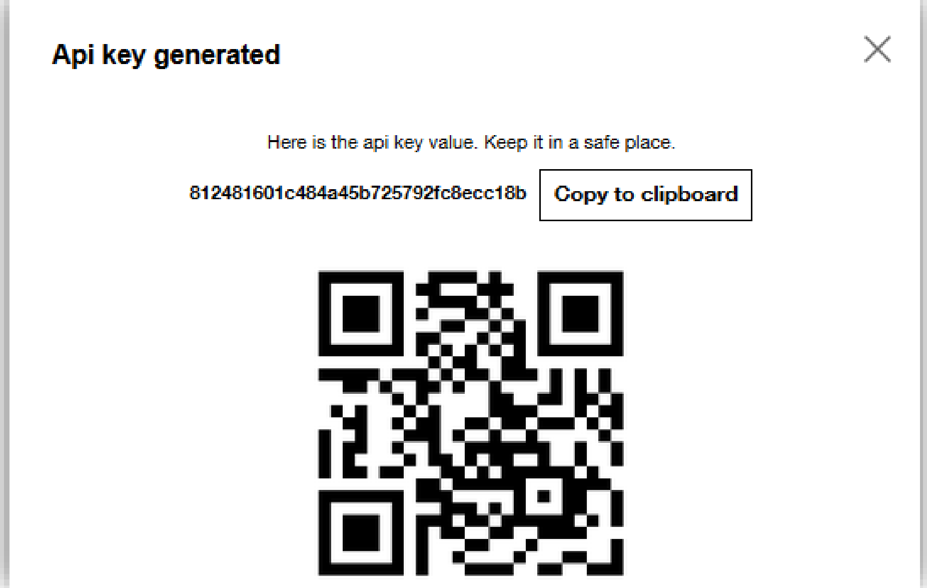
API-Key

A user can create one or several keys, attached to the tenant *(not to himself)*.

An API key allows one to access all Live Objects functions via the APIs.

It can be restricted to the rights necessary for its goal, and time limited.

It can and should be specialized Application or Device.

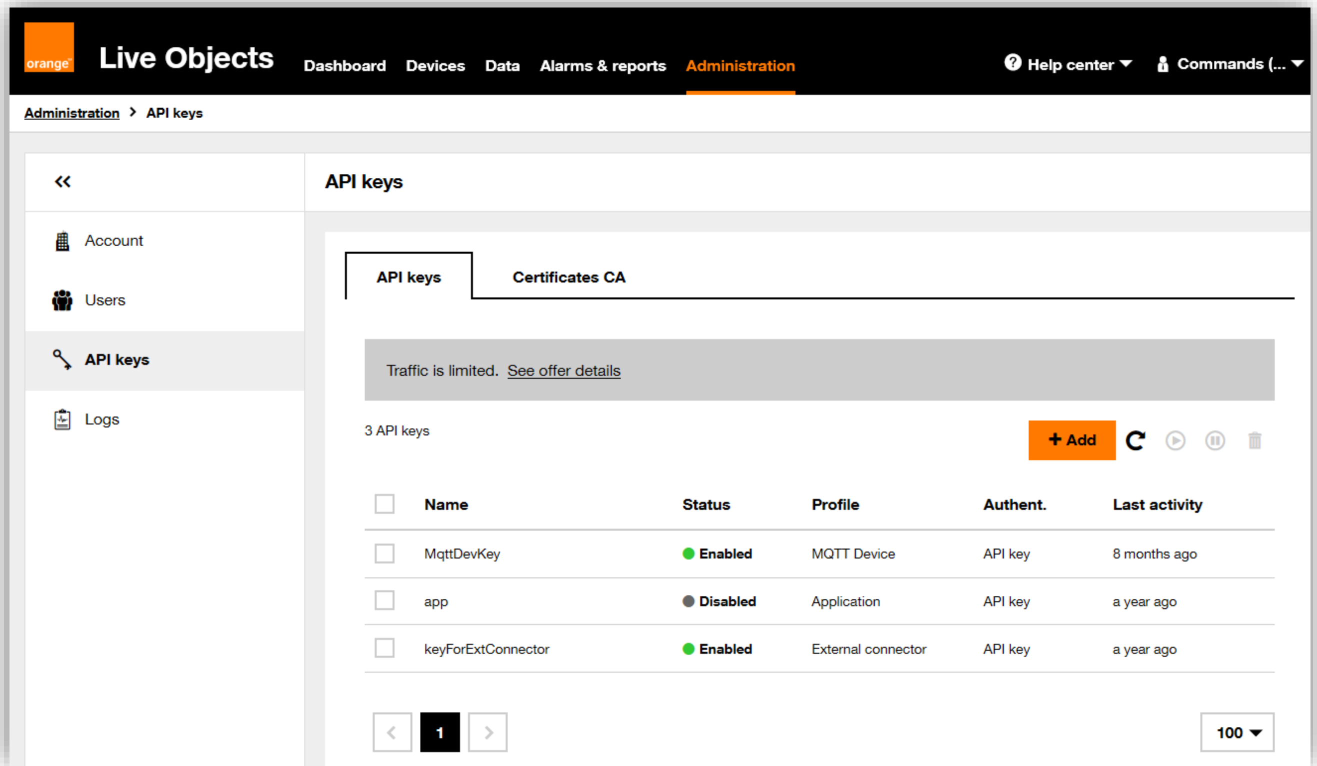


Api key generated

Here is the api key value. Keep it in a safe place.

812481601c484a45b725792fc8ecc18b

List API keys


orange
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
Commands (...
Administration > API keys
«
Account
Users
API keys
Logs
API keys
Certificates CA
+ Add
100

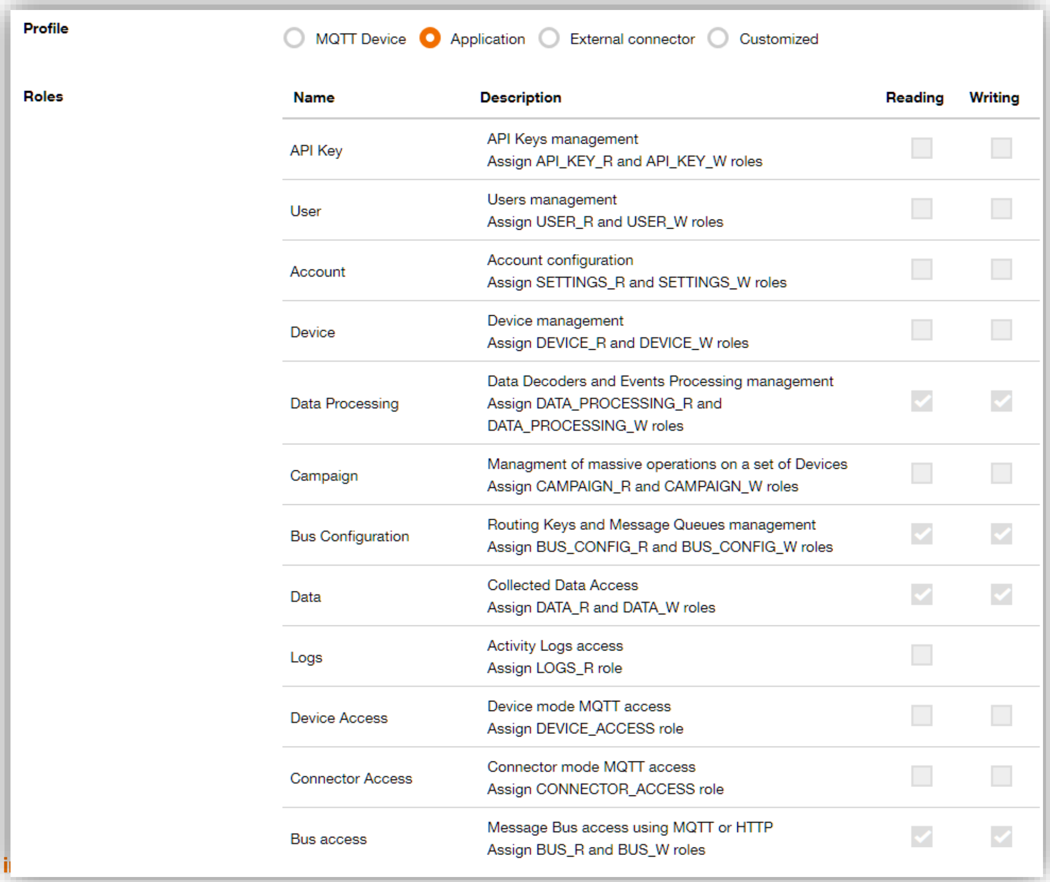
API keys

Traffic is limited. See offer details

3 API keys

☐	Name	Status	Profile	Authent.	Last activity
☐	MqttDevKey	● Enabled	MQTT Device	API key	8 months ago
☐	app	● Disabled	Application	API key	a year ago
☐	keyForExtConnector	● Enabled	External connector	API key	a year ago

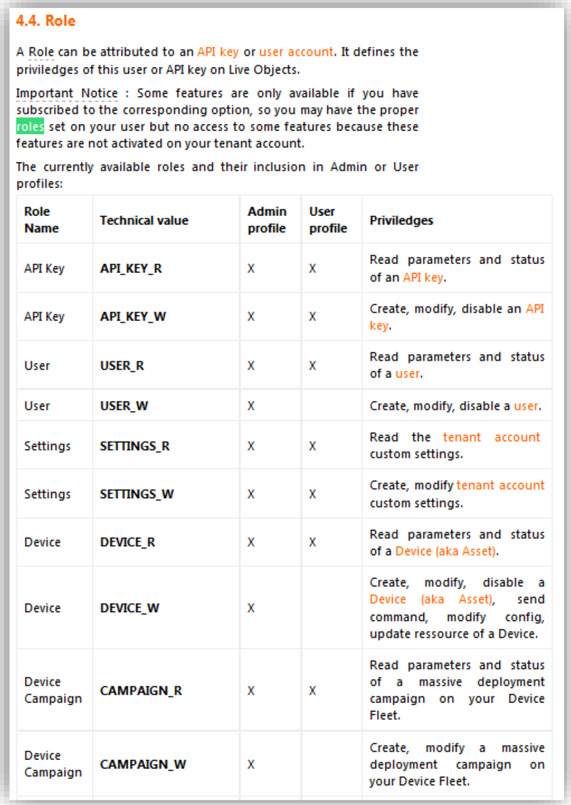
Create an API key
Roles : see technical documentation for details



Profile ○ MQTT Device ● Application ○ External connector ○ Customized

Roles

Name	Description	Reading	Writing
API Key	API Keys management Assign API_KEY_R and API_KEY_W roles	☐	☐
User	Users management Assign USER_R and USER_W roles	☐	☐
Account	Account configuration Assign SETTINGS_R and SETTINGS_W roles	☐	☐
Device	Device management Assign DEVICE_R and DEVICE_W roles	☐	☐
Data Processing	Data Decoders and Events Processing management Assign DATA_PROCESSING_R and DATA_PROCESSING_W roles	☑	☑
Campaign	Managment of massive operations on a set of Devices Assign CAMPAIGN_R and CAMPAIGN_W roles	☐	☐
Bus Configuration	Routing Keys and Message Queues management Assign BUS_CONFIG_R and BUS_CONFIG_W roles	☑	☑
Data	Collected Data Access Assign DATA_R and DATA_W roles	☑	☑
Logs	Activity Logs access Assign LOGS_R role	☐	
Device Access	Device mode MQTT access Assign DEVICE_ACCESS role	☐	☐
Connector Access	Connector mode MQTT access Assign CONNECTOR_ACCESS role	☐	☐
Bus access	Message Bus access using MQTT or HTTP Assign BUS_R and BUS_W roles	☑	☑



4.4. Role

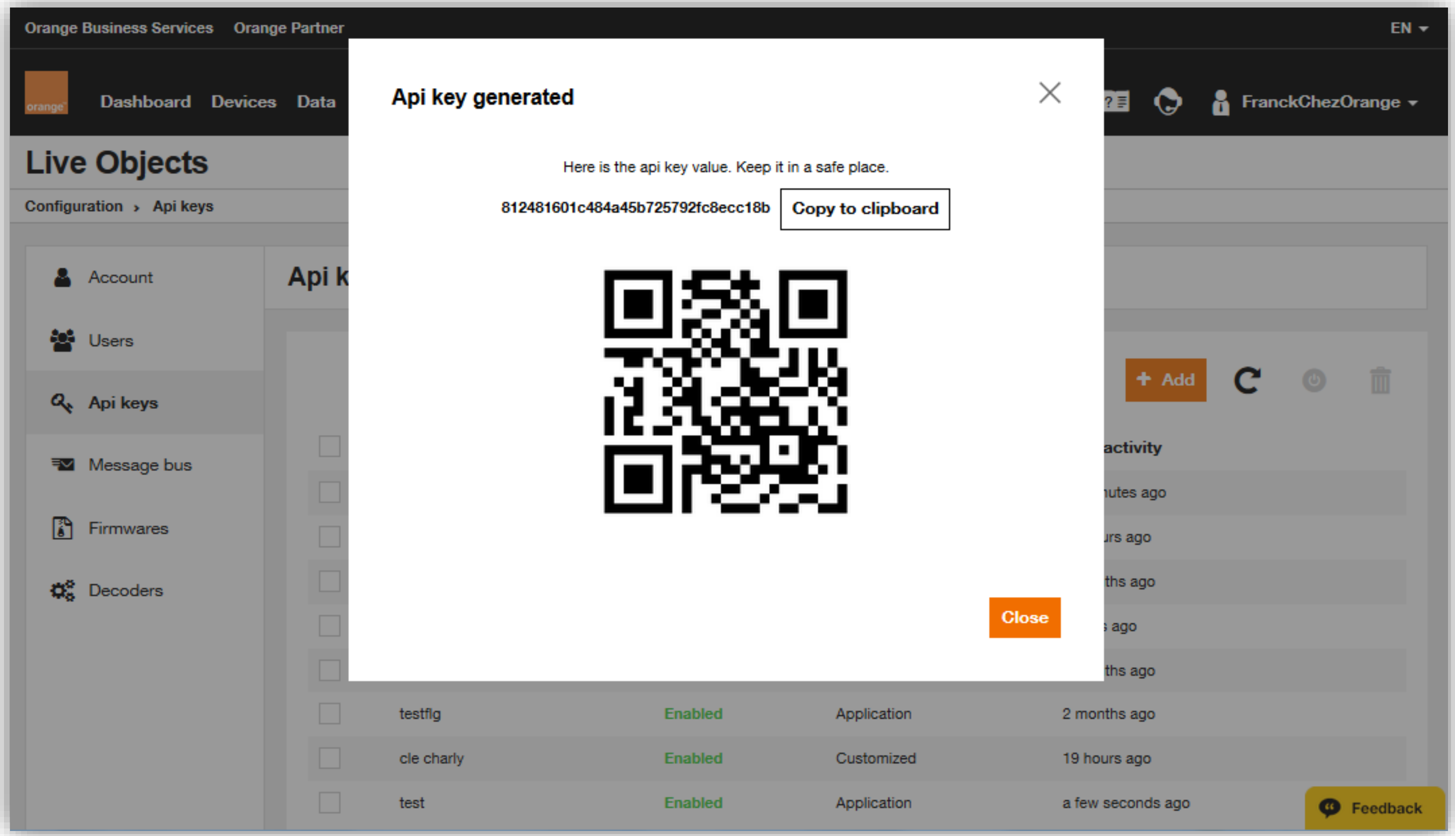
A Role can be attributed to an API key or user account. It defines the priviledges of this user or API key on Live Objects.

Important Notice : Some features are only available if you have subscribed to the corresponding option, so you may have the proper roles set on your user but no access to some features because these features are not activated on your tenant account.

The currently available roles and their inclusion in Admin or User profiles:

Role Name	Technical value	Admin profile	User profile	Priviledges
API Key	**API_KEY_R**	X	X	Read parameters and status of an API key.
API Key	**API_KEY_W**	X	X	Create, modify, disable an API key.
User	**USER_R**	X	X	Read parameters and status of a user.
User	**USER_W**	X		Create, modify, disable a user.
Settings	**SETTINGS_R**	X	X	Read the tenant account custom settings.
Settings	**SETTINGS_W**	X	X	Create, modify tenant account custom settings.
Device	**DEVICE_R**	X	X	Read parameters and status of a Device (aka Asset).
Device	**DEVICE_W**	X		Create, modify, disable a Device (aka Asset), send command, modify config, update ressource of a Device.
Device Campaign	**CAMPAIGN_R**	X	X	Read parameters and status of a massive deployment campaign on your Device Fleet.
Device Campaign	**CAMPAIGN_W**	X		Create, modify a massive deployment campaign on your Device Fleet.

Copy/paste the key, it appears only once!



Orange Business Services
Orange Partner
EN
orange
Dashboard
Devices
Data
FranckChezOrange
Live Objects
Configuration › Api keys
Account
Users
Api keys
Message bus
Firmwares
Decoders
Api k
Add
activity
Feedback
Copy to clipboard
Close

Api key generated

Here is the api key value. Keep it in a safe place.

812481601c484a45b725792fc8ecc18b

			nutes ago
			urs ago
			ths ago
			s ago
			ths ago
testflg	Enabled	Application	2 months ago
cle charly	Enabled	Customized	19 hours ago
test	Enabled	Application	a few seconds ago

API security

As of October 31st, 2020 :

- **devices:**
    - **endpoint:** `mqtt://mqtt.liveobjects.orange-business.com`
    - **TLS 1.2 (or better) required on HTTP APIs**
    - **TLS 1.2 (or better) strongly advised on MQTT APIs**
    - **plain-text MQTT tolerated only with an API-key limited to DEVICE_ACCESS rights**
    - **2-way-handshake TLS advised**

- **applications:**
    - **endpoint:** `mqtt://liveobjects.orange-business.com`
    - **TLS 1.2 (or better) required on all APIs (MQTT, HTTP, WebSocket)**

MQTT connection with devices - device TLS certificate

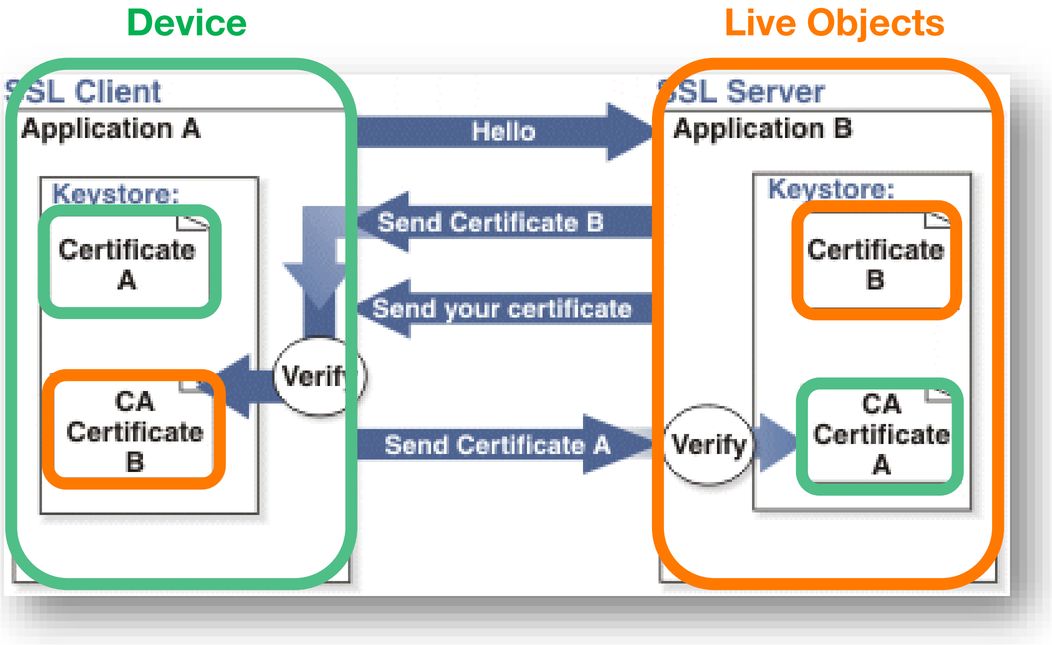
Best security for devices,

recommended implementation for production

Customer CA (in green) is stored in Live Objects, associated to an API-Key

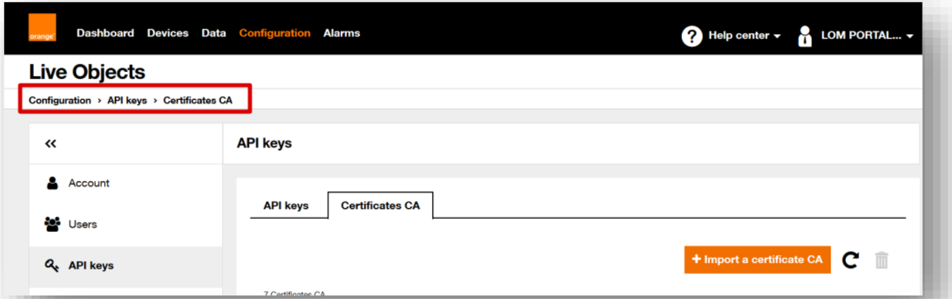
Each device has a unique certificate signed by the customer CA

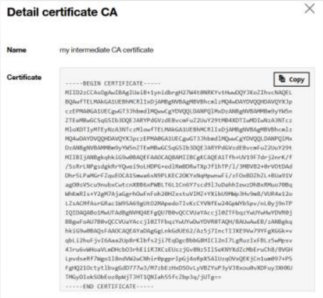
Operation mode described in the developer guide:
https://liveobjects.orange-business.com/doc/html/lo_manual_v2.html#_go_further_and_use_2_way_authentication


Device
Live Objects
SSL Client
Application A
Keystore:
Certificate A
CA Certificate B
Verify
Hello
Send Certificate B
Send your certificate
Send Certificate A
SSL Server
Application B
Keystore:
Certificate B
Verify
CA Certificate A

MQTT connection with devices - device TLS certificate

1 Import a CA Certificate in Configuration/API keys/Certificates CA


orange
Dashboard
Devices
Data
Configuration
Alarms
Help center
LOM PORTAL...
Live Objects
Configuration › API keys › Certificates CA
API keys
Account
Users
API keys
API keys
Certificates CA
+ Import a certificate CA



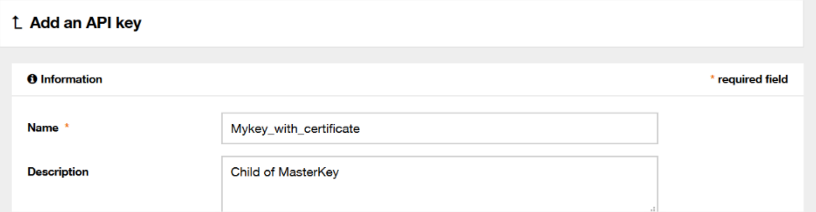
Detail certificate CA

Name my intermediate CA certificate

Certificate

```
-----BEGIN CERTIFICATE-----
-----END CERTIFICATE-----
```

2 Associate an imported CA certificate to an API key used by a device

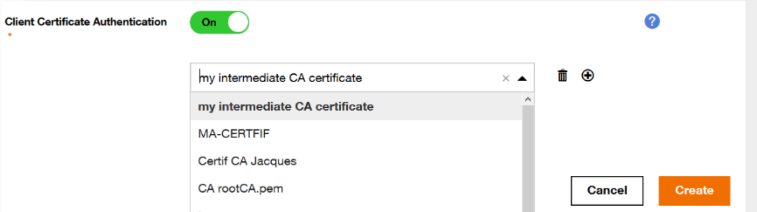


Add an API key

Information * required field

Name * Mykey_with_certificate

Description Child of MasterKey



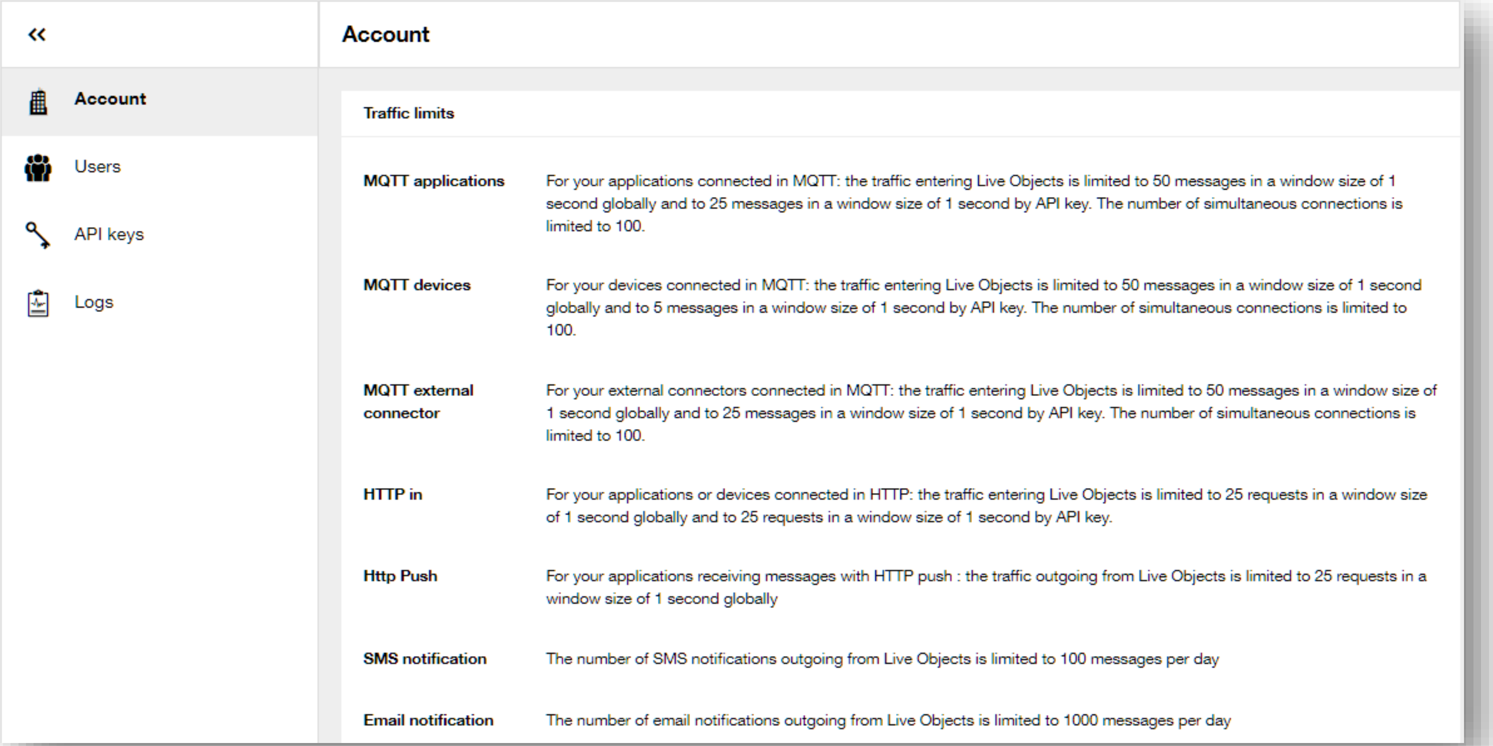
Client Certificate Authentication * On

my intermediate CA certificate

my intermediate CA certificate
MA-CERTFIF
Certif CA Jacques
CA rootCA.pem
temp
Cancel
Create

Traffic limits

Example with a premium+ account

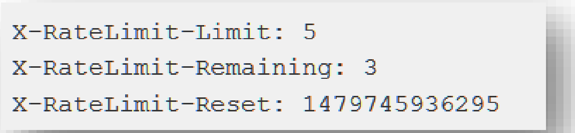


Traffic limits

MQTT applications	For your applications connected in MQTT: the traffic entering Live Objects is limited to 50 messages in a window size of 1 second globally and to 25 messages in a window size of 1 second by API key. The number of simultaneous connections is limited to 100.
MQTT devices	For your devices connected in MQTT: the traffic entering Live Objects is limited to 50 messages in a window size of 1 second globally and to 5 messages in a window size of 1 second by API key. The number of simultaneous connections is limited to 100.
MQTT external connector	For your external connectors connected in MQTT: the traffic entering Live Objects is limited to 50 messages in a window size of 1 second globally and to 25 messages in a window size of 1 second by API key. The number of simultaneous connections is limited to 100.
HTTP in	For your applications or devices connected in HTTP: the traffic entering Live Objects is limited to 25 requests in a window size of 1 second globally and to 25 requests in a window size of 1 second by API key.
Http Push	For your applications receiving messages with HTTP push : the traffic outgoing from Live Objects is limited to 25 requests in a window size of 1 second globally
SMS notification	The number of SMS notifications outgoing from Live Objects is limited to 100 messages per day
Email notification	The number of email notifications outgoing from Live Objects is limited to 1000 messages per day

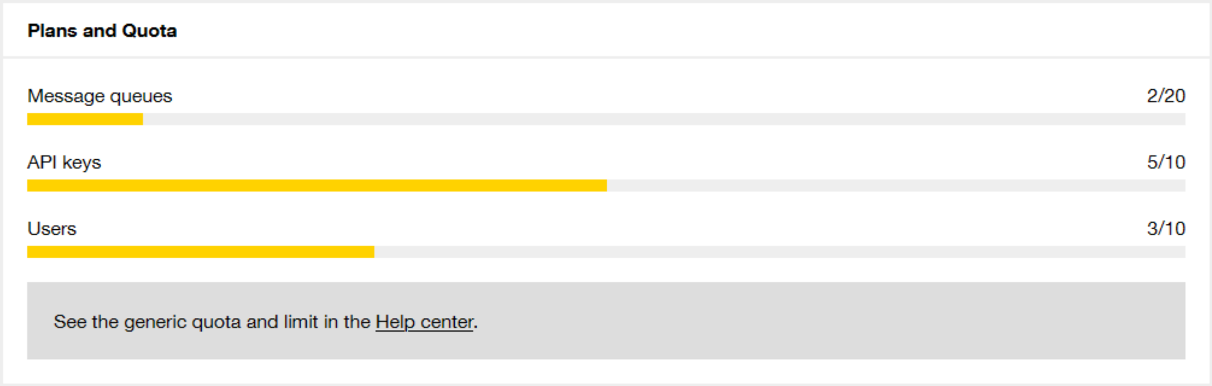
**Information on MQTT frames:
in the portal activity logs when exceeded**

Information in HTTP responses:



```
X-RateLimit-Limit: 5
X-RateLimit-Remaining: 3
X-RateLimit-Reset: 1479745936295
```

Quotas



Plans and Quota

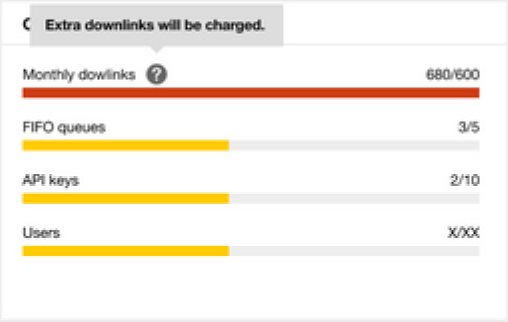
Message queues 2/20

API keys 5/10

Users 3/10

See the generic quota and limit in the Help center.

LoRa downlinks are limited per month for the whole fleet, Charged afterwards



Extra downlinks will be charged.

Monthly dowlinks ? 680/600

FIFO queues 3/5

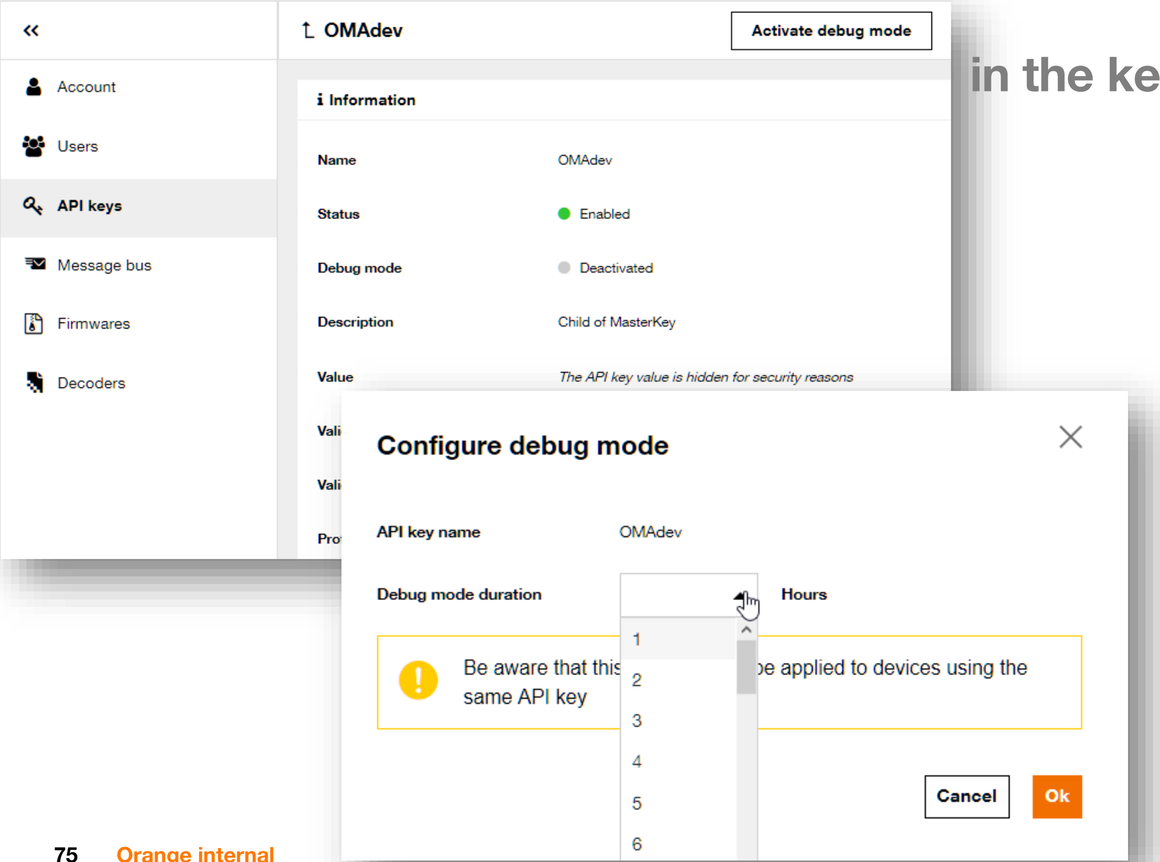
API keys 2/10

Users X/XX

Debug

MQTT debug : activate on an API-Key

in the keys view


«
Account
Users
API keys
Message bus
Firmwares
Decoders
OMAdev
Activate debug mode
Cancel
Ok

Information

Name OMAdev

Status ● Enabled

Debug mode ● Deactivated

Description Child of MasterKey

Value *The API key value is hidden for security reasons*

Configure debug mode

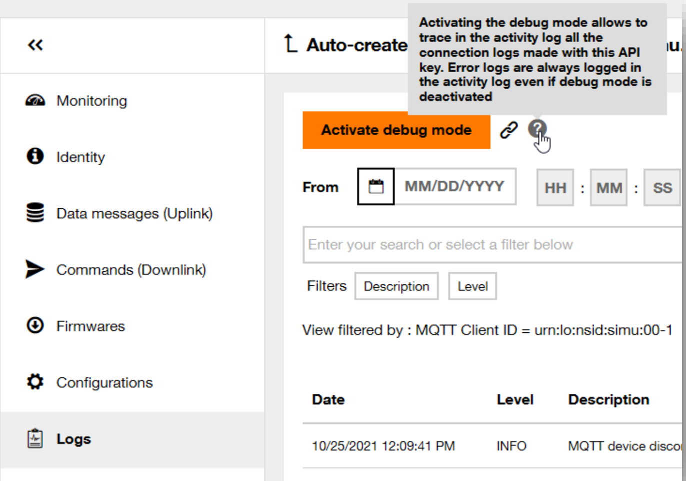
API key name OMAdev

Debug mode duration ▲ **Hours**

1
2
3
4
5
6

Be aware that this … be applied to devices using the same API key

or in the logs view


«
Monitoring
Identity
Data messages (Uplink)
Commands (Downlink)
Firmwares
Configurations
Logs
Auto-create
Activate debug mode
From
MM/DD/YYYY
HH
MM
SS
Filters
Description
Level

Activating the debug mode allows to trace in the activity log all the connection logs made with this API key. Error logs are always logged in the activity log even if debug mode is deactivated

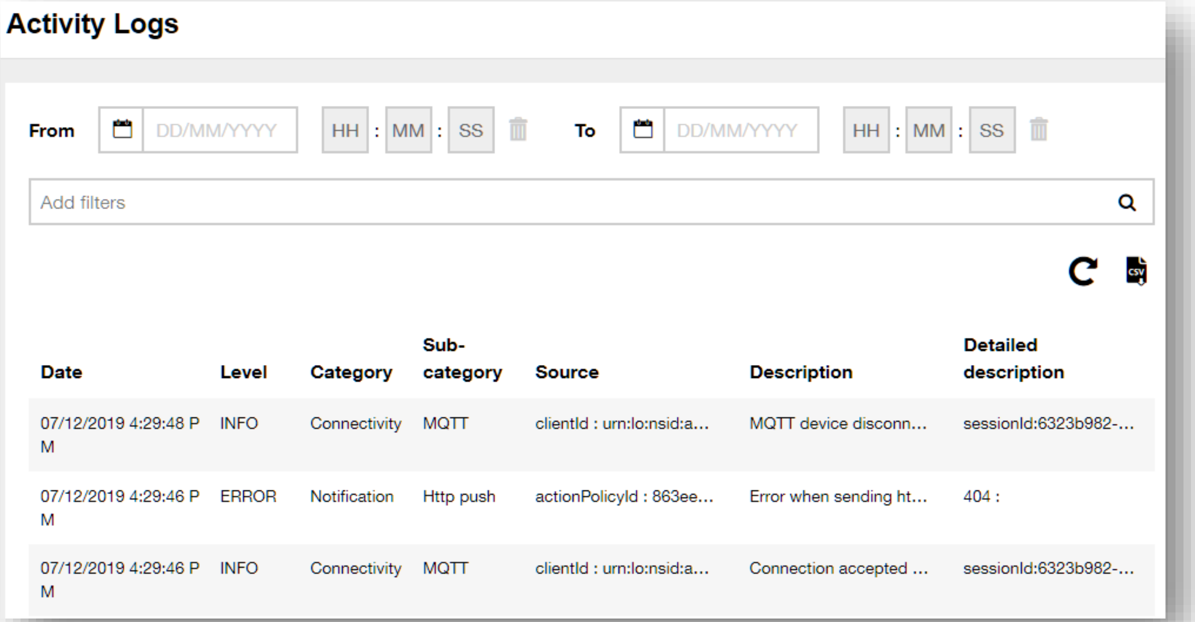
Enter your search or select a filter below

View filtered by : MQTT Client ID = urn:lo:nsid:simu:00-1

Date	Level	Description
10/25/2021 12:09:41 PM	INFO	MQTT device disco

MQTT debug

In the logs:



Activity Logs

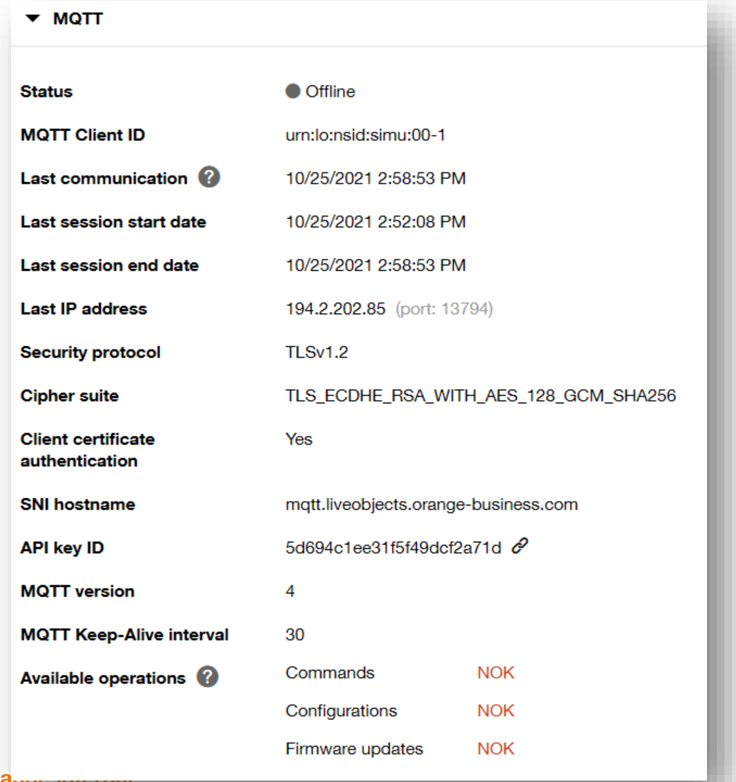
From
DD/MM/YYYY
HH : MM : SS
To
DD/MM/YYYY
HH : MM : SS
Add filters
CSV

Date	Level	Category	Sub-category	Source	Description	Detailed description
07/12/2019 4:29:48 PM	INFO	Connectivity	MQTT	clientId : urn:lo:nsid:a…	MQTT device disconn…	sessionId:6323b982-…
07/12/2019 4:29:46 PM	ERROR	Notification	Http push	actionPolicyId : 863ee…	Error when sending ht…	404 :
07/12/2019 4:29:46 PM	INFO	Connectivity	MQTT	clientId : urn:lo:nsid:a…	Connection accepted …	sessionId:6323b982-…

Debug

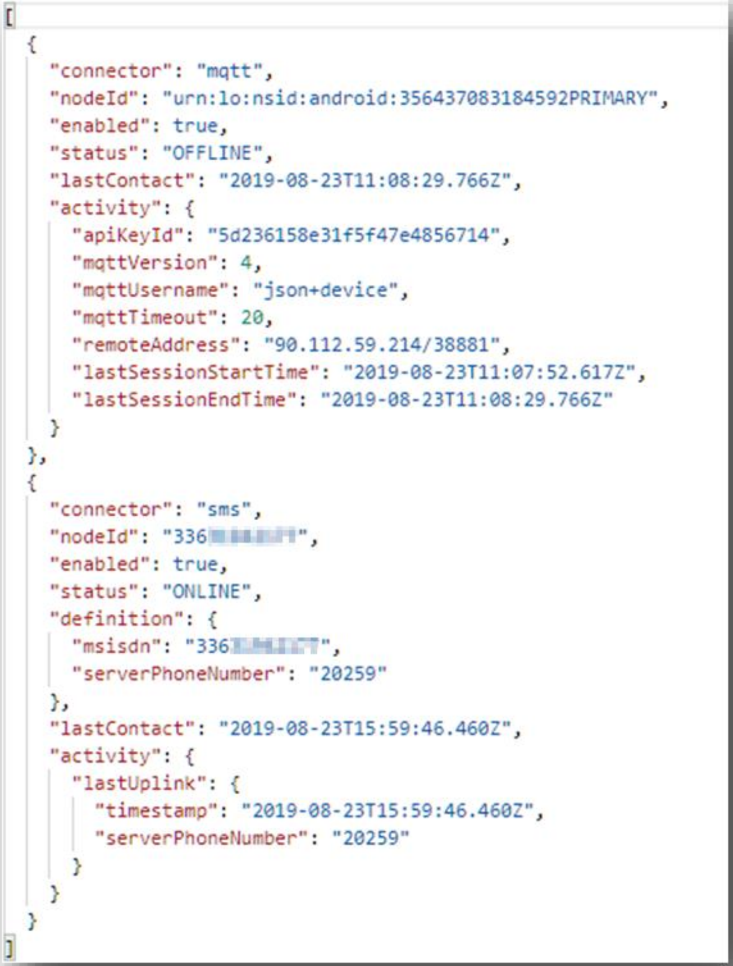
MQTT debug

Query the interface:



▼ **MQTT**

Status	● Offline	
MQTT Client ID	urn:lo:nsid:simu:00-1	
Last communication ?	10/25/2021 2:58:53 PM	
Last session start date	10/25/2021 2:52:08 PM	
Last session end date	10/25/2021 2:58:53 PM	
Last IP address	194.2.202.85 (port: 13794)	
Security protocol	TLSv1.2	
Cipher suite	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	
Client certificate authentication	Yes	
SNI hostname	mqtt.liveobjects.orange-business.com	
API key ID	5d694c1ee31f5f49dcf2a71d	
MQTT version	4	
MQTT Keep-Alive interval	30	
Available operations ?	Commands	NOK
	Configurations	NOK
	Firmware updates	NOK



```
[
  {
    "connector": "mqtt",
    "nodeId": "urn:lo:nsid:android:356437083184592PRIMARY",
    "enabled": true,
    "status": "OFFLINE",
    "lastContact": "2019-08-23T11:08:29.766Z",
    "activity": {
      "apiKeyId": "5d236158e31f5f47e4856714",
      "mqttVersion": 4,
      "mqttUsername": "json+device",
      "mqttTimeout": 20,
      "remoteAddress": "90.112.59.214/38881",
      "lastSessionStartTime": "2019-08-23T11:07:52.617Z",
      "lastSessionEndTime": "2019-08-23T11:08:29.766Z"
    }
  },
  {
    "connector": "sms",
    "nodeId": "336[redacted]",
    "enabled": true,
    "status": "ONLINE",
    "definition": {
      "msisdn": "336[redacted]",
      "serverPhoneNumber": "20259"
    },
    "lastContact": "2019-08-23T15:59:46.460Z",
    "activity": {
      "lastUplink": {
        "timestamp": "2019-08-23T15:59:46.460Z",
        "serverPhoneNumber": "20259"
      }
    }
  }
]
```

https://liveobjects.orange-business.com/api/v1/deviceMgt/devices/urn:lo:nsid:android:356437083184592PRIMARY/interfaces

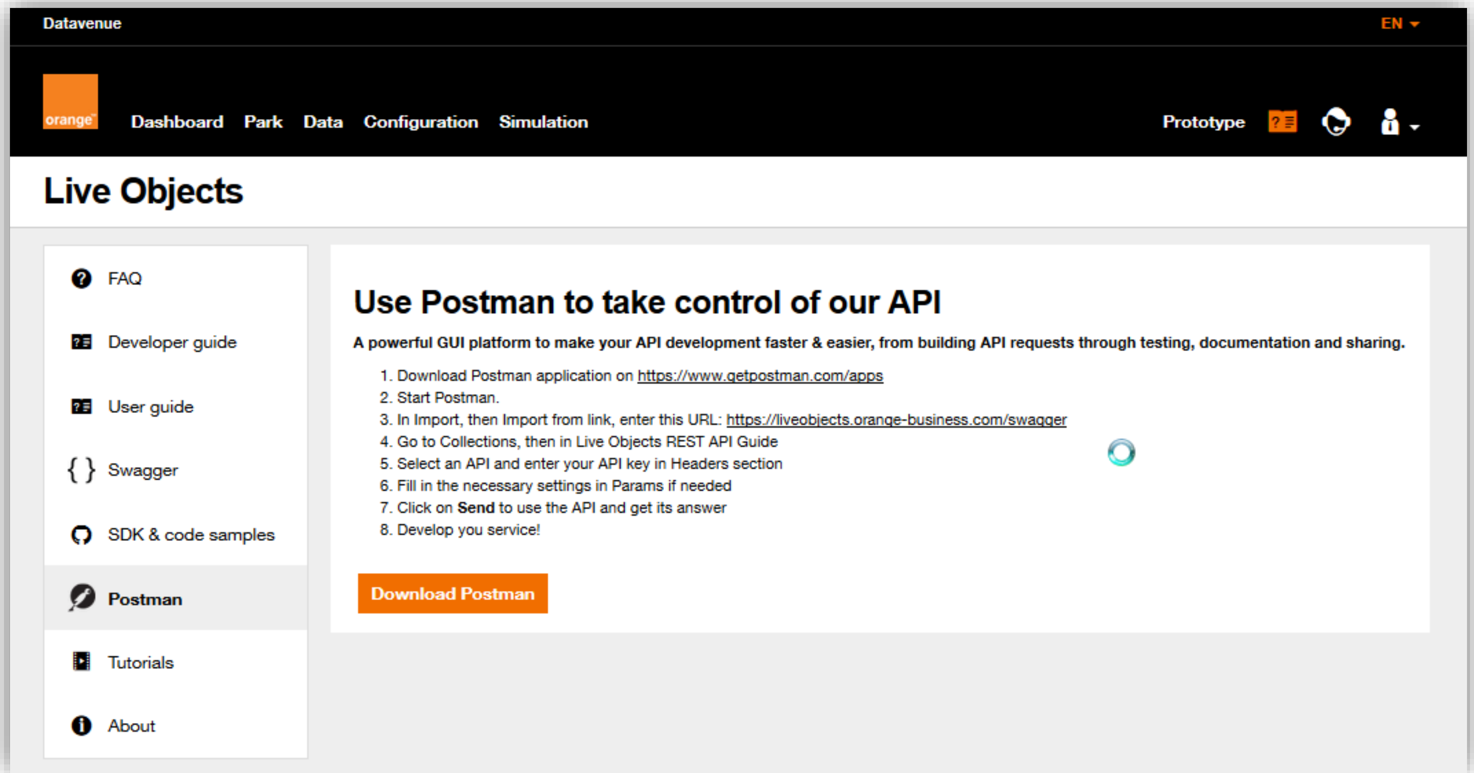
#4.4

tools for APIs

Postman

Postman : installation

Portable version : https://portapps.io/app/postman-portable/#download


Datavenue
EN
orange
Dashboard
Park
Data
Configuration
Simulation
Prototype
FAQ
Developer guide
User guide
Swagger
SDK & code samples
Postman
Tutorials
About
Download Postman

Live Objects

Use Postman to take control of our API

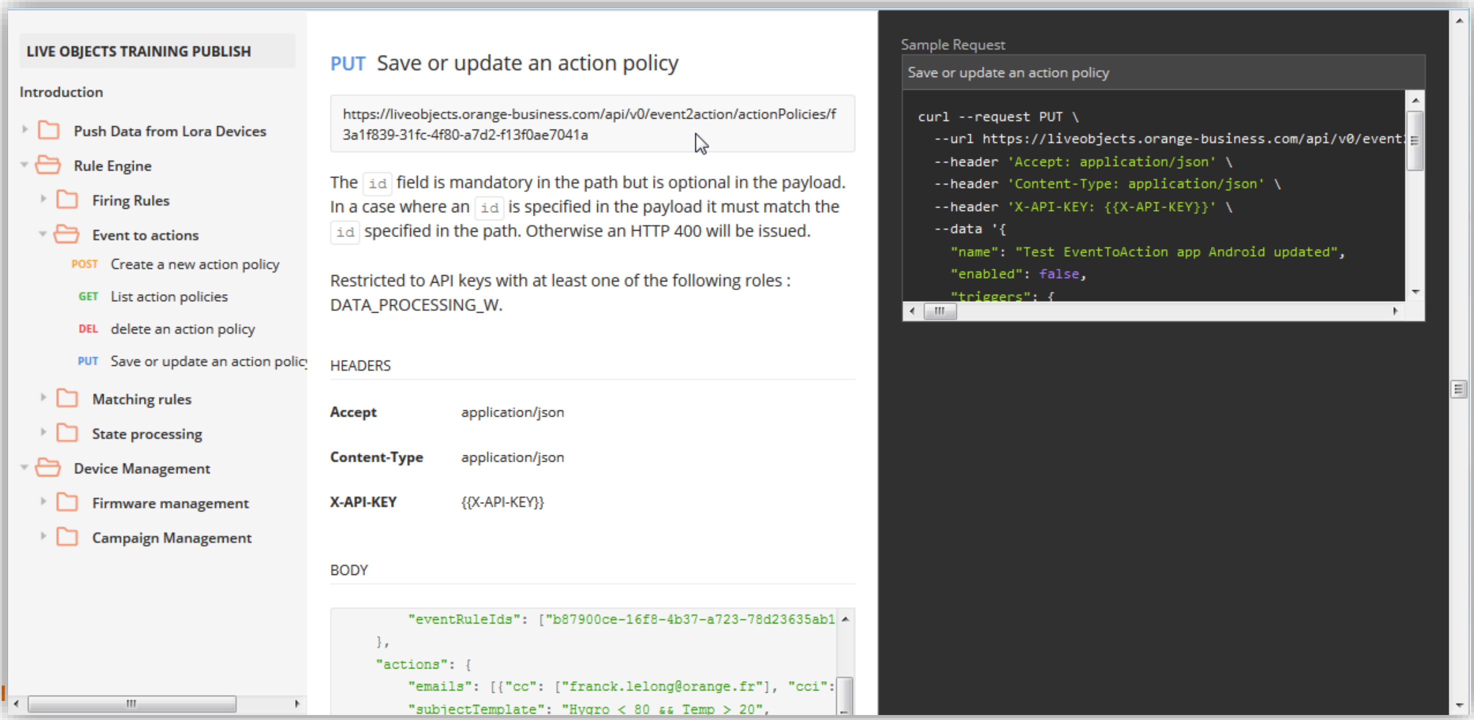
A powerful GUI platform to make your API development faster & easier, from building API requests through testing, documentation and sharing.

1. Download Postman application on https://www.getpostman.com/apps
2. Start Postman.
3. In Import, then Import from link, enter this URL: https://liveobjects.orange-business.com/swagger
4. Go to Collections, then in Live Objects REST API Guide
5. Select an API and enter your API key in Headers section
6. Fill in the necessary settings in Params if needed
7. Click on **Send** to use the API and get its answer
8. Develop you service!

Postman

Shared collection

https://documenter.getpostman.com/view/1510363/live-objects-training-publish/7TJCtGP


LIVE OBJECTS TRAINING PUBLISH
Introduction
Push Data from Lora Devices
Rule Engine
Firing Rules
Event to actions
POST Create a new action policy
GET List action policies
DEL delete an action policy
PUT Save or update an action polic
Matching rules
State processing
Device Management
Firmware management
Campaign Management
Sample Request
Save or update an action policy

PUT Save or update an action policy

https://liveobjects.orange-business.com/api/v0/event2action/actionPolicies/f3a1f839-31fc-4f80-a7d2-f13f0ae7041a

The `id` field is mandatory in the path but is optional in the payload. In a case where an `id` is specified in the payload it must match the `id` specified in the path. Otherwise an HTTP 400 will be issued.

Restricted to API keys with at least one of the following roles : DATA_PROCESSING_W.

HEADERS

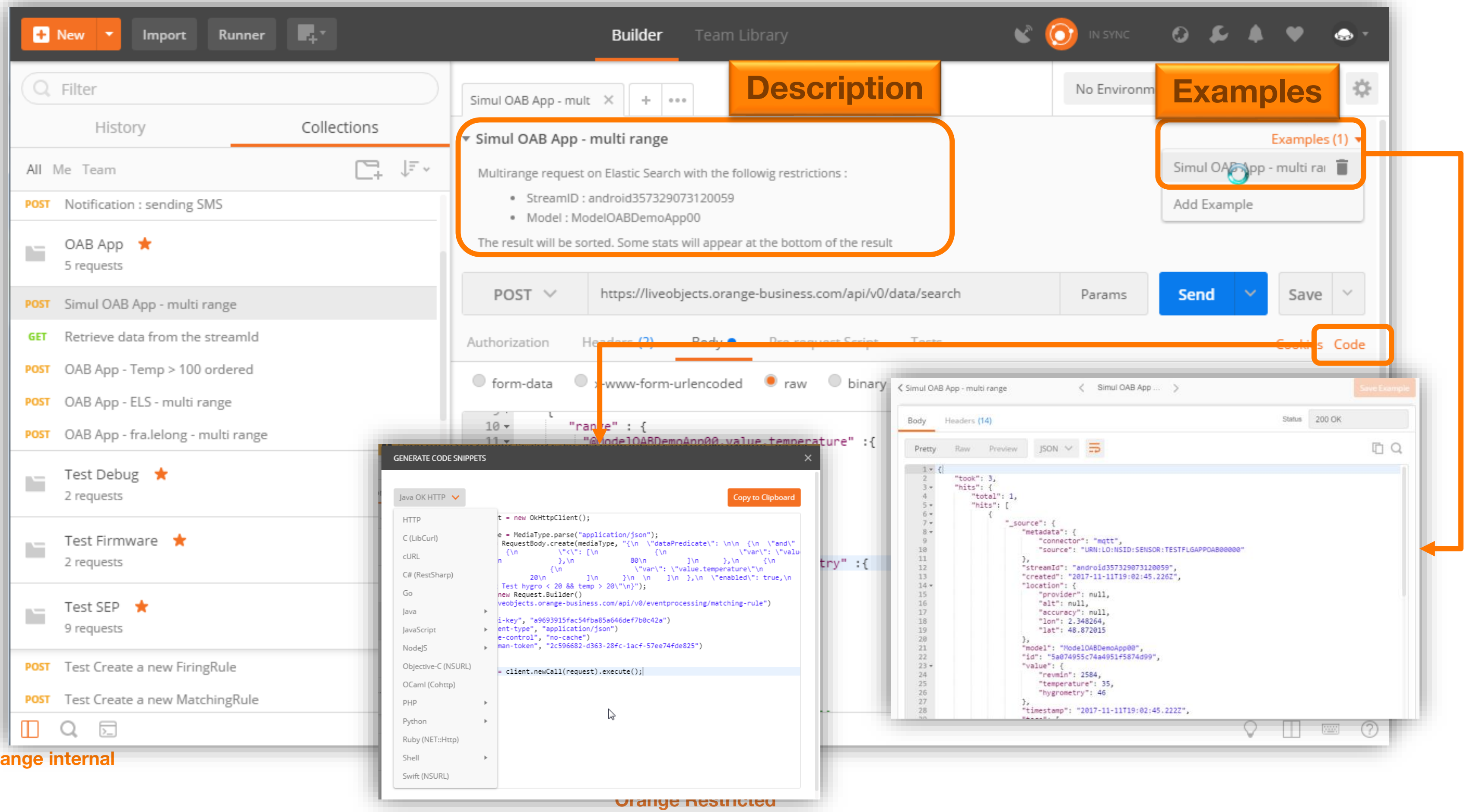
Accept	application/json
Content-Type	application/json
X-API-KEY	{{X-API-KEY}}

BODY

```
        "eventRuleIds": ["b87900ce-16f8-4b37-a723-78d23635ab1
    },
    "actions": {
        "emails": [{"cc": ["franck.lelong@orange.fr"], "cci":
        "subjectTemplate": "Hygro < 80 && Temp > 20",
```

```
curl --request PUT \
  --url https://liveobjects.orange-business.com/api/v0/event
  --header 'Accept: application/json' \
  --header 'Content-Type: application/json' \
  --header 'X-API-KEY: {{X-API-KEY}}' \
  --data '{
    "name": "Test EventToAction app Android updated",
    "enabled": false,
    "triggers": {
```

Postman



Description

Examples

Code

Simul OAB App - multi range

Multirange request on Elastic Search with the followig restrictions :

- StreamID : android357329073120059
- Model : ModelOABDemoApp00

The result will be sorted. Some stats will appear at the bottom of the result

POST https://liveobjects.orange-business.com/api/v0/data/search

GENERATE CODE SNIPPETS

Java OK HTTP

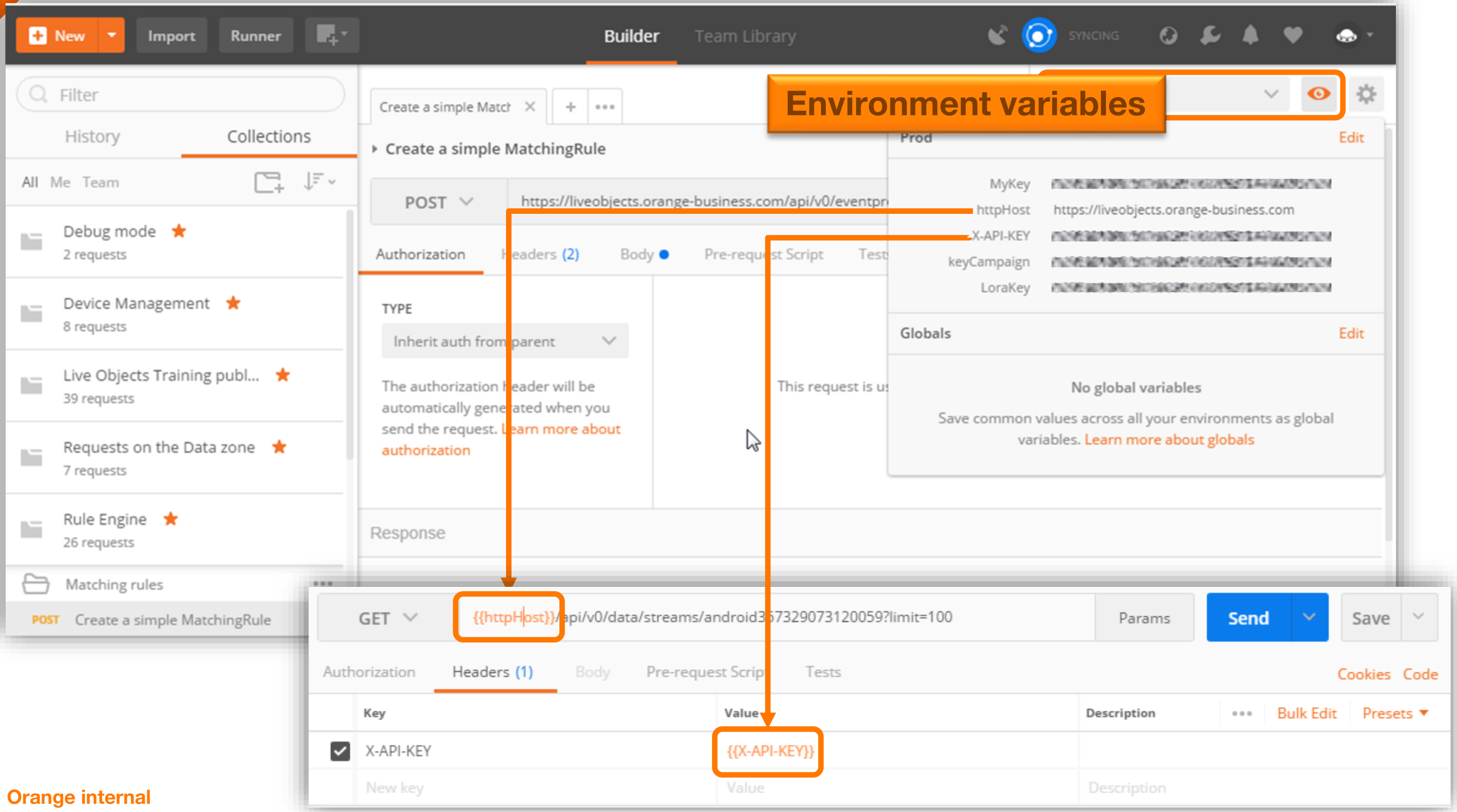
```
t = new OkHttpClient();

e = MediaType.parse("application/json");
 RequestBody.create(mediaType, "{\n  \"dataPredicate\": \n\n  {\n  \"and\"
  {\n          \"<\": [\n              {\n                  \"var\": \"valu
n              },\n              80\n          ]\n      },\n      {\n
             {\n                \"var\": \"value.temperature\"\n
        20\n          ]\n      }\n  \n    ]\n  },\n  \"enabled\": true,\n
 Test hygro < 20 && temp > 20\"\n}");
new Request.Builder()
veobjects.orange-business.com/api/v0/eventprocessing/matching-rule")

i-key", "a9693915fac54fba85a646def7b0c42a")
ent-type", "application/json")
e-control", "no-cache")
man-token", "2c596682-d363-28fc-1acf-57ee74fde825")


= client.newCall(request).execute();
```

Status 200 OK

```
{
    "took": 3,
    "hits": {
        "total": 1,
        "hits": [
            {
                "_source": {
                    "metadata": {
                        "connector": "mqtt",
                        "source": "URN:LO:NSID:SENSOR:TESTFLGAPPOAB00000"
                    },
                    "streamId": "android357329073120059",
                    "created": "2017-11-11T19:02:45.226Z",
                    "location": {
                        "provider": null,
                        "alt": null,
                        "accuracy": null,
                        "lon": 2.348264,
                        "lat": 48.872015
                    },
                    "model": "ModelOABDemoApp00",
                    "id": "5a074955c74a4951f5874d99",
                    "value": {
                        "revmin": 2584,
                        "temperature": 35,
                        "hygrometry": 46
                    },
                    "timestamp": "2017-11-11T19:02:45.222Z",
```

New
Import
Runner
Builder
Team Library
IN SYNC
Filter
History
Collections
All Me Team
POST Notification : sending SMS
OAB App
5 requests
POST Simul OAB App - multi range
GET Retrieve data from the streamId
POST OAB App - Temp > 100 ordered
POST OAB App - ELS - multi range
POST OAB App - fra.lelong - multi range
Test Debug
2 requests
Test Firmware
2 requests
Test SEP
9 requests
POST Test Create a new FiringRule
POST Test Create a new MatchingRule
Simul OAB App - mult
No Environm
Examples (1)
Simul OAB App - multi ra
Add Example
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Cookies
Code
form-data
x-www-form-urlencoded
raw
binary
Copy to Clipboard
HTTP
C (LibCurl)
cURL
C# (RestSharp)
Go
Java
JavaScript
NodeJS
Objective-C (NSURL)
OCaml (Cohttp)
PHP
Python
Ruby (NET::Http)
Shell
Swift (NSURL)
Simul OAB App - multi range
Simul OAB App ...
Save Example
Body
Headers (14)
Pretty
Raw
Preview
JSON

Postman



Environment variables

New
Import
Runner
Builder
Team Library
SYNCING
Filter
History
Collections
All Me Team

Debug mode ★
2 requests

Device Management ★
8 requests

Live Objects Training publ... ★
39 requests

Requests on the Data zone ★
7 requests

Rule Engine ★
26 requests

Matching rules

POST Create a simple MatchingRule

Create a simple Matcl ×
+ •••

Create a simple MatchingRule

POST https://liveobjects.orange-business.com/api/v0/eventpr

Authorization
Headers (2)
Body
Pre-request Script
Test

TYPE

Inherit auth from parent

The authorization header will be automatically generated when you send the request. Learn more about authorization

This request is us

Prod Edit

MyKey	[redacted]
httpHost	https://liveobjects.orange-business.com
X-API-KEY	[redacted]
keyCampaign	[redacted]
LoraKey	[redacted]

Globals Edit

No global variables

Save common values across all your environments as global variables. Learn more about globals

GET {{httpHost}}/api/v0/data/streams/android3[illegible]7329073120059?limit=100

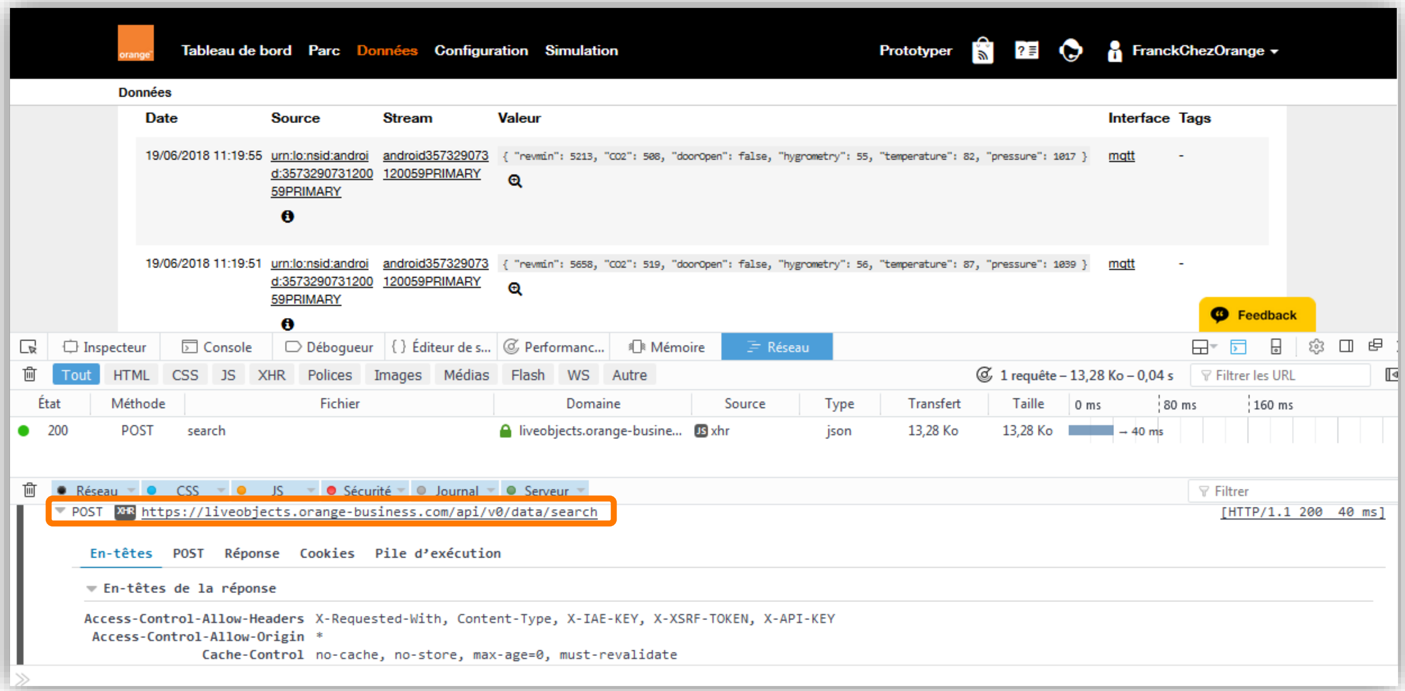
Params
Send
Save
Authorization
Headers (1)
Body
Pre-request Scrip
Tests
Cookies
Code
••• Bulk Edit
Presets

	Key	Value	Description
☑	X-API-KEY	{{X-API-KEY}}	
	New key	Value	Description

Web Portal

Web browsers : use the developer tools (F12) !

The portal behavior is an efficient reference


orange
Tableau de bord
Parc
Données
Configuration
Simulation
Prototyper
FranckChezOrange
Feedback
Inspecteur
Console
Débogueur
{ } Éditeur de s...
Performanc...
Mémoire
Réseau
Tout
HTML
CSS
JS
XHR
Polices
Images
Médias
Flash
WS
Autre
Filtrer les URL
Réseau
CSS
JS
Sécurité
Journal
Serveur
Filtrer

Données

Date	Source	Stream	Valeur	Interface	Tags
19/06/2018 11:19:55	urn:lo:nsid:android:357329073120059PRIMARY	android357329073120059PRIMARY	{ "revmin": 5213, "CO2": 508, "doorOpen": false, "hygrometry": 55, "temperature": 82, "pressure": 1017 }	mqtt	-
19/06/2018 11:19:51	urn:lo:nsid:android:357329073120059PRIMARY	android357329073120059PRIMARY	{ "revmin": 5658, "CO2": 519, "doorOpen": false, "hygrometry": 56, "temperature": 87, "pressure": 1039 }	mqtt	-

1 requête – 13,28 Ko – 0,04 s

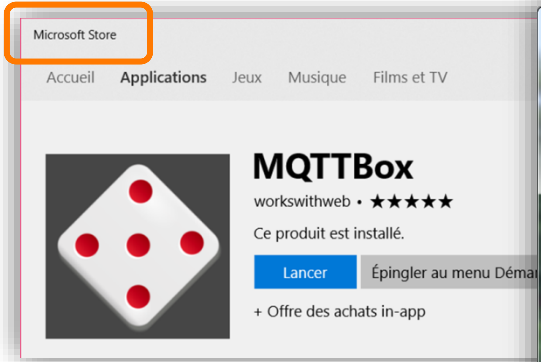
État	Méthode	Fichier	Domaine	Source	Type	Transfert	Taille	0 ms 80 ms 160 ms
● 200	POST	search	liveobjects.orange-busine...	xhr	json	13,28 Ko	13,28 Ko	→ 40 ms

```
POST XHR https://liveobjects.orange-business.com/api/v0/data/search          [HTTP/1.1 200  40 ms]

   En-têtes  POST  Réponse  Cookies  Pile d'exécution

   En-têtes de la réponse

   Access-Control-Allow-Headers X-Requested-With, Content-Type, X-IAE-KEY, X-XSRF-TOKEN, X-API-KEY
    Access-Control-Allow-Origin *
                  Cache-Control no-cache, no-store, max-age=0, must-revalidate
```

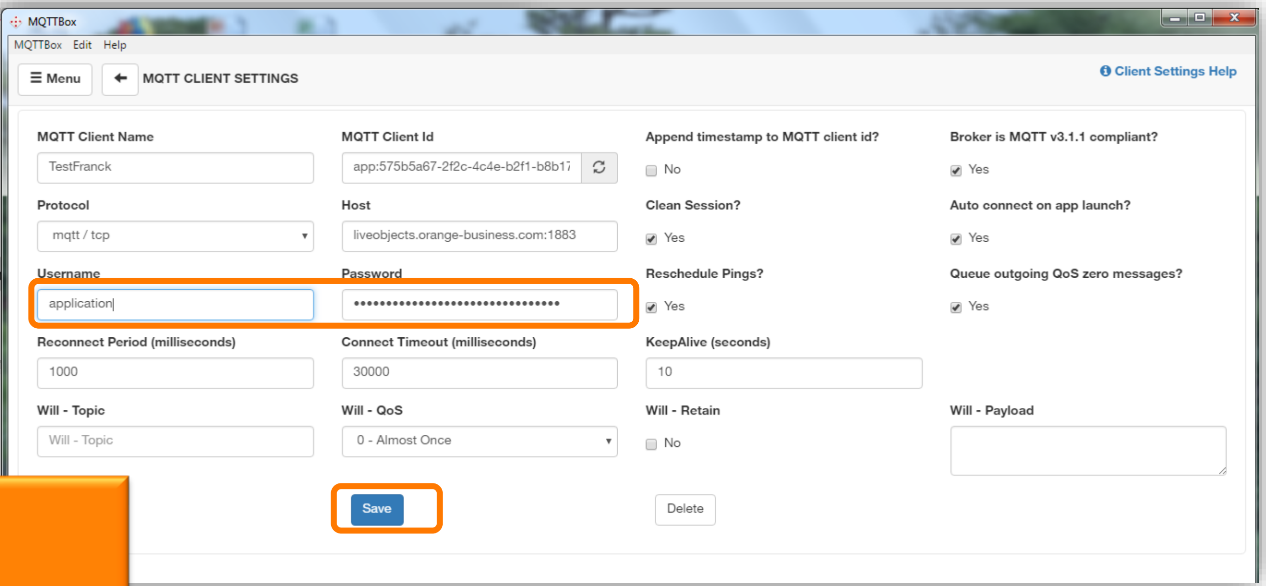
MQTTBox

MQTT Box : install/configure a client

Mqtt/WebSocket, admin install


Microsoft Store
Accueil
Applications
Jeux
Musique
Films et TV
Lancer
Épingler au menu Déma

MQTTBox
workswithweb • ★★★★★
Ce produit est installé.
+ Offre des achats in-app


MQTTBox
MQTTBox Edit Help
☰ Menu
MQTT CLIENT SETTINGS
Client Settings Help
Save
Delete

MQTT Client Name: TestFranck	MQTT Client Id: app:575b5a67-2f2c-4c4e-b2f1-b8b17	Append timestamp to MQTT client id? ☐ No	Broker is MQTT v3.1.1 compliant? ☑ Yes
Protocol: mqtt / tcp	Host: liveobjects.orange-business.com:1883	Clean Session? ☑ Yes	Auto connect on app launch? ☑ Yes
Username: application	Password: ••••••••••••••••••••••••••••••••	Reschedule Pings? ☑ Yes	Queue outgoing QoS zero messages? ☑ Yes
Reconnect Period (milliseconds): 1000	Connect Timeout (milliseconds): 30000	KeepAlive (seconds): 10	
Will - Topic: Will - Topic	Will - QoS: 0 - Almost Once	Will - Retain: ☐ No	Will - Payload:

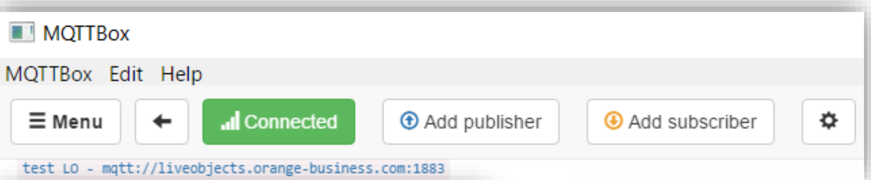
User name : « application »
Password : Live Objects API Key

Plain text:
MQTT: liveobjects.orange-business.com:1883
WebSocket: ws://liveobjects.orange-business.com:80/mqtt

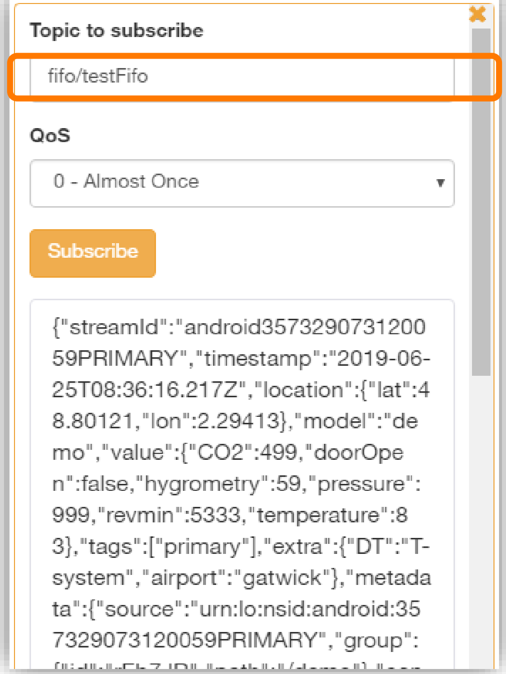
SSL/TLS (1- or 2-way authentication):
MQTTS: liveobjects.orange-business.com:8883
WebSocket: wss://liveobjects.orange-business.com:443/mqtt

MQTT Box

Subscribe to topics, ex :
Application : « fifo/testFifo »


MQTTBox
MQTTBox Edit Help
☰ Menu
Connected
Add publisher
Add subscriber

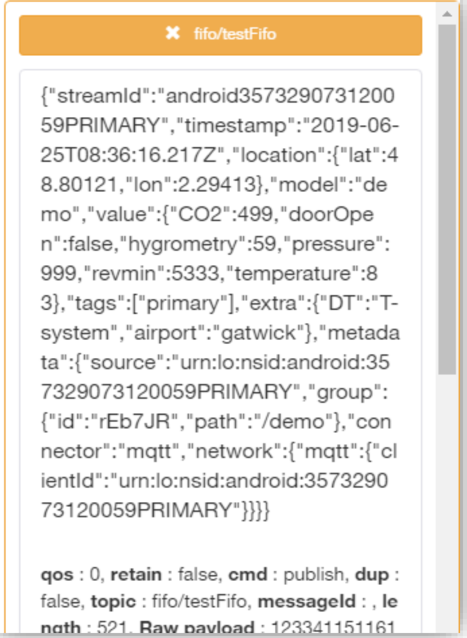
test LO - mqtt://liveobjects.orange-business.com:1883


Topic to subscribe
QoS
Subscribe

Topic to subscribe: fifo/testFifo

QoS: 0 - Almost Once

```
{"streamId":"android3573290731200
59PRIMARY","timestamp":"2019-06-
25T08:36:16.217Z","location":{"lat":4
8.80121,"lon":2.29413},"model":"de
mo","value":{"CO2":499,"doorOpe
n":false,"hygrometry":59,"pressure":
999,"revmin":5333,"temperature":8
3},"tags":["primary"],"extra":{"DT":"T-
system","airport":"gatwick"},"metada
ta":{"source":"urn:lo:nsid:android:35
7329073120059PRIMARY","group":
```

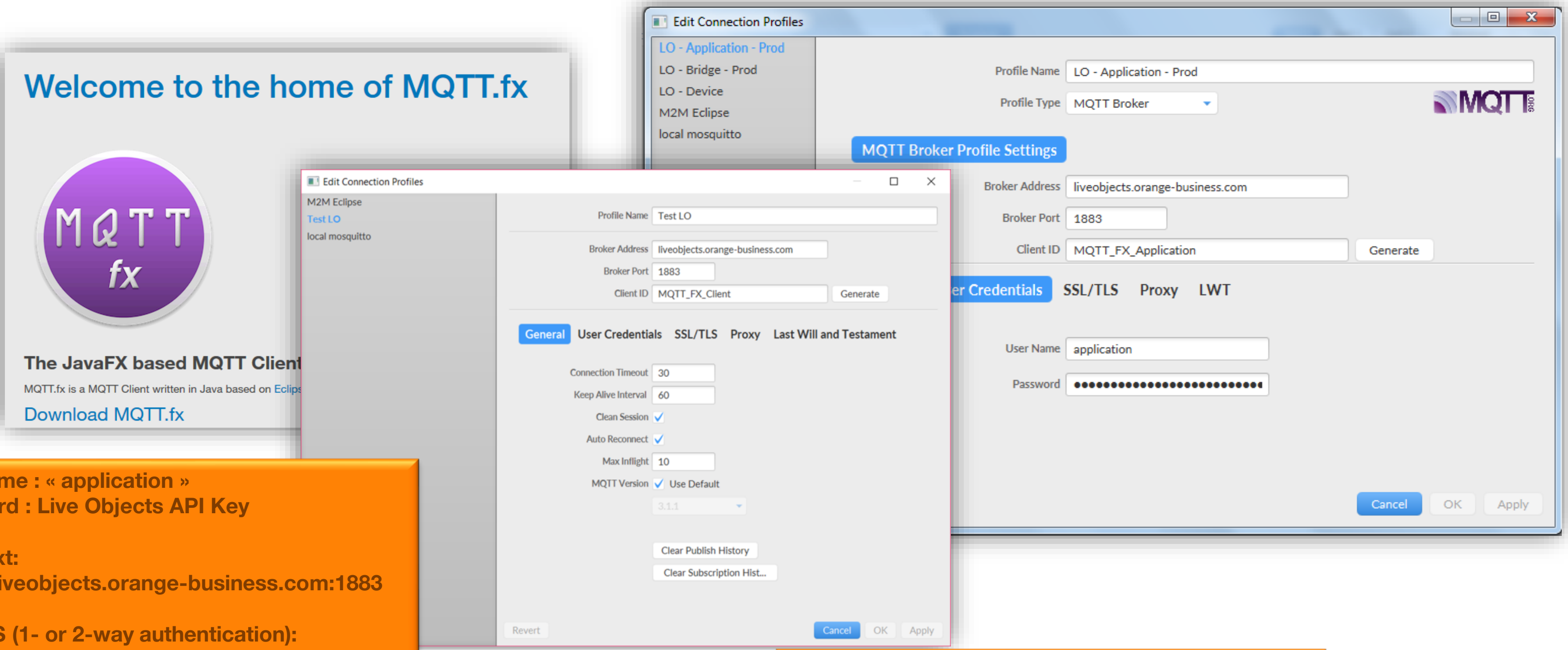

✖ fifo/testFifo

```
{"streamId":"android3573290731200
59PRIMARY","timestamp":"2019-06-
25T08:36:16.217Z","location":{"lat":4
8.80121,"lon":2.29413},"model":"de
mo","value":{"CO2":499,"doorOpe
n":false,"hygrometry":59,"pressure":
999,"revmin":5333,"temperature":8
3},"tags":["primary"],"extra":{"DT":"T-
system","airport":"gatwick"},"metada
ta":{"source":"urn:lo:nsid:android:35
7329073120059PRIMARY","group":
{"id":"rEb7JR","path":"/demo"},"con
nector":"mqtt","network":{"mqtt":{"cl
ientId":"urn:lo:nsid:android:3573290
73120059PRIMARY"}}}}
```

qos : 0, **retain** : false, **cmd** : publish, **dup** : false, **topic** : fifo/testFifo, **messageId** : , **length** : 521, **Raw payload** : 123341151161

MQTT Fx : install/configure a client

tls, HTTP proxy, no websocket, admin install



Welcome to the home of MQTT.fx

The JavaFX based MQTT Client

MQTT.fx is a MQTT Client written in Java based on Eclips

Download MQTT.fx

Edit Connection Profiles

- M2M Eclipse
- Test LO
- local mosquitto

Profile Name: Test LO

Broker Address: liveobjects.orange-business.com

Broker Port: 1883

Client ID: MQTT_FX_Client

General | User Credentials | SSL/TLS | Proxy | Last Will and Testament

Connection Timeout: 30

Keep Alive Interval: 60

Clean Session: ✓

Auto Reconnect: ✓

Max Inflight: 10

MQTT Version: ✓ Use Default

3.1.1

Edit Connection Profiles

- LO - Application - Prod
- LO - Bridge - Prod
- LO - Device
- M2M Eclipse
- local mosquitto

Profile Name: LO - Application - Prod

Profile Type: MQTT Broker

MQTT Broker Profile Settings

Broker Address: liveobjects.orange-business.com

Broker Port: 1883

Client ID: MQTT_FX_Application

er Credentials | SSL/TLS | Proxy | LWT

User Name: application

Password: ••••••••••••••••••••••••••

User name : « application »
Password : Live Objects API Key

Plain text:
MQTT: liveobjects.orange-business.com:1883

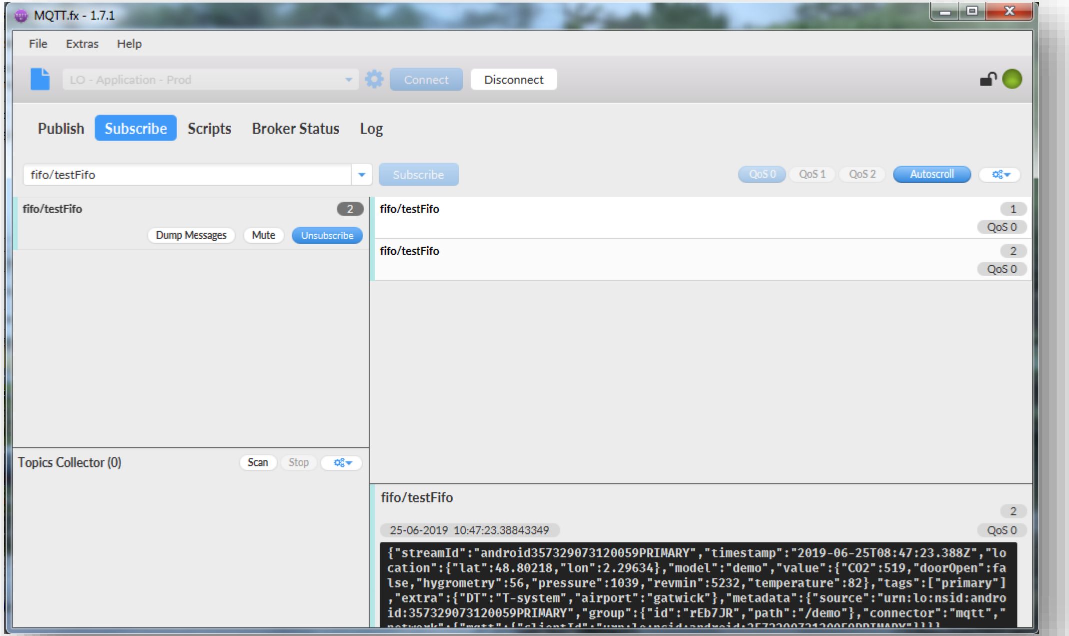
SSL/TLS (1- or 2-way authentication):
MQTTS: liveobjects.orange-business.com:8883

To simulate a device:
User name : « json+device »
Password : Live Objects API Key
Address : mqtt.liveobjects.orange-business.com
Client ID: urn:lo:nsid:<namespace>:<devicename>

MQTT Fx

MQTT Fx : install/configure a client

Subscribe to topics, ex :
Application : « fifo/testFifo »


MQTT.fx - 1.7.1
File
Extras
Help
LO - Application - Prod
Connect
Disconnect
Publish
Subscribe
Scripts
Broker Status
Log
fifo/testFifo
Subscribe
QoS 0
QoS 1
QoS 2
Autoscroll
fifo/testFifo
2
Dump Messages
Mute
Unsubscribe
fifo/testFifo
1
QoS 0
fifo/testFifo
2
QoS 0
Topics Collector (0)
Scan
Stop
fifo/testFifo
2
QoS 0

25-06-2019 10:47:23.38843349

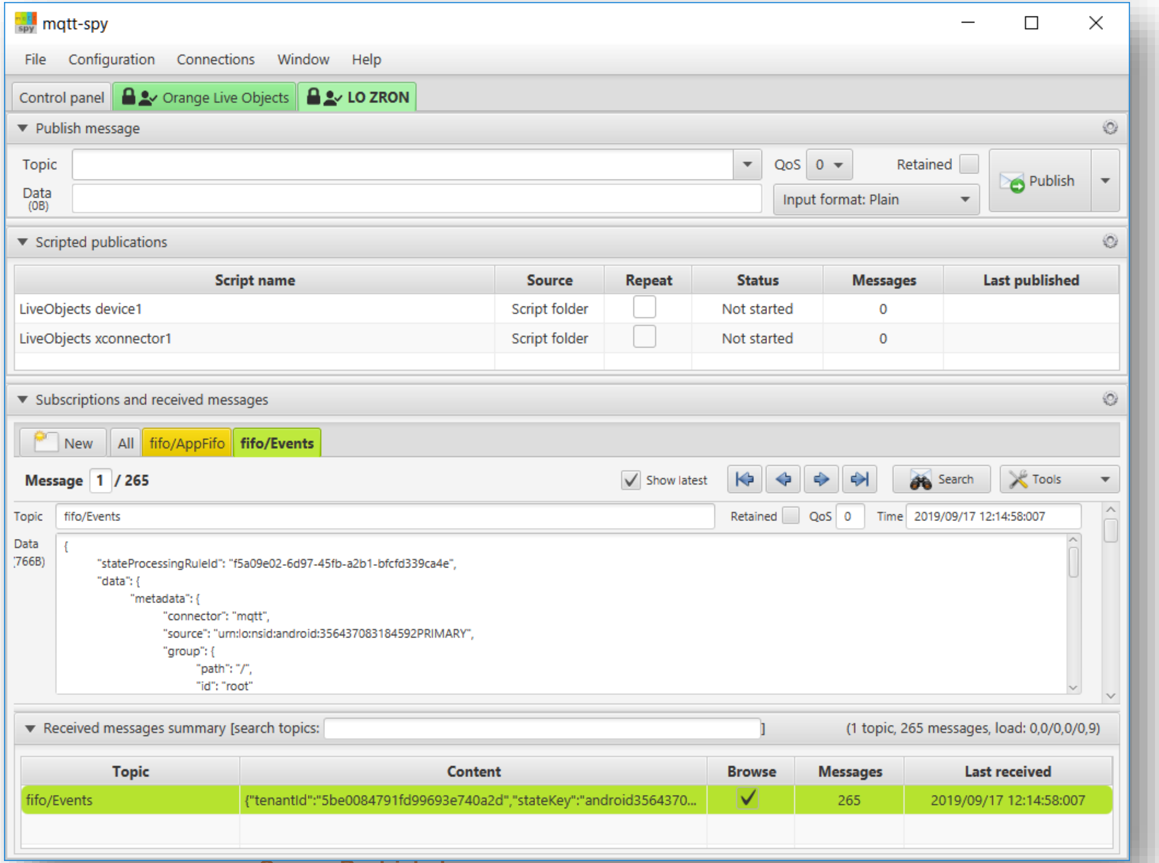
```
{"streamId":"android357329073120059PRIMARY","timestamp":"2019-06-25T08:47:23.388Z","lo
cation":{"lat":48.80218,"lon":2.29634},"model":"demo","value":{"CO2":519,"doorOpen":fa
lse,"hygrometry":56,"pressure":1039,"revmin":5232,"temperature":82},"tags":["primary"]
,"extra":{"DT":"T-system","airport":"gatwick"},"metadata":{"source":"urn:lo:nsid:andro
id:357329073120059PRIMARY","group":{"id":"rEb7JR","path":"/demo"},"connector":"mqtt","
```

MQTT-Spy

mqtt/websocket, tls, portable, no-admin installation, proxy support

Special patched version for portable and proxy support:

https://github.com/olivm-fr/paho.mqtt-spy/releases


mqtt-spy
File
Configuration
Connections
Window
Help
Control panel
Orange Live Objects
LO ZRON
Publish message
Publish
Scripted publications
Subscriptions and received messages
New
All
fifo/AppFifo
fifo/Events
Search
Tools

Topic:

Data (0B):

QoS: 0

Retained: ☐

Input format: Plain

Script name	Source	Repeat	Status	Messages	Last published
LiveObjects device1	Script folder	☐	Not started	0	
LiveObjects xconnector1	Script folder	☐	Not started	0	

Message 1 / 265 ☑ Show latest

Topic: fifo/Events Retained: ☐ QoS: 0 Time: 2019/09/17 12:14:58:007

Data (766B):

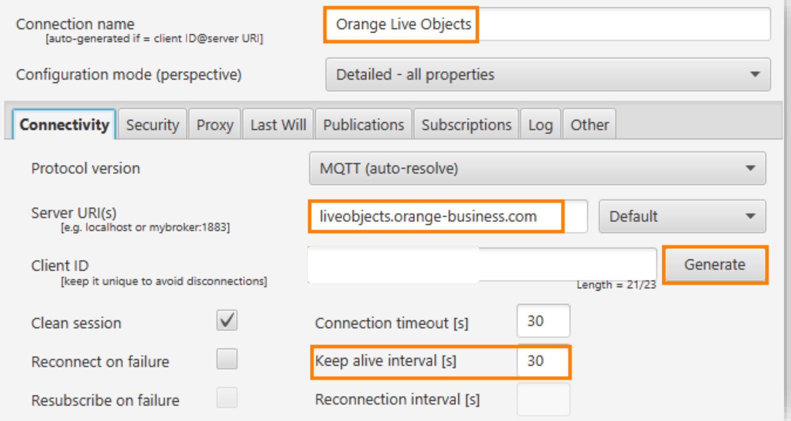
```
{
        "stateProcessingRuleId": "f5a09e02-6d97-45fb-a2b1-bfcfd339ca4e",
        "data": {
                "metadata": {
                        "connector": "mqtt",
                        "source": "urn:lo:nsid:android:356437083184592PRIMARY",
                        "group": {
                                "path": "/",
                                "id": "root"
```

Received messages summary [search topics:] (1 topic, 265 messages, load: 0,0/0,0/0,9)

Topic	Content	Browse	Messages	Last received
fifo/Events	{"tenantId":"5be0084791fd99693e740a2d","stateKey":"android3564370...	✓	265	2019/09/17 12:14:58:007

MQTT-Spy : install/configure a client

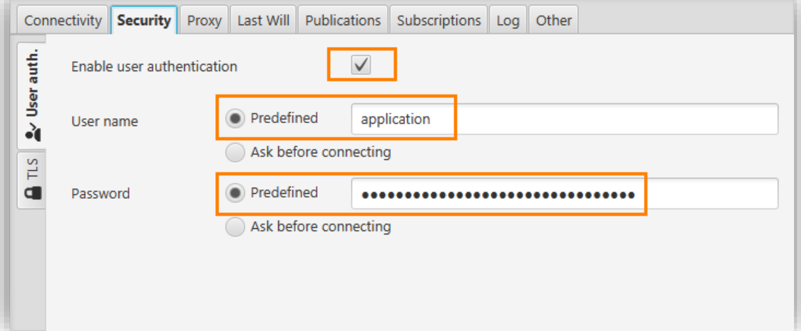
Full guide: https://github.com/olivm-fr/paho.mqtt-spy/raw/master/0-examples/README.docx



Connection name [auto-generated if = client ID@server URI]: Orange Live Objects
Configuration mode (perspective): Detailed - all properties

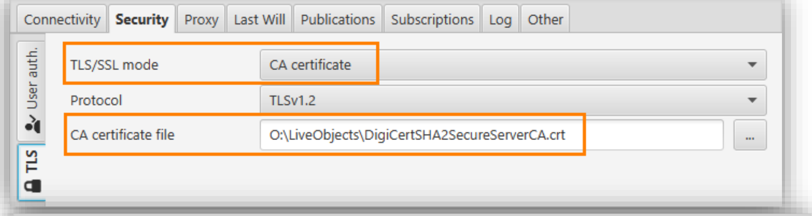
Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other

Protocol version: MQTT (auto-resolve)
Server URI(s) [e.g. localhost or mybroker:1883]: liveobjects.orange-business.com — Default
Client ID [keep it unique to avoid disconnections]: — Generate — Length = 21/23
Clean session: ☑
Connection timeout [s]: 30
Reconnect on failure: ☐
Keep alive interval [s]: 30
Resubscribe on failure: ☐
Reconnection interval [s]:



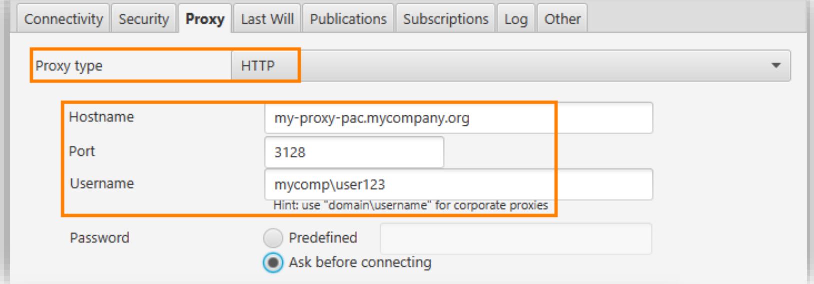
Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other
User auth.
TLS

Enable user authentication: ☑
User name: ● Predefined application
○ Ask before connecting
Password: ● Predefined ••••••••••••••••••••••••••••••••
○ Ask before connecting



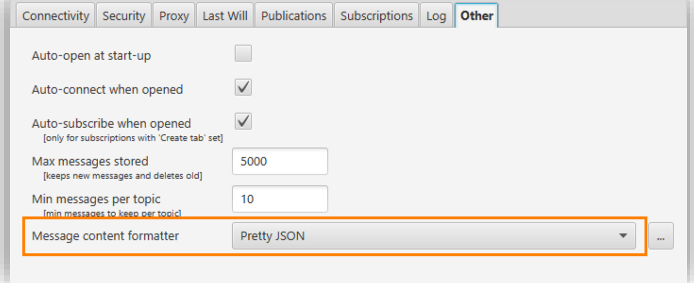
Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other
User auth.
TLS
...

TLS/SSL mode: CA certificate
Protocol: TLSv1.2
CA certificate file: O:\LiveObjects\DigiCertSHA2SecureServerCA.crt



Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other

Proxy type: HTTP
Hostname: my-proxy-pac.mycompany.org
Port: 3128
Username: mycomp\user123
Hint: use "domain\username" for corporate proxies
Password: ○ Predefined
● Ask before connecting

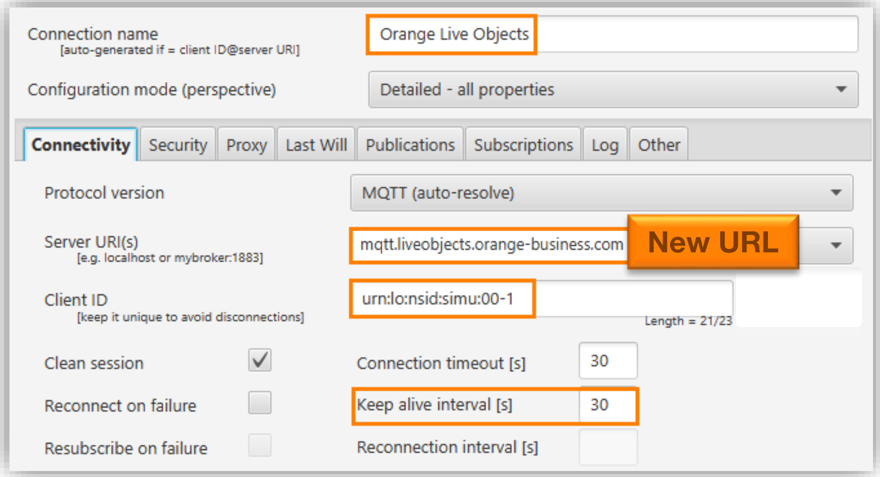


Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other
...

Auto-open at start-up: ☐
Auto-connect when opened: ☑
Auto-subscribe when opened [only for subscriptions with 'Create tab' set]: ☑
Max messages stored [keeps new messages and deletes old]: 5000
Min messages per topic [min messages to keep per topic]: 10
Message content formatter: Pretty JSON

MQTT-Spy : install/configure a client as device

Full guide: https://github.com/olivm-fr/paho.mqtt-spy/raw/master/0-examples/README.docx



Connection name [auto-generated if = client ID@server URI]: Orange Live Objects

Configuration mode (perspective): Detailed - all properties

Connectivity
Security
Proxy
Last Will
Publications
Subscriptions
Log
Other

Protocol version: MQTT (auto-resolve)

Server URI(s) [e.g. localhost or mybroker:1883]: mqtt.liveobjects.orange-business.com

New URL

Client ID [keep it unique to avoid disconnections]: urn:lo:nsid:simu:00-1

Length = 21/23

Clean session ☑

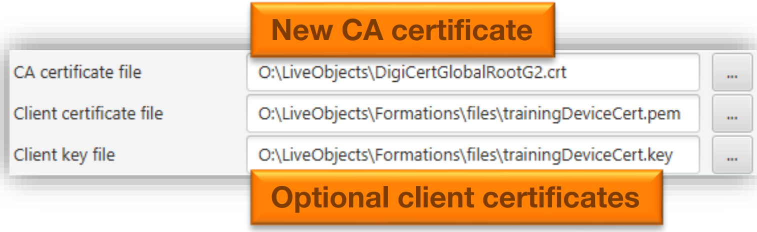
Reconnect on failure ☐

Resubscribe on failure ☐

Connection timeout [s]: 30

Keep alive interval [s]: 30

Reconnection interval [s]:



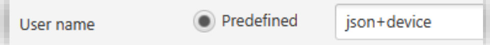
New CA certificate

CA certificate file: O:\LiveObjects\DigiCertGlobalRootG2.crt

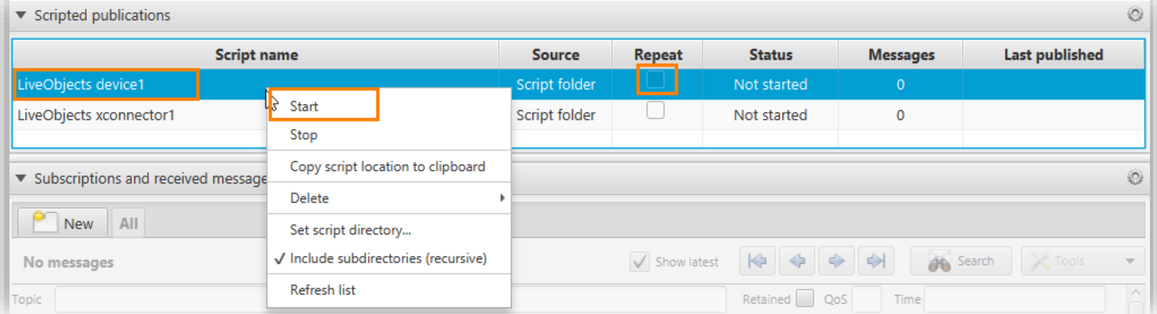
Client certificate file: O:\LiveObjects\Formations\files\trainingDeviceCert.pem

Client key file: O:\LiveObjects\Formations\files\trainingDeviceCert.key

Optional client certificates



User name ● Predefined json+device



Scripted publications

Script name	Source	Repeat	Status	Messages	Last published
LiveObjects device1	Script folder	☐	Not started	0	
LiveObjects xconnector1	Script folder	☐	Not started	0	

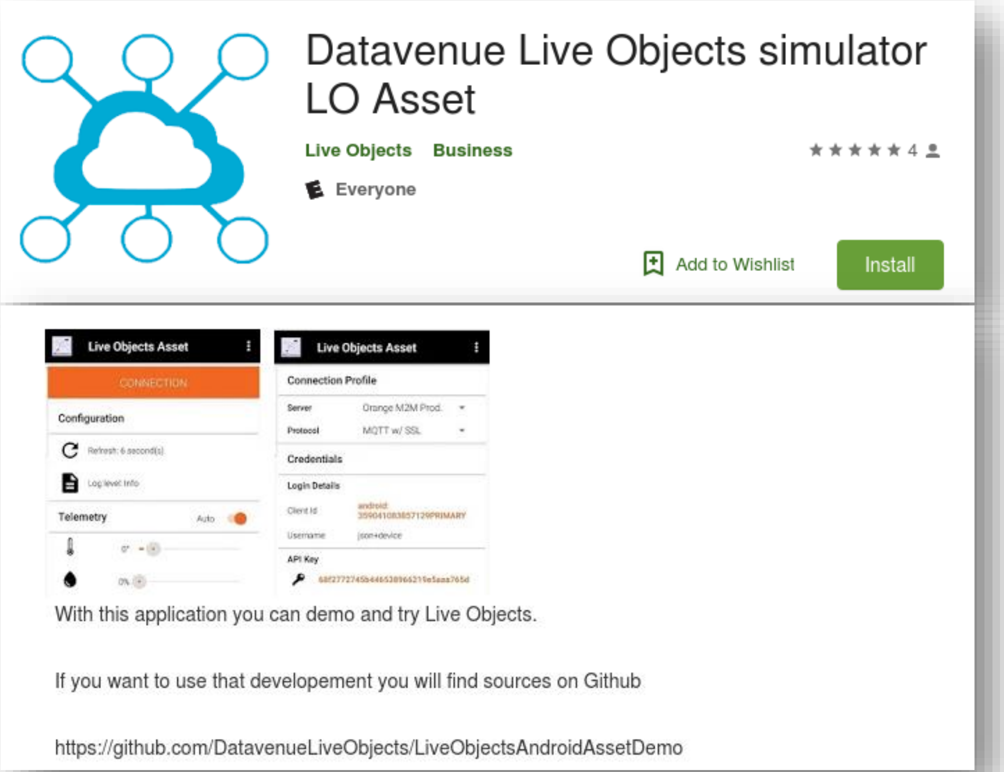
Start
Stop
Copy script location to clipboard
Delete
Set script directory...
✓ Include subdirectories (recursive)
Refresh list
Subscriptions and received message
New
All
No messages
Show latest
Search
Tools
Topic
Retained
QoS
Time

#4.5

simulating a device

Simulator

Android simulator



Datavenue Live Objects simulator LO Asset

Live Objects Business

Everyone

★★★★★ 4
Add to Wishlist
Install
Live Objects Asset
CONNECTION
Configuration
Refresh: 6 second(s)
Log level: Info
Telemetry
Auto
0°
0%
Live Objects Asset
Connection Profile
Credentials
Login Details
API Key

Server: Orange M2M Prod.
Protocol: MQTT w/ SSL
Client Id: android:359041083857129PRIMARY
Username: json+device

With this application you can demo and try Live Objects.

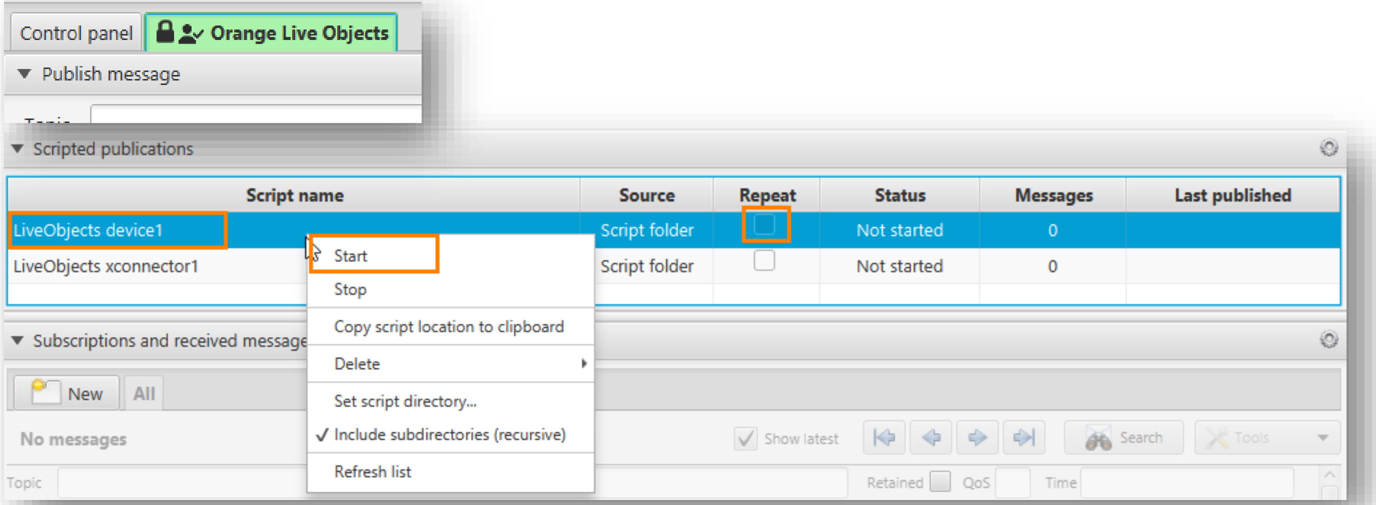
If you want to use that developement you will find sources on Github

https://github.com/DatavenueLiveObjects/LiveObjectsAndroidAssetDemo

https://play.google.com/store/apps/details?id=com.orange.lo.assetdemo

MQTT-Spy simulator

MQTT-device data publishing, external-connector, command-responses



Script name	Source	Repeat	Status	Messages	Last published
LiveObjects device1	Script folder	☐	Not started	0	
LiveObjects xconnector1	Script folder	☐	Not started	0	

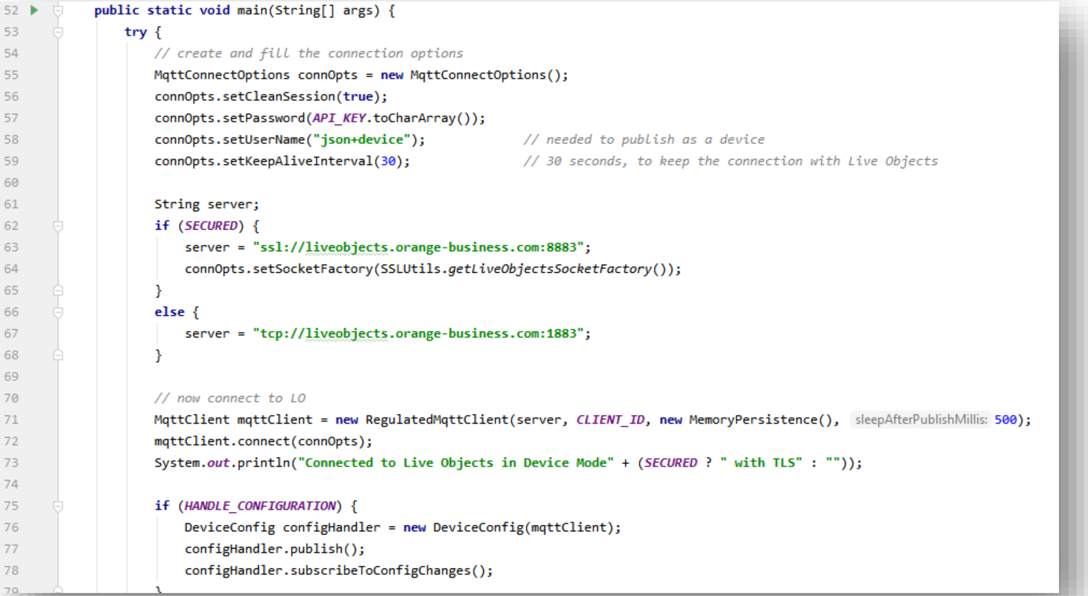
Control panel
Orange Live Objects
Publish message
Topic
Scripted publications
Start
Stop
Copy script location to clipboard
Delete
Set script directory...
✓ Include subdirectories (recursive)
Refresh list
Subscriptions and received message
New
All
No messages
Show latest
Search
Tools
Topic
Retained
QoS
Time

https://github.com/olivm-fr/paho.mqtt-spy/tree/master/0-examples

Simulator

Java device sample

data publishing + commands + parameters + firmware + FiFo



```java
    public static void main(String[] args) {
        try {
            // create and fill the connection options
            MqttConnectOptions connOpts = new MqttConnectOptions();
            connOpts.setCleanSession(true);
            connOpts.setPassword(API_KEY.toCharArray());
            connOpts.setUserName("json+device");             // needed to publish as a device
            connOpts.setKeepAliveInterval(30);               // 30 seconds, to keep the connection with Live Objects

            String server;
            if (SECURED) {
                server = "ssl://liveobjects.orange-business.com:8883";
                connOpts.setSocketFactory(SSLUtils.getLiveObjectsSocketFactory());
            }
            else {
                server = "tcp://liveobjects.orange-business.com:1883";
            }

            // now connect to LO
            MqttClient mqttClient = new RegulatedMqttClient(server, CLIENT_ID, new MemoryPersistence(), sleepAfterPublishMillis: 500);
            mqttClient.connect(connOpts);
            System.out.println("Connected to Live Objects in Device Mode" + (SECURED ? " with TLS" : ""));

            if (HANDLE_CONFIGURATION) {
                DeviceConfig configHandler = new DeviceConfig(mqttClient);
                configHandler.publish();
                configHandler.subscribeToConfigChanges();
            }
```

https://github.com/DatavenueLiveObjects/LiveObjectsMqttDeviceSample

#5

Device Management

#5.1

Device Management Bases

Multi connectivity & device management

1

LoRa

- Command
- Decoder
- Mass import

2

SMS

- Command
- Decoder
- Mass import

3

MQTT

- Command
- Configuration
- FOTA
- Decoder
- Mass import

4

External connector

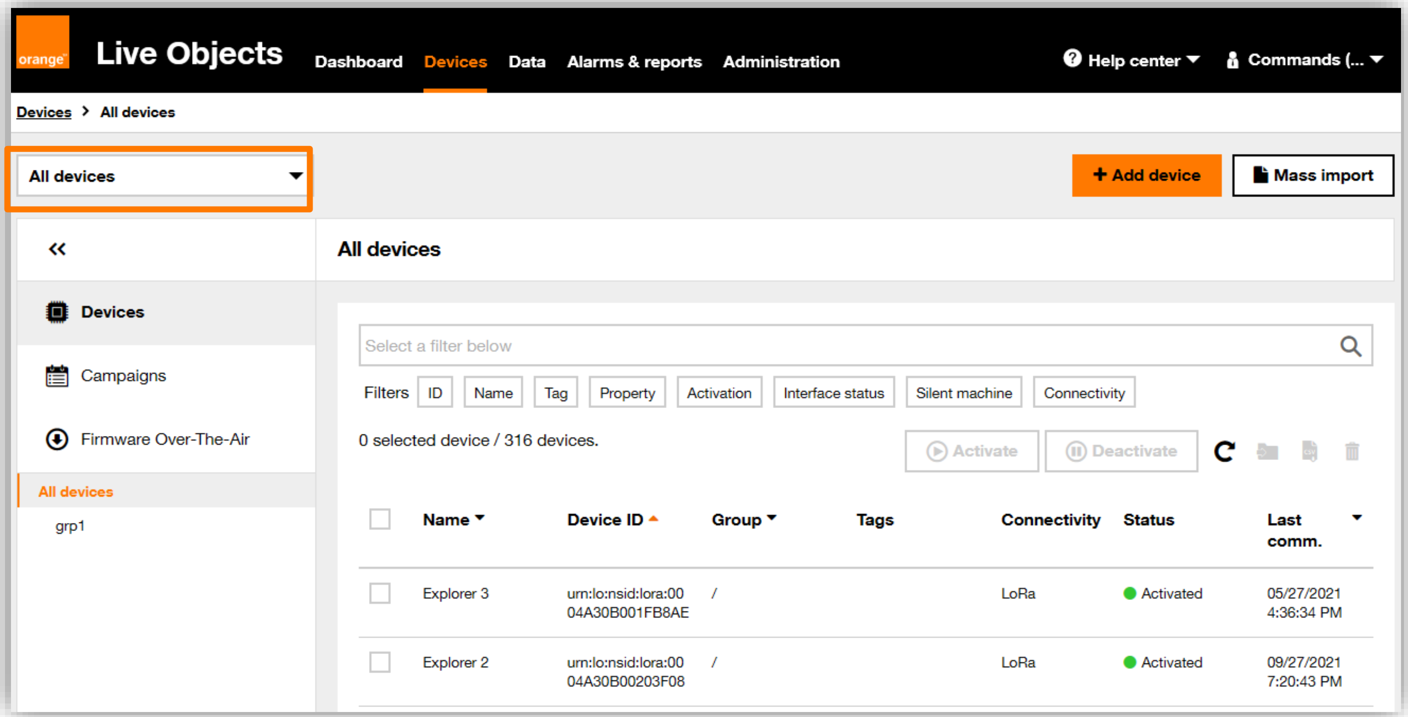
- Command
- Configuration
- FOTA
- Decoder
- Mass import

5

LwM2M

- Read / Write
- Observe / Send
- Command
- FOTA
- Mass import

List the devices (general or specialized view)


orange
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
Commands (...
Devices > All devices
All devices
+ Add device
Mass import
«
Devices
Campaigns
Firmware Over-The-Air
All devices
grp1
Select a filter below
Filters
ID
Name
Tag
Property
Activation
Interface status
Silent machine
Connectivity
Activate
Deactivate

All devices

0 selected device / 316 devices.

☐	Name	Device ID	Group	Tags	Connectivity	Status	Last comm.
☐	Explorer 3	urn:lo:nsid:lora:00 04A30B001FB8AE	/		LoRa	● Activated	05/27/2021 4:36:34 PM
☐	Explorer 2	urn:lo:nsid:lora:00 04A30B00203F08	/		LoRa	● Activated	09/27/2021 7:20:43 PM

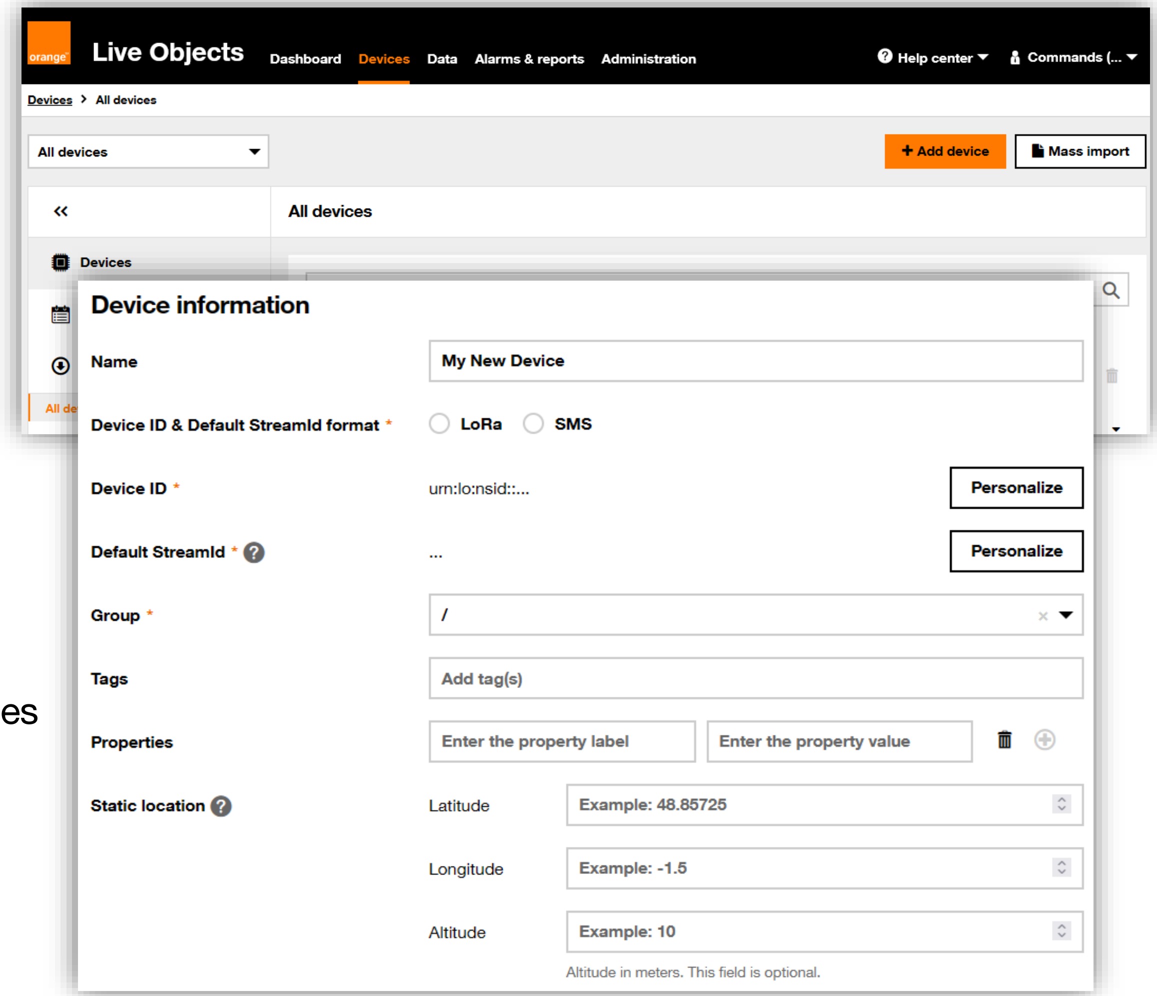
Object provisioning

Unitary provisioning : portal

Common fields:

- Name
- Tags (x10)
- Properties (x10)
- Group
- Static location

- ID & Stream for extended usecases


orange
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
Commands (...
Devices > All devices
All devices
+ Add device
Mass import
«
All devices
Devices
All de
Personalize
Personalize

Device information

Name: My New Device

Device ID & Default StreamId format *: ○ LoRa ○ SMS

Device ID *: urn:lo:nsid::...

Default StreamId * ?: ...

Group *: /

Tags: Add tag(s)

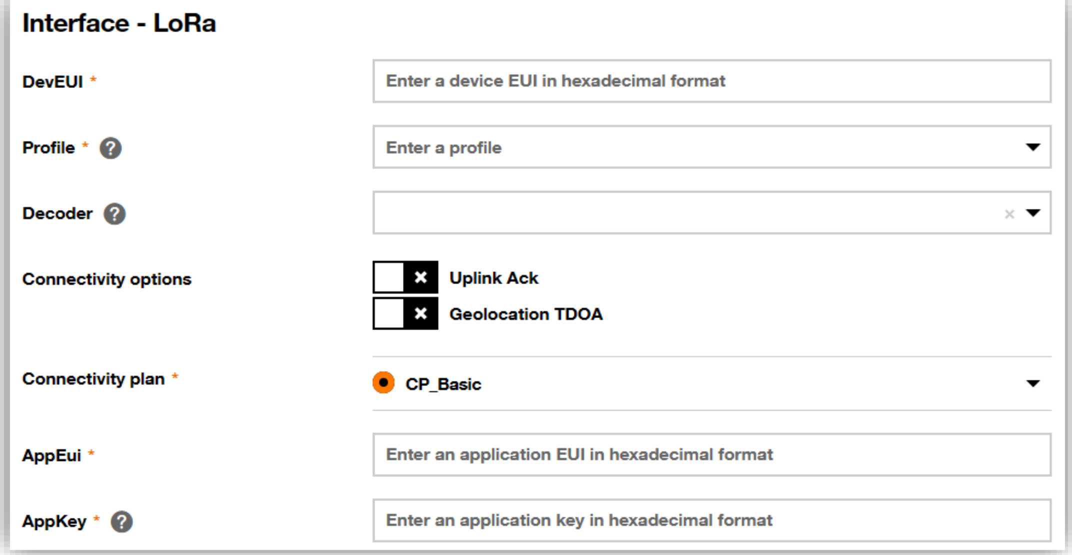
Properties: Enter the property label | Enter the property value

Static location ?
Latitude: Example: 48.85725
Longitude: Example: -1.5
Altitude: Example: 10
Altitude in meters. This field is optional.

LoRa objects provisioning

Specific fields

- DevEUI
- AppEUI / AppKey
- Profile
  - defines : Join SF, class, RX2 SF
  - specific to the manufacturer if available
  - otherwise : Generic_classA_RX2SF12
- Decoder
  - specific to the model if available
  - can be created on-demand
  - otherwise : can stay blank
- Connectivity options / plan :
  - defines : sf min/max, nbTransmissions min/max, ackUL, tdoa
  - depending on the commercial offer



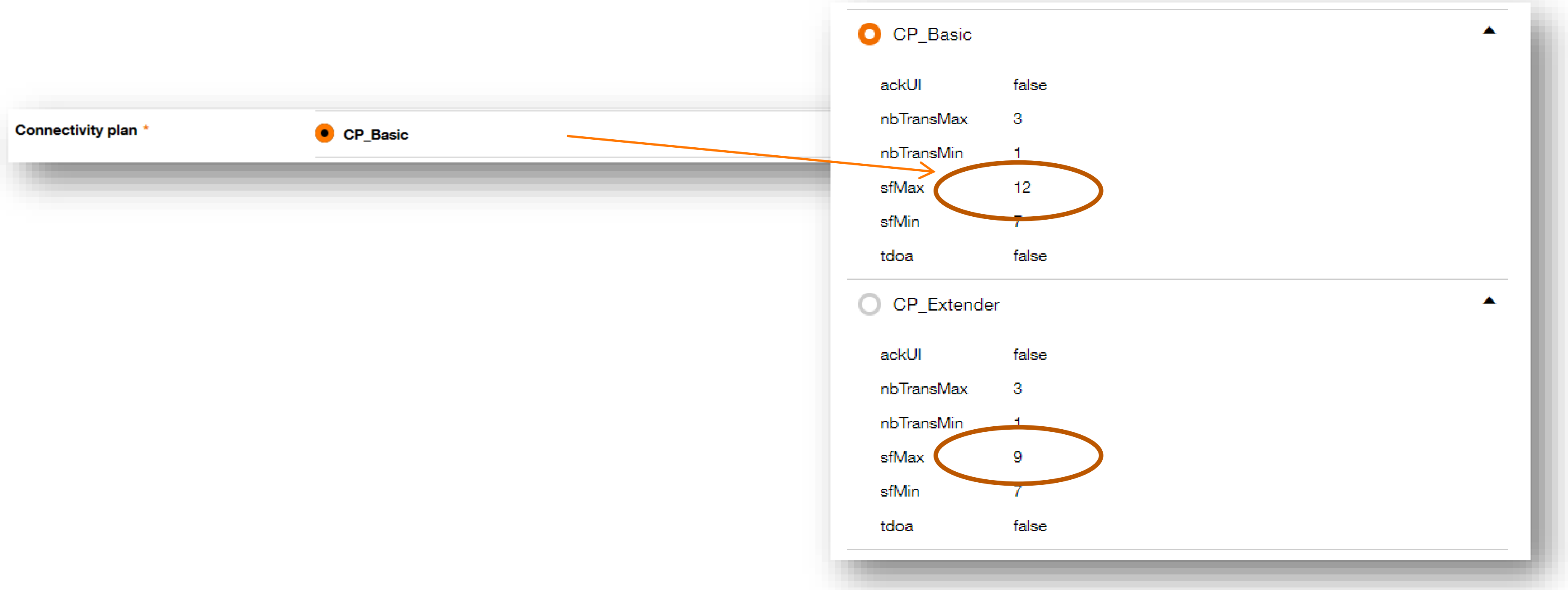
Interface - LoRa

DevEUI *	Enter a device EUI in hexadecimal format
Profile *	Enter a profile
Decoder	
Connectivity options	☒ Uplink Ack ☒ Geolocation TDOA
Connectivity plan *	● CP_Basic
AppEui *	Enter an application EUI in hexadecimal format
AppKey *	Enter an application key in hexadecimal format

LoRa specific parameters

DevEui	Unique and permanent identifier of each sensor (MAC equivalent Address). This number is assigned to the LoRa sensor by its manufacturer in a slot managed and awarded by the IEEE. The DevEUI is stored in the sensor.
AppEui	Identifier of the embedded application in the sensor. The exact use of this parameter can still evolve in the next versions of the LoRaWAN standard. The AppEUI is stored in the sensor at the time of its manufacturing (by default) or later, at the time of its personalization.
AppKey	Unique secret key stored in each sensor and shared with LoRa network. This 128-bit key is the primary encryption key that is used to create other NwkSKey and AppSKey session keys.

Connectivity plan for LoRa



Connectivity plan *

● CP_Basic

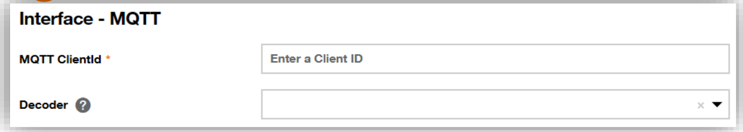
● CP_Basic

ackUl	false
nbTransMax	3
nbTransMin	1
sfMax	12
sfMin	7
tdoa	false

○ CP_Extender

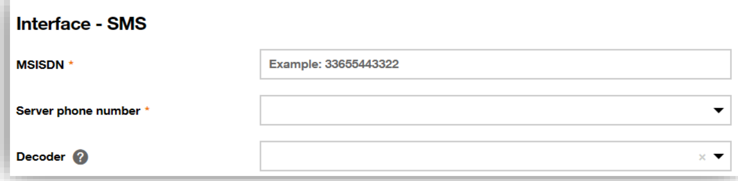
ackUl	false
nbTransMax	3
nbTransMin	1
sfMax	9
sfMin	7
tdoa	false

MQTT / SMS / LwM2M objects provisioning



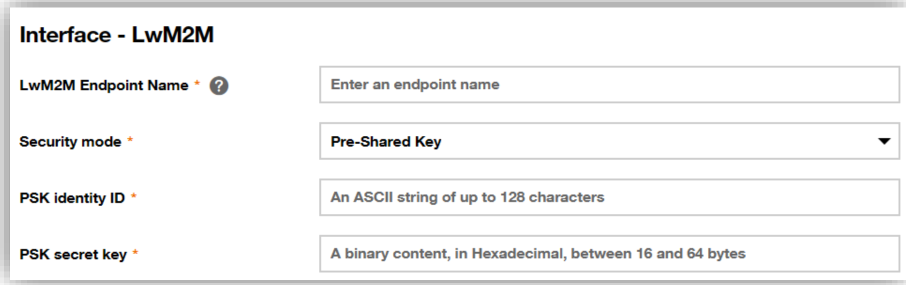
Interface - MQTT

MQTT ClientId *	Enter a Client ID
Decoder ?	



Interface - SMS

MSISDN *	Example: 33655443322
Server phone number *	
Decoder ?	



Interface - LwM2M

LwM2M Endpoint Name * ?	Enter an endpoint name
Security mode *	Pre-Shared Key
PSK identity ID *	An ASCII string of up to 128 characters
PSK secret key *	A binary content, in Hexadecimal, between 16 and 64 bytes

MQTT (auto-provisionning is possible) :

- NameSpace + ID
- Optional decoder (static binary messages)

SMS :

- SIM-card phone number (without “+” sign)
- Server phone number (contract-dependant)
- Decoder

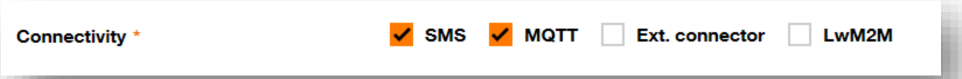
LwM2M :

- Endpoint name (coherent with device)
- Security keys

Multi-connectivity

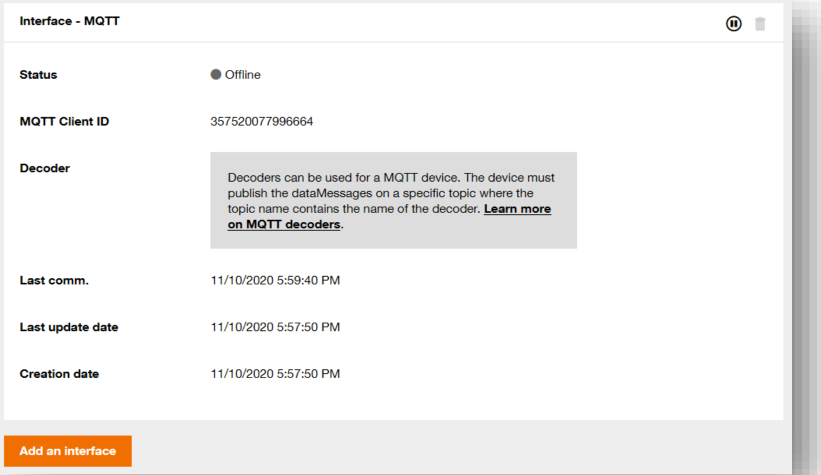
Benefits for single device management (alarms, …)

You manage devices and not protocols



Connectivity *

☑ SMS ☑ MQTT ☐ Ext. connector ☐ LwM2M



Status ● Offline

MQTT Client ID 357520077996664

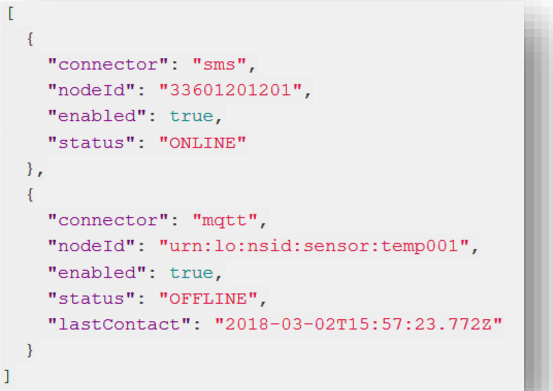
Decoder

Decoders can be used for a MQTT device. The device must publish the dataMessages on a specific topic where the topic name contains the name of the decoder. **Learn more on MQTT decoders**.

Last comm. 11/10/2020 5:59:40 PM

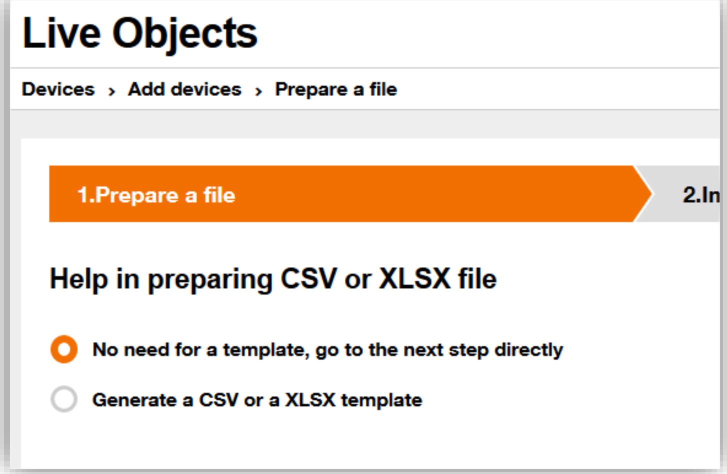
Last update date 11/10/2020 5:57:50 PM

Creation date 11/10/2020 5:57:50 PM



```
[
  {
    "connector": "sms",
    "nodeId": "33601201201",
    "enabled": true,
    "status": "ONLINE"
  },
  {
    "connector": "mqtt",
    "nodeId": "urn:lo:nsid:sensor:temp001",
    "enabled": true,
    "status": "OFFLINE",
    "lastContact": "2018-03-02T15:57:23.772Z"
  }
]
```

Device import
(SMS, LoRa, MQTT, Ext-Connector, LwM2M, multi-connectivity)



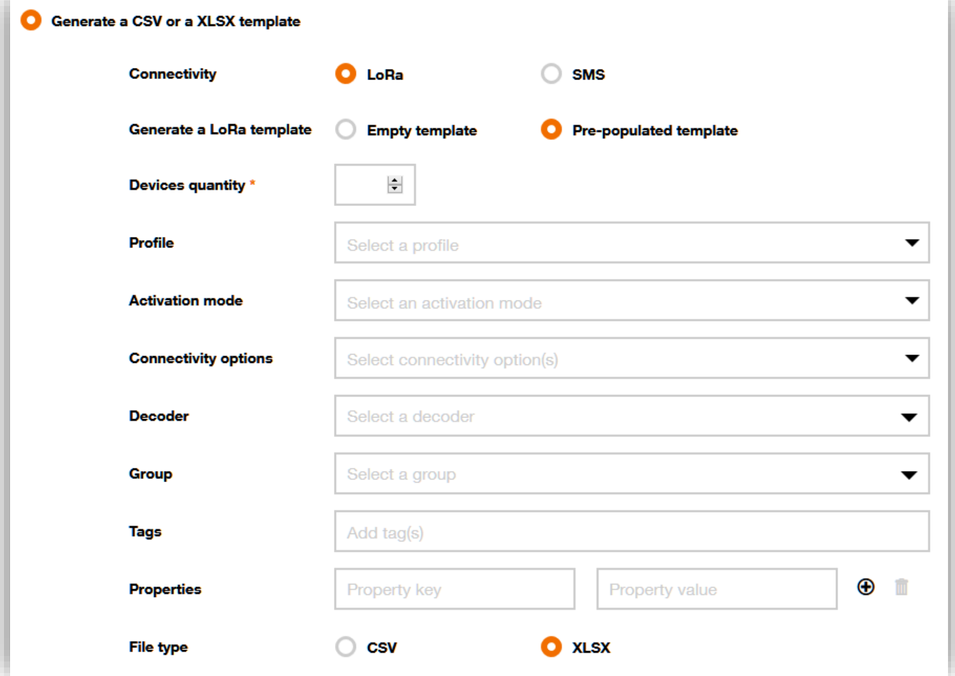
Live Objects

Devices › Add devices › Prepare a file

Help in preparing CSV or XLSX file

● No need for a template, go to the next step directly

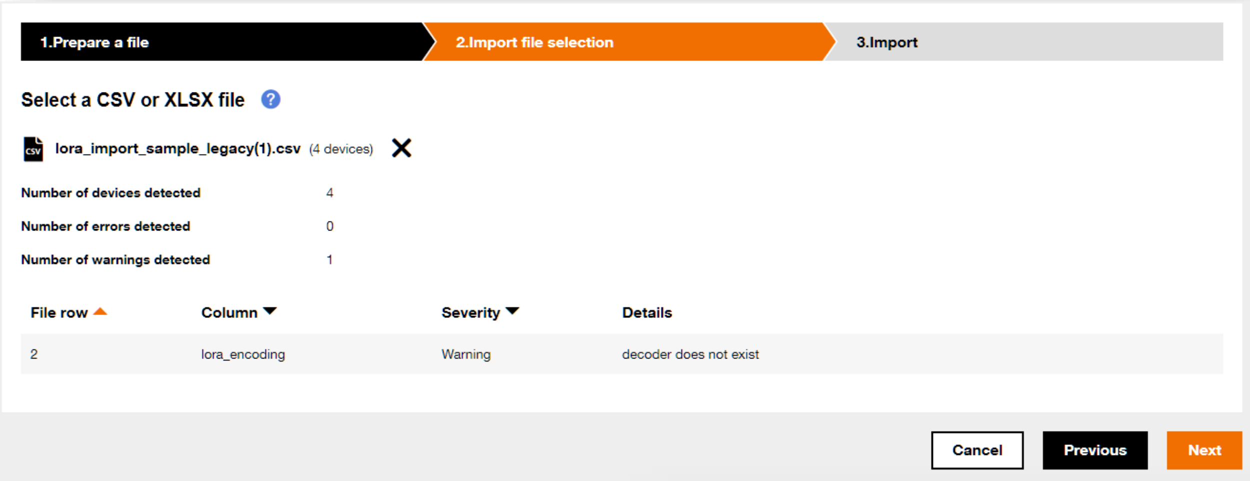
○ Generate a CSV or a XLSX template



● Generate a CSV or a XLSX template

Connectivity	● LoRa	○ SMS
Generate a LoRa template	○ Empty template	● Pre-populated template
Devices quantity *		
Profile	Select a profile	
Activation mode	Select an activation mode	
Connectivity options	Select connectivity option(s)	
Decoder	Select a decoder	
Group	Select a group	
Tags	Add tag(s)	
Properties	Property key	Property value
File type	○ CSV	● XLSX

Device import

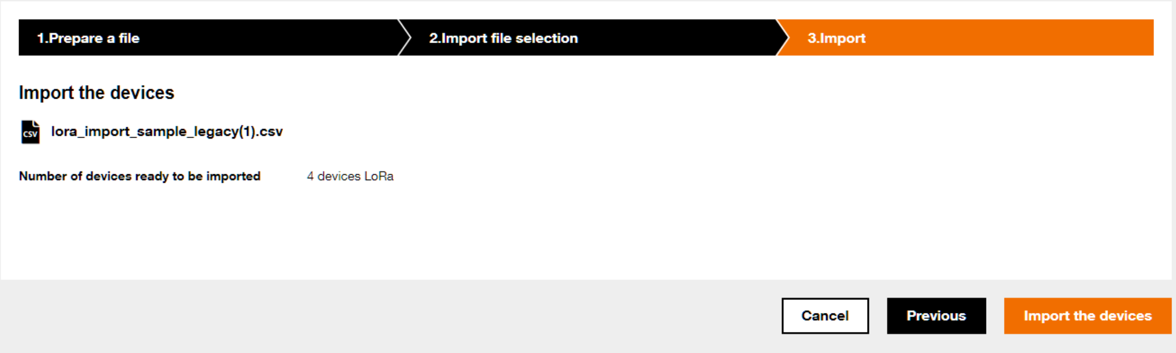

1.Prepare a file
2.Import file selection
3.Import
Cancel
Previous
Next

Select a CSV or XLSX file

lora_import_sample_legacy(1).csv (4 devices)

Number of devices detected	4
Number of errors detected	0
Number of warnings detected	1

File row ▲	Column ▼	Severity ▼	Details
2	lora_encoding	Warning	decoder does not exist


1.Prepare a file
2.Import file selection
3.Import
Cancel
Previous
Import the devices

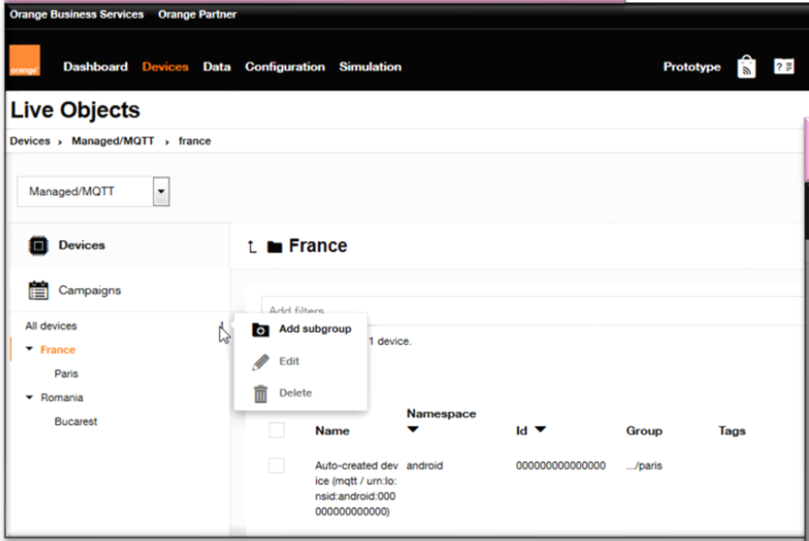
Import the devices

lora_import_sample_legacy(1).csv

Number of devices ready to be imported 4 devices LoRa

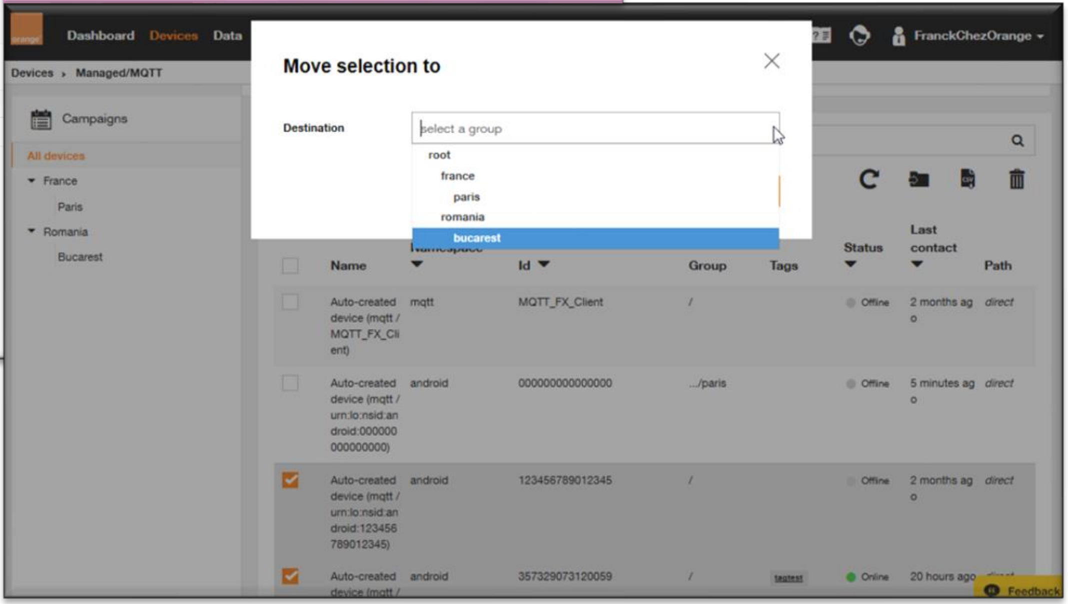
Manage a device hierarchy

Create new groups into the tree


Orange Business Services
Orange Partner
EN
Dashboard
Devices
Data
Configuration
Simulation
Prototype
FranckChezOrange
Live Objects
Devices › Managed/MQTT › france
Managed/MQTT
Devices
Campaigns
All devices
France
Paris
Romania
Bucarest
France
Add filters
Add subgroup
Edit
Delete
1 device.

☐	Name	Namespace	Id	Group	Tags
☐	Auto-created device (mqtt / urn:lo:nsid:android:000000000000000)	android	000000000000000	.../paris	

Move devices into the tree


Dashboard
Devices
Data
FranckChezOrange
Devices › Managed/MQTT
Campaigns
All devices
France
Paris
Romania
Bucarest
Feedback

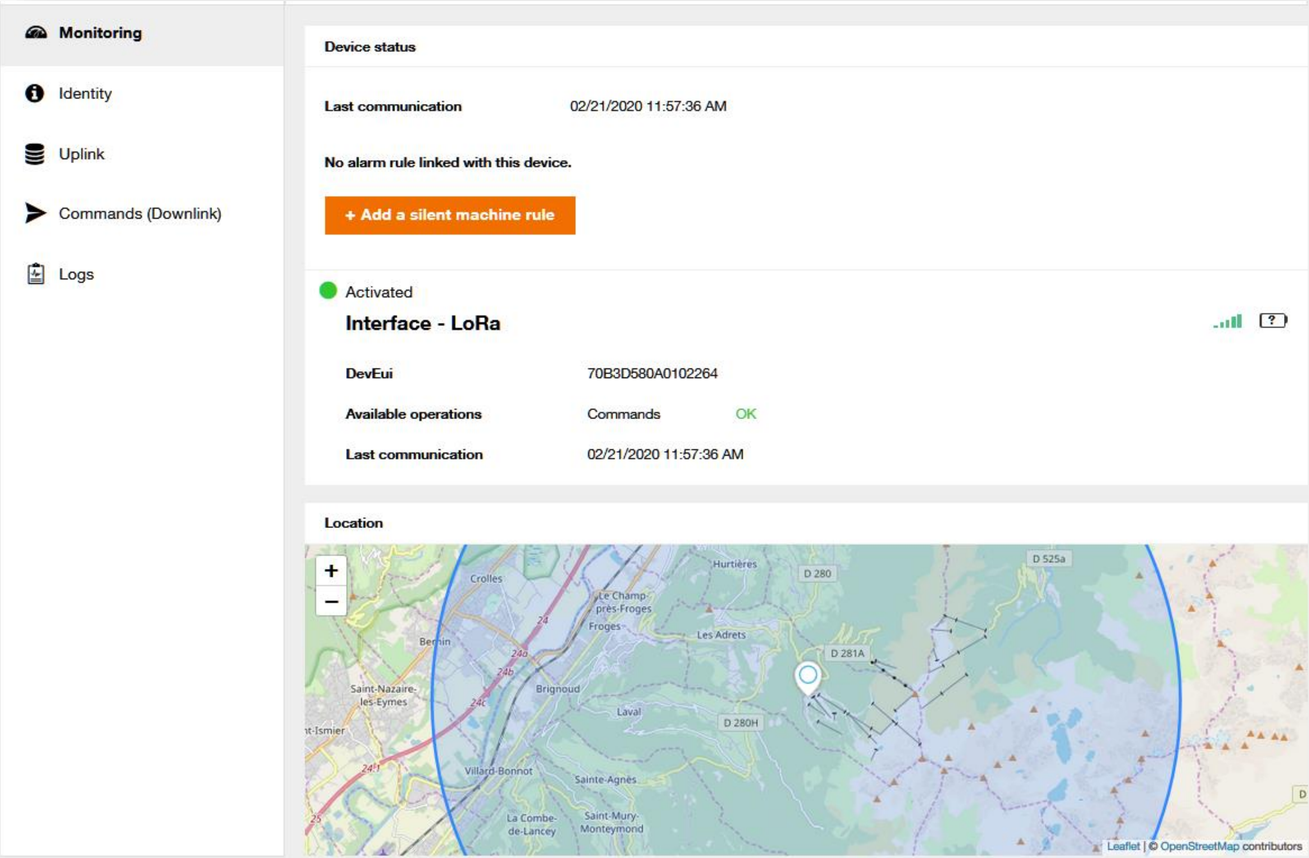
Move selection to

Destination: select a group

- root
  - france
    - paris
  - romania
    - bucarest

☐	Name	Namespace	Id	Group	Tags	Status	Last contact	Path
☐	Auto-created device (mqtt / MQTT_FX_Client)	mqtt	MQTT_FX_Client	/		Offline	2 months ago	direct
☐	Auto-created device (mqtt / urn:lo:nsid:android:000000000000000)	android	000000000000000	.../paris		Offline	5 minutes ago	direct
☑	Auto-created device (mqtt / urn:lo:nsid:android:123456789012345)	android	123456789012345	/		Offline	2 months ago	direct
☑	Auto-created device (mqtt /	android	357329073120059	/	tagtest	Online	20 hours ago	

Check the current state



Monitoring
Identity
Uplink
Commands (Downlink)
Logs

Device status

Last communication 02/21/2020 11:57:36 AM

No alarm rule linked with this device.

+ Add a silent machine rule

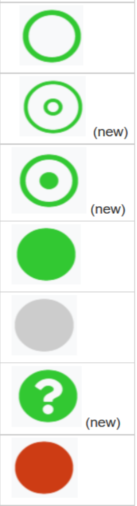
● Activated

Interface - LoRa

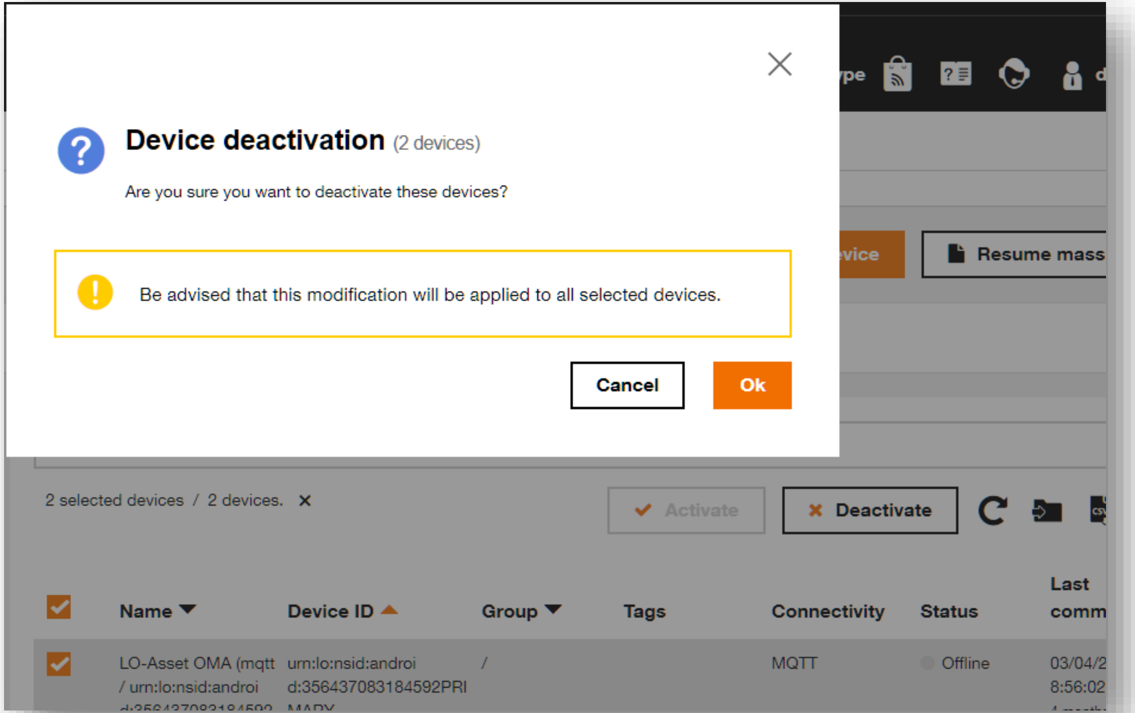
DevEui	70B3D580A0102264	
Available operations	Commands	OK
Last communication	02/21/2020 11:57:36 AM	

Location

+
−
Crolles
Hurtières
D 280
D 525a
Le Champ-près-Froges
Froges
Les Adrets
Bernin
D 281A
Saint-Nazaire-les-Eymes
Brignoud
Laval
D 280H
Villard-Bonnot
Sainte-Agnès
La Combe-de-Lancey
Saint-Mury-Monteymond
Leaflet | © OpenStreetMap contributors



Activate / deactivate a device



Device deactivation (2 devices)

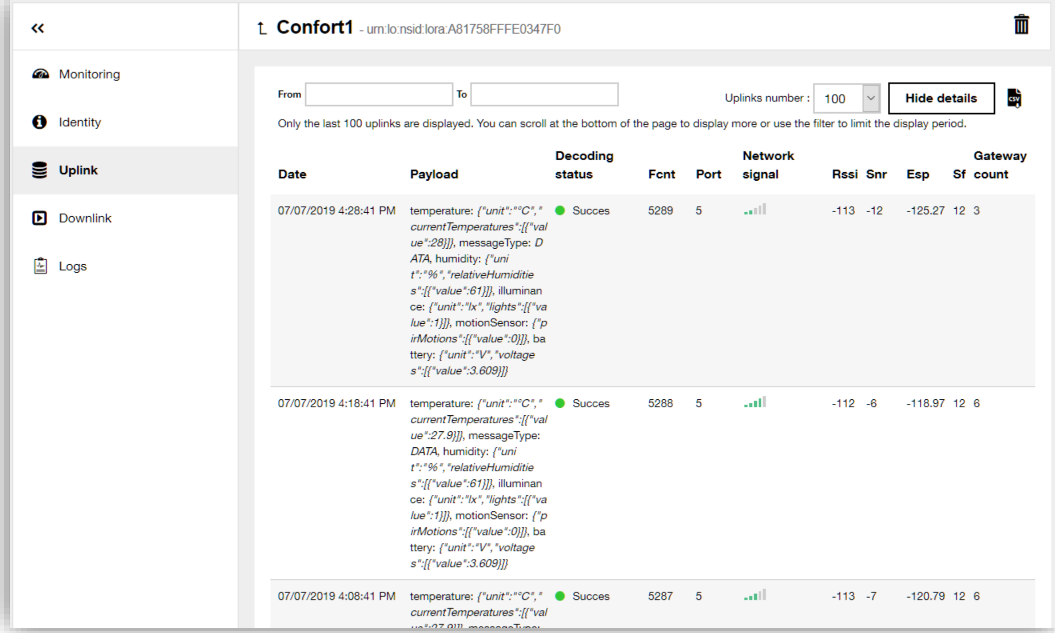
Are you sure you want to deactivate these devices?

Be advised that this modification will be applied to all selected devices.

2 selected devices / 2 devices. ✕

☑	Name	Device ID	Group	Tags	Connectivity	Status	Last comm
☑	LO-Asset OMA (mqtt / urn:lo:nsid:androi	urn:lo:nsid:androi d:356437083184592PRI	/		MQTT	Offline	03/04/2 8:56:02

LoRa: Test the data upload, live

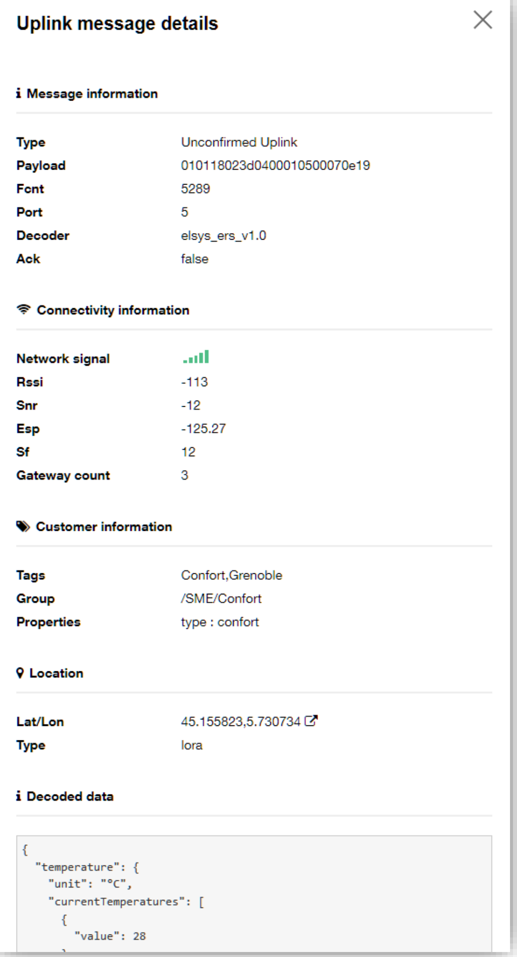


Confort1 - urn:lo:nsid:lora:A81758FFFE0347F0

From To Uplinks number : 100 Hide details

Only the last 100 uplinks are displayed. You can scroll at the bottom of the page to display more or use the filter to limit the display period.

Date	Payload	Decoding status	Fcnt	Port	Network signal	Rssi	Snr	Esp	Sf	Gateway count
07/07/2019 4:28:41 PM	temperature: *{"unit":"°C","currentTemperatures":[{"value":28}]}*, messageType: *DATA*, humidity: *{"unit":"%","relativeHumidities":[{"value":61}]}*, illuminance: *{"unit":"lx","lights":[{"value":1}]}*, motionSensor: *{"pirMotions":[{"value":0}]}*, battery: *{"unit":"V","voltages":[{"value":3.609}]}*	● Succes	5289	5	📶	-113	-12	-125.27	12	3
07/07/2019 4:18:41 PM	temperature: *{"unit":"°C","currentTemperatures":[{"value":27.9}]}*, messageType: *DATA*, humidity: *{"unit":"%","relativeHumidities":[{"value":61}]}*, illuminance: *{"unit":"lx","lights":[{"value":1}]}*, motionSensor: *{"pirMotions":[{"value":0}]}*, battery: *{"unit":"V","voltages":[{"value":3.609}]}*	● Succes	5288	5	📶	-112	-6	-118.97	12	6
07/07/2019 4:08:41 PM	temperature: *{"unit":"°C","currentTemperatures":[{"val*	● Succes	5287	5	📶	-113	-7	-120.79	12	6



Uplink message details

Message information

Type	Unconfirmed Uplink
Payload	010118023d0400010500070e19
Fcnt	5289
Port	5
Decoder	elsys_ers_v1.0
Ack	false

Connectivity information

Network signal	📶
Rssi	-113
Snr	-12
Esp	-125.27
Sf	12
Gateway count	3

Customer information

Tags	Confort,Grenoble
Group	/SME/Confort
Properties	type : confort

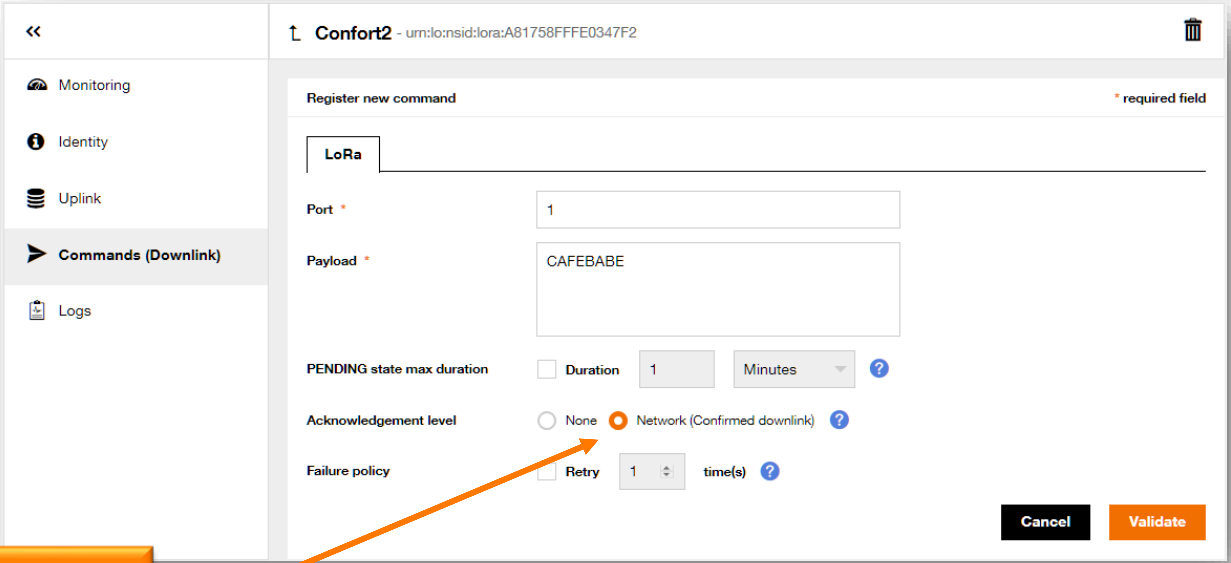
Location

Lat/Lon	45.155823,5.730734
Type	lora

Decoded data

```
{
  "temperature": {
    "unit": "°C",
    "currentTemperatures": [
      {
        "value": 28
```

LoRa: Send a business order / remote configuration


«
Monitoring
Identity
Uplink
Commands (Downlink)
Logs
Cancel
Validate

Confort2 - urn:lo:nsid:lora:A81758FFFE0347F2

Register new command * required field

LoRa

Port * 1

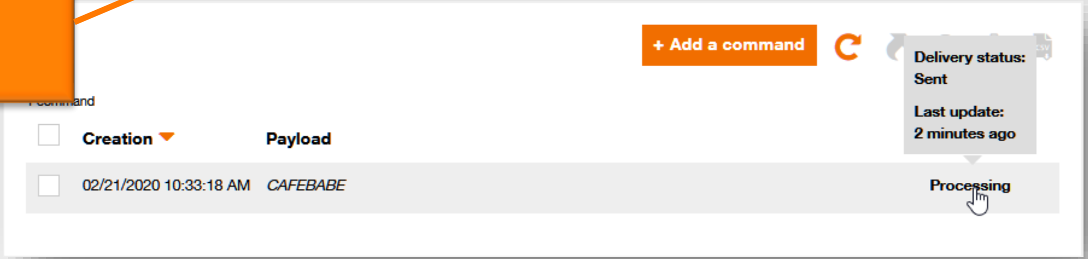
Payload * CAFEBABE

PENDING state max duration ☐ Duration 1 Minutes

Acknowledgement level ○ None ● Network (Confirmed downlink)

Failure policy ☐ Retry 1 time(s)

Confirmation by the device using the standard LoRaWan protocol


+ Add a command

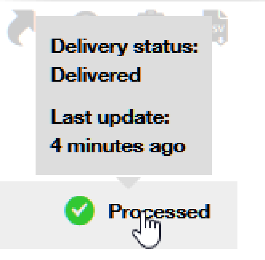
☐	Creation	Payload	
☐	02/21/2020 10:33:18 AM	*CAFEBABE*	Processing

Delivery status: Sent

Last update: 2 minutes ago

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs

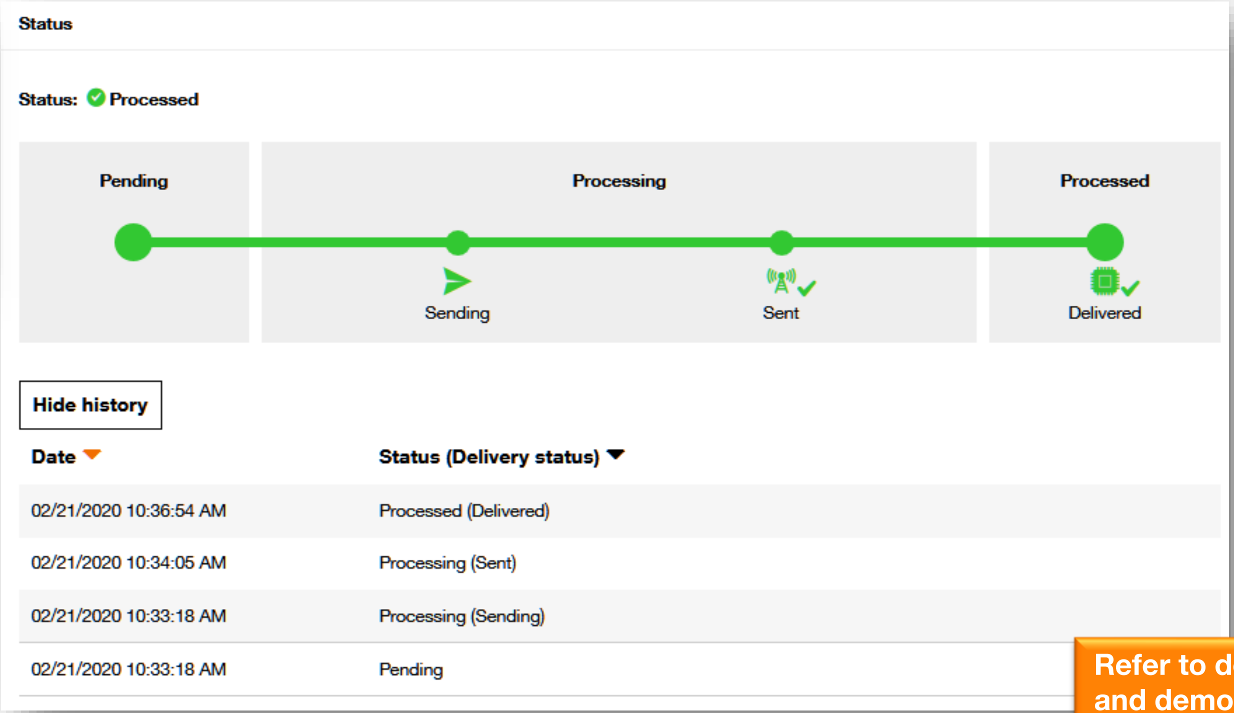
LoRa: Send a business order / remote configuration, result



Delivery status: Delivered

Last update: 4 minutes ago

✓ Processed



Status

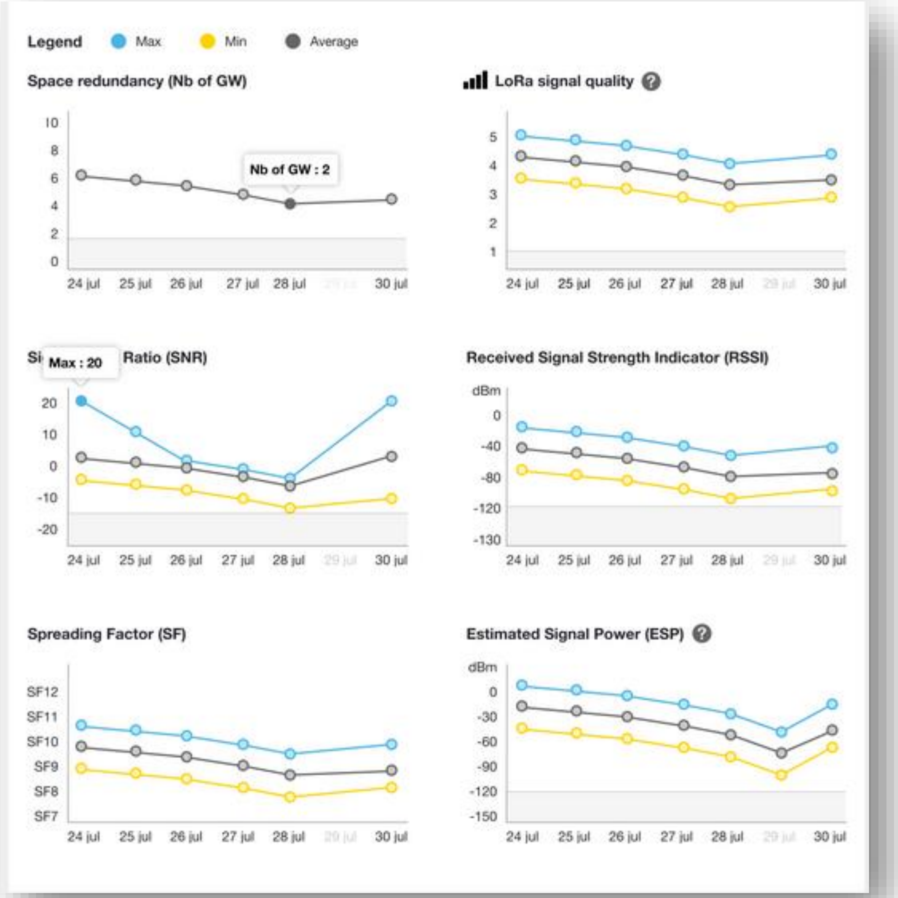
Status: ✓ **Processed**

Pending
Processing
Processed
Sending
Sent
Delivered
Hide history

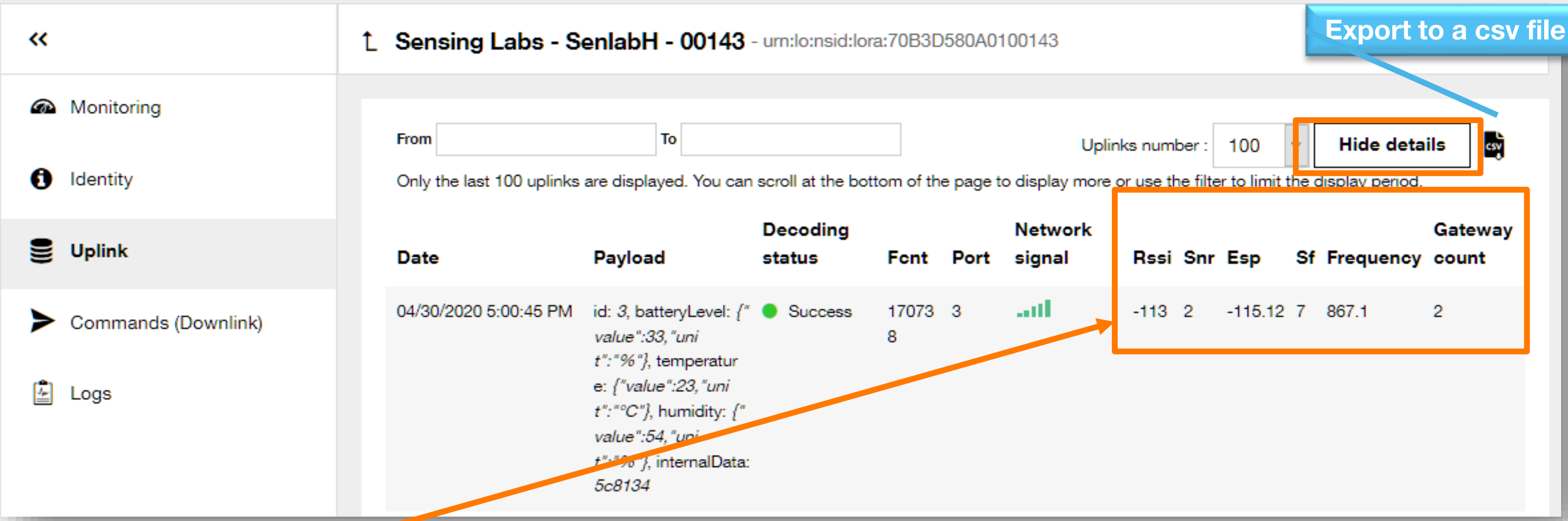
Date	Status (Delivery status)
02/21/2020 10:36:54 AM	Processed (Delivered)
02/21/2020 10:34:05 AM	Processing (Sent)
02/21/2020 10:33:18 AM	Processing (Sending)
02/21/2020 10:33:18 AM	Pending

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs

LoRa: Network performance



LoRa: Network performance



Export to a csv file

Sensing Labs - SenlabH - 00143 - urn:lo:nsid:lora:70B3D580A0100143

From ______ To ______ Uplinks number : 100

Only the last 100 uplinks are displayed. You can scroll at the bottom of the page to display more or use the filter to limit the display period.

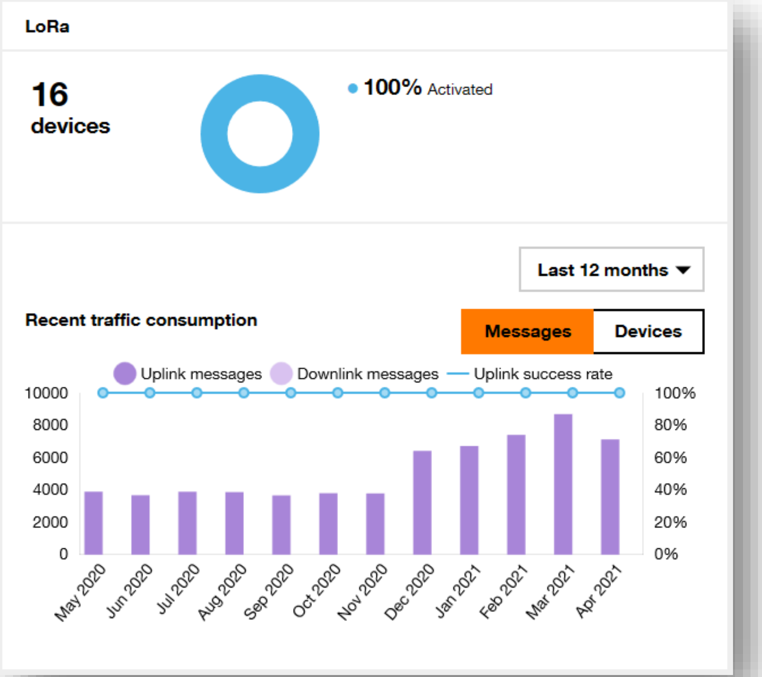
Date	Payload	Decoding status	Fcnt	Port	Network signal	Rssi	Snr	Esp	Sf	Frequency	Gateway count
04/30/2020 5:00:45 PM	id: 3, batteryLevel: {"value":33,"unit":"%"}, temperature: {"value":23,"unit":"°C"}, humidity: {"value":54,"unit":"%"}, internalData: 5c8134	● Success	170738	3	▂▄▆█	-113	2	-115.12	7	867.1	2

Rssi	**Received Signal Strength Indicator ($\simeq P_{Rx}+N$) (dBm)**
Snr	**Signal to Noise Ratio ($\simeq P_{Rx}/N$) (dB)**
Esp	**Estimated signal power ($\simeq P_{Rx}$) (dBm)**
Sf	**Spreading Factor, between SF7 and SF12 :** **- SF7 if network quality enables it, less battery consumption** **- SF12 more battery consumption but better if less network quality**
Frequency	**Actual carrier frequency used to send the message**
GW Count	**Number of gateways that have received the payload**

Some reference values:

Outdoor:	**RSSI > -124dBm**
Indoor:	**RSSI > -108dBm**
SNR > -20dB	**in SF12**

LoRa: Network performance

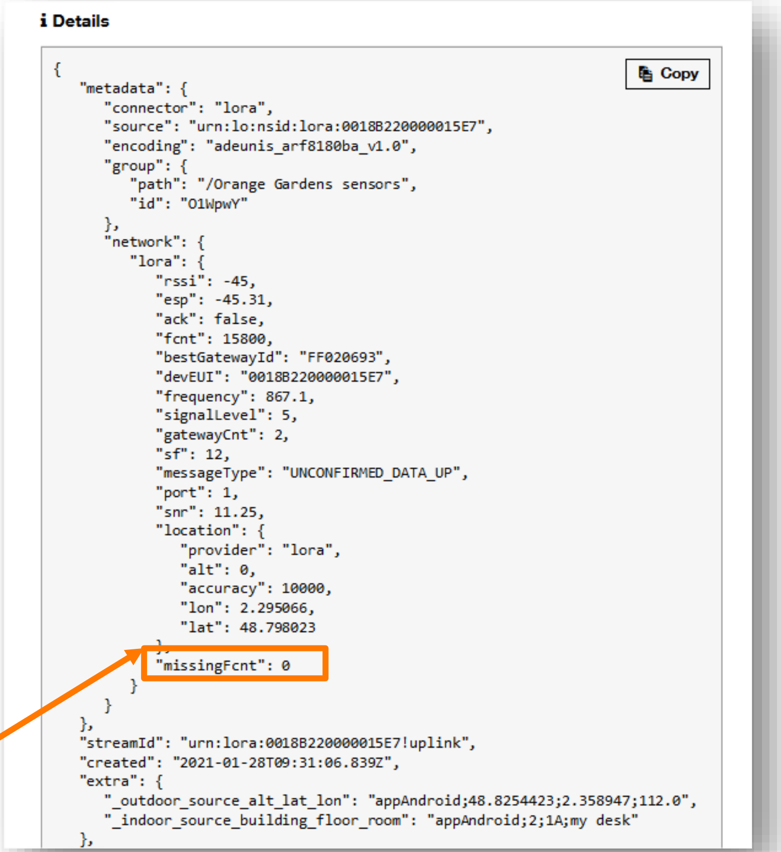


LoRa

16 devices

● **100%** Activated

Recent traffic consumption

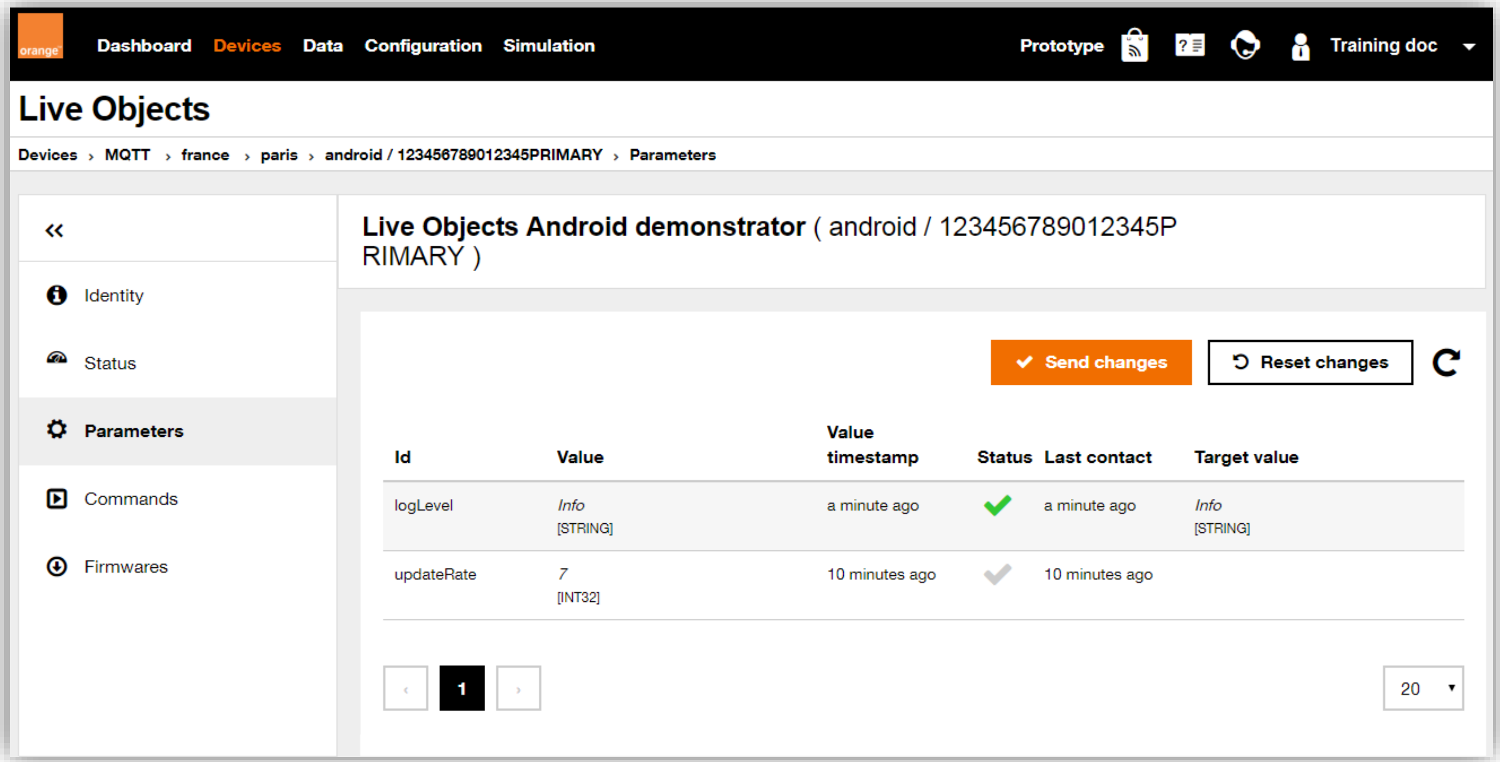


Details

```
{
   "metadata": {
      "connector": "lora",
      "source": "urn:lo:nsid:lora:0018B220000015E7",
      "encoding": "adeunis_arf8180ba_v1.0",
      "group": {
         "path": "/Orange Gardens sensors",
         "id": "O1WpwY"
      },
      "network": {
         "lora": {
            "rssi": -45,
            "esp": -45.31,
            "ack": false,
            "fcnt": 15800,
            "bestGatewayId": "FF020693",
            "devEUI": "0018B220000015E7",
            "frequency": 867.1,
            "signalLevel": 5,
            "gatewayCnt": 2,
            "sf": 12,
            "messageType": "UNCONFIRMED_DATA_UP",
            "port": 1,
            "snr": 11.25,
            "location": {
               "provider": "lora",
               "alt": 0,
               "accuracy": 10000,
               "lon": 2.295066,
               "lat": 48.798023
            },
            "missingFcnt": 0
         }
      }
   },
   "streamId": "urn:lora:0018B220000015E7!uplink",
   "created": "2021-01-28T09:31:06.839Z",
   "extra": {
      "_outdoor_source_alt_lat_lon": "appAndroid;48.8254423;2.358947;112.0",
      "_indoor_source_building_floor_room": "appAndroid;2;1A;my desk"
   },
```

For each payload, you get the number of previous missed payloads (since the last received payload)

MQTT: device parameters


orange
Dashboard
Devices
Data
Configuration
Simulation
Prototype
Training doc

Live Objects

Devices › MQTT › france › paris › android / 123456789012345PRIMARY › Parameters

«
Identity
Status
Parameters
Commands
Firmwares

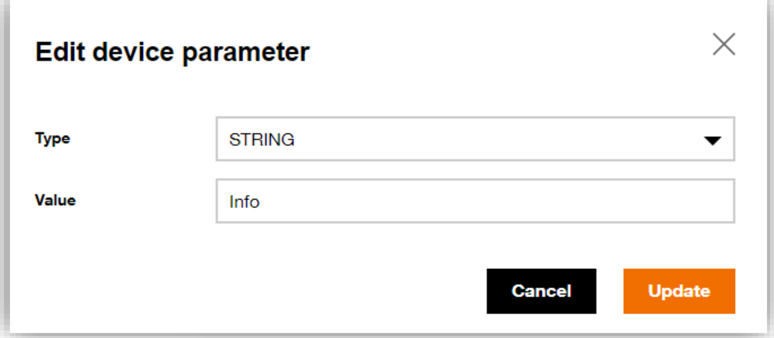
Live Objects Android demonstrator (android / 123456789012345PRIMARY)

Send changes
Reset changes

Id	Value	Value timestamp	Status	Last contact	Target value
logLevel	*Info* [STRING]	a minute ago	✓	a minute ago	*Info* [STRING]
updateRate	*7* [INT32]	10 minutes ago	✓	10 minutes ago	

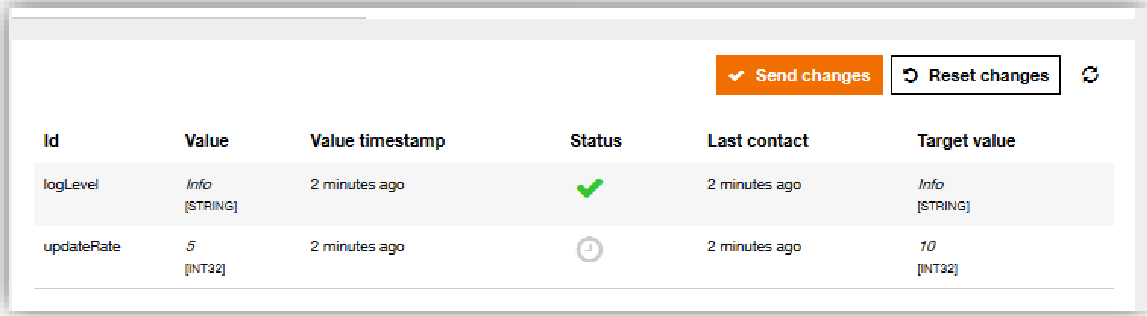
‹
1
›
20

MQTT: Remotely apply parameters on devices

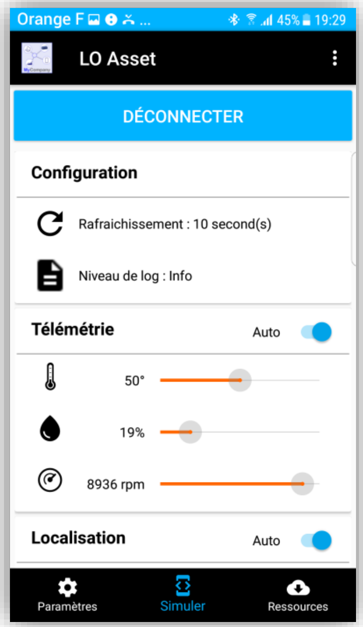

Edit device parameter
Cancel
Update

Type: STRING

Value: Info


Send changes
Reset changes

Id	Value	Value timestamp	Status	Last contact	Target value
logLevel	*Info* [STRING]	2 minutes ago	✓	2 minutes ago	*Info* [STRING]
updateRate	*5* [INT32]	2 minutes ago	🕒	2 minutes ago	*10* [INT32]


Orange F
45% 19:29
LO Asset
DÉCONNECTER
Paramètres
Simuler
Ressources

Configuration

Rafraichissement : 10 second(s)

Niveau de log : Info

Télémétrie Auto

50°

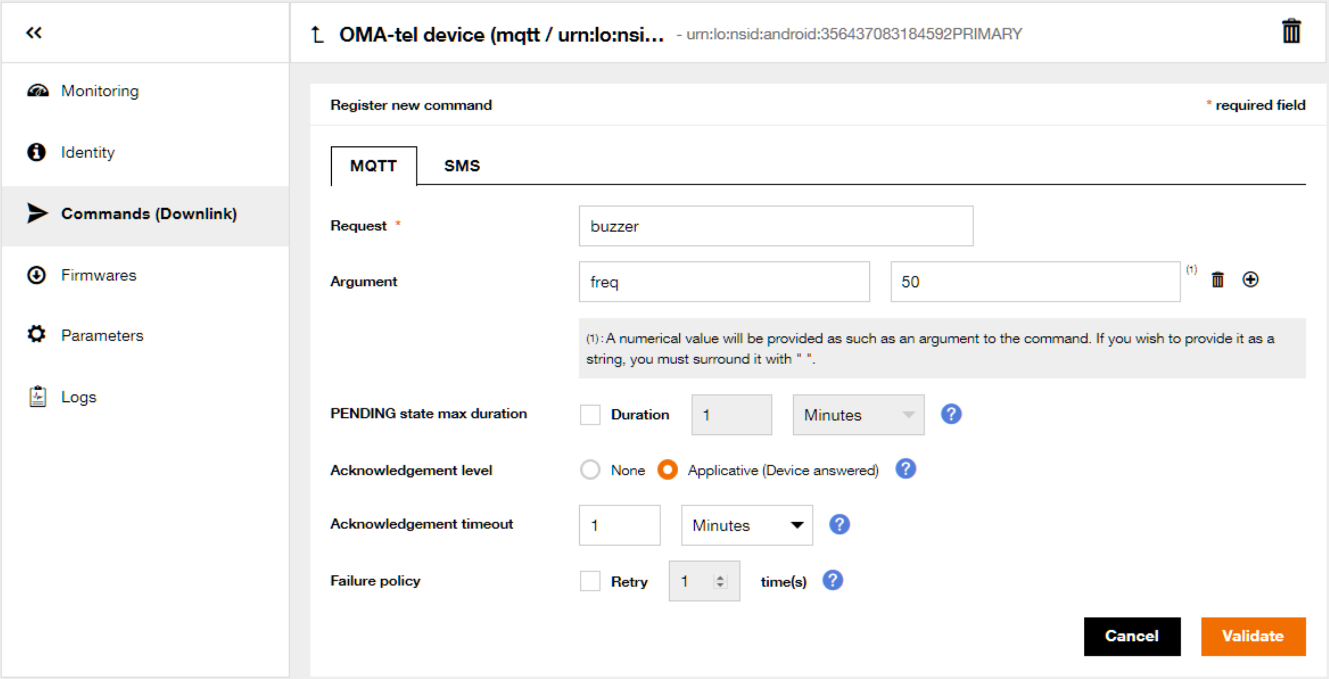
19%

8936 rpm

Localisation Auto

MQTT: Send a command on a device

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs


«
Monitoring
Identity
Commands (Downlink)
Firmwares
Parameters
Logs

OMA-tel device (mqtt / urn:lo:nsi… - urn:lo:nsid:android:356437083184592PRIMARY

Register new command

* required field

MQTT
SMS

Request *: buzzer

Argument: freq — 50 (1)

(1) : A numerical value will be provided as such as an argument to the command. If you wish to provide it as a string, you must surround it with " ".

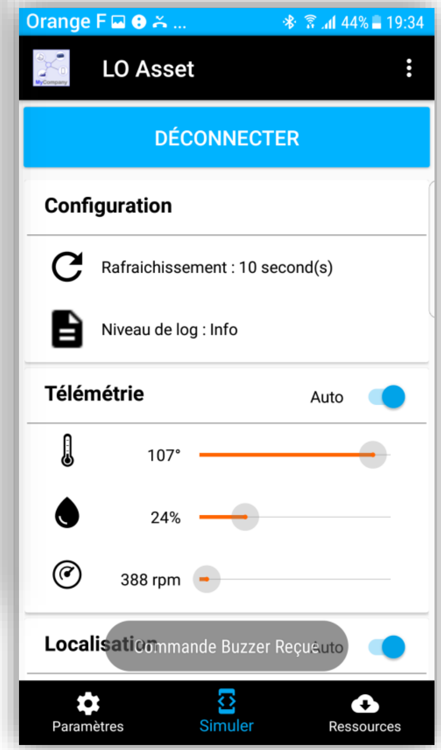
PENDING state max duration: ☐ Duration 1 Minutes

Acknowledgement level: ○ None ● Applicative (Device answered)

Acknowledgement timeout: 1 Minutes

Failure policy: ☐ Retry 1 time(s)

Cancel
Validate


Orange F
44% 19:34
LO Asset
DÉCONNECTER

Configuration

Rafraichissement : 10 second(s)

Niveau de log : Info

Télémétrie Auto

107°

24%

388 rpm

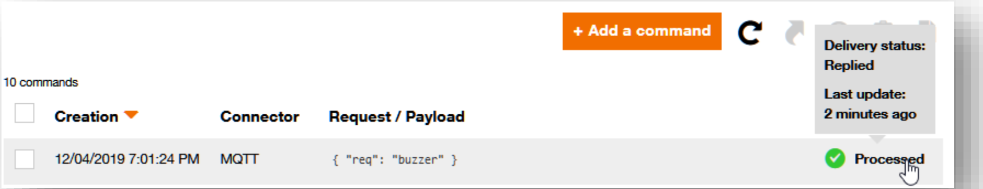
Localisation Auto

Commande Buzzer Reçue

Paramètres
Simuler
Ressources

MQTT: Send a command on a device, result

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs

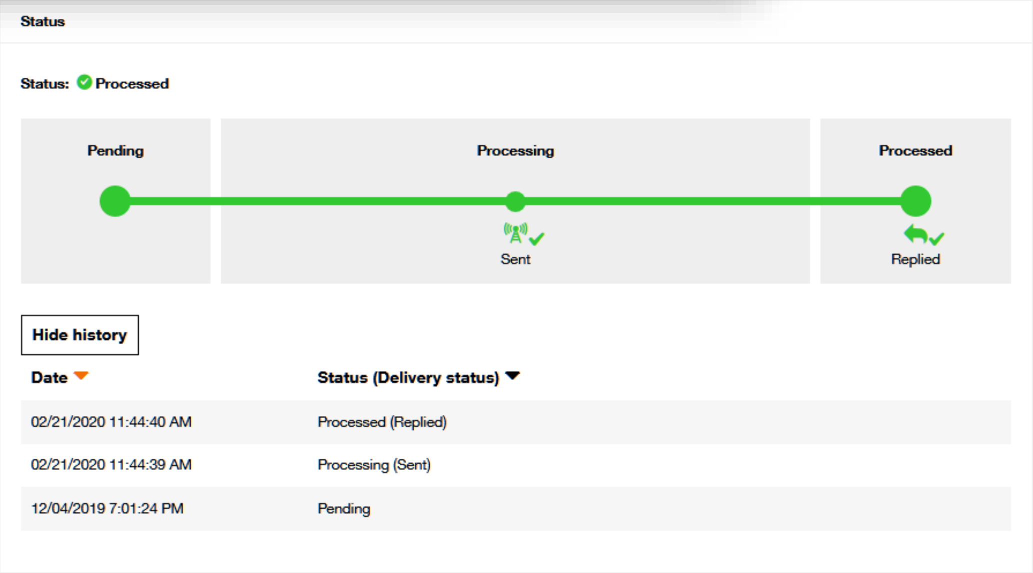

+ Add a command

10 commands

☐	Creation	Connector	Request / Payload	
☐	12/04/2019 7:01:24 PM	MQTT	`{ "req": "buzzer" }`	✓ Processed

Delivery status: Replied

Last update: 2 minutes ago

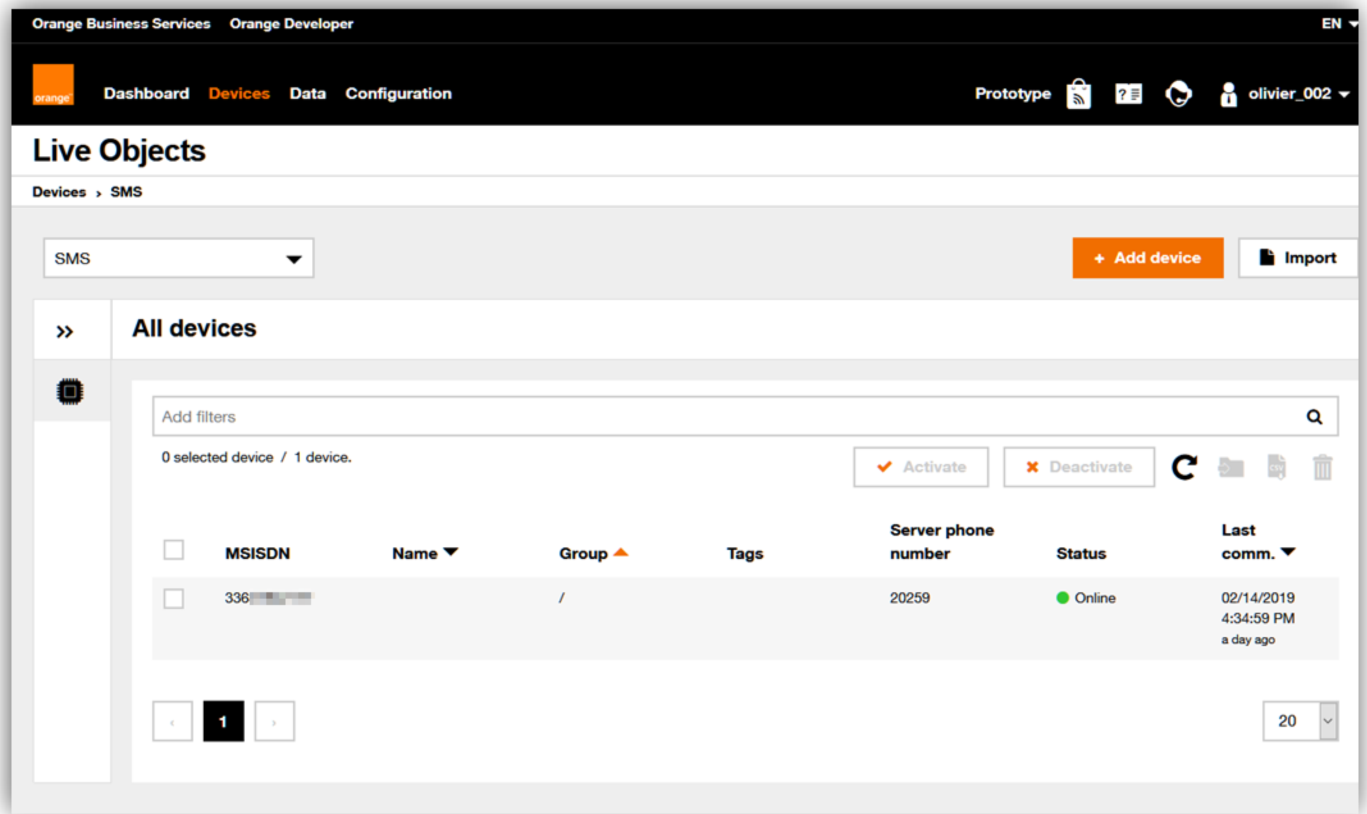

Pending
Processing
Processed
Sent
Replied
Hide history

Status

Status: ✓ Processed

Date	Status (Delivery status)
02/21/2020 11:44:40 AM	Processed (Replied)
02/21/2020 11:44:39 AM	Processing (Sent)
12/04/2019 7:01:24 PM	Pending

SMS devices


Orange Business Services
Orange Developer
EN
Dashboard
Devices
Data
Configuration
Prototype
olivier_002

Live Objects

Devices › SMS

SMS
+ Add device
Import

All devices

Add filters

0 selected device / 1 device.

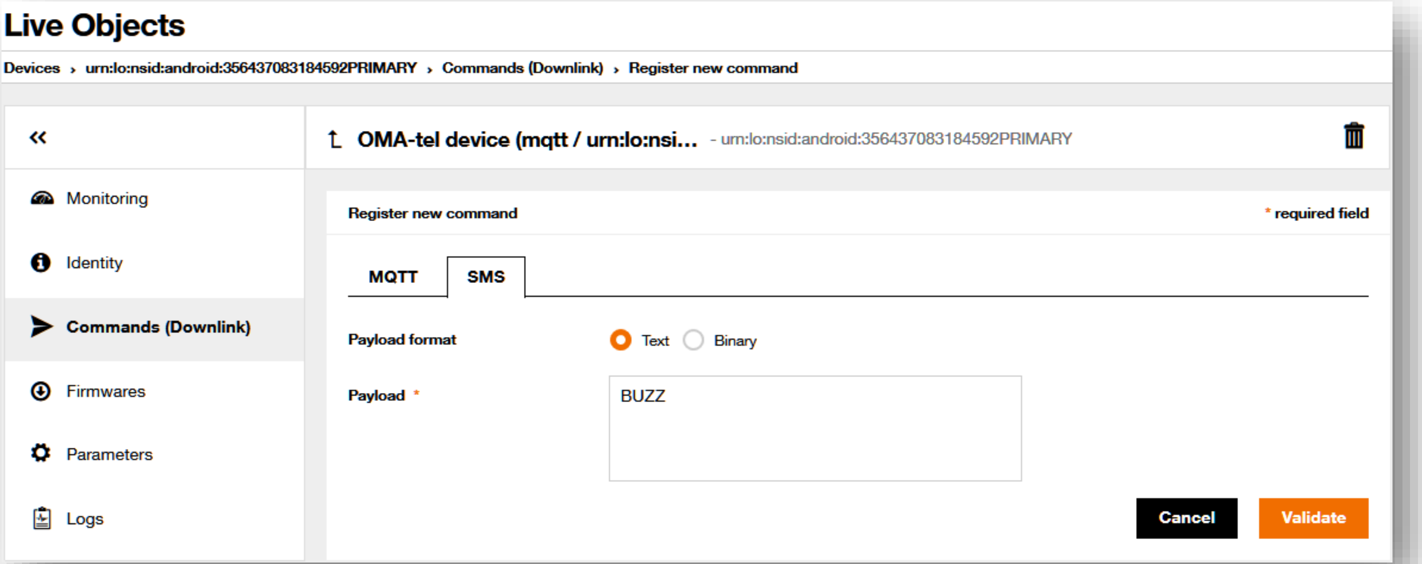
✓ Activate
✗ Deactivate

☐	MSISDN	Name ▼	Group ▲	Tags	Server phone number	Status	Last comm. ▼
☐	336[redacted]		/		20259	● Online	02/14/2019 4:34:59 PM a day ago

‹
1
›
20

SMS : send an SMS-MT

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs



Live Objects

Devices › urn:lo:nsid:android:356437083184592PRIMARY › Commands (Downlink) › Register new command

OMA-tel device (mqtt / urn:lo:nsi... - urn:lo:nsid:android:356437083184592PRIMARY

Register new command

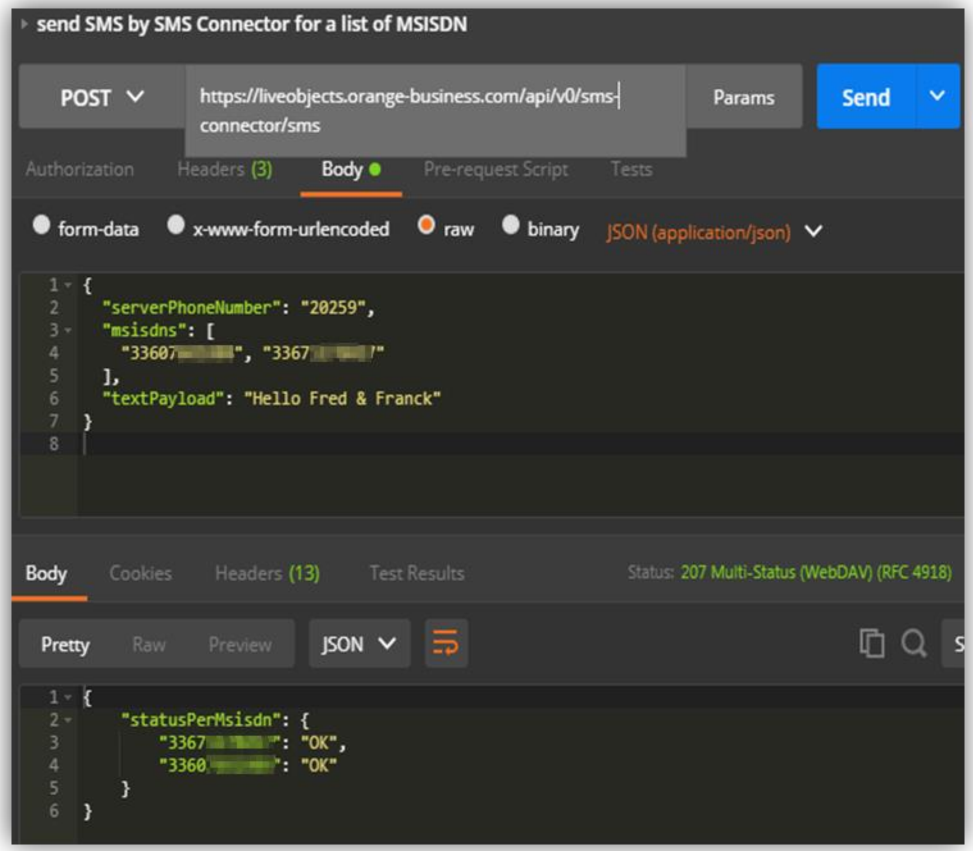
* required field

Payload format: ● Text ○ Binary

Payload *: BUZZ

«
Monitoring
Identity
Commands (Downlink)
Firmwares
Parameters
Logs
MQTT
SMS
Cancel
Validate

SMS : send an SMS-MT


send SMS by SMS Connector for a list of MSISDN
Params
Send
Authorization
Headers (3)
Body
Pre-request Script
Tests
form-data
x-www-form-urlencoded
raw
binary
Cookies
Headers (13)
Test Results
Pretty
Raw
Preview

POST https://liveobjects.orange-business.com/api/v0/sms-connector/sms

Body: ● raw, JSON (application/json)

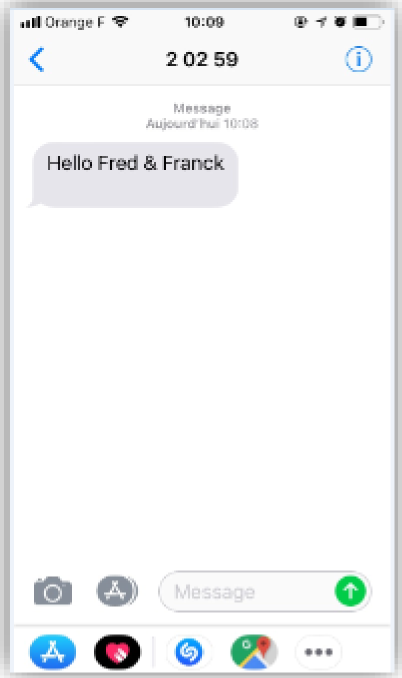
```
{
  "serverPhoneNumber": "20259",
  "msisdns": [
    "33607[redacted]", "3367[redacted]"
  ],
  "textPayload": "Hello Fred & Franck"
}
```

Status: 207 Multi-Status (WebDAV) (RFC 4918)

Body: JSON

```
{
    "statusPerMsisdn": {
        "3367[redacted]": "OK",
        "3360[redacted]": "OK"
    }
}
```

Message received by the devices !

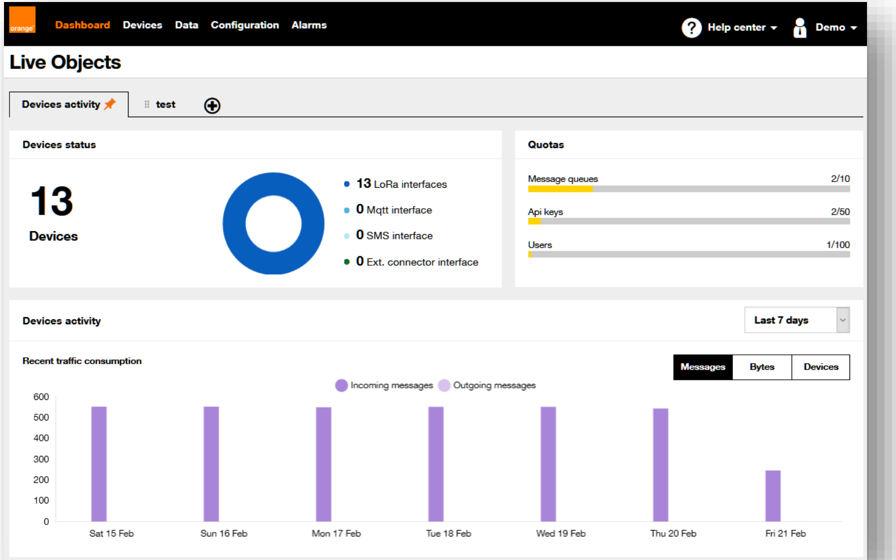

Orange F
10:09
Message

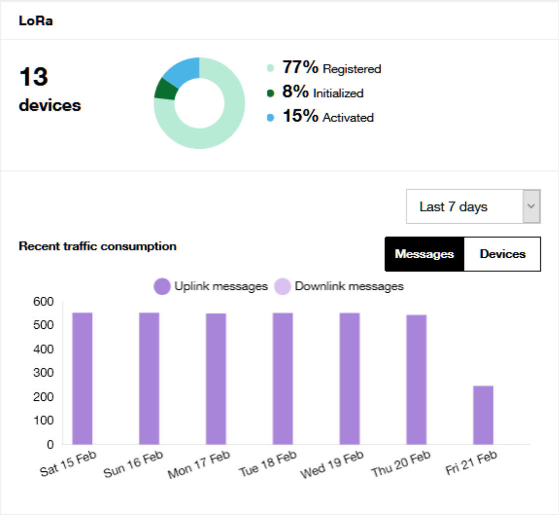
2 02 59

Message
Aujourd'hui 10:08

Hello Fred & Franck

Dashboard view, connectivity statistics


orange
Dashboard
Devices
Data
Configuration
Alarms
Help center
Demo
Live Objects
Devices activity
test
Devices status
13
Devices
13 LoRa interfaces
0 Mqtt interface
0 SMS interface
0 Ext. connector interface
Quotas
Message queues 2/10
Api keys 2/50
Users 1/100
Devices activity
Last 7 days
Recent traffic consumption
Messages
Bytes
Devices
Incoming messages
Outgoing messages
600
500
400
300
200
100
0
Sat 15 Feb
Sun 16 Feb
Mon 17 Feb
Tue 18 Feb
Wed 19 Feb
Thu 20 Feb
Fri 21 Feb


LoRa
13
devices
77% Registered
8% Initialized
15% Activated
Last 7 days
Recent traffic consumption
Messages
Devices
Uplink messages
Downlink messages
600
500
400
300
200
100
0
Sat 15 Feb
Sun 16 Feb
Mon 17 Feb
Tue 18 Feb
Wed 19 Feb
Thu 20 Feb
Fri 21 Feb

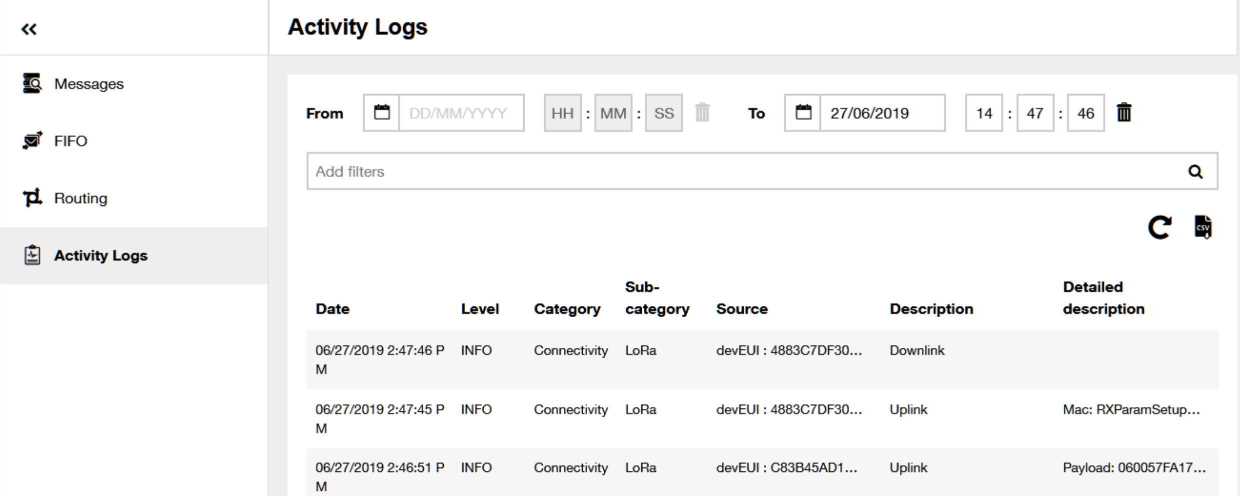
Debug connectivity

Portal activity logs

LoRa: JOIN accept and reject logs, MAC frames

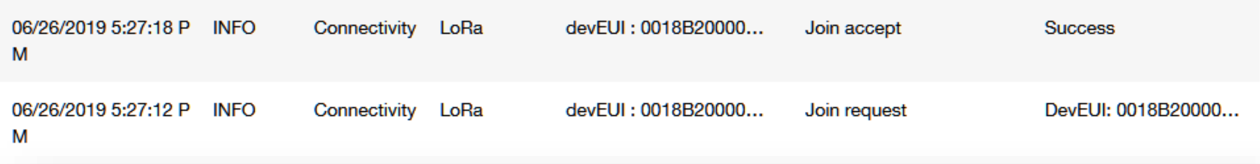
MQTT: disconnection logs
If debug mode activated on the API key : errors and connection logs

Eg: rate limit exceeded
several connections with the same deviceID
use of a bad topic name
bad data message format

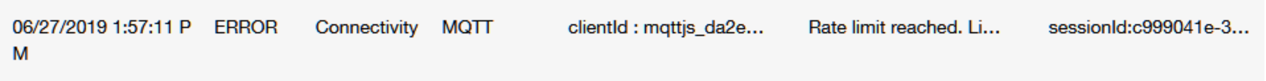


From DD/MM/YYYY HH : MM : SS To 27/06/2019 14 : 47 : 46

Date	Level	Category	Sub-category	Source	Description	Detailed description
06/27/2019 2:47:46 PM	INFO	Connectivity	LoRa	devEUI : 4883C7DF30...	Downlink	
06/27/2019 2:47:45 PM	INFO	Connectivity	LoRa	devEUI : 4883C7DF30...	Uplink	Mac: RXParamSetup...
06/27/2019 2:46:51 PM	INFO	Connectivity	LoRa	devEUI : C83B45AD1...	Uplink	Payload: 060057FA17...



06/26/2019 5:27:18 PM	INFO	Connectivity	LoRa	devEUI : 0018B20000...	Join accept	Success
06/26/2019 5:27:12 PM	INFO	Connectivity	LoRa	devEUI : 0018B20000...	Join request	DevEUI: 0018B20000...



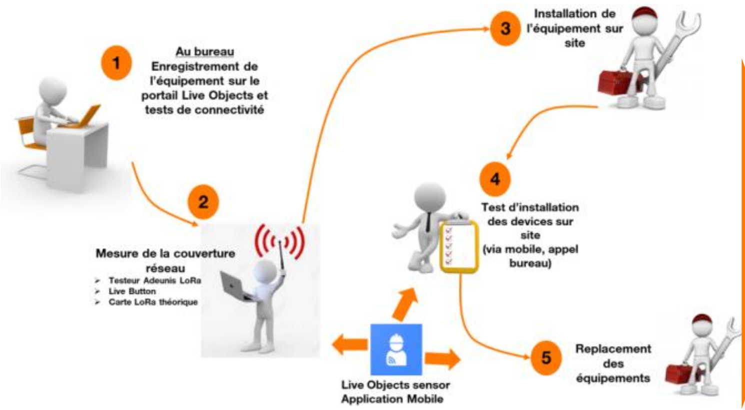
06/27/2019 1:57:11 PM	ERROR	Connectivity	MQTT	clientId : mqttjs_da2e...	Rate limit reached. Li...	sessionId:c999041e-3...

#5.2

Device Management Advanced

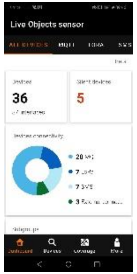
“Live Objects sensor” : the Android application for technician adaptable to your specific business needs

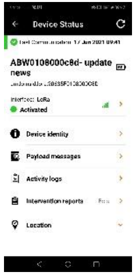
Help with the deployment & installation of your equipment fleet

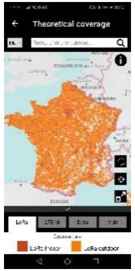

1
Au bureau
Enregistrement de l'équipement sur le portail Live Objects et tests de connectivité
2
Mesure de la couverture réseau
➢ Testeur Adeunis LoRa
➢ Live Button
➢ Carte LoRa théorique
3
Installation de l'équipement sur site
4
Test d'installation des devices sur site (via mobile, appel bureau)
5
Replacement des équipements
Live Objects sensor Application Mobile

Main features

- **Theoretical network coverage maps**
  for IoT connectivity for Spain and France
- **Device dashboard**
- **Search for a device**
  for the device to install using:
  - filters as ID, Name, Group name, Interface status, Connectivity, or Silent machine alarm
  - Qrcode / BarCode using specific format
  - NFC
- **Device info**
  with the possibility to edit them (manually or using OCR):
  - Device information (status, Battery, interface, tags, Properties)
  - Silent machine Alarms
  - Network signal (only for LoRa)
  - Uplink messages
  - Activity logs
  - MQTT parameters configuration
- **Activate Lora devices**
- **Static outdoor location**
  of your device thanks to the GPS coordinates of your mobile and store indoor information of the installation location (building, floor, room)
- **Show on map**
  the device static location or the network one
- **Installation report**
  generation including pictures


Live Objects sensor
ALL DEVICES
MQTT
LORA
SMS
36
5
20
7
7
3
Dashboard
Devices
Coverage
More

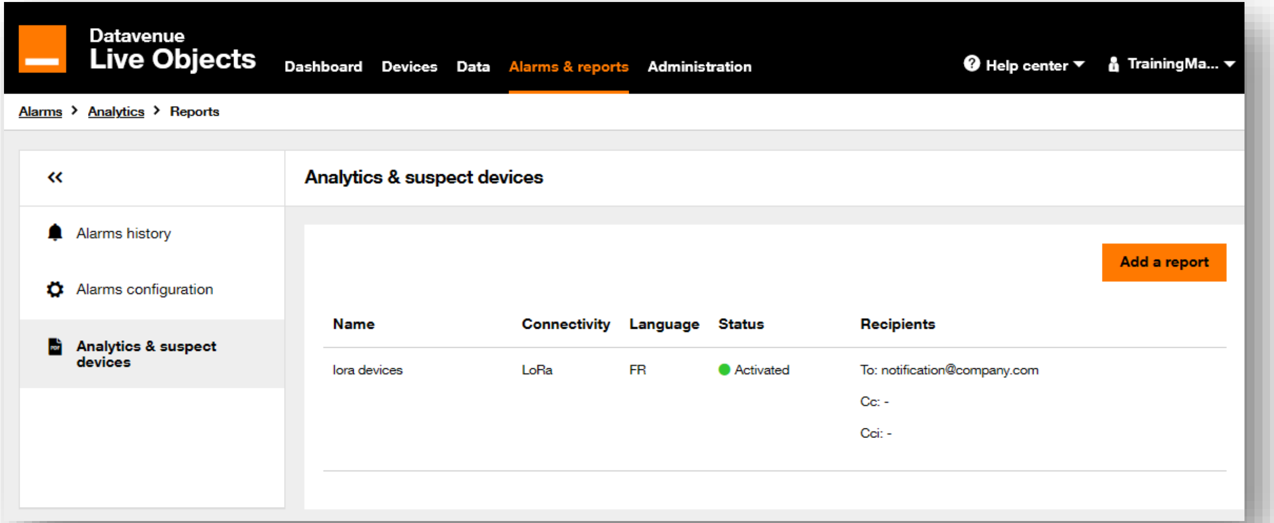

Device Status
ABW0108000c8d- update news
Interface: LoRa
Activated
Device identity
Payload messages
Activity logs
Intervention reports
Location


Theoretical coverage
LoRa
LoRa indoor
LoRa outdoor

Available also in open sources

Analytics and Suspect Devices

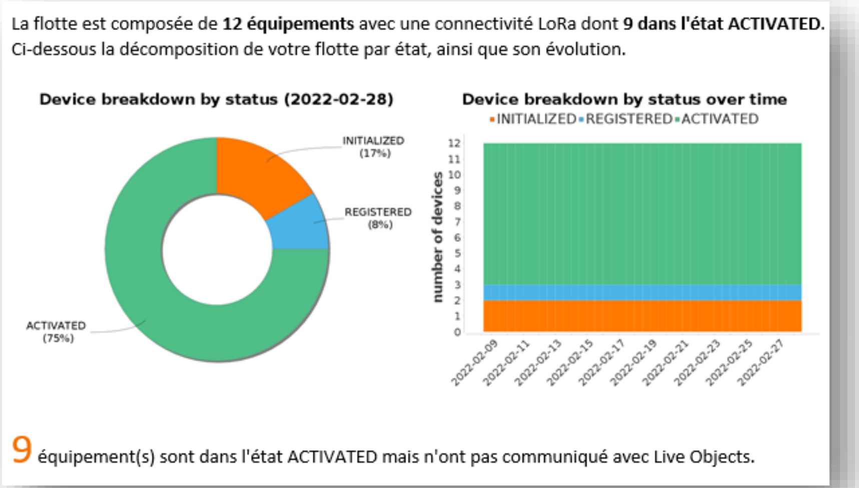
- weekly report by email + latest report downloadable on the portal
- evolution of your devices : quantity and status
- AI-powered analytics


Datavenue
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
TrainingMa...
Alarms
Analytics
Reports
Alarms history
Alarms configuration
Analytics & suspect devices
Add a report

Analytics & suspect devices

Name	Connectivity	Language	Status	Recipients
lora devices	LoRa	FR	● Activated	To: notification@company.com Cc: - Cci: -

Analytics and Suspect Devices

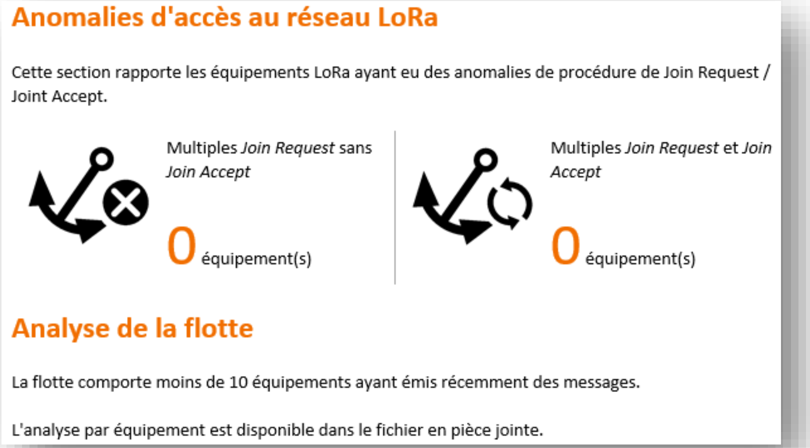


La flotte est composée de **12 équipements** avec une connectivité LoRa dont **9 dans l'état ACTIVATED.** Ci-dessous la décomposition de votre flotte par état, ainsi que son évolution.

Device breakdown by status (2022-02-28)

Device breakdown by status over time

9 équipement(s) sont dans l'état ACTIVATED mais n'ont pas communiqué avec Live Objects.



Anomalies d'accès au réseau LoRa

Cette section rapporte les équipements LoRa ayant eu des anomalies de procédure de Join Request / Joint Accept.

Multiples *Join Request* sans *Join Accept*

0 équipement(s)

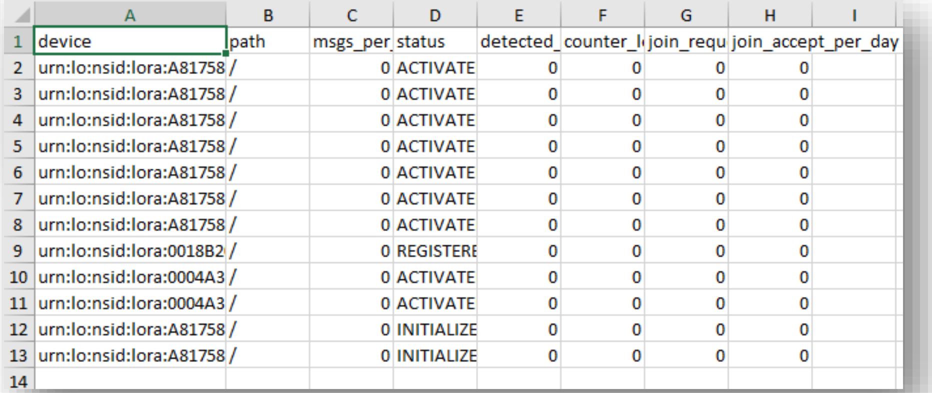
Multiples *Join Request* et *Join Accept*

0 équipement(s)

Analyse de la flotte

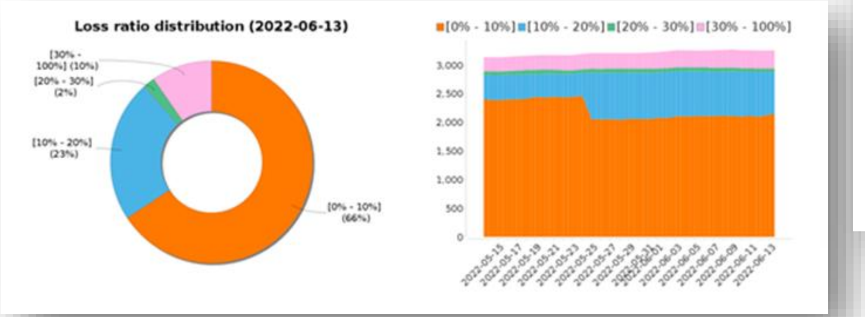
La flotte comporte moins de 10 équipements ayant émis récemment des messages.

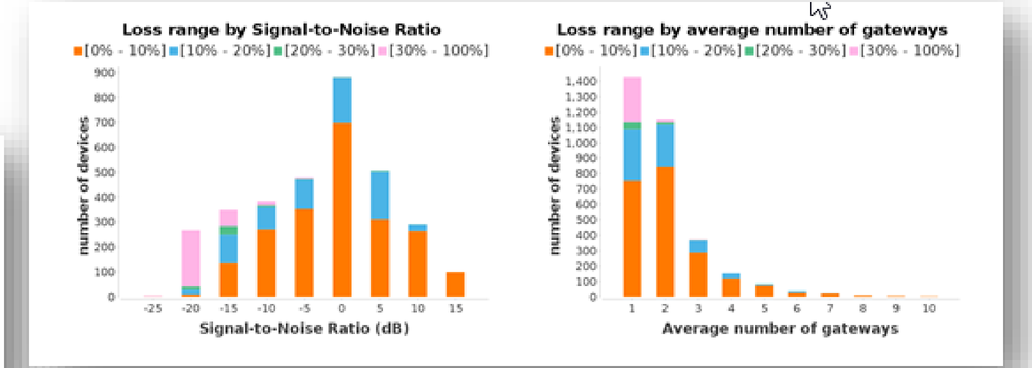
L'analyse par équipement est disponible dans le fichier en pièce jointe.

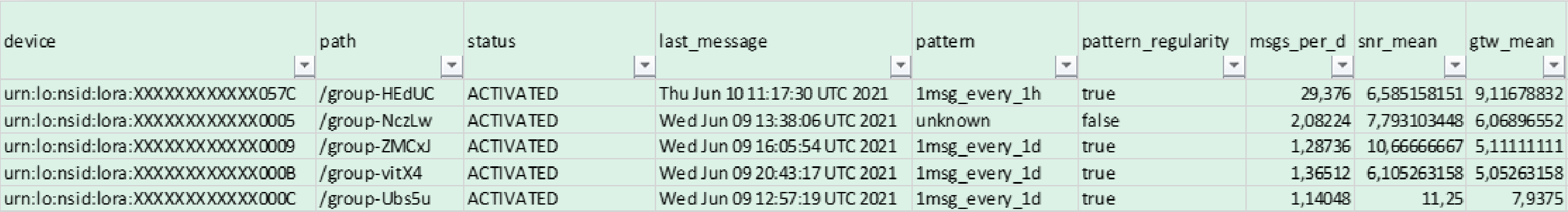


	A	B	C	D	E	F	G	H	I
1	device	path	msgs_per	status	detected_	counter_l	join_requ	join_accept_per_day	
2	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
3	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
4	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
5	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
6	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
7	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
8	urn:lo:nsid:lora:A81758	/	0	ACTIVATE	0	0	0	0	
9	urn:lo:nsid:lora:0018B2	/	0	REGISTERE	0	0	0	0	
10	urn:lo:nsid:lora:0004A3	/	0	ACTIVATE	0	0	0	0	
11	urn:lo:nsid:lora:0004A3	/	0	ACTIVATE	0	0	0	0	
12	urn:lo:nsid:lora:A81758	/	0	INITIALIZE	0	0	0	0	
13	urn:lo:nsid:lora:A81758	/	0	INITIALIZE	0	0	0	0	
14									

Analytics : QoS

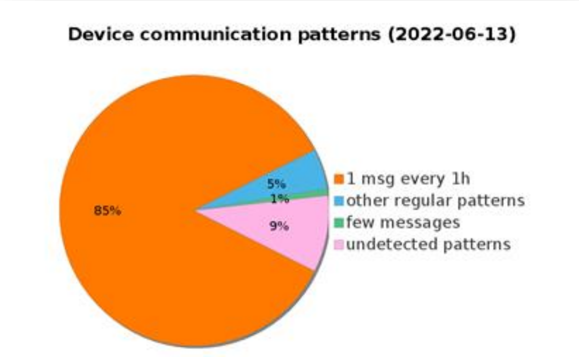


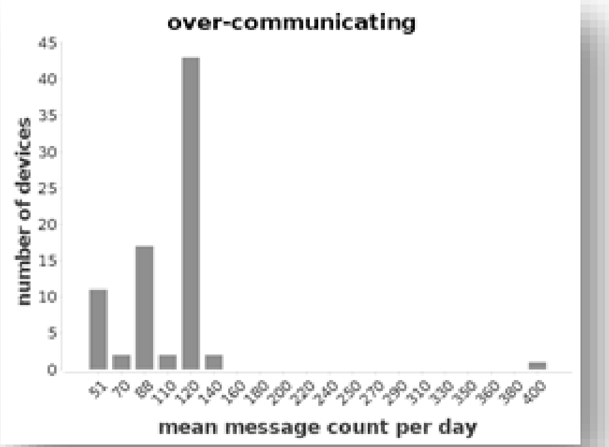


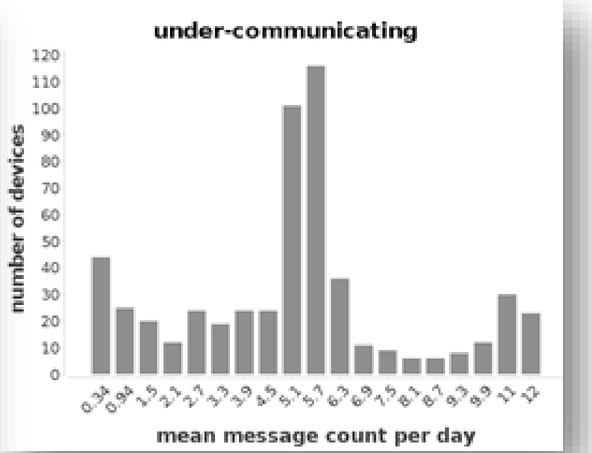


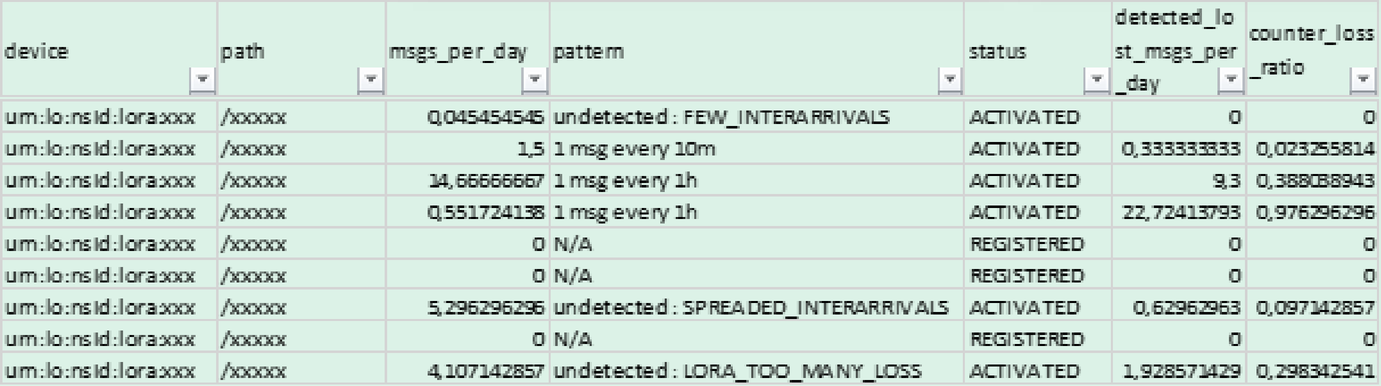
device	path	status	last_message	pattern	pattern_regularity	msgs_per_d	snr_mean	gtw_mean
urn:lo:nsid:lora:XXXXXXXXXXXX057C	/group-HEdUC	ACTIVATED	Thu Jun 10 11:17:30 UTC 2021	1msg_every_1h	true	29,376	6,585158151	9,11678832
urn:lo:nsid:lora:XXXXXXXXXXXX0005	/group-NczLw	ACTIVATED	Wed Jun 09 13:38:06 UTC 2021	unknown	false	2,08224	7,793103448	6,06896552
urn:lo:nsid:lora:XXXXXXXXXXXX0009	/group-ZMCxJ	ACTIVATED	Wed Jun 09 16:05:54 UTC 2021	1msg_every_1d	true	1,28736	10,66666667	5,11111111
urn:lo:nsid:lora:XXXXXXXXXXXX000B	/group-vitX4	ACTIVATED	Wed Jun 09 20:43:17 UTC 2021	1msg_every_1d	true	1,36512	6,105263158	5,05263158
urn:lo:nsid:lora:XXXXXXXXXXXX000C	/group-Ubs5u	ACTIVATED	Wed Jun 09 12:57:19 UTC 2021	1msg_every_1d	true	1,14048	11,25	7,9375

Analytics : irregular behavior









device	path	msgs_per_day	pattern	status	detected_lost_msgs_per_day	counter_loss_ratio
urn:lo:nsId:loraxxx	/xxxxx	0,045454545	undetected : FEW_INTERARRIVALS	ACTIVATED	0	0
urn:lo:nsId:loraxxx	/xxxxx	1,5	1 msg every 10m	ACTIVATED	0,333333333	0,023255814
urn:lo:nsId:loraxxx	/xxxxx	14,66666667	1 msg every 1h	ACTIVATED	9,3	0,388088943
urn:lo:nsId:loraxxx	/xxxxx	0,551724138	1 msg every 1h	ACTIVATED	22,72413793	0,976296296
urn:lo:nsId:loraxxx	/xxxxx	0	N/A	REGISTERED	0	0
urn:lo:nsId:loraxxx	/xxxxx	0	N/A	REGISTERED	0	0
urn:lo:nsId:loraxxx	/xxxxx	5,296296296	undetected : SPREADED_INTERARRIVALS	ACTIVATED	0,62962963	0,097142857
urn:lo:nsId:loraxxx	/xxxxx	0	N/A	REGISTERED	0	0
urn:lo:nsId:loraxxx	/xxxxx	4,107142857	undetected : LORA_TOO_MANY_LOSS	ACTIVATED	1,928571429	0,298342541

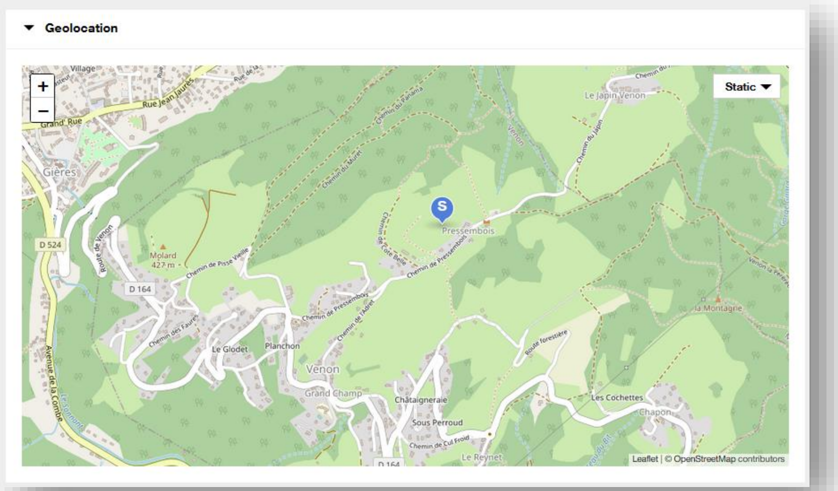
Static location

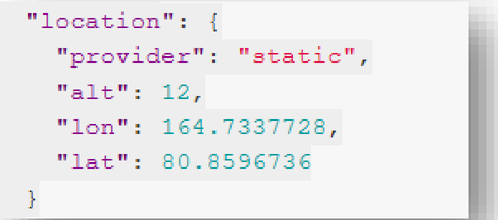
Configure a location at installation (not given by the device nor network)

- By API
- By *Live Objects Sensor* mobile application (phone GPS or manual)
- In web portal soon

That location is added on Live Objects maps and in every enriched frame.

Several locations can be concurrent : static, by the device, by the network.
See how the priority applies here :
https://liveobjects.orange-business.com/doc/html/lo_manual_v2.html#_priority_location


▾ Geolocation
+
−
Static ▾
S
Gières
Venon
Pressembois
Molard 427 m
Le Glodet
Planchon
Grand Champ
Châtaigneraie
Sous Perroud
Les Cochettes
Chapon
La Montagne
Le Japin Venon
D 524
D 164
Leaflet | © OpenStreetMap contributors

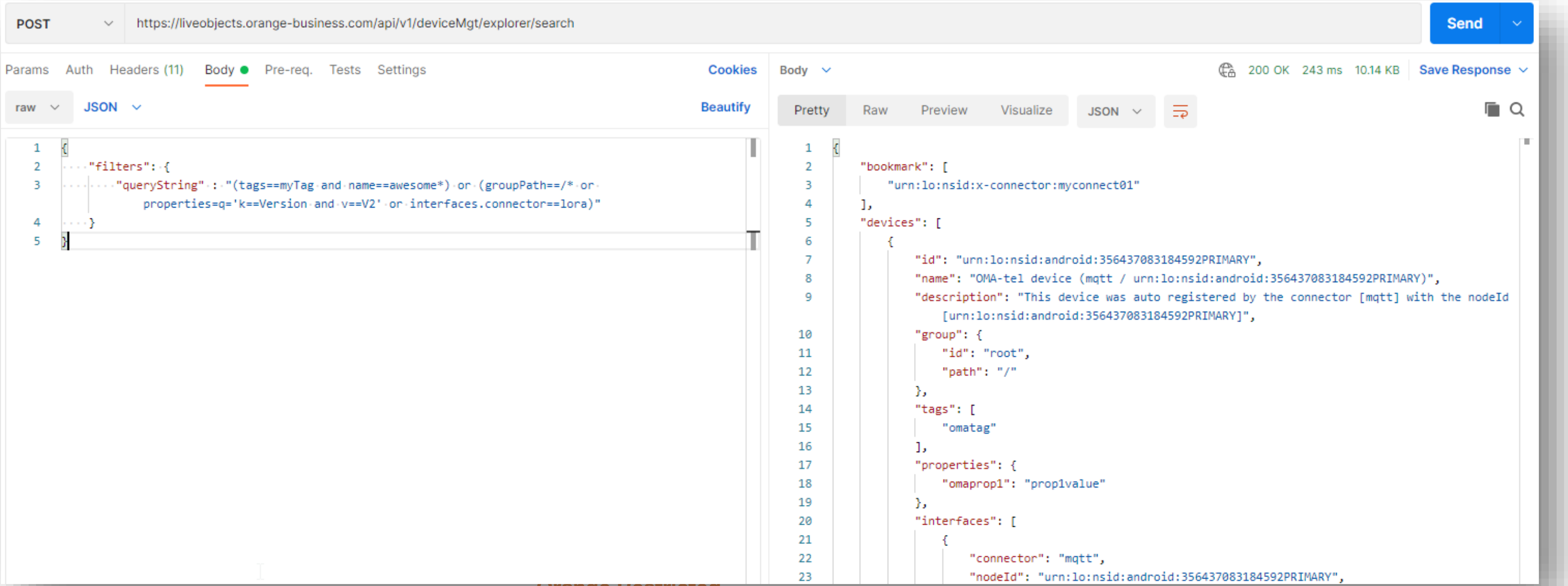


```
"location": {
  "provider": "static",
  "alt": 12,
  "lon": 164.7337728,
  "lat": 80.8596736
}
```

Device explorer APIs

Querying or Counting devices based on RSQL criteria :

- **Name, id**
- **Properties, tags, group**
- **Interface type and status**
- **Geo-bounds**
- **With sorting and response-limits, paginated, grouped (incl. by location)**

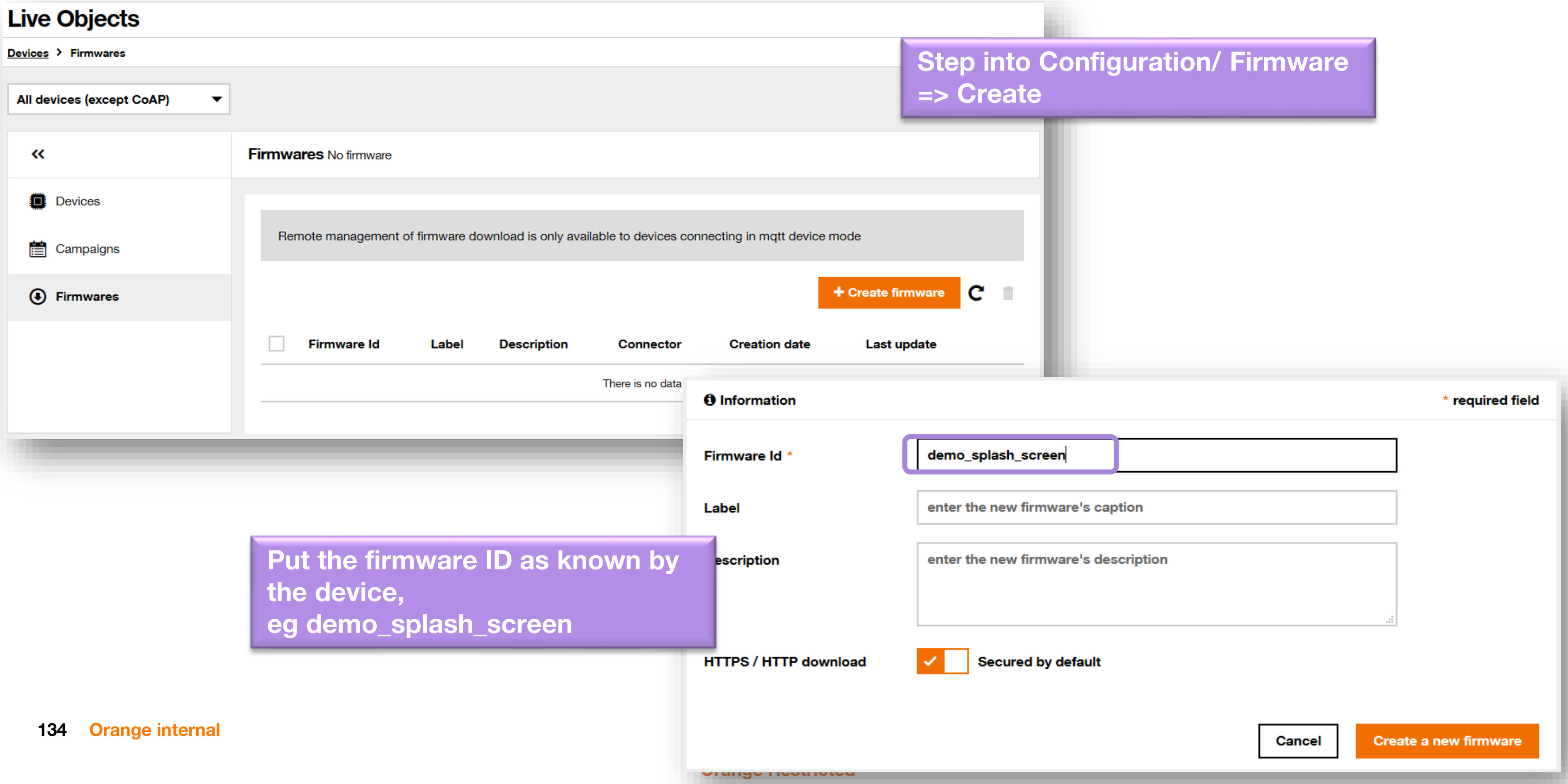

POST
Send
Params
Auth
Headers (11)
Body
Pre-req.
Tests
Settings
Cookies
raw
JSON
Beautify
Body
200 OK
243 ms
10.14 KB
Save Response
Pretty
Raw
Preview
Visualize
JSON

https://liveobjects.orange-business.com/api/v1/deviceMgt/explorer/search

```
{
    "filters": {
        "queryString" : "(tags==myTag and name==awesome*) or (groupPath==/* or 
            properties=q='k==Version and v==V2' or interfaces.connector==lora)"
    }
}
```

```
{
    "bookmark": [
        "urn:lo:nsid:x-connector:myconnect01"
    ],
    "devices": [
        {
            "id": "urn:lo:nsid:android:356437083184592PRIMARY",
            "name": "OMA-tel device (mqtt / urn:lo:nsid:android:356437083184592PRIMARY)",
            "description": "This device was auto registered by the connector [mqtt] with the nodeId
                [urn:lo:nsid:android:356437083184592PRIMARY]",
            "group": {
                "id": "root",
                "path": "/"
            },
            "tags": [
                "omatag"
            ],
            "properties": {
                "omaprop1": "prop1value"
            },
            "interfaces": [
                {
                    "connector": "mqtt",
                    "nodeId": "urn:lo:nsid:android:356437083184592PRIMARY",
```

MQTT: firmware management : creating a new version



Step into Configuration/ Firmware => Create

Put the firmware ID as known by the device,
eg demo_splash_screen

Live Objects

Devices > Firmwares

All devices (except CoAP)

«
Devices
Campaigns
Firmwares

Firmwares No firmware

Remote management of firmware download is only available to devices connecting in mqtt device mode

+ Create firmware

☐	Firmware Id	Label	Description	Connector	Creation date	Last update

There is no data

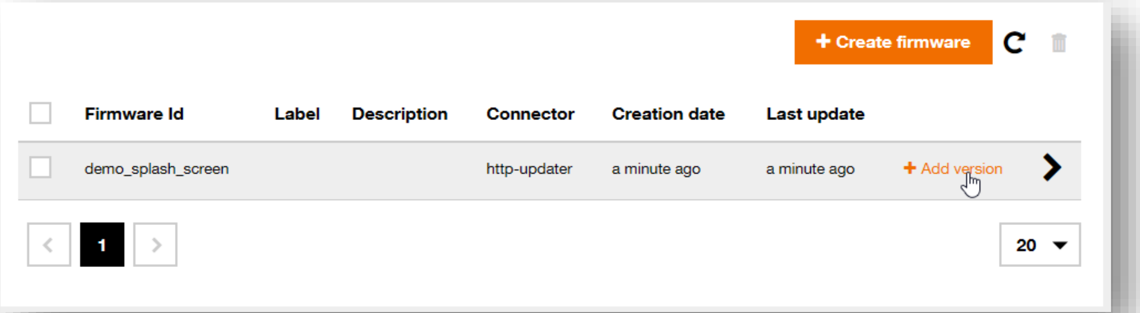
Information * required field

Firmware Id *	demo_splash_screen
Label	enter the new firmware's caption
escription	enter the new firmware's description
HTTPS / HTTP download	☑ Secured by default

Cancel
Create a new firmware

MQTT: firmware management : creating a new version

Click « Add version »

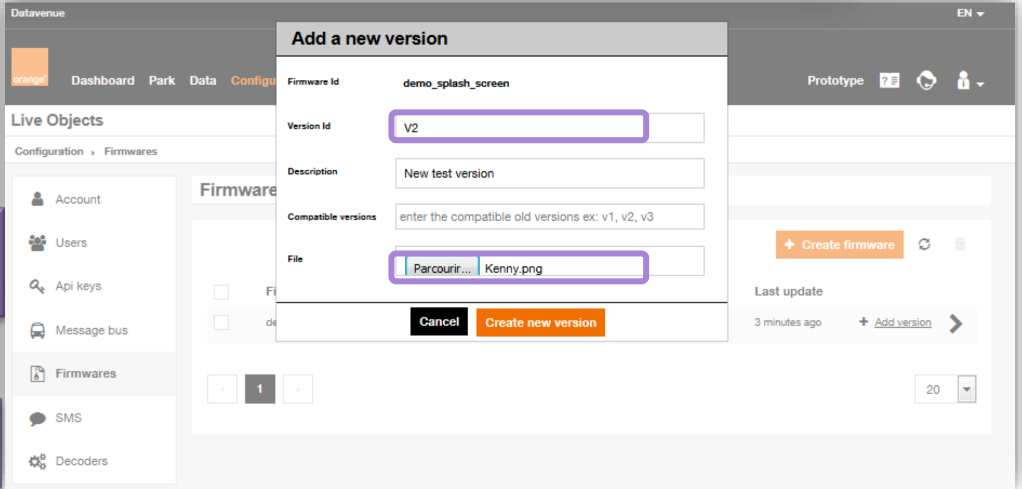

+ Create firmware

☐	Firmware Id	Label	Description	Connector	Creation date	Last update		
☐	demo_splash_screen			http-updater	a minute ago	a minute ago	+ Add version	›

1
20

Enter the new version Id
Choose any file to send to devices

If you play with the Android Simulator demo, pick a PNG image < 15KB

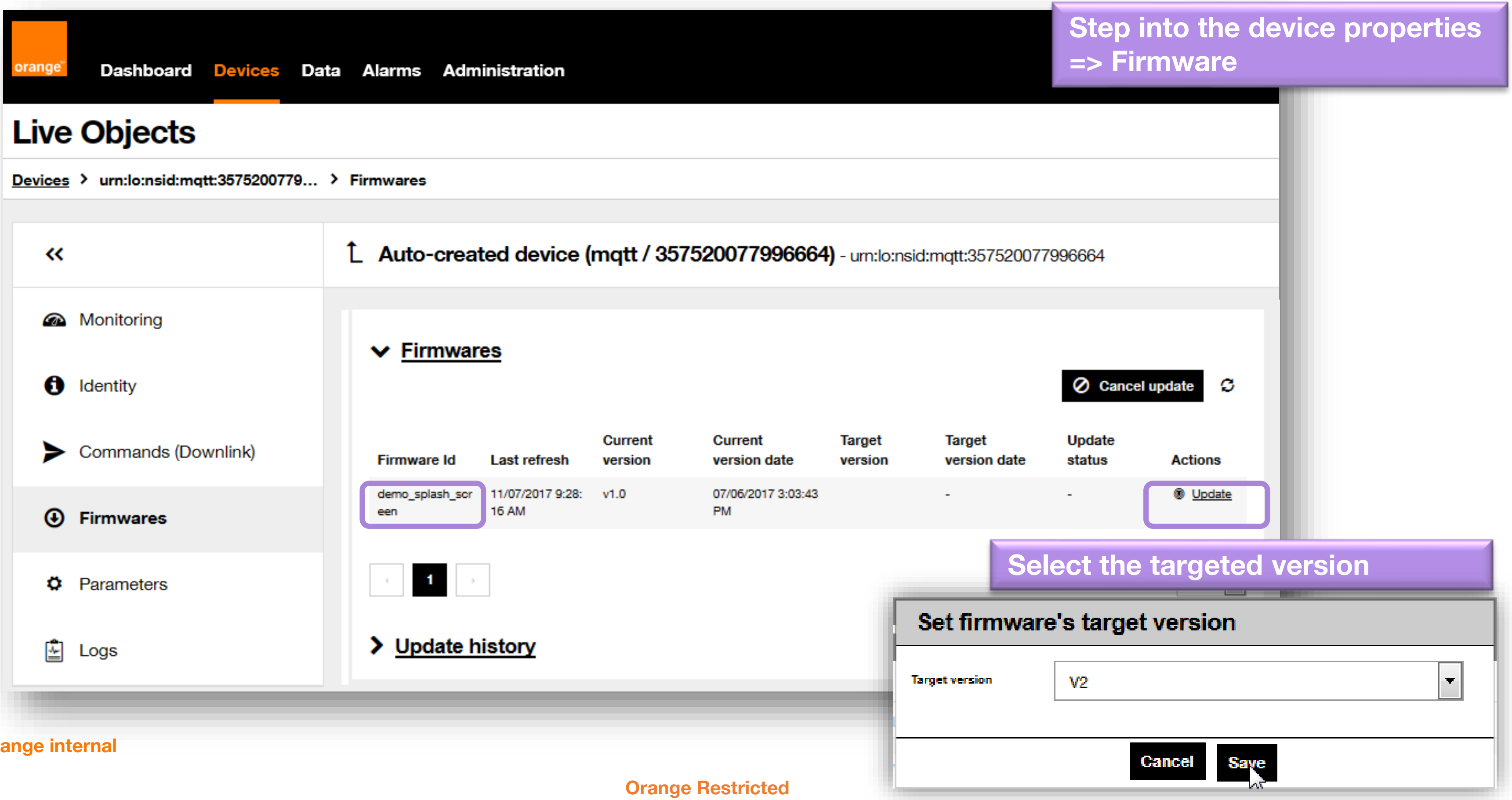

Datavenue
EN
orange
Dashboard
Park
Data
Configu
Prototype
Live Objects
Configuration › Firmwares
Account
Users
Api keys
Message bus
Firmwares
SMS
Decoders
Firmware
+ Create firmware
Last update
3 minutes ago
+ Add version
1
20

Add a new version

Firmware Id	demo_splash_screen
Version Id	V2
Description	New test version
Compatible versions	enter the compatible old versions ex: v1, v2, v3
File	Parcourir... Kenny.png

Cancel
Create new version

MQTT: firmware management


orange
Dashboard
Devices
Data
Alarms
Administration
Live Objects
«
Monitoring
Identity
Commands (Downlink)
Firmwares
Parameters
Logs
Cancel update
Update
1
Update history
Cancel
Save

Step into the device properties => Firmware

Devices > urn:lo:nsid:mqtt:3575200779... > Firmwares

Auto-created device (mqtt / 357520077996664) - urn:lo:nsid:mqtt:357520077996664

Firmwares

Firmware Id	Last refresh	Current version	Current version date	Target version	Target version date	Update status	Actions
demo_splash_screen	11/07/2017 9:28:16 AM	v1.0	07/06/2017 3:03:43 PM		-	-	Update

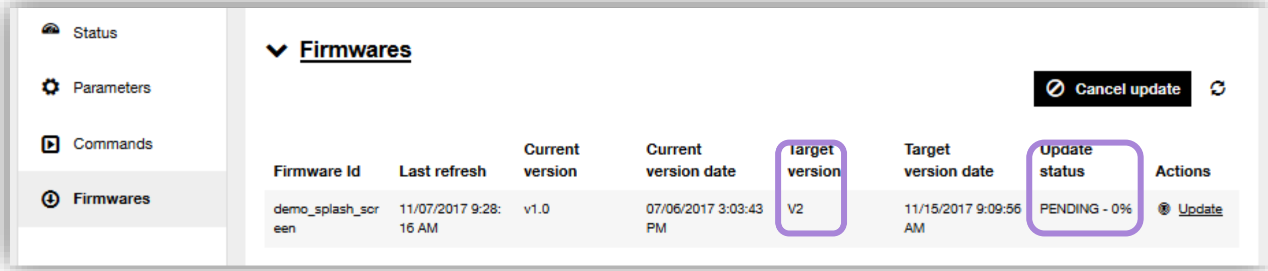
Select the targeted version

Set firmware's target version

Target version: V2

MQTT: firmware management : upgrade

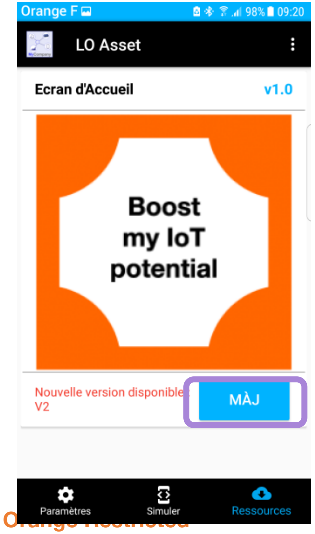
The new version is pending, waiting for the device connection


Status
Parameters
Commands
Firmwares
Cancel update

Firmwares

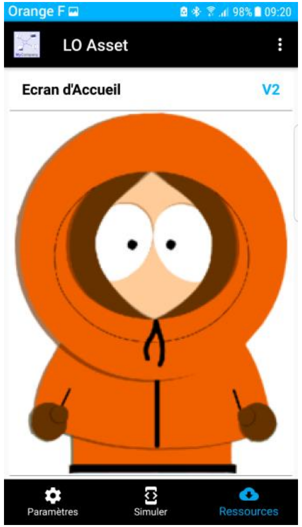
Firmware Id	Last refresh	Current version	Current version date	Target version	Target version date	Update status	Actions
demo_splash_screen	11/07/2017 9:28:16 AM	v1.0	07/06/2017 3:03:43 PM	V2	11/15/2017 9:09:56 AM	PENDING - 0%	Update

Notification of a new version :
- Select « MAJ » => the image/firmware has changed


Orange F
98% 09:20
LO Asset
Boost my IoT potential
MÀJ
Paramètres
Simuler
Ressources

Ecran d'Accueil v1.0

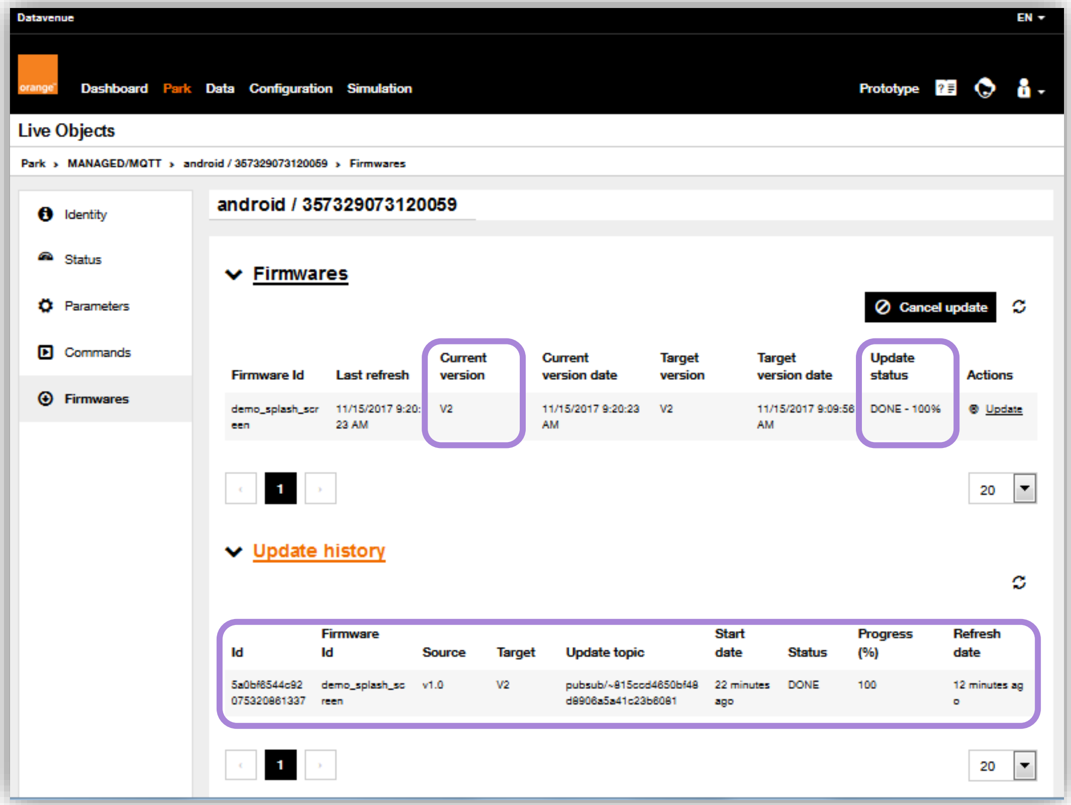
Nouvelle version disponible V2


Orange F
98% 09:20
LO Asset
Paramètres
Simuler
Ressources

Ecran d'Accueil V2

MQTT: firmware management : upgrade status

Status & history on the portal


Datavenue
EN
orange
Dashboard
Park
Data
Configuration
Simulation
Prototype
Live Objects
Park › MANAGED/MQTT › android / 357329073120059 › Firmwares
Identity
Status
Parameters
Commands
Firmwares
Cancel update
20

android / 357329073120059

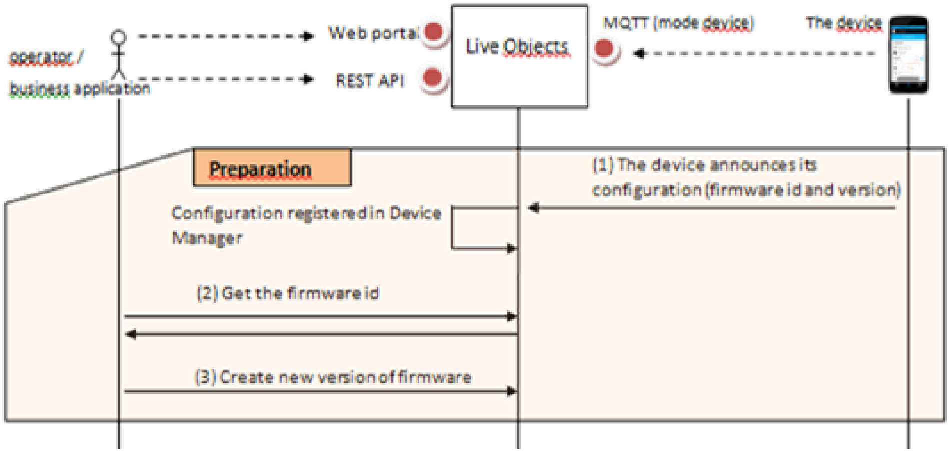
Firmwares

Firmware Id	Last refresh	Current version	Current version date	Target version	Target version date	Update status	Actions
demo_splash_screen	11/15/2017 9:20:23 AM	V2	11/15/2017 9:20:23 AM	V2	11/15/2017 9:09:56 AM	DONE - 100%	Update

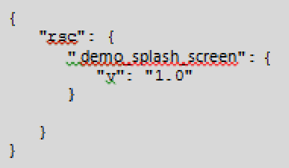
Update history

Id	Firmware Id	Source	Target	Update topic	Start date	Status	Progress (%)	Refresh date
5a0bf6544c92075320861337	demo_splash_screen	v1.0	V2	pubsub/~815ccd4650bf48d8906a5a41c23b6081	22 minutes ago	DONE	100	12 minutes ago

MQTT: firmware management : upgrade using API


operator /
business application
Web portal
REST API
Live Objects
MQTT (mode device)
The device
Preparation
(1) The device announces its configuration (firmware id and version)
Configuration registered in Device Manager
(2) Get the firmware id
(3) Create new version of firmware

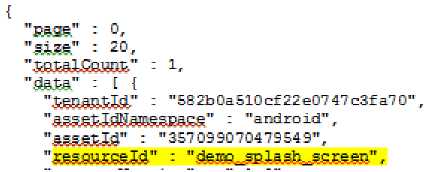
1 Device on : MQTT topic dev/rsc



```
{
    "rsc": {
        " demo_splash_screen": {
            "v": "1.0"
        }

    }
}
```

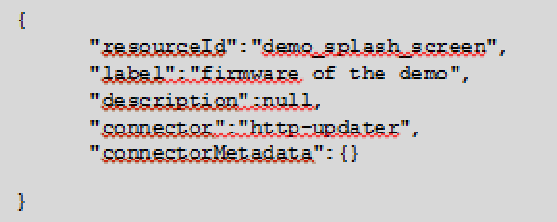
2 Get the device firmware Id
GET https://liveobjects.orange-business.com/api/v0/rm/asset/android/357099070479549?page=0&size=20

Answer :



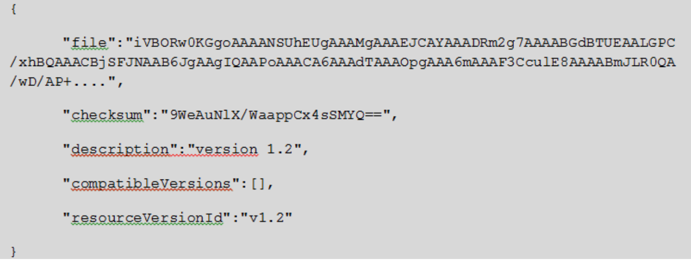
```
{
  "page" : 0,
  "size" : 20,
  "totalCount" : 1,
  "data" : [ {
    "tenantId" : "582b0a510cf22e0747c3fa70",
    "assetIdNamespace" : "android",
    "assetId" : "357099070479549",
    "resourceId" : "demo_splash_screen",
```

3 a Create the firmware into the Live Objects Resource Manager
POST https://liveobjects.orange-business.com/api/v0/rm



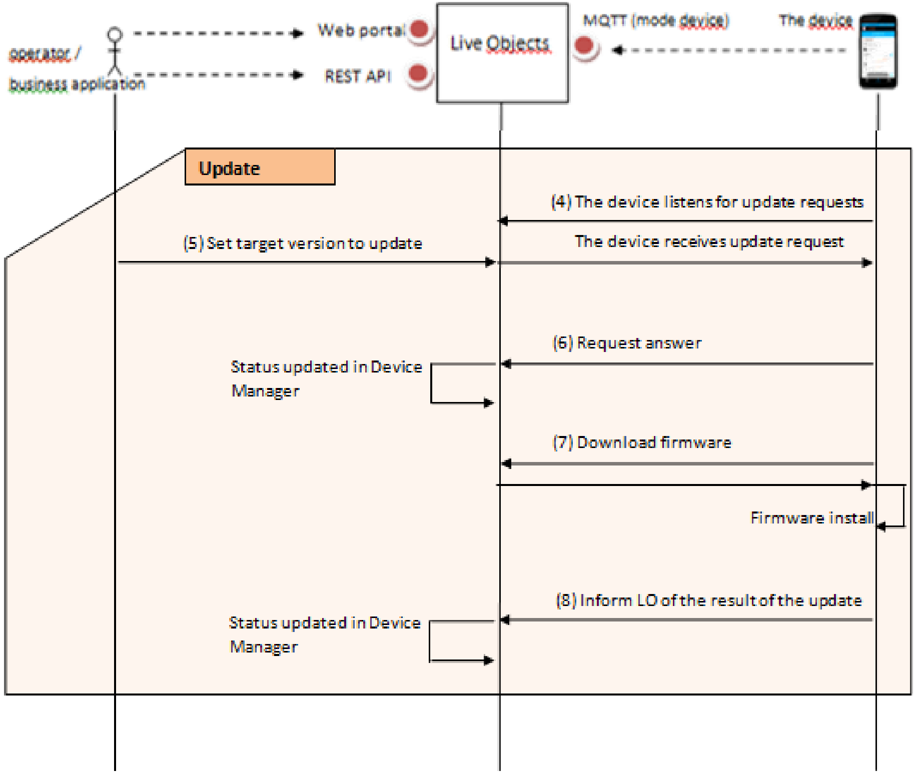
```
{
        "resourceId":"demo_splash_screen",
        "label":"firmware of the demo",
        "description":null,
        "connector":"http-updater",
        "connectorMetadata":{}

}
```

3 b Push the new firmware into the Resource Manager– define its version (1.2) : POST https://liveobjects.orange-business.com/api/v0/rm/demo_splash_screen/version



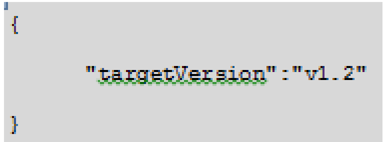
```
{

      "file":"iVBORw0KGgoAAAANSUhEUgAAAMgAAAEJCAYAAADRm2g7AAAABGdBTUEAALGPC
/xhBQAAACBjSFJNAAB6JgAAgIQAAPoAAACA6AAAdTAAAOpgAAA6mAAAF3CculE8AAAABmJLR0QA
/wD/AP+....",

      "checksum":"9WeAuNlX/WaappCx4sSMYQ==",

      "description":"version 1.2",

      "compatibleVersions":[],

      "resourceVersionId":"v1.2"

}
```

MQTT: firmware management : upgrade using API


operator / business application
Web portal
REST API
Live Objects
MQTT (mode device)
The device
Update
(4) The device listens for update requests
(5) Set target version to update
The device receives update request
(6) Request answer
Status updated in Device Manager
(7) Download firmware
Firmware install
(8) Inform LO of the result of the update
Status updated in Device Manager

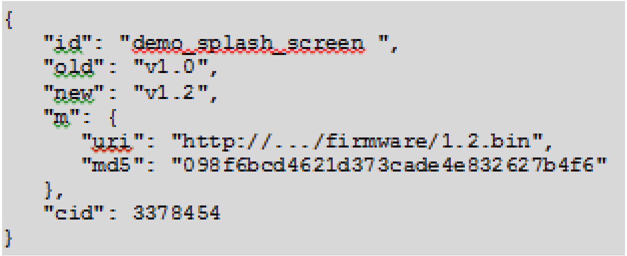
4 The device listens for update requests : it subscribes to MQTT topic dev/rsc/upd, waiting for update request

5 Define a transition from older to the new firmware
PUT https://liveobjects.orange-business.com/api/v0/rm/asset/**android/357099070479549**/resource/demo_splash_screen/targetversion



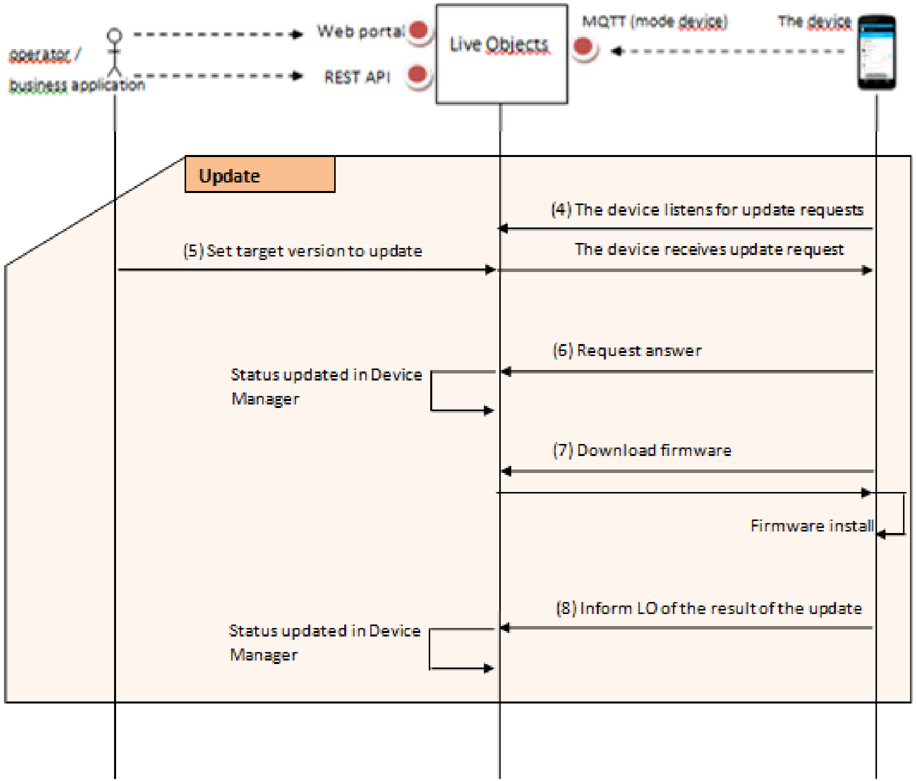
```
{
      "targetVersion":"v1.2"
}
```

The Device receives this message on dev/rsc/upd

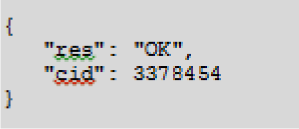


```
{
   "id": "demo_splash_screen ",
   "old": "v1.0",
   "new": "v1.2",
   "m": {
      "uri": "http://.../firmware/1.2.bin",
      "md5": "098f6bcd4621d373cade4e832627b4f6"
   },
   "cid": 3378454
}
```

MQTT: firmware management : upgrade using API


operator /
business application
Web portal
REST API
Live Objects
MQTT (mode device)
The device
Update
(4) The device listens for update requests
(5) Set target version to update
The device receives update request
(6) Request answer
Status updated in Device Manager
(7) Download firmware
Firmware install
(8) Inform LO of the result of the update
Status updated in Device Manager

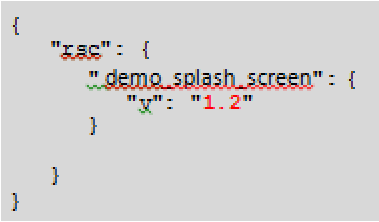
6 The device answers that it accepts to download the new firmware by publishing on dev/rsc/upd/res



```
{
   "res": "OK",
   "cid": 3378454
}
```

7 The device downloads the firmware from the URI given on step 5 (within 24h)
The device check the firmware, installs it

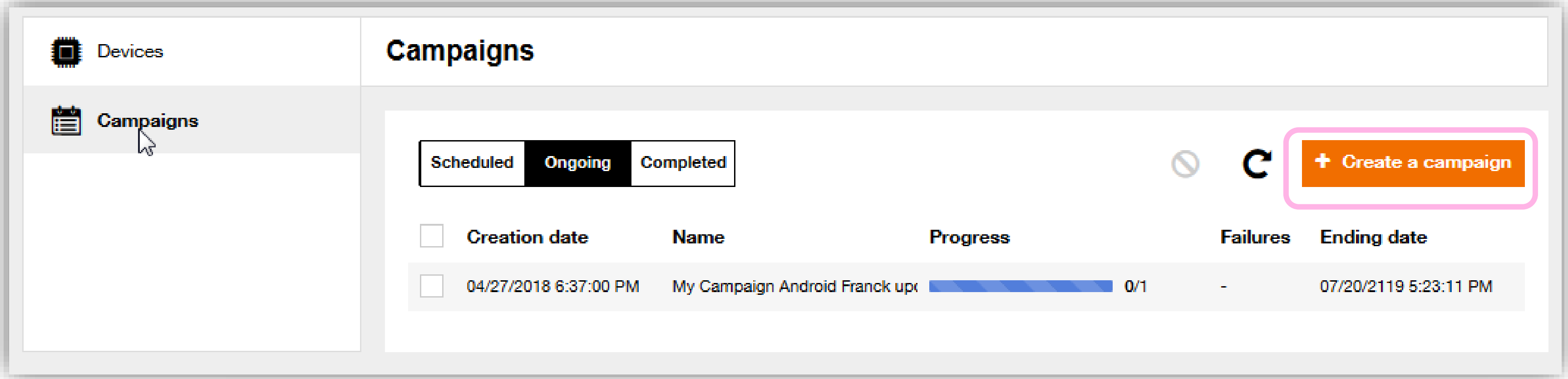
8 Inform Live Objects of the result of the update by publishing its new version on dev/rsc



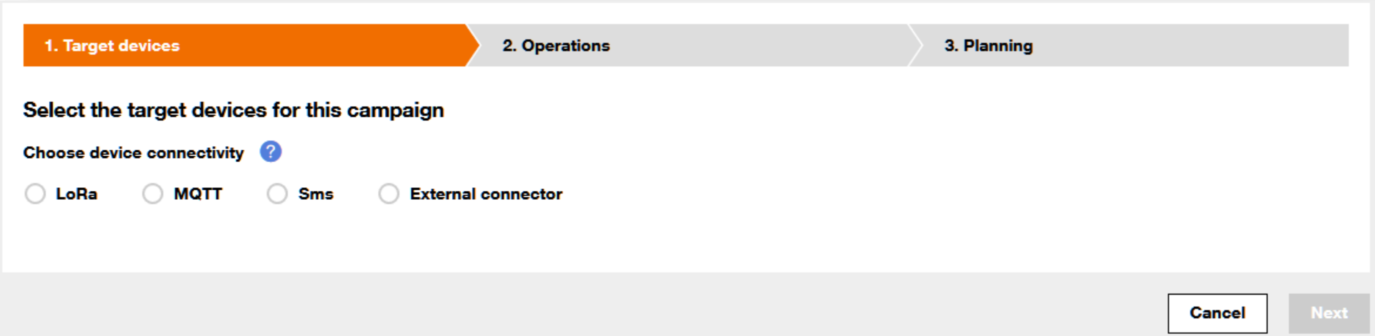
```
{
   "rsc": {
      "demo_splash_screen": {
         "v": "1.2"
      }

   }
}
```

Campaigns

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs


Devices
Campaigns
Campaigns
Scheduled
Ongoing
Completed
+ Create a campaign

☐	Creation date	Name	Progress	Failures	Ending date
☐	04/27/2018 6:37:00 PM	My Campaign Android Franck upc	0/1	-	07/20/2119 5:23:11 PM


1. Target devices
2. Operations
3. Planning

Select the target devices for this campaign

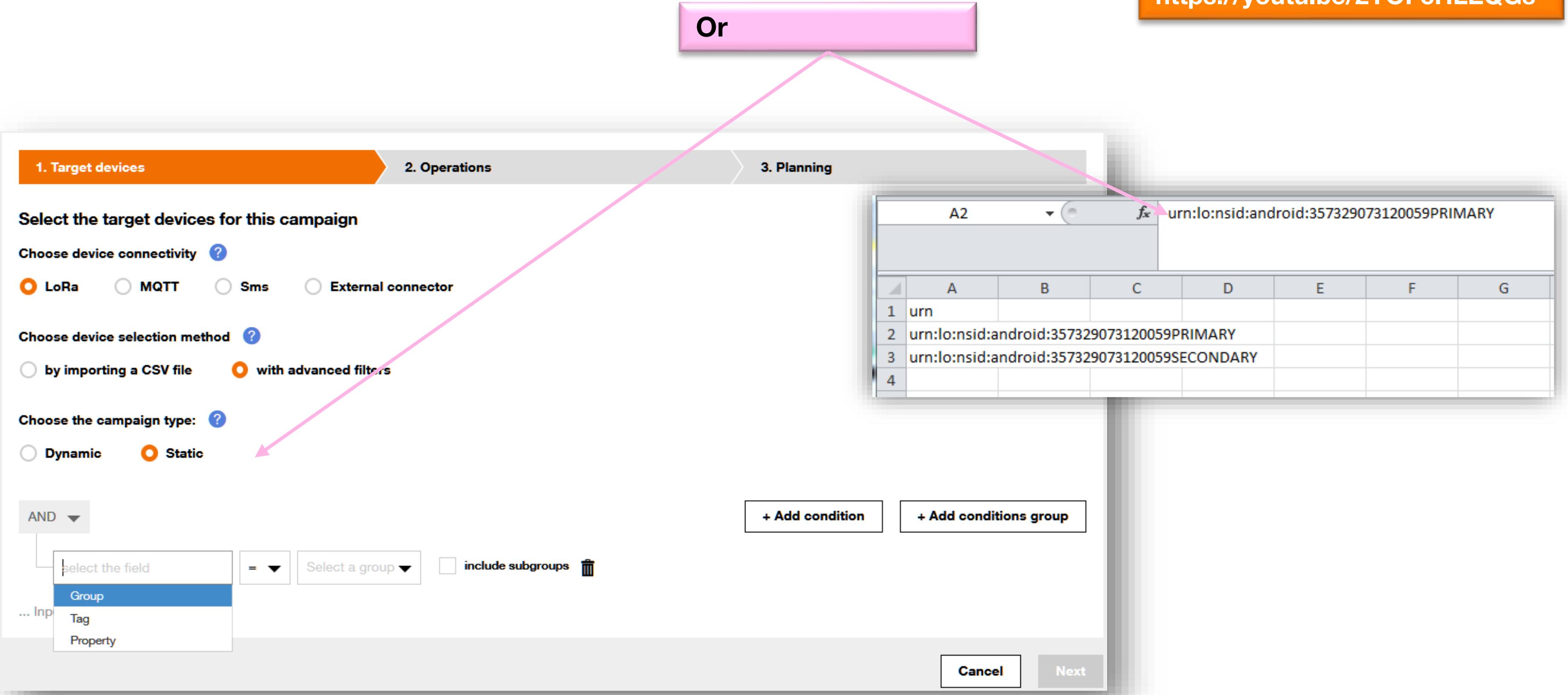
Choose device connectivity

○ LoRa ○ MQTT ○ Sms ○ External connector

Cancel
Next

Campaigns: devices

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs



Or

1. Target devices · 2. Operations · 3. Planning

Select the target devices for this campaign

Choose device connectivity

● LoRa ○ MQTT ○ Sms ○ External connector

Choose device selection method

○ by importing a CSV file ● with advanced filters

Choose the campaign type:

○ Dynamic ● Static

AND

select the field = Select a group ☐ include subgroups

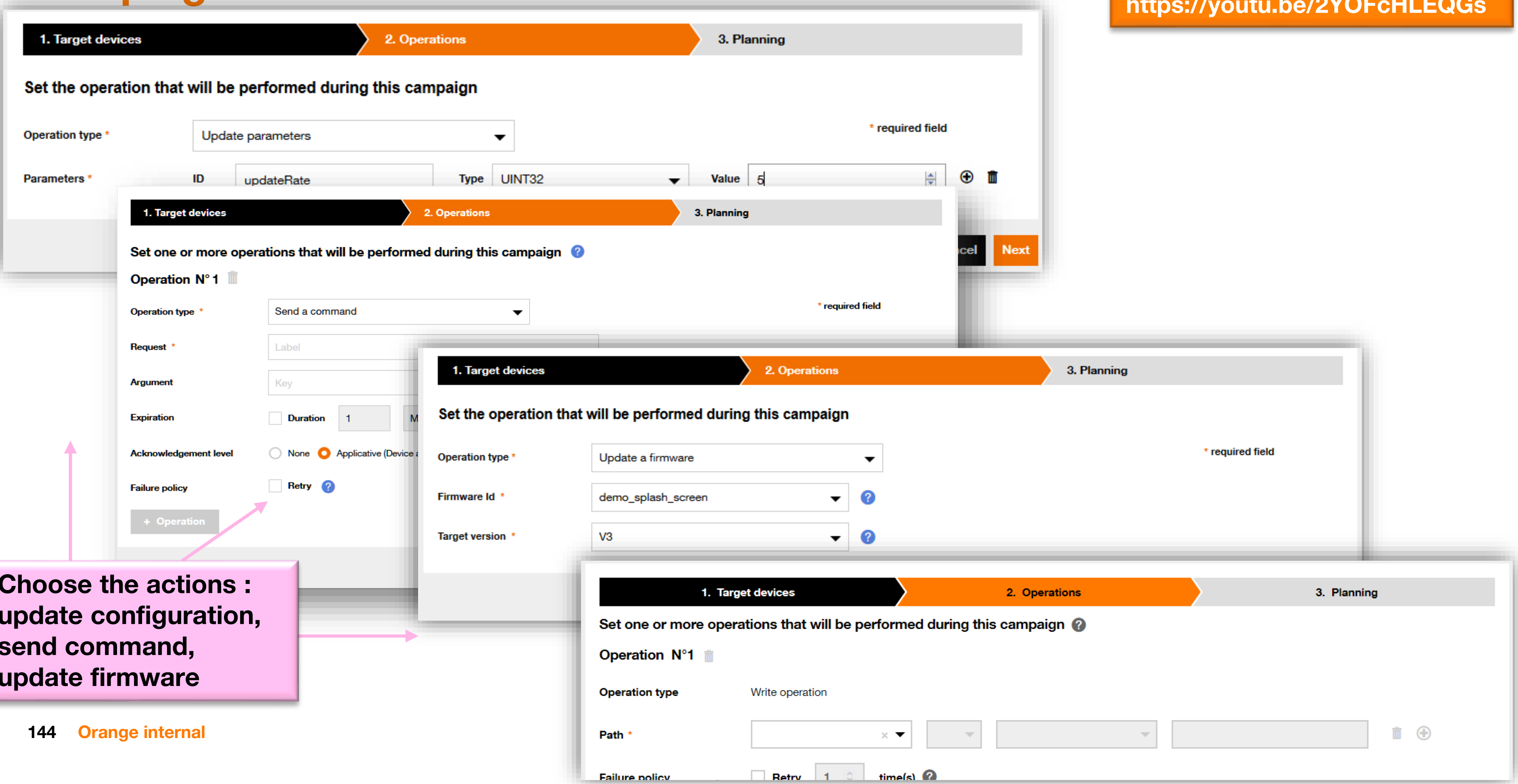
+ Add condition
+ Add conditions group
Group
Tag
Property
... Inp
Cancel
Next

A2 urn:lo:nsid:android:357329073120059PRIMARY

	A	B	C	D	E	F	G
1	urn						
2	urn:lo:nsid:android:357329073120059PRIMARY						
3	urn:lo:nsid:android:357329073120059SECONDARY						
4							

Campaigns: action

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs



1. Target devices | 2. Operations | 3. Planning

Set the operation that will be performed during this campaign

* required field

Operation type *: Update parameters

Parameters *: ID updateRate | Type UINT32 | Value 5

1. Target devices | 2. Operations | 3. Planning

Set one or more operations that will be performed during this campaign

Operation N° 1

* required field

Operation type *: Send a command

Request *: Label

Argument: Key

Expiration: ☐ Duration 1 M

Acknowledgement level: ○ None ● Applicative (Device a

Failure policy: ☐ Retry

1. Target devices | 2. Operations | 3. Planning

Set the operation that will be performed during this campaign

* required field

Operation type *: Update a firmware

Firmware Id *: demo_splash_screen

Target version *: V3

1. Target devices | 2. Operations | 3. Planning

Set one or more operations that will be performed during this campaign

Operation N°1

Operation type: Write operation

Path *:

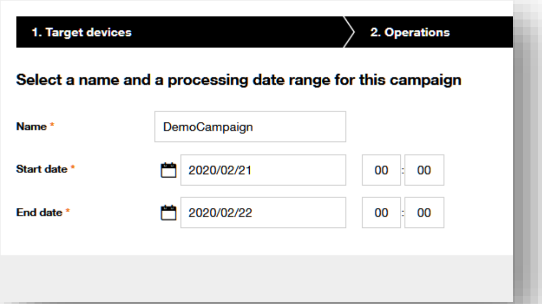
Failure policy: ☐ Retry 1 time(s)

Choose the actions : update configuration, send command, update firmware

Campaigns: results

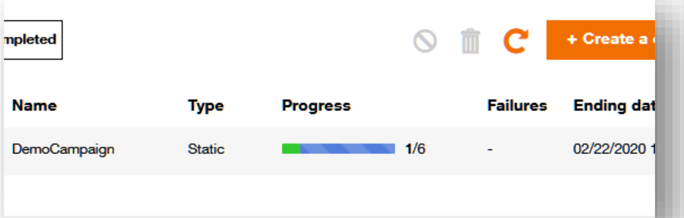
Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs

Define a schedule

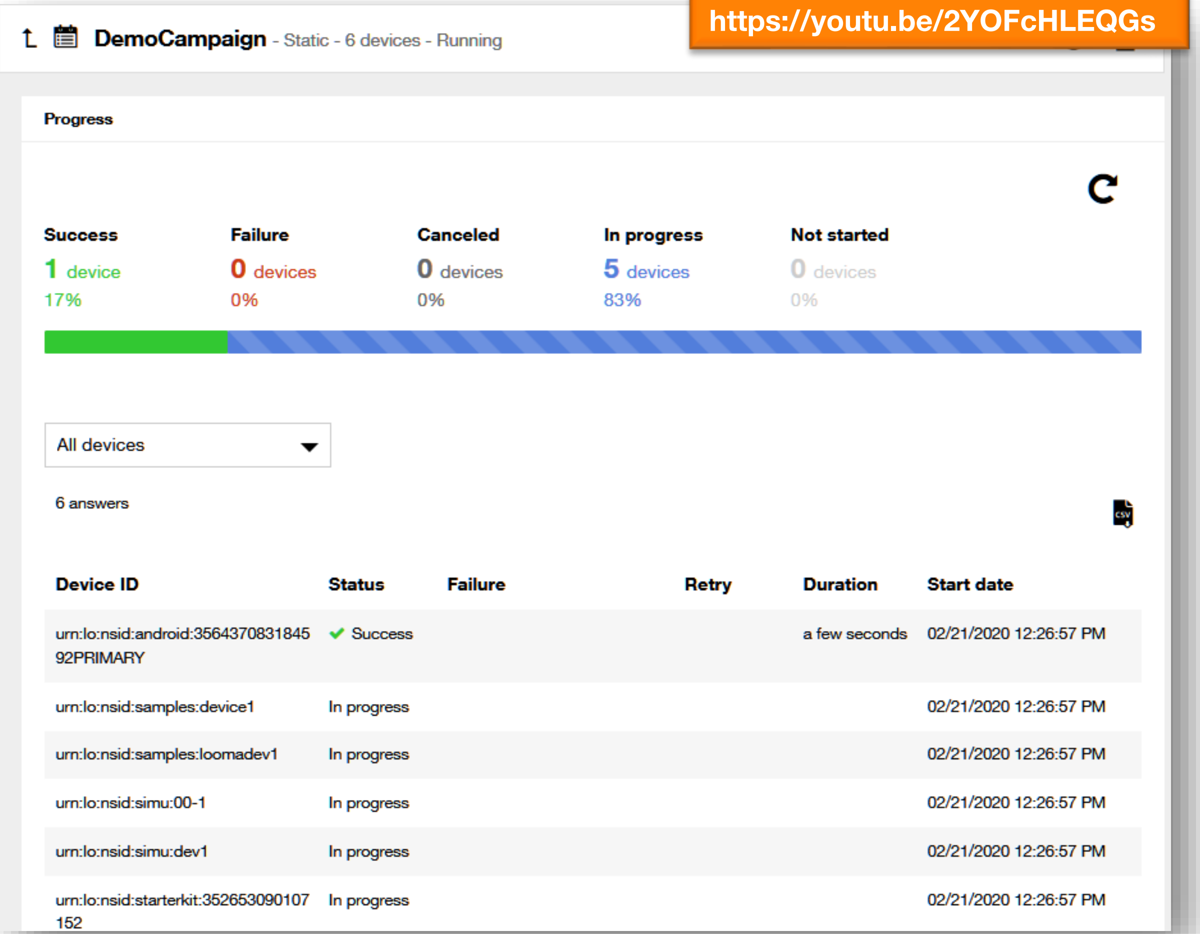


Select a name and a processing date range for this campaign

Name *	DemoCampaign	
Start date *	2020/02/21	00 : 00
End date *	2020/02/22	00 : 00



Name	Type	Progress	Failures	Ending dat
DemoCampaign	Static	1/6	-	02/22/2020 1



DemoCampaign - Static - 6 devices - Running

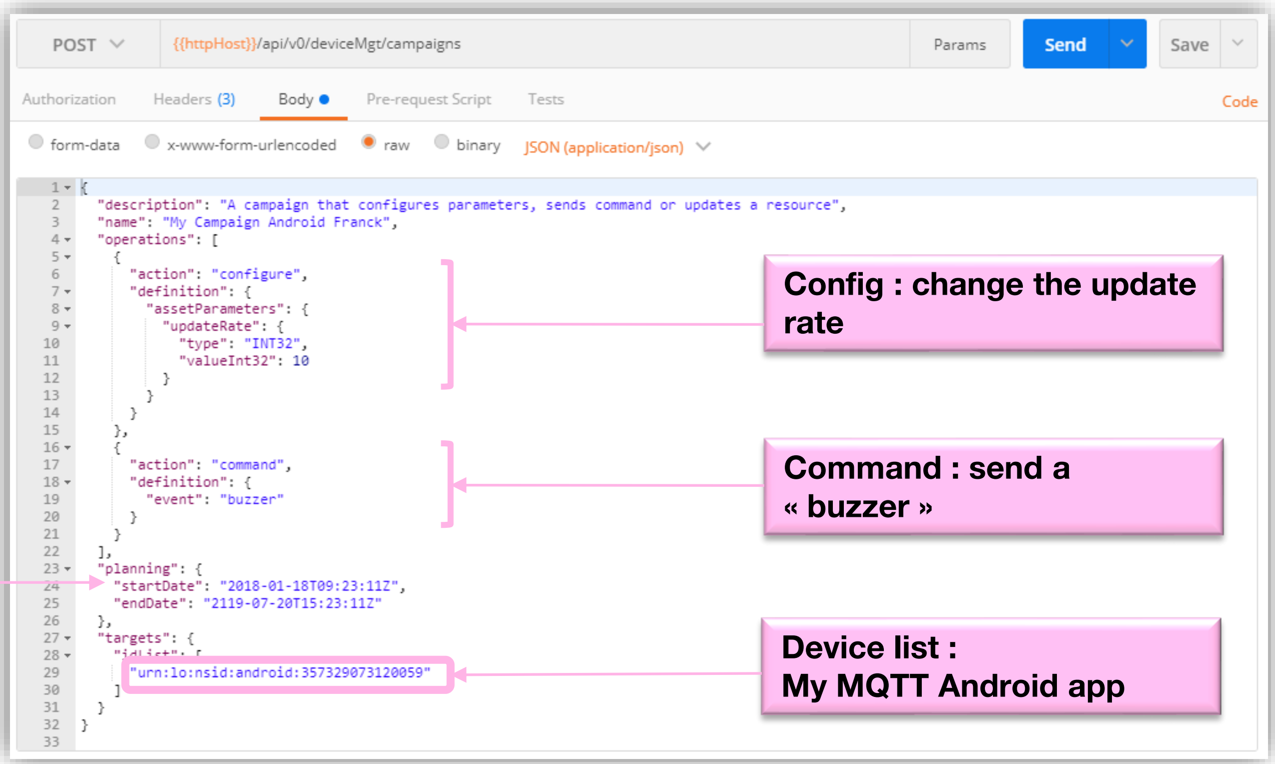
Progress

Success	Failure	Canceled	In progress	Not started
1 device	0 devices	0 devices	5 devices	0 devices
17%	0%	0%	83%	0%

6 answers

Device ID	Status	Failure	Retry	Duration	Start date
urn:lo:nsid:android:356437083184592PRIMARY	✓ Success			a few seconds	02/21/2020 12:26:57 PM
urn:lo:nsid:samples:device1	In progress				02/21/2020 12:26:57 PM
urn:lo:nsid:samples:loomadev1	In progress				02/21/2020 12:26:57 PM
urn:lo:nsid:simu:00-1	In progress				02/21/2020 12:26:57 PM
urn:lo:nsid:simu:dev1	In progress				02/21/2020 12:26:57 PM
urn:lo:nsid:starterkit:352653090107152	In progress				02/21/2020 12:26:57 PM

Campaigns using API


Params
Send
Save
Authorization
Headers (3)
Body
Pre-request Script
Tests
Code
○ form-data
○ x-www-form-urlencoded
● raw
○ binary
JSON (application/json)

POST {{httpHost}}/api/v0/deviceMgt/campaigns

```
{
  "description": "A campaign that configures parameters, sends command or updates a resource",
  "name": "My Campaign Android Franck",
  "operations": [
    {
      "action": "configure",
      "definition": {
        "assetParameters": {
          "updateRate": {
            "type": "INT32",
            "valueInt32": 10
          }
        }
      }
    },
    {
      "action": "command",
      "definition": {
        "event": "buzzer"
      }
    }
  ],
  "planning": {
    "startDate": "2018-01-18T09:23:11Z",
    "endDate": "2119-07-20T15:23:11Z"
  },
  "targets": {
    "idList": [
      "urn:lo:nsid:android:357329073120059"
    ]
  }
}
```

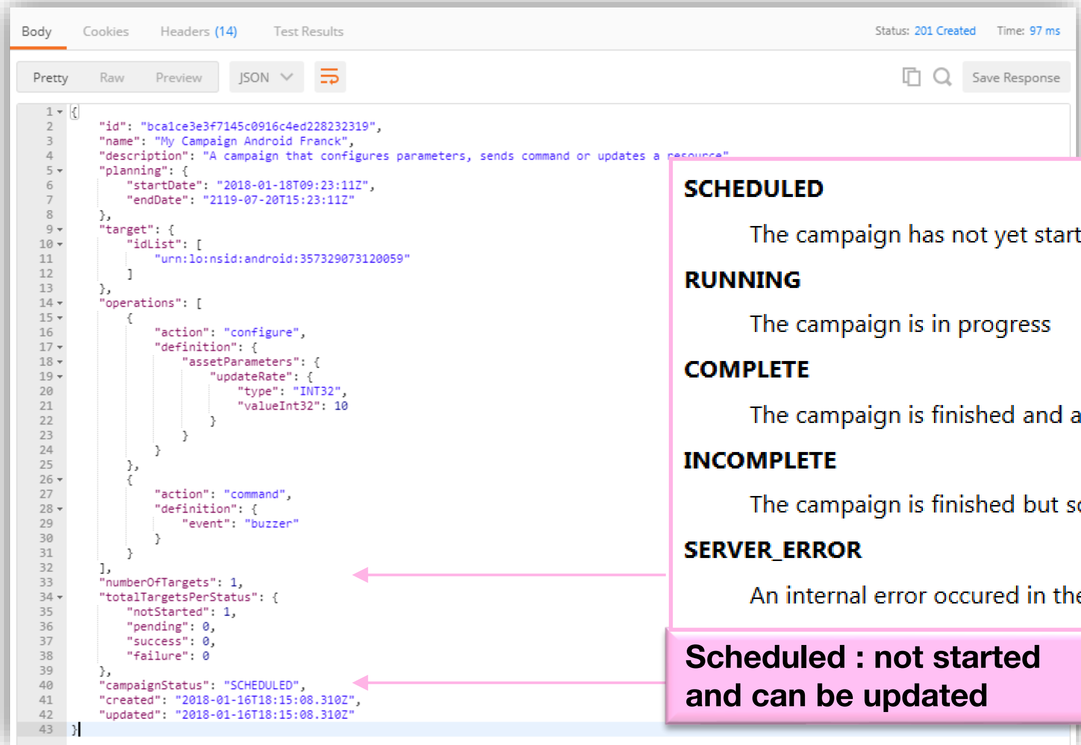
Config : change the update rate

Command : send a « buzzer »

Campaign planning

**Device list :
My MQTT Android app**

Campaigns using API - result



```json
{
    "id": "bca1ce3e3f7145c0916c4ed228232319",
    "name": "My Campaign Android Franck",
    "description": "A campaign that configures parameters, sends command or updates a resource",
    "planning": {
        "startDate": "2018-01-18T09:23:11Z",
        "endDate": "2119-07-20T15:23:11Z"
    },
    "target": {
        "idList": [
            "urn:lo:nsid:android:357329073120059"
        ]
    },
    "operations": [
        {
            "action": "configure",
            "definition": {
                "assetParameters": {
                    "updateRate": {
                        "type": "INT32",
                        "valueInt32": 10
                    }
                }
            }
        },
        {
            "action": "command",
            "definition": {
                "event": "buzzer"
            }
        }
    ],
    "numberOfTargets": 1,
    "totalTargetsPerStatus": {
        "notStarted": 1,
        "pending": 0,
        "success": 0,
        "failure": 0
    },
    "campaignStatus": "SCHEDULED",
    "created": "2018-01-16T18:15:08.310Z",
    "updated": "2018-01-16T18:15:08.310Z"
}
```

SCHEDULED

The campaign has not yet started

RUNNING

The campaign is in progress

COMPLETE

The campaign is finished and all devices have properly been configured

INCOMPLETE

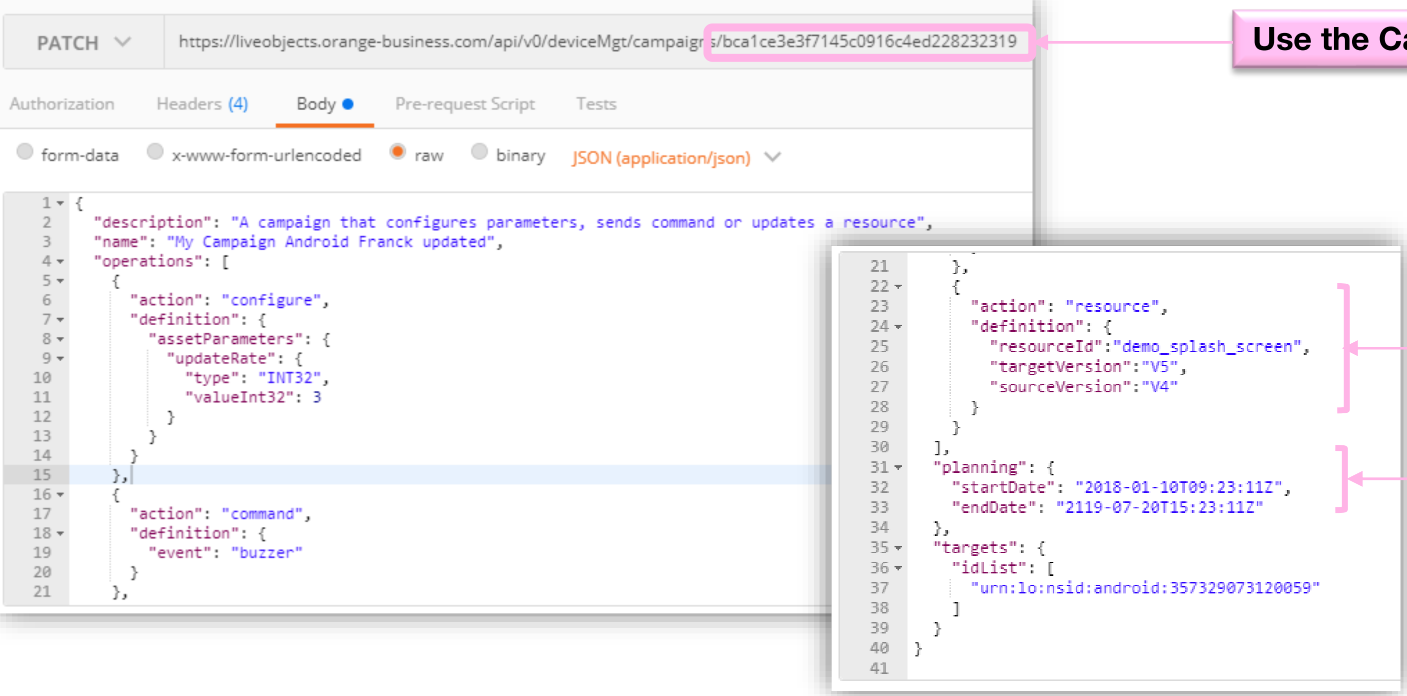
The campaign is finished but some devices could not be configured

SERVER_ERROR

An internal error occured in the platform and the campaign could not be completed

Scheduled : not started and can be updated

Campaigns using API – modification


PATCH
Authorization
Headers (4)
Body
Pre-request Script
Tests
○ form-data
○ x-www-form-urlencoded
● raw
○ binary
JSON (application/json)

```
https://liveobjects.orange-business.com/api/v0/deviceMgt/campaigns/bca1ce3e3f7145c0916c4ed228232319
```

```
{
  "description": "A campaign that configures parameters, sends command or updates a resource",
  "name": "My Campaign Android Franck updated",
  "operations": [
    {
      "action": "configure",
      "definition": {
        "assetParameters": {
          "updateRate": {
            "type": "INT32",
            "valueInt32": 3
          }
        }
      }
    },
    {
      "action": "command",
      "definition": {
        "event": "buzzer"
      }
    },
    {
      "action": "resource",
      "definition": {
        "resourceId":"demo_splash_screen",
        "targetVersion":"V5",
        "sourceVersion":"V4"
      }
    }
  ],
  "planning": {
    "startDate": "2018-01-10T09:23:11Z",
    "endDate": "2119-07-20T15:23:11Z"
  },
  "targets": {
    "idList": [
      "urn:lo:nsid:android:357329073120059"
    ]
  }
}
```

Use the Campaign Id

Add a firmware update

Launch ASAP => The status will be “Running”

CoAP / LwM2M

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ

To build a solution

- ☐ LwM2M interface for plug & play devices
- ☐ No need to develop or adapt a firmware to a specific cloud
- ☐ You can change a device model with no extra development
- ☐ You can change among LwM2M servers with no firmware development

To deploy device fleet

- ☐ “0 touch” provisioning with LwM2M Bootstrap (available end of 2022)

To run a solution

- ☐ Act on devices remotely
- ☐ Commands are clear (no hexadecimal command to find)
- ☐ Firmware update over the air
- ☐ Configure triggers to send a data or not

Live Objects specific support:

Through internet or mutualized APN : CoAP over TLS 1.2, with mandatory PSK

A private APN is required to use NO_SEC. Please contact our support if you want to use no_sec.

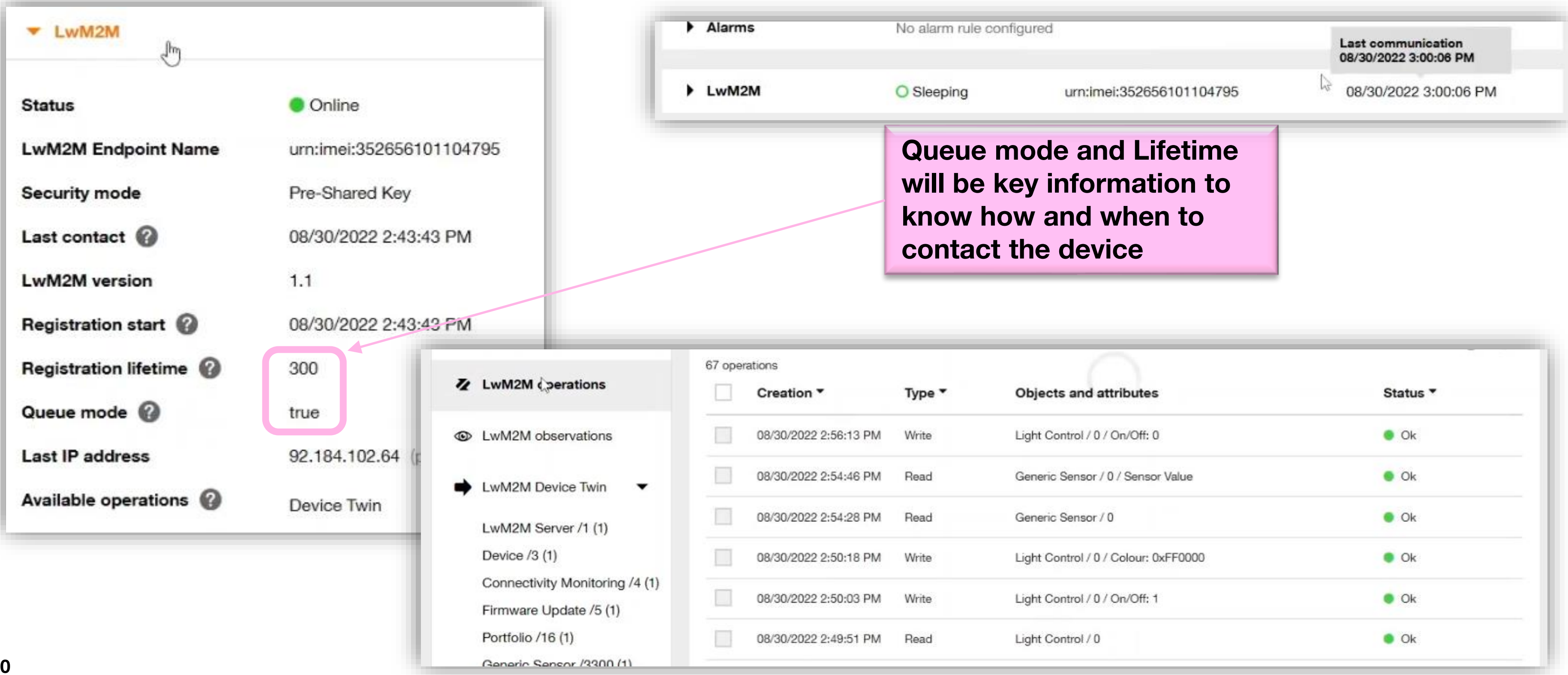
Any IP network, including LTE-M and NB-IoT, ready for 5G

LwM2M 1.0 and 1.1 compatibility, see the developer guide for the supported features

CoAP / LwM2M

Interface, sleeping and operations

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ



LwM2M

Status	● Online
LwM2M Endpoint Name	urn:imei:352656101104795
Security mode	Pre-Shared Key
Last contact	08/30/2022 2:43:43 PM
LwM2M version	1.1
Registration start	08/30/2022 2:43:43 PM
Registration lifetime	300
Queue mode	true
Last IP address	92.184.102.64
Available operations	Device Twin

Alarms	No alarm rule configured		
LwM2M	○ Sleeping	urn:imei:352656101104795	08/30/2022 3:00:06 PM

Last communication
08/30/2022 3:00:06 PM

Queue mode and Lifetime will be key information to know how and when to contact the device

- **LwM2M operations**
- LwM2M observations
- LwM2M Device Twin
  - LwM2M Server /1 (1)
  - Device /3 (1)
  - Connectivity Monitoring /4 (1)
  - Firmware Update /5 (1)
  - Portfolio /16 (1)
  - Generic Sensor /3300 (1)

67 operations

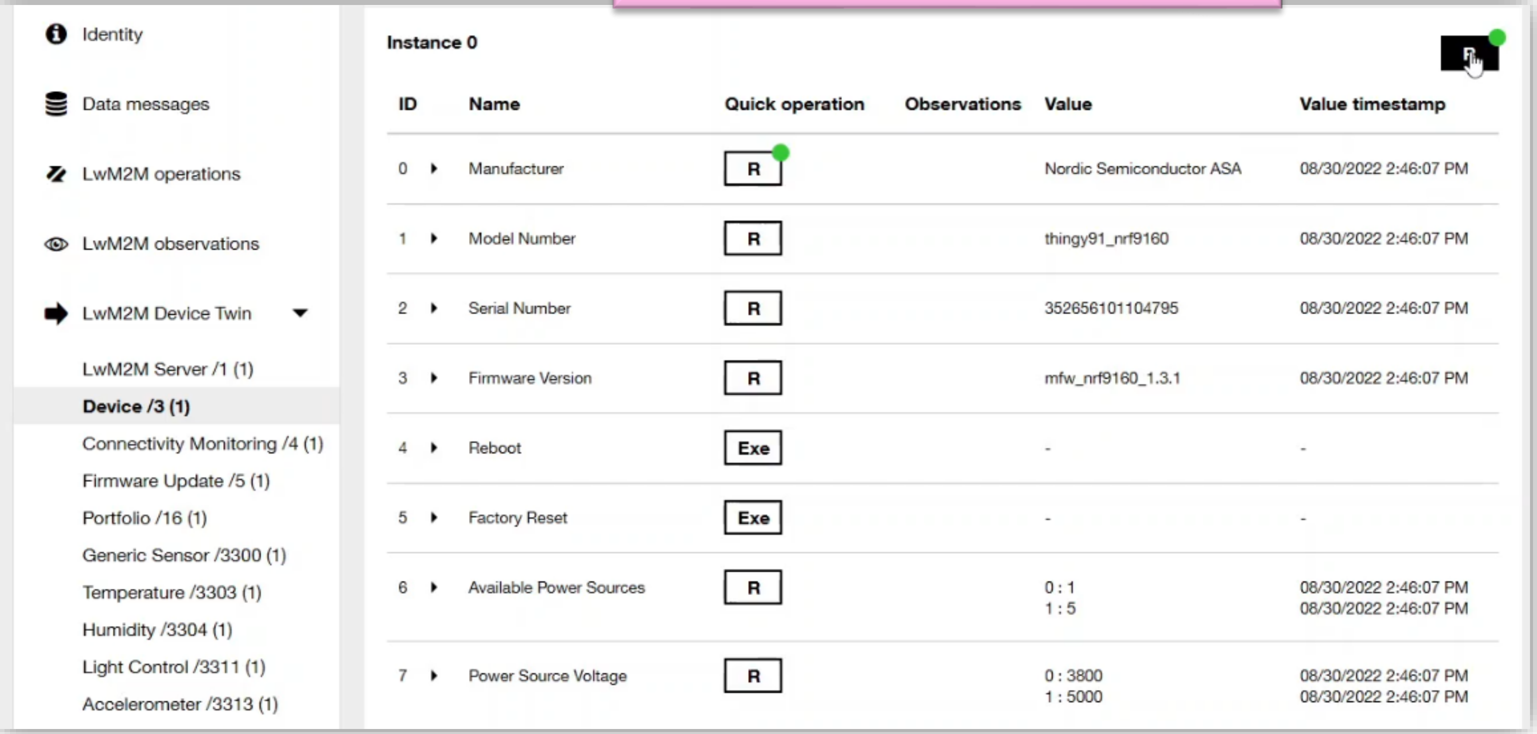
☐	Creation	Type	Objects and attributes	Status
☐	08/30/2022 2:56:13 PM	Write	Light Control / 0 / On/Off: 0	● Ok
☐	08/30/2022 2:54:46 PM	Read	Generic Sensor / 0 / Sensor Value	● Ok
☐	08/30/2022 2:54:28 PM	Read	Generic Sensor / 0	● Ok
☐	08/30/2022 2:50:18 PM	Write	Light Control / 0 / Colour: 0xFF0000	● Ok
☐	08/30/2022 2:50:03 PM	Write	Light Control / 0 / On/Off: 1	● Ok
☐	08/30/2022 2:49:51 PM	Read	Light Control / 0	● Ok

CoAP / LwM2M

Device twin: device management object

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ

Custom objects support, see the API on how to update the description XML



Identity
Data messages
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1 (1)
Device /3 (1)
Connectivity Monitoring /4 (1)
Firmware Update /5 (1)
Portfolio /16 (1)
Generic Sensor /3300 (1)
Temperature /3303 (1)
Humidity /3304 (1)
Light Control /3311 (1)
Accelerometer /3313 (1)

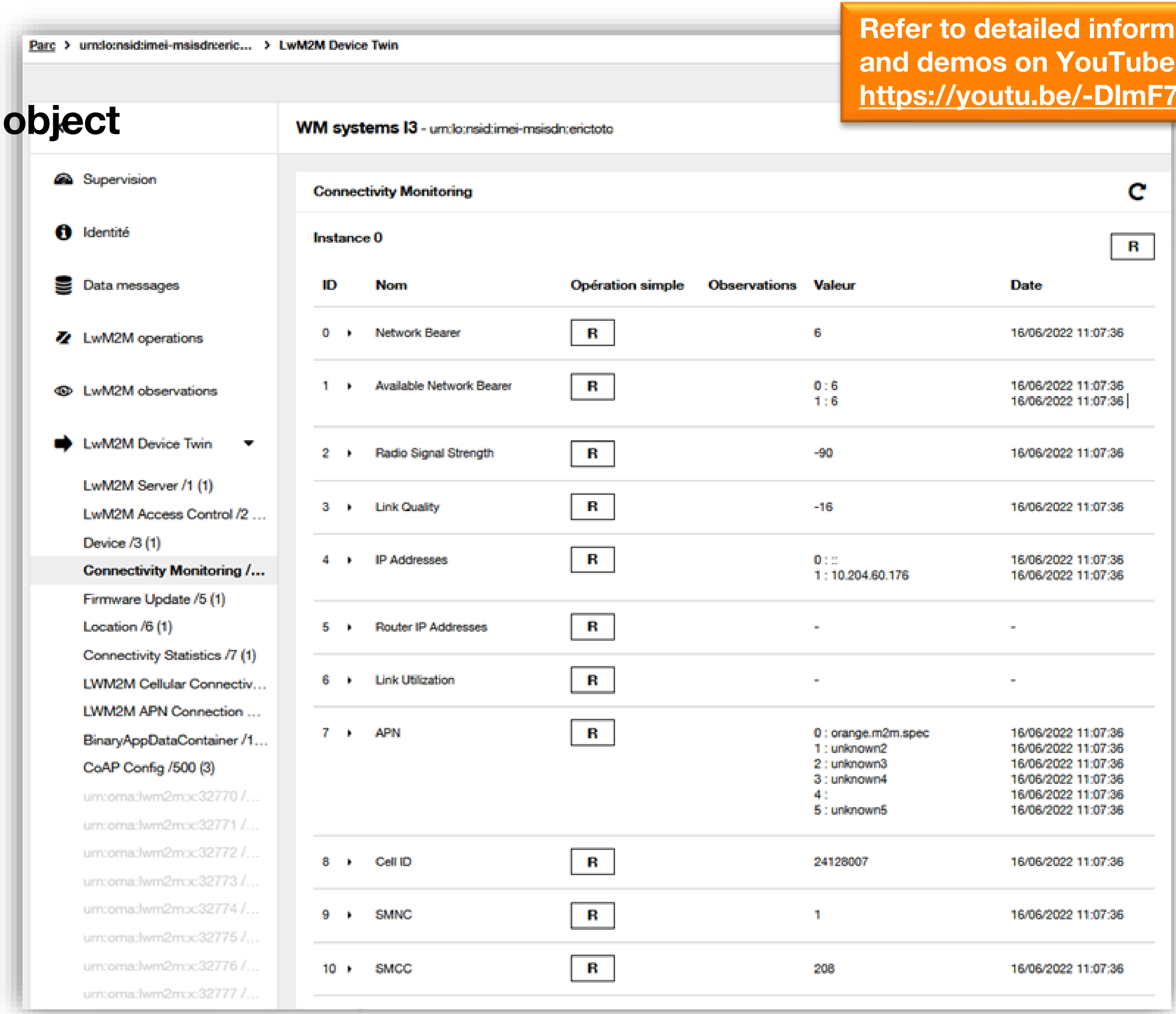
Instance 0

ID	Name	Quick operation	Observations	Value	Value timestamp
0	Manufacturer	R		Nordic Semiconductor ASA	08/30/2022 2:46:07 PM
1	Model Number	R		thingy91_nrf9160	08/30/2022 2:46:07 PM
2	Serial Number	R		352656101104795	08/30/2022 2:46:07 PM
3	Firmware Version	R		mfw_nrf9160_1.3.1	08/30/2022 2:46:07 PM
4	Reboot	Exe		-	-
5	Factory Reset	Exe		-	-
6	Available Power Sources	R		0 : 1 1 : 5	08/30/2022 2:46:07 PM 08/30/2022 2:46:07 PM
7	Power Source Voltage	R		0 : 3800 1 : 5000	08/30/2022 2:46:07 PM 08/30/2022 2:46:07 PM

CoAP / LwM2M

Device twin: monitoring object

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


Parc > urn:lo:nsid:imei-msisdn:eric... > LwM2M Device Twin
Supervision
Identité
Data messages
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1 (1)
LwM2M Access Control /2 ...
Device /3 (1)
Connectivity Monitoring /...
Firmware Update /5 (1)
Location /6 (1)
Connectivity Statistics /7 (1)
LWM2M Cellular Connectiv...
LWM2M APN Connection ...
BinaryAppDataContainer /1...
CoAP Config /500 (3)
urn:oma:lwm2m:x:32770 /...
urn:oma:lwm2m:x:32771 /...
urn:oma:lwm2m:x:32772 /...
urn:oma:lwm2m:x:32773 /...
urn:oma:lwm2m:x:32774 /...
urn:oma:lwm2m:x:32775 /...
urn:oma:lwm2m:x:32776 /...
urn:oma:lwm2m:x:32777 /...

WM systems I3 - urn:lo:nsid:imei-msisdn:erictoto

Connectivity Monitoring

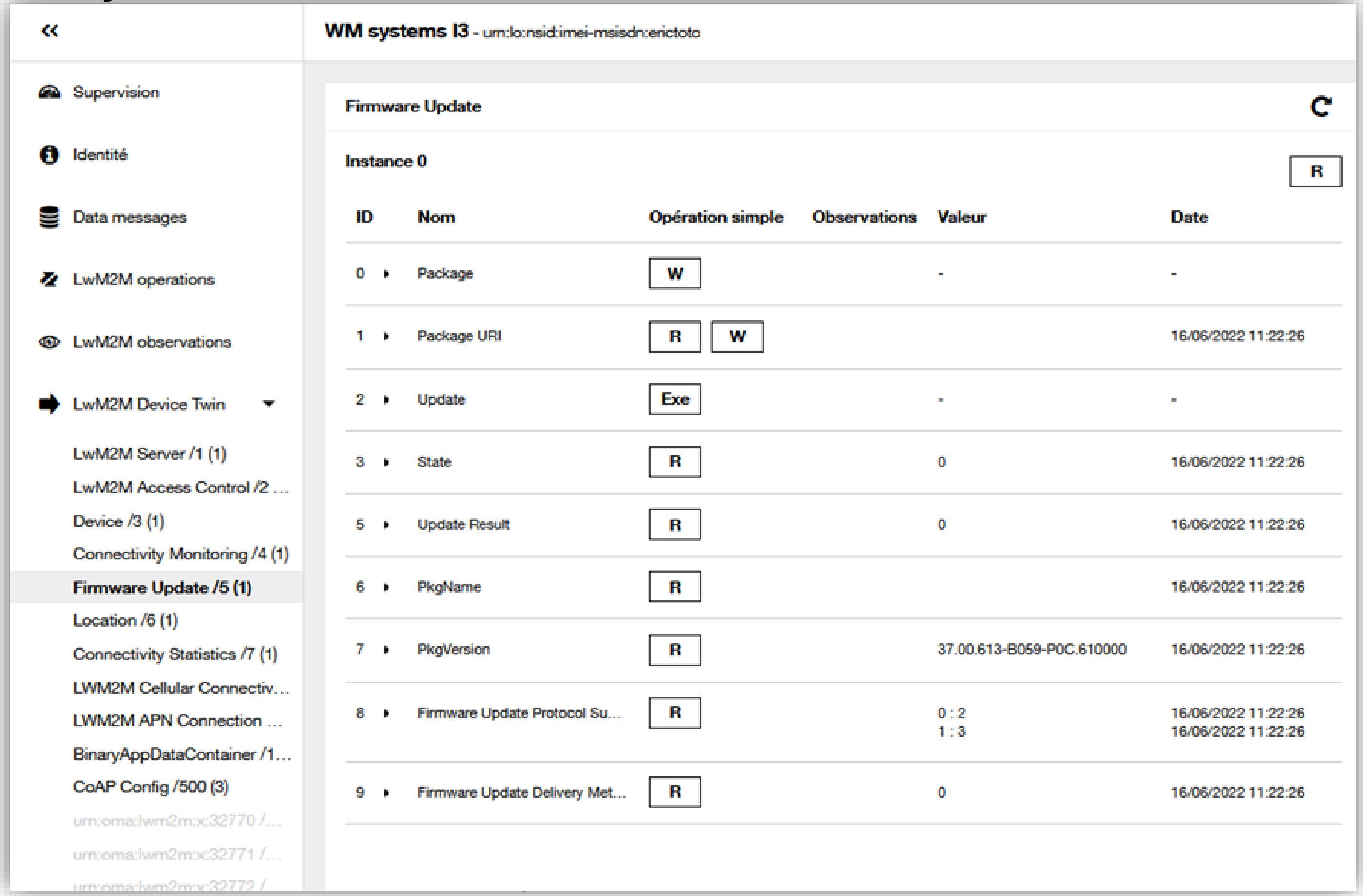
Instance 0

ID	Nom	Opération simple	Observations	Valeur	Date
0	Network Bearer	R		6	16/06/2022 11:07:36
1	Available Network Bearer	R		0 : 6 1 : 6	16/06/2022 11:07:36 16/06/2022 11:07:36
2	Radio Signal Strength	R		-90	16/06/2022 11:07:36
3	Link Quality	R		-16	16/06/2022 11:07:36
4	IP Addresses	R		0 : :: 1 : 10.204.60.176	16/06/2022 11:07:36 16/06/2022 11:07:36
5	Router IP Addresses	R		-	-
6	Link Utilization	R		-	-
7	APN	R		0 : orange.m2m.spec 1 : unknown2 2 : unknown3 3 : unknown4 4 : 5 : unknown5	16/06/2022 11:07:36 16/06/2022 11:07:36 16/06/2022 11:07:36 16/06/2022 11:07:36 16/06/2022 11:07:36 16/06/2022 11:07:36
8	Cell ID	R		24128007	16/06/2022 11:07:36
9	SMNC	R		1	16/06/2022 11:07:36
10	SMCC	R		208	16/06/2022 11:07:36

CoAP / LwM2M

Device twin: FOTA object

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


«
Supervision
Identité
Data messages
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1 (1)
LwM2M Access Control /2 ...
Device /3 (1)
Connectivity Monitoring /4 (1)
Firmware Update /5 (1)
Location /6 (1)
Connectivity Statistics /7 (1)
LWM2M Cellular Connectiv...
LWM2M APN Connection ...
BinaryAppDataContainer /1...
CoAP Config /500 (3)
urn:oma:lwm2m:x:32770 /...
urn:oma:lwm2m:x:32771 /...
urn:oma:lwm2m:x:32772 /...
C
R

WM systems I3 - urn:lo:nsid:imei-msisdn:erictoto

Firmware Update

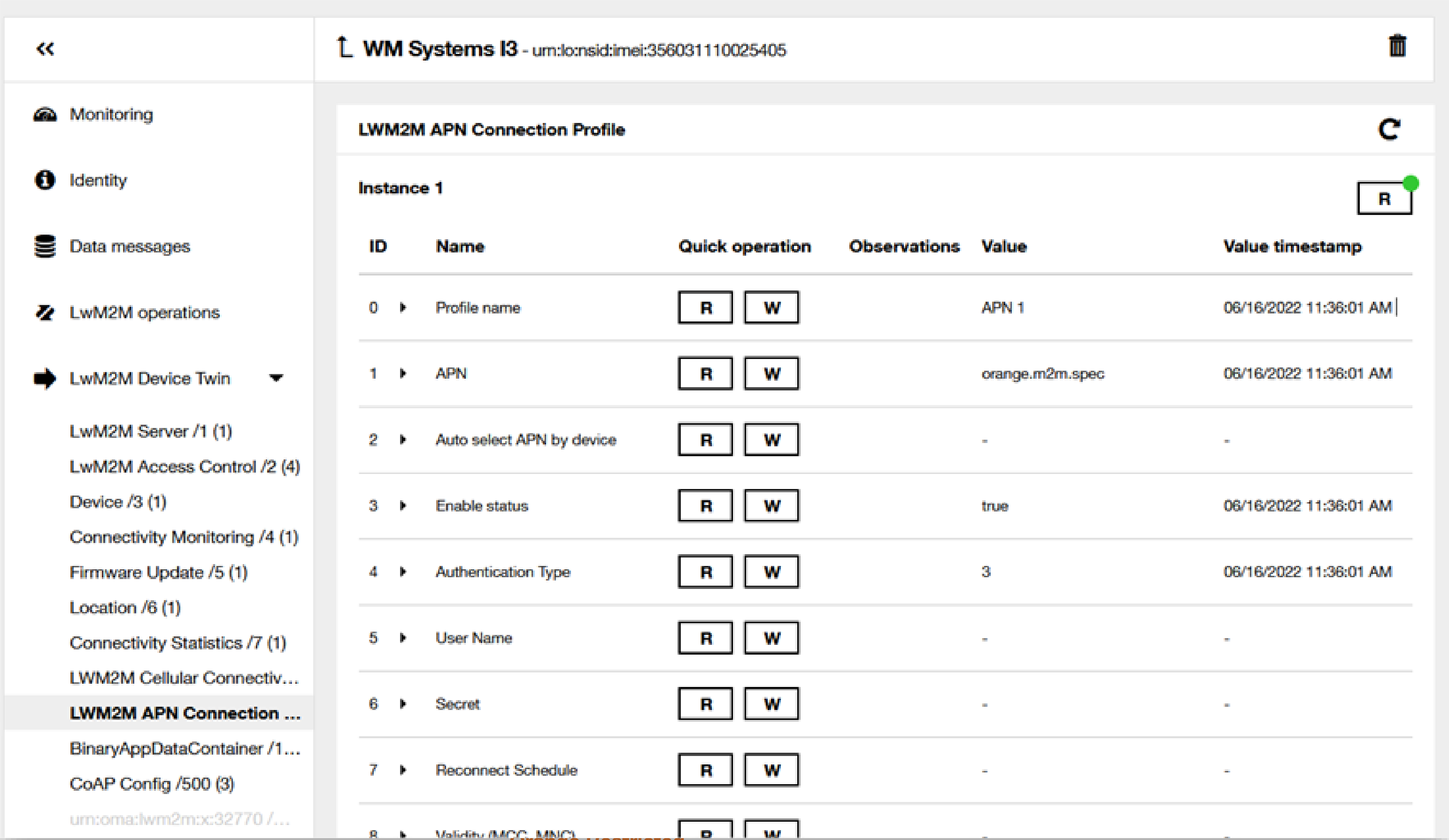
Instance 0

ID	Nom	Opération simple	Observations	Valeur	Date
0	Package	W		-	-
1	Package URI	R W			16/06/2022 11:22:26
2	Update	Exe		-	-
3	State	R		0	16/06/2022 11:22:26
5	Update Result	R		0	16/06/2022 11:22:26
6	PkgName	R			16/06/2022 11:22:26
7	PkgVersion	R		37.00.613-B059-P0C.610000	16/06/2022 11:22:26
8	Firmware Update Protocol Su...	R		0 : 2 1 : 3	16/06/2022 11:22:26 16/06/2022 11:22:26
9	Firmware Update Delivery Met...	R		0	16/06/2022 11:22:26

CoAP / LwM2M

Device twin: configuration object

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


«
Monitoring
Identity
Data messages
LwM2M operations
LwM2M Device Twin
LwM2M Server /1 (1)
LwM2M Access Control /2 (4)
Device /3 (1)
Connectivity Monitoring /4 (1)
Firmware Update /5 (1)
Location /6 (1)
Connectivity Statistics /7 (1)
LWM2M Cellular Connectiv…
LWM2M APN Connection …
BinaryAppDataContainer /1…
CoAP Config /500 (3)
urn:oma:lwm2m:x:32770 /…
R

WM Systems I3 - urn:lo:nsid:imei:356031110025405

LWM2M APN Connection Profile

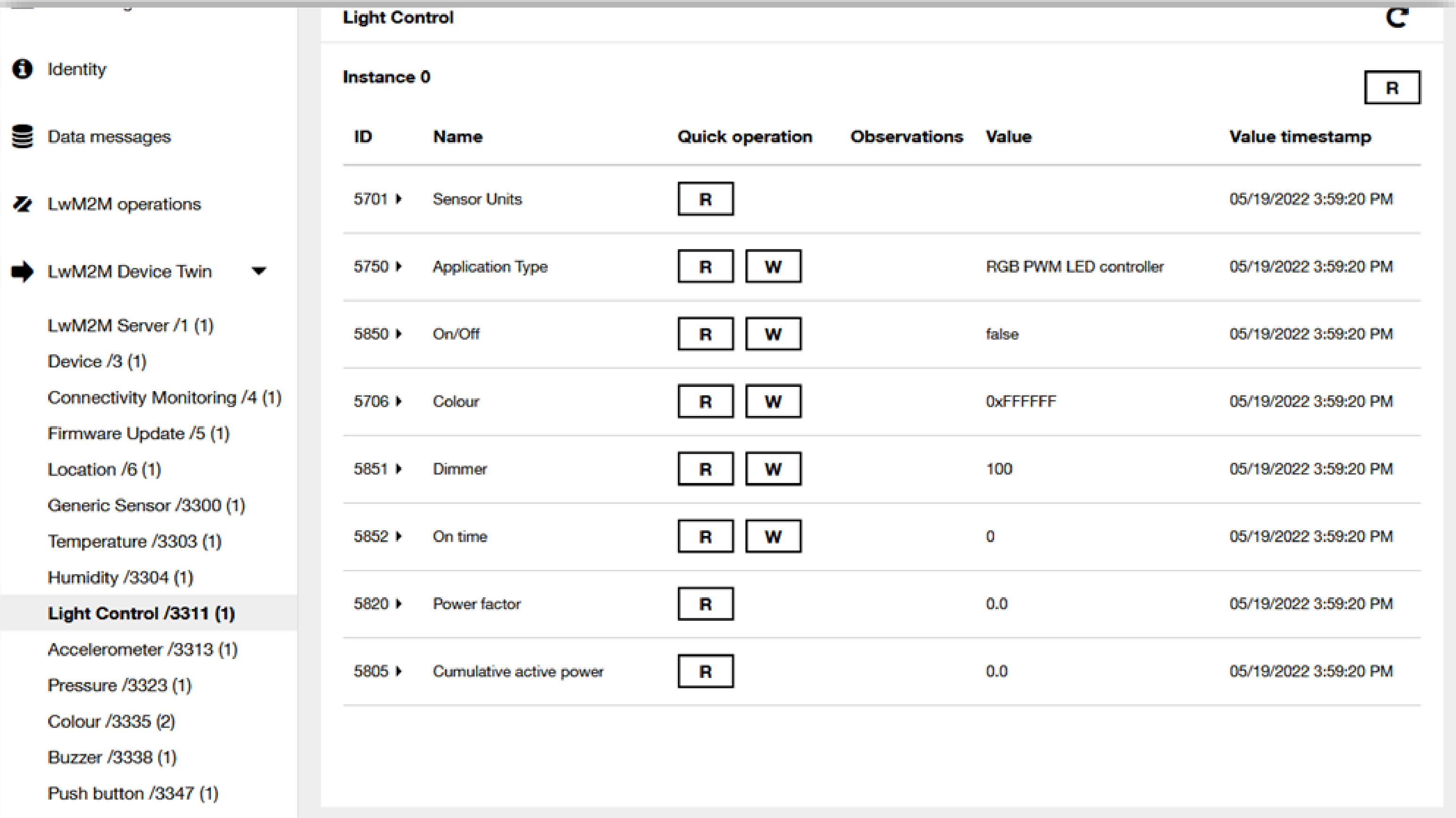
Instance 1

ID	Name	Quick operation	Observations	Value	Value timestamp
0	Profile name	R W		APN 1	06/16/2022 11:36:01 AM
1	APN	R W		orange.m2m.spec	06/16/2022 11:36:01 AM
2	Auto select APN by device	R W		-	-
3	Enable status	R W		true	06/16/2022 11:36:01 AM
4	Authentication Type	R W		3	06/16/2022 11:36:01 AM
5	User Name	R W		-	-
6	Secret	R W		-	-
7	Reconnect Schedule	R W		-	-
8	Validity (MCC, MNC)	R W		-	-

CoAP / LwM2M

Device twin: business object

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ



- Identity
- Data messages
- LwM2M operations
- LwM2M Device Twin
  - LwM2M Server /1 (1)
  - Device /3 (1)
  - Connectivity Monitoring /4 (1)
  - Firmware Update /5 (1)
  - Location /6 (1)
  - Generic Sensor /3300 (1)
  - Temperature /3303 (1)
  - Humidity /3304 (1)
  - **Light Control /3311 (1)**
  - Accelerometer /3313 (1)
  - Pressure /3323 (1)
  - Colour /3335 (2)
  - Buzzer /3338 (1)
  - Push button /3347 (1)

Light Control

Instance 0

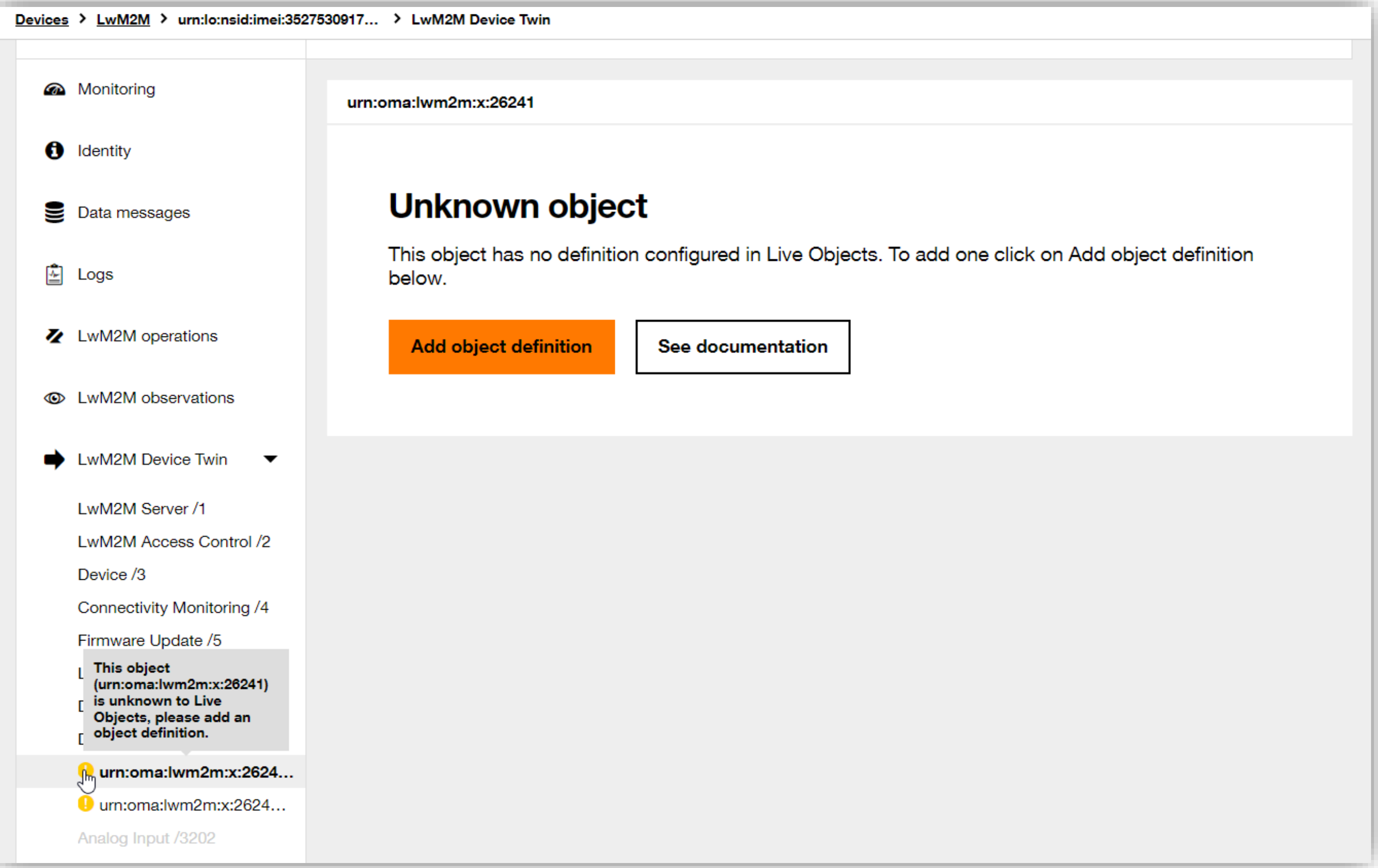
R

ID	Name	Quick operation	Observations	Value	Value timestamp
5701 ▸	Sensor Units	R			05/19/2022 3:59:20 PM
5750 ▸	Application Type	R W		RGB PWM LED controller	05/19/2022 3:59:20 PM
5850 ▸	On/Off	R W		false	05/19/2022 3:59:20 PM
5706 ▸	Colour	R W		0xFFFFFF	05/19/2022 3:59:20 PM
5851 ▸	Dimmer	R W		100	05/19/2022 3:59:20 PM
5852 ▸	On time	R W		0	05/19/2022 3:59:20 PM
5820 ▸	Power factor	R		0.0	05/19/2022 3:59:20 PM
5805 ▸	Cumulative active power	R		0.0	05/19/2022 3:59:20 PM

CoAP / LwM2M

Device twin: custom objects

Refer to detailed information and demos on YouTube: https://youtu.be/-DImF70aKLQ


Devices > LwM2M > urn:lo:nsid:imei:3527530917… > LwM2M Device Twin
Monitoring
Identity
Data messages
Logs
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1
LwM2M Access Control /2
Device /3
Connectivity Monitoring /4
Firmware Update /5
urn:oma:lwm2m:x:2624…
urn:oma:lwm2m:x:2624…
Analog Input /3202
urn:oma:lwm2m:x:26241
Add object definition
See documentation

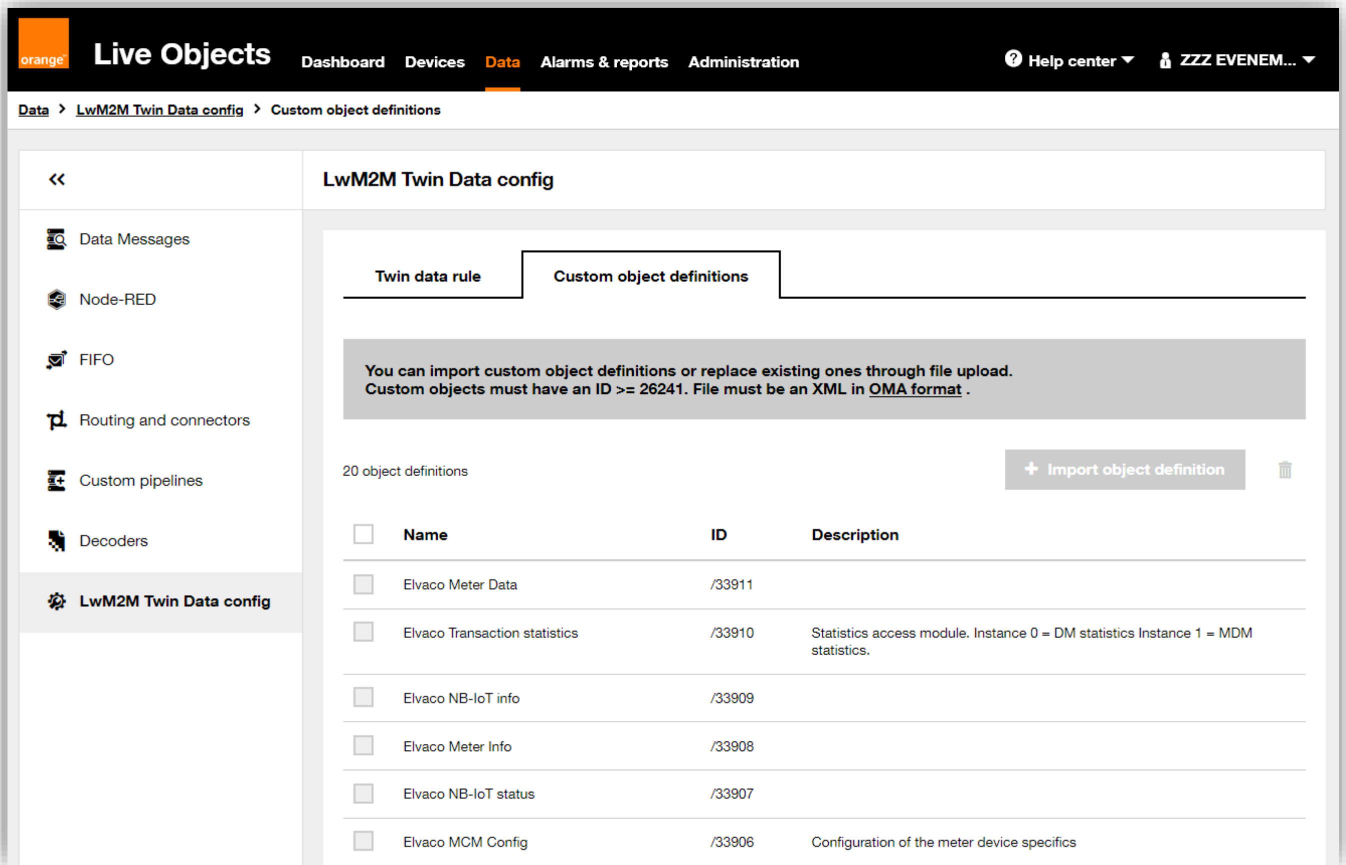
Unknown object

This object has no definition configured in Live Objects. To add one click on Add object definition below.

This object (urn:oma:lwm2m:x:26241) is unknown to Live Objects, please add an object definition.

CoAP / LwM2M
Device twin: custom objects

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


orange
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
ZZZ EVENEM...
Data › LwM2M Twin Data config › Custom object definitions
«
Data Messages
Node-RED
FIFO
Routing and connectors
Custom pipelines
Decoders
LwM2M Twin Data config
LwM2M Twin Data config
Twin data rule
Custom object definitions
+ Import object definition

You can import custom object definitions or replace existing ones through file upload.
Custom objects must have an ID >= 26241. File must be an XML in OMA format .

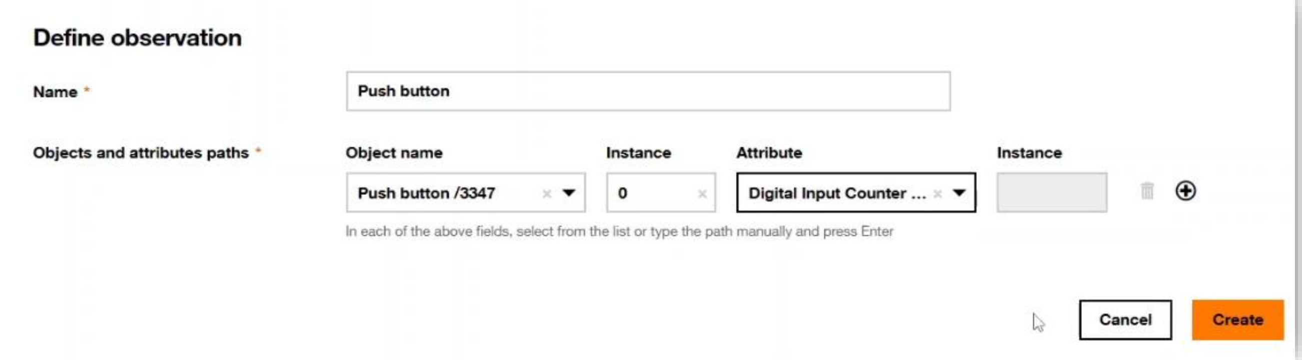
20 object definitions

☐	Name	ID	Description
☐	Elvaco Meter Data	/33911	
☐	Elvaco Transaction statistics	/33910	Statistics access module. Instance 0 = DM statistics Instance 1 = MDM statistics.
☐	Elvaco NB-IoT info	/33909	
☐	Elvaco Meter Info	/33908	
☐	Elvaco NB-IoT status	/33907	
☐	Elvaco MCM Config	/33906	Configuration of the meter device specifics

CoAP / LwM2M

Observations

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ



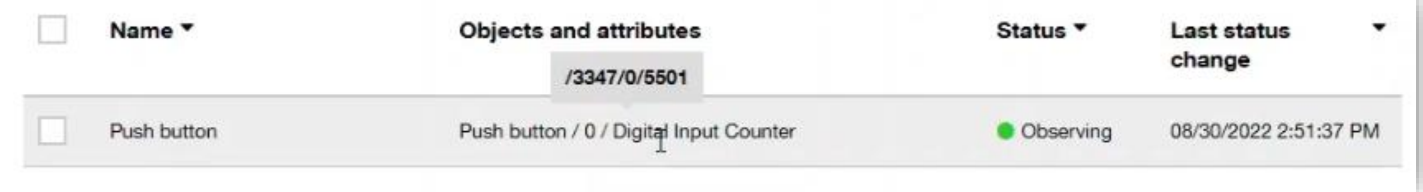
Define observation

Name * : Push button

Objects and attributes paths *

Object name	Instance	Attribute	Instance
Push button /3347	0	Digital Input Counter ...	

In each of the above fields, select from the list or type the path manually and press Enter



☐	Name	Objects and attributes	Status	Last status change
☐	Push button	Push button / 0 / Digital Input Counter	● Observing	08/30/2022 2:51:37 PM

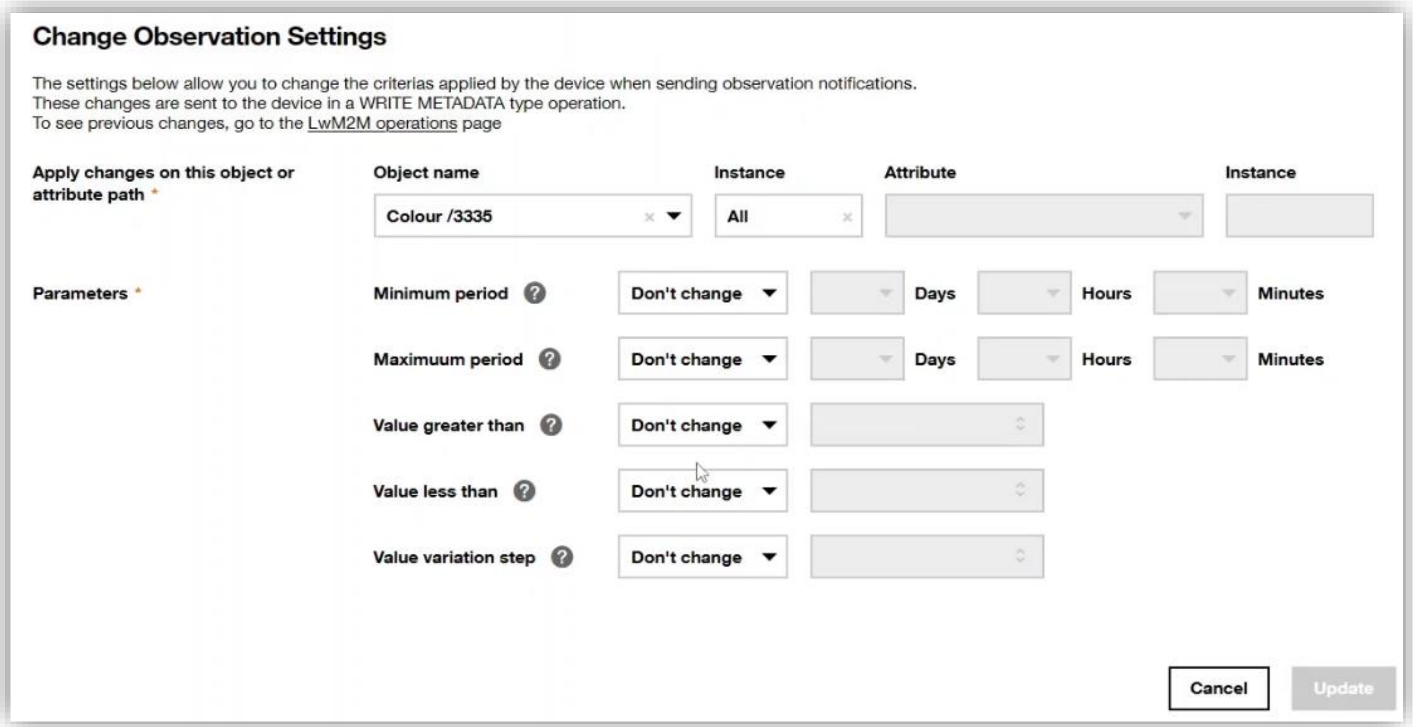
/3347/0/5501

Device-originated SEND operation is also supported

Observations are persistent across device reboots : they will be re-sent by Live Objects

CoAP / LwM2M
Observations settings

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ



Change Observation Settings

The settings below allow you to change the criterias applied by the device when sending observation notifications.
These changes are sent to the device in a WRITE METADATA type operation.
To see previous changes, go to the LwM2M operations page

Apply changes on this object or attribute path *

Object name	Instance	Attribute	Instance
Colour /3335	All		

Parameters *

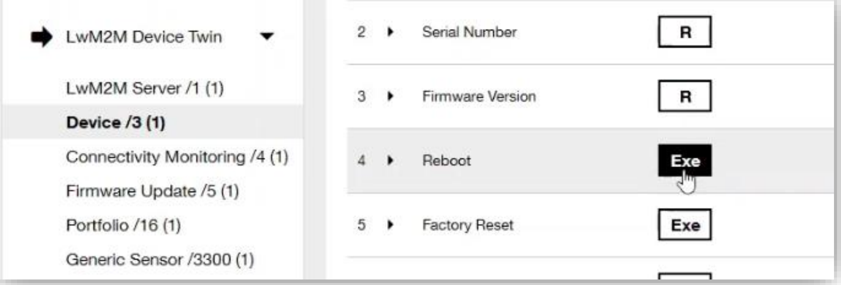
Minimum period	Don't change		Days		Hours		Minutes
Maximuum period	Don't change		Days		Hours		Minutes
Value greater than	Don't change						
Value less than	Don't change						
Value variation step	Don't change						

Only changed attributes will be sent to the device

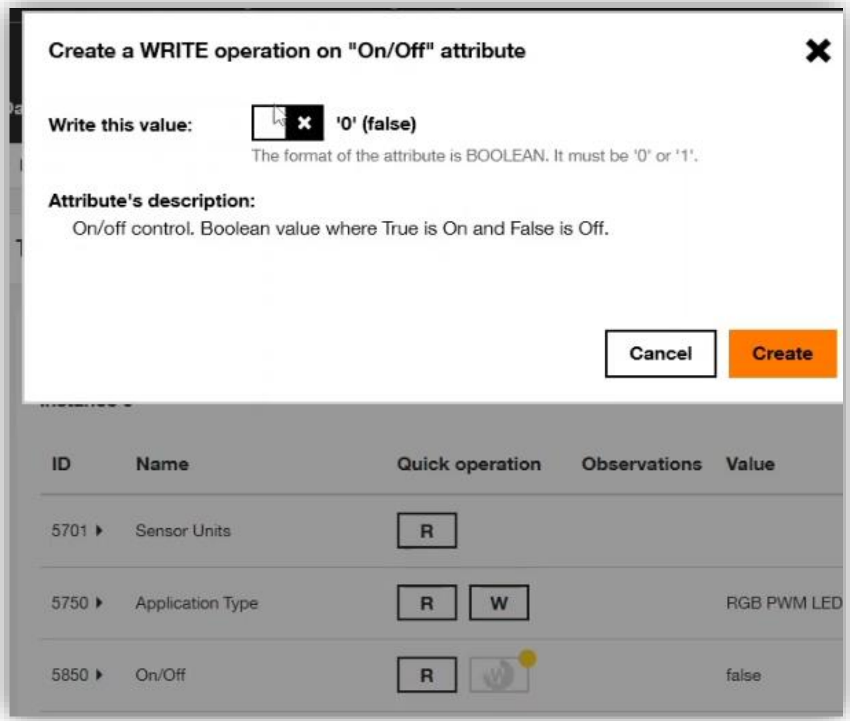
CoAP / LwM2M

Commands and configuration

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


LwM2M Device Twin
LwM2M Server /1 (1)
Device /3 (1)
Connectivity Monitoring /4 (1)
Firmware Update /5 (1)
Portfolio /16 (1)
Generic Sensor /3300 (1)

2	Serial Number	R
3	Firmware Version	R
4	Reboot	Exe
5	Factory Reset	Exe



Create a WRITE operation on "On/Off" attribute

Write this value: '0' (false)

The format of the attribute is BOOLEAN. It must be '0' or '1'.

Attribute's description:

On/off control. Boolean value where True is On and False is Off.

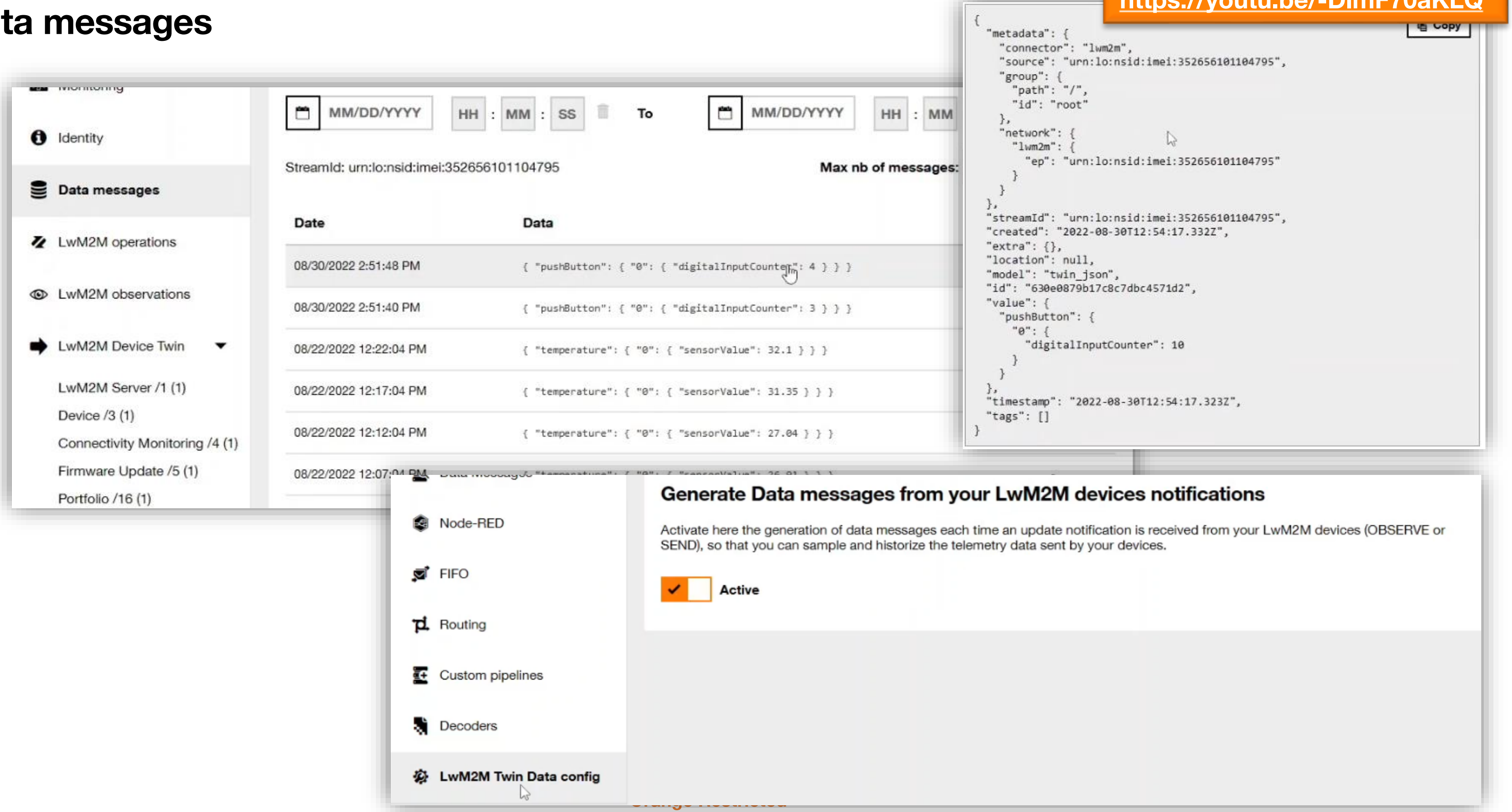
Cancel
Create

ID	Name	Quick operation	Observations	Value
5701	Sensor Units	R		
5750	Application Type	R W		RGB PWM LED
5850	On/Off	R		false

CoAP / LwM2M

Data messages

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ



Identity
Data messages
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1 (1)
Device /3 (1)
Connectivity Monitoring /4 (1)
Firmware Update /5 (1)
Portfolio /16 (1)
MM/DD/YYYY
HH
MM
SS
To
Max nb of messages:
Copy
Node-RED
FIFO
Routing
Custom pipelines
Decoders
LwM2M Twin Data config

StreamId: urn:lo:nsid:imei:352656101104795

Date	Data
08/30/2022 2:51:48 PM	`{ "pushButton": { "0": { "digitalInputCounter": 4 } } }`
08/30/2022 2:51:40 PM	`{ "pushButton": { "0": { "digitalInputCounter": 3 } } }`
08/22/2022 12:22:04 PM	`{ "temperature": { "0": { "sensorValue": 32.1 } } }`
08/22/2022 12:17:04 PM	`{ "temperature": { "0": { "sensorValue": 31.35 } } }`
08/22/2022 12:12:04 PM	`{ "temperature": { "0": { "sensorValue": 27.04 } } }`
08/22/2022 12:07:0	

```
{
  "metadata": {
    "connector": "lwm2m",
    "source": "urn:lo:nsid:imei:352656101104795",
    "group": {
      "path": "/",
      "id": "root"
    },
    "network": {
      "lwm2m": {
        "ep": "urn:lo:nsid:imei:352656101104795"
      }
    }
  },
  "streamId": "urn:lo:nsid:imei:352656101104795",
  "created": "2022-08-30T12:54:17.332Z",
  "extra": {},
  "location": null,
  "model": "twin_json",
  "id": "630e0879b17c8c7dbc4571d2",
  "value": {
    "pushButton": {
      "0": {
        "digitalInputCounter": 10
      }
    }
  },
  "timestamp": "2022-08-30T12:54:17.323Z",
  "tags": []
}
```

Generate Data messages from your LwM2M devices notifications

Activate here the generation of data messages each time an update notification is received from your LwM2M devices (OBSERVE or SEND), so that you can sample and historize the telemetry data sent by your devices.

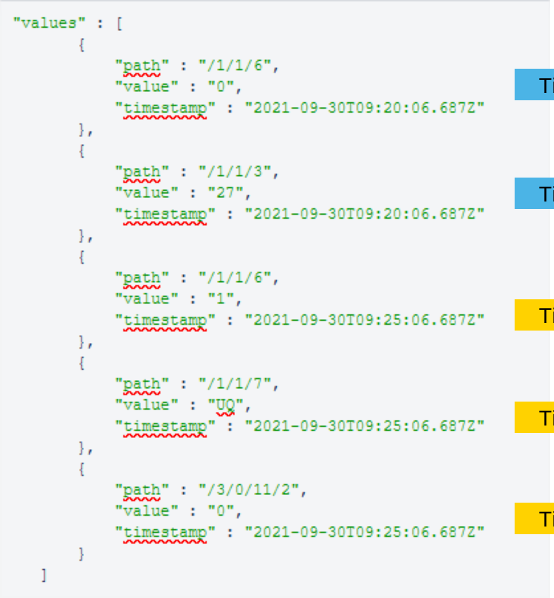
☑ **Active**

CoAP / LwM2M

SenML: get batch values

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ

If a LwM2M device sends data using SenML format (JSON/CBOR), each timestamp in the SenML will generate a DataMessage.



```
"values" : [
        {
            "path" : "/1/1/6",
            "value" : "0",
            "timestamp" : "2021-09-30T09:20:06.687Z"
        },
        {
            "path" : "/1/1/3",
            "value" : "27",
            "timestamp" : "2021-09-30T09:20:06.687Z"
        },
        {
            "path" : "/1/1/6",
            "value" : "1",
            "timestamp" : "2021-09-30T09:25:06.687Z"
        },
        {
            "path" : "/1/1/7",
            "value" : "UQ",
            "timestamp" : "2021-09-30T09:25:06.687Z"
        },
        {
            "path" : "/3/0/11/2",
            "value" : "0",
            "timestamp" : "2021-09-30T09:25:06.687Z"
        }
    ]
```

Timestamp 1

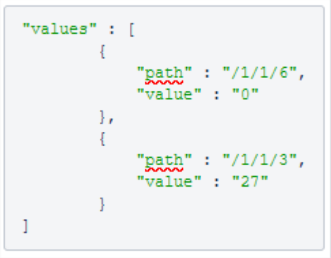
Timestamp 1

Timestamp 2

Timestamp 2

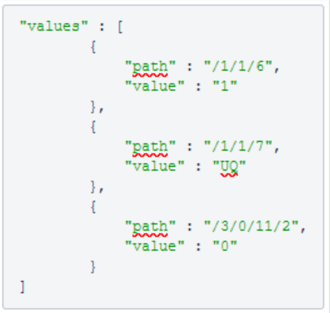
Timestamp 2

Timestamp 1



```
"values" : [
        {
            "path" : "/1/1/6",
            "value" : "0"
        },
        {
            "path" : "/1/1/3",
            "value" : "27"
        }
]
```

Timestamp 2

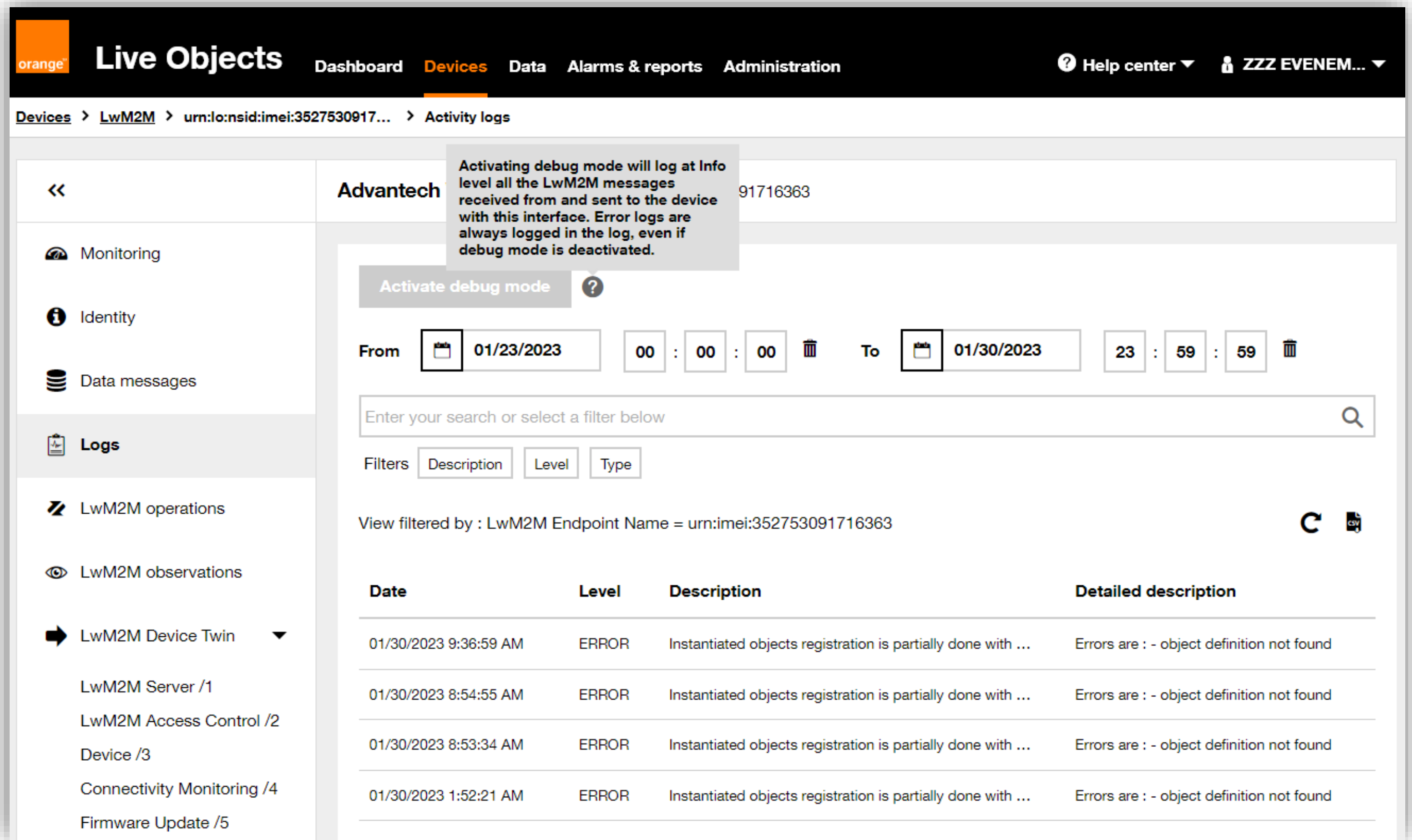


```
"values" : [
        {
            "path" : "/1/1/6",
            "value" : "1"
        },
        {
            "path" : "/1/1/7",
            "value" : "UQ"
        },
        {
            "path" : "/3/0/11/2",
            "value" : "0"
        }
]
```

CoAP / LwM2M

Debug

Refer to detailed information and demos on YouTube: https://youtu.be/-DlmF70aKLQ


orange
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
ZZZ EVENEM...
Devices > LwM2M > urn:lo:nsid:imei:3527530917... > Activity logs
Advantech
91716363
Monitoring
Identity
Data messages
Logs
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1
LwM2M Access Control /2
Device /3
Connectivity Monitoring /4
Firmware Update /5
Activate debug mode
Enter your search or select a filter below
Filters
Description
Level
Type

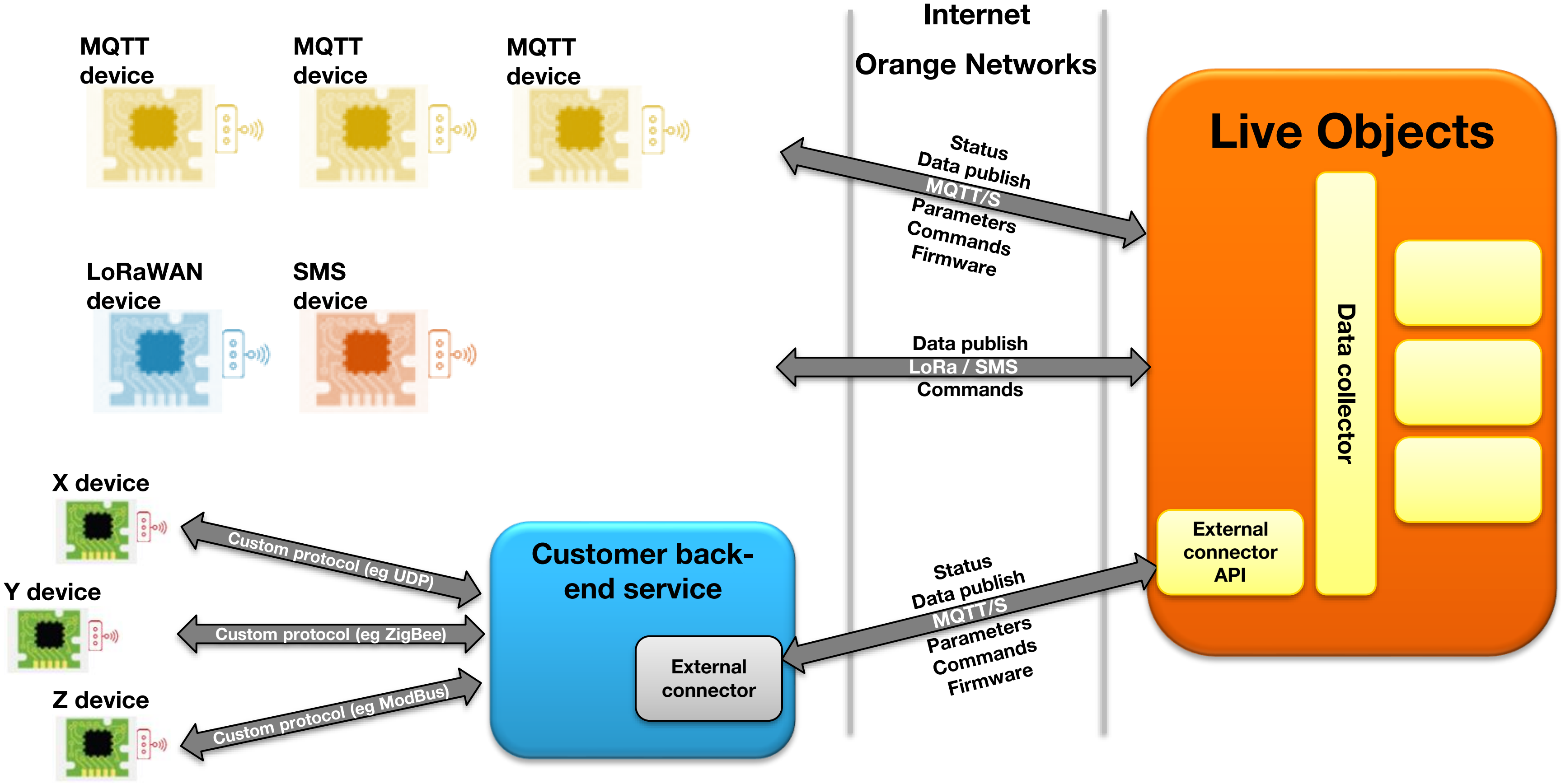
Activating debug mode will log at Info level all the LwM2M messages received from and sent to the device with this interface. Error logs are always logged in the log, even if debug mode is deactivated.

From 01/23/2023 00 : 00 : 00 To 01/30/2023 23 : 59 : 59

View filtered by : LwM2M Endpoint Name = urn:imei:352753091716363

Date	Level	Description	Detailed description
01/30/2023 9:36:59 AM	ERROR	Instantiated objects registration is partially done with ...	Errors are : - object definition not found
01/30/2023 8:54:55 AM	ERROR	Instantiated objects registration is partially done with ...	Errors are : - object definition not found
01/30/2023 8:53:34 AM	ERROR	Instantiated objects registration is partially done with ...	Errors are : - object definition not found
01/30/2023 1:52:21 AM	ERROR	Instantiated objects registration is partially done with ...	Errors are : - object definition not found

External connector mode — Device modes



Internet

Orange Networks

Live Objects

MQTT device

MQTT device

MQTT device

Status
Data publish
MQTT/S
Parameters
Commands
Firmware

LoRaWAN device

SMS device

Data publish
LoRa / SMS
Commands

Data collector

X device

Y device

Z device

Custom protocol (eg UDP)

Custom protocol (eg ZigBee)

Custom protocol (eg ModBus)

Customer back-end service

External connector

Status
Data publish
MQTT/S
Parameters
Commands
Firmware

External connector API

External connector mode

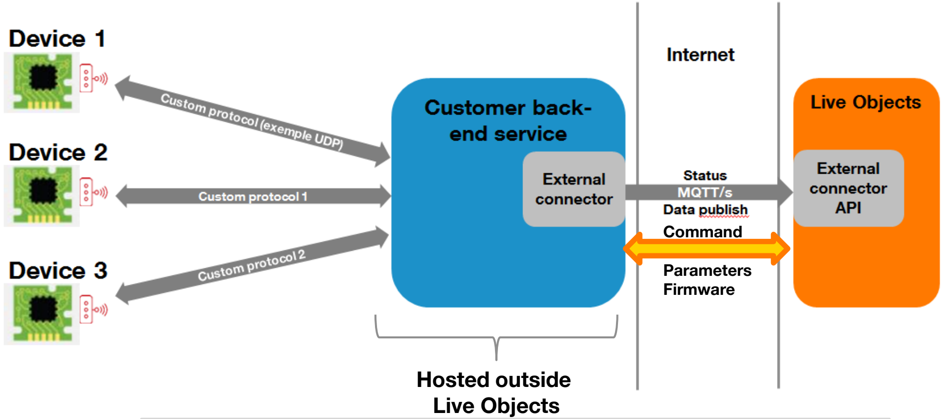
(+)

- Open to proprietary protocols (MQTT without Live Objects format, UDP….)
- Open to objects which are not able to modify their firmware

(-)

- Necessity to develop, host and run the external connector outside Live Objects.
- End to end SLA not guaranteed by Live Objects

Device NOT directly connected to Live Objects


Device 1
Device 2
Device 3
Custom protocol (exemple UDP)
Custom protocol 1
Custom protocol 2
Customer back-end service
External connector
Internet
Status
MQTT/s
Data publish
Command
Parameters
Firmware
Live Objects
External connector API
Hosted outside Live Objects

- MQTT External Connector mode
- MQTT username « *connector* », API key with CONNECTOR_ACCESS role
- Manages data
- Full Device management (remote commands, configuration, firmware, decoding)

- Follow the tutorial on https://youtu.be/nvNhTMuTyJU
- Use the Java SDK at https://github.com/DatavenueLiveObjects/external-connector-SDK-LiveObjects-

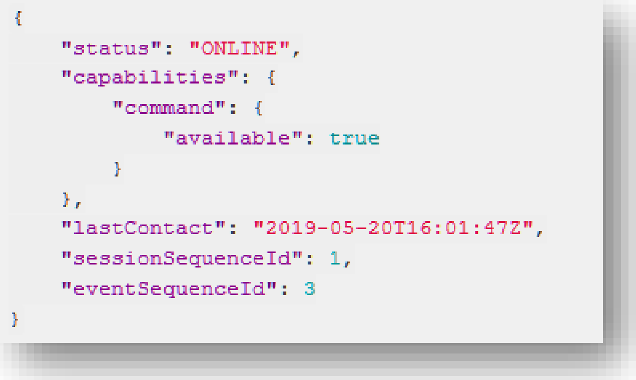
See details at https://liveobjects.orange-business.com/doc/html/lo_manual_v2.html#EXTERNAL_CONNECTOR_MODE

External connector mode

Manual or auto-provisionning
deviceId = urn:lo:nsid:x-connector:{nodeId}
The nodeId is the ID of the device in the customer referential

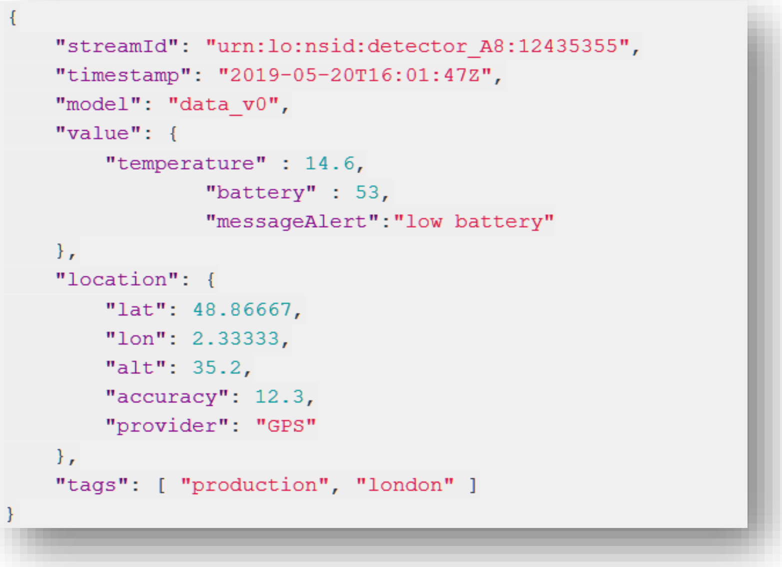
Optional decoder (static binary messages)

topic
connector/v1/nodes/{nodeId}/status



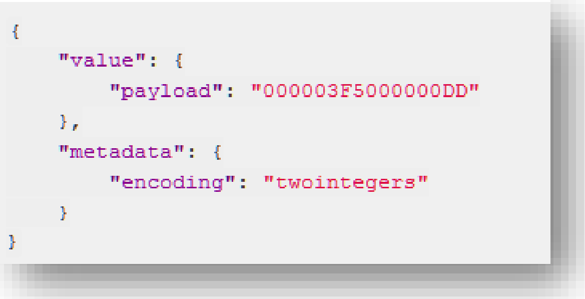
```
{
    "status": "ONLINE",
    "capabilities": {
        "command": {
            "available": true
        }
    },
    "lastContact": "2019-05-20T16:01:47Z",
    "sessionSequenceId": 1,
    "eventSequenceId": 3
}
```

topic
connector/v1/nodes/{nodeId}/data



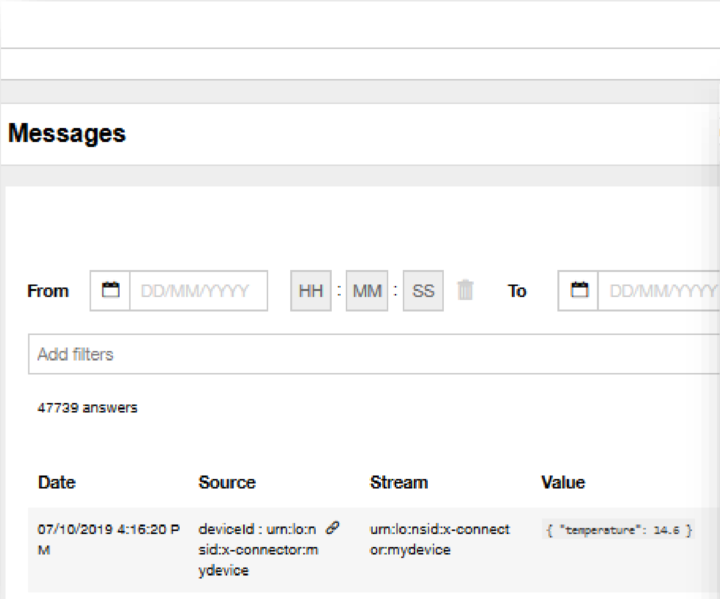
```
{
    "streamId": "urn:lo:nsid:detector_A8:12435355",
    "timestamp": "2019-05-20T16:01:47Z",
    "model": "data_v0",
    "value": {
        "temperature" : 14.6,
                "battery" : 53,
                "messageAlert":"low battery"
    },
    "location": {
        "lat": 48.86667,
        "lon": 2.33333,
        "alt": 35.2,
        "accuracy": 12.3,
        "provider": "GPS"
    },
    "tags": [ "production", "london" ]
}
```

or compacted data, decoded by Live Objects



```
{
    "value": {
        "payload": "000003F5000000DD"
    },
    "metadata": {
        "encoding": "twointegers"
    }
}
```

External connector mode



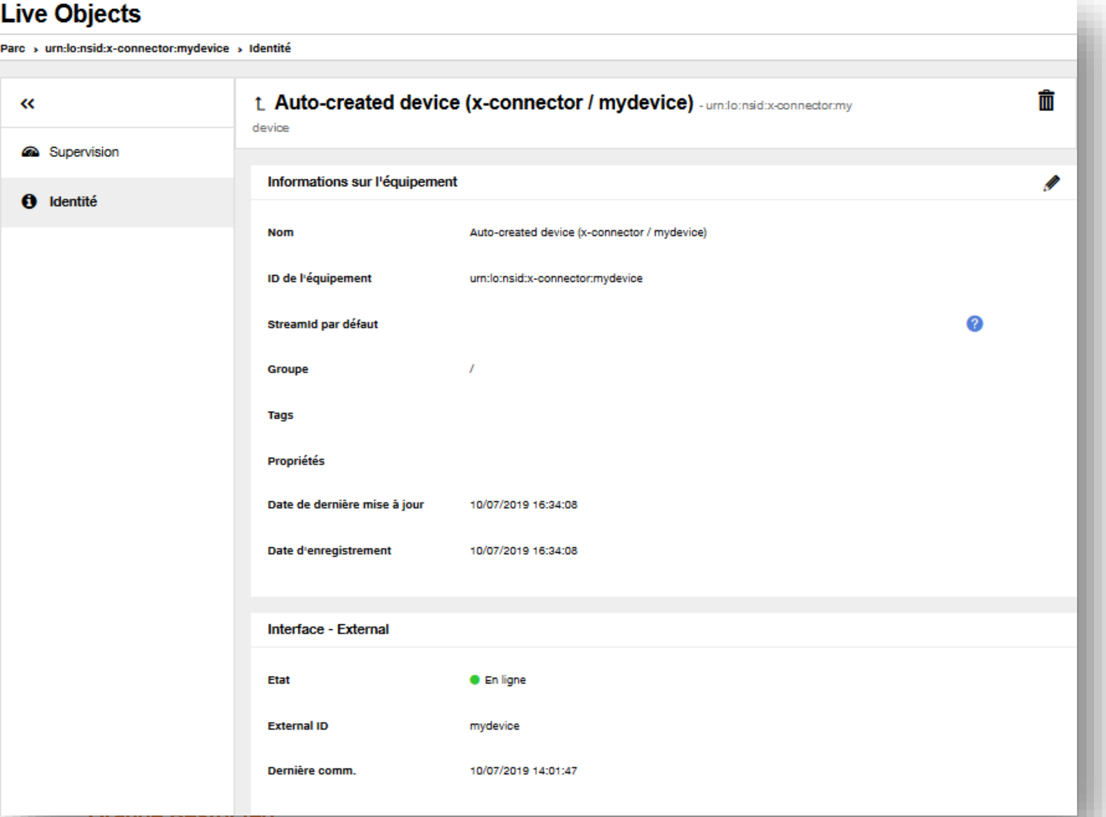
Messages

From 📅 DD/MM/YYYY HH : MM : SS To 📅 DD/MM/YYYY

Add filters

47739 answers

Date	Source	Stream	Value
07/10/2019 4:16:20 PM	deviceId : urn:lo:nsid:x-connector:mydevice	urn:lo:nsid:x-connector:mydevice	`{ "temperature": 14.6 }`



Live Objects

Parc › urn:lo:nsid:x-connector:mydevice › Identité

Auto-created device (x-connector / mydevice) - urn:lo:nsid:x-connector:mydevice

Informations sur l'équipement

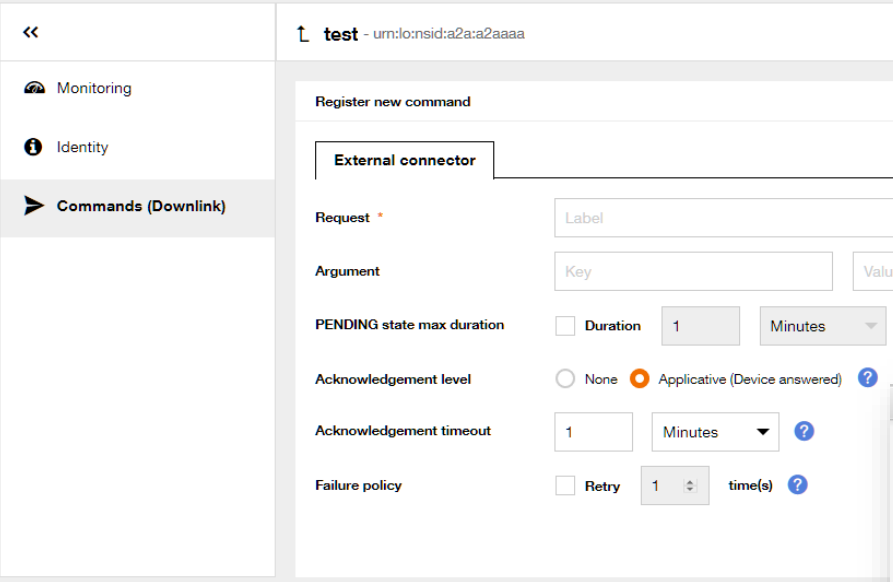
Nom	Auto-created device (x-connector / mydevice)
ID de l'équipement	urn:lo:nsid:x-connector:mydevice
StreamId par défaut	
Groupe	/
Tags	
Propriétés	
Date de dernière mise à jour	10/07/2019 16:34:08
Date d'enregistrement	10/07/2019 16:34:08

Interface - External

Etat	● En ligne
External ID	mydevice
Dernière comm.	10/07/2019 14:01:47

External connector mode: commands

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs

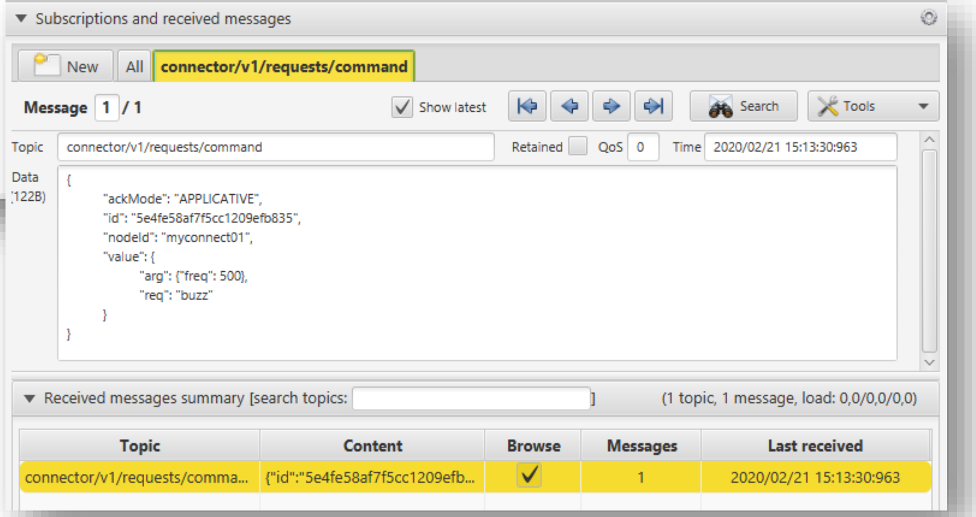

«
Monitoring
Identity
Commands (Downlink)

test - urn:lo:nsid:a2a:a2aaaa

Register new command — * required field

External connector

Request *	Label
Argument	Key / Value
PENDING state max duration	☐ Duration 1 Minutes
Acknowledgement level	○ None ● Applicative (Device answered)
Acknowledgement timeout	1 Minutes
Failure policy	☐ Retry 1 time(s)


Subscriptions and received messages
New
All
connector/v1/requests/command
Show latest
Search
Tools

Message 1 / 1 ☑ Show latest

Topic: connector/v1/requests/command Retained ☐ QoS 0 Time 2020/02/21 15:13:30:963

Data (122B)

```
{
        "ackMode": "APPLICATIVE",
        "id": "5e4fe58af7f5cc1209efb835",
        "nodeId": "myconnect01",
        "value": {
                "arg": {"freq": 500},
                "req": "buzz"
        }
}
```

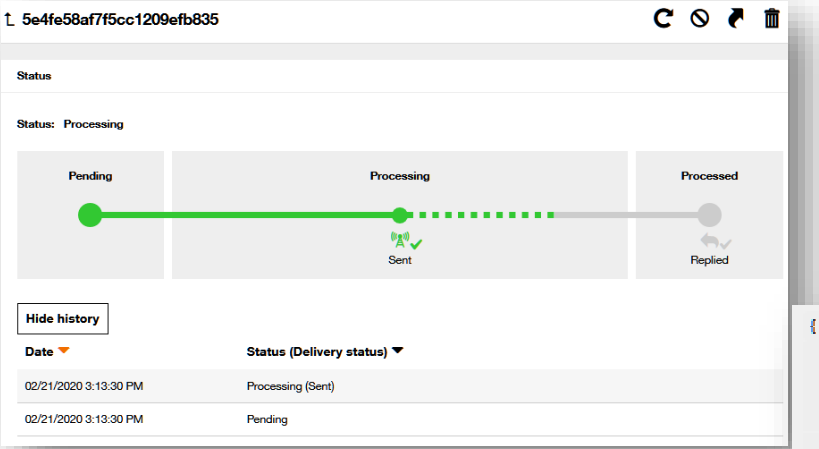
Received messages summary [search topics:] (1 topic, 1 message, load: 0,0/0,0/0,0)

Topic	Content	Browse	Messages	Last received
connector/v1/requests/comma...	{"id":"5e4fe58af7f5cc1209efb...	✓	1	2020/02/21 15:13:30:963

subscribed topic connector/v1/requests/command

External connector mode: commands processing

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs



5e4fe58af7f5cc1209efb835

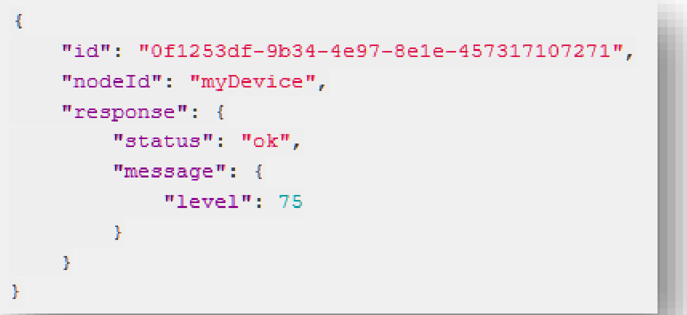
Status

Status: Processing

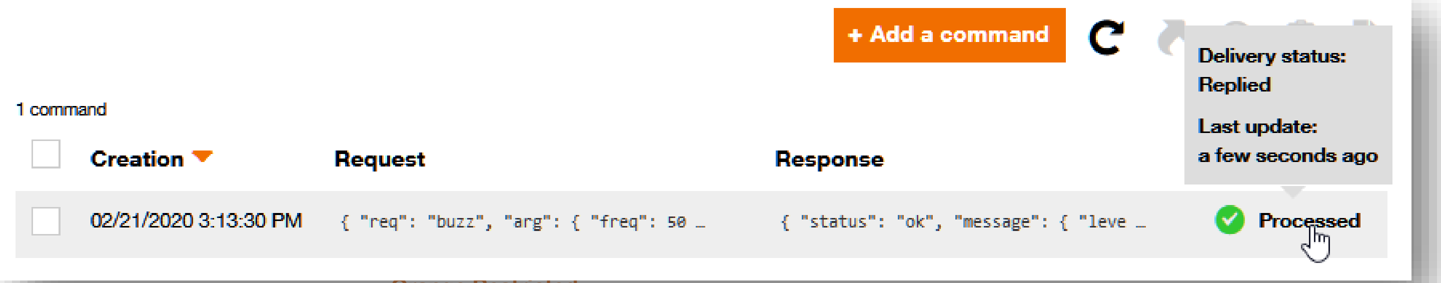
Pending
Processing
Processed
Sent
Replied
Hide history

Date	Status (Delivery status)
02/21/2020 3:13:30 PM	Processing (Sent)
02/21/2020 3:13:30 PM	Pending

reply to topic
connector/v1/responses/command



```
{
    "id": "0f1253df-9b34-4e97-8e1e-457317107271",
    "nodeId": "myDevice",
    "response": {
        "status": "ok",
        "message": {
            "level": 75
        }
    }
}
```



+ Add a command

Delivery status: Replied

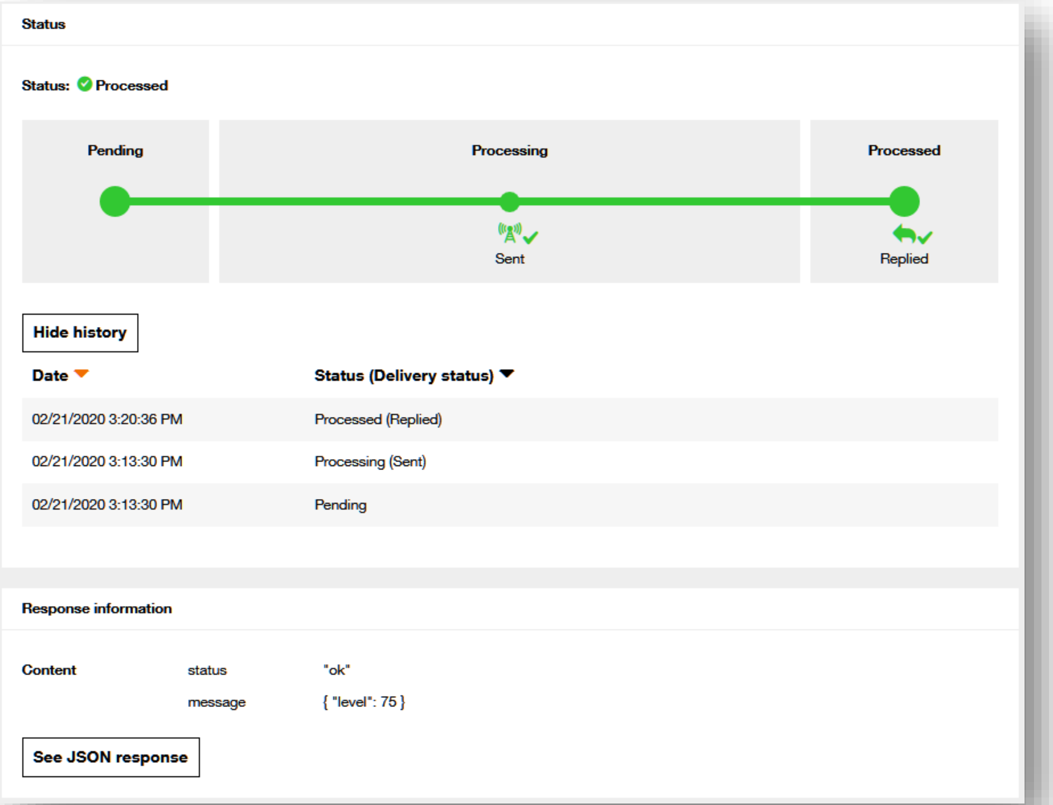
Last update: a few seconds ago

1 command

☐	Creation	Request	Response	
☐	02/21/2020 3:13:30 PM	`{ "req": "buzz", "arg": { "freq": 50 …`	`{ "status": "ok", "message": { "leve …`	✓ Processed

External connector mode: commands status

Refer to detailed information and demos on YouTube: https://youtu.be/2YOFcHLEQGs



Status

Status: ✓ Processed

Pending
Processing
Processed
Sent
Replied
Hide history

Date	Status (Delivery status)
02/21/2020 3:20:36 PM	Processed (Replied)
02/21/2020 3:13:30 PM	Processing (Sent)
02/21/2020 3:13:30 PM	Pending

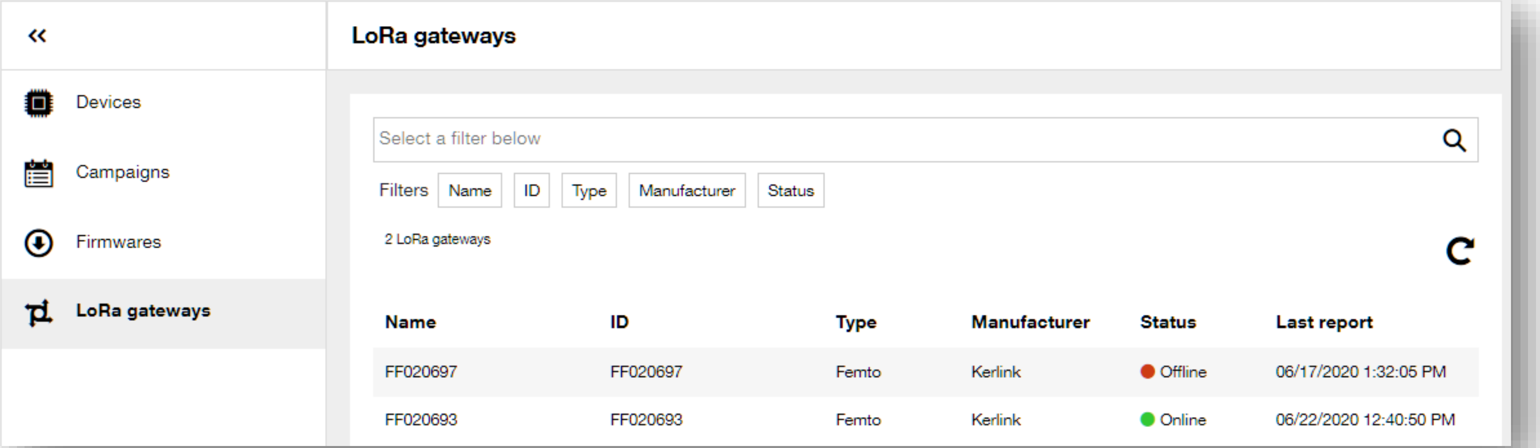
Response information

Content	status	"ok"
	message	{ "level": 75 }

See JSON response

Semi-Private LoRaWAN Gateways

Nano/Femto gateways monitoring


«
Devices
Campaigns
Firmwares
LoRa gateways

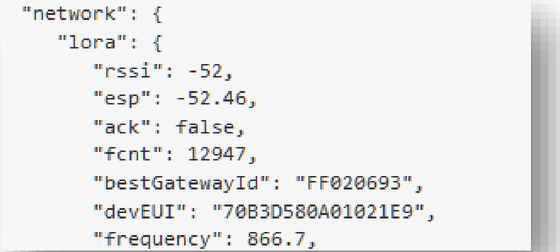
LoRa gateways

Select a filter below

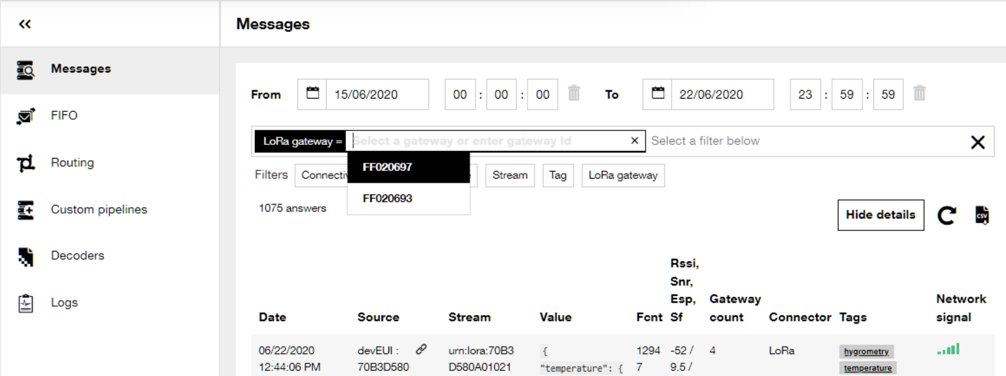
Filters: Name | ID | Type | Manufacturer | Status

2 LoRa gateways

Name	ID	Type	Manufacturer	Status	Last report
FF020697	FF020697	Femto	Kerlink	● Offline	06/17/2020 1:32:05 PM
FF020693	FF020693	Femto	Kerlink	● Online	06/22/2020 12:40:50 PM



```
"network": {
   "lora": {
      "rssi": -52,
      "esp": -52.46,
      "ack": false,
      "fcnt": 12947,
      "bestGatewayId": "FF020693",
      "devEUI": "70B3D580A01021E9",
      "frequency": 866.7,
```


«
Messages
FIFO
Routing
Custom pipelines
Decoders
Logs
Hide details

Messages

From 15/06/2020 00 : 00 : 00 To 22/06/2020 23 : 59 : 59

LoRa gateway = Select a gateway or enter gateway Id ✕ Select a filter below

FF020697
FF020693

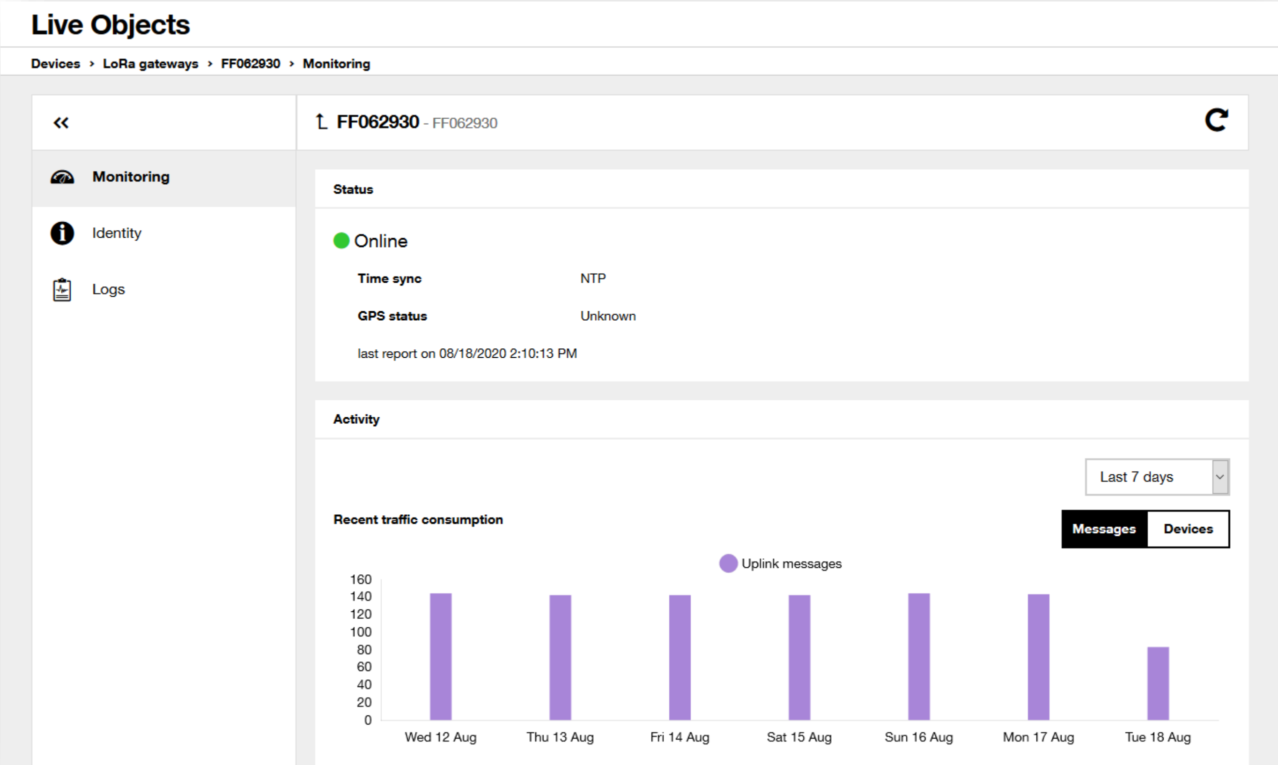
Filters: Connecti… | Stream | Tag | LoRa gateway

1075 answers

Date	Source	Stream	Value	Fcnt	Rssi, Snr, Esp, Sf	Gateway count	Connector	Tags	Network signal
06/22/2020 12:44:06 PM	devEUI : 70B3D580	urn:lora:70B3D580A01021	{ "temperature": {	12947	-52 / 9.5 /	4	LoRa	hygrometry temperature	

Semi-Private LoRaWAN Gateways

Nano/Femto gateways monitoring



Live Objects

Devices › LoRa gateways › FF062930 › Monitoring

FF062930 - FF062930

Status

● Online

Time sync NTP

GPS status Unknown

last report on 08/18/2020 2:10:13 PM

Activity

Last 7 days

Recent traffic consumption

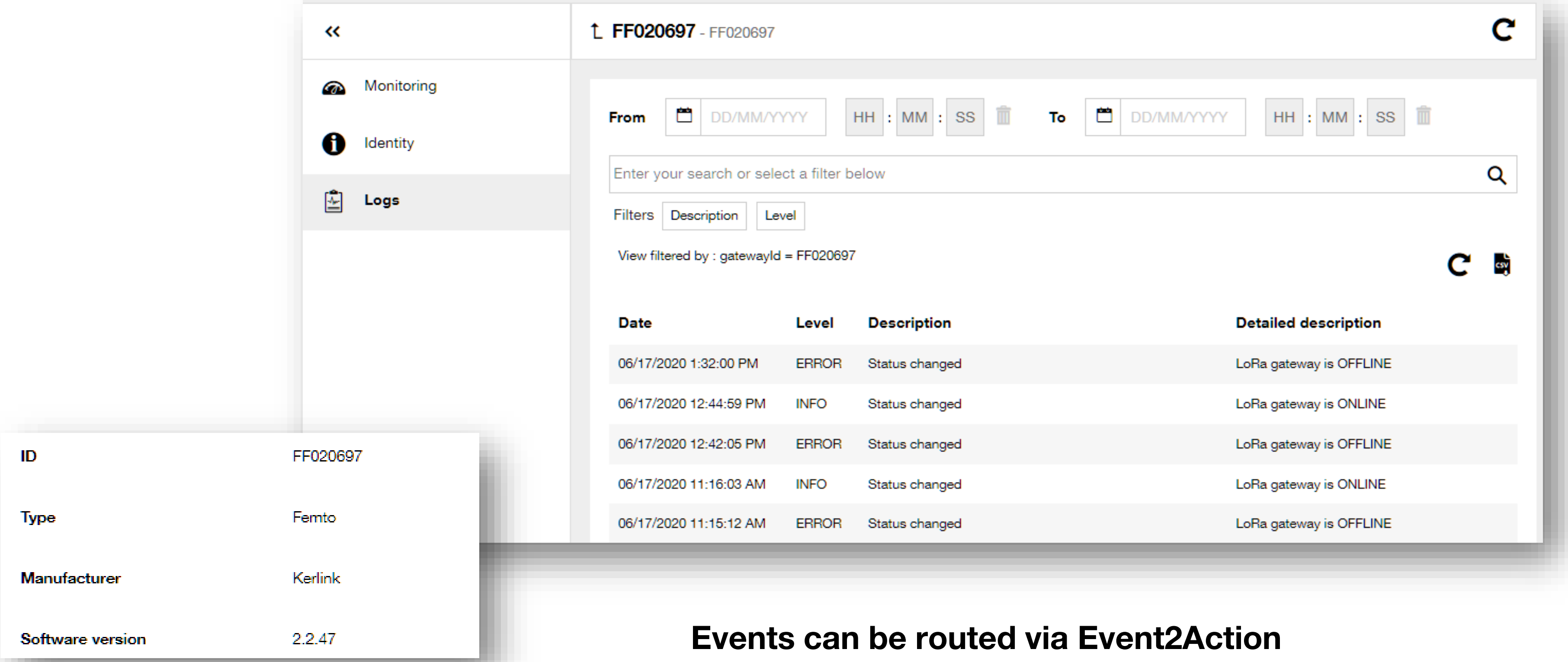
«
Monitoring
Identity
Logs
Messages
Devices
● Uplink messages
160
140
120
100
80
60
40
20
0
Wed 12 Aug
Thu 13 Aug
Fri 14 Aug
Sat 15 Aug
Sun 16 Aug
Mon 17 Aug
Tue 18 Aug

Messages and devices trafficking thought your gateway

↘ Only **uplink** messages are monitored

Semi-Private LoRaWAN Gateways

Nano/Femto gateways monitoring



«
Monitoring
Identity
Logs
FF020697 - FF020697
From
DD/MM/YYYY
HH : MM : SS
To
DD/MM/YYYY
HH : MM : SS
Enter your search or select a filter below
Filters
Description
Level

View filtered by : gatewayId = FF020697

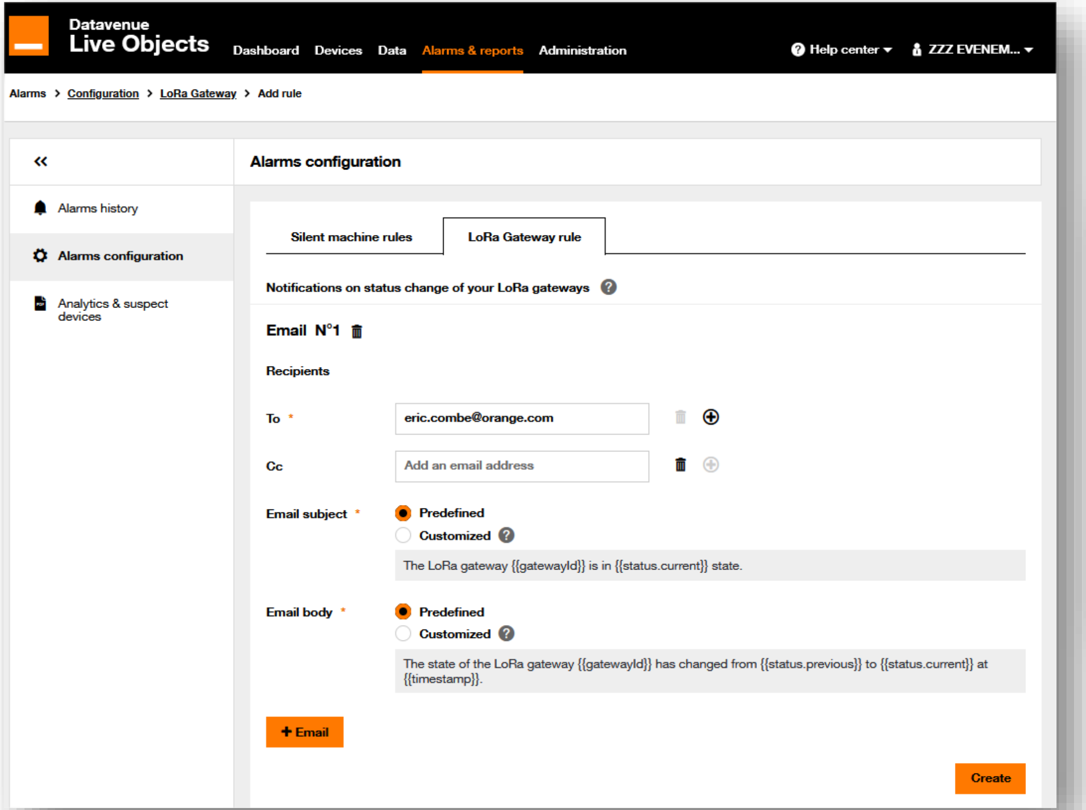
Date	Level	Description	Detailed description
06/17/2020 1:32:00 PM	ERROR	Status changed	LoRa gateway is OFFLINE
06/17/2020 12:44:59 PM	INFO	Status changed	LoRa gateway is ONLINE
06/17/2020 12:42:05 PM	ERROR	Status changed	LoRa gateway is OFFLINE
06/17/2020 11:16:03 AM	INFO	Status changed	LoRa gateway is ONLINE
06/17/2020 11:15:12 AM	ERROR	Status changed	LoRa gateway is OFFLINE

ID	FF020697
Type	Femto
Manufacturer	Kerlink
Software version	2.2.47

Events can be routed via Event2Action

Semi-Private LoRaWAN Gateways

Nano/Femto gateways monitoring


Datavenue
Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
ZZZ EVENEM...
Alarms
Configuration
LoRa Gateway
Add rule
Alarms history
Alarms configuration
Analytics & suspect devices
Silent machine rules
LoRa Gateway rule
+ Email
Create

Alarms > Configuration > LoRa Gateway > Add rule

Alarms configuration

Notifications on status change of your LoRa gateways

Email N°1

Recipients

To *: eric.combe@orange.com

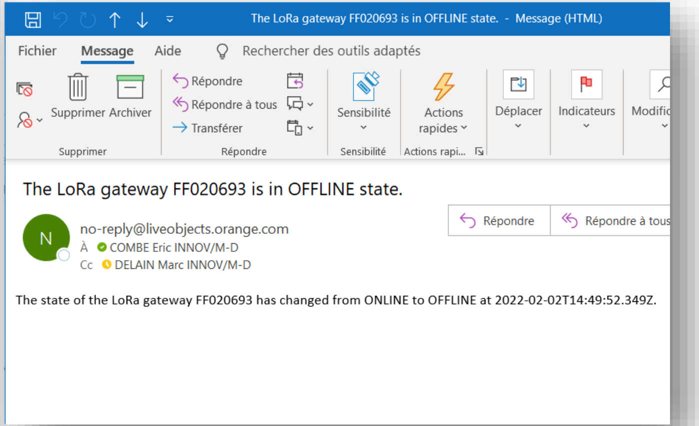
Cc: Add an email address

Email subject *: ● Predefined ○ Customized

The LoRa gateway {{gatewayId}} is in {{status.current}} state.

Email body *: ● Predefined ○ Customized

The state of the LoRa gateway {{gatewayId}} has changed from {{status.previous}} to {{status.current}} at {{timestamp}}.


Fichier
Message
Aide
Rechercher des outils adaptés
Supprimer
Archiver
Répondre
Répondre à tous
Transférer
Sensibilité
Actions rapides
Déplacer
Indicateurs
Modifi
Supprimer
Répondre
Sensibilité
Actions rapi...
Répondre
Répondre à tous
N

The LoRa gateway FF020693 is in OFFLINE state. - Message (HTML)

The LoRa gateway FF020693 is in OFFLINE state.

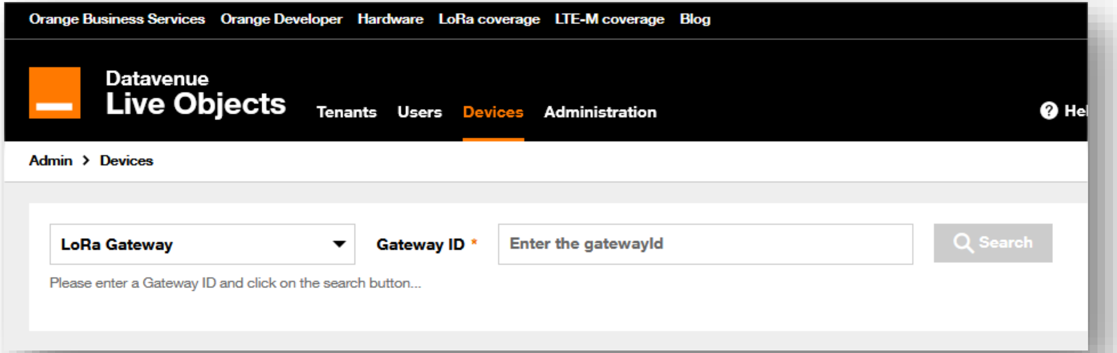
no-reply@liveobjects.orange.com
À COMBE Eric INNOV/M-D
Cc DELAIN Marc INNOV/M-D

The state of the LoRa gateway FF020693 has changed from ONLINE to OFFLINE at 2022-02-02T14:49:52.349Z.

Semi-Private LoRaWAN Gateways

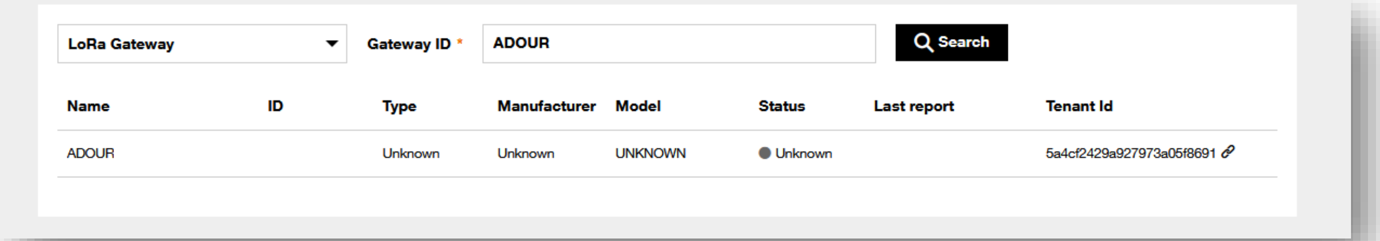
Nano/Femto gateways monitoring

For vendors, search gateways :


Orange Business Services
Orange Developer
Hardware
LoRa coverage
LTE-M coverage
Blog
Datavenue
Live Objects
Tenants
Users
Devices
Administration
Hel
Admin > Devices
Search

LoRa Gateway ▾ **Gateway ID** * Enter the gatewayId

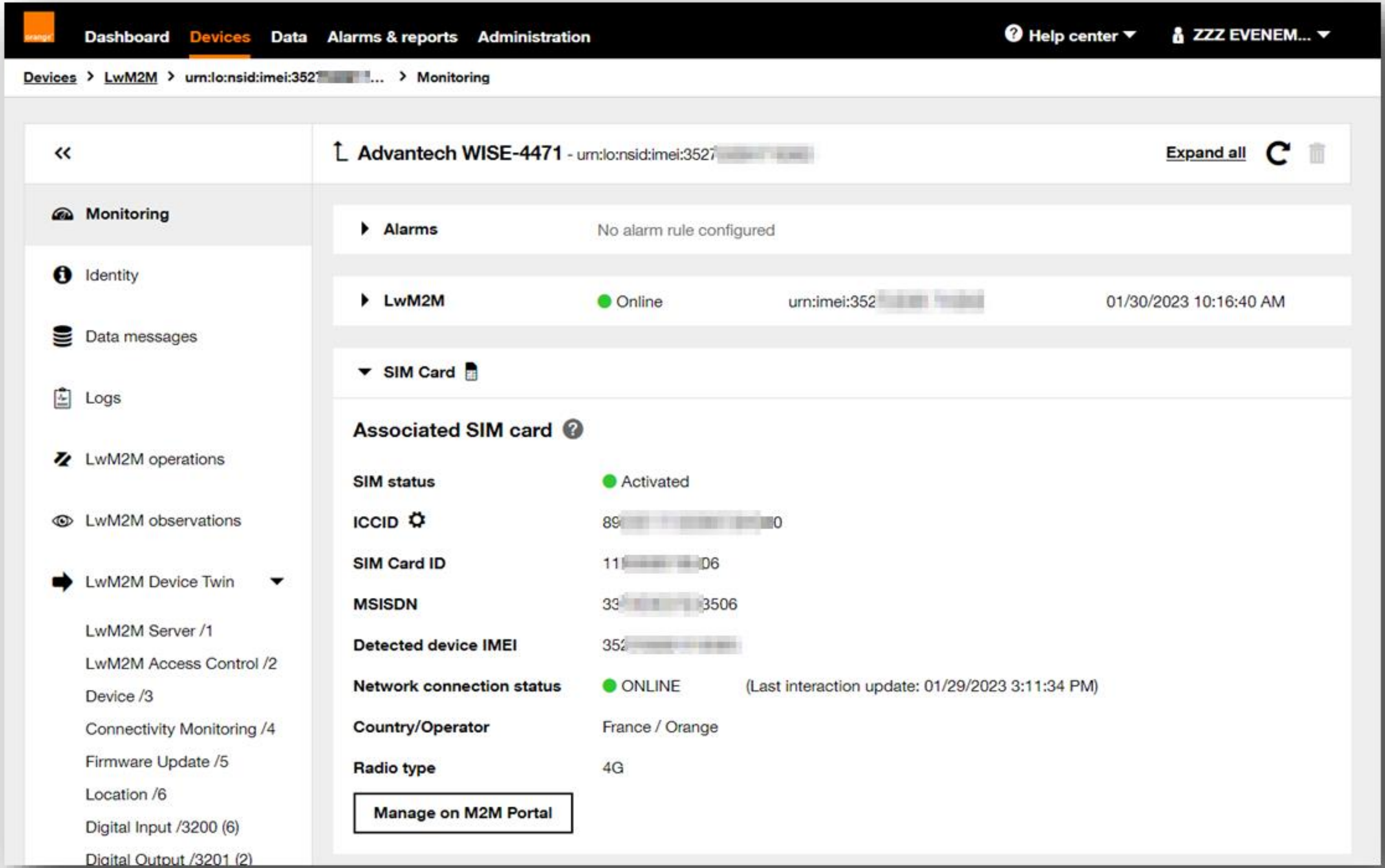
Please enter a Gateway ID and click on the search button...



LoRa Gateway ▾ **Gateway ID** * ADOUR

Name	ID	Type	Manufacturer	Model	Status	Last report	Tenant Id
ADOUR		Unknown	Unknown	UNKNOWN	● Unknown		5a4cf2429a927973a05f8691

SIM-Card link with Orange M2M Portal


Dashboard
Devices
Data
Alarms & reports
Administration
Help center
ZZZ EVENEM...
Devices > LwM2M > urn:lo:nsid:imei:352[redacted]... > Monitoring
Expand all
Monitoring
Identity
Data messages
Logs
LwM2M operations
LwM2M observations
LwM2M Device Twin
LwM2M Server /1
LwM2M Access Control /2
Device /3
Connectivity Monitoring /4
Firmware Update /5
Location /6
Digital Input /3200 (6)
Digital Output /3201 (2)
Manage on M2M Portal

Advantech WISE-4471 - urn:lo:nsid:imei:3527[redacted]

Alarms No alarm rule configured

LwM2M ● Online urn:imei:352[redacted] 01/30/2023 10:16:40 AM

SIM Card

Associated SIM card

SIM status	● Activated
ICCID	89[redacted]0
SIM Card ID	11[redacted]06
MSISDN	33[redacted]3506
Detected device IMEI	352[redacted]
Network connection status	● ONLINE (Last interaction update: 01/29/2023 3:11:34 PM)
Country/Operator	France / Orange
Radio type	4G

#6

Data management

Data management

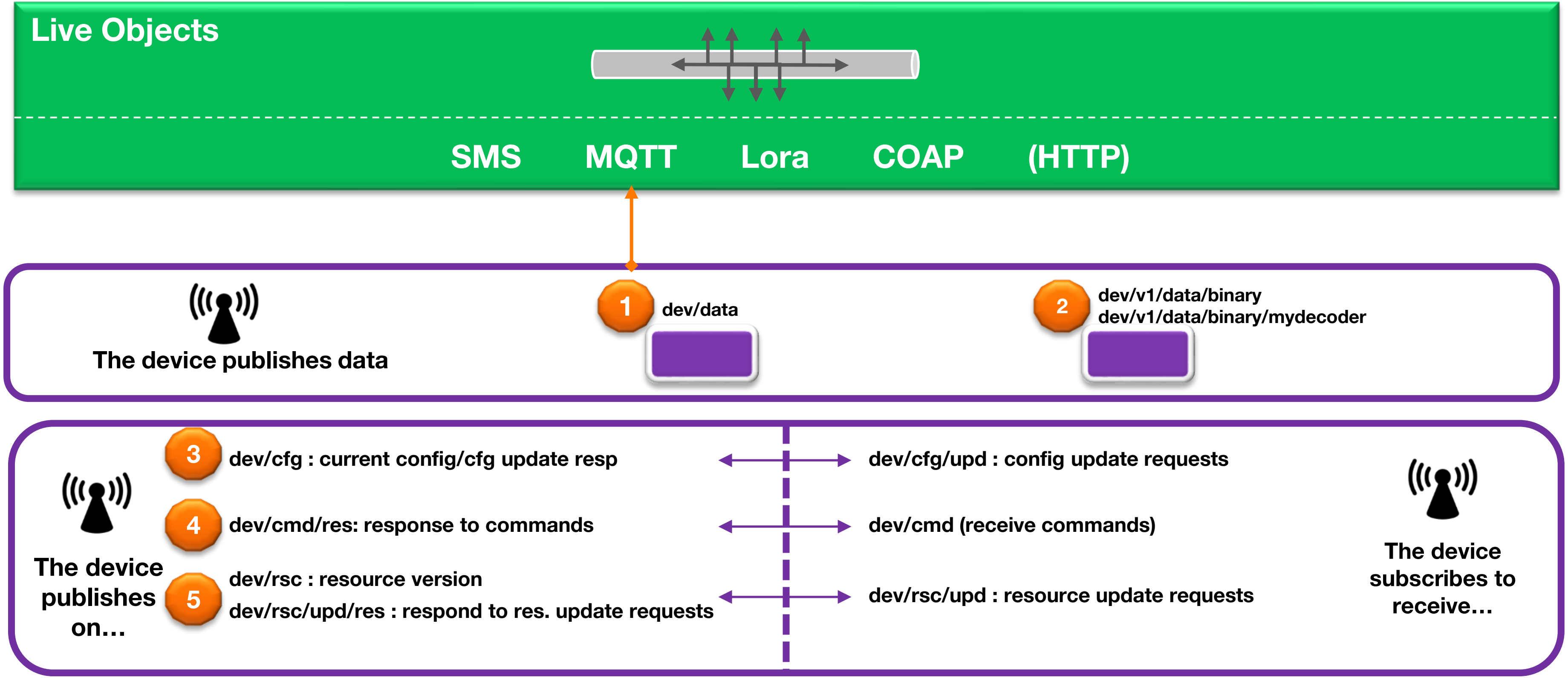
Available tools

FIFO	**Retrieve my data in a business application using MQTT or Rest via queues (FIFO)**
Decoders	**Create or use decoders to structure and index object data**
Custom Pipelines	**Use external webservices to enrich or prepare your data**
Data management	**Perform Complex Queries (BI) on my indexed data with Elastic Search**
Event/state processing	**Create rules for triggering alerts on object data sent to the business application**
Notifications & Event to Action	**Live Objects or the business application can send SMS, email or push Http notifications following an event**
Silent devices	**Create alarms on unexpected device behavior**

#6.1

Data management
Decoders and queues

MQTT Device publishing topics



Live Objects

SMS MQTT Lora COAP (HTTP)

The device publishes data

① dev/data

② dev/v1/data/binary
dev/v1/data/binary/mydecoder

The device publishes on…

③ dev/cfg : current config/cfg update resp

④ dev/cmd/res: response to commands

⑤ dev/rsc : resource version
dev/rsc/upd/res : respond to res. update requests

dev/cfg/upd : config update requests

dev/cmd (receive commands)

dev/rsc/upd : resource update requests

The device subscribes to receive…

Connecting Sigfox to Live Objects

For organizations already having deployed Sigfox devices

Add a component synchronizing data and devices between Sigfox and Live Objects Platform:

https://github.com/DatavenueLiveObjects/Sigfox-Live-Objects-connector

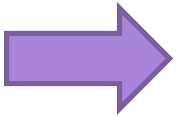
Data enrichment

Data messages sent by devices are automatically enriched with device management data:

- ✓ **Device group**
- ✓ **Device tags**
- ✓ **Device properties**
- ✓ **Connector name**
- ✓ **Device id**
- ✓ **Default data stream id**

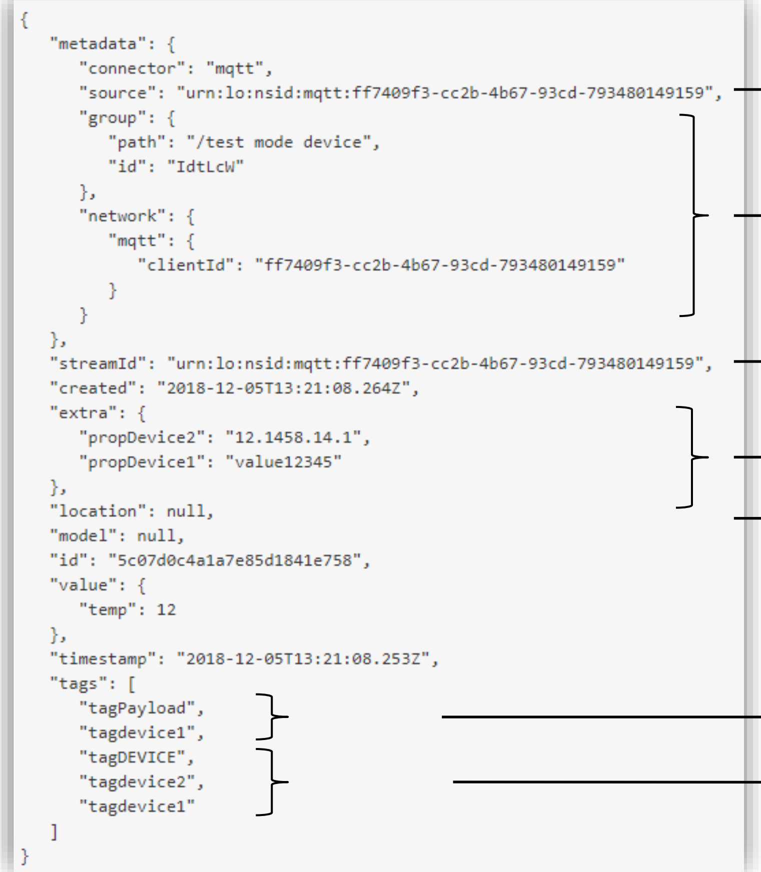
```
{
"value":{
   "temp":12
   }
“tags”: [
  “tagPayload”,”tagdevice1”
  ]
}
```

Payload sent by the device
to Live Objects
MQTT device mode
Publish on dev/data



Metadata enrichment

Message stored in Live Objects



```
{
   "metadata": {
      "connector": "mqtt",
      "source": "urn:lo:nsid:mqtt:ff7409f3-cc2b-4b67-93cd-793480149159",
      "group": {
         "path": "/test mode device",
         "id": "IdtLcW"
      },
      "network": {
         "mqtt": {
            "clientId": "ff7409f3-cc2b-4b67-93cd-793480149159"
         }
      }
   },
   "streamId": "urn:lo:nsid:mqtt:ff7409f3-cc2b-4b67-93cd-793480149159",
   "created": "2018-12-05T13:21:08.264Z",
   "extra": {
      "propDevice2": "12.1458.14.1",
      "propDevice1": "value12345"
   },
   "location": null,
   "model": null,
   "id": "5c07d0c4a1a7e85d1841e758",
   "value": {
      "temp": 12
   },
   "timestamp": "2018-12-05T13:21:08.253Z",
   "tags": [
      "tagPayload",
      "tagdevice1",
      "tagDEVICE",
      "tagdevice2",
      "tagdevice1"
   ]
}
```

Device Id

Group,
connector’s name

Data stream Id

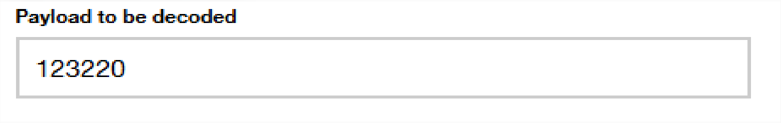
Device properties

Location when available

Payload tags

Device tags

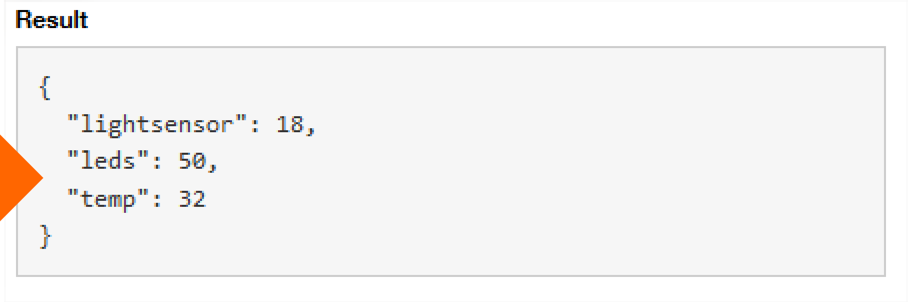
Decoders



Payload to be decoded

123220

to this



Result

```
{
  "lightsensor": 18,
  "leds": 50,
  "temp": 32
}
```

3 kinds of decoders available

Binary

- Bit per bit decoding

CSV

- Text-based decoding

Binary and CSV:

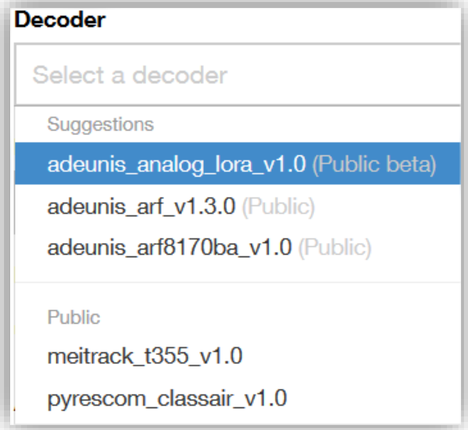
- Depending on the device behavior
- For devices with fixed payload
- Customers can develop their own decoder

JavaScript

- For devices with complex behavior
- For devices with variable or packed payloads
- JS decoders must be qualified by Live Objects team

Javascript Decoders

Private	Public Beta	Public
Developed by a customer	Developed by Orange	
Only available for the customer	Available for all customers (all countries, all vendors)	
In charge of maintenance and completeness: the customer	In charge of maintenance and completeness: no-one, no warranty of completeness	In charge of maintenance and completeness: Orange



Decoder

Select a decoder

Suggestions

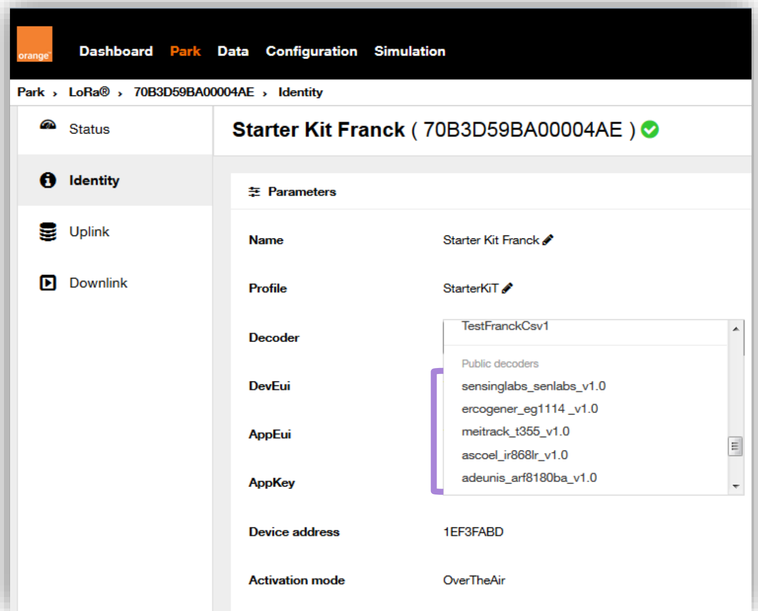
- adeunis_analog_lora_v1.0 (Public beta)
- adeunis_arf_v1.3.0 (Public)
- adeunis_arf8170ba_v1.0 (Public)

Public

- meitrack_t355_v1.0
- pyrescom_classair_v1.0

public/beta JavaScript decoders

Documentation : https://liveobjects.orange-business.com/doc/decoders/decoder_outputs_with_example.html



orange
Dashboard
Park
Data
Configuration
Simulation
Park › LoRa® › 70B3D59BA00004AE › Identity
Status
Identity
Uplink
Downlink
Parameters

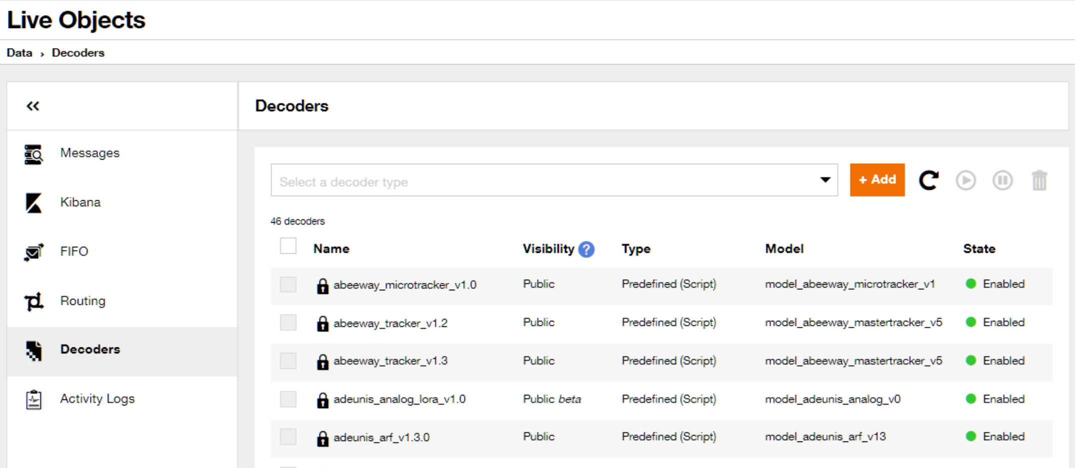
Starter Kit Franck (70B3D59BA00004AE)

Name	Starter Kit Franck
Profile	StarterKiT
Decoder	TestFranckCsv1
DevEui	
AppEui	
AppKey	
Device address	1EF3FABD
Activation mode	OverTheAir

Public decoders
- sensinglabs_senlabs_v1.0
- ercogener_eg1114 _v1.0
- meitrack_t355_v1.0
- ascoel_ir868lr_v1.0
- adeunis_arf8180ba_v1.0

Since mid-2021, decoders can split a single device frame into several business frames

To get the list of available decoders, go to the menu « Data > Decoders » in your Live Objects portal



Live Objects
Data › Decoders
Messages
Kibana
FIFO
Routing
Decoders
Activity Logs
Select a decoder type
+ Add

Decoders

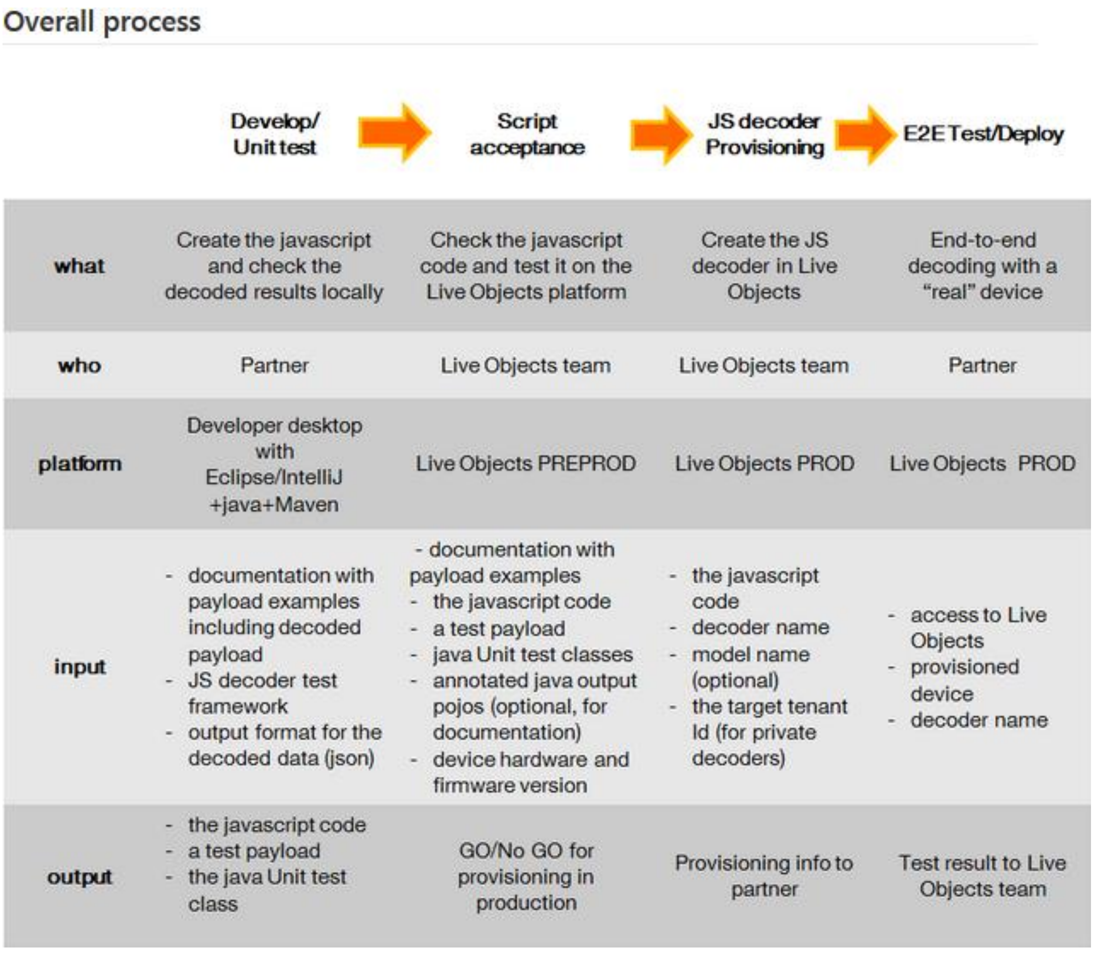
46 decoders

☐	Name	Visibility	Type	Model	State
☐	abeeway_microtracker_v1.0	Public	Predefined (Script)	model_abeeway_microtracker_v1	● Enabled
☐	abeeway_tracker_v1.2	Public	Predefined (Script)	model_abeeway_mastertracker_v5	● Enabled
☐	abeeway_tracker_v1.3	Public	Predefined (Script)	model_abeeway_mastertracker_v5	● Enabled
☐	adeunis_analog_lora_v1.0	Public *beta*	Predefined (Script)	model_adeunis_analog_v0	● Enabled
☐	adeunis_arf_v1.3.0	Public	Predefined (Script)	model_adeunis_arf_v13	● Enabled

private JavaScript decoders

How to proceed ?

- You can download our IDE in order for you to develop & test your decoder
  Go to https://github.com/DatavenueLiveObjects/Payload-decoders
- Or, you can use the code generator on https://codegenerator-lopayloadtest.noprod-b.kmt.orange.com
- Test your decoder on https://codegenerator-lopayloadtest.noprod-b.kmt.orange.com/tester
- When you are ready, contact us at liveobjects.support@orange.com in order to provision it as a private decoder on your account.
- If your live test on Live Objects is OK, then give us the go to turn your decoder to a « public » one.



Overall process

	Develop/ Unit test	Script acceptance	JS decoder Provisioning	E2E Test/Deploy
what	Create the javascript and check the decoded results locally	Check the javascript code and test it on the Live Objects platform	Create the JS decoder in Live Objects	End-to-end decoding with a "real" device
who	Partner	Live Objects team	Live Objects team	Partner
platform	Developer desktop with Eclipse/IntelliJ +java+Maven	Live Objects PREPROD	Live Objects PROD	Live Objects PROD
input	- documentation with payload examples including decoded payload - JS decoder test framework - output format for the decoded data (json)	- documentation with payload examples - the javascript code - a test payload - java Unit test classes - annotated java output pojos (optional, for documentation) - device hardware and firmware version	- the javascript code - decoder name - model name (optional) - the target tenant Id (for private decoders)	- access to Live Objects - provisioned device - decoder name
output	- the javascript code - a test payload - the java Unit test class	GO/No GO for provisioning in production	Provisioning info to partner	Test result to Live Objects team

Orange Restricted

private decoders : binary

Example based on a 3 Bytes payload : 38AAFF to be structured into 4 fields

38		AA	FF
0 0 1 1 1	0 0 0	1 0 1 0 1 0 1 0	1 1 1 1 1 1 1 1
test5	test3	pressure	temperature

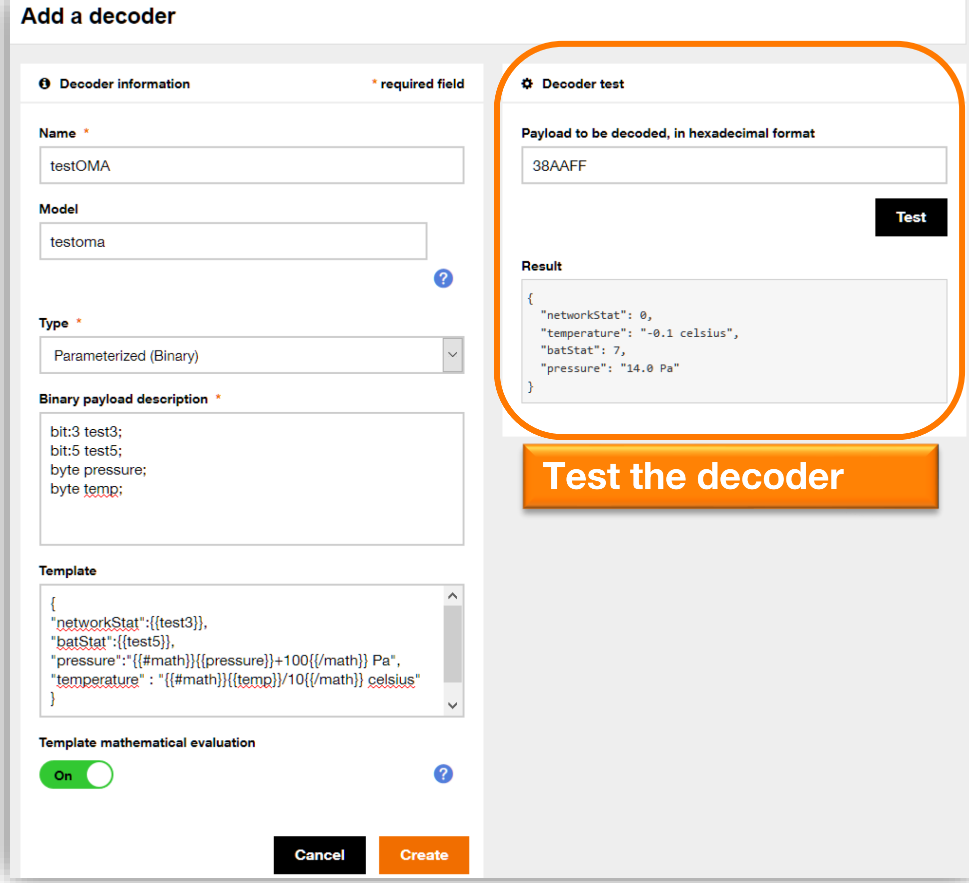
described as

`bit:3 test3;`	1st byte: *test3* coded on 3 bits (LSb)
`bit:5 test5;`	1st byte: *test5* coded on 5 bits (MSb)
`byte pressure;`	2nd byte
`byte temperature;`	3rd byte

and to be presented following this template

```
{
"networkStat":{{test3}},
"batStat":{{test5}},
"pressure":"{{#math}}{{pressure}}+100{{/math}} Pa",
"temperature" : "{{#math}}{{temperature}}/10{{/math}} celsius"
}
```

https://github.com/raydac/java-binary-block-parser



Add a decoder

Decoder information * required field

Name *: testOMA

Model: testoma

Type *: Parameterized (Binary)

Binary payload description *:

```
bit:3 test3;
bit:5 test5;
byte pressure;
byte temp;
```

Template:

```
{
"networkStat":{{test3}},
"batStat":{{test5}},
"pressure":"{{#math}}{{pressure}}+100{{/math}} Pa",
"temperature" : "{{#math}}{{temp}}/10{{/math}} celsius"
}
```

Template mathematical evaluation: On

Decoder test

Payload to be decoded, in hexadecimal format: 38AAFF

Result

```
{
  "networkStat": 0,
  "temperature": "-0.1 celsius",
  "batStat": 7,
  "pressure": "14.0 Pa"
}
```

Test the decoder

private decoders : CSV

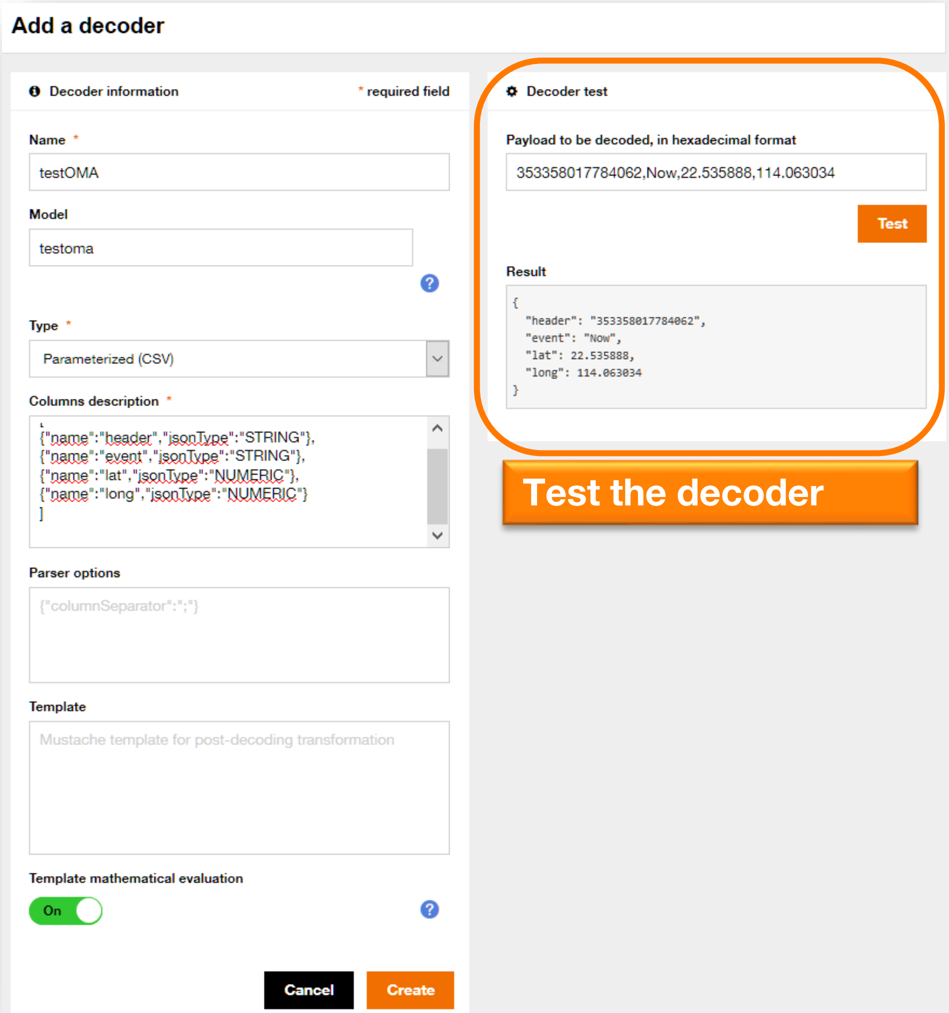
Typical SMS use-case

Example of a 4 fields payload :

```
353358017784062,Now,22.535888,114.063034
```

to be structured into 4 fields

```
[
{"name":"header","jsonType":"STRING"},
{"name":"event","jsonType":"STRING"},
{"name":"lat","jsonType":"NUMERIC"},
{"name":"long","jsonType":"NUMERIC"}
]
```



Add a decoder

Decoder information * required field

Name *: testOMA

Model: testoma

Type *: Parameterized (CSV)

Columns description *:

```
[
{"name":"header","jsonType":"STRING"},
{"name":"event","jsonType":"STRING"},
{"name":"lat","jsonType":"NUMERIC"},
{"name":"long","jsonType":"NUMERIC"}
]
```

Parser options: {"columnSeparator":";"}

Template: Mustache template for post-decoding transformation

Template mathematical evaluation: On

Decoder test

Payload to be decoded, in hexadecimal format: 353358017784062,Now,22.535888,114.063034

Result:

```
{
  "header": "353358017784062",
  "event": "Now",
  "lat": 22.535888,
  "long": 114.063034
}
```

Test the decoder

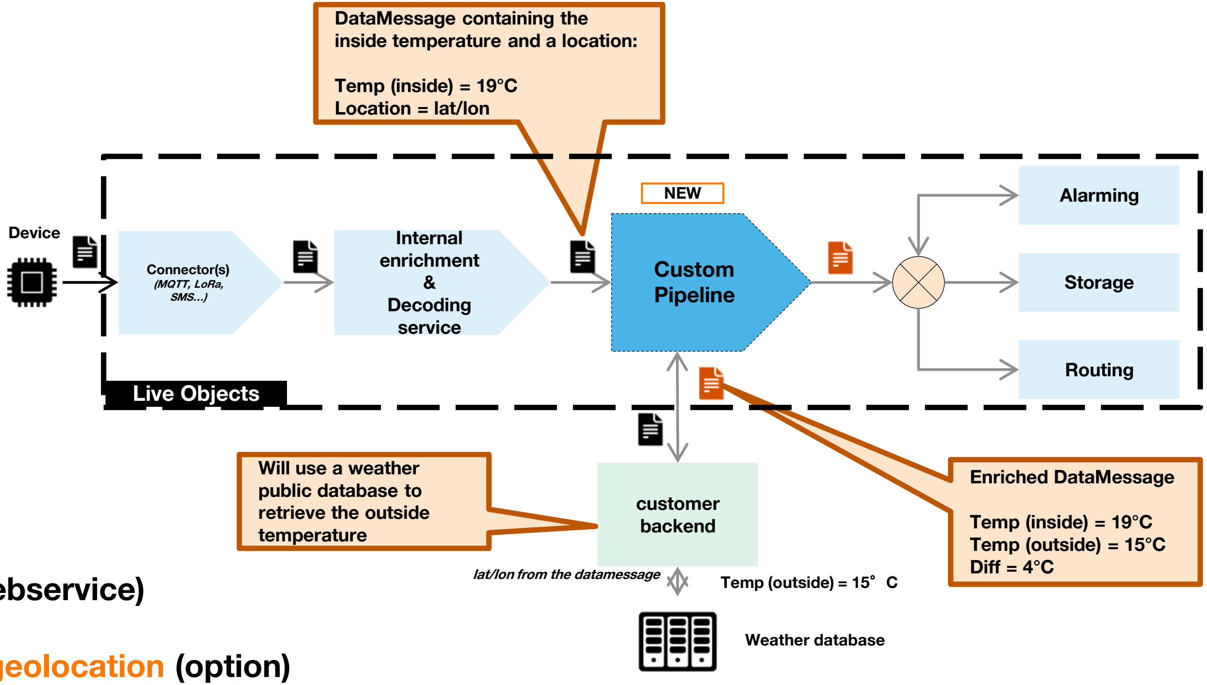
JavaScript public or private decoders with MQTT

A device using MQTT can push encoded data to Live Objects:
2 topics:

- ✓ **dev/v1/data/binary**
  - ⇒ **to push raw data directly in the datazone**
  - ⇒ **or to use the decoder set in the device configuration**
- ✓ **dev/v1/data/binary/{decoderName} => used to link the device with a decoder already provisioned in Live Objects, data will be decoded**

The data is enriched with enricher feature and a streamId is set.
The data is stored in the datazone.

Custom Pipelines



DataMessage containing the inside temperature and a location:

Temp (inside) = 19°C
Location = lat/lon

Device

Connector(s)
(MQTT, LoRa, SMS…)

Internal enrichment & Decoding service

NEW

Custom Pipeline

Alarming

Storage

Routing

Live Objects

Will use a weather public database to retrieve the outside temperature

customer backend

lat/lon from the datamessage

Temp (outside) = 15° C

Weather database

Enriched DataMessage

Temp (inside) = 19°C
Temp (outside) = 15°C
Diff = 4°C

Uses:

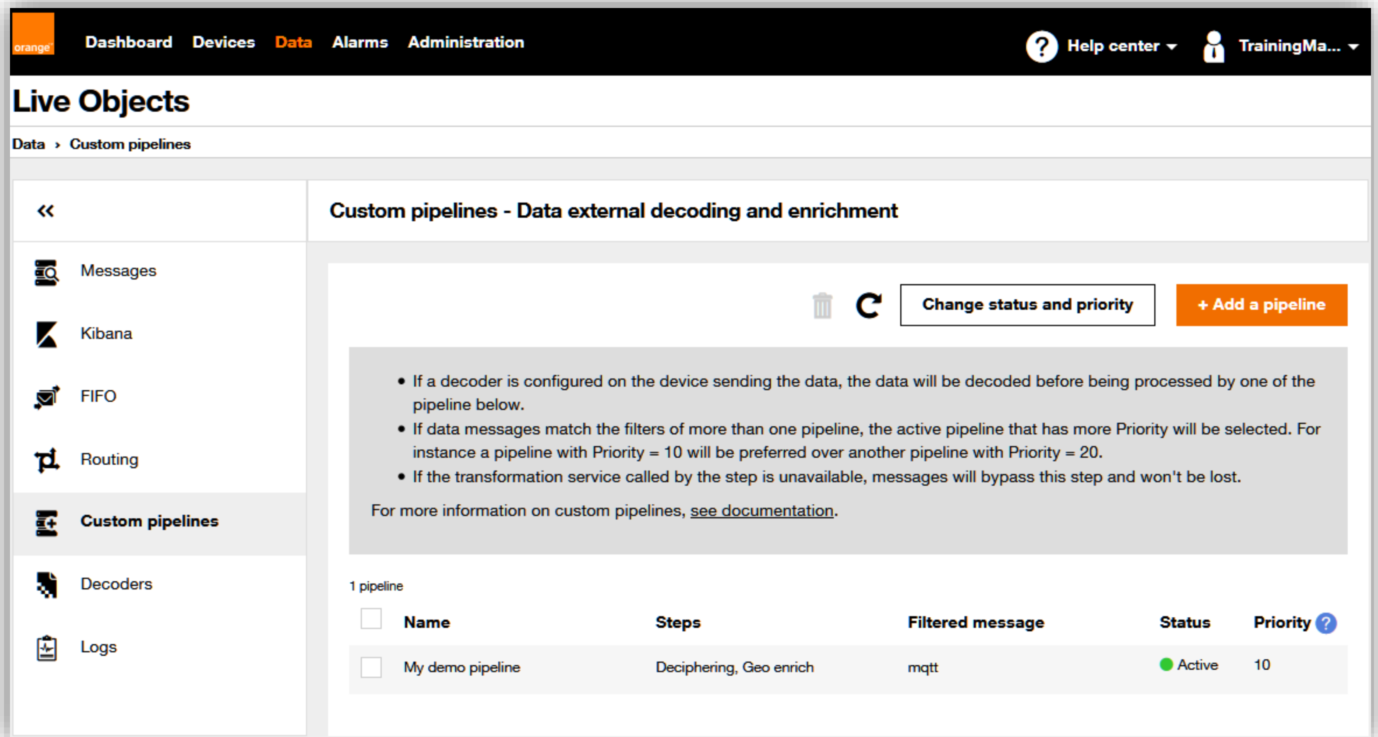
- ✓ decoding
- ✓ deciphering
- ✓ add external data (eg, from a webservice)
- ✓ heavy computation
- ✓ cellular (Orange + OpenCellID) geolocation (option)

Priorities:

- ✓ several steps per pipeline
- ✓ at most one pipeline can handle a Data Message
- ✓ lowest priority level pipeline will be selected

- Follow the tutorial on https://youtu.be/rpqjJiu0H3A

Custom Pipelines on portal


Dashboard
Devices
Data
Alarms
Administration
Help center
TrainingMa...
Live Objects
Data › Custom pipelines
Messages
Kibana
FIFO
Routing
Custom pipelines
Decoders
Logs
Change status and priority
+ Add a pipeline

Custom pipelines - Data external decoding and enrichment

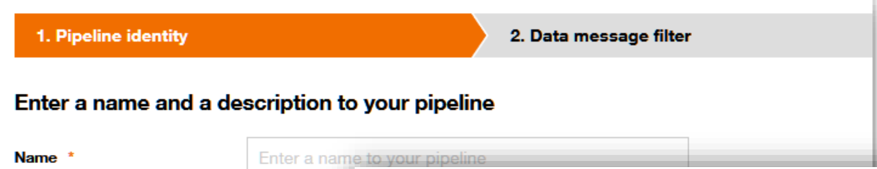
- If a decoder is configured on the device sending the data, the data will be decoded before being processed by one of the pipeline below.
- If data messages match the filters of more than one pipeline, the active pipeline that has more Priority will be selected. For instance a pipeline with Priority = 10 will be preferred over another pipeline with Priority = 20.
- If the transformation service called by the step is unavailable, messages will bypass this step and won't be lost.

For more information on custom pipelines, see documentation.

1 pipeline

☐	Name	Steps	Filtered message	Status	Priority
☐	My demo pipeline	Deciphering, Geo enrich	mqtt	● Active	10

Custom Pipelines on portal

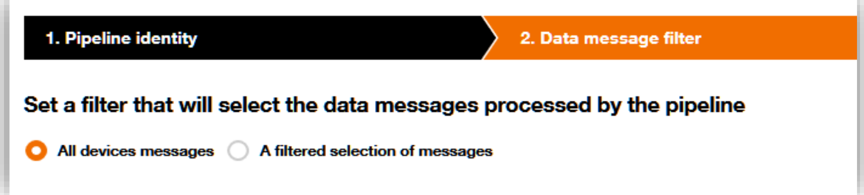


1. Pipeline identity
2. Data message filter

Enter a name and a description to your pipeline

Name * Enter a name to your pipeline

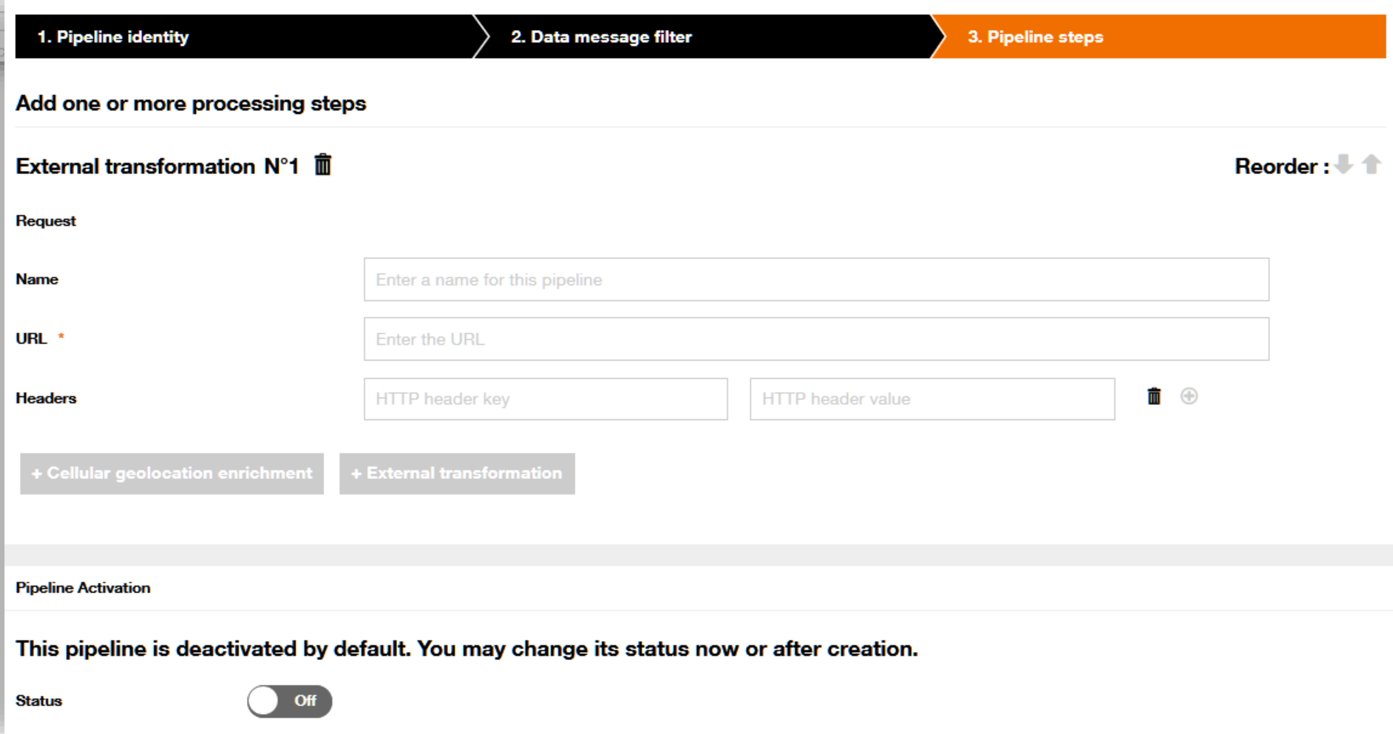
Description Enter a desc



1. Pipeline identity
2. Data message filter

Set a filter that will select the data messages processed by the pipeline

● All devices messages ○ A filtered selection of messages



1. Pipeline identity
2. Data message filter
3. Pipeline steps

Add one or more processing steps

External transformation N°1

Reorder :

Request

Name Enter a name for this pipeline

URL * Enter the URL

Headers HTTP header key HTTP header value

+ Cellular geolocation enrichment
+ External transformation

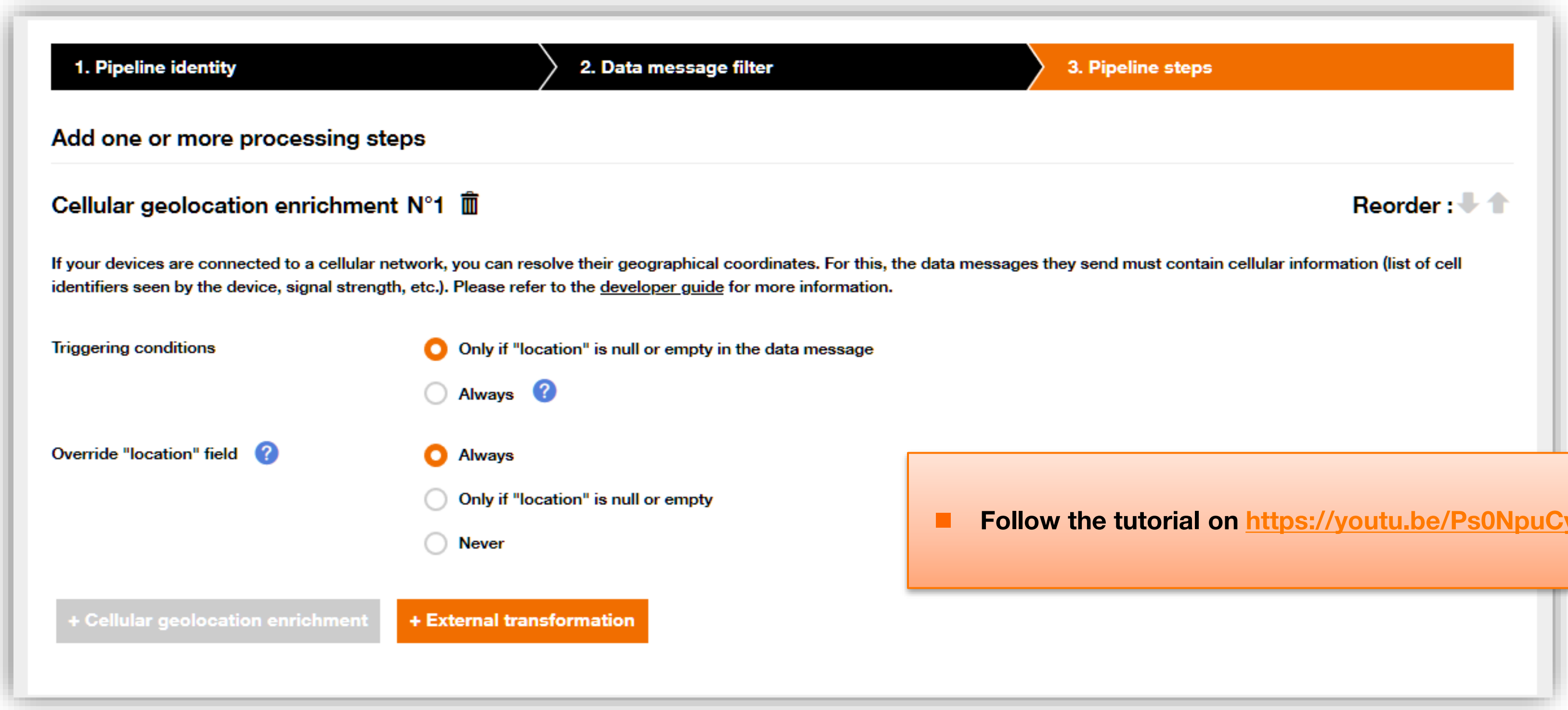
Pipeline Activation

This pipeline is deactivated by default. You may change its status now or after creation.

Status Off

Custom Pipelines on portal

GSM geolocation (OpenCellId + Orange)



1. Pipeline identity
2. Data message filter
3. Pipeline steps

Add one or more processing steps

Cellular geolocation enrichment N°1

Reorder :

If your devices are connected to a cellular network, you can resolve their geographical coordinates. For this, the data messages they send must contain cellular information (list of cell identifiers seen by the device, signal strength, etc.). Please refer to the developer guide for more information.

Triggering conditions
● Only if "location" is null or empty in the data message
○ Always ?

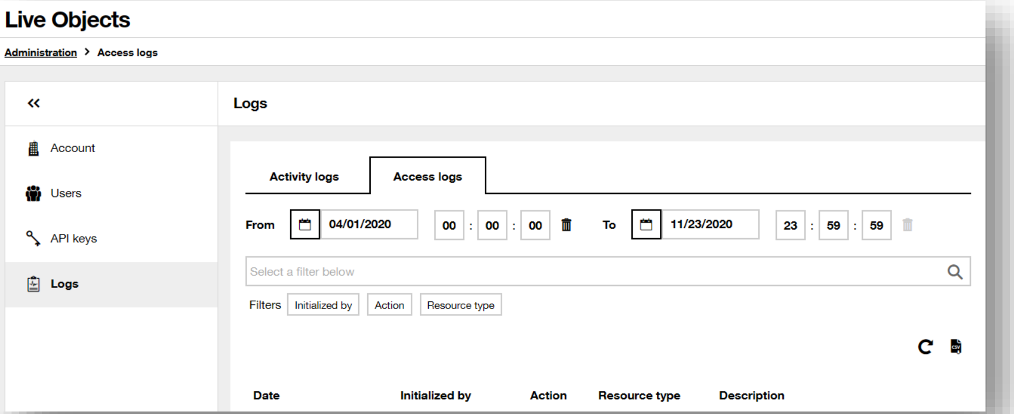
Override "location" field ?
● Always
○ Only if "location" is null or empty
○ Never

+ Cellular geolocation enrichment
+ External transformation

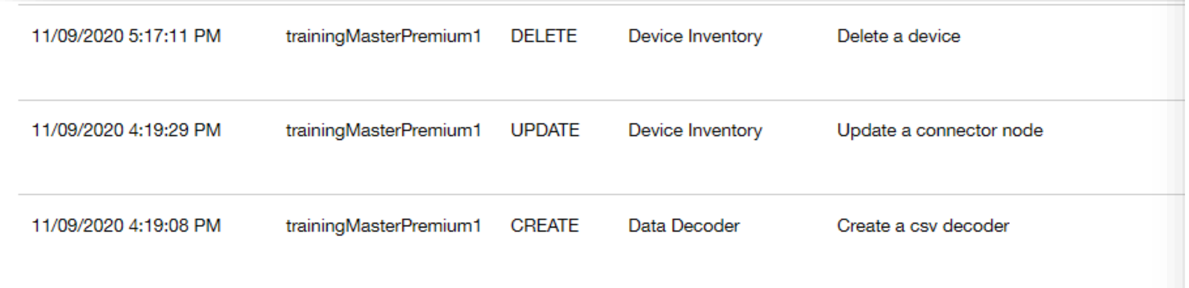
- Follow the tutorial on https://youtu.be/Ps0NpuCyiHw

https://liveobjects.orange-business.com/doc/html/lo_manual_v2.html#_cellulargeolocenrichment_step

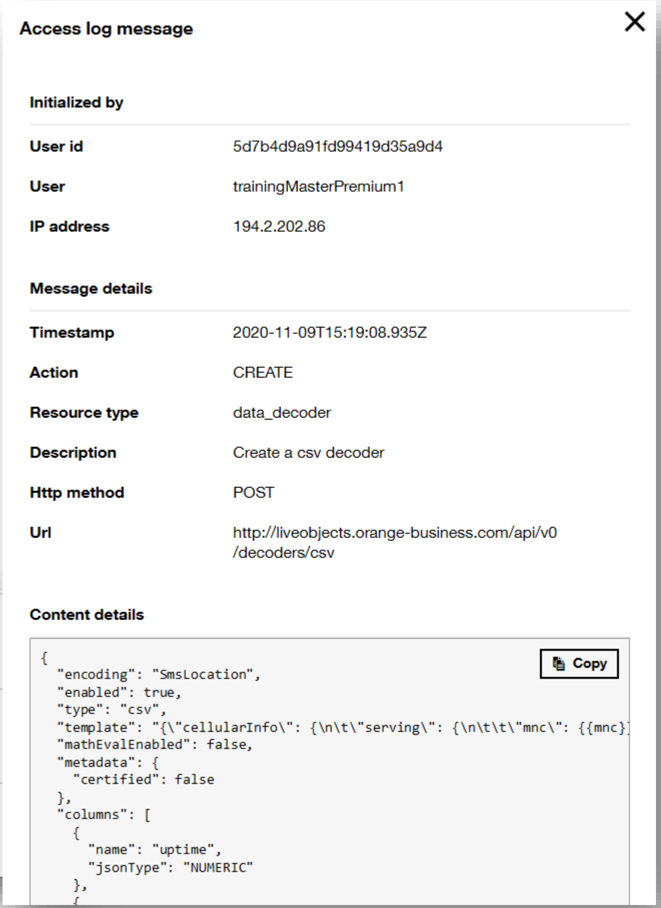
Debug : access logs for history


Live Objects
Administration > Access logs
«
Account
Users
API keys
Logs
Logs
Activity logs
Access logs
Select a filter below
Filters
Initialized by
Action
Resource type
Date
Initialized by
Action
Resource type
Description

From 04/01/2020 00 : 00 : 00 To 11/23/2020 23 : 59 : 59



11/09/2020 5:17:11 PM	trainingMasterPremium1	DELETE	Device Inventory	Delete a device
11/09/2020 4:19:29 PM	trainingMasterPremium1	UPDATE	Device Inventory	Update a connector node
11/09/2020 4:19:08 PM	trainingMasterPremium1	CREATE	Data Decoder	Create a csv decoder


Access log message
Copy

Initialized by

User id	5d7b4d9a91fd99419d35a9d4
User	trainingMasterPremium1
IP address	194.2.202.86

Message details

Timestamp	2020-11-09T15:19:08.935Z
Action	CREATE
Resource type	data_decoder
Description	Create a csv decoder
Http method	POST
Url	http://liveobjects.orange-business.com/api/v0 /decoders/csv

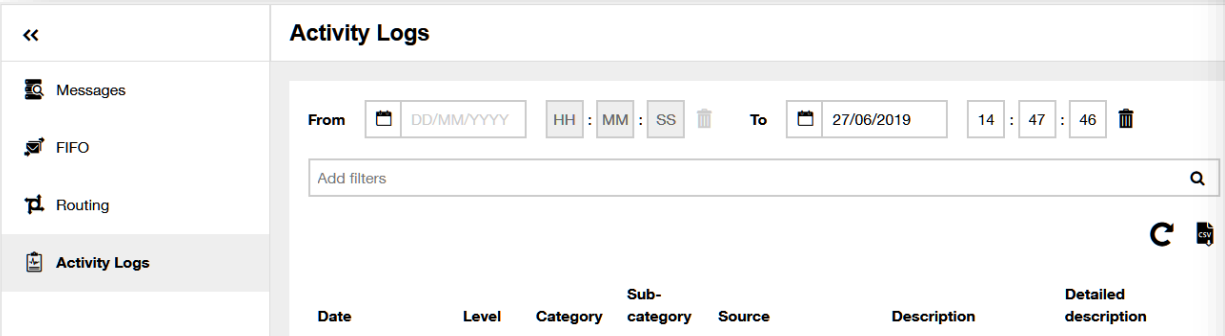
Content details

```
{
  "encoding": "SmsLocation",
  "enabled": true,
  "type": "csv",
  "template": "{\"cellularInfo\": {\n\t\"serving\": {\n\t\t\"mnc\": {{mnc}
  "mathEvalEnabled": false,
  "metadata": {
    "certified": false
  },
  "columns": [
    {
      "name": "uptime",
      "jsonType": "NUMERIC"
    },
    {
```

Debug: activity logs

Storage: model indexation issues

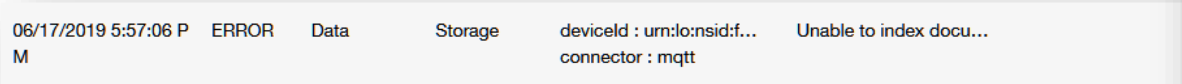
eg: bad format
model change



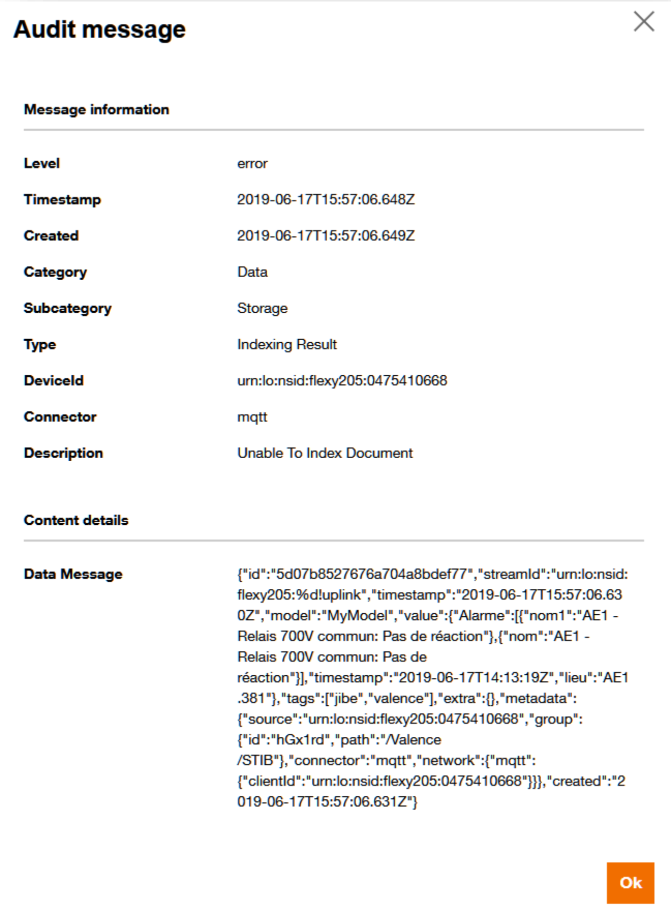
Activity Logs

From DD/MM/YYYY HH : MM : SS To 27/06/2019 14 : 47 : 46

Add filters



Date	Level	Category	Sub-category	Source	Description	Detailed description
06/17/2019 5:57:06 PM	ERROR	Data	Storage	deviceId : urn:lo:nsid:f... connector : mqtt	Unable to index docu...	



Audit message

Message information

Level	error
Timestamp	2019-06-17T15:57:06.648Z
Created	2019-06-17T15:57:06.649Z
Category	Data
Subcategory	Storage
Type	Indexing Result
DeviceId	urn:lo:nsid:flexy205:0475410668
Connector	mqtt
Description	Unable To Index Document

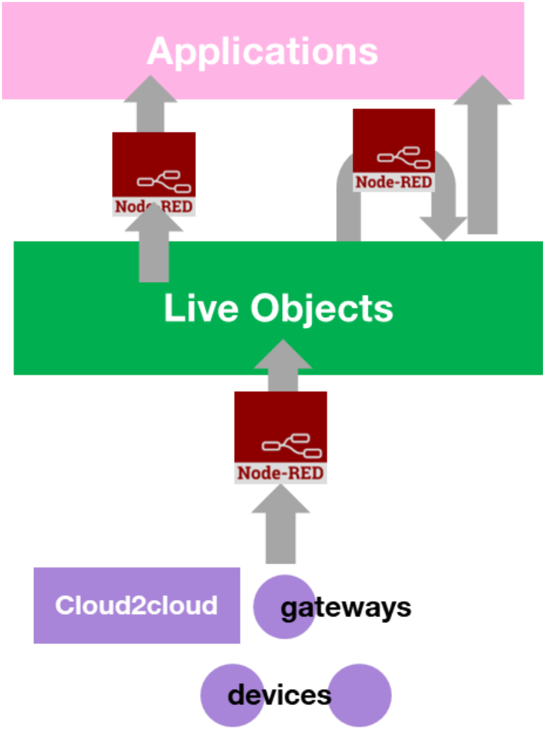
Content details

Data Message

```
{"id":"5d07b8527676a704a8bdef77","streamId":"urn:lo:nsid:
flexy205:%d!uplink","timestamp":"2019-06-17T15:57:06.63
0Z","model":"MyModel","value":{"Alarme":[{"nom1":"AE1 -
Relais 700V commun: Pas de réaction"},{"nom":"AE1 -
Relais 700V commun: Pas de
réaction"}],"timestamp":"2019-06-17T14:13:19Z","lieu":"AE1
.381"},"tags":["jibe","valence"],"extra":{},"metadata":
{"source":"urn:lo:nsid:flexy205:0475410668","group":
{"id":"hGx1rd","path":"/Valence
/STIB"},"connector":"mqtt","network":{"mqtt":
{"clientId":"urn:lo:nsid:flexy205:0475410668"}}},"created":"2
019-06-17T15:57:06.631Z"}
```

Node-RED SaaS to allow adding your own data transformations

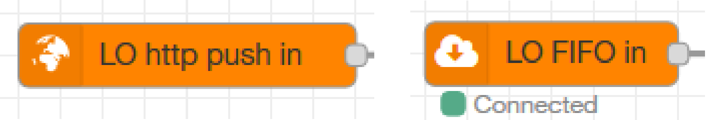
https://eventdriven.orange.com/


Applications
Node-RED
Node-RED
Live Objects
Node-RED
Cloud2cloud
gateways
devices

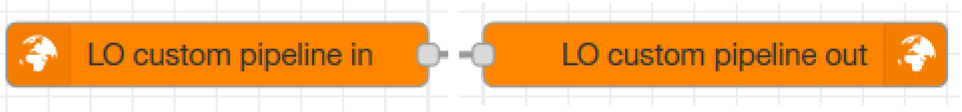
popular Apache 2.0 opensource Node-RED in SaaS-mode

D : Format adaptation and backend treatment

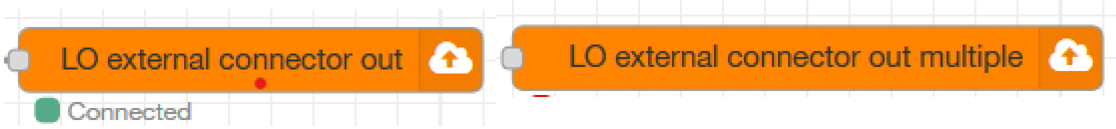
C : Event processing


LO http push in
LO FIFO in
Connected

B : Data enrichment, decoding (pipeline)


LO custom pipeline in
LO custom pipeline out

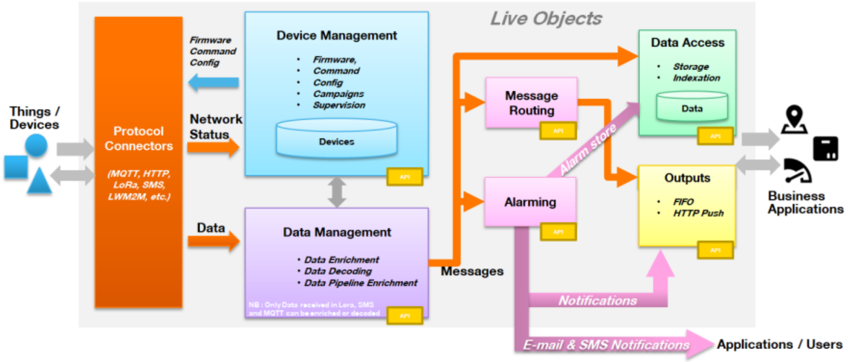
A : Data frame format adaptation


LO external connector out
Connected
LO external connector out multiple

#6.2

Data management
Publishing

Application modes


Live Objects
Things / Devices
Protocol Connectors
(MQTT, HTTP, LoRa, SMS, LWM2M, etc.)
Firmware
Command
Config
Network Status
Data
Device Management
Firmware,
Command
Config
Campaigns
Supervision
Devices
API
Data Management
Data Enrichment
Data Decoding
Data Pipeline Enrichment
NB : Only Data received in Lora, SMS and MQTT can be enriched or decoded
API
Messages
Message Routing
API
Alarming
API
Alarm store
Notifications
E-mail & SMS Notifications
Applications / Users
Data Access
Storage
Indexation
Data
API
Outputs
FIFO
HTTP Push
API
Business Applications

Applications consume data:

- ✓ in data history (time-series) with REST APIs:
  - ✓ from streams
  - ✓ with Elastic Search
- ✓ from FIFOs in real time with MQTT "application" mode (including connectors to clouds)
- ✓ received from HTTP-Push or Azure-Push

BTW, applications can also produce data (not linked to a device):

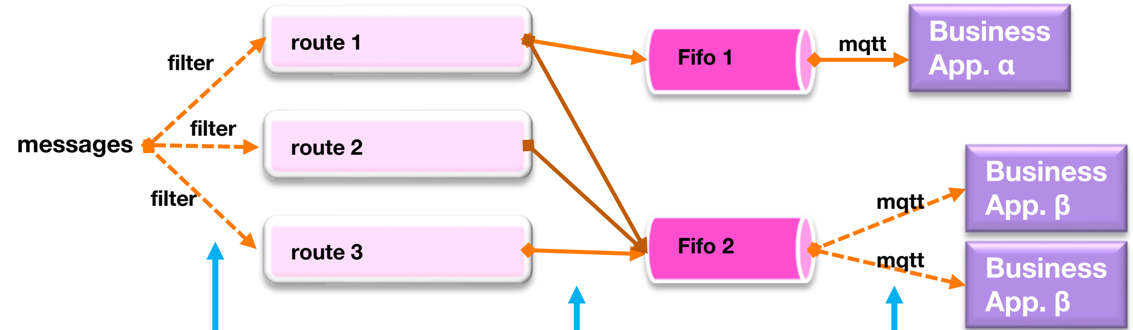
- ✓ with REST APIs:
  - ✓ stream writing (eg. deviceIdentifier, or deviceIdentifier-typeOfData)
  - ✓ bulk import
- ✓ "application" mode in MQTT, on topic application/v1/data

It makes use of decoding, pipelines, etc (if "value.payload" and "metadata.encoding" are included)

Message queues : FiFo

Benefit : it guarantees that the messages are delivered to the Application. Messages are stored in a queue on disk until consumed and acknowledged (7 days max)

1) Create the Fifo
2) Create links between data and the FiFo

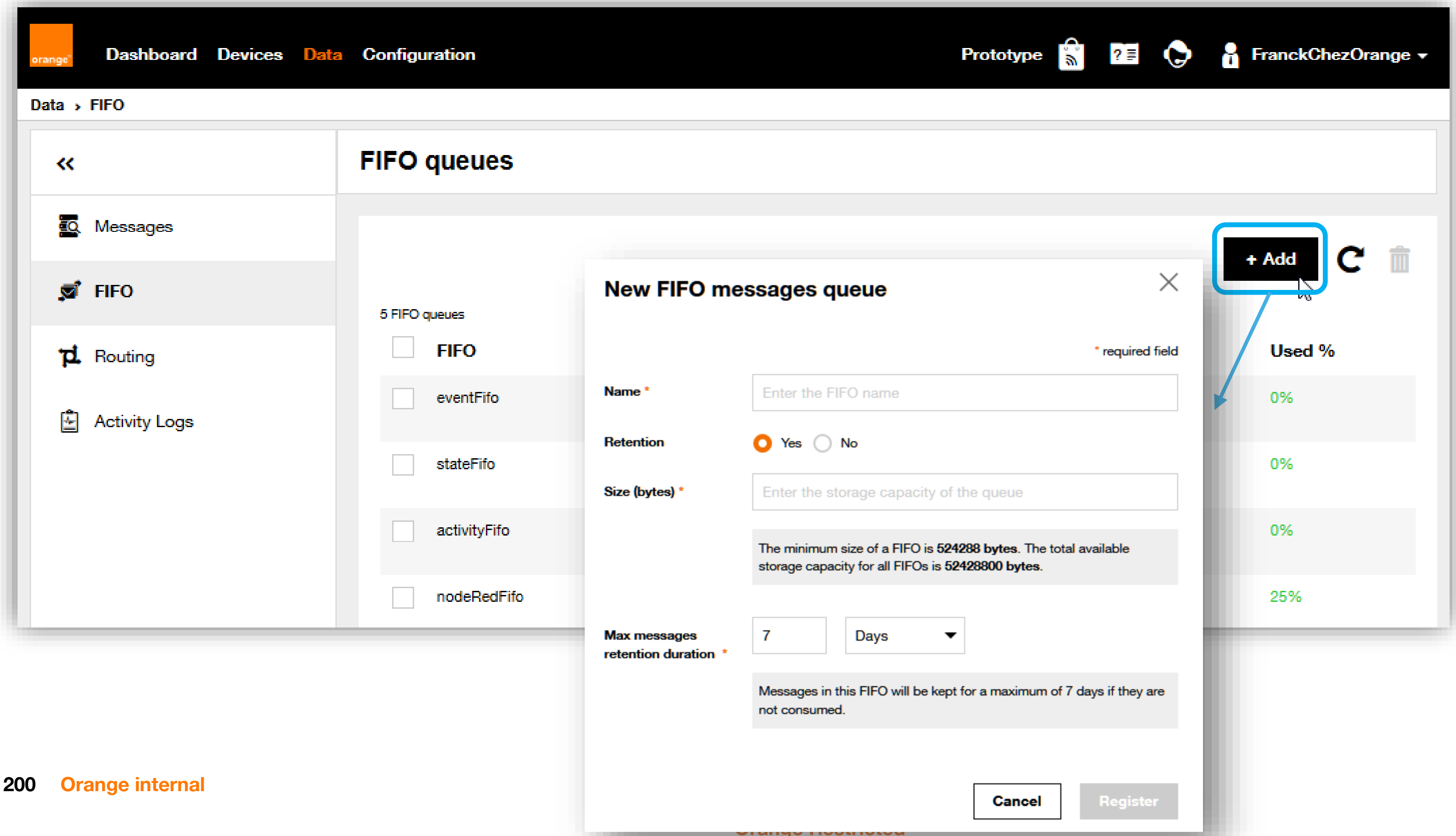


messages
filter
filter
filter
route 1
route 2
route 3
Fifo 1
Fifo 2
mqtt
mqtt
mqtt
Business App. α
Business App. β
Business App. β

Messages are replicated to all routes (with respect to filters) and all routed-to Fifos

Messages are shared among consumers of a single Fifo (random distribution)

Create a Fifo queue



orange
Dashboard
Devices
Data
Configuration
Prototype
FranckChezOrange
Data › FIFO
Messages
FIFO
Routing
Activity Logs
+ Add

FIFO queues

5 FIFO queues

☐	FIFO	Used %
☐	eventFifo	0%
☐	stateFifo	0%
☐	activityFifo	0%
☐	nodeRedFifo	25%

New FIFO messages queue

* required field

Name * Enter the FIFO name

Retention ● Yes ○ No

Size (bytes) * Enter the storage capacity of the queue

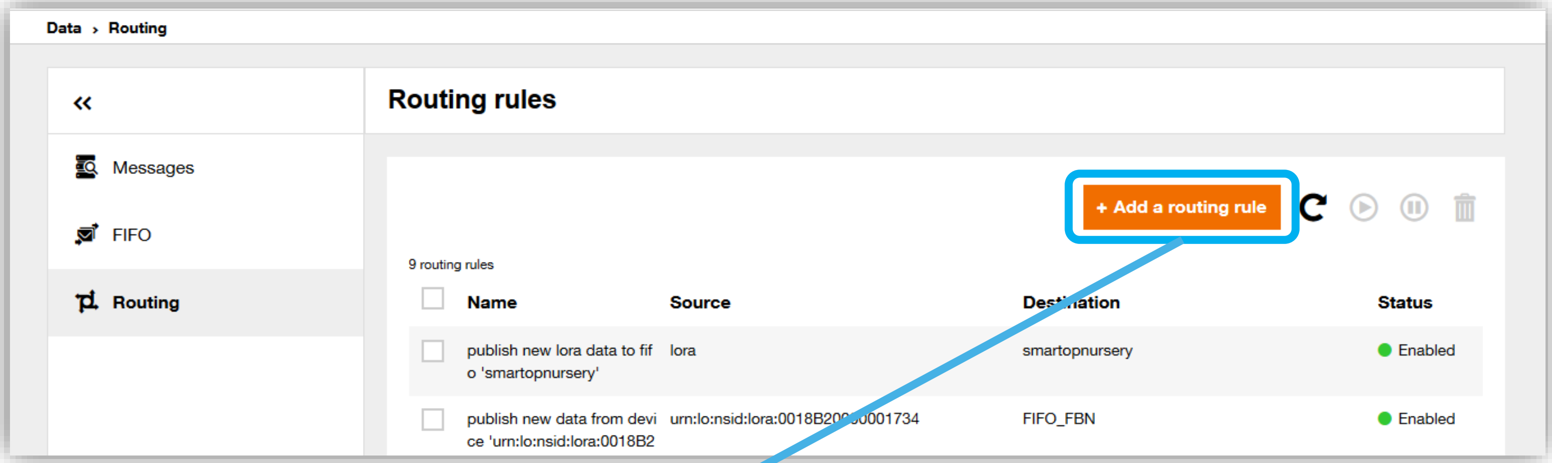
The minimum size of a FIFO is **524288 bytes**. The total available storage capacity for all FIFOs is **52428800 bytes**.

Max messages retention duration * 7 Days

Messages in this FIFO will be kept for a maximum of 7 days if they are not consumed.

Cancel Register

Feed the Fifo queue by a routing rule

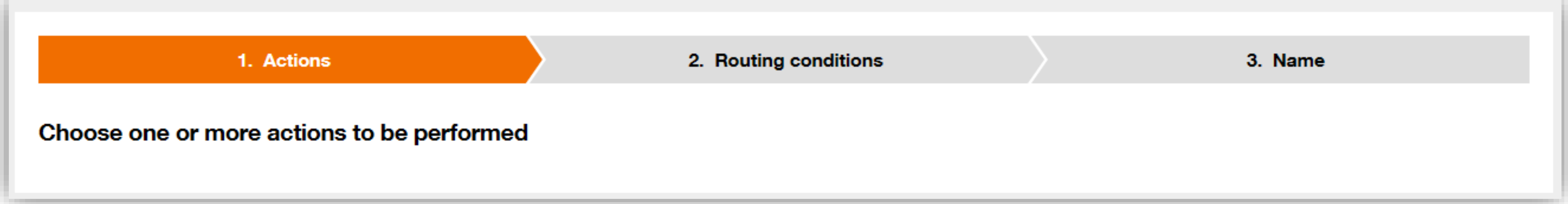


Data › Routing
«
Messages
FIFO
Routing
+ Add a routing rule

Routing rules

9 routing rules

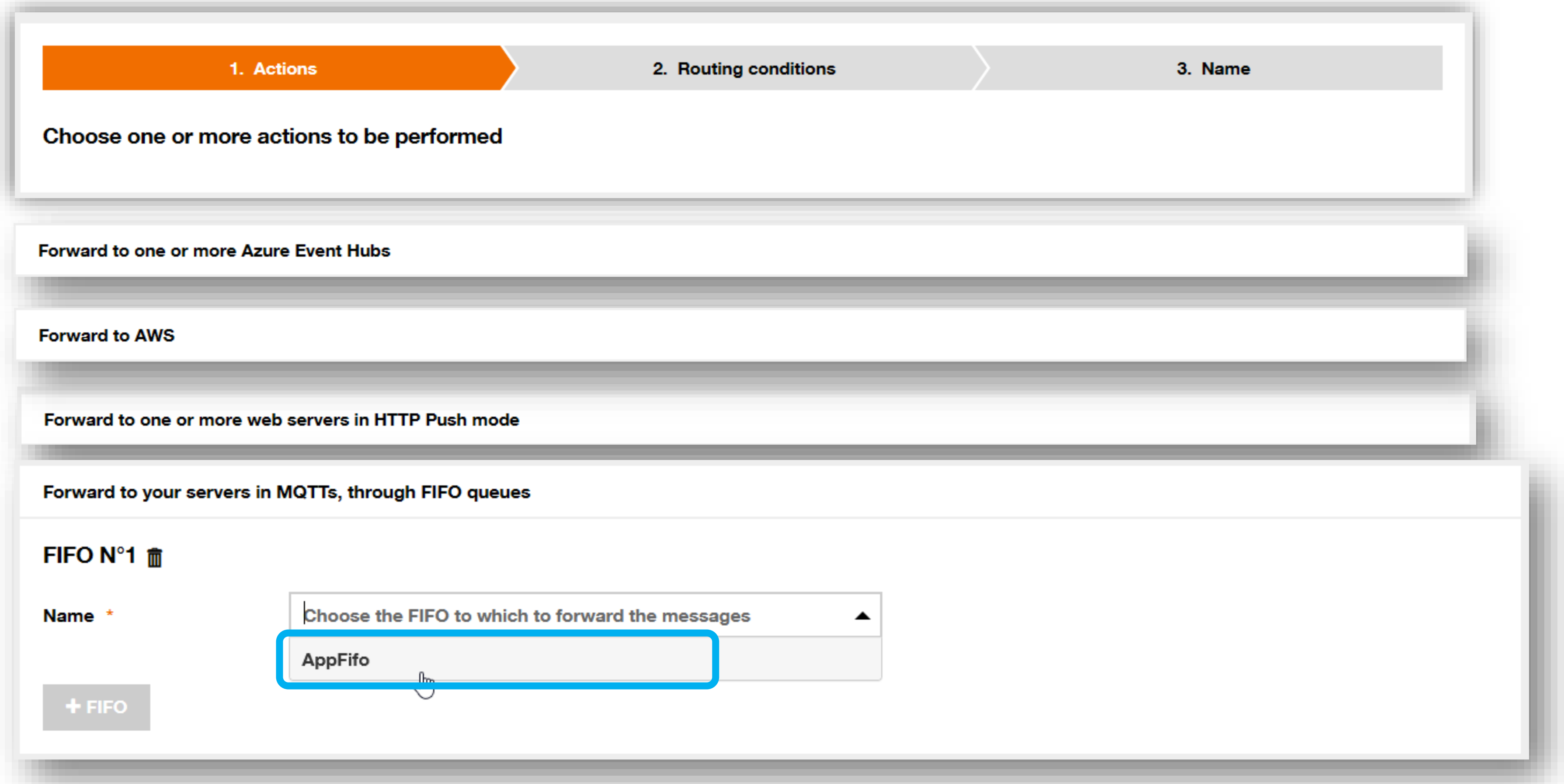
☐	Name	Source	Destination	Status
☐	publish new lora data to fifo 'smartopnursery'	lora	smartopnursery	● Enabled
☐	publish new data from device 'urn:lo:nsid:lora:0018B2	urn:lo:nsid:lora:0018B20000001734	FIFO_FBN	● Enabled



1. Actions
2. Routing conditions
3. Name

Choose one or more actions to be performed

Feed the Fifo queue by a routing rule


1. Actions
2. Routing conditions
3. Name

Choose one or more actions to be performed

Forward to one or more Azure Event Hubs

Forward to AWS

Forward to one or more web servers in HTTP Push mode

Forward to your servers in MQTTs, through FIFO queues

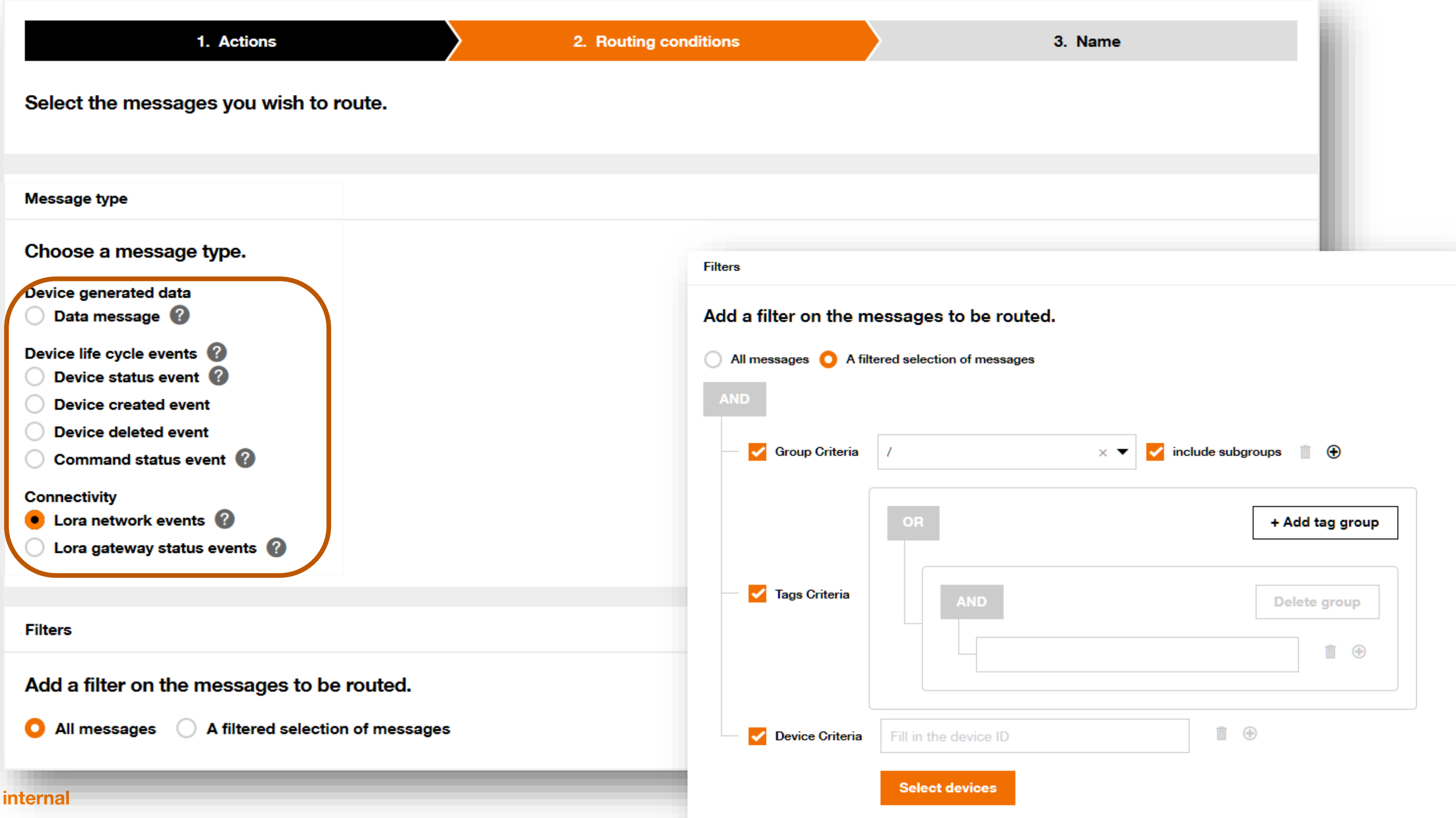
FIFO N°1

Name * Choose the FIFO to which to forward the messages

AppFifo

+ FIFO

Routing messages or status/events



1. Actions
2. Routing conditions
3. Name

Select the messages you wish to route.

Message type

Choose a message type.

Device generated data

○ Data message ?

Device life cycle events ?

○ Device status event ?
○ Device created event
○ Device deleted event
○ Command status event ?

Connectivity

● Lora network events ?
○ Lora gateway status events ?

Filters

Add a filter on the messages to be routed.

● All messages ○ A filtered selection of messages

Filters

Add a filter on the messages to be routed.

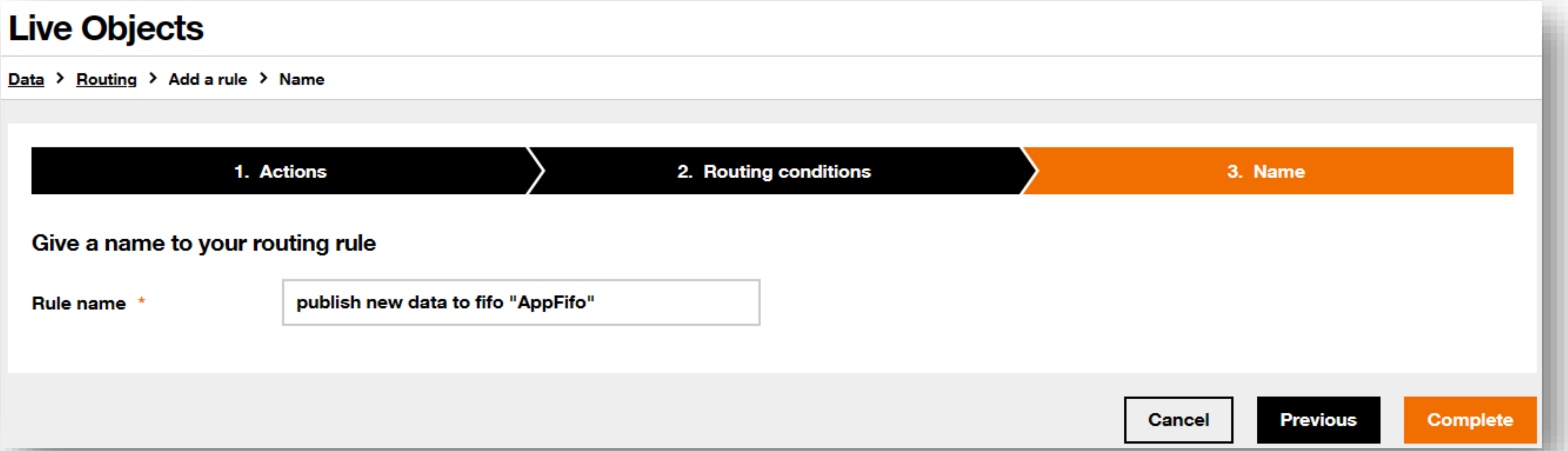
○ All messages ● A filtered selection of messages

☑ Group Criteria: / ☑ include subgroups

☑ Tags Criteria

☑ Device Criteria: Fill in the device ID

Feed the Fifo queue by a routing rule


Live Objects
Data › Routing › Add a rule › Name
1. Actions
2. Routing conditions
3. Name

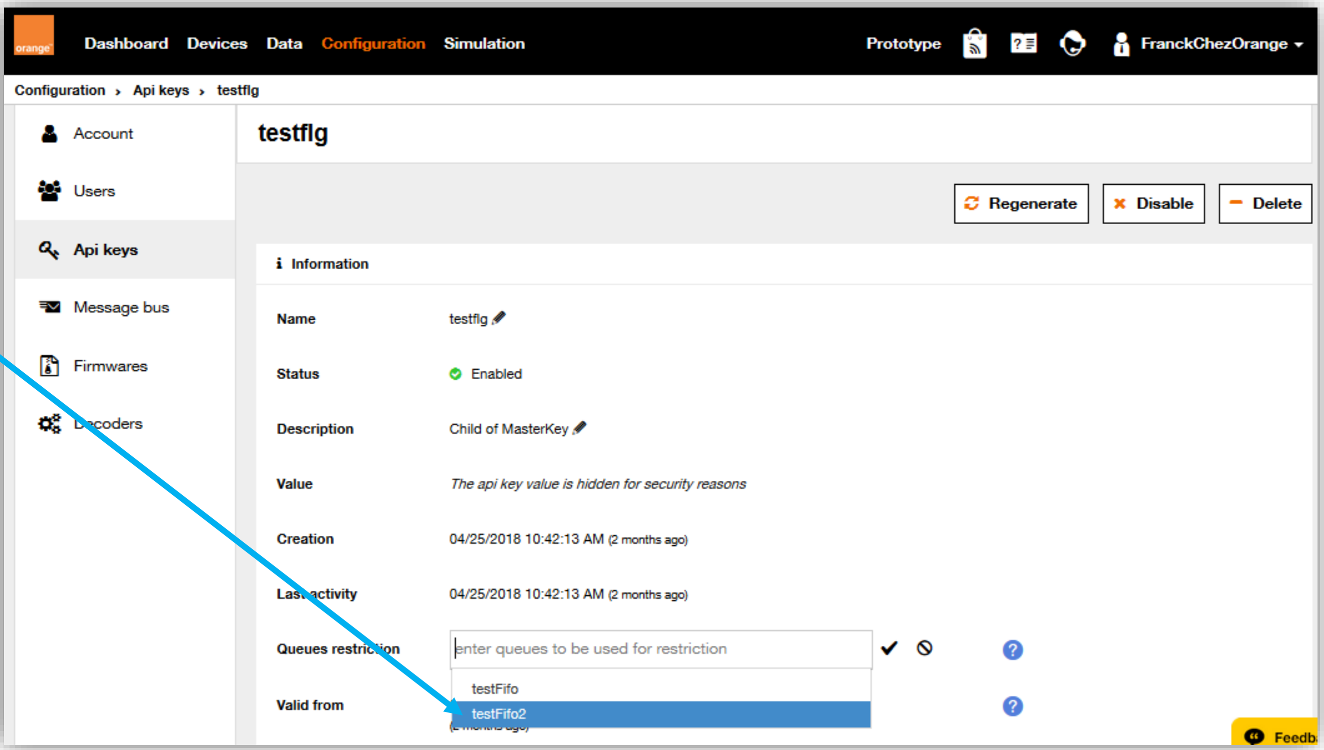
Give a name to your routing rule

Rule name * publish new data to fifo "AppFifo"

Cancel
Previous
Complete

Restrict an API key to access only one Fifo queue

Goal : Provide 3rd parties with an API Key that has restricted access


orange
Dashboard
Devices
Data
Configuration
Simulation
Prototype
FranckChezOrange
Configuration › Api keys › testflg
Account
Users
Api keys
Message bus
Firmwares
Decoders
Regenerate
Disable
Delete
Information
testFifo
testFifo2
Feedb

testflg

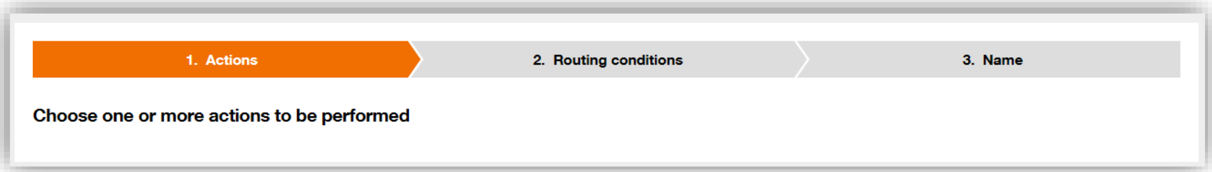
Name	testflg
Status	Enabled
Description	Child of MasterKey
Value	*The api key value is hidden for security reasons*
Creation	04/25/2018 10:42:13 AM (2 months ago)
Last activity	04/25/2018 10:42:13 AM (2 months ago)
Queues restriction	enter queues to be used for restriction
Valid from	(2 months ago)

Routing rules : HTTP-Push action

Try on https://webhook.site/

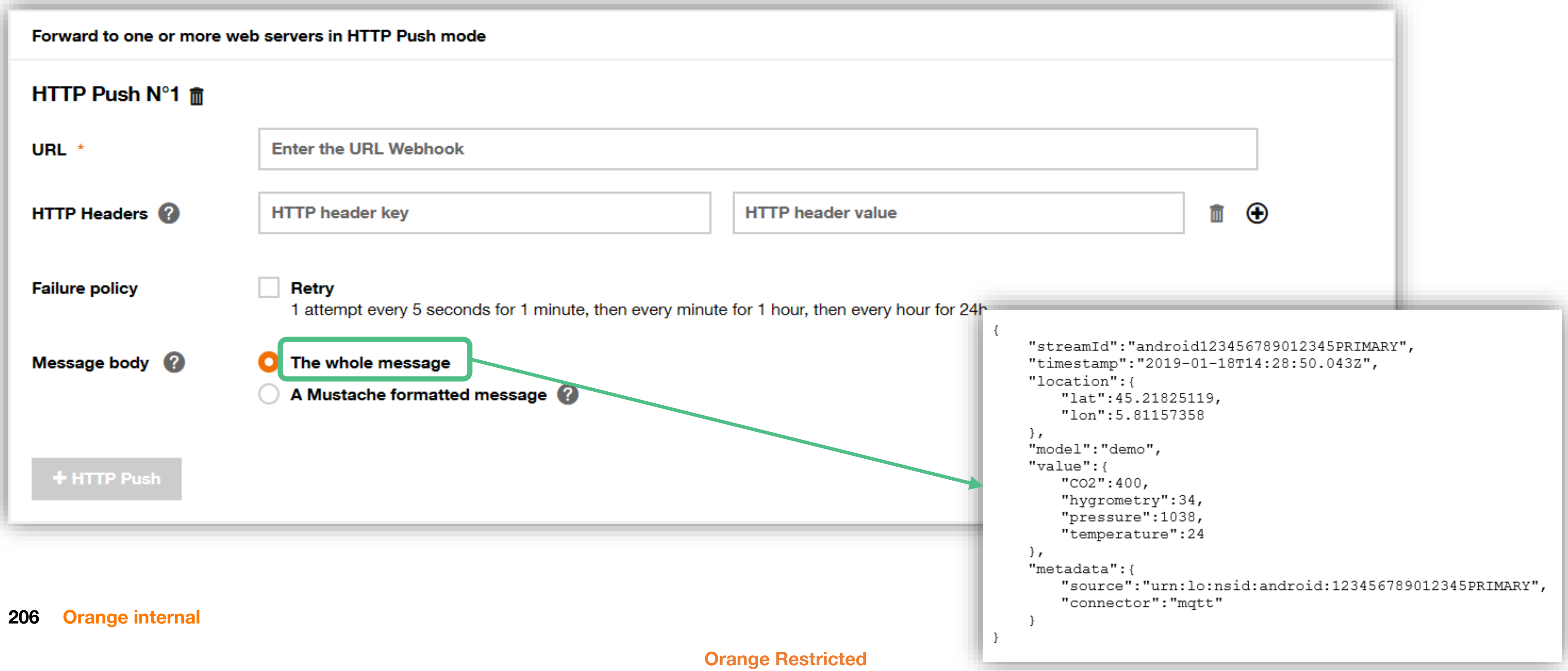
Or https://beeceptor.com/

ports: 80, 443, 8080, 8443, 9243



1. Actions
2. Routing conditions
3. Name

Choose one or more actions to be performed



Forward to one or more web servers in HTTP Push mode

HTTP Push N°1

URL * Enter the URL Webhook

HTTP Headers ? HTTP header key HTTP header value

Failure policy ☐ Retry
1 attempt every 5 seconds for 1 minute, then every minute for 1 hour, then every hour for 24h

Message body ?
● The whole message
○ A Mustache formatted message ?

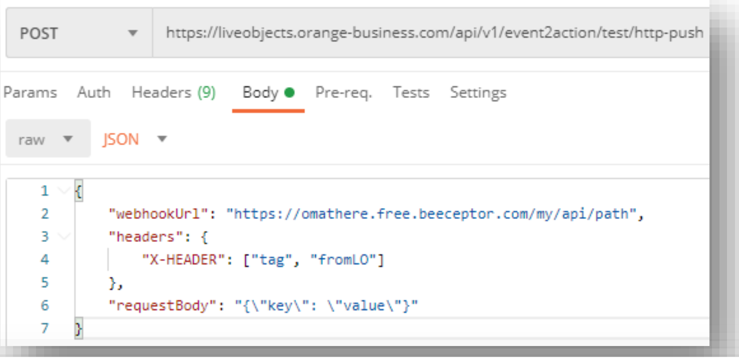
```
{
    "streamId":"android123456789012345PRIMARY",
    "timestamp":"2019-01-18T14:28:50.043Z",
    "location":{
        "lat":45.21825119,
        "lon":5.81157358
    },
    "model":"demo",
    "value":{
        "CO2":400,
        "hygrometry":34,
        "pressure":1038,
        "temperature":24
    },
    "metadata":{
        "source":"urn:lo:nsid:android:123456789012345PRIMARY",
        "connector":"mqtt"
    }
}
```

Debug: HTTP-Push action

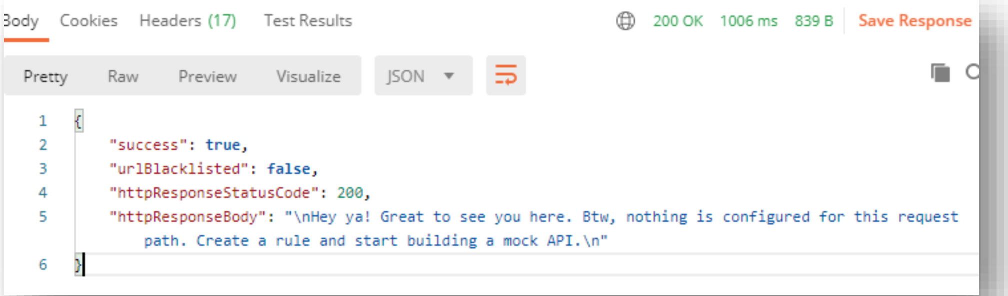
1. Check HTTP Push failures: in the activity logs on the portal

2. Check HTTP Push tryout:

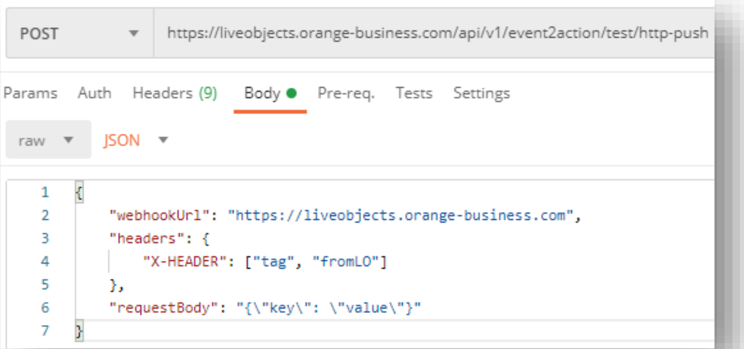
https://liveobjects.orange-business.com/api/v1/event2action/test/http-push


POST
https://liveobjects.orange-business.com/api/v1/event2action/test/http-push
Params
Auth
Headers (9)
Body
Pre-req.
Tests
Settings
raw
JSON

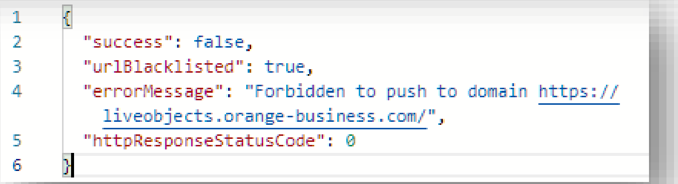
```
{
    "webhookUrl": "https://omathere.free.beeceptor.com/my/api/path",
    "headers": {
        "X-HEADER": ["tag", "fromLO"]
    },
    "requestBody": "{\"key\": \"value\"}"
}
```


Body
Cookies
Headers (17)
Test Results
200 OK
1006 ms
839 B
Save Response
Pretty
Raw
Preview
Visualize
JSON

```
{
    "success": true,
    "urlBlacklisted": false,
    "httpResponseStatusCode": 200,
    "httpResponseBody": "\nHey ya! Great to see you here. Btw, nothing is configured for this request
        path. Create a rule and start building a mock API.\n"
}
```


POST
https://liveobjects.orange-business.com/api/v1/event2action/test/http-push
Params
Auth
Headers (9)
Body
Pre-req.
Tests
Settings
raw
JSON

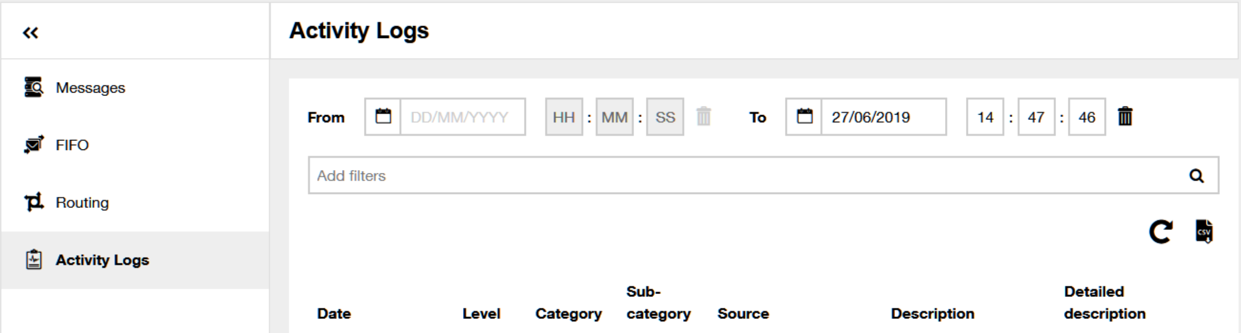
```
{
    "webhookUrl": "https://liveobjects.orange-business.com",
    "headers": {
        "X-HEADER": ["tag", "fromLO"]
    },
    "requestBody": "{\"key\": \"value\"}"
}
```



```
{
    "success": false,
    "urlBlacklisted": true,
    "errorMessage": "Forbidden to push to domain https://
      liveobjects.orange-business.com/",
    "httpResponseStatusCode": 0
}
```

Debug: activity logs

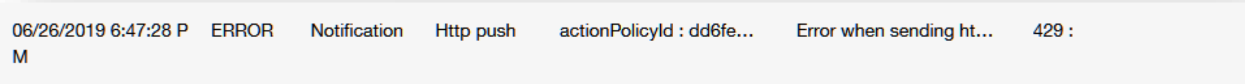
Http-Push: errors (only)



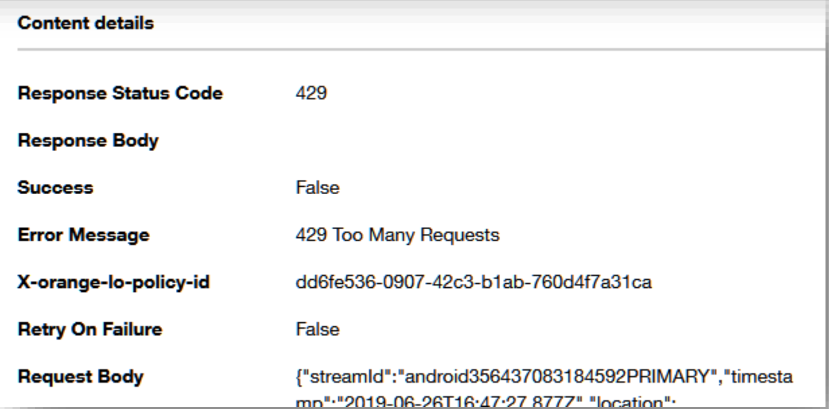
Activity Logs

From DD/MM/YYYY HH : MM : SS To 27/06/2019 14 : 47 : 46

Date	Level	Category	Sub-category	Source	Description	Detailed description



06/26/2019 6:47:28 PM	ERROR	Notification	Http push	actionPolicyId : dd6fe...	Error when sending ht...	429 :



Content details

Response Status Code	429
Response Body	
Success	False
Error Message	429 Too Many Requests
X-orange-lo-policy-id	dd6fe536-0907-42c3-b1ab-760d4f7a31ca
Retry On Failure	False
Request Body	{"streamId":"android356437083184592PRIMARY","timestamp":"2019-06-26T16:47:27.877Z","location":

Cloud connectors

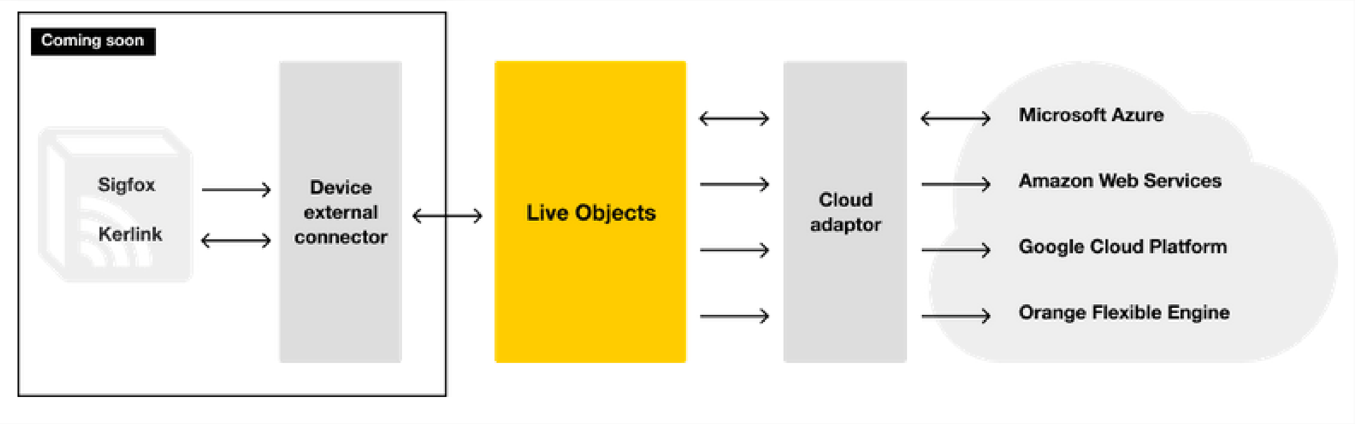
Hosted open-source code to connect Live Objects to public cloud providers

Why cloud connectors?

More reliable

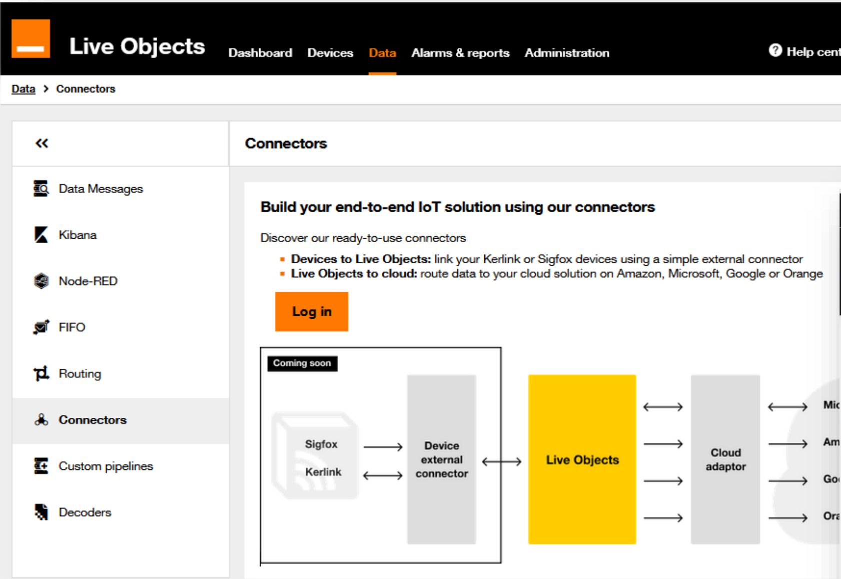
Enable also device management from cloud

Works with Google GCP, AWS, Azure IoT and flexible engine


Coming soon
Sigfox
Kerlink
Device external connector
Live Objects
Cloud adaptor
Microsoft Azure
Amazon Web Services
Google Cloud Platform
Orange Flexible Engine

Cloud connectors

Parallel component, you have to log-in with the same Live Objects credentials


Live Objects
Dashboard
Devices
Data
Alarms & reports
Administration
Help center
LOM PORTAL...
Data > Connectors
Data Messages
Kibana
Node-RED
FIFO
Routing
Connectors
Custom pipelines
Decoders
Coming soon
Sigfox
Kerlink
Device external connector
Live Objects
Cloud adaptor
Mic
Am
Go
Ora

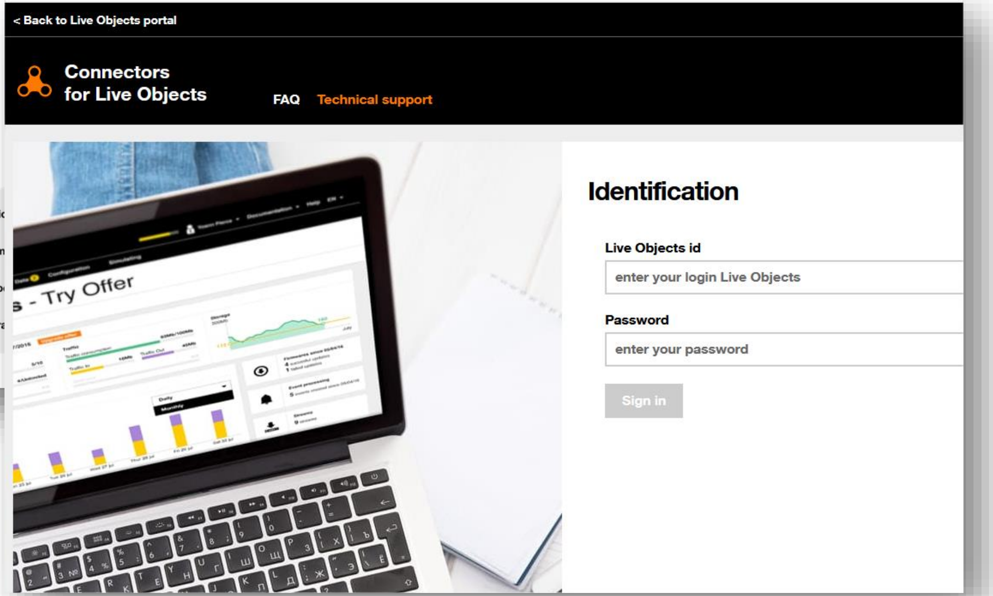
Connectors

Build your end-to-end IoT solution using our connectors

Discover our ready-to-use connectors

- **Devices to Live Objects:** link your Kerlink or Sigfox devices using a simple external connector
- **Live Objects to cloud:** route data to your cloud solution on Amazon, Microsoft, Google or Orange

Log in


< Back to Live Objects portal
Connectors for Live Objects
FAQ
Technical support
- Try Offer

Identification

Live Objects id: enter your login Live Objects

Password: enter your password

Sign in

Connecting Live Objects to Amazon AWS SQS

For organizations already running business logic on Amazon, planning to work on events from IoT devices sourced via Live Objects

Add a component receiving messages from Live Objects and pushing them into AWS :

https://github.com/DatavenueLiveObjects/Pushing-data-to-AWS-Simple-Queue-Service-SQS

Connecting Live Objects to Microsoft IoT Azure Event Hub / IoT Hub

2 ways:

1st: add a component receiving messages from Live Objects and pushing them into Azure

https://github.com/DatavenueLiveObjects/Azure-Event-Hub-connector-to-install-on-Azure

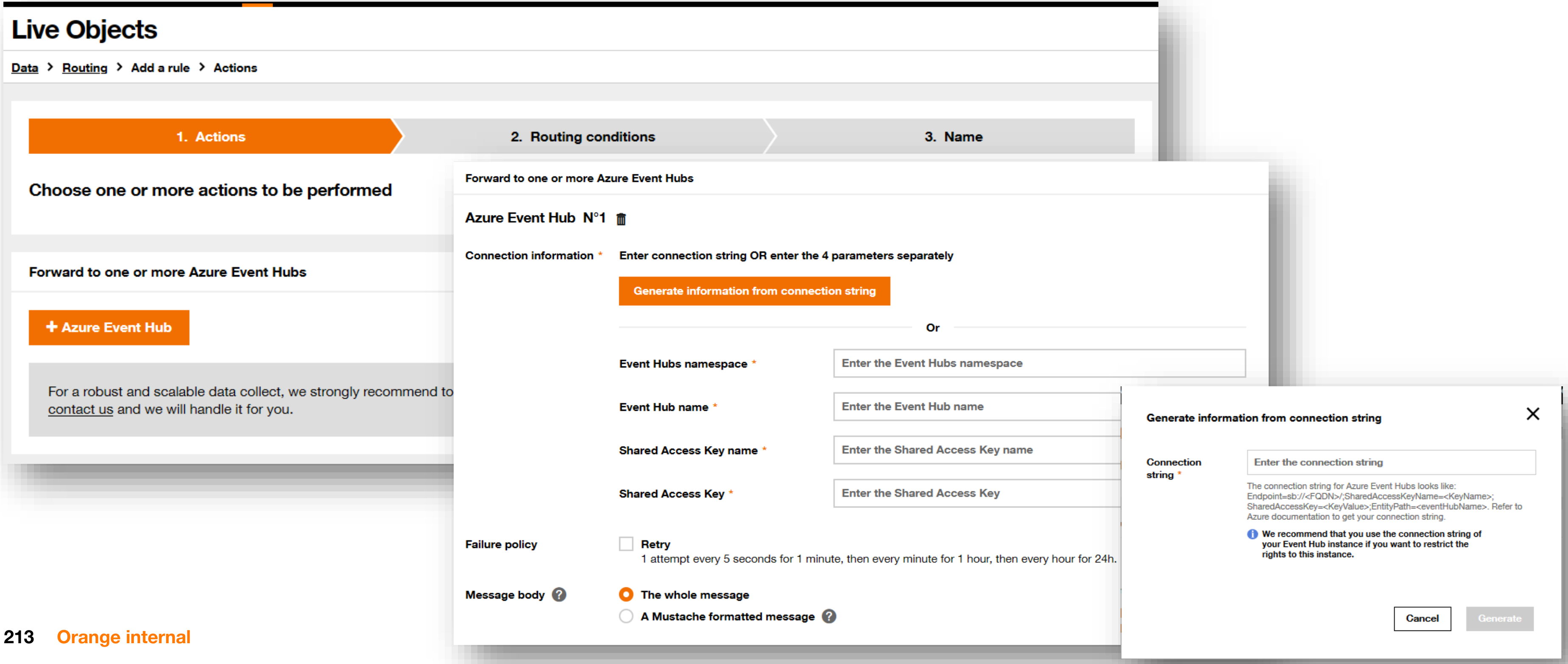
Messages and device information pushed to Azure

Commands from Azure sent to devices

Azure IoT Hub Multi tenant version available

Connecting Live Objects to Microsoft IoT Azure Event Hub / IoT Hub

2nd: HTTP-push unitary messages to Azure EventHub using Routing Rules



Live Objects

Data > Routing > Add a rule > Actions

1. Actions — 2. Routing conditions — 3. Name

Choose one or more actions to be performed

Forward to one or more Azure Event Hubs

For a robust and scalable data collect, we strongly recommend to contact us and we will handle it for you.

Forward to one or more Azure Event Hubs

Azure Event Hub N°1

Connection information * — Enter connection string OR enter the 4 parameters separately

Event Hubs namespace * — Enter the Event Hubs namespace

Event Hub name * — Enter the Event Hub name

Shared Access Key name * — Enter the Shared Access Key name

Shared Access Key * — Enter the Shared Access Key

Failure policy — ☐ Retry
1 attempt every 5 seconds for 1 minute, then every minute for 1 hour, then every hour for 24h.

Message body ?
- ● The whole message
- ○ A Mustache formatted message ?

Generate information from connection string

Connection string * — Enter the connection string

The connection string for Azure Event Hubs looks like: Endpoint=sb://<FQDN>/;SharedAccessKeyName=<KeyName>; SharedAccessKey=<KeyValue>;EntityPath=<eventHubName>. Refer to Azure documentation to get your connection string.

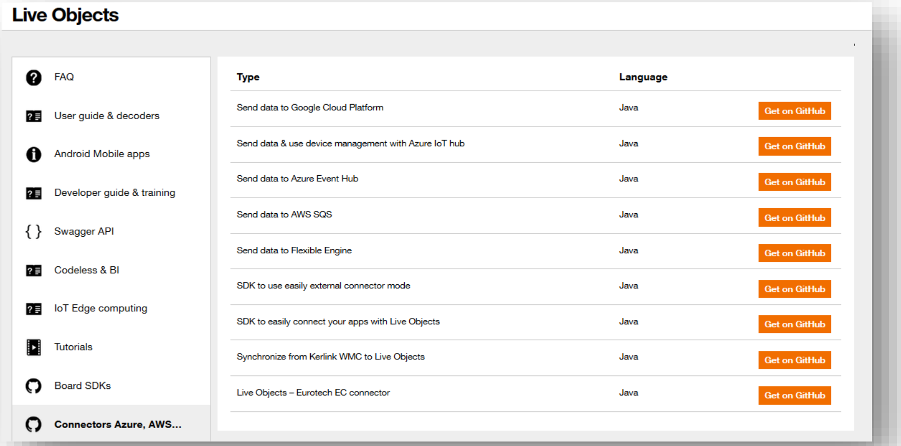
We recommend that you use the connection string of your Event Hub instance if you want to restrict the rights to this instance.

Connecting Live Objects to

Google Cloud

Flexible Engine DIS

(Data Ingestion Service)


Live Objects
FAQ
User guide & decoders
Android Mobile apps
Developer guide & training
Swagger API
Codeless & BI
IoT Edge computing
Tutorials
Board SDKs
Connectors Azure, AWS...

Type	Language	
Send data to Google Cloud Platform	Java	Get on GitHub
Send data & use device management with Azure IoT hub	Java	Get on GitHub
Send data to Azure Event Hub	Java	Get on GitHub
Send data to AWS SQS	Java	Get on GitHub
Send data to Flexible Engine	Java	Get on GitHub
SDK to use easily external connector mode	Java	Get on GitHub
SDK to easily connect your apps with Live Objects	Java	Get on GitHub
Synchronize from Kerlink WMC to Live Objects	Java	Get on GitHub
Live Objects – Eurotech EC connector	Java	Get on GitHub

https://liveobjects.orange-business.com/#/cms/ressources-connectors/

#6.3

Data management Rules

Event rules

Configuration via API only

Limited in number by offer

3 event types :

Simple Event Processing

- **To trigger on values or metadata**
- **Cut in 3 steps:**
  - detection of a triggering value : matching rule
  - rule that defines the event triggering : firing rule
  - triggering inhibitor for interval repeats : firing guard

State Processing

- **To trigger on all state changes (based on values)**

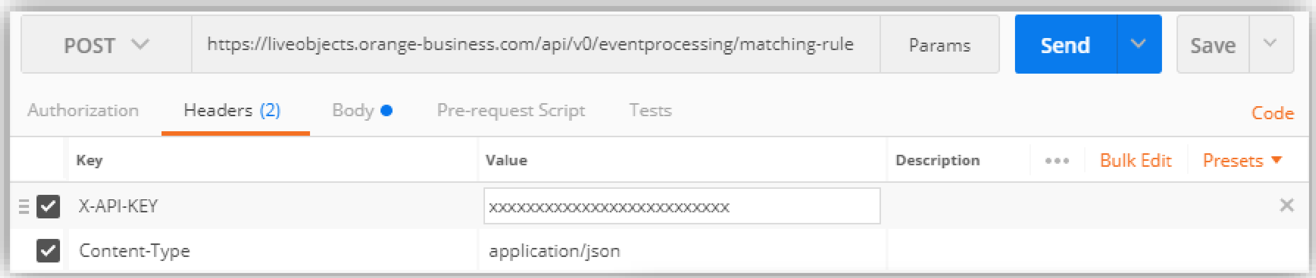
Activity Processing

- **To trigger after a device inactivity during a given duration**

Optional action after triggering an event : Event 2 Action

Simple Event Processing : detecting a triggering value

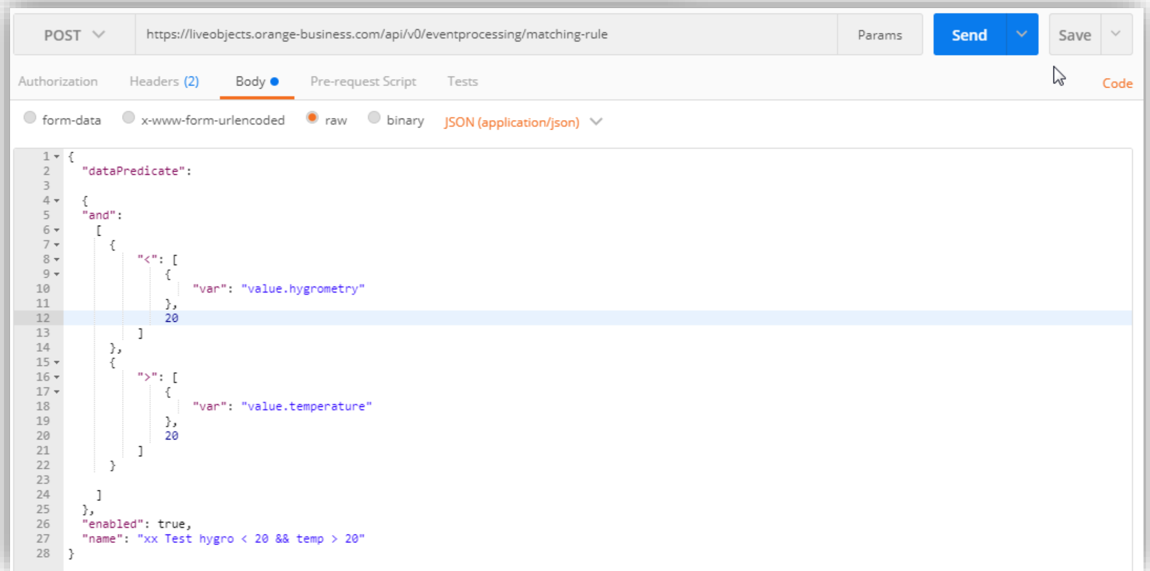
Create a Matching Rule


POST
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
Description
Bulk Edit
Presets

https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule

Key	Value
☑ X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxxxxx
☑ Content-Type	application/json

Create the rule "hygrometry < 20 and temperature > 20"


POST
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code

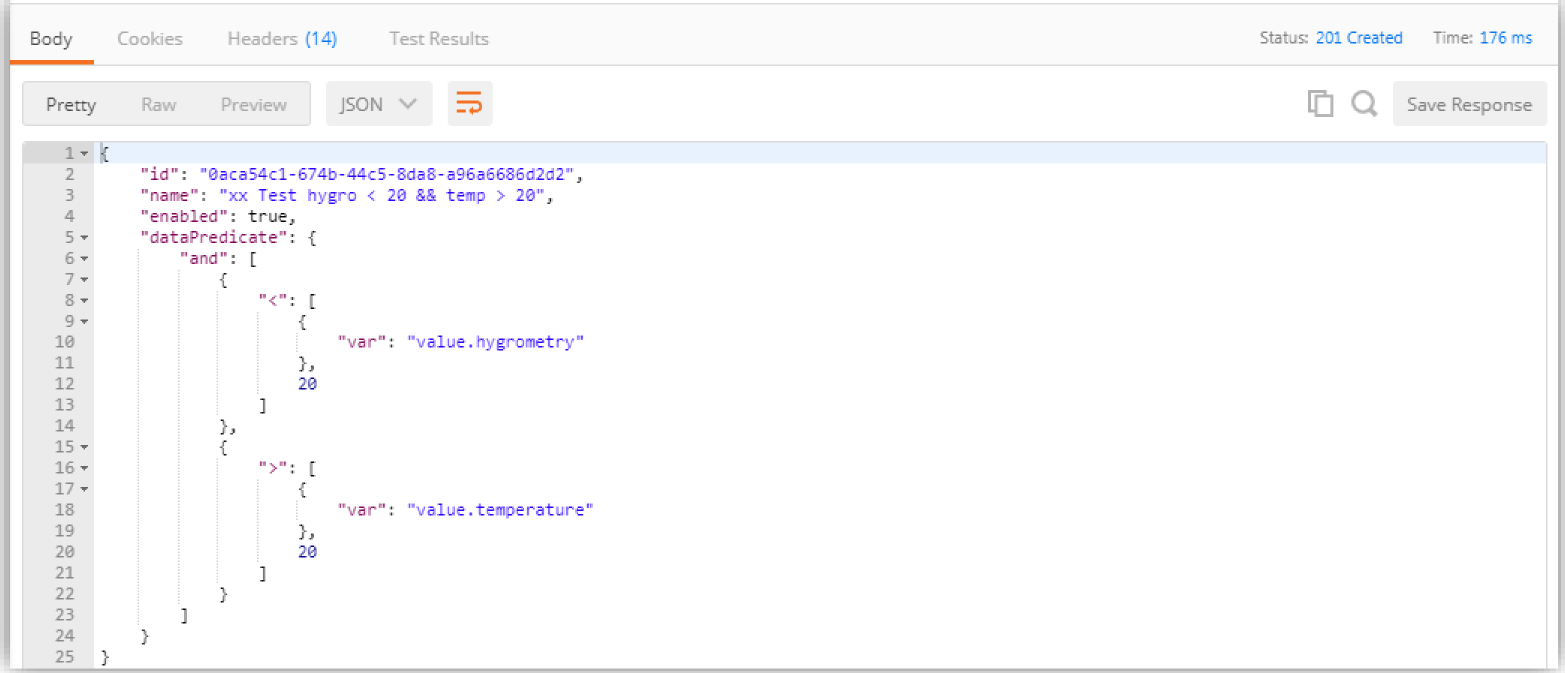
https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule

○ form-data ○ x-www-form-urlencoded ● raw ○ binary JSON (application/json)

```
{
  "dataPredicate":

  {
  "and":
    [
      {
         "<": [
             {
                 "var": "value.hygrometry"
             },
             20
         ]
      },
      {
         ">": [
             {
                 "var": "value.temperature"
             },
             20
         ]
      }

    ]
  },
  "enabled": true,
  "name": "xx Test hygro < 20 && temp > 20"
}
```

Simple Event Processing : detecting a triggering value

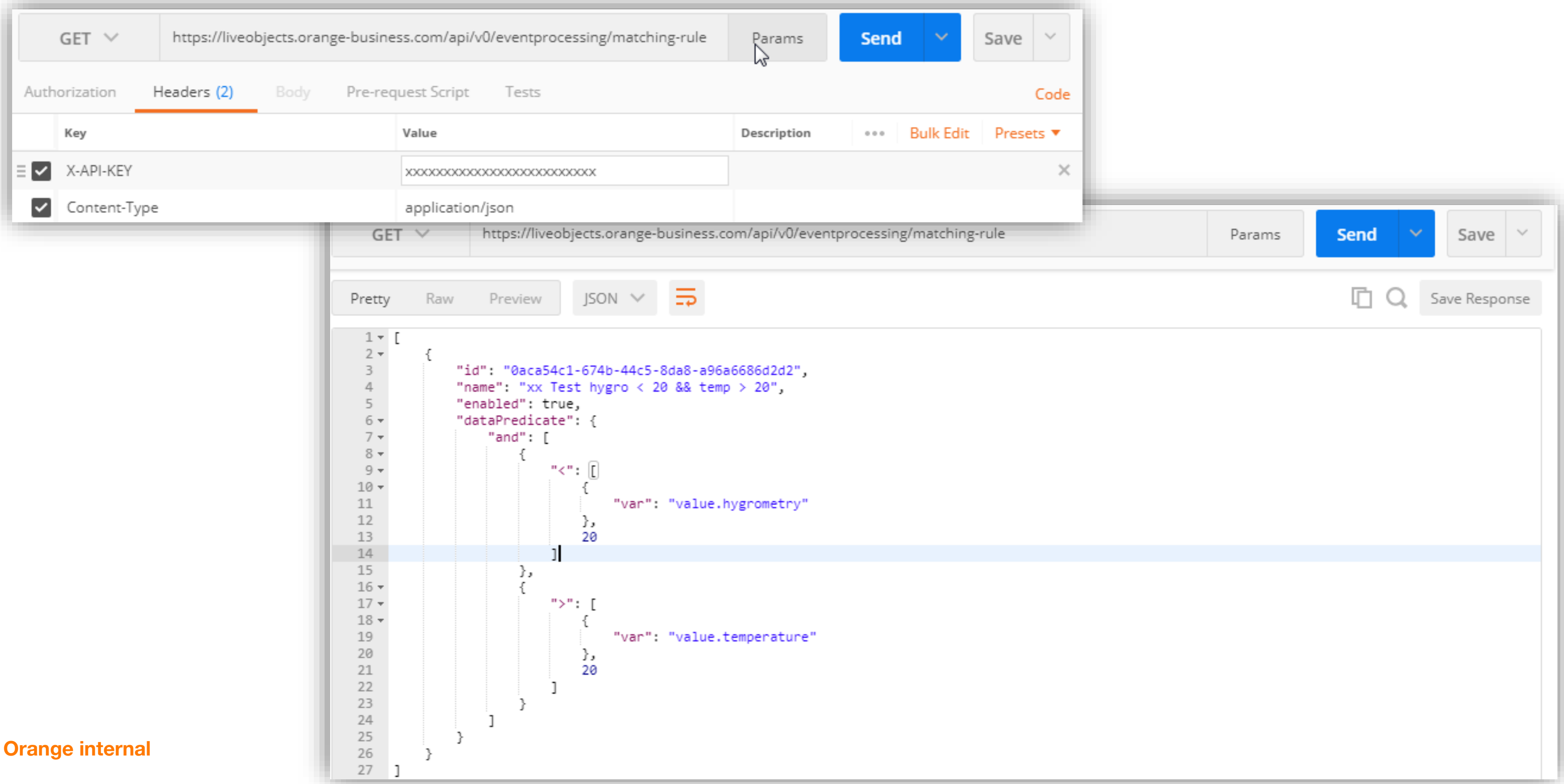
Create a Matching Rule : the response


Body
Cookies
Headers (14)
Test Results
Status: 201 Created
Time: 176 ms
Pretty
Raw
Preview
JSON
Save Response

```
{
    "id": "0aca54c1-674b-44c5-8da8-a96a6686d2d2",
    "name": "xx Test hygro < 20 && temp > 20",
    "enabled": true,
    "dataPredicate": {
        "and": [
            {
                "<": [
                    {
                        "var": "value.hygrometry"
                    },
                    20
                ]
            },
            {
                ">": [
                    {
                        "var": "value.temperature"
                    },
                    20
                ]
            }
        ]
    }
}
```

Simple Event Processing : detecting a triggering value

Retrieve the list of Matching Rules


GET
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
Bulk Edit
Presets
Pretty
Raw
Preview
JSON
Save Response

GET https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule

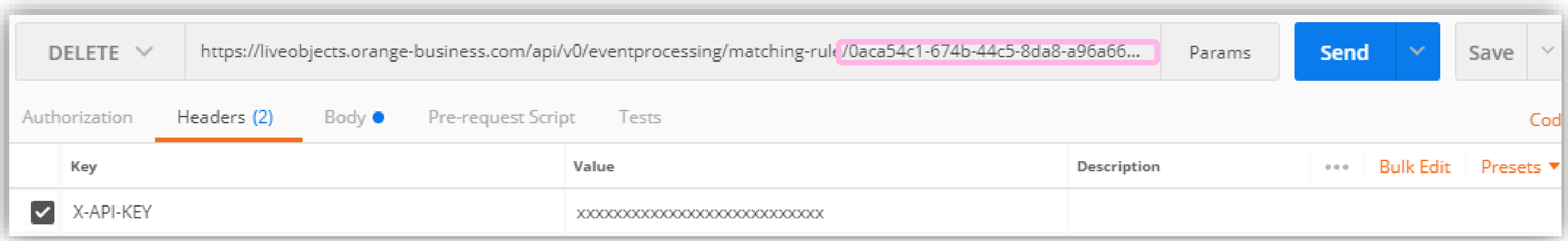
	Key	Value	Description
☑	X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxx	
☑	Content-Type	application/json	

GET https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule

```
[
    {
        "id": "0aca54c1-674b-44c5-8da8-a96a6686d2d2",
        "name": "xx Test hygro < 20 && temp > 20",
        "enabled": true,
        "dataPredicate": {
            "and": [
                {
                    "<": [
                        {
                            "var": "value.hygrometry"
                        },
                        20
                    ]
                },
                {
                    ">": [
                        {
                            "var": "value.temperature"
                        },
                        20
                    ]
                }
            ]
        }
    }
]
```

Simple Event Processing : detecting a triggering value

Delete a Matching Rule


DELETE
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Cod
Bulk Edit
Presets

DELETE https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rul/0aca54c1-674b-44c5-8da8-a96a66...

	Key	Value	Description
☑	X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	

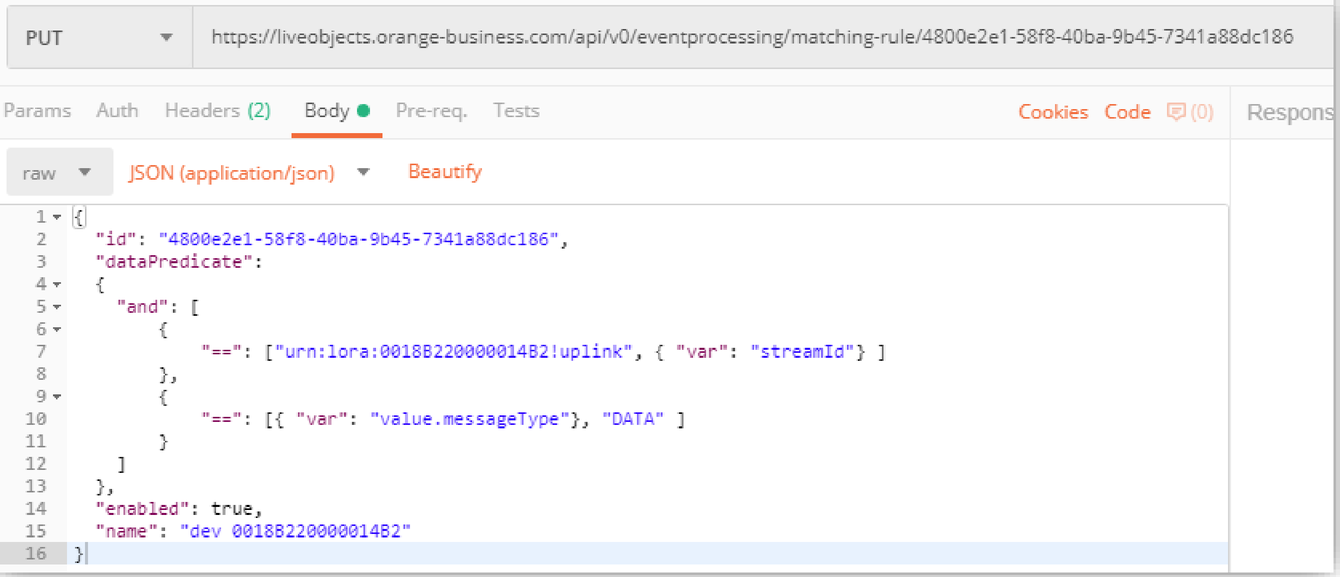
Put the Matching rule Id into the request

Simple Event Processing : detecting a triggering value

Enhance a Matching Rule

Restrict to one device and a specific message type

http://jsonlogic.com/operations.html

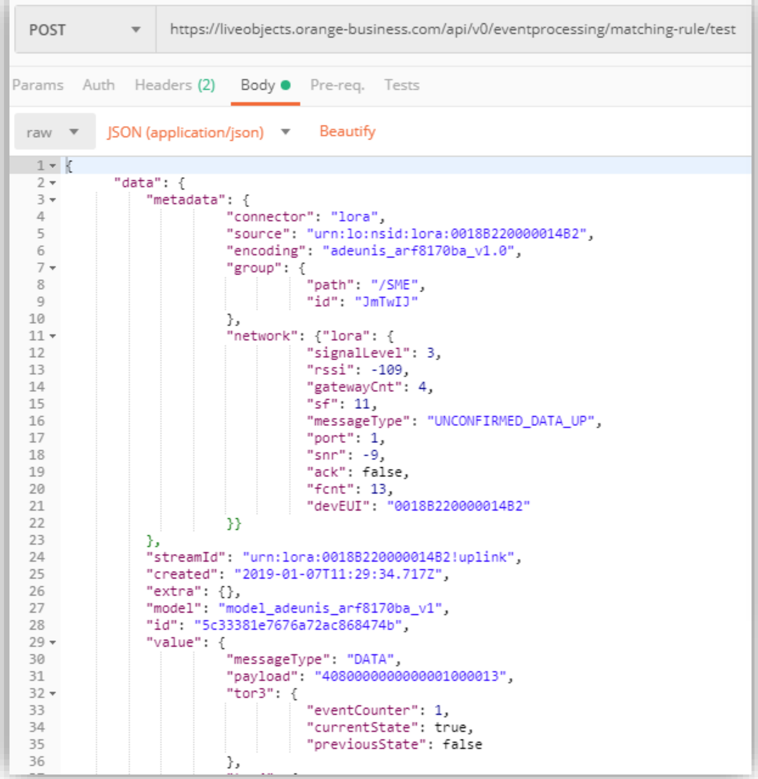

PUT
Params
Auth
Headers (2)
Body
Pre-req.
Tests
Cookies
Code
(0)
Respons
raw
JSON (application/json)
Beautify

https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule/4800e2e1-58f8-40ba-9b45-7341a88dc186

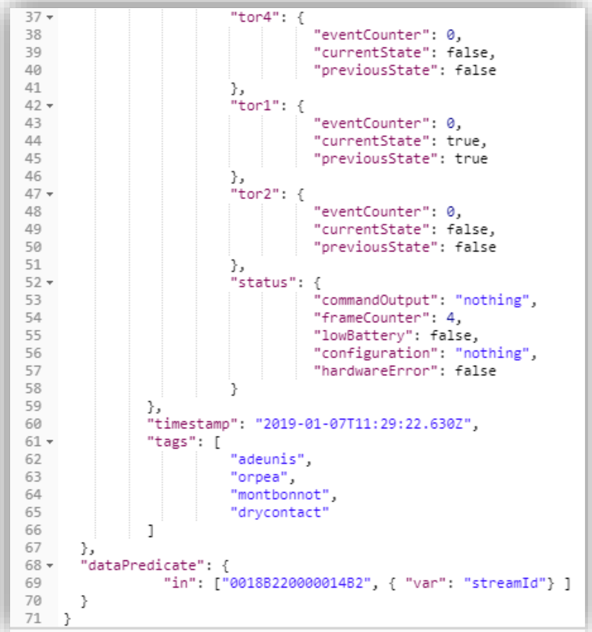
```json
{
  "id": "4800e2e1-58f8-40ba-9b45-7341a88dc186",
  "dataPredicate":
  {
    "and": [
        {
            "==": ["urn:lora:0018B220000014B2!uplink", { "var": "streamId"} ]
        },
        {
            "==": [{ "var": "value.messageType"}, "DATA" ]
        }
    ]
  },
  "enabled": true,
  "name": "dev 0018B220000014B2"
}
```

Simple Event Processing : detecting a triggering value

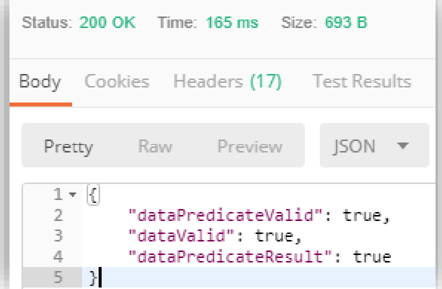
Test a Matching Rule


POST
Params
Auth
Headers (2)
Body
Pre-req.
Tests
raw
JSON (application/json)
Beautify

https://liveobjects.orange-business.com/api/v0/eventprocessing/matching-rule/test



```json
{
    "data": {
        "metadata": {
            "connector": "lora",
            "source": "urn:lo:nsid:lora:0018B220000014B2",
            "encoding": "adeunis_arf8170ba_v1.0",
            "group": {
                "path": "/SME",
                "id": "JmTwIJ"
            },
            "network": {"lora": {
                "signalLevel": 3,
                "rssi": -109,
                "gatewayCnt": 4,
                "sf": 11,
                "messageType": "UNCONFIRMED_DATA_UP",
                "port": 1,
                "snr": -9,
                "ack": false,
                "fcnt": 13,
                "devEUI": "0018B220000014B2"
            }}
        },
        "streamId": "urn:lora:0018B220000014B2!uplink",
        "created": "2019-01-07T11:29:34.717Z",
        "extra": {},
        "model": "model_adeunis_arf8170ba_v1",
        "id": "5c33381e7676a72ac868474b",
        "value": {
            "messageType": "DATA",
            "payload": "4080000000000001000013",
            "tor3": {
                "eventCounter": 1,
                "currentState": true,
                "previousState": false
            },
            "tor4": {
                "eventCounter": 0,
                "currentState": false,
                "previousState": false
            },
            "tor1": {
                "eventCounter": 0,
                "currentState": true,
                "previousState": true
            },
            "tor2": {
                "eventCounter": 0,
                "currentState": false,
                "previousState": false
            },
            "status": {
                "commandOutput": "nothing",
                "frameCounter": 4,
                "lowBattery": false,
                "configuration": "nothing",
                "hardwareError": false
            }
        },
        "timestamp": "2019-01-07T11:29:22.630Z",
        "tags": [
            "adeunis",
            "orpea",
            "montbonnot",
            "drycontact"
        ]
    },
    "dataPredicate": {
        "in": ["0018B220000014B2", { "var": "streamId"} ]
    }
}
```

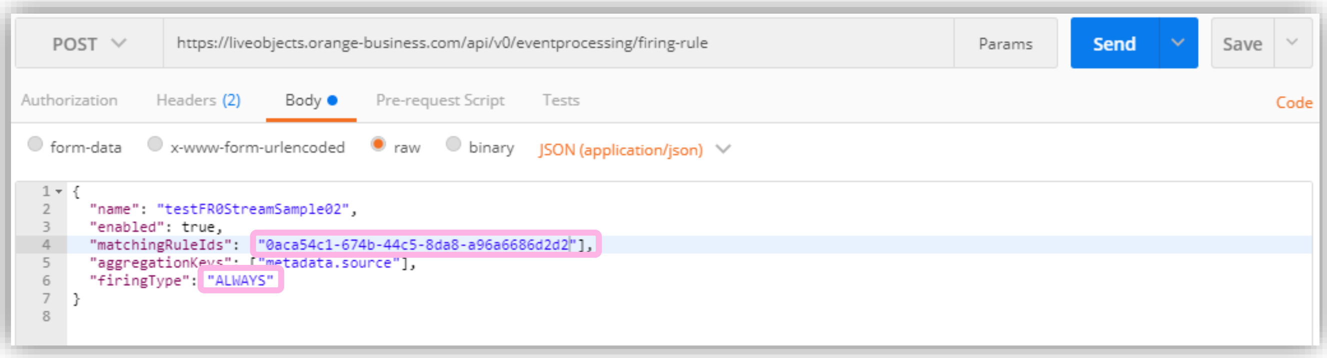

Body
Cookies
Headers (17)
Test Results
Pretty
Raw
Preview
JSON

Status: 200 OK Time: 165 ms Size: 693 B

```json
{
    "dataPredicateValid": true,
    "dataValid": true,
    "dataPredicateResult": true
}
```

Simple Event Processing : event triggering rule

Create a Firing Rule


POST
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
○ form-data
○ x-www-form-urlencoded
● raw
○ binary
JSON (application/json)

https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-rule

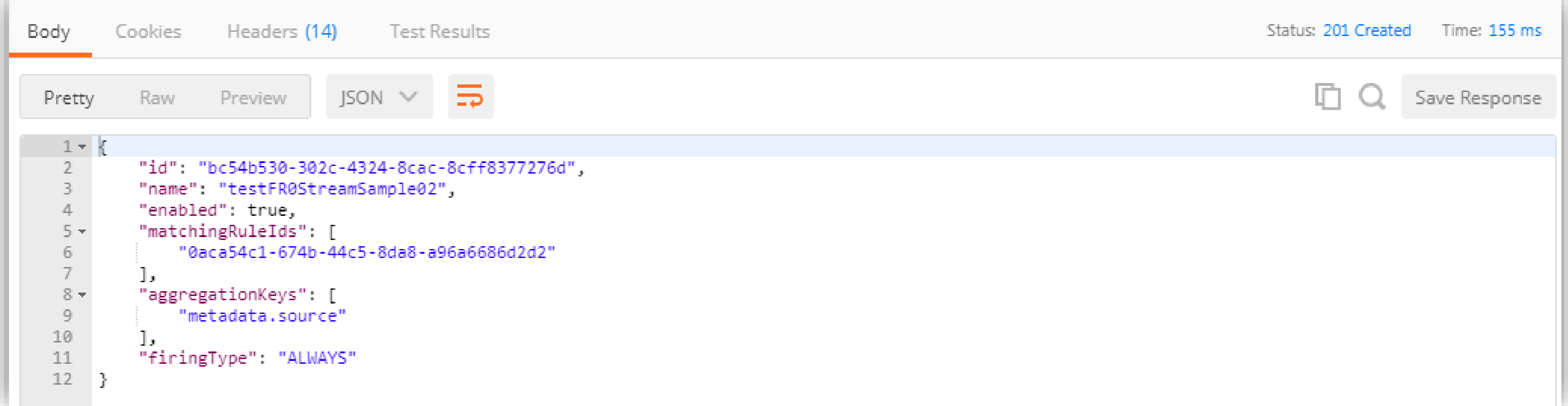
```
{
  "name": "testFR0StreamSample02",
  "enabled": true,
  "matchingRuleIds":  "0aca54c1-674b-44c5-8da8-a96a6686d2d2"],
  "aggregationKeys": ["metadata.source"],
  "firingType": "ALWAYS"
}
```

The Firing rule will trigger the events

Firing rules type = frequency function which defines when "fired events" must be generated	
ONCE	Once only, the firing guard must be removed to reactivate the rule
ALWAYS	Each time the match occurs
SLEEP	Once only, then waits for the sleep duration to automaticaly reactivate the rule

Simple Event Processing : event triggering rule

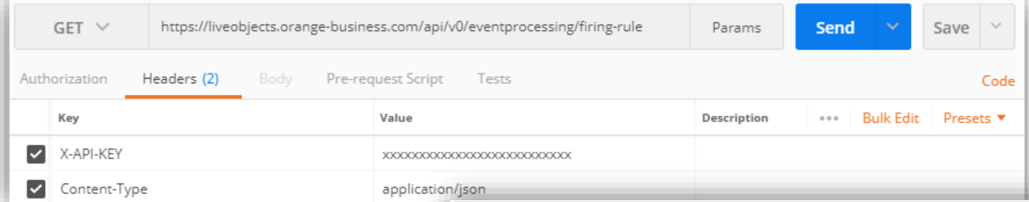
Create a Firing Rule : the response


Body
Cookies
Headers (14)
Test Results
Status: 201 Created
Time: 155 ms
Pretty
Raw
Preview
JSON
Save Response

```json
{
    "id": "bc54b530-302c-4324-8cac-8cff8377276d",
    "name": "testFR0StreamSample02",
    "enabled": true,
    "matchingRuleIds": [
        "0aca54c1-674b-44c5-8da8-a96a6686d2d2"
    ],
    "aggregationKeys": [
        "metadata.source"
    ],
    "firingType": "ALWAYS"
}
```

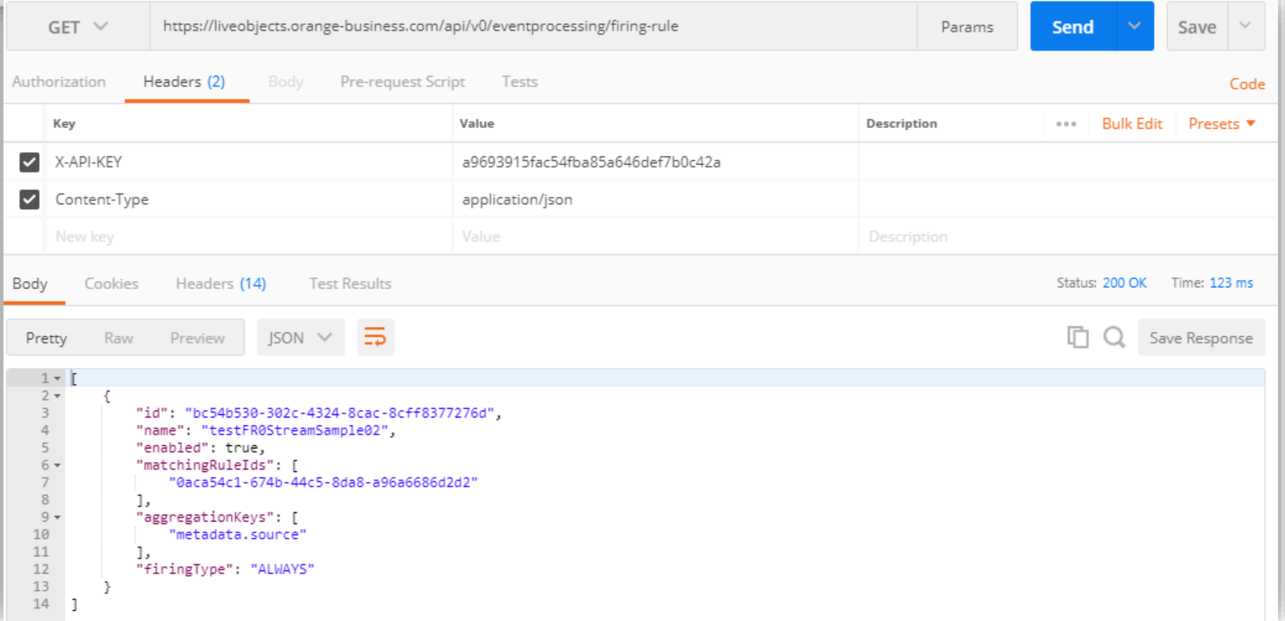
Simple Event Processing : event triggering rule

Retrieve the list of Firing Rules


GET
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
Bulk Edit
Presets

GET https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-rule

	Key	Value	Description
☑	X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxxxx	
☑	Content-Type	application/json	


GET
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
Bulk Edit
Presets
Body
Cookies
Headers (14)
Test Results
Pretty
Raw
Preview
JSON
Save Response

GET https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-rule

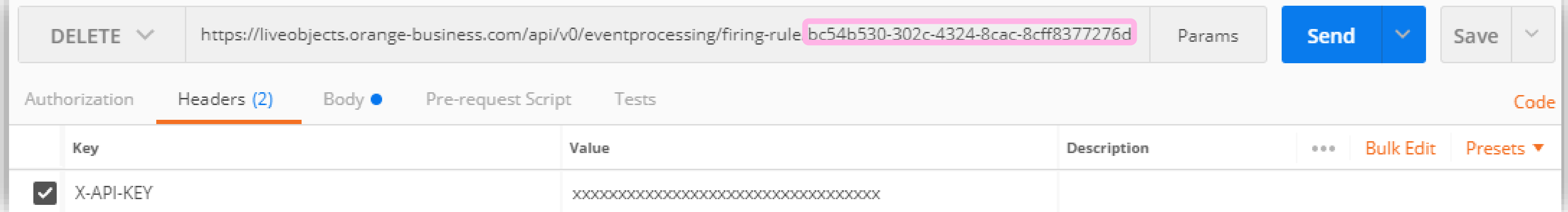
	Key	Value	Description
☑	X-API-KEY	a9693915fac54fba85a646def7b0c42a	
☑	Content-Type	application/json	
	New key	Value	Description

Status: 200 OK Time: 123 ms

```
[
    {
        "id": "bc54b530-302c-4324-8cac-8cff8377276d",
        "name": "testFR0StreamSample02",
        "enabled": true,
        "matchingRuleIds": [
            "0aca54c1-674b-44c5-8da8-a96a6686d2d2"
        ],
        "aggregationKeys": [
            "metadata.source"
        ],
        "firingType": "ALWAYS"
    }
]
```

Simple Event Processing : event triggering rule

Delete a Firing Rule



DELETE https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-rule/bc54b530-302c-4324-8cac-8cff8377276d

	Key	Value	Description
☑	X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	

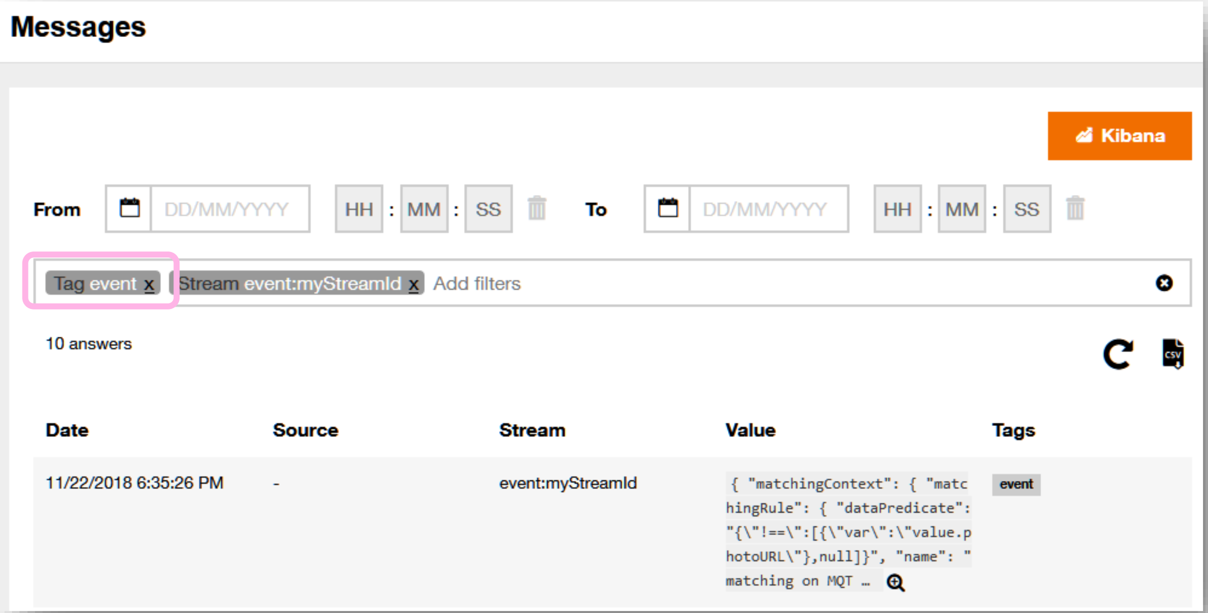
Params
Send
Save
Authorization
Headers (2)
Body ●
Pre-request Script
Tests
Code
●●●
Bulk Edit
Presets ▾

Put the Firing rule Id into the request

Simple Event Processing : test it !

Event fired :
- type of firing rule : ALWAYS
- hygrometry < 80 and temperature > 20

LO Asset
DISCONNECTION
Configuration
Refresh: 2 second(s)
Log level: Info
Telemery
Auto
94°
41%
3031 rpm
Client connected successfully
Settings
Simulate
Resources



Messages

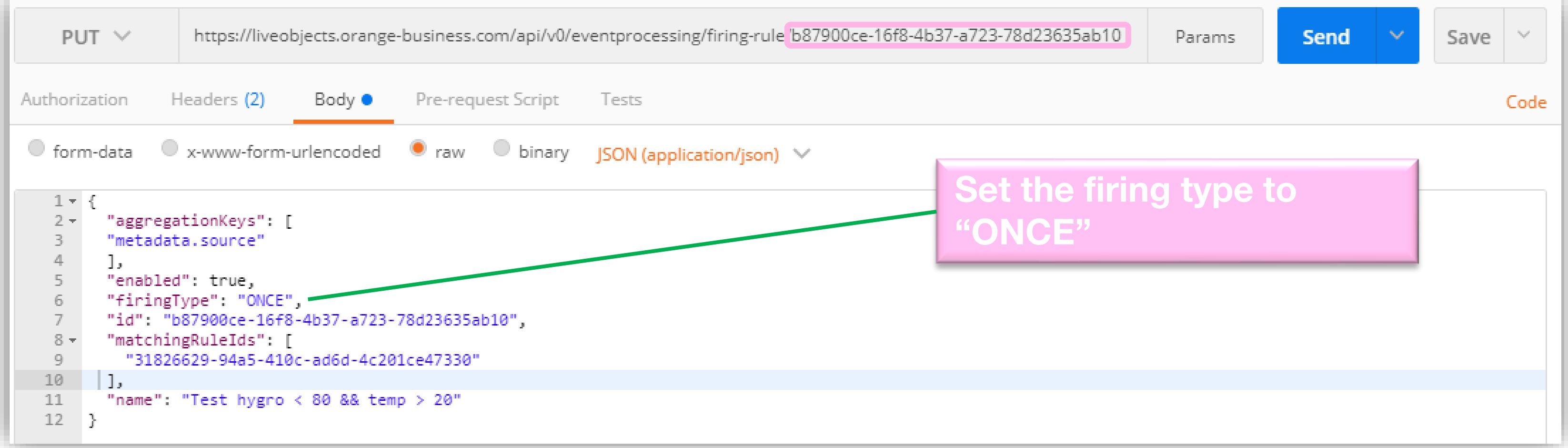
Kibana
From
DD/MM/YYYY
HH : MM : SS
To
DD/MM/YYYY
HH : MM : SS
Tag event x
Stream event:myStreamId x
Add filters

10 answers

Date	Source	Stream	Value	Tags
11/22/2018 6:35:26 PM	-	event:myStreamId	`{ "matchingContext": { "matchingRule": { "dataPredicate": "{\"!==\":[{\"var\":\"value.photoURL\"},null]}", "name": " matching on MQT …`	event

Simple Event Processing : triggering inhibitor

Update the firing rule to the firing type « ONCE »



PUT
Params
Send
Save
Authorization
Headers (2)
Body ●
Pre-request Script
Tests
Code
○ form-data
○ x-www-form-urlencoded
● raw
○ binary
JSON (application/json)

```
https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-rule/b87900ce-16f8-4b37-a723-78d23635ab10
```

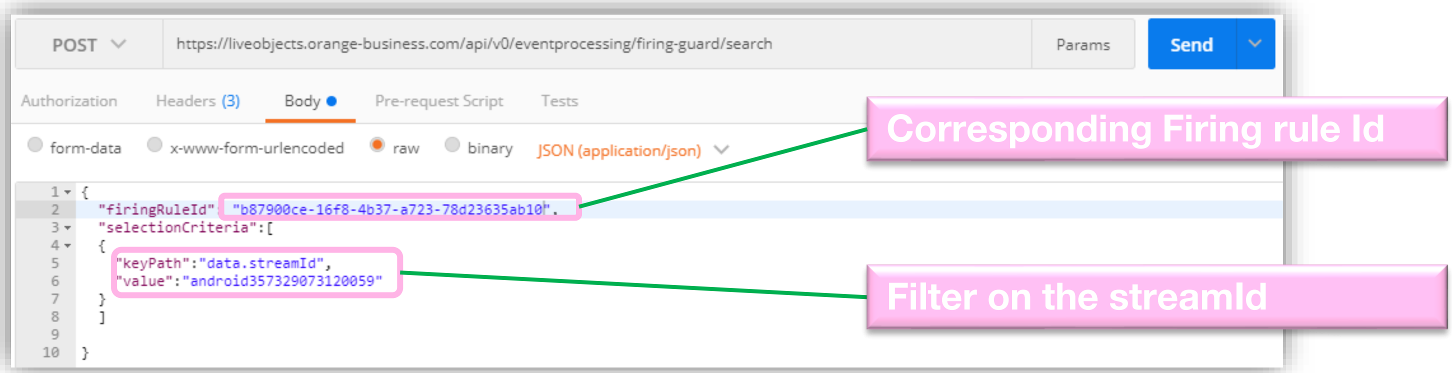
```
{
  "aggregationKeys": [
  "metadata.source"
  ],
  "enabled": true,
  "firingType": "ONCE",
  "id": "b87900ce-16f8-4b37-a723-78d23635ab10",
  "matchingRuleIds": [
    "31826629-94a5-410c-ad6d-4c201ce47330"
  ],
  "name": "Test hygro < 80 && temp > 20"
}
```

Set the firing type to "ONCE"

aggregationKeys: the rule inhibition will be applied after grouping data by this key eg: metadata.source, streamId

Simple Event Processing : triggering inhibitor

Managing a Firing Guard : get the list of firing guards


Params
Send
Authorization
Headers (3)
Body
Pre-request Script
Tests
○ form-data
○ x-www-form-urlencoded
● raw
○ binary
JSON (application/json)

POST https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-guard/search

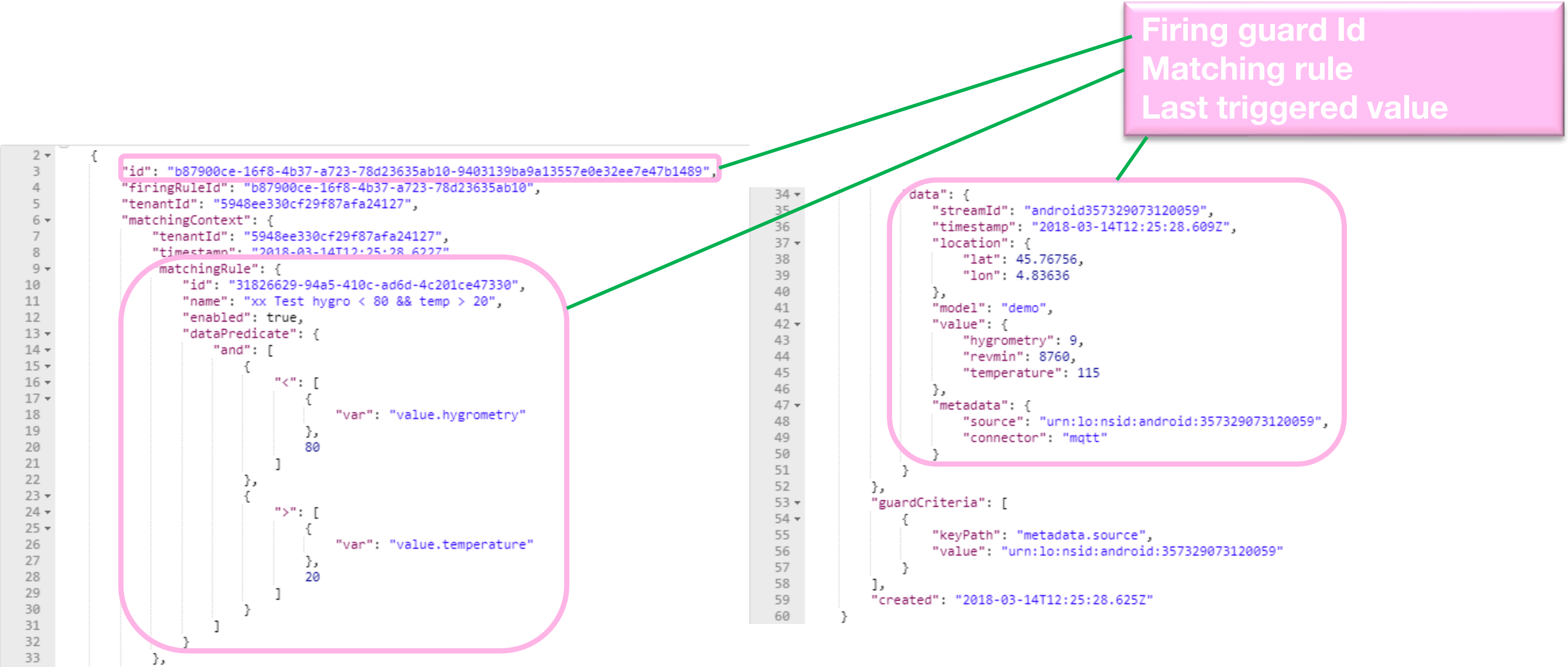
```
{
  "firingRuleId": "b87900ce-16f8-4b37-a723-78d23635ab10",
  "selectionCriteria":[
  {
    "keyPath":"data.streamId",
    "value":"android357329073120059"
  }
  ]

}
```

Corresponding Firing rule Id

Filter on the streamId

Simple Event Processing : triggering inhibitor

Managing a Firing Guard : get the list of firing guards : the response



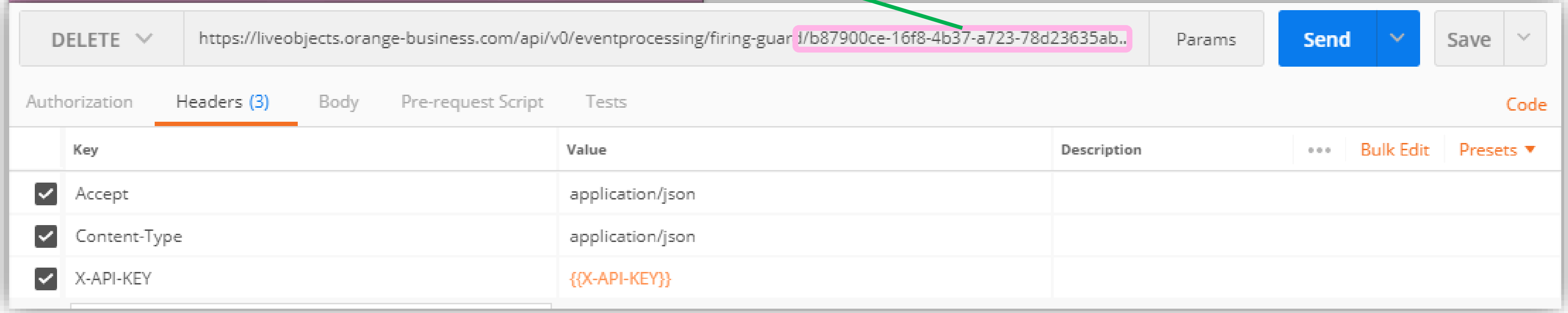
Firing guard Id
Matching rule
Last triggered value

```
{
    "id": "b87900ce-16f8-4b37-a723-78d23635ab10-9403139ba9a13557e0e32ee7e47b1489",
    "firingRuleId": "b87900ce-16f8-4b37-a723-78d23635ab10",
    "tenantId": "5948ee330cf29f87afa24127",
    "matchingContext": {
        "tenantId": "5948ee330cf29f87afa24127",
        "timestamp": "2018-03-14T12:25:28.622Z",
        "matchingRule": {
            "id": "31826629-94a5-410c-ad6d-4c201ce47330",
            "name": "xx Test hygro < 80 && temp > 20",
            "enabled": true,
            "dataPredicate": {
                "and": [
                    {
                        "<": [
                            {
                                "var": "value.hygrometry"
                            },
                            80
                        ]
                    },
                    {
                        ">": [
                            {
                                "var": "value.temperature"
                            },
                            20
                        ]
                    }
                ]
            }
        },
        "data": {
            "streamId": "android357329073120059",
            "timestamp": "2018-03-14T12:25:28.609Z",
            "location": {
                "lat": 45.76756,
                "lon": 4.83636
            },
            "model": "demo",
            "value": {
                "hygrometry": 9,
                "revmin": 8760,
                "temperature": 115
            },
            "metadata": {
                "source": "urn:lo:nsid:android:357329073120059",
                "connector": "mqtt"
            }
        }
    },
    "guardCriteria": [
        {
            "keyPath": "metadata.source",
            "value": "urn:lo:nsid:android:357329073120059"
        }
    ],
    "created": "2018-03-14T12:25:28.625Z"
}
```

Simple Event Processing : triggering inhibitor

Delete the Firing Guard to reactivate the rule

Put the Firing guard Id into the request


DELETE
Params
Send
Save
Authorization
Headers (3)
Body
Pre-request Script
Tests
Code
Bulk Edit
Presets

DELETE https://liveobjects.orange-business.com/api/v0/eventprocessing/firing-guard/b87900ce-16f8-4b37-a723-78d23635ab..

	Key	Value	Description
☑	Accept	application/json	
☑	Content-Type	application/json	
☑	X-API-KEY	{{X-API-KEY}}	

The event will trigger « ONCE » again

State Processing : events on all state changes

State Processing :

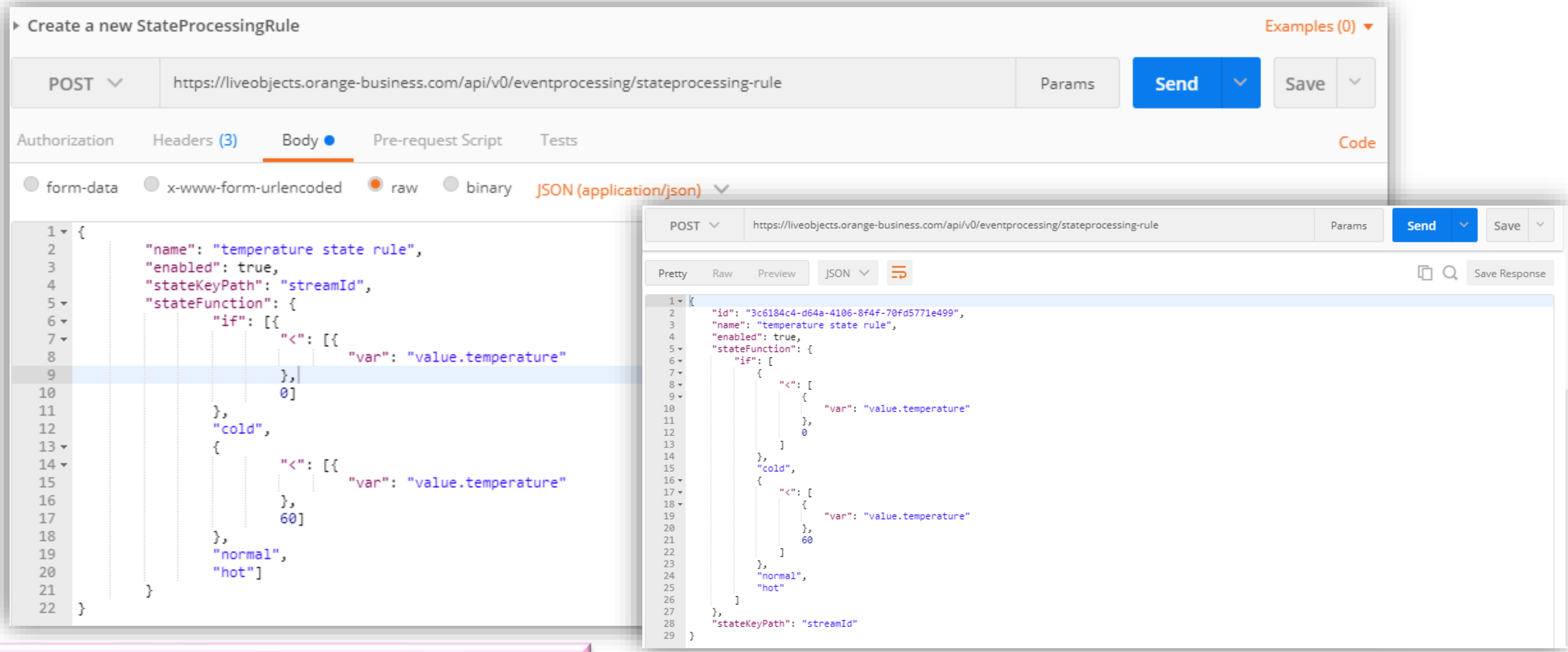
- **Device data are transformed to states, eg:**
    - Geo-zone ("paris-area", "london-area", ..)
    - Temperature ("hot", "cold", ..)

- **It is possible to filter the data source**

- **Switching from one state to another generates an event**
- **The event shows the old and the new states, allowing one to manage more complicated cases**

State Processing : events on all state changes

Create a rule to define states based on values or metadata


Create a new StateProcessingRule
Examples (0)
POST
Params
Send
Save
Authorization
Headers (3)
Body
Pre-request Script
Tests
Code
form-data
x-www-form-urlencoded
raw
binary
JSON (application/json)
Pretty
Raw
Preview
JSON
Save Response

https://liveobjects.orange-business.com/api/v0/eventprocessing/stateprocessing-rule

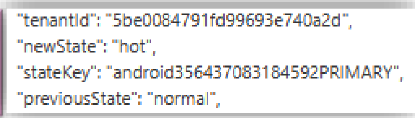
```
{
        "name": "temperature state rule",
        "enabled": true,
        "stateKeyPath": "streamId",
        "stateFunction": {
                "if": [{
                        "<": [{
                                "var": "value.temperature"
                        },
                        0]
                },
                "cold",
                {
                        "<": [{
                                "var": "value.temperature"
                        },
                        60]
                },
                "normal",
                "hot"]
        }
}
```

https://liveobjects.orange-business.com/api/v0/eventprocessing/stateprocessing-rule

```
{
    "id": "3c6184c4-d64a-4106-8f4f-70fd5771e499",
    "name": "temperature state rule",
    "enabled": true,
    "stateFunction": {
        "if": [
            {
                "<": [
                    {
                        "var": "value.temperature"
                    },
                    0
                ]
            },
            "cold",
            {
                "<": [
                    {
                        "var": "value.temperature"
                    },
                    60
                ]
            },
            "normal",
            "hot"
        ]
    },
    "stateKeyPath": "streamId"
}
```

Set 3 temperature ranges :
- **Cold : temperature is below 0 degree**
- **Normal : if temperature is between 0 and 60 degrees**
- **Hot : temperature is higher than 60 degree**

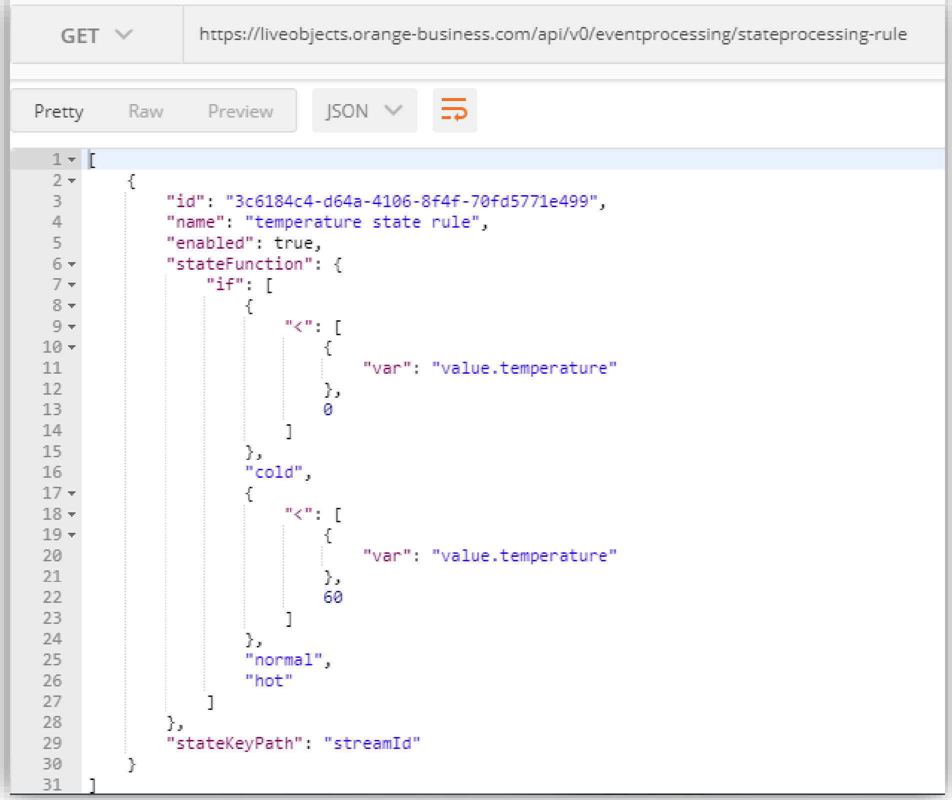
StateKeyPath gives the path for the stateKey variable in the generated events



```
"tenantId": "5be0084791fd99693e740a2d",
"newState": "hot",
"stateKey": "android356437083184592PRIMARY",
"previousState": "normal",
```

State Processing : events on all state changes

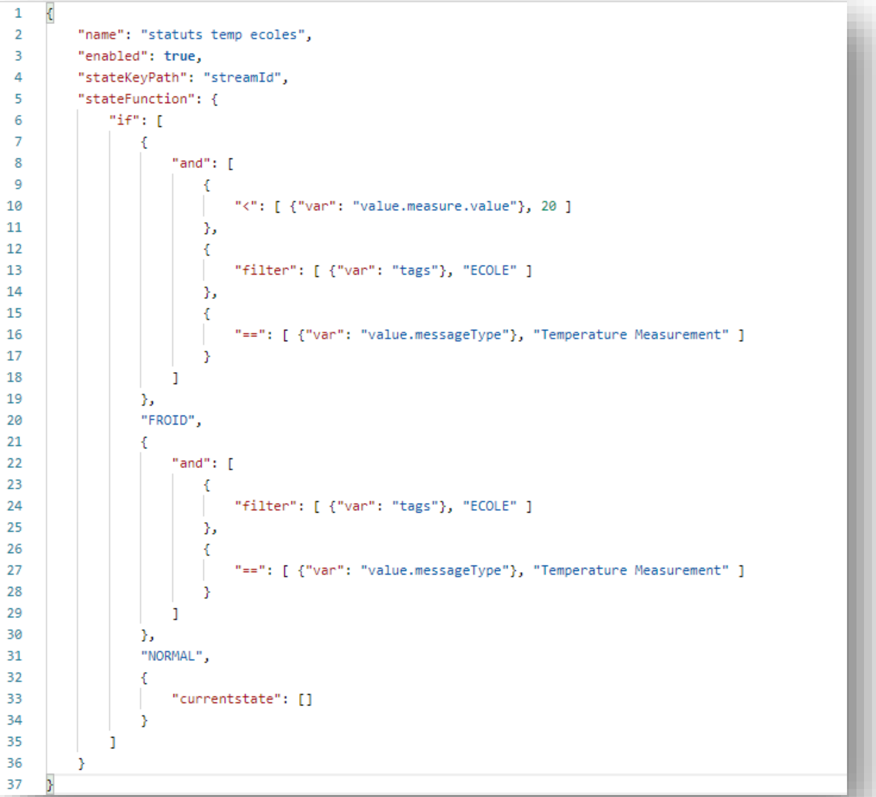
List rules



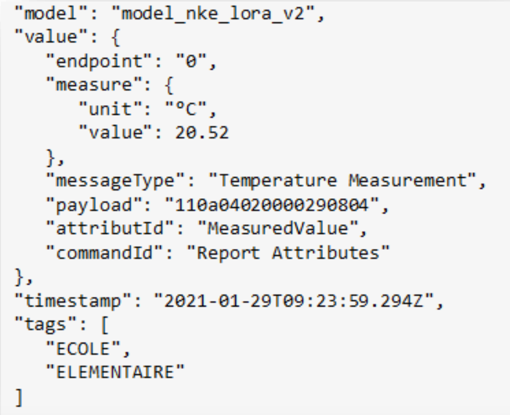
GET https://liveobjects.orange-business.com/api/v0/eventprocessing/stateprocessing-rule

```
[
    {
        "id": "3c6184c4-d64a-4106-8f4f-70fd5771e499",
        "name": "temperature state rule",
        "enabled": true,
        "stateFunction": {
            "if": [
                {
                    "<": [
                        {
                            "var": "value.temperature"
                        },
                        0
                    ]
                },
                "cold",
                {
                    "<": [
                        {
                            "var": "value.temperature"
                        },
                        60
                    ]
                },
                "normal",
                "hot"
            ]
        },
        "stateKeyPath": "streamId"
    }
]
```

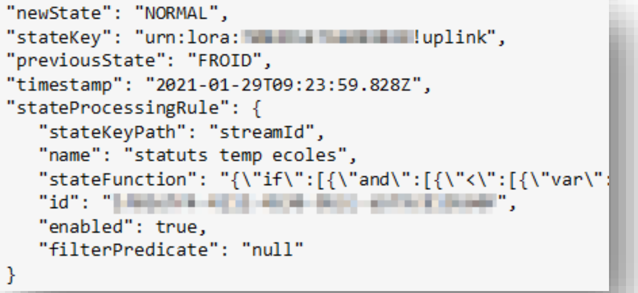
State Processing : events on certain frames only



```
{
    "name": "statuts temp ecoles",
    "enabled": true,
    "stateKeyPath": "streamId",
    "stateFunction": {
        "if": [
            {
                "and": [
                    {
                        "<": [ {"var": "value.measure.value"}, 20 ]
                    },
                    {
                        "filter": [ {"var": "tags"}, "ECOLE" ]
                    },
                    {
                        "==": [ {"var": "value.messageType"}, "Temperature Measurement" ]
                    }
                ]
            },
            "FROID",
            {
                "and": [
                    {
                        "filter": [ {"var": "tags"}, "ECOLE" ]
                    },
                    {
                        "==": [ {"var": "value.messageType"}, "Temperature Measurement" ]
                    }
                ]
            },
            "NORMAL",
            {
                "currentstate": []
            }
        ]
    }
}
```



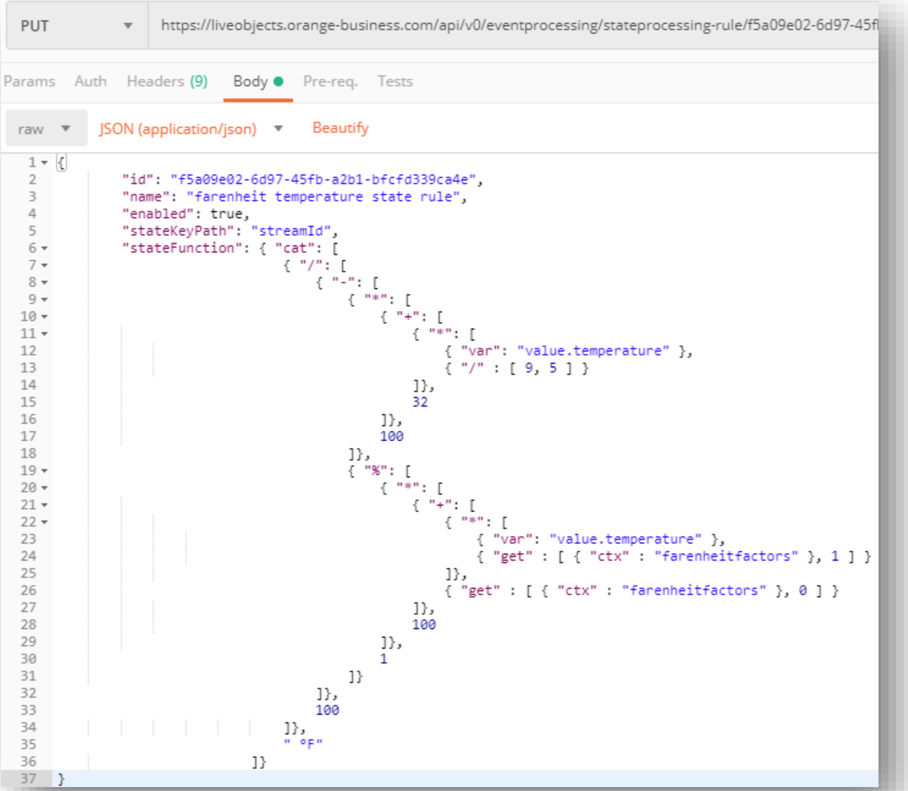
```
"model": "model_nke_lora_v2",
"value": {
   "endpoint": "0",
   "measure": {
      "unit": "°C",
      "value": 20.52
   },
   "messageType": "Temperature Measurement",
   "payload": "110a04020000290804",
   "attributId": "MeasuredValue",
   "commandId": "Report Attributes"
},
"timestamp": "2021-01-29T09:23:59.294Z",
"tags": [
   "ECOLE",
   "ELEMENTAIRE"
]
```



```
"newState": "NORMAL",
"stateKey": "urn:lora:[redacted]!uplink",
"previousState": "FROID",
"timestamp": "2021-01-29T09:23:59.828Z",
"stateProcessingRule": {
   "stateKeyPath": "streamId",
   "name": "statuts temp ecoles",
   "stateFunction": "{\"if\":[{\"and\":[{\"<\":[{\"var\":
   "id": "[redacted]",
   "enabled": true,
   "filterPredicate": "null"
}
```

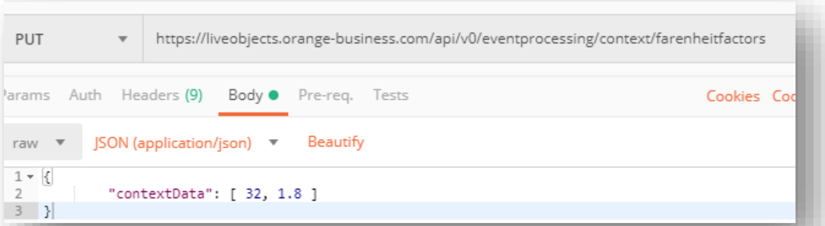
State Processing : events on all state changes

Create a rule with a simple computation (°C to °F)


PUT
Params
Auth
Headers (9)
Body
Pre-req.
Tests
raw
JSON (application/json)
Beautify

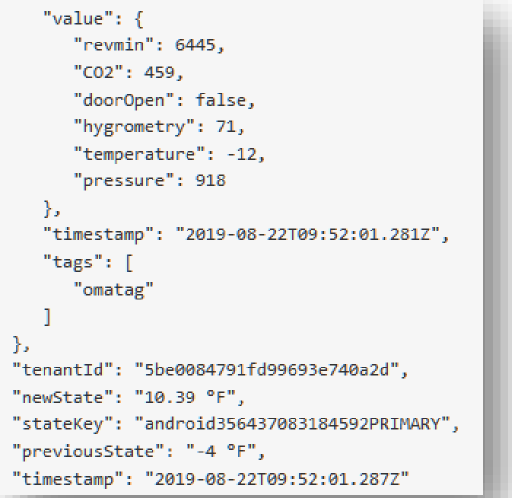
https://liveobjects.orange-business.com/api/v0/eventprocessing/stateprocessing-rule/f5a09e02-6d97-45f

```
{
        "id": "f5a09e02-6d97-45fb-a2b1-bfcfd339ca4e",
        "name": "farenheit temperature state rule",
        "enabled": true,
        "stateKeyPath": "streamId",
        "stateFunction": { "cat": [
                           { "/": [
                               { "-": [
                                   { "*": [
                                       { "+": [
                                           { "*": [
                                               { "var": "value.temperature" },
                                               { "/" : [ 9, 5 ] }
                                           ]},
                                           32
                                       ]},
                                       100
                                   ]},
                                   { "%": [
                                       { "*": [
                                           { "+": [
                                               { "*": [
                                                   { "var": "value.temperature" },
                                                   { "get" : [ { "ctx" : "farenheitfactors" }, 1 ] }
                                               ]},
                                               { "get" : [ { "ctx" : "farenheitfactors" }, 0 ] }
                                           ]},
                                           100
                                       ]},
                                       1
                                   ]}
                               ]},
                               100
                           ]},
                           " °F"
                       ]}
}
```


PUT
Params
Auth
Headers (9)
Body
Pre-req.
Tests
Cookies
Co
raw
JSON (application/json)
Beautify

https://liveobjects.orange-business.com/api/v0/eventprocessing/context/farenheitfactors

```
{
    "contextData": [ 32, 1.8 ]
}
```

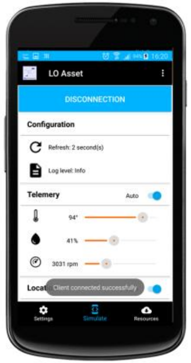


```
   "value": {
      "revmin": 6445,
      "CO2": 459,
      "doorOpen": false,
      "hygrometry": 71,
      "temperature": -12,
      "pressure": 918
   },
   "timestamp": "2019-08-22T09:52:01.281Z",
   "tags": [
      "omatag"
   ]
},
"tenantId": "5be0084791fd99693e740a2d",
"newState": "10.39 °F",
"stateKey": "android356437083184592PRIMARY",
"previousState": "-4 °F",
"timestamp": "2019-08-22T09:52:01.287Z"
```

State Processing : events on all state changes

Test it !

State changed from cold to hot, following the new temperature value (93)



LO Asset

Configuration

Refresh: 2 second(s)

Log level: Info

Telemery

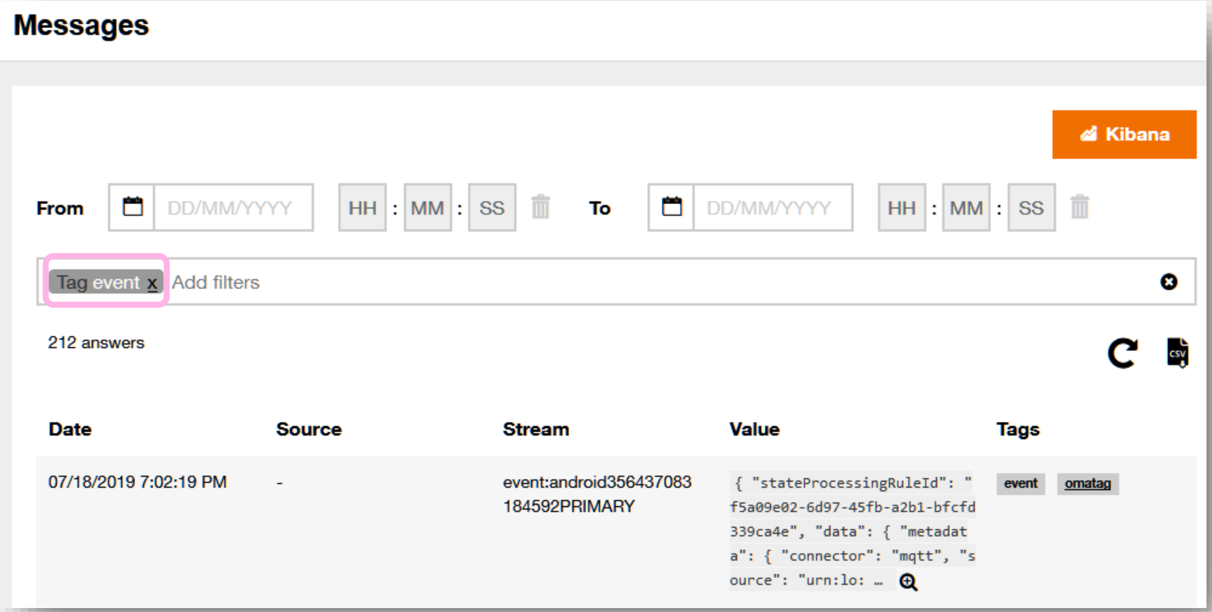
Auto

94°

41%

3031 rpm

Client connected successfully



Messages

From DD/MM/YYYY HH : MM : SS To DD/MM/YYYY HH : MM : SS

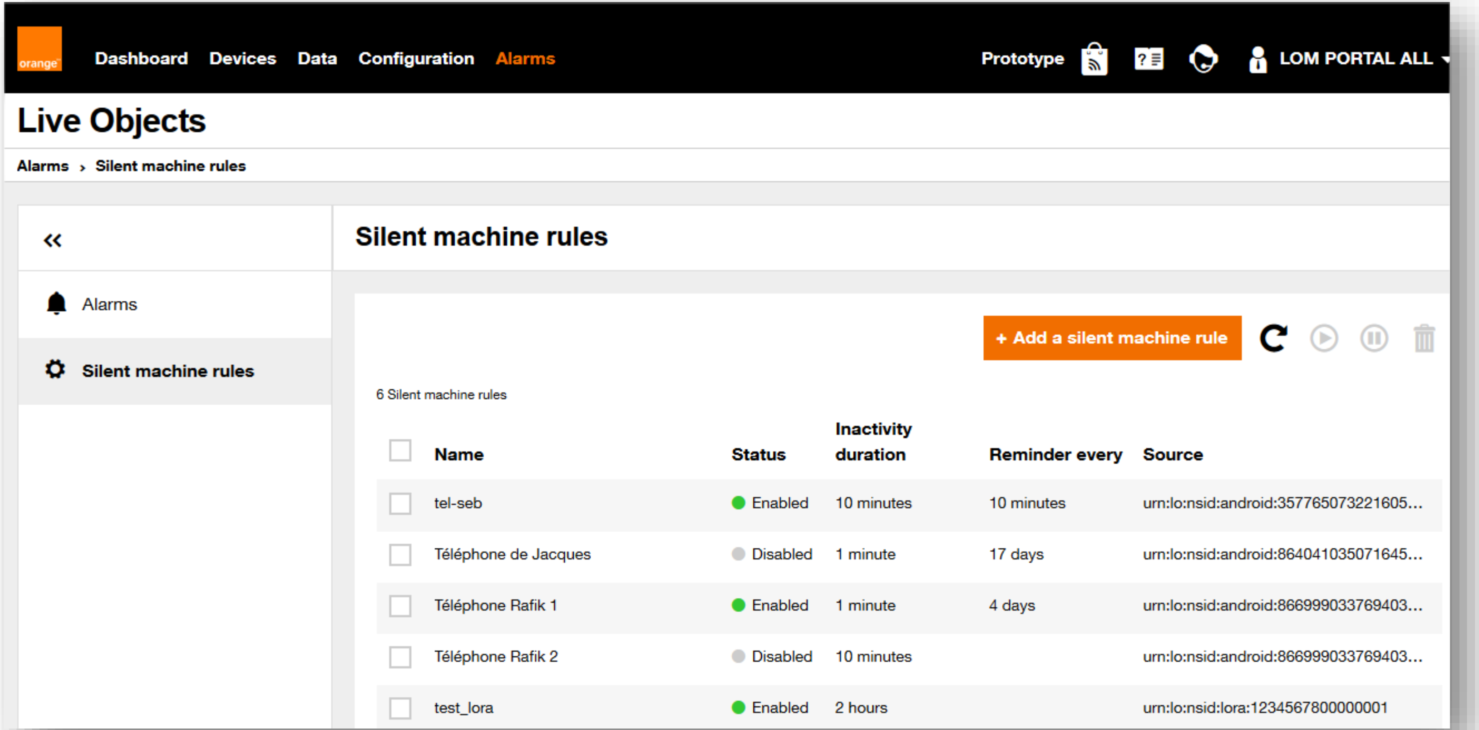
Tag event x Add filters

212 answers

Date	Source	Stream	Value	Tags
07/18/2019 7:02:19 PM	-	event:android356437083184592PRIMARY	`{ "stateProcessingRuleId": "f5a09e02-6d97-45fb-a2b1-bfcfd339ca4e", "data": { "metadata": { "connector": "mqtt", "source": "urn:lo: …`	event omatag

Activity Processing : events on silent devices

Fire events if some devices don’t send data (portal)


orange
Dashboard
Devices
Data
Configuration
Alarms
Prototype
LOM PORTAL ALL
Live Objects
Alarms › Silent machine rules
«
Alarms
Silent machine rules
+ Add a silent machine rule

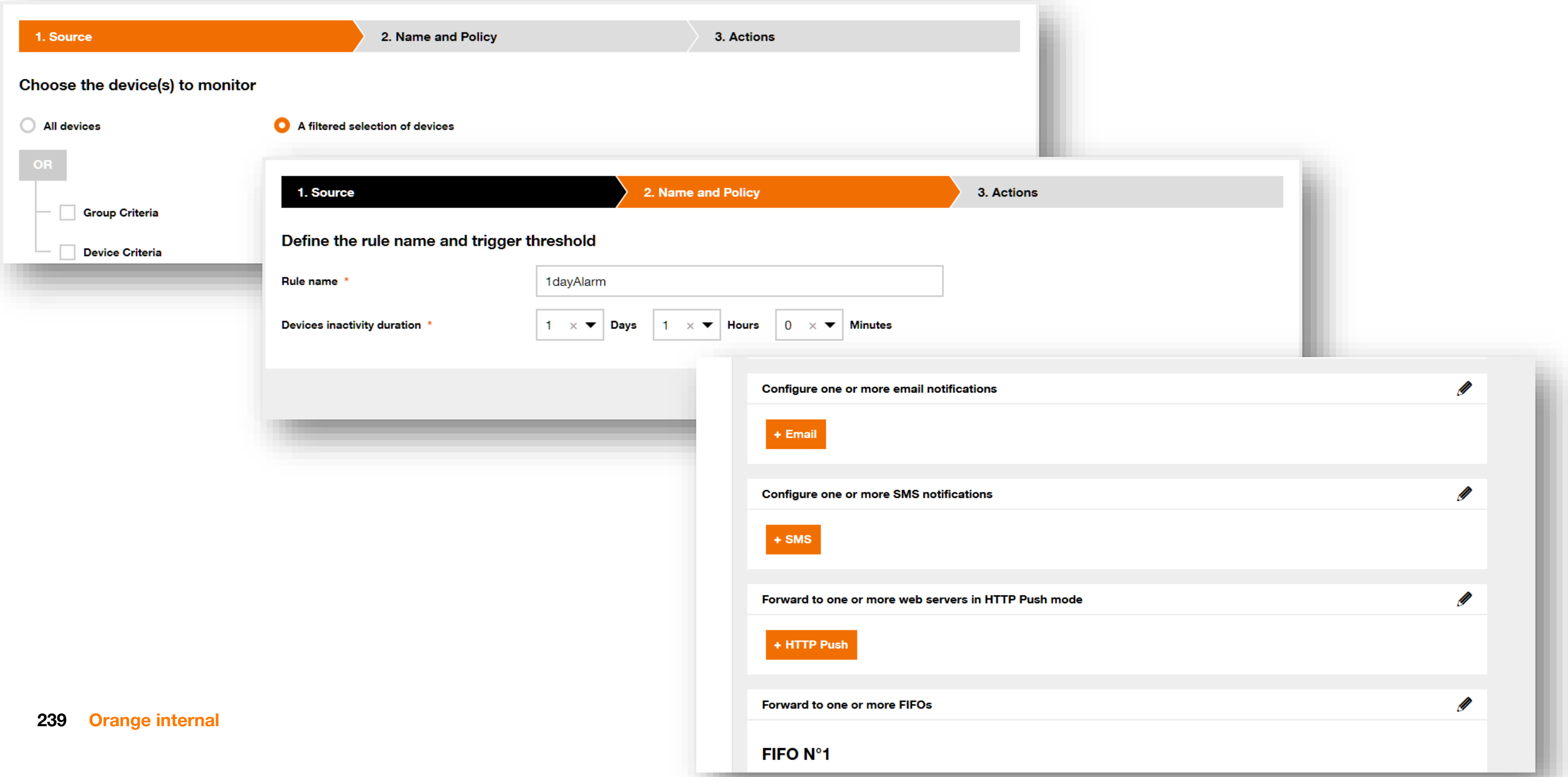
Silent machine rules

6 Silent machine rules

☐	Name	Status	Inactivity duration	Reminder every	Source
☐	tel-seb	● Enabled	10 minutes	10 minutes	urn:lo:nsid:android:357765073221605…
☐	Téléphone de Jacques	● Disabled	1 minute	17 days	urn:lo:nsid:android:864041035071645…
☐	Téléphone Rafik 1	● Enabled	1 minute	4 days	urn:lo:nsid:android:866999033769403…
☐	Téléphone Rafik 2	● Disabled	10 minutes		urn:lo:nsid:android:866999033769403…
☐	test_lora	● Enabled	2 hours		urn:lo:nsid:lora:1234567800000001

Activity Processing : events on silent devices

Fire events if some devices don’t send data (portal)


1. Source
2. Name and Policy
3. Actions

Choose the device(s) to monitor

○ All devices

● A filtered selection of devices

OR

☐ Group Criteria

☐ Device Criteria

1. Source
2. Name and Policy
3. Actions

Define the rule name and trigger threshold

Rule name * 1dayAlarm

Devices inactivity duration * 1 Days 1 Hours 0 Minutes

Configure one or more email notifications

+ Email

Configure one or more SMS notifications

+ SMS

Forward to one or more web servers in HTTP Push mode

+ HTTP Push

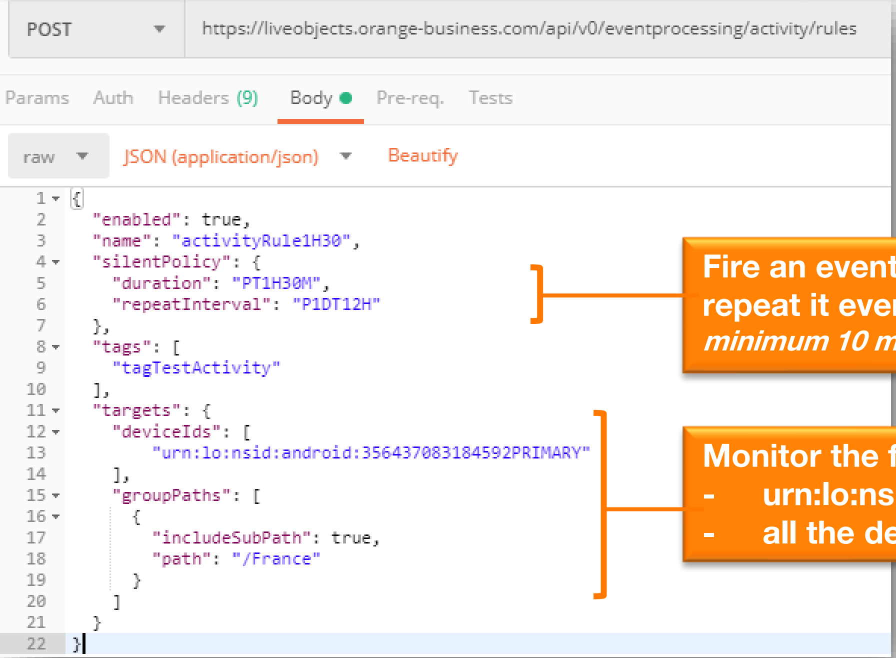
Forward to one or more FIFOs

FIFO N°1

Activity Processing : events on silent devices

Fire events if some devices don't send data (API)

Create a new activity rule



`https://liveobjects.orange-business.com/api/v0/eventprocessing/activity/rules`

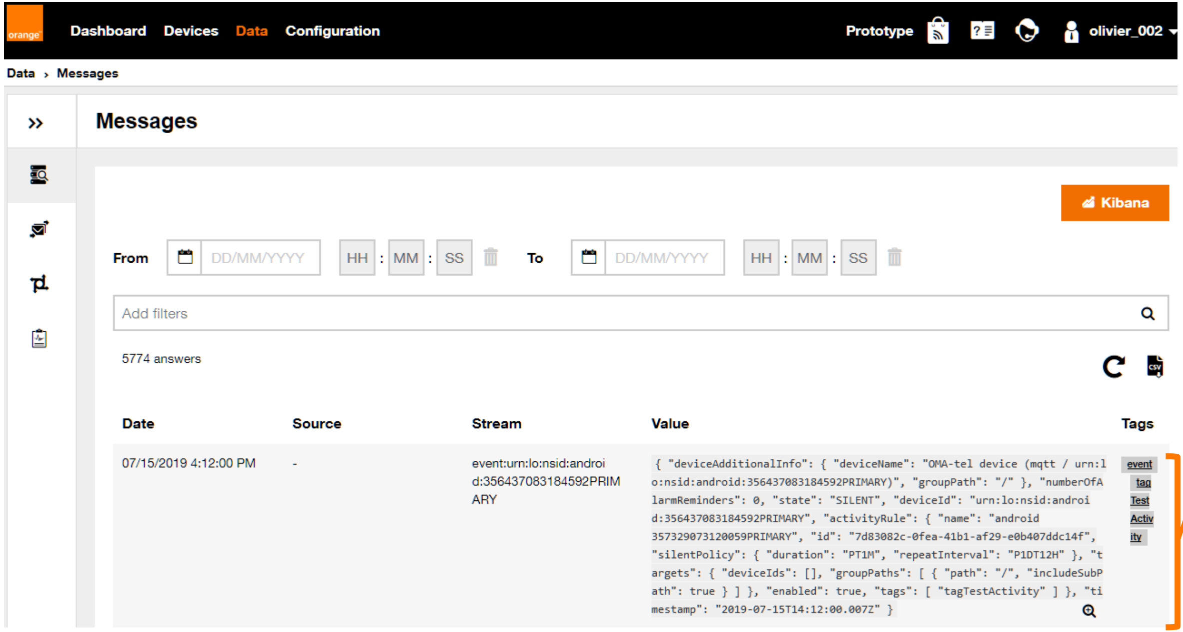
```json
{
  "enabled": true,
  "name": "activityRule1H30",
  "silentPolicy": {
    "duration": "PT1H30M",
    "repeatInterval": "P1DT12H"
  },
  "tags": [
    "tagTestActivity"
  ],
  "targets": {
    "deviceIds": [
        "urn:lo:nsid:android:356437083184592PRIMARY"
    ],
    "groupPaths": [
      {
        "includeSubPath": true,
        "path": "/France"
      }
    ]
  }
}
```

Fire an event if the device has not sent data for 1½ hour, repeat it every 1½ day (ISO 8601)
minimum 10 minutes, enforced every round 10 minutes

Monitor the following devices :
- **urn:lo:nsid:android:356437083184592PRIMARY**
- **all the devices into the /France group and under it**

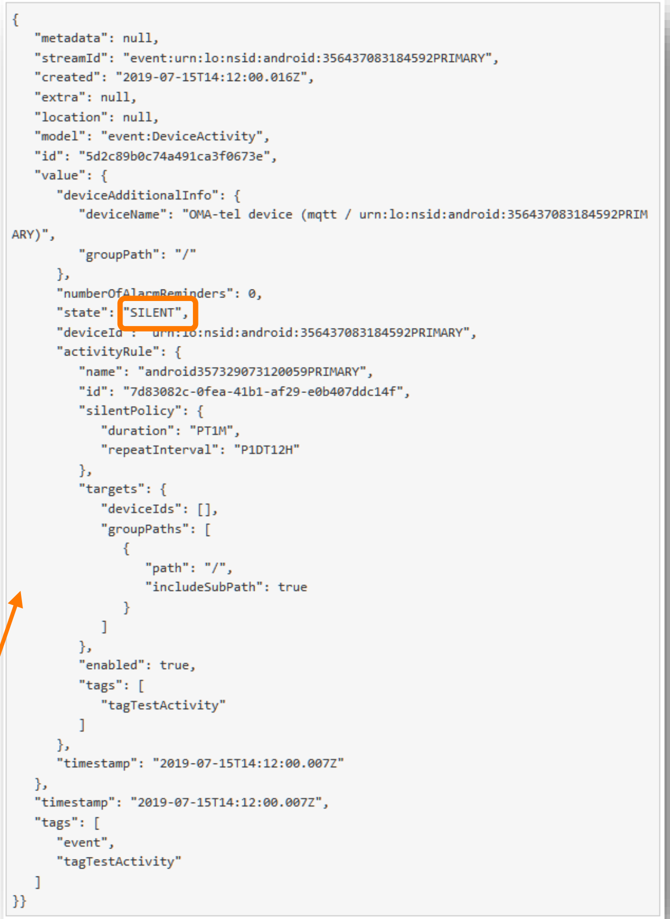
Activity Processing : events on silent devices

Fire events if some devices don't send data



5774 answers

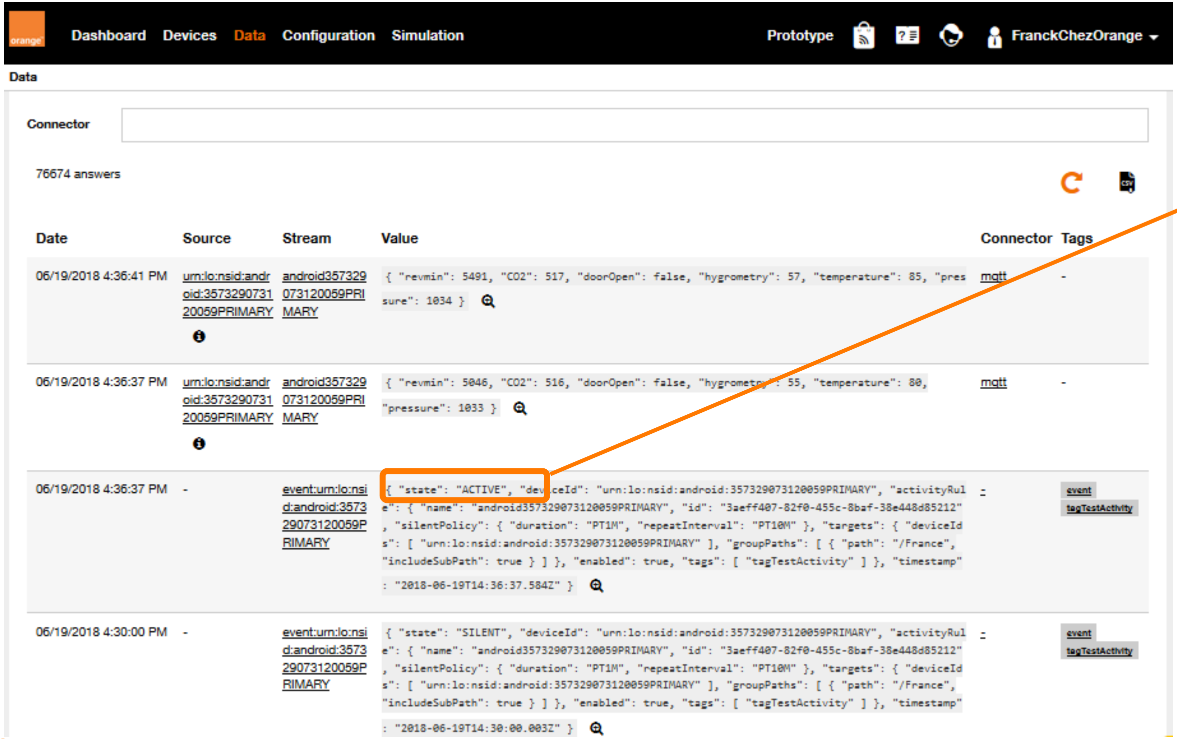
Date	Source	Stream	Value	Tags
07/15/2019 4:12:00 PM	-	event:urn:lo:nsid:android:356437083184592PRIMARY	{ "deviceAdditionalInfo": { "deviceName": "OMA-tel device (mqtt / urn:lo:nsid:android:356437083184592PRIMARY)", "groupPath": "/" }, "numberOfAlarmReminders": 0, "state": "SILENT", "deviceId": "urn:lo:nsid:android:356437083184592PRIMARY", "activityRule": { "name": "android357329073120059PRIMARY", "id": "7d83082c-0fea-41b1-af29-e0b407ddc14f", "silentPolicy": { "duration": "PT1M", "repeatInterval": "P1DT12H" }, "targets": { "deviceIds": [], "groupPaths": [{ "path": "/", "includeSubPath": true }] }, "enabled": true, "tags": ["tagTestActivity"] }, "timestamp": "2019-07-15T14:12:00.007Z" }	event tag TestActivity



```
{
   "metadata": null,
   "streamId": "event:urn:lo:nsid:android:356437083184592PRIMARY",
   "created": "2019-07-15T14:12:00.016Z",
   "extra": null,
   "location": null,
   "model": "event:DeviceActivity",
   "id": "5d2c89b0c74a491ca3f0673e",
   "value": {
      "deviceAdditionalInfo": {
         "deviceName": "OMA-tel device (mqtt / urn:lo:nsid:android:356437083184592PRIM
ARY)",
         "groupPath": "/"
      },
      "numberOfAlarmReminders": 0,
      "state": "SILENT",
      "deviceId": "urn:lo:nsid:android:356437083184592PRIMARY",
      "activityRule": {
         "name": "android357329073120059PRIMARY",
         "id": "7d83082c-0fea-41b1-af29-e0b407ddc14f",
         "silentPolicy": {
            "duration": "PT1M",
            "repeatInterval": "P1DT12H"
         },
         "targets": {
            "deviceIds": [],
            "groupPaths": [
               {
                  "path": "/",
                  "includeSubPath": true
               }
            ]
         },
         "enabled": true,
         "tags": [
            "tagTestActivity"
         ]
      },
      "timestamp": "2019-07-15T14:12:00.007Z"
   },
   "timestamp": "2019-07-15T14:12:00.007Z",
   "tags": [
      "event",
      "tagTestActivity"
   ]
}}
```

Activity Processing : events on silent devices

Fire events when a device becomes active again



Data

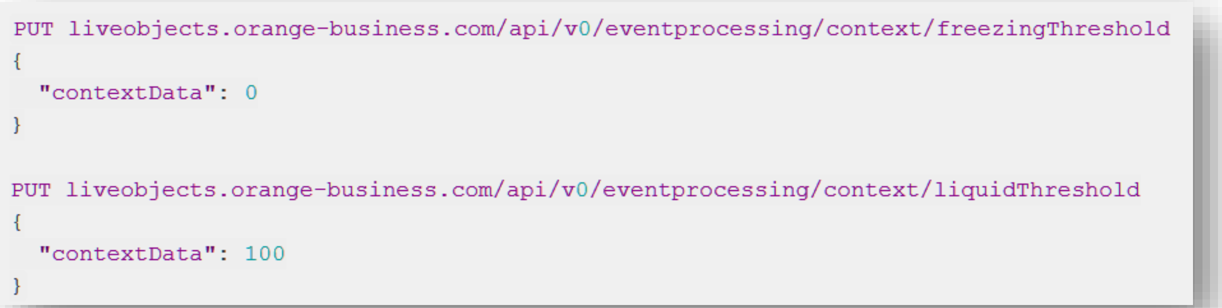
Connector

76674 answers

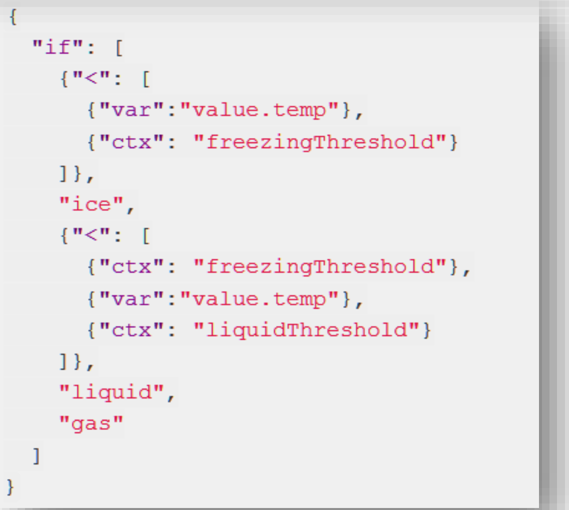
Date	Source	Stream	Value	Connector	Tags
06/19/2018 4:36:41 PM	urn:lo:nsid:android:357329073120059PRIMARY	android357329073120059PRIMARY	{ "revmin": 5491, "CO2": 517, "doorOpen": false, "hygrometry": 57, "temperature": 85, "pressure": 1034 }	mqtt	-
06/19/2018 4:36:37 PM	urn:lo:nsid:android:357329073120059PRIMARY	android357329073120059PRIMARY	{ "revmin": 5046, "CO2": 516, "doorOpen": false, "hygrometry": 55, "temperature": 80, "pressure": 1033 }	mqtt	-
06/19/2018 4:36:37 PM	-	event:urn:lo:nsid:android:357329073120059PRIMARY	{ "state": "ACTIVE", "deviceId": "urn:lo:nsid:android:357329073120059PRIMARY", "activityRule": { "name": "android357329073120059PRIMARY", "id": "3aeff407-82f0-455c-8baf-38e448d85212", "silentPolicy": { "duration": "PT1M", "repeatInterval": "PT10M" }, "targets": { "deviceIds": ["urn:lo:nsid:android:357329073120059PRIMARY"], "groupPaths": [{ "path": "/France", "includeSubPath": true }] }, "enabled": true, "tags": ["tagTestActivity"] }, "timestamp" : "2018-06-19T14:36:37.584Z" }	-	event tagTestActivity
06/19/2018 4:30:00 PM	-	event:urn:lo:nsid:android:357329073120059PRIMARY	{ "state": "SILENT", "deviceId": "urn:lo:nsid:android:357329073120059PRIMARY", "activityRule": { "name": "android357329073120059PRIMARY", "id": "3aeff407-82f0-455c-8baf-38e448d85212", "silentPolicy": { "duration": "PT1M", "repeatInterval": "PT10M" }, "targets": { "deviceIds": ["urn:lo:nsid:android:357329073120059PRIMARY"], "groupPaths": [{ "path": "/France", "includeSubPath": true }] }, "enabled": true, "tags": ["tagTestActivity"] }, "timestamp" : "2018-06-19T14:30:00.003Z" }	-	event tagTestActivity

"ACTIVE" state when the device sends a message after having being silent

Contexts

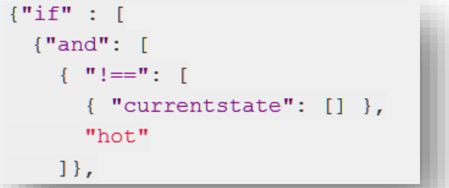


```
PUT liveobjects.orange-business.com/api/v0/eventprocessing/context/freezingThreshold
{
  "contextData": 0
}

PUT liveobjects.orange-business.com/api/v0/eventprocessing/context/liquidThreshold
{
  "contextData": 100
}
```



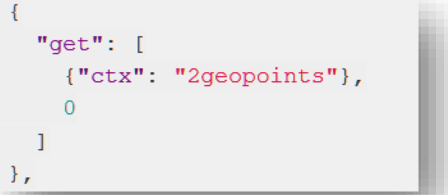
```
{
  "if": [
    {"<": [
      {"var":"value.temp"},
      {"ctx": "freezingThreshold"}
    ]},
    "ice",
    {"<": [
      {"ctx": "freezingThreshold"},
      {"var":"value.temp"},
      {"ctx": "liquidThreshold"}
    ]},
    "liquid",
    "gas"
  ]
}
```

For state processing only:



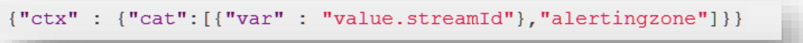
```
{"if" : [
  {"and": [
    { "!==": [
      { "currentstate": [] },
      "hot"
    ]},
```

For arrays:

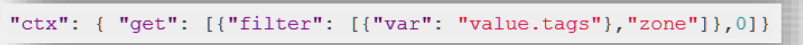


```
{
  "get": [
    {"ctx": "2geopoints"},
    0
  ]
},
```

For indirect reference:



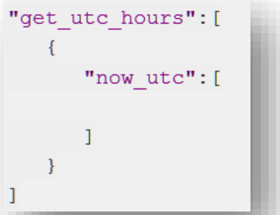
```
{"ctx" : {"cat":[{"var" : "value.streamId"},"alertingzone"]}}
```



```
"ctx": { "get": [{"filter": [{"var": "value.tags"},"zone"]},0]}
```

For date:

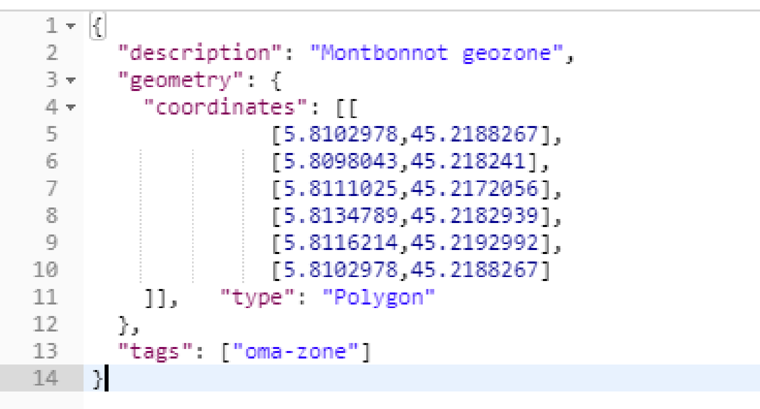
get_utc_hours
get_utc_minutes
get_utc_day
get_utc_date
get_time (epoch)



```
"get_utc_hours":[
    {
        "now_utc":[

        ]
    }
]
```

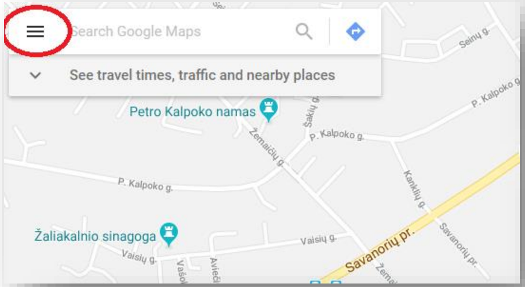
Contexts for geozones

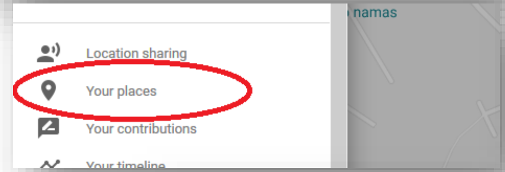
Declaring the zones:

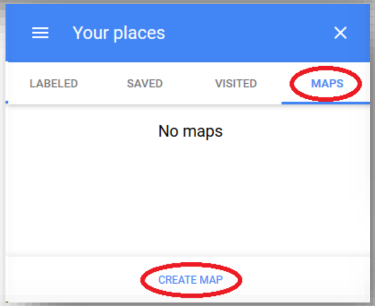


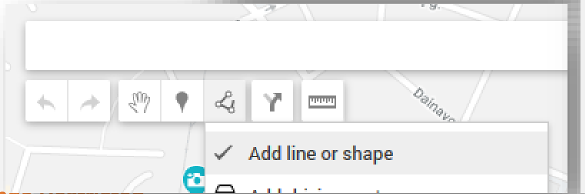
```
{
  "description": "Montbonnot geozone",
  "geometry": {
    "coordinates": [[
              [5.8102978,45.2188267],
              [5.8098043,45.218241],
              [5.8111025,45.2172056],
              [5.8134789,45.2182939],
              [5.8116214,45.2192992],
              [5.8102978,45.2188267]
    ]],  "type": "Polygon"
  },
  "tags": ["oma-zone"]
}
```

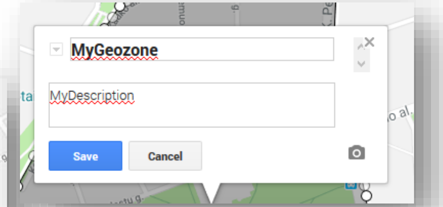
Creating the polygon with Gmaps:


Search Google Maps
See travel times, traffic and nearby places
Petro Kalpoko namas
Žaliakalnio sinagoga
P. Kalpoko g.
Savanorių pr.


Location sharing
Your places
Your contributions
Your timeline


Your places
LABELED
SAVED
VISITED
MAPS
No maps
CREATE MAP

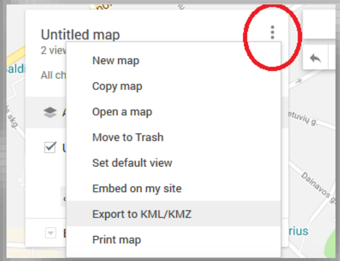

Add line or shape

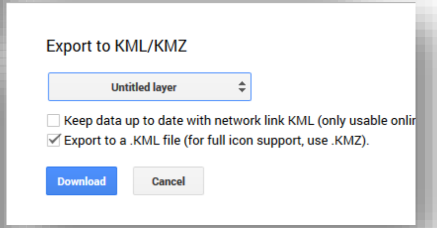


MyGeozone

MyDescription

Save
Cancel


Untitled map
New map
Copy map
Open a map
Move to Trash
Set default view
Embed on my site
Export to KML/KMZ
Print map



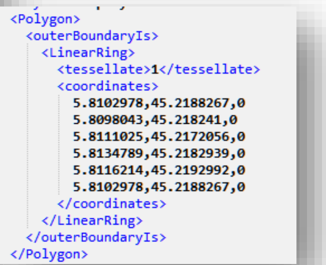
Export to KML/KMZ

Untitled layer

☐ Keep data up to date with network link KML (only usable onlir

☑ Export to a .KML file (for full icon support, use .KMZ).

Download
Cancel

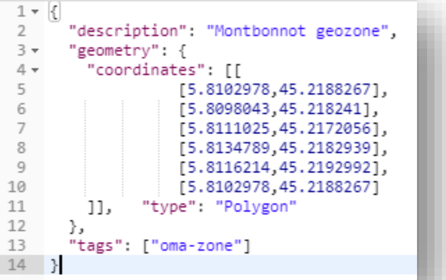


```
<Polygon>
  <outerBoundaryIs>
    <LinearRing>
      <tessellate>1</tessellate>
      <coordinates>
        5.8102978,45.2188267,0
        5.8098043,45.218241,0
        5.8111025,45.2172056,0
        5.8134789,45.2182939,0
        5.8116214,45.2192992,0
        5.8102978,45.2188267,0
      </coordinates>
    </LinearRing>
  </outerBoundaryIs>
</Polygon>
```

Contexts for geozones

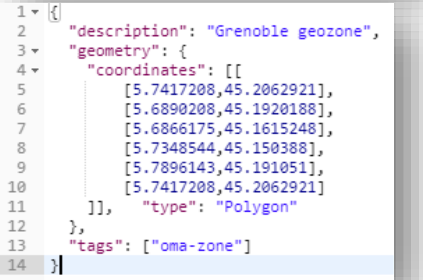
Using the zones:

https://liveobjects.orange-business.com/api/v0/eventprocessing/geozones/montbonnot



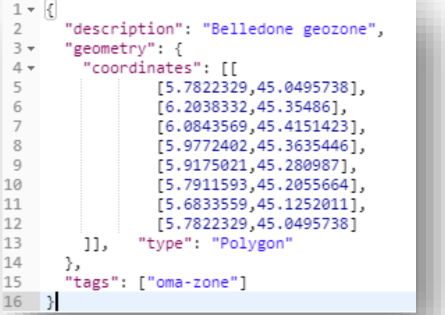
```
{
  "description": "Montbonnot geozone",
  "geometry": {
    "coordinates": [[
              [5.8102978,45.2188267],
              [5.8098043,45.218241],
              [5.8111025,45.2172056],
              [5.8134789,45.2182939],
              [5.8116214,45.2192992],
              [5.8102978,45.2188267]
    ]],   "type": "Polygon"
  },
  "tags": ["oma-zone"]
}
```

https://liveobjects.orange-business.com/api/v0/eventprocessing/geozones/grenoble



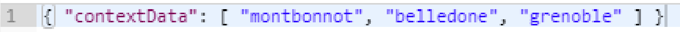
```
{
  "description": "Grenoble geozone",
  "geometry": {
    "coordinates": [[
        [5.7417208,45.2062921],
        [5.6890208,45.1920188],
        [5.6866175,45.1615248],
        [5.7348544,45.150388],
        [5.7896143,45.191051],
        [5.7417208,45.2062921]
    ]],   "type": "Polygon"
  },
  "tags": ["oma-zone"]
}
```

https://liveobjects.orange-business.com/api/v0/eventprocessing/geozones/belledone



```
{
  "description": "Belledone geozone",
  "geometry": {
    "coordinates": [[
            [5.7822329,45.0495738],
            [6.2038332,45.35486],
            [6.0843569,45.4151423],
            [5.9772402,45.3635446],
            [5.9175021,45.280987],
            [5.7911593,45.2055664],
            [5.6833559,45.1252011],
            [5.7822329,45.0495738]
    ]],   "type": "Polygon"
  },
  "tags": ["oma-zone"]
}
```

https://liveobjects.orange-business.com/api/v0/eventprocessing/context/zones-38000

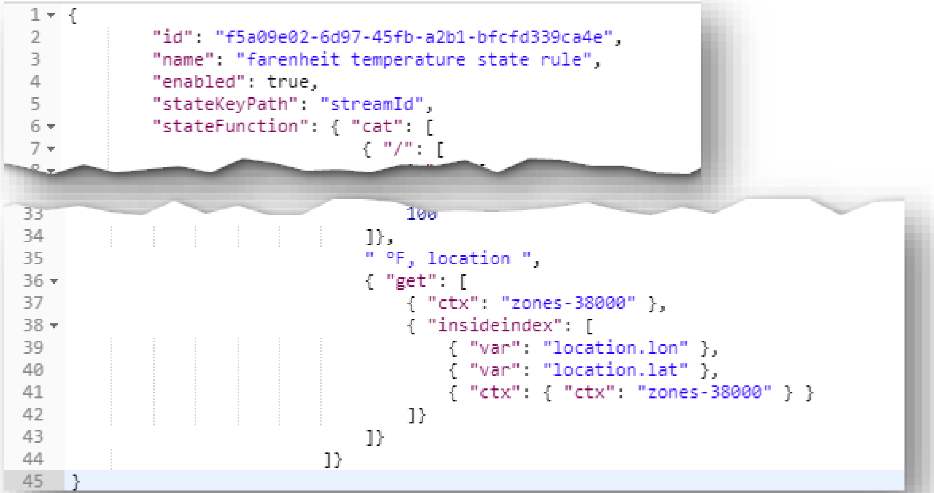


```
{ "contextData": [ "montbonnot", "belledone", "grenoble" ] }
```

Contexts for geozones

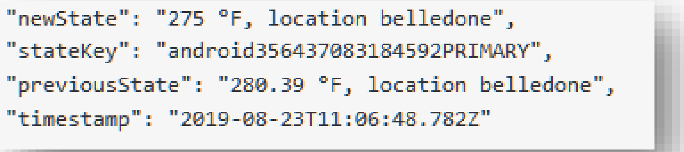
Using the zones:

https://liveobjects.orange-business.com/api/v0/eventprocessing/stateprocessing-rule



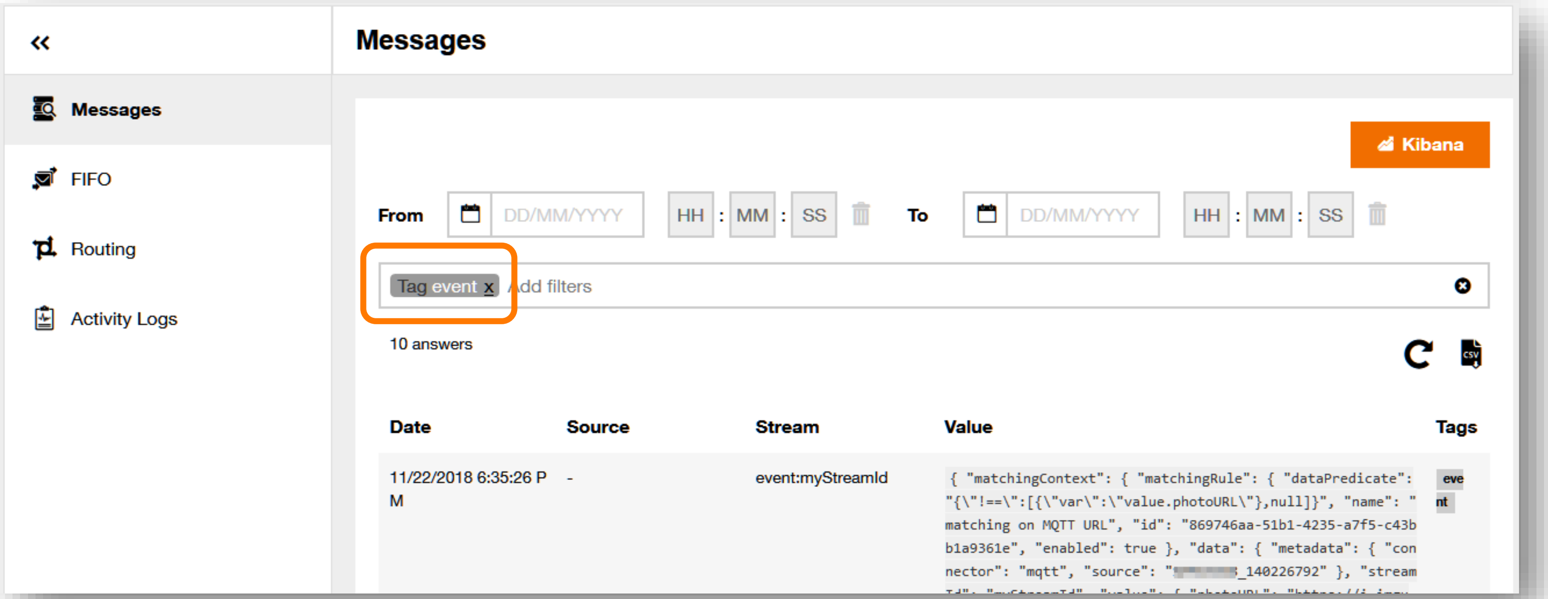
```
{
        "id": "f5a09e02-6d97-45fb-a2b1-bfcfd339ca4e",
        "name": "farenheit temperature state rule",
        "enabled": true,
        "stateKeyPath": "streamId",
        "stateFunction": { "cat": [
                    { "/": [
```

```
                        100
                    ]},
                    " °F, location ",
                    { "get": [
                        { "ctx": "zones-38000" },
                        { "insideindex": [
                            { "var": "location.lon" },
                            { "var": "location.lat" },
                            { "ctx": { "ctx": "zones-38000" } }
                        ]}
                    ]}
                ]}
}
```



```
"newState": "275 °F, location belledone",
"stateKey": "android356437083184592PRIMARY",
"previousState": "280.39 °F, location belledone",
"timestamp": "2019-08-23T11:06:48.782Z"
```

View events
for Simple event processing and activity events



«
Messages
FIFO
Routing
Activity Logs
Kibana
From
DD/MM/YYYY
HH
MM
SS
To
DD/MM/YYYY
HH
MM
SS
Add filters

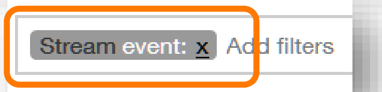
Messages

Tag event x

10 answers

Date	Source	Stream	Value	Tags
11/22/2018 6:35:26 PM	-	event:myStreamId	{ "matchingContext": { "matchingRule": { "dataPredicate": "{\"!==\":[{\"var\":\"value.photoURL\"},null]}", "name": " matching on MQTT URL", "id": "869746aa-51b1-4235-a7f5-c43bb1a9361e", "enabled": true }, "data": { "metadata": { "connector": "mqtt", "source": "[redacted]_140226792" }, "stream	event

… or



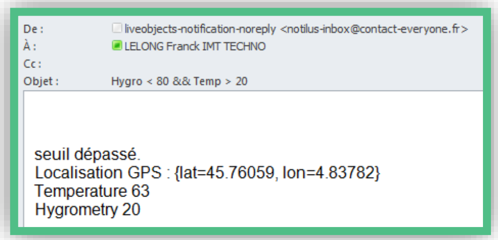
Stream event: x

Add filters

#6.4

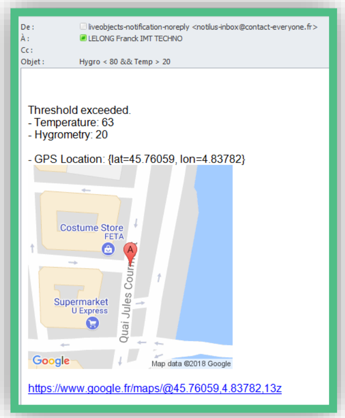
Data management
Notifications

Automatic actions on events : Event to Action



De : ☐ liveobjects-notification-noreply <notilus-inbox@contact-everyone.fr>
À : LELONG Franck IMT TECHNO
Cc :
Objet : Hygro < 80 && Temp > 20

seuil dépassé.
Localisation GPS : {lat=45.76059, lon=4.83782}
Temperature 63
Hygrometry 20



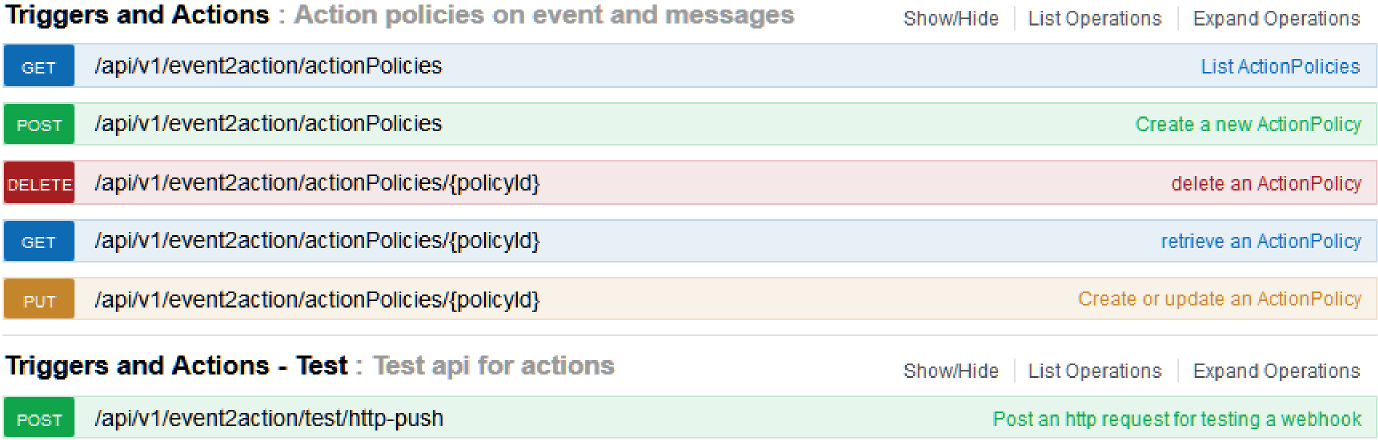
De : ☐ liveobjects-notification-noreply <notilus-inbox@contact-everyone.fr>
À : LELONG Franck IMT TECHNO
Cc :
Objet : Hygro < 80 && Temp > 20

Threshold exceeded.
- Temperature: 63
- Hygrometry: 20

- GPS Location: {lat=45.76059, lon=4.83782}

Costume Store
FETA
A
Supermarket
U Express
Quai Jules Courm
Google
Map data ©2018 Google

https://www.google.fr/maps/@45.76059,4.83782,13z



Triggers and Actions : Action policies on event and messages

Show/Hide
List Operations
Expand Operations

GET	/api/v1/event2action/actionPolicies	List ActionPolicies
POST	/api/v1/event2action/actionPolicies	Create a new ActionPolicy
DELETE	/api/v1/event2action/actionPolicies/{policyId}	delete an ActionPolicy
GET	/api/v1/event2action/actionPolicies/{policyId}	retrieve an ActionPolicy
PUT	/api/v1/event2action/actionPolicies/{policyId}	Create or update an ActionPolicy

Triggers and Actions - Test : Test api for actions

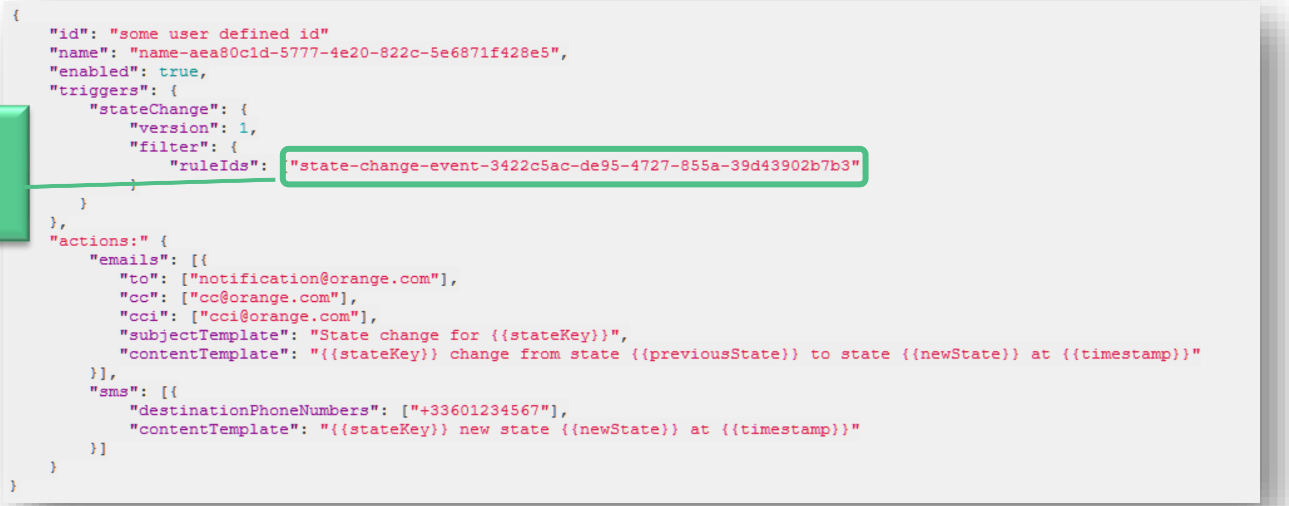
Show/Hide
List Operations
Expand Operations

POST	/api/v1/event2action/test/http-push	Post an http request for testing a webhook

Automatic actions on events : Event to Action

Create a new Action Policy for events

/api/v1/event2action/actionPolicies



```
{
    "id": "some user defined id"
    "name": "name-aea80c1d-5777-4e20-822c-5e6871f428e5",
    "enabled": true,
    "triggers": {
        "stateChange": {
            "version": 1,
            "filter": {
                "ruleIds": ["state-change-event-3422c5ac-de95-4727-855a-39d43902b7b3"
            }
        }
    },
    "actions:" {
        "emails": [{
           "to": ["notification@orange.com"],
           "cc": ["cc@orange.com"],
           "cci": ["cci@orange.com"],
           "subjectTemplate": "State change for {{stateKey}}",
           "contentTemplate": "{{stateKey}} change from state {{previousState}} to state {{newState}} at {{timestamp}}"
        }],
        "sms": [{
            "destinationPhoneNumbers": ["+33601234567"],
            "contentTemplate": "{{stateKey}} new state {{newState}} at {{timestamp}}"
        }]
    }
}
```

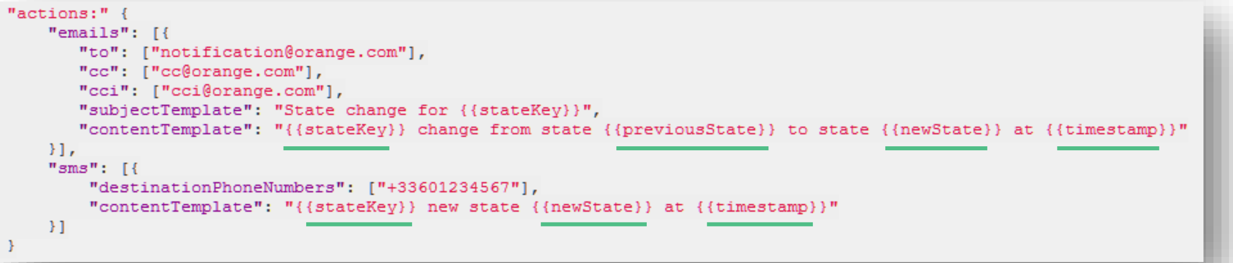
Firing rule Id or Activity rule Id or stateProcessingRule Id

Triggers and filters on:
- matchingFired
- stateChange
- deviceActivity

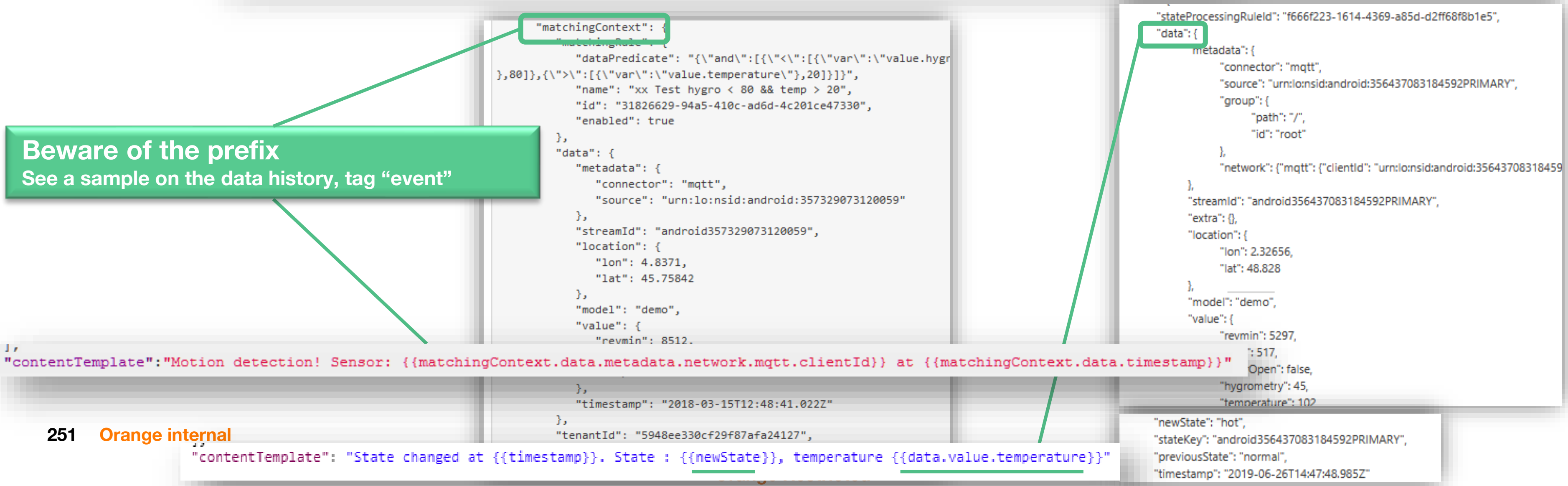
- dataMessage
- DM events

Automatic actions on events : Event to Action

Create a new Action Policy to send Email & SMS on selected events



```
"actions:" {
    "emails": [{
        "to": ["notification@orange.com"],
        "cc": ["cc@orange.com"],
        "cci": ["cci@orange.com"],
        "subjectTemplate": "State change for {{stateKey}}",
        "contentTemplate": "{{stateKey}} change from state {{previousState}} to state {{newState}} at {{timestamp}}"
    }],
    "sms": [{
        "destinationPhoneNumbers": ["+33601234567"],
        "contentTemplate": "{{stateKey}} new state {{newState}} at {{timestamp}}"
    }]
}
```



Beware of the prefix

See a sample on the data history, tag “event”

```
"matchingContext": {
    "matchingRule": {
        "dataPredicate": "{\"and\":[{\"<\":[{\"var\":\"value.hygr
},80]},{\">\":[{\"var\":\"value.temperature\"},20]}]}",
        "name": "xx Test hygro < 80 && temp > 20",
        "id": "31826629-94a5-410c-ad6d-4c201ce47330",
        "enabled": true
    },
    "data": {
        "metadata": {
            "connector": "mqtt",
            "source": "urn:lo:nsid:android:357329073120059"
        },
        "streamId": "android357329073120059",
        "location": {
            "lon": 4.8371,
            "lat": 45.75842
        },
        "model": "demo",
        "value": {
            "revmin": 8512,
```

```
        },
        "timestamp": "2018-03-15T12:48:41.022Z"
    },
    "tenantId": "5948ee330cf29f87afa24127",
```

```
],
"contentTemplate":"Motion detection! Sensor: {{matchingContext.data.metadata.network.mqtt.clientId}} at {{matchingContext.data.timestamp}}"
```

```
"stateProcessingRuleId": "f666f223-1614-4369-a85d-d2ff68f8b1e5",
"data": {
    "metadata": {
        "connector": "mqtt",
        "source": "urn:lo:nsid:android:356437083184592PRIMARY",
        "group": {
            "path": "/",
            "id": "root"
        },
        "network": {"mqtt": {"clientId": "urn:lo:nsid:android:35643708318459
    },
    "streamId": "android356437083184592PRIMARY",
    "extra": {},
    "location": {
        "lon": 2.32656,
        "lat": 48.828
    },
    "model": "demo",
    "value": {
        "revmin": 5297,
        ": 517,
        Open": false,
        "hygrometry": 45,
        "temperature": 102
```

```
"newState": "hot",
"stateKey": "android356437083184592PRIMARY",
"previousState": "normal",
"timestamp": "2019-06-26T14:47:48.985Z"
```

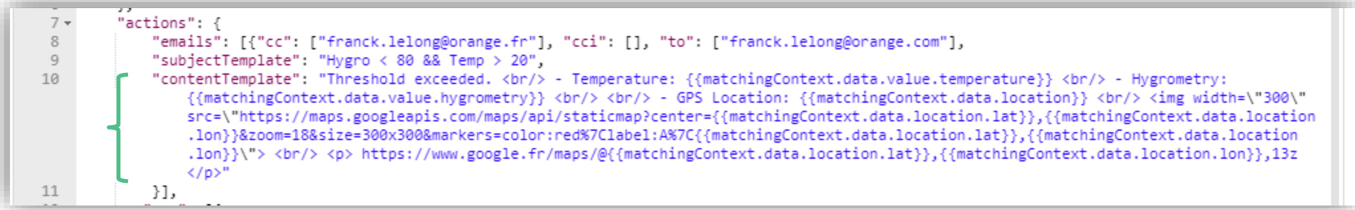
```
"contentTemplate": "State changed at {{timestamp}}. State : {{newState}}, temperature {{data.value.temperature}}"
```

Automatic actions on events : Event to Action

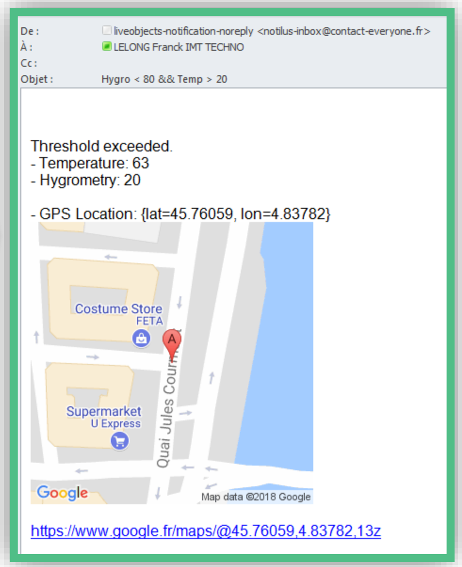
Update an Action Policy : make a more complex email

Toggle the rule activation : true/false

Change rules, receivers…The Email/SMS bodies - ex: add a Google map



```
"actions": {
    "emails": [{"cc": ["franck.lelong@orange.fr"], "cci": [], "to": ["franck.lelong@orange.com"],
    "subjectTemplate": "Hygro < 80 && Temp > 20",
    "contentTemplate": "Threshold exceeded. <br/> - Temperature: {{matchingContext.data.value.temperature}} <br/> - Hygrometry:
        {{matchingContext.data.value.hygrometry}} <br/> <br/> - GPS Location: {{matchingContext.data.location}} <br/> <img width=\"300\"
        src=\"https://maps.googleapis.com/maps/api/staticmap?center={{matchingContext.data.location.lat}},{{matchingContext.data.location
        .lon}}&zoom=18&size=300x300&markers=color:red%7Clabel:A%7C{{matchingContext.data.location.lat}},{{matchingContext.data.location
        .lon}}\"> <br/> <p> https://www.google.fr/maps/@{{matchingContext.data.location.lat}},{{matchingContext.data.location.lon}},13z
        </p>"
    }],
```



De : ☐ liveobjects-notification-noreply <notilus-inbox@contact-everyone.fr>
À : 🟩 LELONG Franck IMT TECHNO
Cc :
Objet : Hygro < 80 && Temp > 20

Threshold exceeded.
- Temperature: 63
- Hygrometry: 20

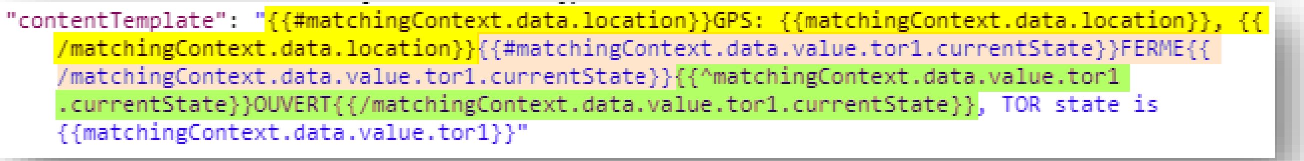
- GPS Location: {lat=45.76059, lon=4.83782}

https://www.google.fr/maps/@45.76059,4.83782,13z

Automatic actions on events : Event to Action

Update an Action Policy : build a conditional text

Eg, translate a 0/1 to a user-localized string *Fermé/Ouvert*



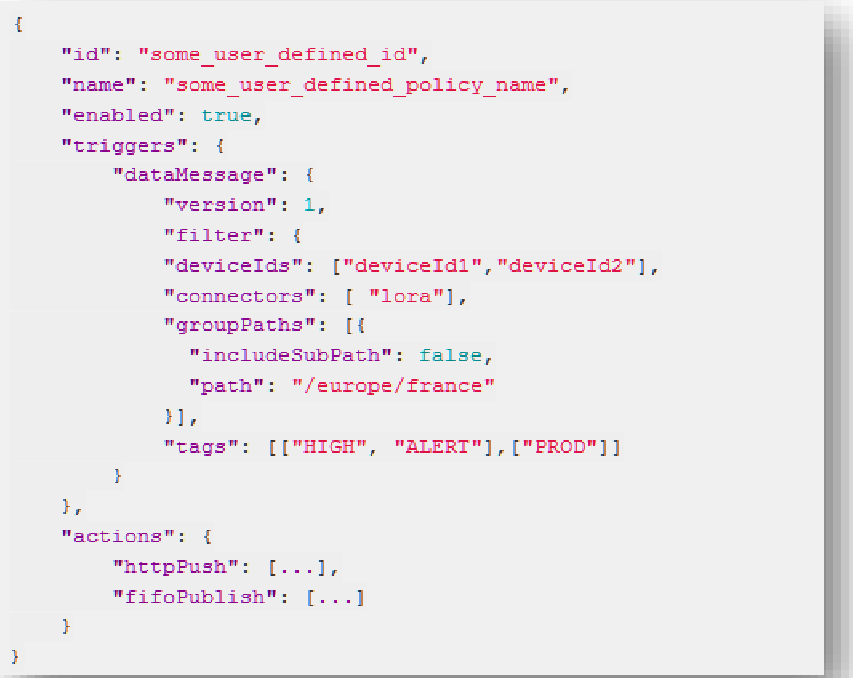
```
"contentTemplate": "{{#matchingContext.data.location}}GPS: {{matchingContext.data.location}}, {{
    /matchingContext.data.location}}{{#matchingContext.data.value.tor1.currentState}}FERME{{
    /matchingContext.data.value.tor1.currentState}}{{^matchingContext.data.value.tor1
    .currentState}}OUVERT{{/matchingContext.data.value.tor1.currentState}}, TOR state is
    {{matchingContext.data.value.tor1}}"
```

https://mustache.github.io/mustache.5.html

Automatic actions on events : Event to Action

Make an HTTP Push or FIFO Publish & advanced filtering

/api/v1/event2action/actionPolicies

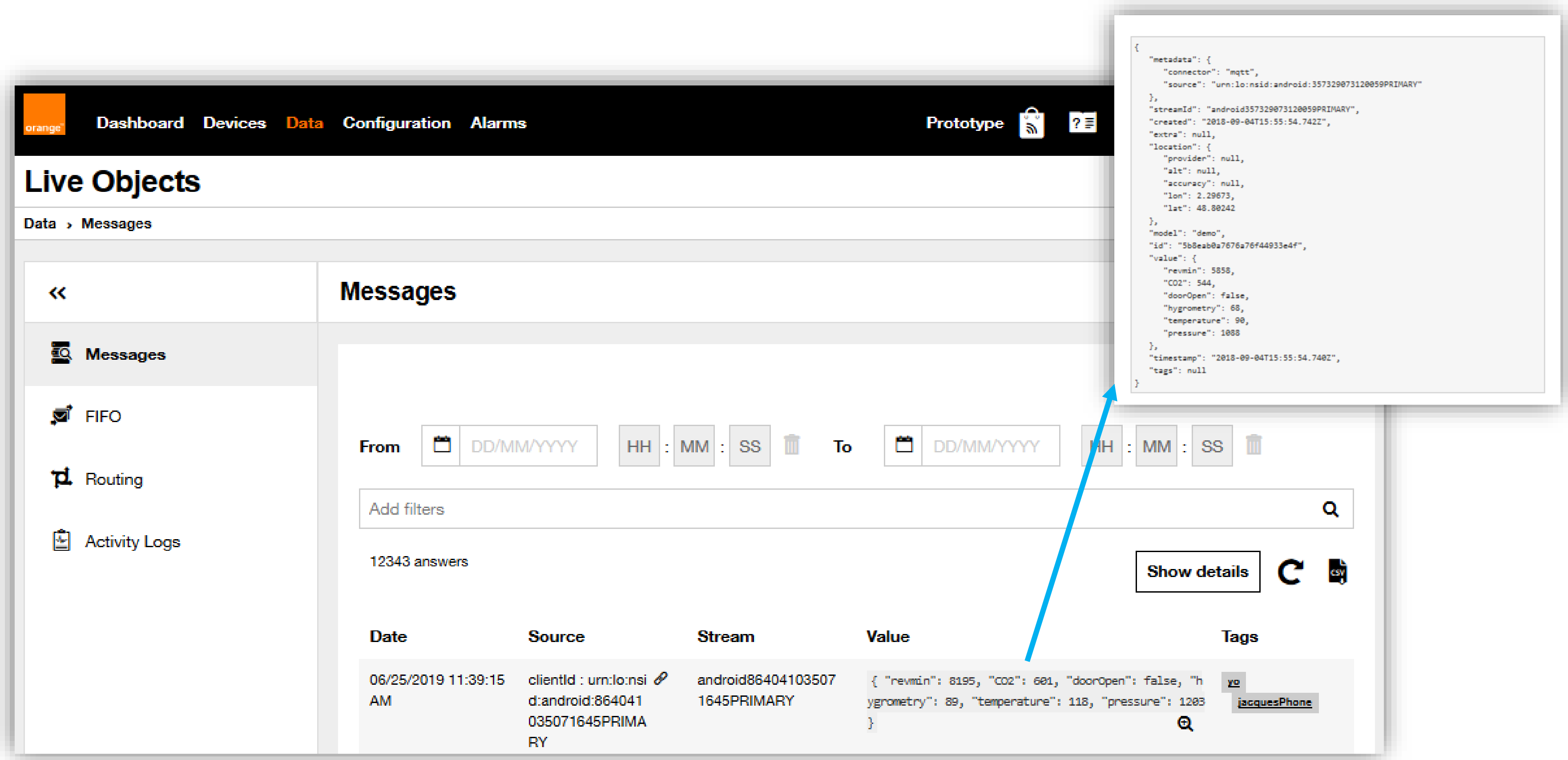


```
{
    "id": "some_user_defined_id",
    "name": "some_user_defined_policy_name",
    "enabled": true,
    "triggers": {
        "dataMessage": {
            "version": 1,
            "filter": {
            "deviceIds": ["deviceId1","deviceId2"],
            "connectors": [ "lora"],
            "groupPaths": [{
              "includeSubPath": false,
              "path": "/europe/france"
            }],
            "tags": [["HIGH", "ALERT"],["PROD"]]
        }
    },
    "actions": {
        "httpPush": [...],
        "fifoPublish": [...]
    }
}
```

#6.5

Data management
Analysis and search

viewing the data on the portal

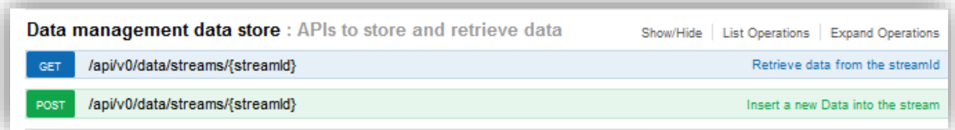

orange
Dashboard
Devices
Data
Configuration
Alarms
Prototype
?
Live Objects
Data › Messages
«
Messages
FIFO
Routing
Activity Logs
Messages
From
DD/MM/YYYY
HH : MM : SS
To
DD/MM/YYYY
HH : MM : SS
Add filters
Show details

12343 answers

Date	Source	Stream	Value	Tags
06/25/2019 11:39:15 AM	clientId : urn:lo:nsid:android:864041035071645PRIMARY	android864041035071645PRIMARY	{ "revmin": 8195, "CO2": 601, "doorOpen": false, "hygrometry": 89, "temperature": 118, "pressure": 1203 }	yo jacquesPhone

```
{
  "metadata": {
    "connector": "mqtt",
    "source": "urn:lo:nsid:android:357329073120059PRIMARY"
  },
  "streamId": "android357329073120059PRIMARY",
  "created": "2018-09-04T15:55:54.742Z",
  "extra": null,
  "location": {
    "provider": null,
    "alt": null,
    "accuracy": null,
    "lon": 2.29673,
    "lat": 48.80242
  },
  "model": "demo",
  "id": "5b8eab0a7676a76f44933e4f",
  "value": {
    "revmin": 5858,
    "CO2": 544,
    "doorOpen": false,
    "hygrometry": 68,
    "temperature": 90,
    "pressure": 1088
  },
  "timestamp": "2018-09-04T15:55:54.740Z",
  "tags": null
}
```

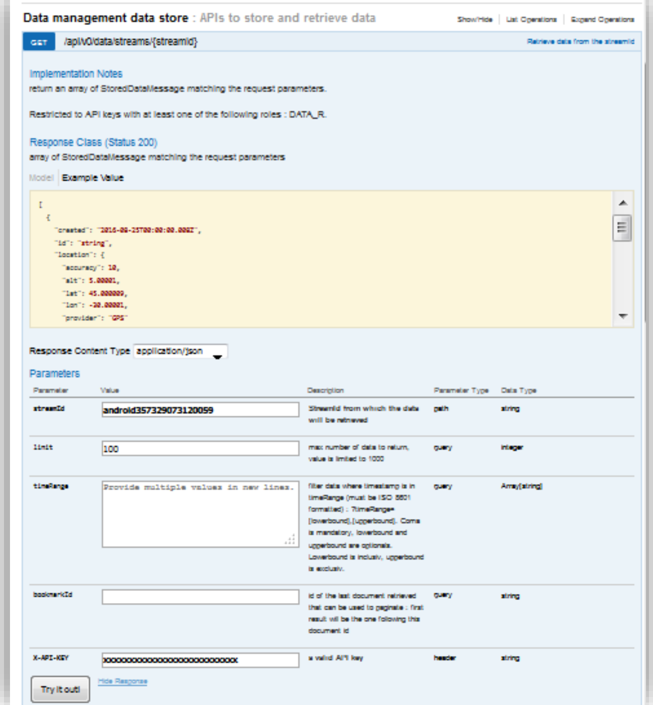
history search



Data management data store : APIs to store and retrieve data

GET /api/v0/data/streams/{streamId} — Retrieve data from the streamId

POST /api/v0/data/streams/{streamId} — Insert a new Data into the stream



Data management data store : APIs to store and retrieve data

GET /api/v0/data/streams/{streamId} — Retrieve data from the streamId

Implementation Notes

return an array of StoredDataMessage matching the request parameters.

Restricted to API keys with at least one of the following roles : DATA_R.

Response Class (Status 200)

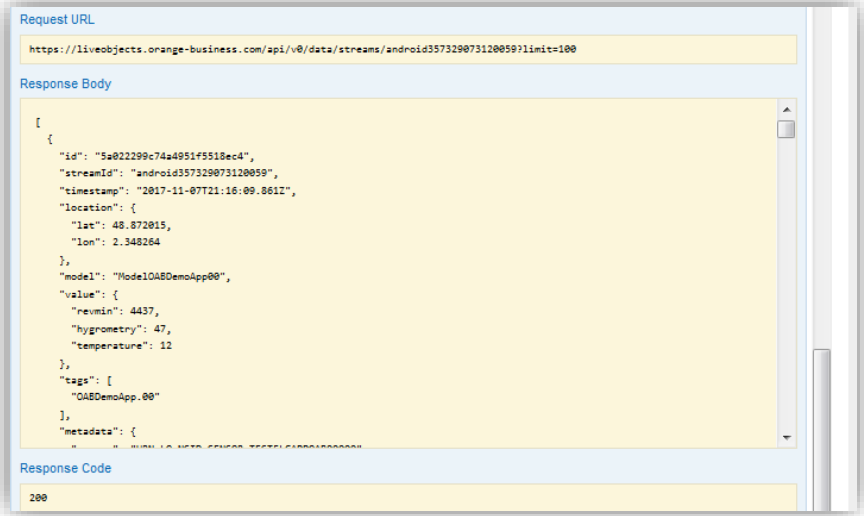
array of StoredDataMessage matching the request parameters

```
[
  {
    "created": "2016-08-25T00:00:00.000Z",
    "id": "string",
    "location": {
      "accuracy": 10,
      "alt": 5.00001,
      "lat": 45.000009,
      "lon": -30.00001,
      "provider": "GPS"
```

Response Content Type: application/json

Parameters

Parameter	Value	Description	Parameter Type	Data Type
streamId	android357329073120059	StreamId from which the data will be retrieved	path	string
limit	100	max number of data to return, value is limited to 1000	query	integer
timeRange	Provide multiple values in new lines.	filter data where timestamp is in timeRange (must be ISO 8601 formatted) : ?timeRange=[lowerbound],[upperbound]. Coma is mandatory, lowerbound and upperbound are optionals. Lowerbound is inclusiv, upperbound is exclusiv.	query	Array[string]
bookmarkId		id of the last document retrieved that can be used to paginate : first result will be the one following this document id	query	string
X-API-KEY	xxxxxxxxxxxxxxxxxxxxxxxxxxx	a valid API key	header	string



Request URL

```
https://liveobjects.orange-business.com/api/v0/data/streams/android357329073120059?limit=100
```

Response Body

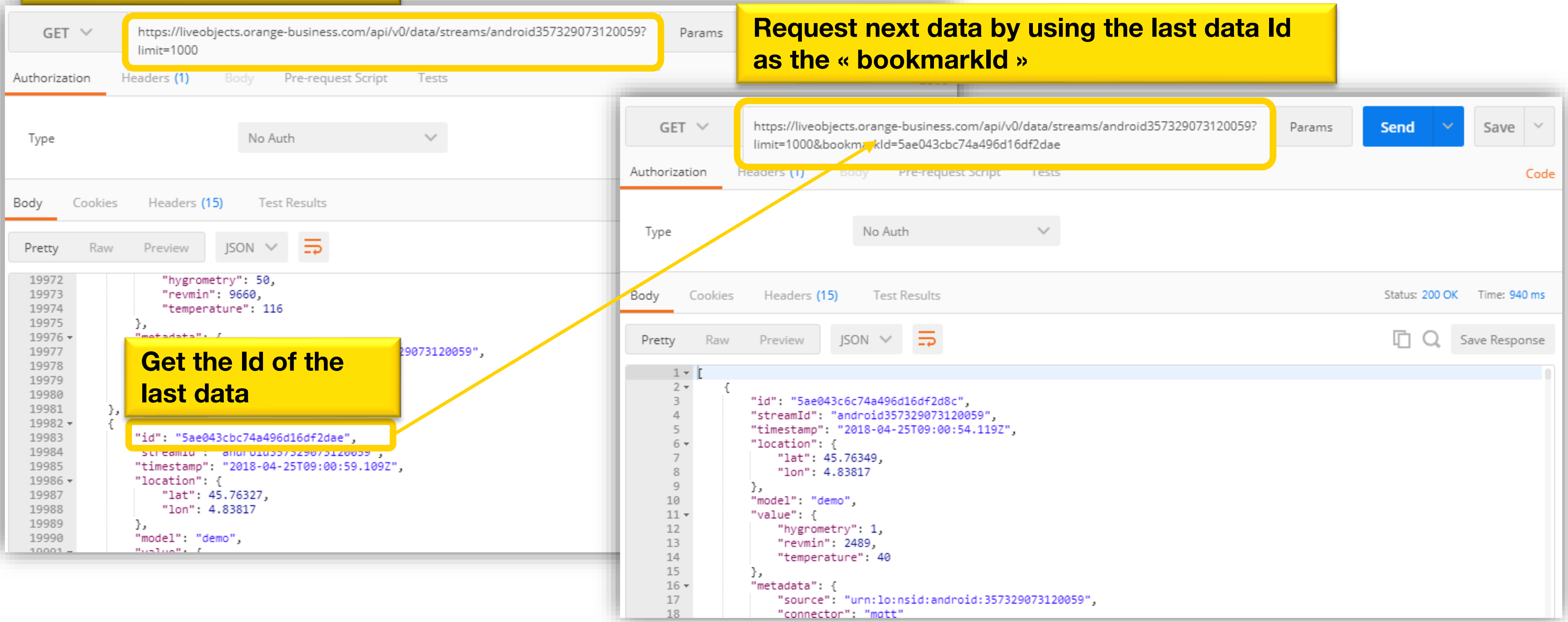
```
[
  {
    "id": "5a022299c74a4951f5518ec4",
    "streamId": "android357329073120059",
    "timestamp": "2017-11-07T21:16:09.861Z",
    "location": {
      "lat": 48.872015,
      "lon": 2.348264
    },
    "model": "ModelOABDemoApp00",
    "value": {
      "revmin": 4437,
      "hygrometry": 47,
      "temperature": 12
    },
    "tags": [
      "OABDemoApp.00"
    ],
    "metadata": {
```

Response Code

```
200
```

```
curl -X GET
--header 'Accept: application/json'
--header 'X-API-KEY: xxxxxxxxxxxxxxxxxxxxxxxxxxx'
'https://liveobjects.orange-business.com/
api/v0/data/streams/android357329073120059?limit=100'
```

history search – beyond the first 1000 messages



Get the 1000 first data

`GET https://liveobjects.orange-business.com/api/v0/data/streams/android357329073120059?limit=1000`

GET
Params
Authorization
Headers (1)
Body
Pre-request Script
Tests
Type
No Auth
Body
Cookies
Headers (15)
Test Results
Pretty
Raw
Preview
JSON

```
            "hygrometry": 50,
            "revmin": 9660,
            "temperature": 116
        },
```

Get the Id of the last data

```
    },
    {
        "id": "5ae043cbc74a496d16df2dae",
        "timestamp": "2018-04-25T09:00:59.109Z",
        "location": {
            "lat": 45.76327,
            "lon": 4.83817
        },
        "model": "demo",
```

Request next data by using the last data Id as the « bookmarkId »

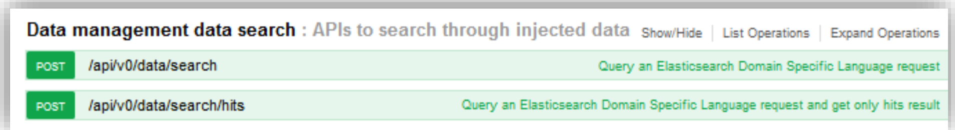
`GET https://liveobjects.orange-business.com/api/v0/data/streams/android357329073120059?limit=1000&bookmarkId=5ae043cbc74a496d16df2dae`

GET
Params
Send
Save
Authorization
Headers (1)
Body
Pre-request Script
Tests
Code
Type
No Auth
Body
Cookies
Headers (15)
Test Results
Pretty
Raw
Preview
JSON
Save Response

Status: 200 OK Time: 940 ms

```
[
    {
        "id": "5ae043c6c74a496d16df2d8c",
        "streamId": "android357329073120059",
        "timestamp": "2018-04-25T09:00:54.119Z",
        "location": {
            "lat": 45.76349,
            "lon": 4.83817
        },
        "model": "demo",
        "value": {
            "hygrometry": 1,
            "revmin": 2489,
            "temperature": 40
        },
        "metadata": {
            "source": "urn:lo:nsid:android:357329073120059",
            "connector": "mqtt"
```

searching with ElasticSearch



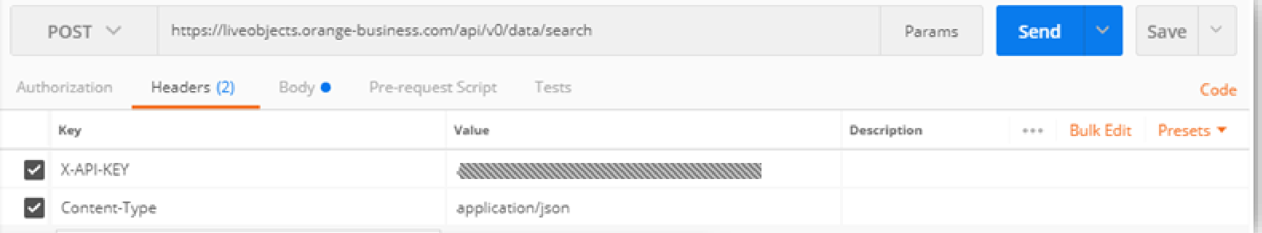
Data management data search : APIs to search through injected data

POST	/api/v0/data/search	Query an Elasticsearch Domain Specific Language request
POST	/api/v0/data/search/hits	Query an Elasticsearch Domain Specific Language request and get only hits result

Elasticsearch is a distributed, JSON-based search and analytics engine designed for horizontal scalability, maximum reliability, and easy management.

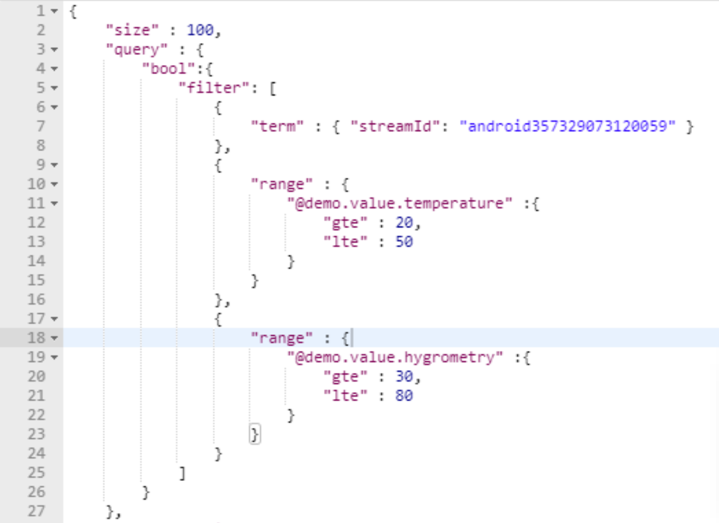
https://www.elastic.co/guide/en/elasticsearch/reference/current/index.html

searching with ElasticSearch, multicriteria


POST
Params
Send
Save
Authorization
Headers (2)
Body
Pre-request Script
Tests
Code
Description
Bulk Edit
Presets

POST https://liveobjects.orange-business.com/api/v0/data/search

	Key	Value
☑	X-API-KEY	[redacted]
☑	Content-Type	application/json



```
{
    "size" : 100,
    "query" : {
        "bool":{
            "filter": [
                {
                    "term" : { "streamId": "android357329073120059" }
                },
                {
                    "range" : {
                        "@demo.value.temperature" :{
                            "gte" : 20,
                            "lte" : 50
                        }
                    }
                },
                {
                    "range" : {
                        "@demo.value.hygrometry" :{
                            "gte" : 30,
                            "lte" : 80
                        }
                    }
                }
            ]
        }
    },
```

Request :

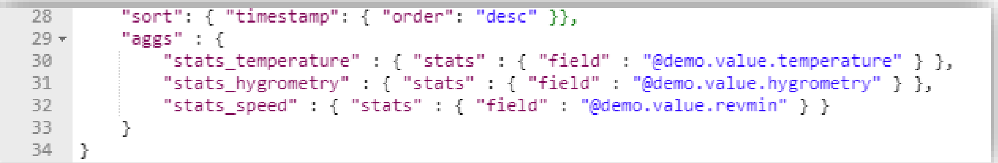
100 last values

with 50°<Temperature< 20° & 80<Hygrometry<30

ordered by timestamp

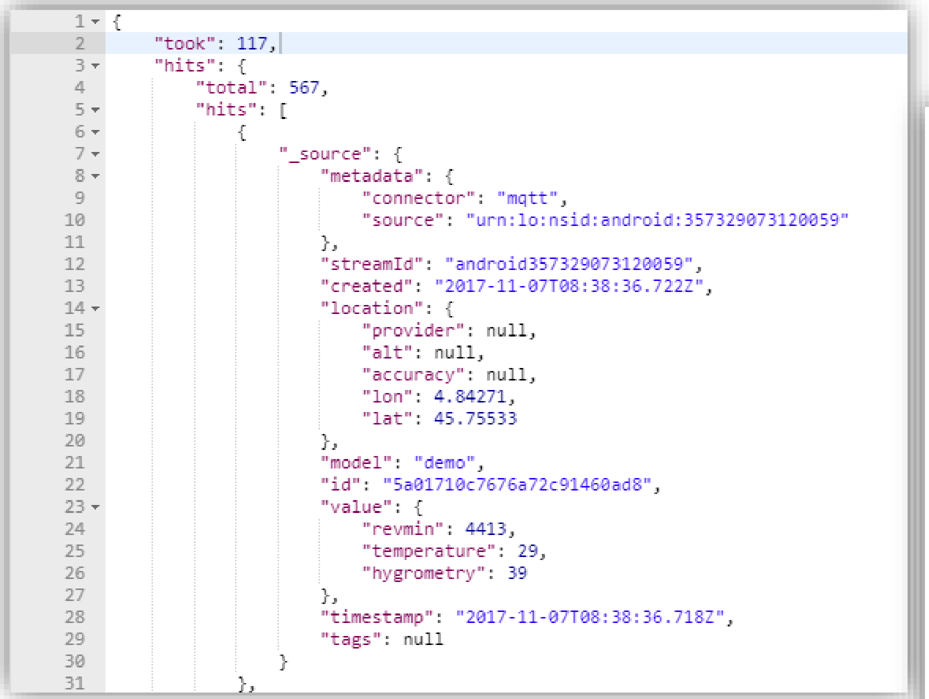
+ stats on temperature, hygrometry, rev/min

…



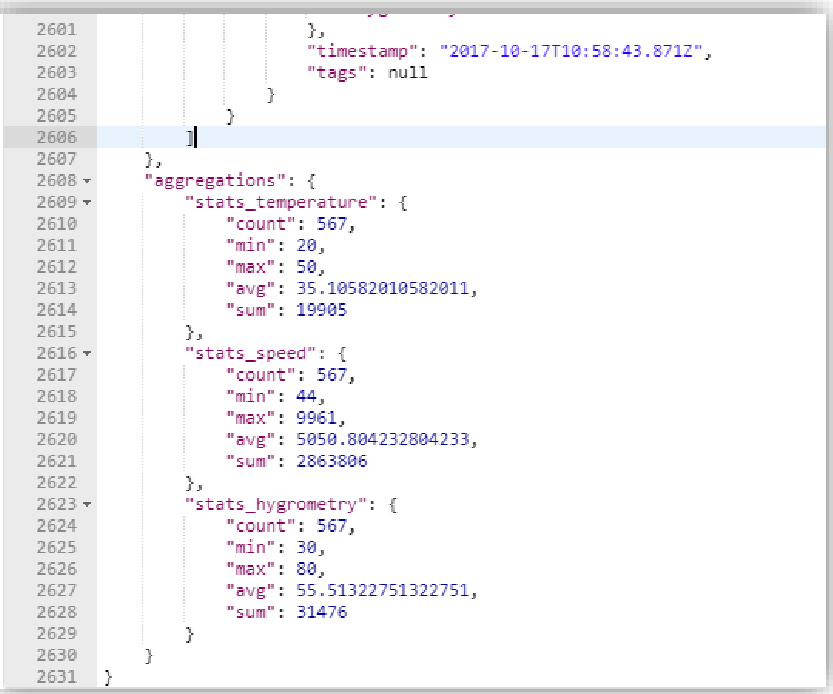
```
    "sort": { "timestamp": { "order": "desc" }},
    "aggs" : {
        "stats_temperature" : { "stats" : { "field" : "@demo.value.temperature" } },
        "stats_hygrometry" : { "stats" : { "field" : "@demo.value.hygrometry" } },
        "stats_speed" : { "stats" : { "field" : "@demo.value.revmin" } }
    }
}
```

Multicriteria search result



```
{
    "took": 117,
    "hits": {
        "total": 567,
        "hits": [
            {
                "_source": {
                    "metadata": {
                        "connector": "mqtt",
                        "source": "urn:lo:nsid:android:357329073120059"
                    },
                    "streamId": "android357329073120059",
                    "created": "2017-11-07T08:38:36.722Z",
                    "location": {
                        "provider": null,
                        "alt": null,
                        "accuracy": null,
                        "lon": 4.84271,
                        "lat": 45.75533
                    },
                    "model": "demo",
                    "id": "5a01710c7676a72c91460ad8",
                    "value": {
                        "revmin": 4413,
                        "temperature": 29,
                        "hygrometry": 39
                    },
                    "timestamp": "2017-11-07T08:38:36.718Z",
                    "tags": null
                }
            },
```

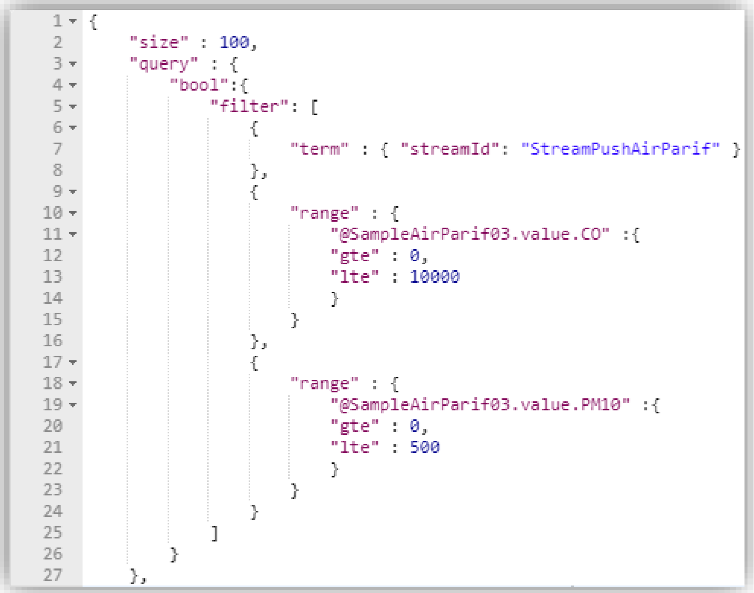
...



```
                            },
                            "timestamp": "2017-10-17T10:58:43.871Z",
                            "tags": null
                        }
                    }
                ]
        },
        "aggregations": {
            "stats_temperature": {
                "count": 567,
                "min": 20,
                "max": 50,
                "avg": 35.10582010582011,
                "sum": 19905
            },
            "stats_speed": {
                "count": 567,
                "min": 44,
                "max": 9961,
                "avg": 5050.804232804233,
                "sum": 2863806
            },
            "stats_hygrometry": {
                "count": 567,
                "min": 30,
                "max": 80,
                "avg": 55.51322751322751,
                "sum": 31476
            }
        }
}
```

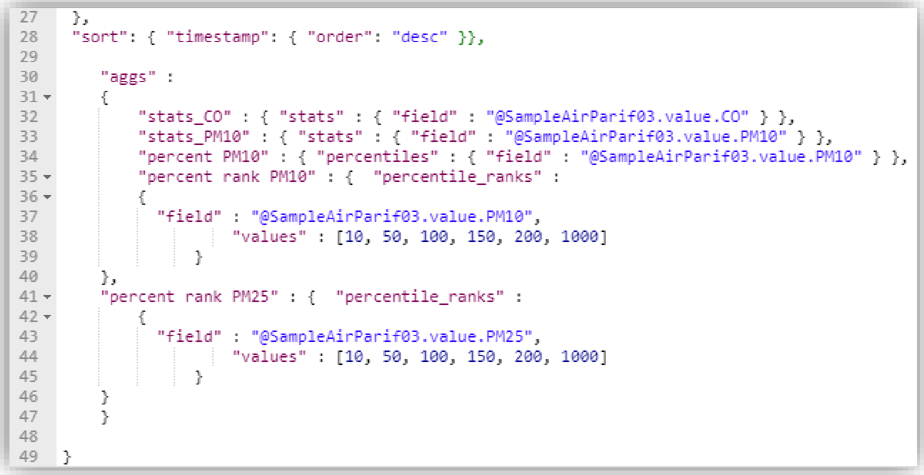
...

searching with ElasticSearch, with more statistics



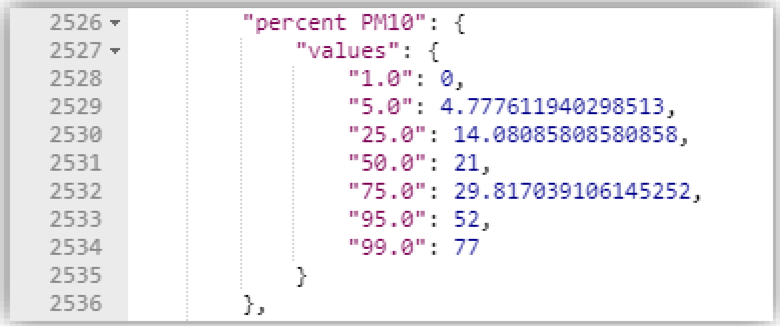
```
{
    "size" : 100,
    "query" : {
        "bool":{
            "filter": [
                {
                    "term" : { "streamId": "StreamPushAirParif" }
                },
                {
                    "range" : {
                        "@SampleAirParif03.value.CO" :{
                        "gte" : 0,
                        "lte" : 10000
                        }
                    }
                },
                {
                    "range" : {
                        "@SampleAirParif03.value.PM10" :{
                        "gte" : 0,
                        "lte" : 500
                        }
                    }
                }
            ]
        }
    },
```

…

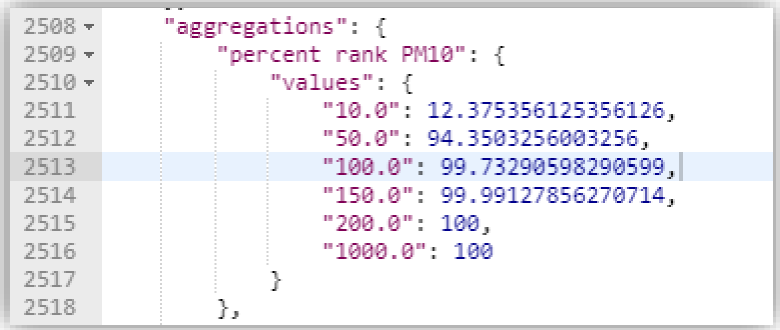


```
 },
 "sort": { "timestamp": { "order": "desc" }},

    "aggs" :
    {
        "stats_CO" : { "stats" : { "field" : "@SampleAirParif03.value.CO" } },
        "stats_PM10" : { "stats" : { "field" : "@SampleAirParif03.value.PM10" } },
        "percent PM10" : { "percentiles" : { "field" : "@SampleAirParif03.value.PM10" } },
        "percent rank PM10" : {  "percentile_ranks" :
        {
          "field" : "@SampleAirParif03.value.PM10",
                  "values" : [10, 50, 100, 150, 200, 1000]
              }
    },
    "percent rank PM25" : {  "percentile_ranks" :
        {
          "field" : "@SampleAirParif03.value.PM25",
                  "values" : [10, 50, 100, 150, 200, 1000]
              }
    }
    }

}
```

searching with ElasticSearch, with more statistics : results



```
      "percent PM10": {
          "values": {
              "1.0": 0,
              "5.0": 4.777611940298513,
              "25.0": 14.08085808580858,
              "50.0": 21,
              "75.0": 29.817039106145252,
              "95.0": 52,
              "99.0": 77
          }
      },
```

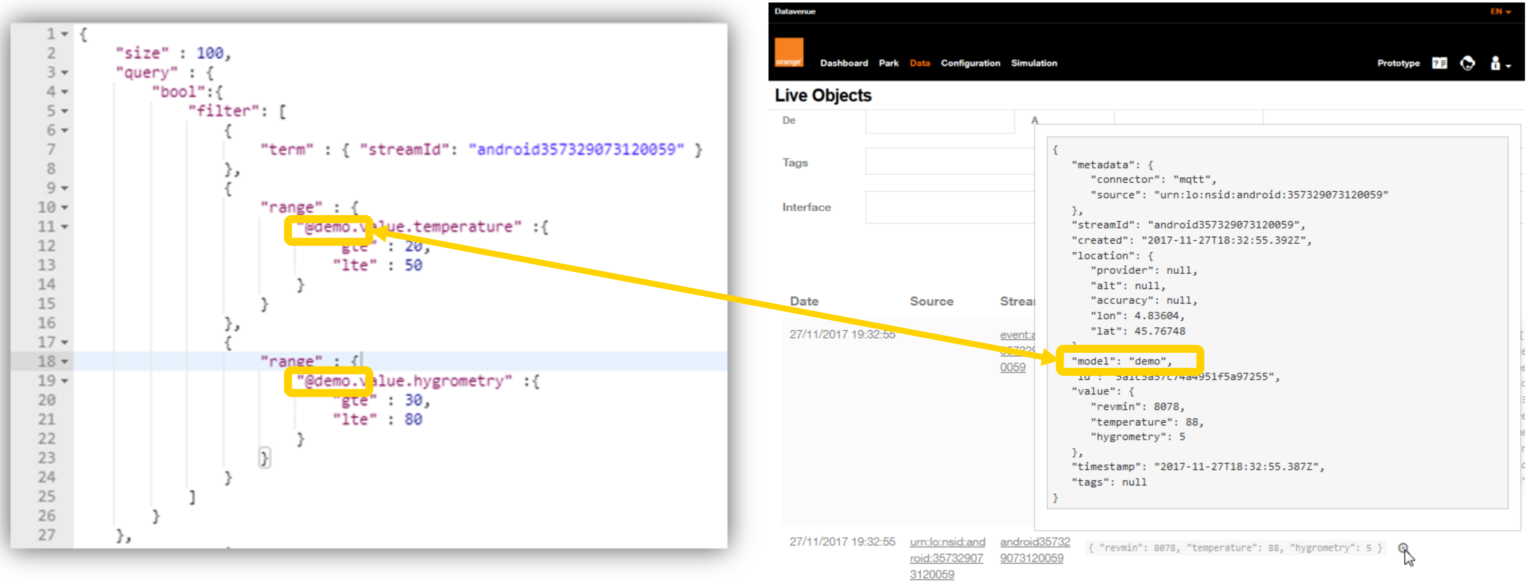


```
      "aggregations": {
          "percent rank PM10": {
              "values": {
                  "10.0": 12.375356125356126,
                  "50.0": 94.3503256003256,
                  "100.0": 99.73290598290599,
                  "150.0": 99.99127856270714,
                  "200.0": 100,
                  "1000.0": 100
              }
          },
```

Percentiles show the point at which a certain percentage of observed values occur.
eg : if my tolerance is 5% of the readings, I know that my PM10 is ≤ 52ppm

Percentile rank show the percentage of observed values which are below a certain value.
eg : if my threshold is 100ppm, I know that 99.73% of PM10 readings are compliant

searching with ElasticSearch, focus on the « model »


Datavenue
EN
Dashboard
Park
Data
Configuration
Simulation
Prototype
Live Objects
De
A
Tags
Interface
Date
Source
Strea
27/11/2017 19:32:55
event:a
0059
27/11/2017 19:32:55
urn:lo:nsid:android:357329073120059
android357329073120059
{ "revmin": 8078, "temperature": 88, "hygrometry": 5 }

```
{
    "size" : 100,
    "query" : {
        "bool":{
            "filter": [
                {
                    "term" : { "streamId": "android357329073120059" }
                },
                {
                    "range" : {
                        "@demo.value.temperature" :{
                            "gte" : 20,
                            "lte" : 50
                        }
                    }
                },
                {
                    "range" : {
                        "@demo.value.hygrometry" :{
                            "gte" : 30,
                            "lte" : 80
                        }
                    }
                }
            ]
        }
    },
```

```
{
   "metadata": {
      "connector": "mqtt",
      "source": "urn:lo:nsid:android:357329073120059"
   },
   "streamId": "android357329073120059",
   "created": "2017-11-27T18:32:55.392Z",
   "location": {
      "provider": null,
      "alt": null,
      "accuracy": null,
      "lon": 4.83604,
      "lat": 45.76748
   },
   "model": "demo",
   "id": "5a1c5a57c74a4951f5a97255",
   "value": {
      "revmin": 8078,
      "temperature": 88,
      "hygrometry": 5
   },
   "timestamp": "2017-11-27T18:32:55.387Z",
   "tags": null
}
```

The data field must be prefixed by @ + the « model » of the json data

- When the device sends Json data, it must put a « model » field in order to make Elastic Search (ELS) index it
- ELS starts indexing these data when it receives the first payload containing a « model »
- The device can add fields to the same « model »
- The device must not change the data type fields into the same « model » otherwise it will not be indexed.

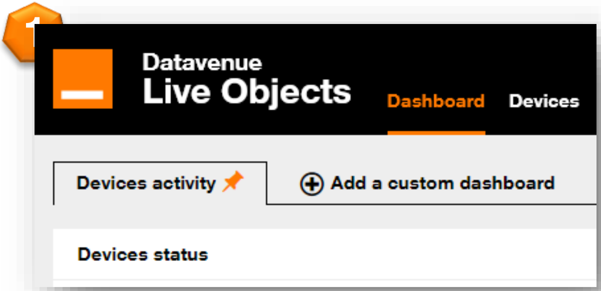
#7

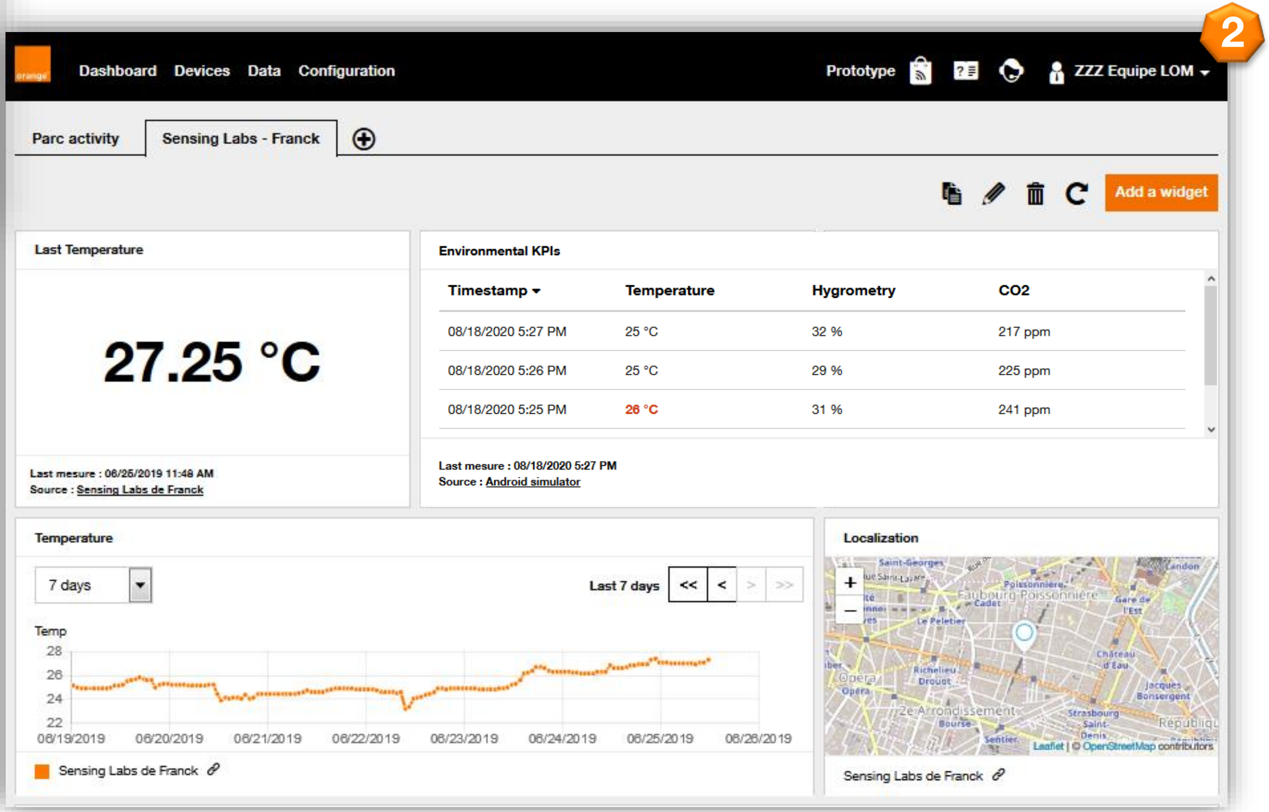
Data Visualization

Datavisualization

Portal Data tab	**Inside Live Objects: list of all received payloads**
Portal Widgets	**Inside Live Objects: graphs and maps of device values**
Node-red	**Above Live Objects : easy graphical tool to prototype simple interactive dashboards and share them**
Freeboard **Tableau / Vantiq**	**Above Live Objects: easy graphical tools for Business Intelligence, and to create simple or advanced dashboards**
Kheiron	**Above Live Objects: easy business application building**
Bespoke development	**Above Live Objects: turnkey application developed by integrator using Live Objects MQTT or REST APIs**

Dashboard


1
Datavenue
Live Objects
Dashboard
Devices
Devices activity
Add a custom dashboard
Devices status


2
orange
Dashboard
Devices
Data
Configuration
Prototype
ZZZ Equipe LOM
Parc activity
Sensing Labs - Franck
Add a widget
Last Temperature
Environmental KPIs
Temperature
7 days
Last 7 days
<<
<
>
>>
Temp
28
26
24
22
06/19/2019
06/20/2019
06/21/2019
06/22/2019
06/23/2019
06/24/2019
06/25/2019
06/26/2019
Sensing Labs de Franck
Localization
+
−
Faubourg Poissonnière
Opéra
2e Arrondissement
République
Leaflet | © OpenStreetMap contributors
Sensing Labs de Franck

Last Temperature

27.25 °C

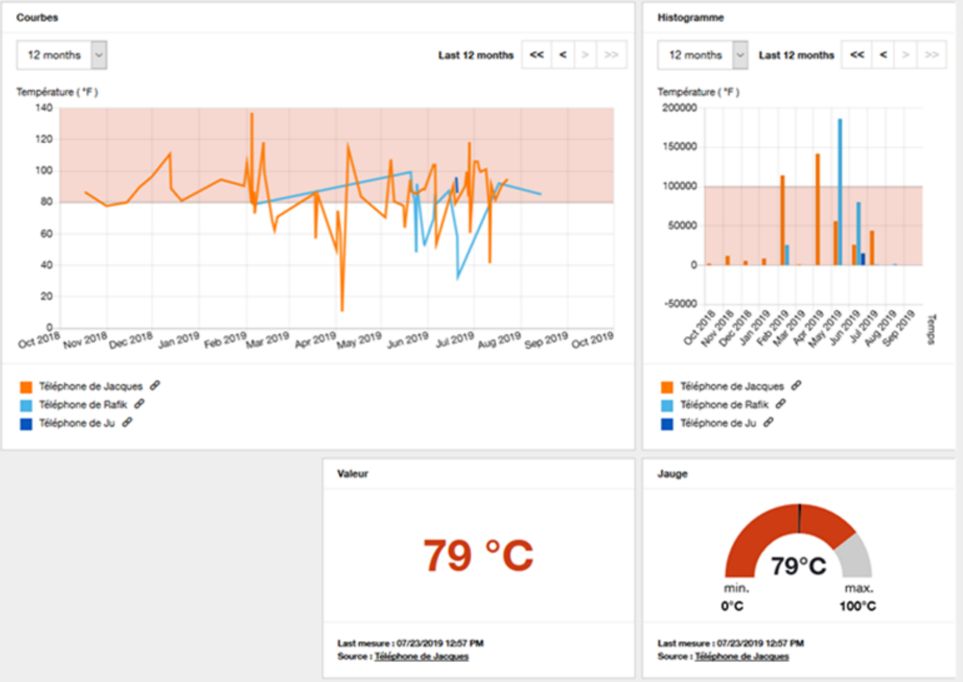
Last mesure : 06/25/2019 11:48 AM
Source : Sensing Labs de Franck

Environmental KPIs

Timestamp	Temperature	Hygrometry	CO2
08/18/2020 5:27 PM	25 °C	32 %	217 ppm
08/18/2020 5:26 PM	25 °C	29 %	225 ppm
08/18/2020 5:25 PM	26 °C	31 %	241 ppm

Last mesure : 08/18/2020 5:27 PM
Source : Android simulator

Personalized dashboards with Widgets


Courbes
12 months
Last 12 months
<<
<
>
>>
Température (°F)
140
120
100
80
60
40
20
0
Oct 2018
Nov 2018
Dec 2018
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Histogramme
12 months
Last 12 months
Température (°F)
200000
150000
100000
50000
0
-50000
Temps
Valeur
Jauge
min.
0°C
max.
100°C

🟧 Téléphone de Jacques
🟦 Téléphone de Rafik
🟦 Téléphone de Ju

79 °C

Last mesure : 07/23/2019 12:57 PM
Source : Téléphone de Jacques

79°C

Last mesure : 07/23/2019 12:57 PM
Source : Téléphone de Jacques

- Linked to a user
- Several dashboards possible per user
- Can be shared among users

- Device management : statistics on the fleet status and connectivity

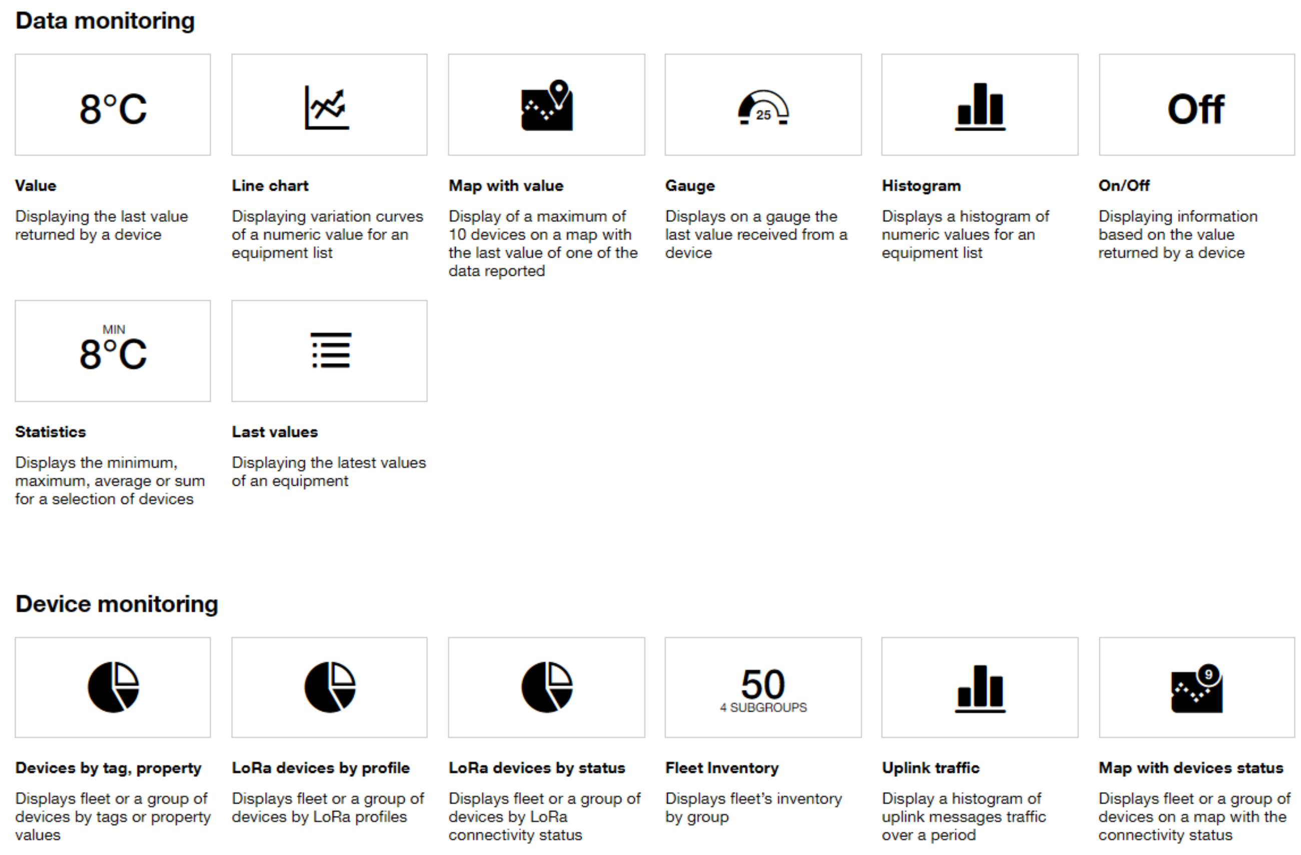
- Values : display the last values returned by a device

- Curves : display line charts for a value from a list of devices (up to 10)

- Maps : display a map of a list of devices (up to 10) with their last value

Important : to create a widget the selected devices must have sent data at least once.

Personalized dashboards with Widgets



Data monitoring

Value

Displaying the last value returned by a device

Line chart

Displaying variation curves of a numeric value for an equipment list

Map with value

Display of a maximum of 10 devices on a map with the last value of one of the data reported

Gauge

Displays on a gauge the last value received from a device

Histogram

Displays a histogram of numeric values for an equipment list

On/Off

Displaying information based on the value returned by a device

Statistics

Displays the minimum, maximum, average or sum for a selection of devices

Last values

Displaying the latest values of an equipment

Device monitoring

Devices by tag, property

Displays fleet or a group of devices by tags or property values

LoRa devices by profile

Displays fleet or a group of devices by LoRa profiles

LoRa devices by status

Displays fleet or a group of devices by LoRa connectivity status

Fleet Inventory

Displays fleet’s inventory by group

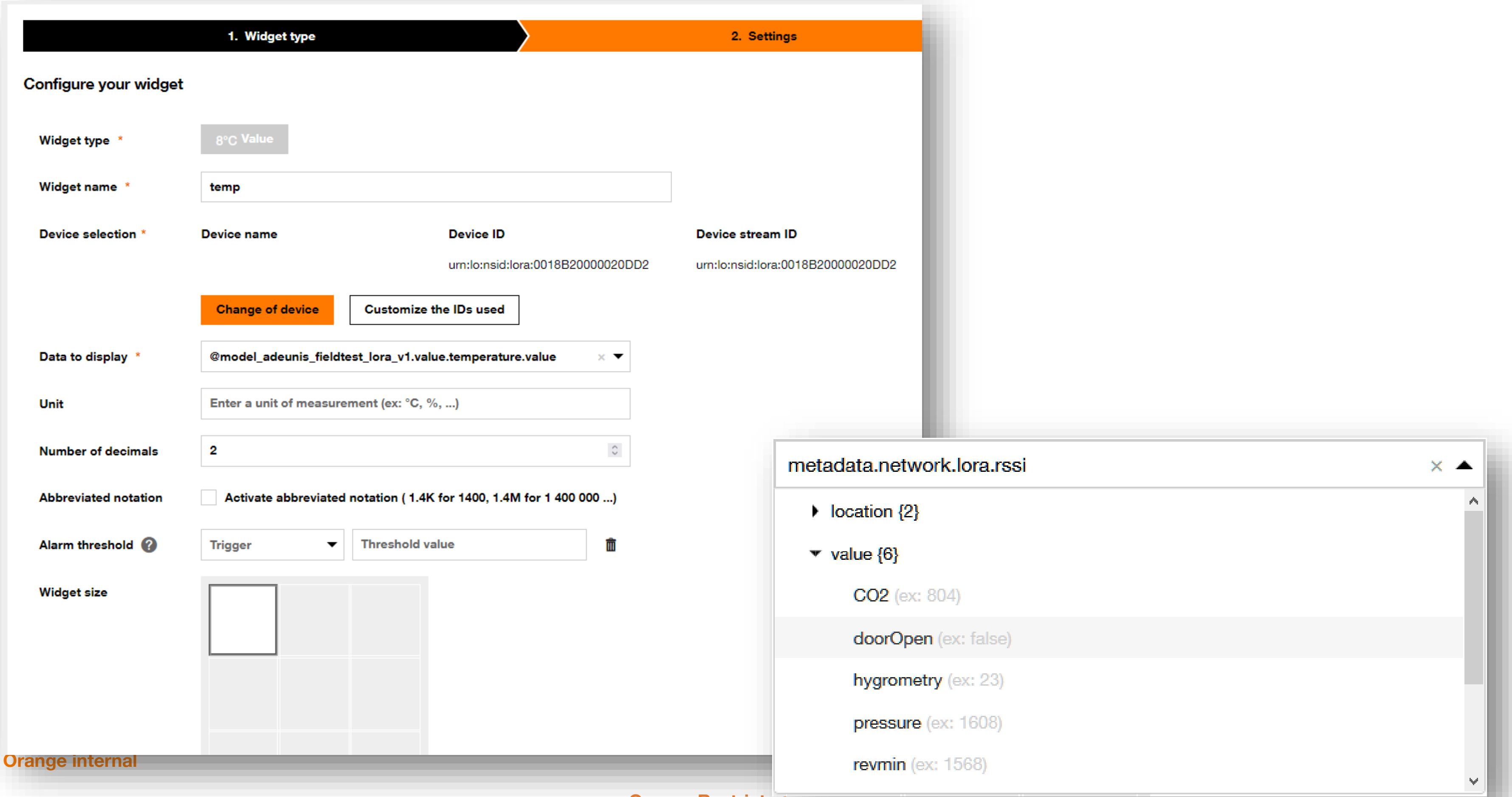
Uplink traffic

Display a histogram of uplink messages traffic over a period

Map with devices status

Displays fleet or a group of devices on a map with the connectivity status

Personalized dashboards with Widgets



Configure your widget

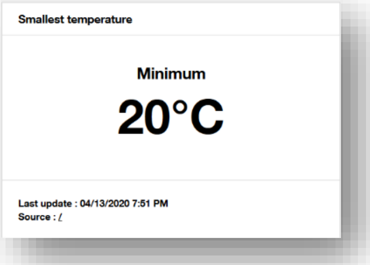
Widget type *	8°C Value		
Widget name *	temp		
Device selection *	**Device name**	**Device ID**	**Device stream ID**
		urn:lo:nsid:lora:0018B20000020DD2	urn:lo:nsid:lora:0018B20000020DD2
	Change of device	Customize the IDs used	
Data to display *	@model_adeunis_fieldtest_lora_v1.value.temperature.value		
Unit	Enter a unit of measurement (ex: °C, %, ...)		
Number of decimals	2		
Abbreviated notation	☐ Activate abbreviated notation (1.4K for 1400, 1.4M for 1 400 000 ...)		
Alarm threshold ?	Trigger	Threshold value	
Widget size			

metadata.network.lora.rssi

- location {2}
- value {6}
  - CO2 (ex: 804)
  - doorOpen (ex: false)
  - hygrometry (ex: 23)
  - pressure (ex: 1608)
  - revmin (ex: 1568)

Personalized dashboards with Widgets

statistics widgets

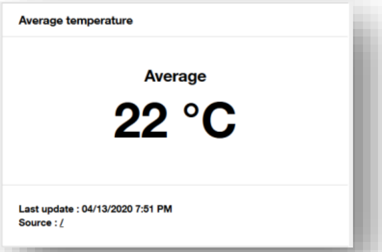


Smallest temperature

Minimum

20°C

Last update : 04/13/2020 7:51 PM
Source : /

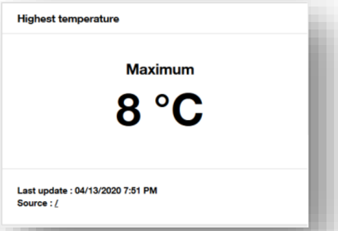


Average temperature

Average

22 °C

Last update : 04/13/2020 7:51 PM
Source : /

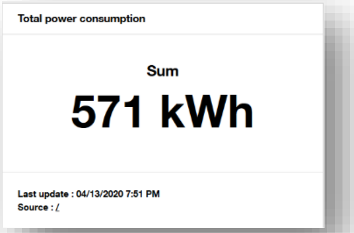


Highest temperature

Maximum

8 °C

Last update : 04/13/2020 7:51 PM
Source : /



Total power consumption

Sum

571 kWh

Last update : 04/13/2020 7:51 PM
Source : /

Statistics mode

- Minimum
- Maximum
- Average
- Sum

Based on

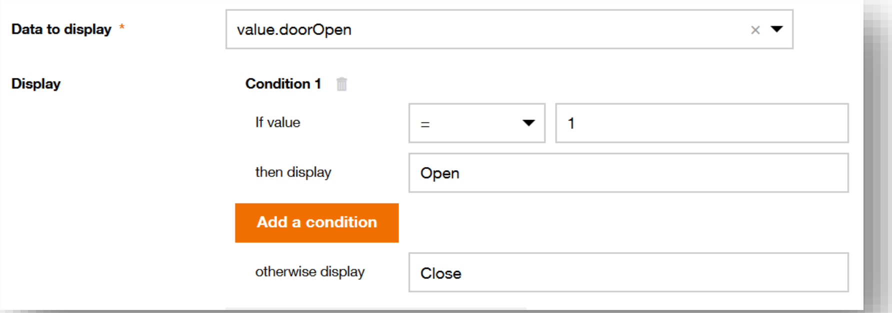
- The last measurement of each device (given a validity period)
- All measurements over a time range (configurable absolute/relative)

Applies to

- Up to 10 devices
- A whole group of devices

Personalized dashboards with Widgets

on/off and multistate widgets



Data to display * value.doorOpen

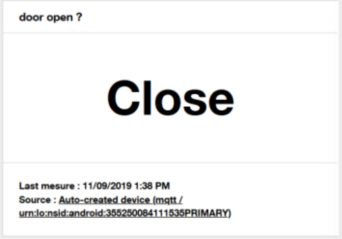
Display

Condition 1

If value = 1

then display Open

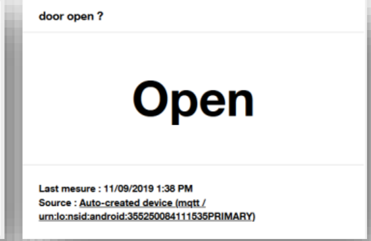
otherwise display Close



door open ?

Close

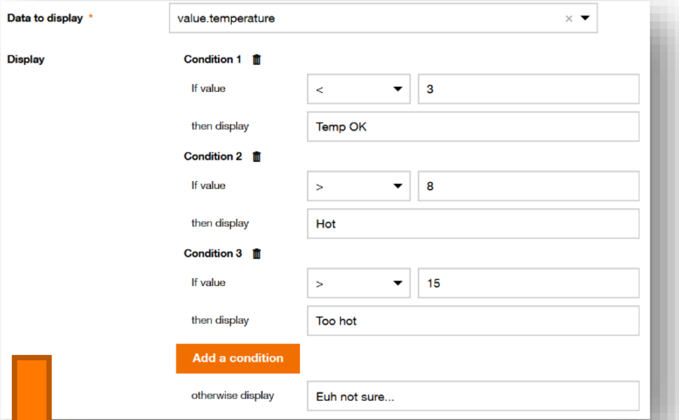
Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)



door open ?

Open

Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)



Data to display * value.temperature

Display

Condition 1

If value < 3

then display Temp OK

Condition 2

If value > 8

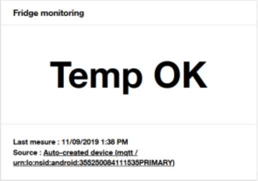
then display Hot

Condition 3

If value > 15

then display Too hot

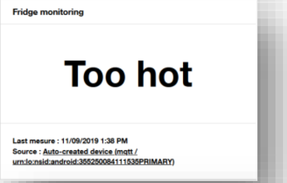
otherwise display Euh not sure...



Fridge monitoring

Temp OK

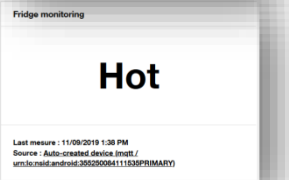
Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)



Fridge monitoring

Too hot

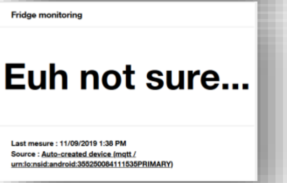
Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)



Fridge monitoring

Hot

Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)



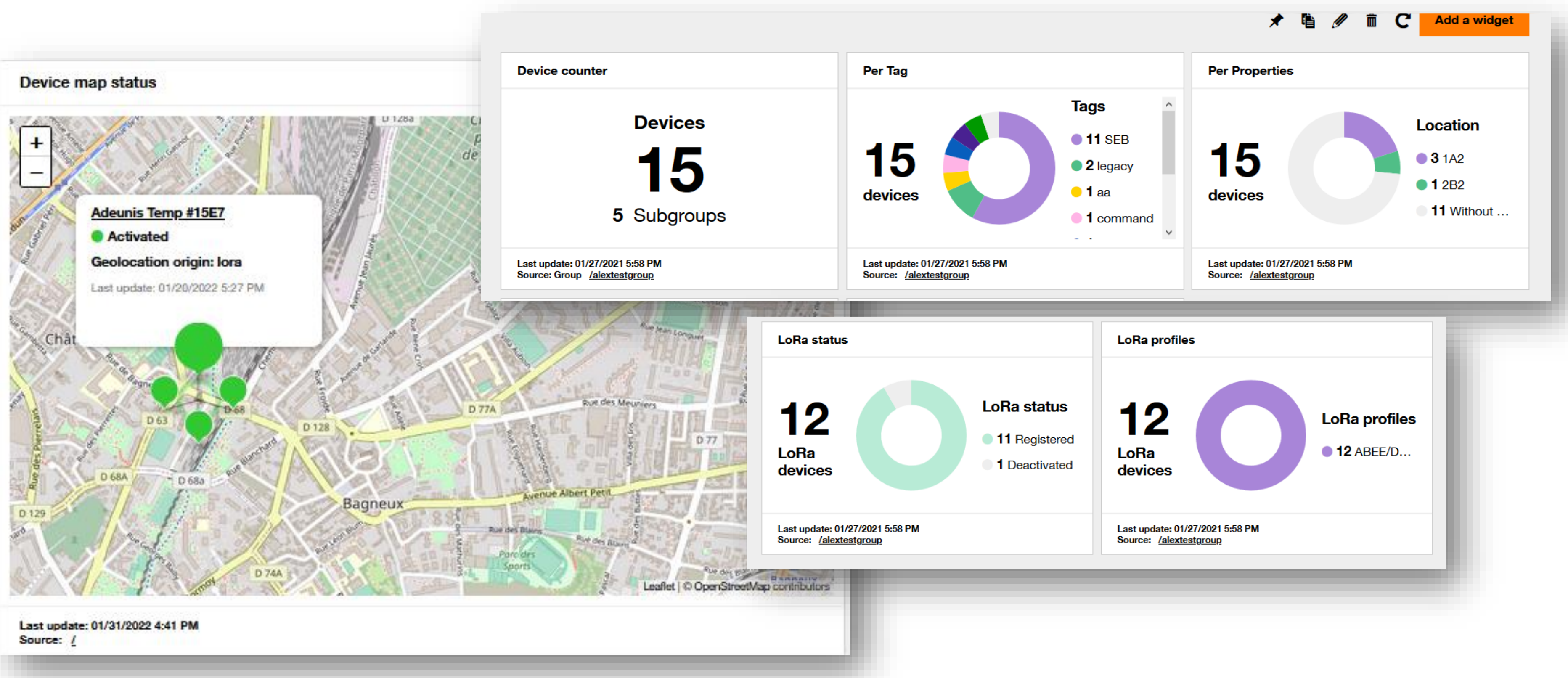
Fridge monitoring

Euh not sure...

Last mesure : 11/09/2019 1:38 PM
Source : Auto-created device (mqtt / urn:lo:nsid:android:355250084111535PRIMARY)

Personalized dashboards with Widgets

device management widgets



Add a widget

Device map status

Adeunis Temp #15E7
● Activated
Geolocation origin: lora
Last update: 01/20/2022 5:27 PM

+
−
Bagneux
D 128
D 77A
D 77
D 63
D 68
D 68A
D 68a
D 129
D 74A
Rue des Meuniers
Avenue Albert Petit
Rue Blanchard
Rue des Blains
Parc des Sports
Leaflet | © OpenStreetMap contributors

Last update: 01/31/2022 4:41 PM
Source: /

Device counter

Devices
15
5 Subgroups

Last update: 01/27/2021 5:58 PM
Source: Group /alextestgroup

Per Tag

15 devices

Tags
● 11 SEB
● 2 legacy
● 1 aa
● 1 command

Last update: 01/27/2021 5:58 PM
Source: /alextestgroup

Per Properties

15 devices

Location
● 3 1A2
● 1 2B2
● 11 Without ...

Last update: 01/27/2021 5:58 PM
Source: /alextestgroup

LoRa status

12 LoRa devices

LoRa status
● 11 Registered
● 1 Deactivated

Last update: 01/27/2021 5:58 PM
Source: /alextestgroup

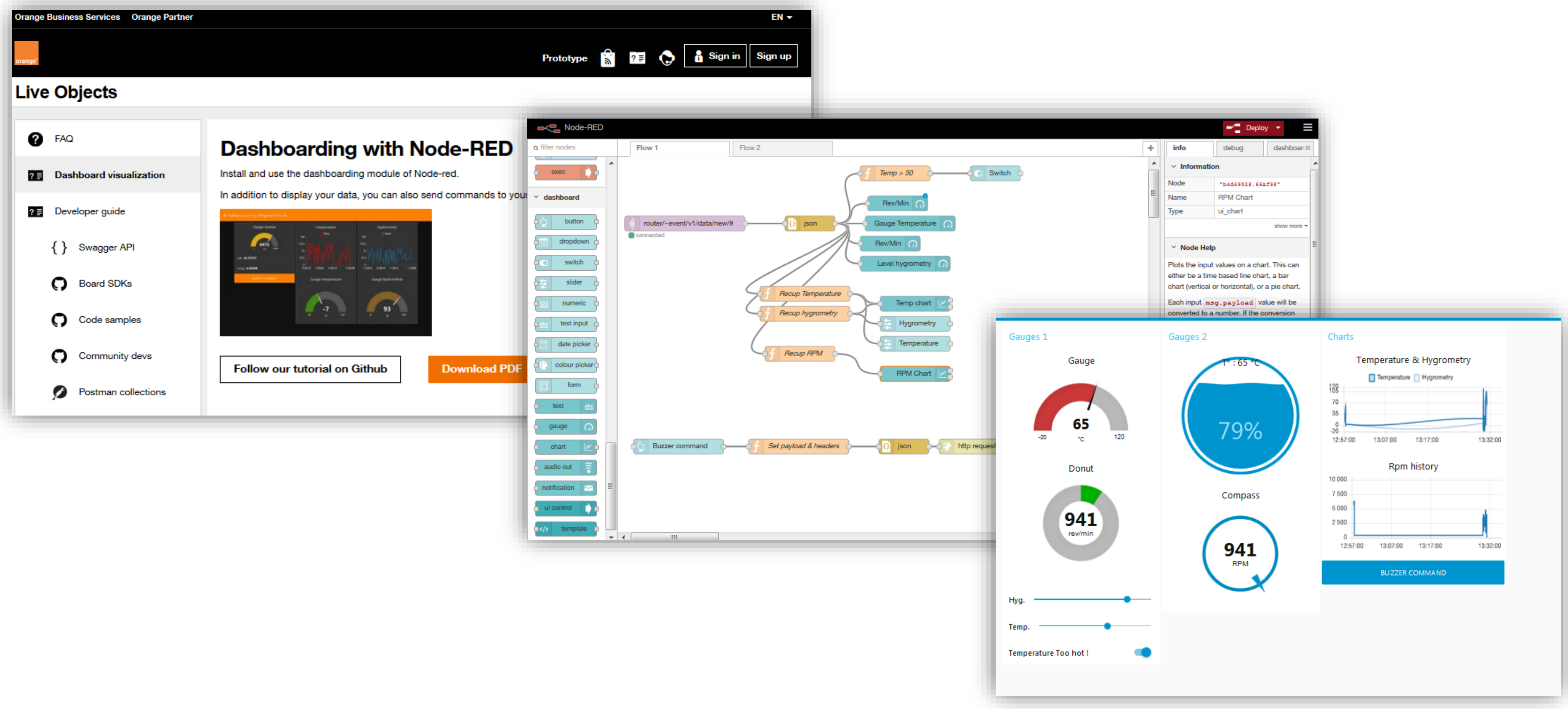
LoRa profiles

12 LoRa devices

LoRa profiles
● 12 ABEE/D...

Last update: 01/27/2021 5:58 PM
Source: /alextestgroup

Node-red : graphical prototyping tool



Orange Business Services Orange Partner

Live Objects

Dashboarding with Node-RED

Install and use the dashboarding module of Node-red.

In addition to display your data, you can also send commands to your

Node	"b4d49528.66af98"
Name	RPM Chart
Type	ui_chart

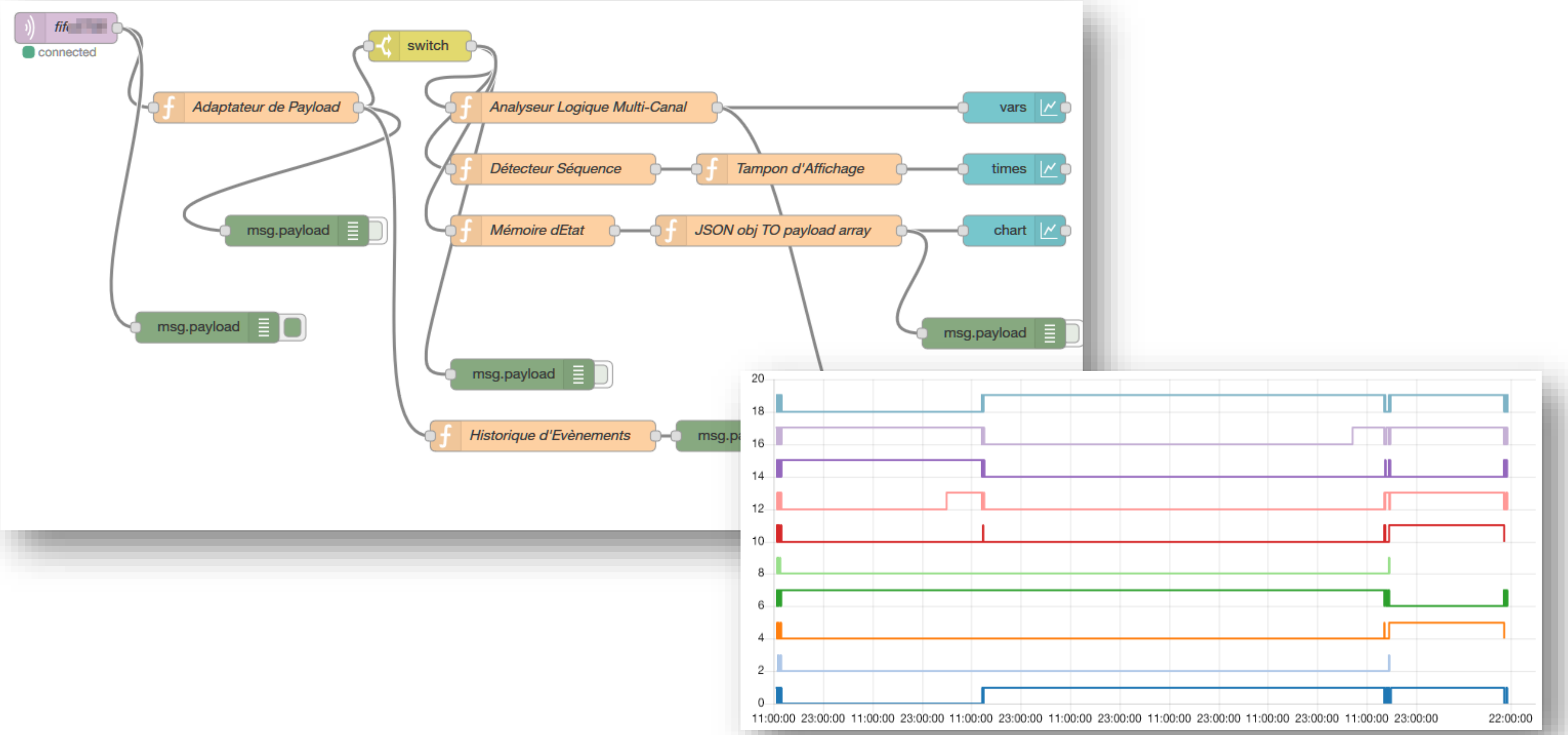
Plots the input values on a chart. This can either be a time based line chart, a bar chart (vertical or horizontal), or a pie chart.

Each input `msg.payload` value will be converted to a number. If the conversion

EN
orange
Prototype
Sign in
Sign up
FAQ
Dashboard visualization
Developer guide
Swagger API
Board SDKs
Code samples
Community devs
Postman collections
Follow our tutorial on Github
Download PDF
Node-RED
Deploy
filter nodes
Flow 1
Flow 2
info
debug
dashboard
Information
show more
Node Help
exec
dashboard
button
dropdown
switch
slider
numeric
text input
date picker
colour picker
form
text
gauge
chart
audio out
notification
ui control
template
router/~event/v1/data/new/#
connected
json
Temp > 50
Switch
Rev/Min
Gauge Temperature
Rev/Min
Level hygrometry
Recup Temperature
Recup hygrometry
Recup RPM
Temp chart
Hygrometry
Temperature
RPM Chart
Buzzer command
Set payload & headers
json
http request
Gauges 1
Gauge
65
°C
-20
120
Donut
941
rev/min
Hyg.
Temp.
Temperature Too hot !
Gauges 2
T° : 65 °C
79%
Compass
941
RPM
Charts
Temperature & Hygrometry
Temperature
Hygrometry
12:57:00
13:07:00
13:17:00
13:32:00
Rpm history
10 000
7 500
5 000
2 500
0
BUZZER COMMAND

https://liveobjects.orange-business.com/#/cms/ressources-codeless-bi/

Node-red : example – computing a time-delta amongst frames

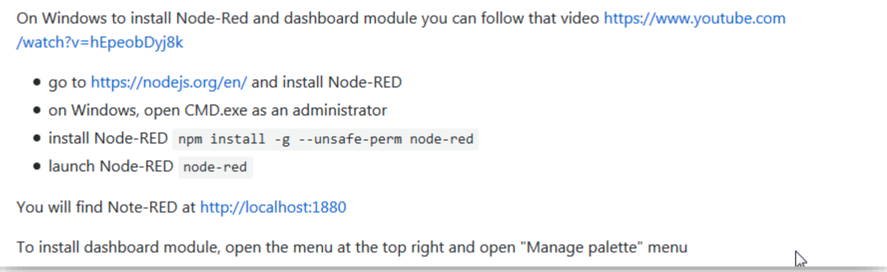

fif[redacted]
connected
switch
Adaptateur de Payload
Analyseur Logique Multi-Canal
vars
Détecteur Séquence
Tampon d'Affichage
times
msg.payload
Mémoire dEtat
JSON obj TO payload array
chart
msg.payload
msg.payload
msg.payload
Historique d'Evènements
msg.pa
20
18
16
14
12
10
8
6
4
2
0
11:00:00
23:00:00
11:00:00
23:00:00
11:00:00
23:00:00
11:00:00
23:00:00
11:00:00
23:00:00
11:00:00
23:00:00
11:00:00
23:00:00
22:00:00

Node-red : graphical prototyping tool

Free tool (open source, Apache license)

PC, public-hosted, or private-hosted deployment

Dashboard needs to be activated:

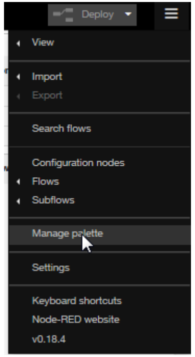


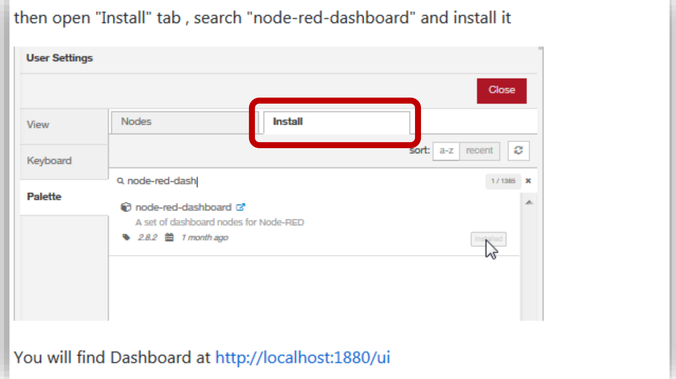
On Windows to install Node-Red and dashboard module you can follow that video https://www.youtube.com/watch?v=hEpeobDyj8k

- go to https://nodejs.org/en/ and install Node-RED
- on Windows, open CMD.exe as an administrator
- install Node-RED `npm install -g --unsafe-perm node-red`
- launch Node-RED `node-red`

You will find Note-RED at http://localhost:1880

To install dashboard module, open the menu at the top right and open "Manage palette" menu


Deploy
View
Import
Export
Search flows
Configuration nodes
Flows
Subflows
Manage palette
Settings
Keyboard shortcuts
Node-RED website
v0.18.4

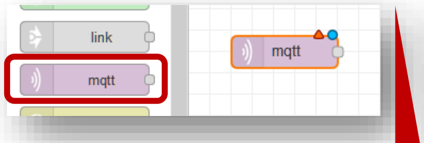


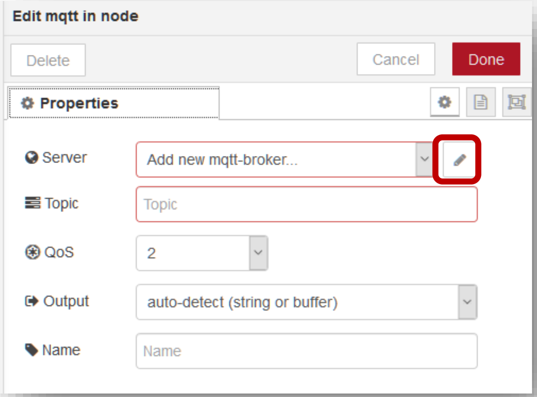
then open "Install" tab , search "node-red-dashboard" and install it

User Settings
Close
View
Keyboard
Palette
Nodes
Install
sort: a-z recent
node-red-dash
1 / 1385
node-red-dashboard
A set of dashboard nodes for Node-RED
2.8.2
1 month ago
installed

You will find Dashboard at http://localhost:1880/ui

Node-red : graphical prototyping tool


link
mqtt
mqtt


Edit mqtt in node

Delete
Cancel
Done
Properties

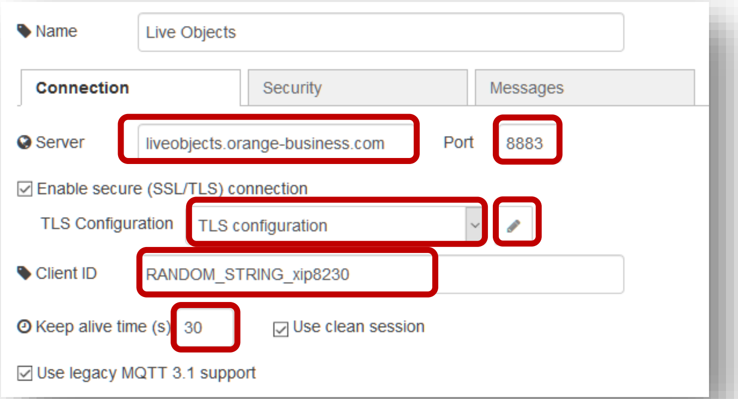
Server: Add new mqtt-broker...

Topic: Topic

QoS: 2

Output: auto-detect (string or buffer)

Name: Name


Name: Live Objects

Connection
Security
Messages

Server: liveobjects.orange-business.com Port: 8883

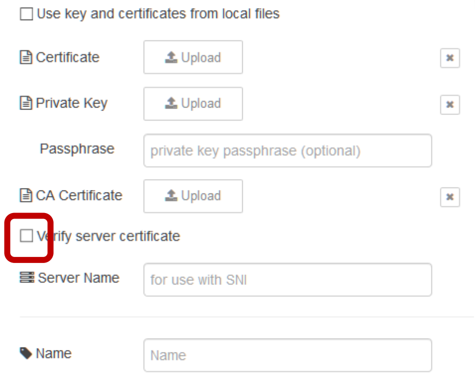
☑ Enable secure (SSL/TLS) connection

TLS Configuration: TLS configuration

Client ID: RANDOM_STRING_xip8230

Keep alive time (s): 30 ☑ Use clean session

☑ Use legacy MQTT 3.1 support


☐ Use key and certificates from local files

Certificate: Upload

Private Key: Upload

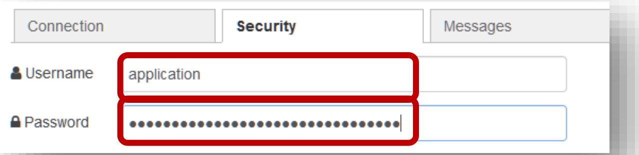
Passphrase: private key passphrase (optional)

CA Certificate: Upload

☐ Verify server certificate

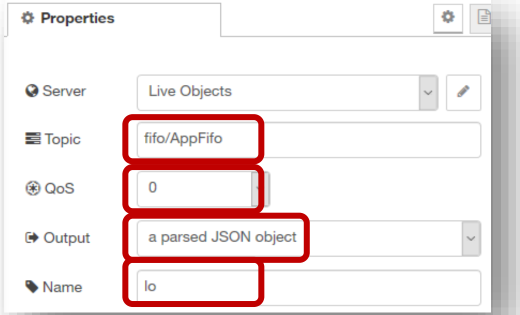
Server Name: for use with SNI

Name: Name


Connection
Security
Messages

Username: application

Password: ••••••••••••••••••••••••••••••••


Properties

Server: Live Objects

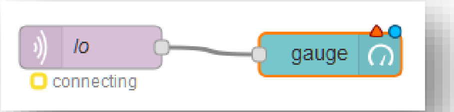
Topic: fifo/AppFifo

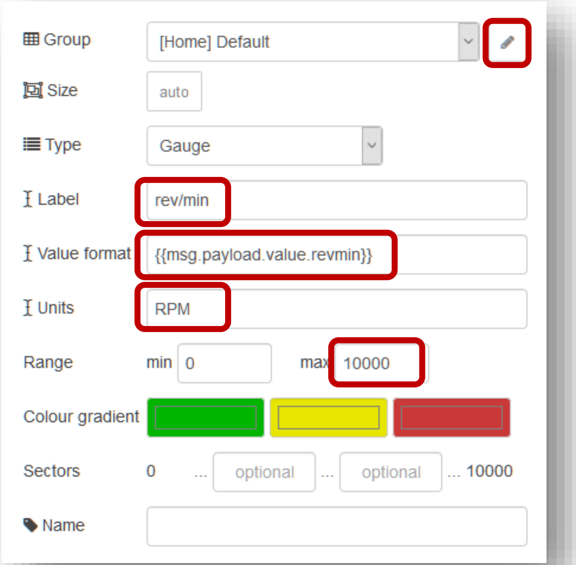
QoS: 0

Output: a parsed JSON object

Name: lo

Node-red : graphical prototyping tool


lo
connecting
gauge



Group: [Home] Default

Size: auto

Type: Gauge

Label: rev/min

Value format: {{msg.payload.value.revmin}}

Units: RPM

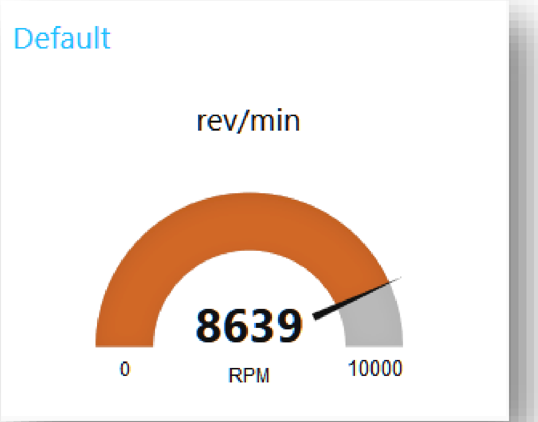
Range: min 0 max 10000

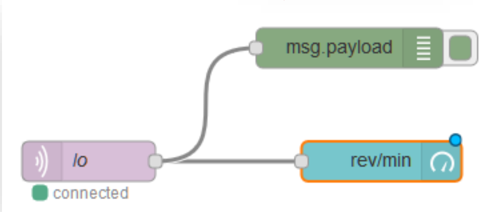
Colour gradient: 🟩 🟨 🟥

Sectors: 0 ... optional ... optional ... 10000

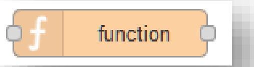
Name:

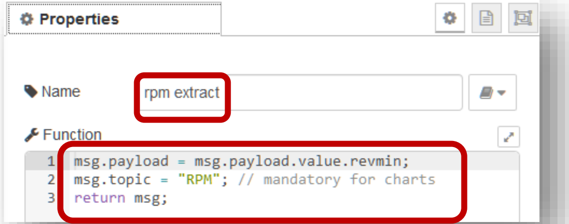
https://nodered.kermit-noprod-b.itn.intraorange/ui


Default
rev/min
8639
0
RPM
10000


msg.payload
lo
connected
rev/min

Node-red : graphical prototyping tool

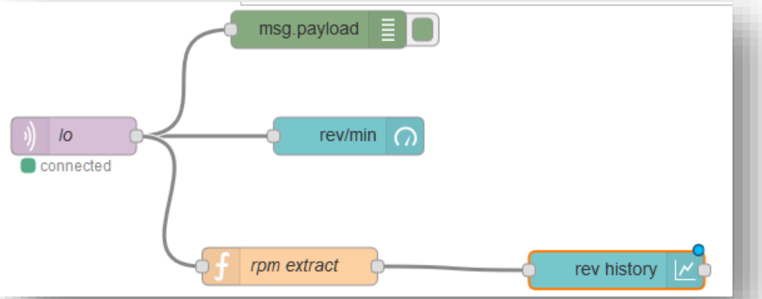


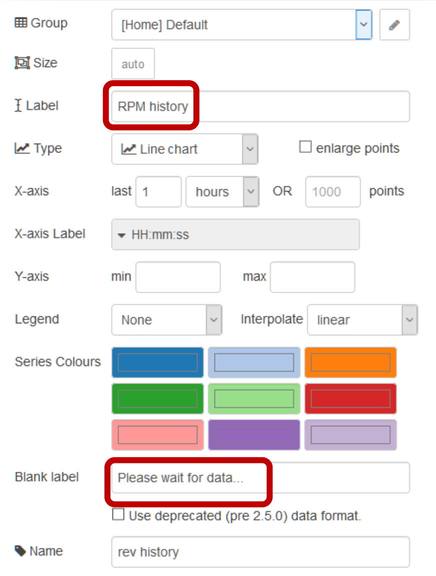

Properties

Name: rpm extract

Function

```
msg.payload = msg.payload.value.revmin;
msg.topic = "RPM"; // mandatory for charts
return msg;
```


msg.payload
lo
connected
rev/min
rpm extract
rev history


Group: [Home] Default

Size: auto

Label: RPM history

Type: Line chart ☐ enlarge points

X-axis last 1 hours OR 1000 points

X-axis Label HH:mm:ss

Y-axis min max

Legend: None Interpolate: linear

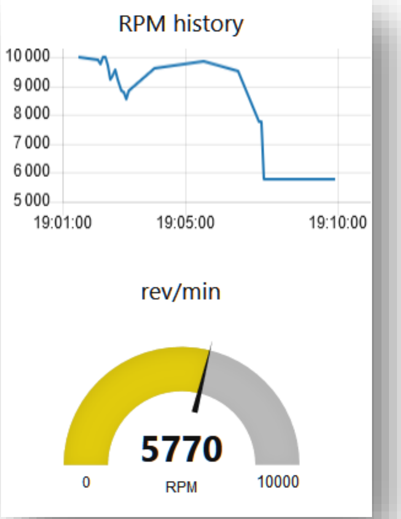
Series Colours

Blank label: Please wait for data...

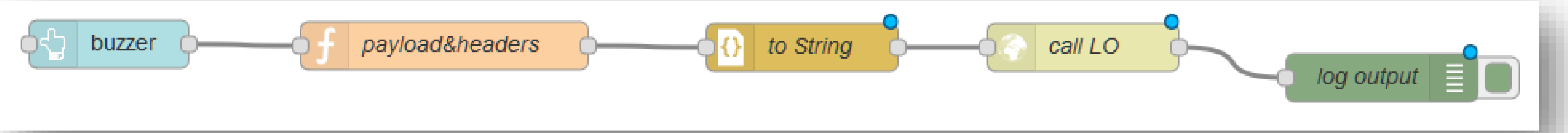
☐ Use deprecated (pre 2.5.0) data format.

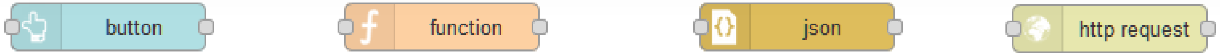
Name: rev history

https://nodered.kermit-noprod-b.itn.intraorange/ui

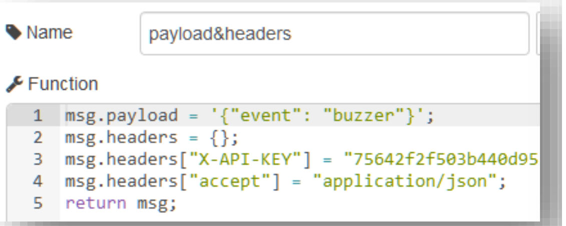

RPM history
10 000
9 000
8 000
7 000
6 000
5 000
19:01:00
19:05:00
19:10:00
rev/min
5770
0
RPM
10000

Node-red : graphical prototyping tool


buzzer
payload&headers
to String
call LO
log output


button
function
json
http request

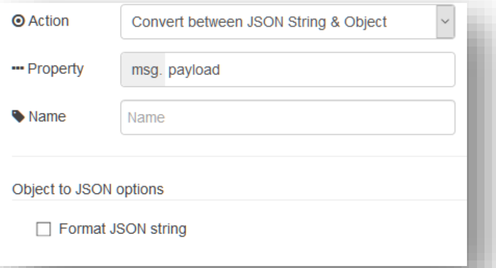
https://liveobjects.orange-business.com/api/v0/assets/android/356437083184592PRIMARY/commands



Name payload&headers

Function

```
msg.payload = '{"event": "buzzer"}';
msg.headers = {};
msg.headers["X-API-KEY"] = "75642f2f503b440d95
msg.headers["accept"] = "application/json";
return msg;
```



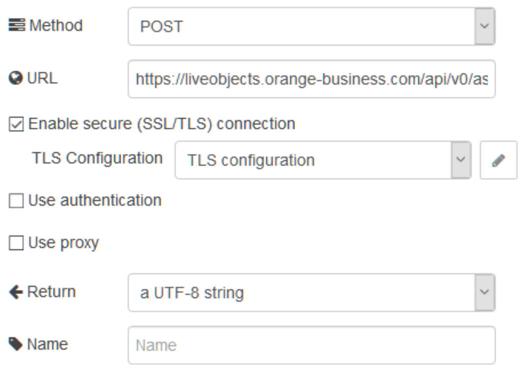
Action Convert between JSON String & Object

Property msg. payload

Name Name

Object to JSON options

☐ Format JSON string



Method POST

URL https://liveobjects.orange-business.com/api/v0/as

☑ Enable secure (SSL/TLS) connection

TLS Configuration TLS configuration

☐ Use authentication

☐ Use proxy

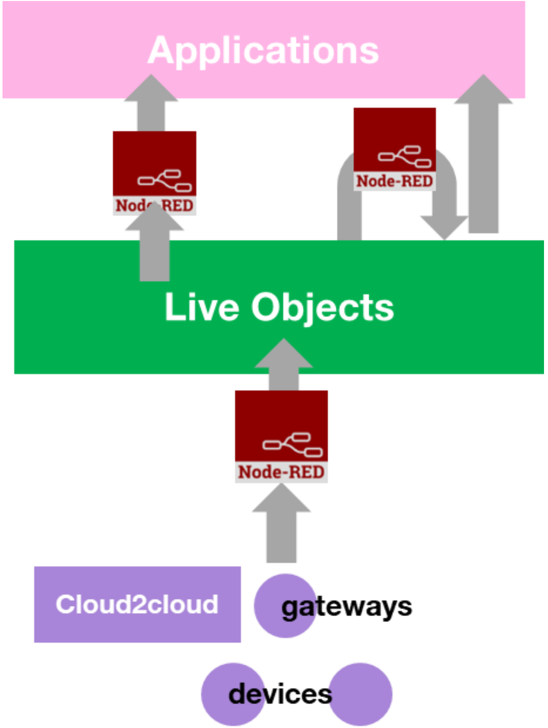
Return a UTF-8 string

Name Name

https://nodered.kermit-noprod-b.itn.intraorange/ui

Node-RED SaaS to allow adding your own data transformations

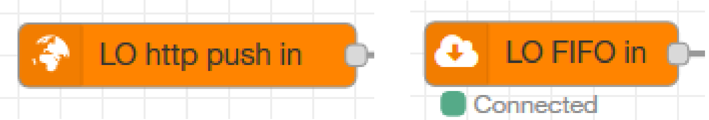
https://eventdriven.orange.com/


Applications
Node-RED
Node-RED
Live Objects
Node-RED
Cloud2cloud
gateways
devices

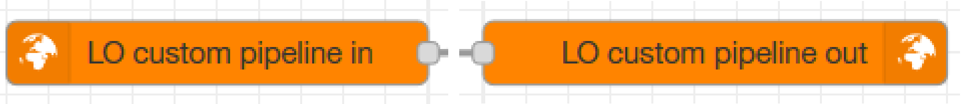
popular Apache 2.0 opensource Node-RED in SaaS-mode

D : Format adaptation and backend treatment

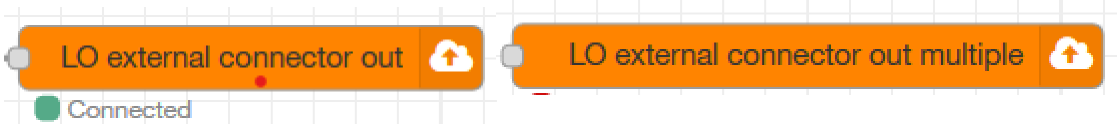
C : Event processing


LO http push in
LO FIFO in
Connected

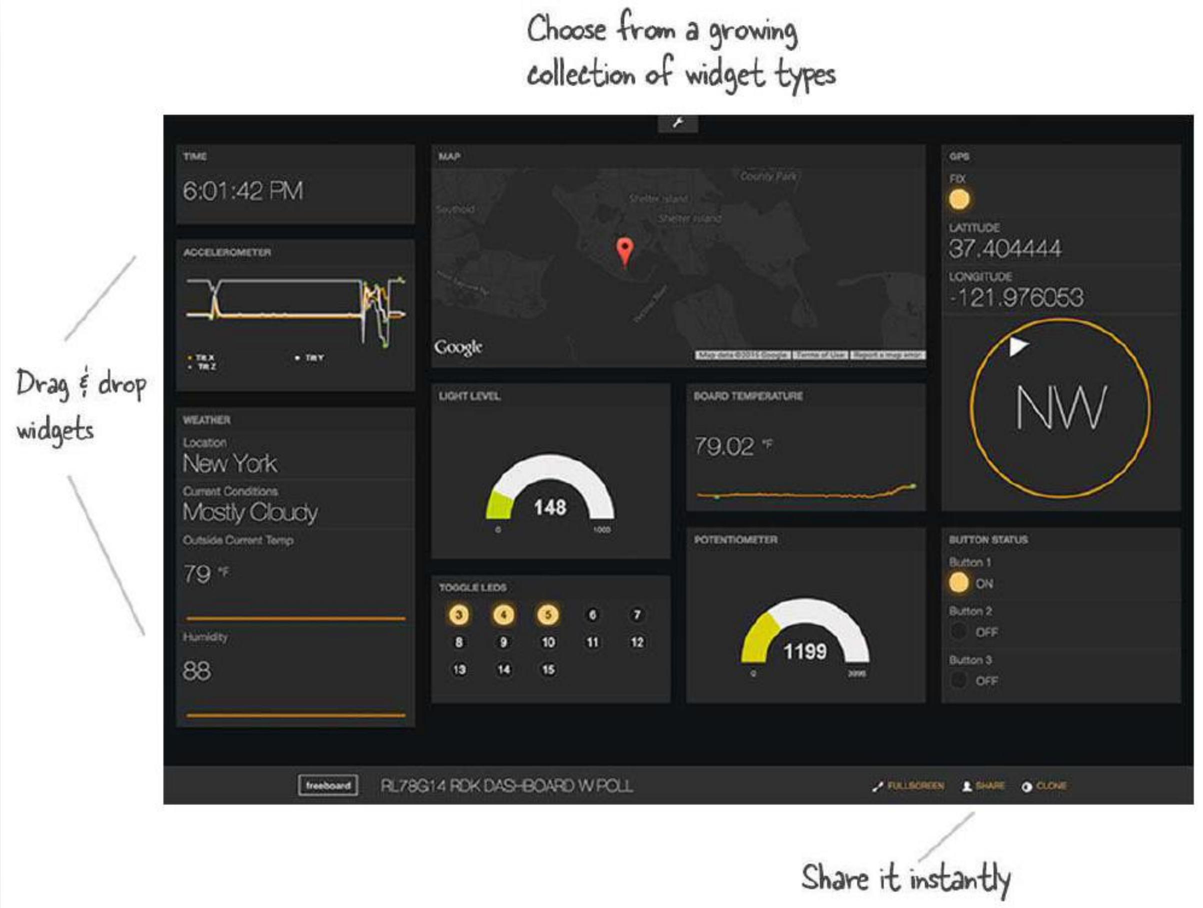
B : Data enrichment, decoding (pipeline)


LO custom pipeline in
LO custom pipeline out

A : Data frame format adaptation


LO external connector out
Connected
LO external connector out multiple

Freeboard.io



Choose from a growing collection of widget types

Drag & drop widgets

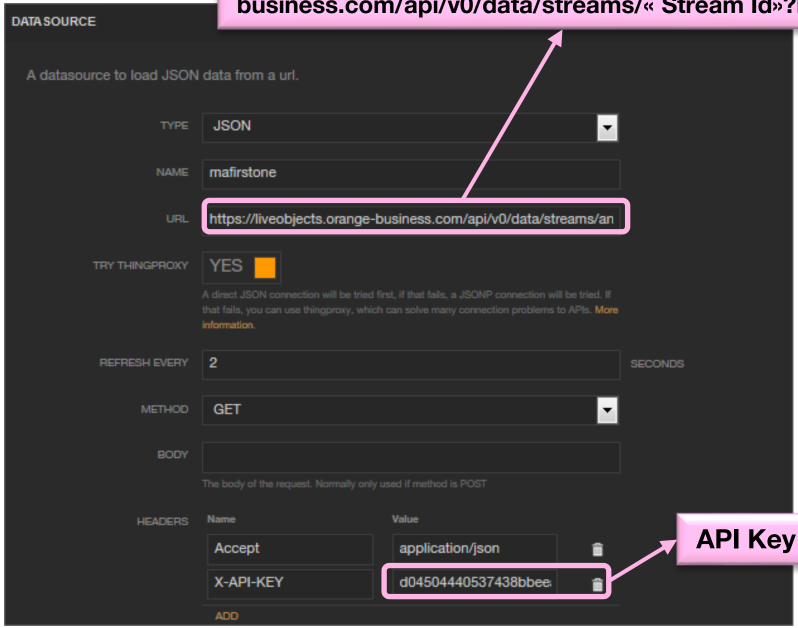
Share it instantly

TIME
6:01:42 PM
ACCELEROMETER
TR X
TR Z
TR Y
WEATHER
Location
New York
Current Conditions
Mostly Cloudy
Outside Current Temp
79 °F
Humidity
88
MAP
Google
LIGHT LEVEL
148
0
1000
TOGGLE LEDS
3 4 5 6 7
8 9 10 11 12
13 14 15
BOARD TEMPERATURE
79.02 °F
POTENTIOMETER
1199
0
3095
GPS
FIX
LATITUDE
37.404444
LONGITUDE
-121.976053
NW
BUTTON STATUS
Button 1
ON
Button 2
OFF
Button 3
OFF
freeboard
RL78G14 RDK DASHBOARD W POLL
FULLSCREEN
SHARE
CLONE

https://liveobjects.orange-business.com/#/cms/ressources-codeless-bi/

Freeboard.io

Configure sources



DATASOURCE

A datasource to load JSON data from a url.

TYPE: JSON

NAME: mafirstone

URL: https://liveobjects.orange-business.com/api/v0/data/streams/an

TRY THINGPROXY: YES

A direct JSON connection will be tried first, if that fails, a JSONP connection will be tried. If that fails, you can use thingproxy, which can solve many connection problems to APIs. More information.

REFRESH EVERY: 2 SECONDS

METHOD: GET

BODY:

The body of the request. Normally only used if method is POST

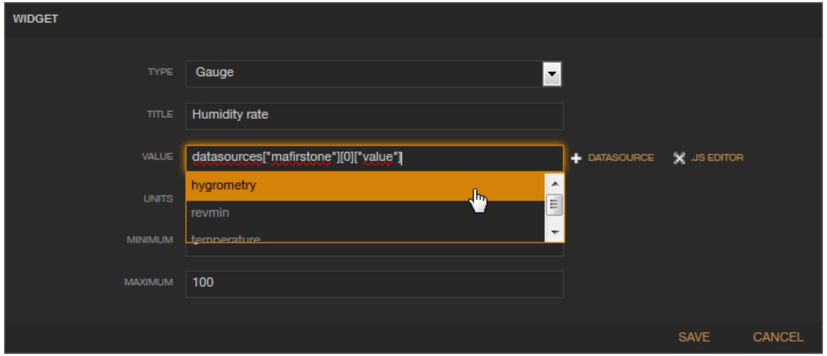
HEADERS

Name	Value
Accept	application/json
X-API-KEY	d04504440537438bbee

https://liveobjects.orange-business.com/api/v0/data/streams/« Stream Id»?limit=1

API Key

Then choose and configure your widgets



WIDGET

TYPE: Gauge

TITLE: Humidity rate

VALUE: datasources["mafirstone"][0]["value"]

UNITS:

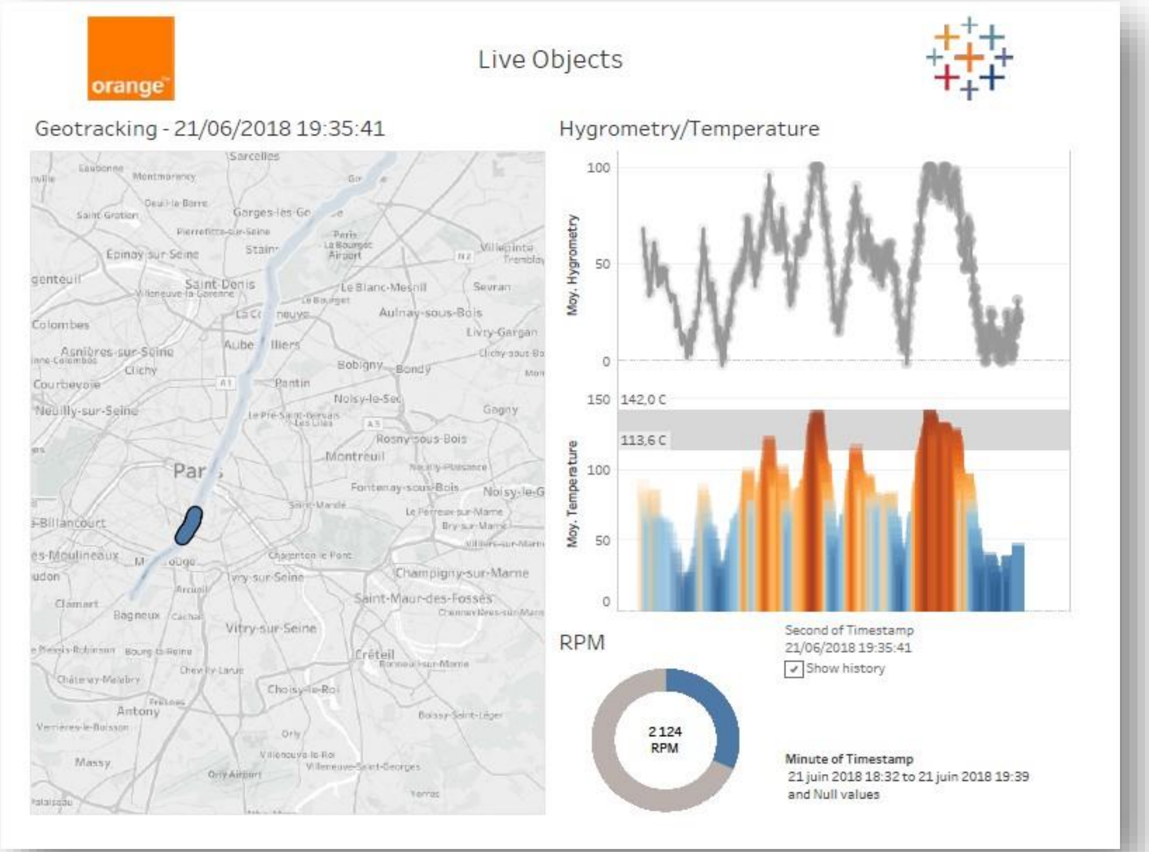
MINIMUM:

MAXIMUM: 100

Tableau :

Powerfull BI tool
Desktop application, trial version available

Reads streams from Live Objects


orange
Live Objects
Geotracking - 21/06/2018 19:35:41
Hygrometry/Temperature
Sarcelles
Montmorency
Garges-lès-Gonesse
Epinay-sur-Seine
Saint-Denis
Le Blanc-Mesnil
Aulnay-sous-Bois
Sevran
Livry-Gargan
Colombes
Asnières-sur-Seine
Clichy
Courbevoie
Neuilly-sur-Seine
Aubervilliers
Bobigny
Bondy
Pantin
Noisy-le-Sec
Gagny
Rosny-sous-Bois
Montreuil
Paris
Fontenay-sous-Bois
Noisy-le-Grand
Boulogne-Billancourt
Issy-les-Moulineaux
Meudon
Clamart
Bagneux
Ivry-sur-Seine
Charenton-le-Pont
Champigny-sur-Marne
Saint-Maur-des-Fossés
Vitry-sur-Seine
Créteil
Choisy-le-Roi
Châtenay-Malabry
Antony
Massy
Orly
Orly Airport
Villeneuve-Saint-Georges
Moy. Hygrometry
100
50
0
150
142,0 C
113,6 C
Moy. Temperature
100
50
0
RPM
2 124
RPM

Second of Timestamp
21/06/2018 19:35:41
☑ Show history

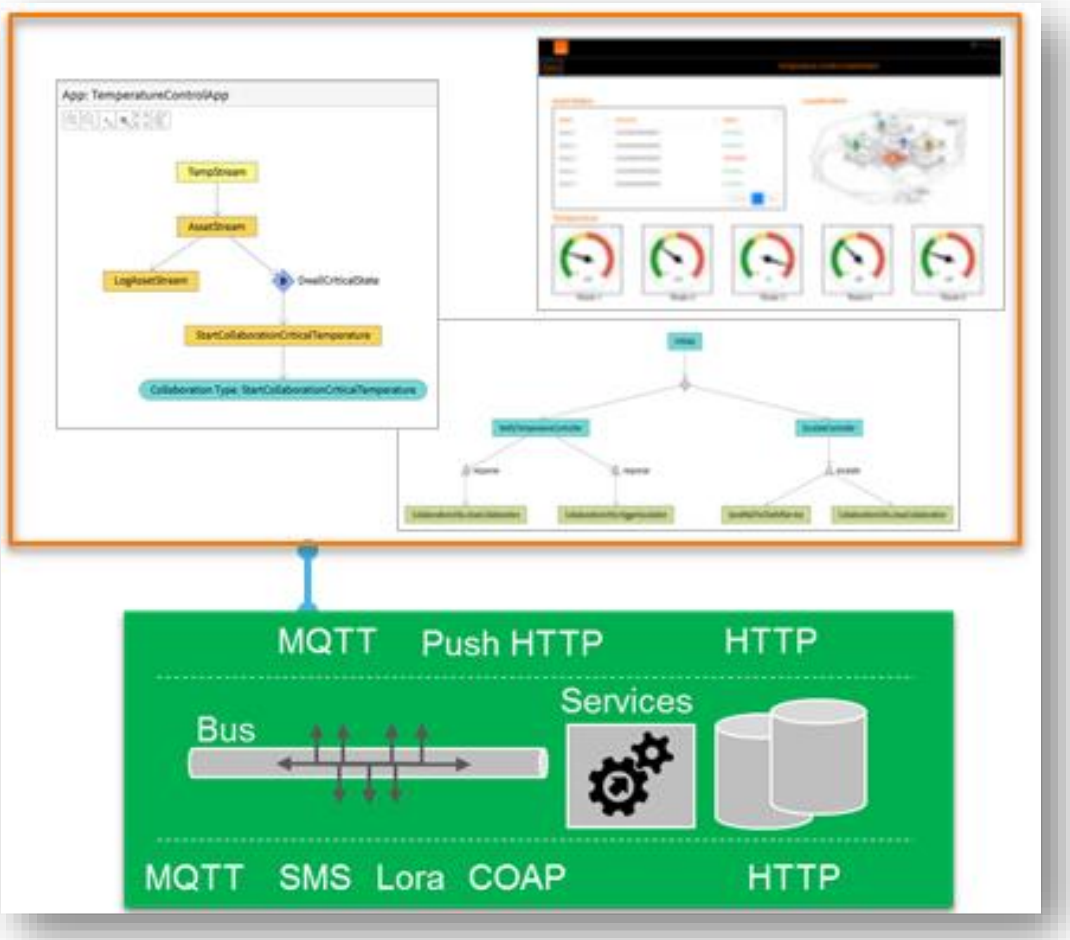
Minute of Timestamp
21 juin 2018 18:32 to 21 juin 2018 19:39
and Null values

https://github.com/DatavenueLiveObjects/tableau-getting-started

Vantiq :

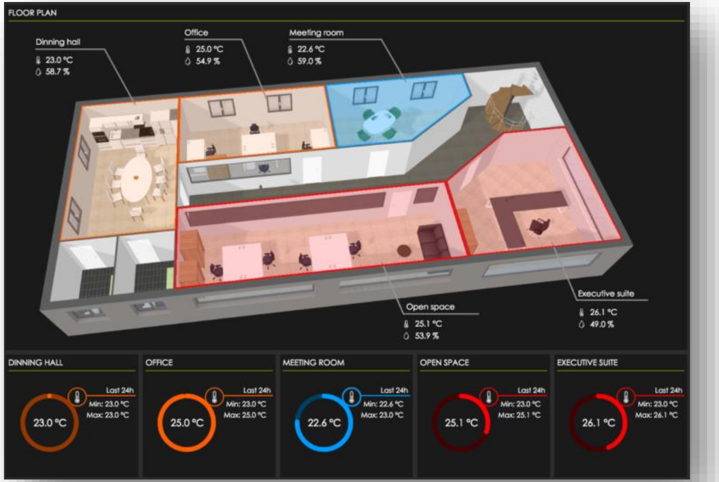
Vantiq solution
Real-time business application builder
Enabling human-to-machine collaboration
Demo version available

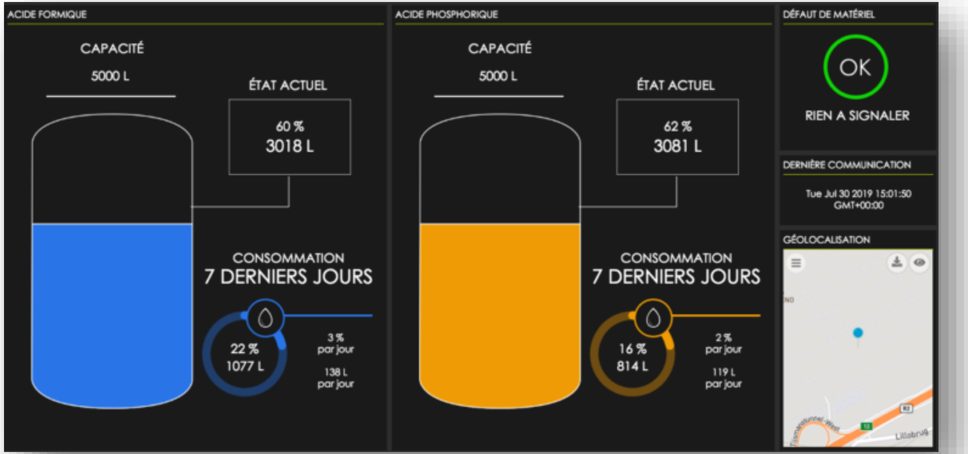
Consumes real-time MQTT data from Live Objects


App: TemperatureControlApp
TempStream
AssetStream
LogAssetStream
DwellCriticalState
StartCollaborationCriticalTemperature
Collaboration Type: StartCollaborationCriticalTemperature
MQTT
Push HTTP
HTTP
Services
Bus
MQTT
SMS
Lora
COAP
HTTP

https://github.com/DatavenueLiveObjects/vantiq-getting-started

Kheiron :


FLOOR PLAN
Dinning hall
23.0 °C
58.7 %
Office
25.0 °C
54.9 %
Meeting room
22.6 °C
59.0 %
Open space
25.1 °C
53.9 %
Executive suite
26.1 °C
49.0 %
DINNING HALL
23.0 °C
Last 24h
Min: 23.0 °C
Max: 23.0 °C
OFFICE
25.0 °C
Last 24h
Min: 23.0 °C
Max: 25.0 °C
MEETING ROOM
22.6 °C
Last 24h
Min: 22.6 °C
Max: 23.0 °C
OPEN SPACE
25.1 °C
Last 24h
Min: 23.0 °C
Max: 25.1 °C
EXECUTIVE SUITE
26.1 °C
Last 24h
Min: 23.0 °C
Max: 26.1 °C


ACIDE FORMIQUE
CAPACITÉ
5000 L
ÉTAT ACTUEL
60 %
3018 L
CONSOMMATION
7 DERNIERS JOURS
22 %
1077 L
3 %
par jour
138 L
par jour
ACIDE PHOSPHORIQUE
CAPACITÉ
5000 L
ÉTAT ACTUEL
62 %
3081 L
CONSOMMATION
7 DERNIERS JOURS
16 %
814 L
2 %
par jour
119 L
par jour
DÉFAUT DE MATÉRIEL
OK
RIEN A SIGNALER
DERNIÈRE COMMUNICATION
Tue Jul 30 2019 15:01:50
GMT+00:00
GÉOLOCALISATION

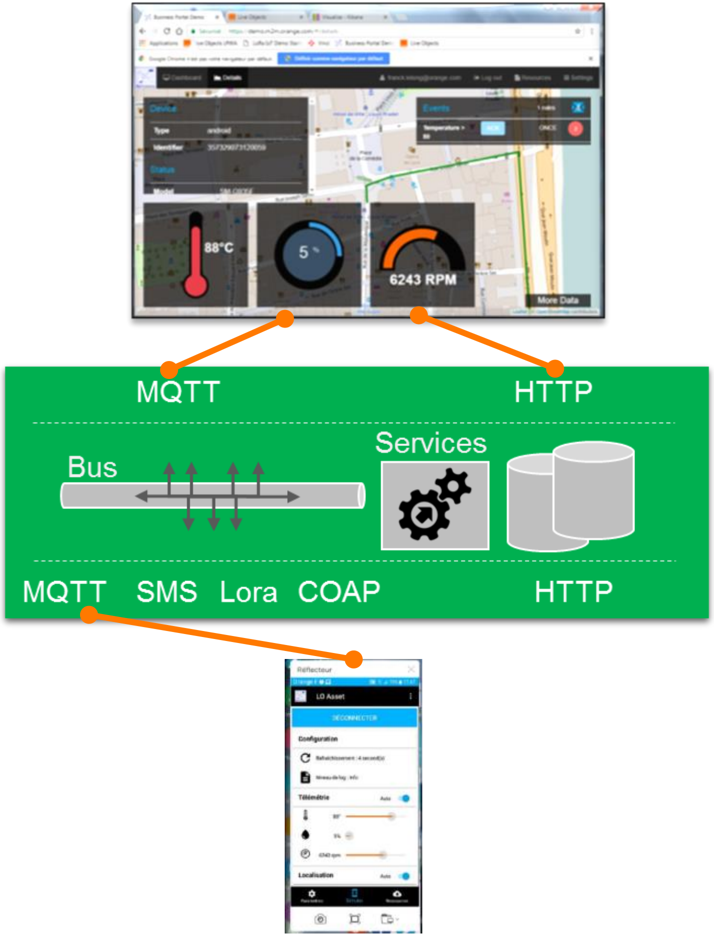
IoThink Kheiron studio
Powerful 0-code Application builder
Service logics, dashboards, mobile app

https://liveobjects.orange-business.com/#/cms/ressources-codeless-bi/

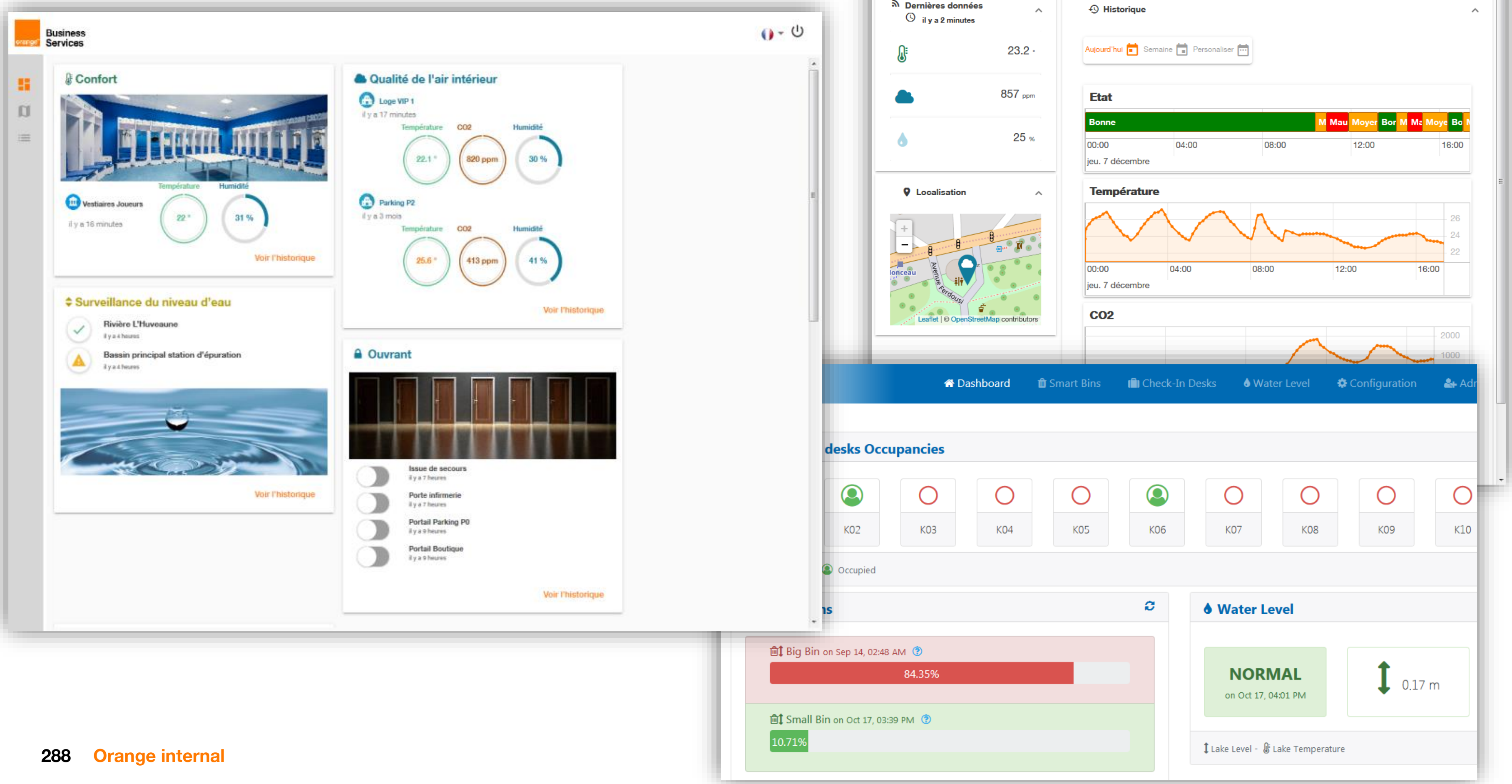
Bespoke development

Business portal application using Live Objects API

- Real time data collection (MQTT)
- Database request/time-deferred data/analysis (HTTP/REST)
- Command/config updates
- Event processing


88°C
5
6243 RPM
More Data
MQTT
HTTP
Services
Bus
MQTT
SMS
Lora
COAP
HTTP
LO Asset

Bespoke development: example



Business Services

Confort

Vestiaires Joueurs
il y a 16 minutes
Température 22 °
Humidité 31 %
Voir l'historique

Qualité de l'air intérieur

Loge VIP 1
il y a 17 minutes
Température 22.1 °
CO2 820 ppm
Humidité 30 %

Parking P2
il y a 3 mois
Température 25.6 °
CO2 413 ppm
Humidité 41 %
Voir l'historique

Surveillance du niveau d'eau

Rivière L'Huveaune
il y a 4 heures

Bassin principal station d'épuration
il y a 4 heures

Voir l'historique

Ouvrant

Issue de secours
il y a 7 heures

Porte infirmerie
il y a 7 heures

Portail Parking P0
il y a 9 heures

Portail Boutique
il y a 9 heures

Voir l'historique

Toilettes publiques Femme

Dernières données
il y a 2 minutes
23.2 °
857 ppm
25 %

Localisation

Historique
Aujourd'hui Semaine Personaliser

Etat

Température

CO2

desks Occupancies

K02 K03 K04 K05 K06 K07 K08 K09 K10

Occupied

Big Bin on Sep 14, 02:48 AM
84.35%

Small Bin on Oct 17, 03:39 PM
10.71%

Water Level

NORMAL
on Oct 17, 04:01 PM

0.17 m

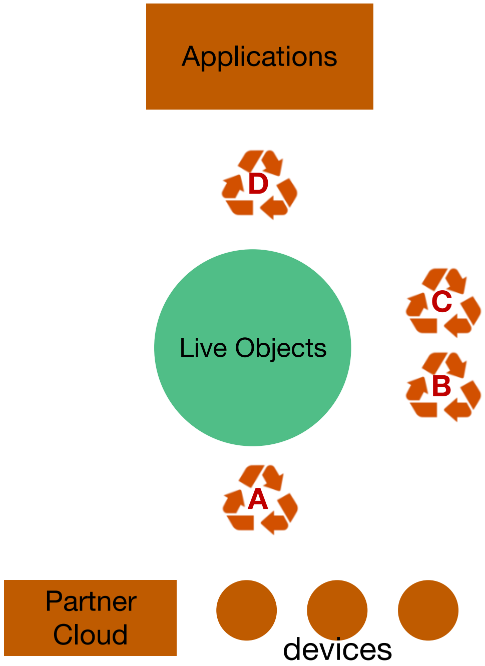
Lake Level - Lake Temperature

Bonne
M
Mau
Moyer
Bor
M
Ma
Moye
Bo
00:00
04:00
08:00
12:00
16:00
jeu. 7 décembre
26
24
22
2000
1000
Leaflet | © OpenStreetMap contributors
Avenue Ferdousi
lonceau
Dashboard
Smart Bins
Check-In Desks
Water Level
Configuration
Adr

Annex

#A

Release of a Node-RED SaaS to allow adding own data transformations


Applications
D
Live Objects
C
B
A
Partner Cloud
devices

Node-RED

Use of popular Apache 2.0 opensource Node-RED in SaaS-mode allow customer :

D : Format adaptation and backend treatment

C : Event processing

B : Data enrichment, decoding (pipeline)

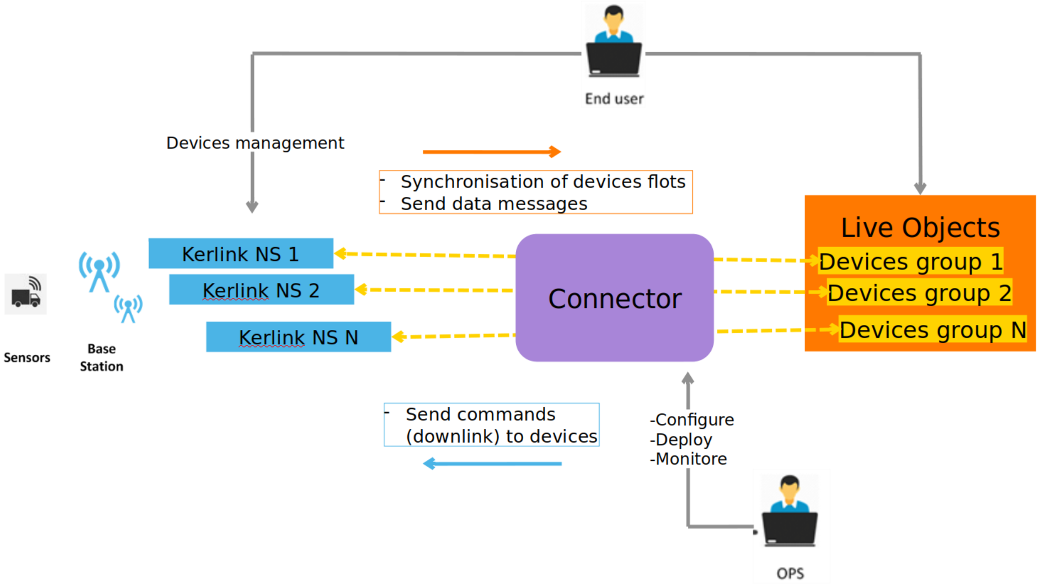
A : Data frame format adaptation

Private LoRa network support

'Kerlink to Live Objects' connector

WMC Kerlink base stations support
Devices synchronization (NS to LO)
Messages synchronization
Commands synchronization

Multi-customer support

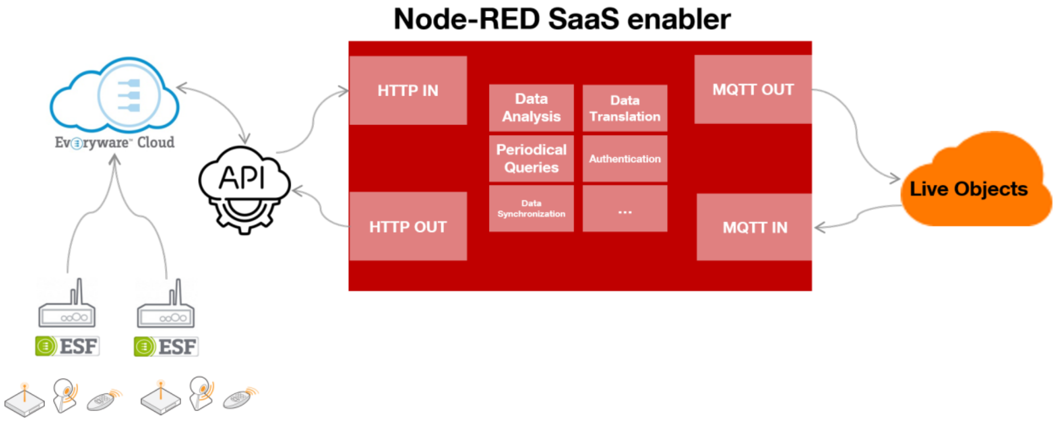

End user
Devices management
- Synchronisation of devices flots
- Send data messages
Live Objects
Devices group 1
Devices group 2
Devices group N
Kerlink NS 1
Kerlink NS 2
Kerlink NS N
Connector
Sensors
Base Station
- Send commands (downlink) to devices
-Configure
-Deploy
-Monitore
OPS

https://github.com/DatavenueLiveObjects/Kerlink-NS-WMC-connector-for-Private-lora-network-

Edge computing support

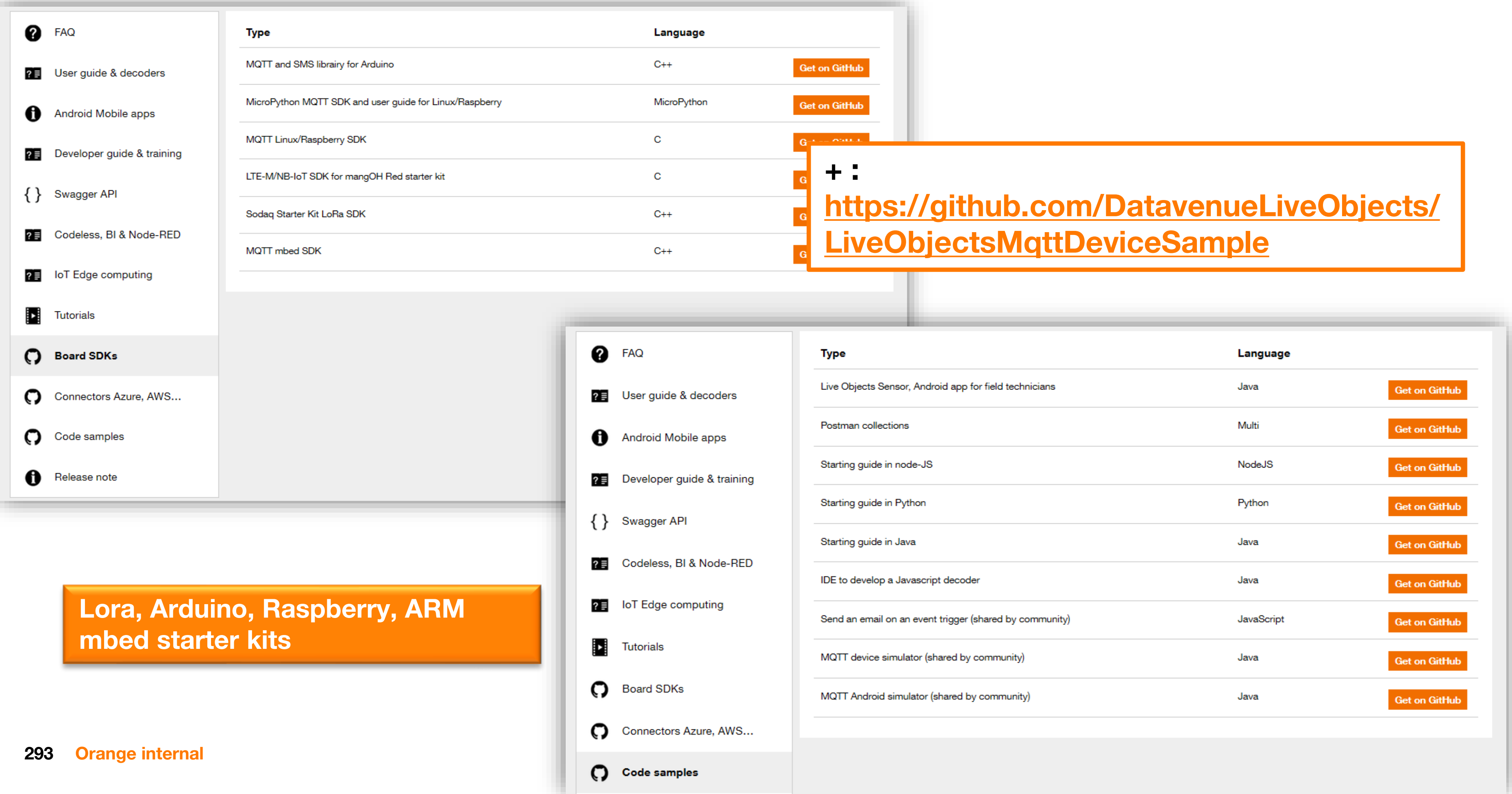
‘Eurotech to Live Objects' connector

Everyware Cloud support
Devices synchronization (EC to LO)
Messages synchronization
Commands synchronization


Node-RED SaaS enabler
Everyware Cloud
API
HTTP IN
HTTP OUT
Data Analysis
Data Translation
Periodical Queries
Authentication
Data Synchronization
...
MQTT OUT
MQTT IN
Live Objects
ESF
ESF

- ↘ Watch the video on https://youtu.be/PrAPJqHsBtg
- ↘ Download the connector on https://github.com/DatavenueLiveObjects/Eurotech-Live-Objects-connector-for-IoT-edge-computing

Device-side development



FAQ
User guide & decoders
Android Mobile apps
Developer guide & training
Swagger API
Codeless, BI & Node-RED
IoT Edge computing
Tutorials
Board SDKs
Connectors Azure, AWS...
Code samples
Release note

Type	Language	
MQTT and SMS librairy for Arduino	C++	Get on GitHub
MicroPython MQTT SDK and user guide for Linux/Raspberry	MicroPython	Get on GitHub
MQTT Linux/Raspberry SDK	C	G
LTE-M/NB-IoT SDK for mangOH Red starter kit	C	G
Sodaq Starter Kit LoRa SDK	C++	G
MQTT mbed SDK	C++	G

+ :
https://github.com/DatavenueLiveObjects/LiveObjectsMqttDeviceSample

FAQ
User guide & decoders
Android Mobile apps
Developer guide & training
Swagger API
Codeless, BI & Node-RED
IoT Edge computing
Tutorials
Board SDKs
Connectors Azure, AWS...
Code samples

Type	Language	
Live Objects Sensor, Android app for field technicians	Java	Get on GitHub
Postman collections	Multi	Get on GitHub
Starting guide in node-JS	NodeJS	Get on GitHub
Starting guide in Python	Python	Get on GitHub
Starting guide in Java	Java	Get on GitHub
IDE to develop a Javascript decoder	Java	Get on GitHub
Send an email on an event trigger (shared by community)	JavaScript	Get on GitHub
MQTT device simulator (shared by community)	Java	Get on GitHub
MQTT Android simulator (shared by community)	Java	Get on GitHub

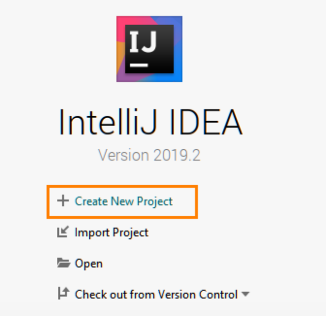
Lora, Arduino, Raspberry, ARM mbed starter kits

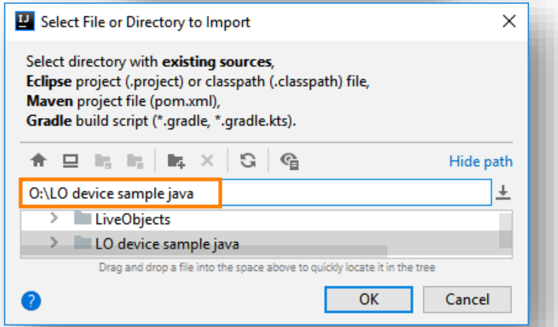
Code Samples

Small introduction : make a device simulator in Java

Connect an MQTT device and send a payload

Create the Project with your IDE, from Maven pom.xml

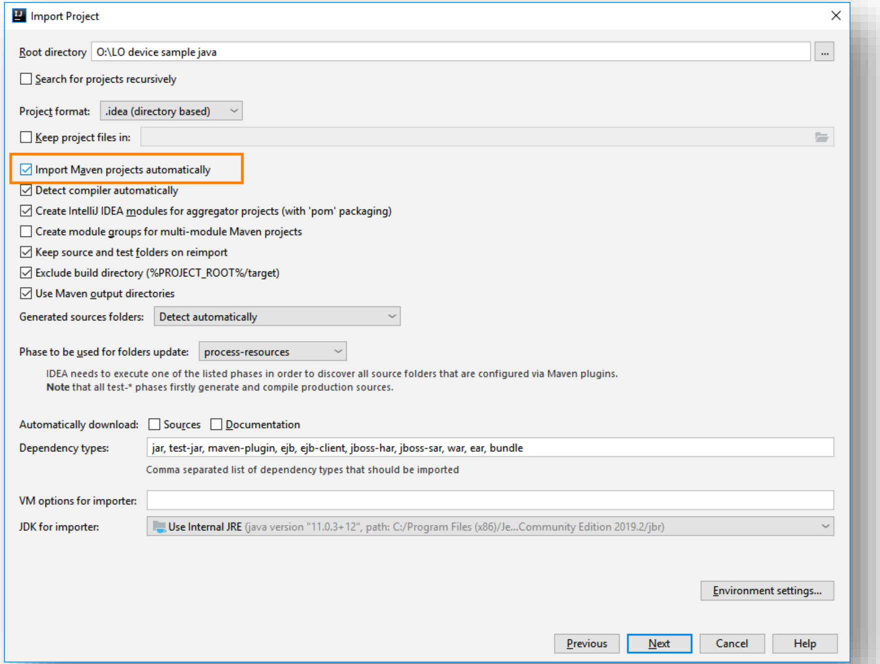

IntelliJ IDEA
Version 2019.2
+ Create New Project
Import Project
Open
Check out from Version Control


Select File or Directory to Import

Select directory with **existing sources**,
Eclipse project (.project) or classpath (.classpath) file,
Maven project file (pom.xml),
Gradle build script (*.gradle, *.gradle.kts).

O:\LO device sample java

Hide path
LiveObjects
LO device sample java
Drag and drop a file into the space above to quickly locate it in the tree
OK
Cancel


Import Project

Root directory: O:\LO device sample java

☐ Search for projects recursively

Project format: .idea (directory based)

☐ Keep project files in:

☑ Import Maven projects automatically

☑ Detect compiler automatically

☑ Create IntelliJ IDEA modules for aggregator projects (with 'pom' packaging)

☐ Create module groups for multi-module Maven projects

☑ Keep source and test folders on reimport

☑ Exclude build directory (%PROJECT_ROOT%/target)

☑ Use Maven output directories

Generated sources folders: Detect automatically

Phase to be used for folders update: process-resources

IDEA needs to execute one of the listed phases in order to discover all source folders that are configured via Maven plugins.
Note that all test-* phases firstly generate and compile production sources.

Automatically download: ☐ Sources ☐ Documentation

Dependency types: jar, test-jar, maven-plugin, ejb, ejb-client, jboss-har, jboss-sar, war, ear, bundle

Comma separated list of dependency types that should be imported

VM options for importer:

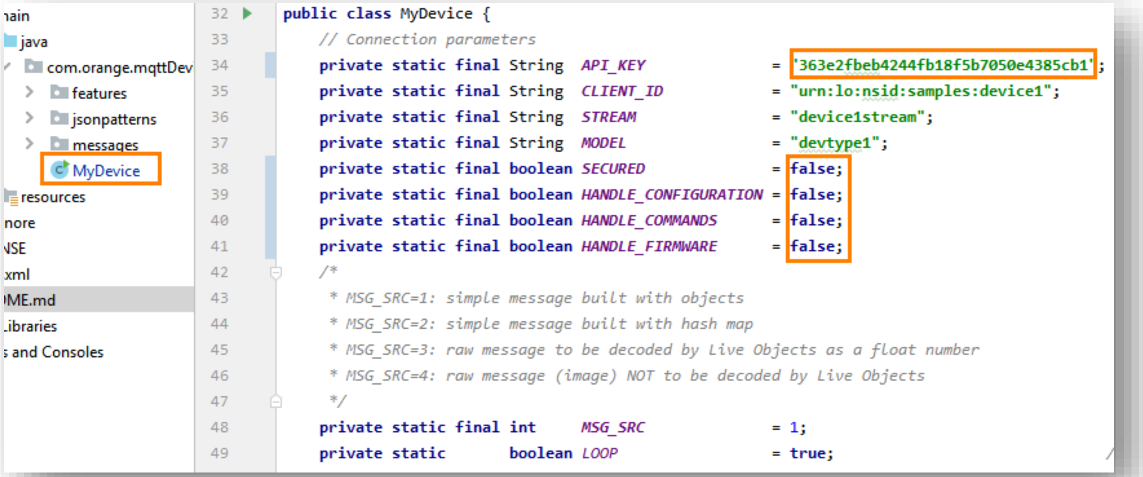
JDK for importer: Use Internal JRE (java version "11.0.3+12", path: C:/Program Files (x86)/Je...Community Edition 2019.2/jbr)

Environment settings...
Previous
Next
Cancel
Help

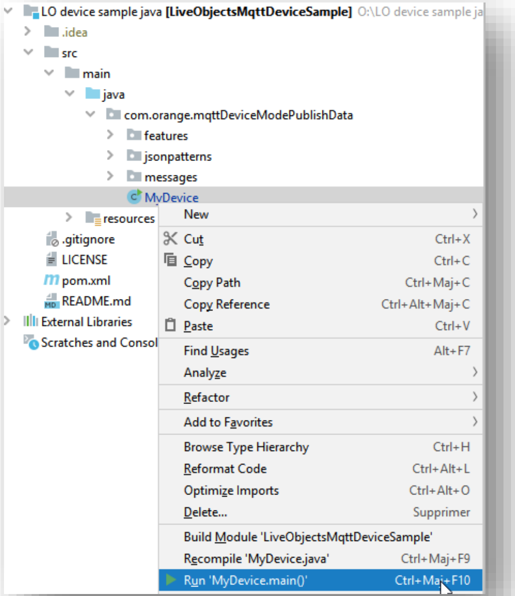
Git : https://github.com/DatavenueLiveObjects/LiveObjectsMqttDeviceSample
https://github.com/portapps/intellij-idea-community-portable/releases

Connect an MQTT device and send a payload

Configure (your API-Key + easy start) and run !


ain
java
com.orange.mqttDev
features
jsonpatterns
messages
MyDevice
resources
nore
NSE
xml
ME.md
ibraries
and Consoles

```java
public class MyDevice {
    // Connection parameters
    private static final String  API_KEY              = "363e2fbeb4244fb18f5b7050e4385cb1";
    private static final String  CLIENT_ID            = "urn:lo:nsid:samples:device1";
    private static final String  STREAM               = "device1stream";
    private static final String  MODEL                = "devtype1";
    private static final boolean SECURED              = false;
    private static final boolean HANDLE_CONFIGURATION = false;
    private static final boolean HANDLE_COMMANDS      = false;
    private static final boolean HANDLE_FIRMWARE      = false;
    /*
     * MSG_SRC=1: simple message built with objects
     * MSG_SRC=2: simple message built with hash map
     * MSG_SRC=3: raw message to be decoded by Live Objects as a float number
     * MSG_SRC=4: raw message (image) NOT to be decoded by Live Objects
     */
    private static final int     MSG_SRC              = 1;
    private static       boolean LOOP                 = true;
```


LO device sample java [LiveObjectsMqttDeviceSample] O:\LO device sample ja
.idea
src
main
java
com.orange.mqttDeviceModePublishData
features
jsonpatterns
messages
MyDevice
resources
.gitignore
LICENSE
pom.xml
README.md
External Libraries
Scratches and Consol
New
Cut Ctrl+X
Copy Ctrl+C
Copy Path Ctrl+Maj+C
Copy Reference Ctrl+Alt+Maj+C
Paste Ctrl+V
Find Usages Alt+F7
Analyze
Refactor
Add to Favorites
Browse Type Hierarchy Ctrl+H
Reformat Code Ctrl+Alt+L
Optimize Imports Ctrl+Alt+O
Delete... Supprimer
Build Module 'LiveObjectsMqttDeviceSample'
Recompile 'MyDevice.java' Ctrl+Maj+F9
Run 'MyDevice.main()' Ctrl+Maj+F10

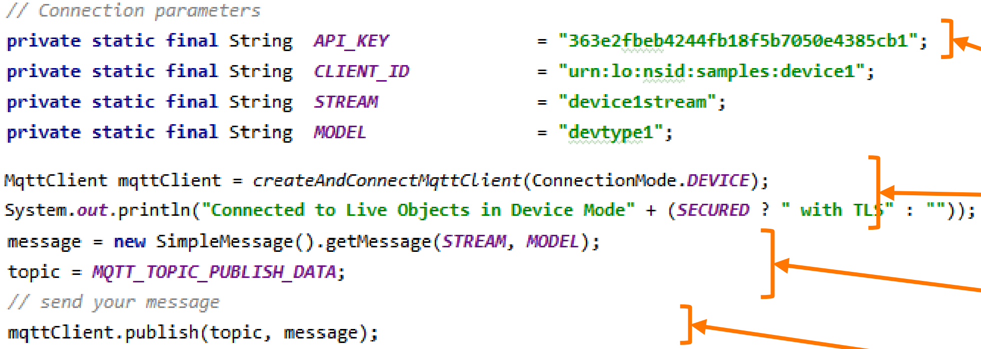
Git : https://github.com/DatavenueLiveObjects/LiveObjectsMqttDeviceSample

Code Samples

Small introduction : make a device simulator in Java

Connect an MQTT device and send a payload

MyDevice.java



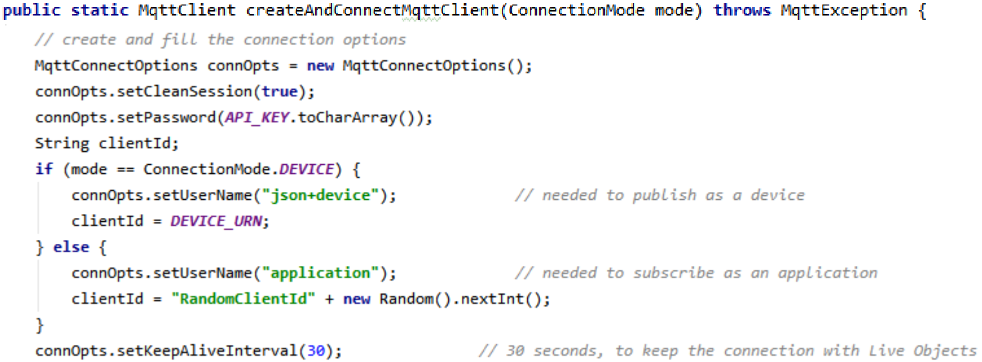
```
// Connection parameters
private static final String  API_KEY              = "363e2fbeb4244fb18f5b7050e4385cb1";
private static final String  CLIENT_ID            = "urn:lo:nsid:samples:device1";
private static final String  STREAM               = "device1stream";
private static final String  MODEL                = "devtype1";

MqttClient mqttClient = createAndConnectMqttClient(ConnectionMode.DEVICE);
System.out.println("Connected to Live Objects in Device Mode" + (SECURED ? " with TLS" : ""));
message = new SimpleMessage().getMessage(STREAM, MODEL);
topic = MQTT_TOPIC_PUBLISH_DATA;
// send your message
mqttClient.publish(topic, message);
```

Generate the API Key from the portal

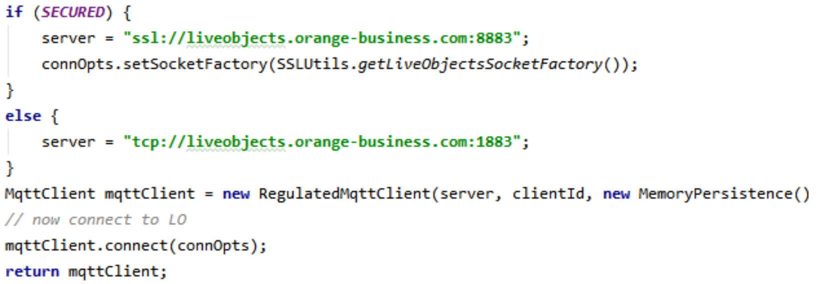
Create an MQTT connection as a device « json+device »

Build the payload

Publish the message

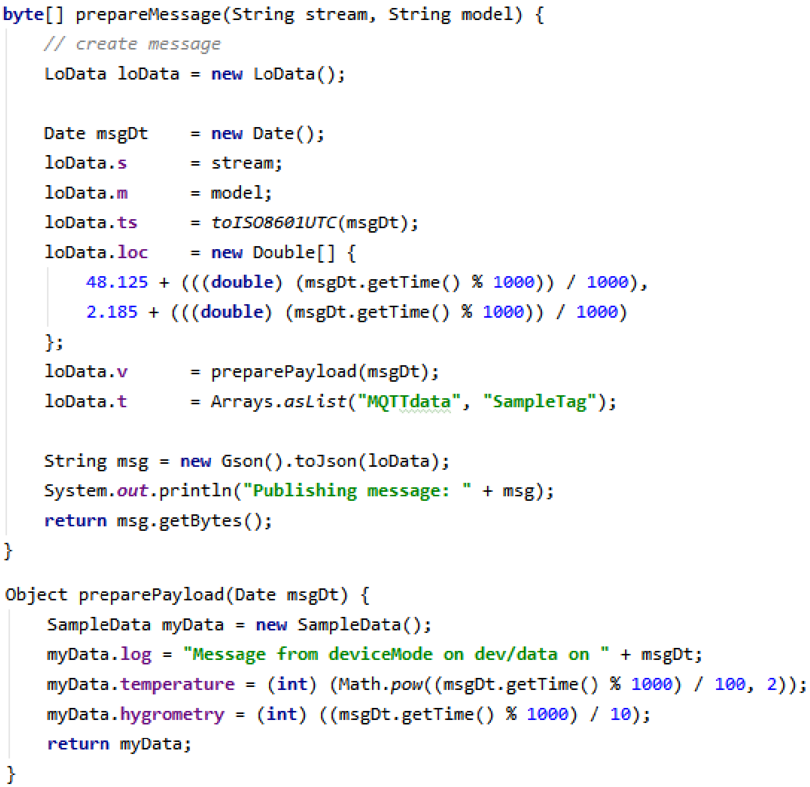


```
public static MqttClient createAndConnectMqttClient(ConnectionMode mode) throws MqttException {
    // create and fill the connection options
    MqttConnectOptions connOpts = new MqttConnectOptions();
    connOpts.setCleanSession(true);
    connOpts.setPassword(API_KEY.toCharArray());
    String clientId;
    if (mode == ConnectionMode.DEVICE) {
        connOpts.setUserName("json+device");           // needed to publish as a device
        clientId = DEVICE_URN;
    } else {
        connOpts.setUserName("application");           // needed to subscribe as an application
        clientId = "RandomClientId" + new Random().nextInt();
    }
    connOpts.setKeepAliveInterval(30);             // 30 seconds, to keep the connection with Live Objects
```



```
if (SECURED) {
    server = "ssl://liveobjects.orange-business.com:8883";
    connOpts.setSocketFactory(SSLUtils.getLiveObjectsSocketFactory());
}
else {
    server = "tcp://liveobjects.orange-business.com:1883";
}
MqttClient mqttClient = new RegulatedMqttClient(server, clientId, new MemoryPersistence()
// now connect to LO
mqttClient.connect(connOpts);
return mqttClient;
```

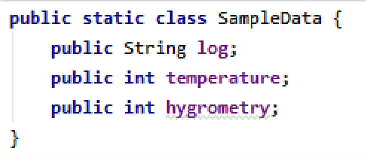
Connect an MQTT device and send a payload



```
byte[] prepareMessage(String stream, String model) {
    // create message
    LoData loData = new LoData();

    Date msgDt    = new Date();
    loData.s      = stream;
    loData.m      = model;
    loData.ts     = toISO8601UTC(msgDt);
    loData.loc    = new Double[] {
        48.125 + (((double) (msgDt.getTime() % 1000)) / 1000),
        2.185 + (((double) (msgDt.getTime() % 1000)) / 1000)
    };
    loData.v      = preparePayload(msgDt);
    loData.t      = Arrays.asList("MQTTdata", "SampleTag");

    String msg = new Gson().toJson(loData);
    System.out.println("Publishing message: " + msg);
    return msg.getBytes();
}

Object preparePayload(Date msgDt) {
    SampleData myData = new SampleData();
    myData.log = "Message from deviceMode on dev/data on " + msgDt;
    myData.temperature = (int) (Math.pow((msgDt.getTime() % 1000) / 100, 2));
    myData.hygrometry = (int) ((msgDt.getTime() % 1000) / 10);
    return myData;
}
```

Main payload definition with metadata (stream, model, timestamp, location, tags)

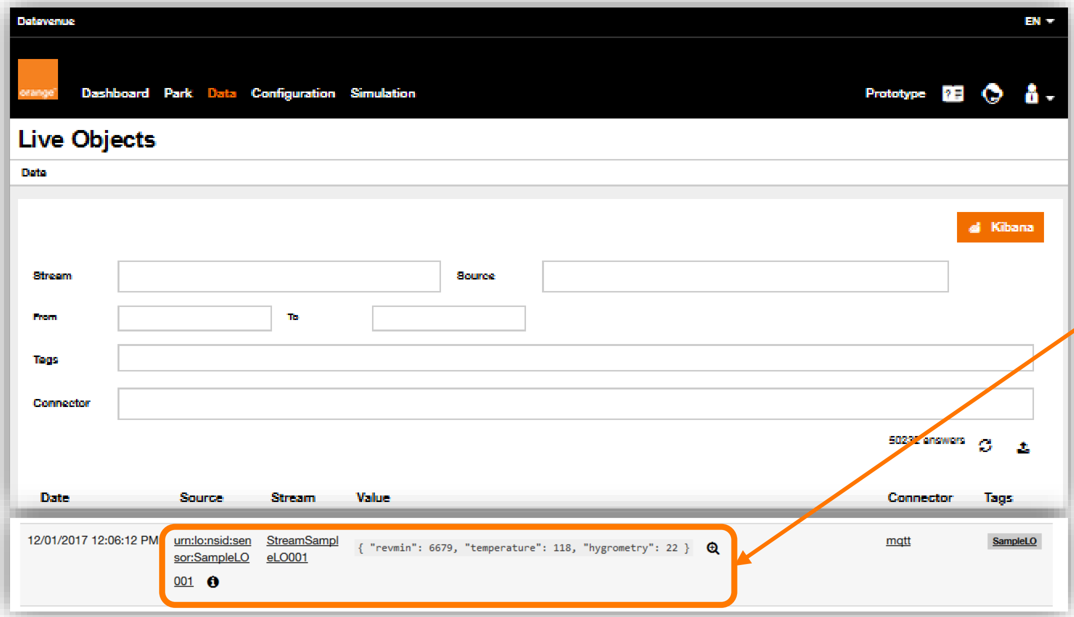
Actual values



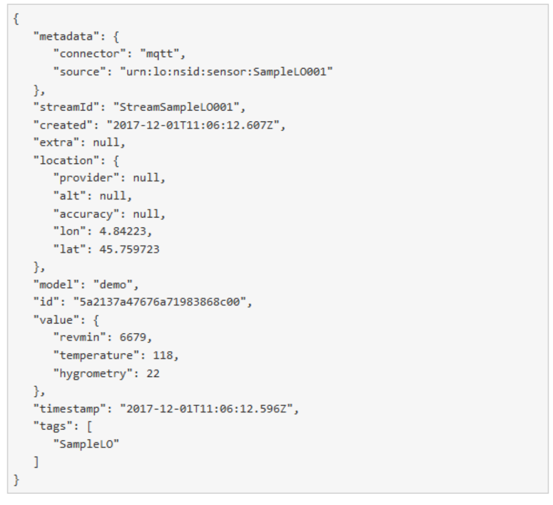
```
public static class SampleData {
    public String log;
    public int temperature;
    public int hygrometry;
}
```

Connect an MQTT device and send a payload

Result on Live Objects portal


Datavenue
EN
orange
Dashboard
Park
Data
Configuration
Simulation
Prototype
Live Objects
Data
Kibana
Stream
Source
From
To
Tags
Connector
[illegible] answers

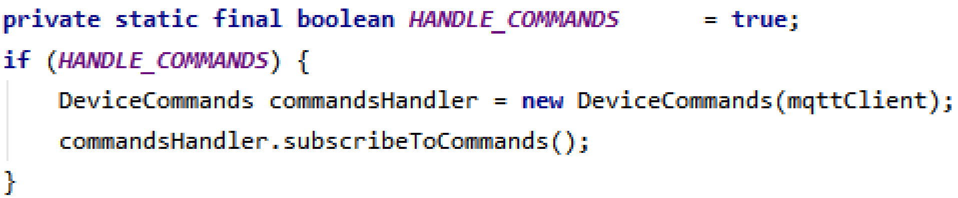
Date	Source	Stream	Value	Connector	Tags
12/01/2017 12:06:12 PM	urn:lo:nsid:sensor:SampleLO001	StreamSampleLO001	`{ "revmin": 6679, "temperature": 118, "hygrometry": 22 }`	mqtt	SampleLO



```
{
   "metadata": {
      "connector": "mqtt",
      "source": "urn:lo:nsid:sensor:SampleLO001"
   },
   "streamId": "StreamSampleLO001",
   "created": "2017-12-01T11:06:12.607Z",
   "extra": null,
   "location": {
      "provider": null,
      "alt": null,
      "accuracy": null,
      "lon": 4.84223,
      "lat": 45.759723
   },
   "model": "demo",
   "id": "5a2137a47676a71983868c00",
   "value": {
      "revmin": 6679,
      "temperature": 118,
      "hygrometry": 22
   },
   "timestamp": "2017-12-01T11:06:12.596Z",
   "tags": [
      "SampleLO"
   ]
}
```

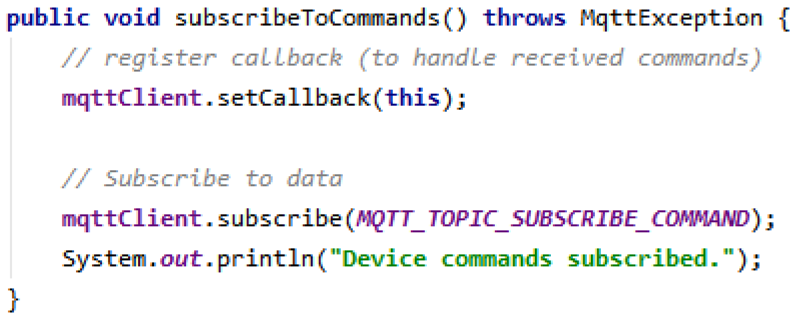
Small introduction : make a device simulator in Java

Collect and answer a command



```
private static final boolean HANDLE_COMMANDS      = true;
if (HANDLE_COMMANDS) {
    DeviceCommands commandsHandler = new DeviceCommands(mqttClient);
    commandsHandler.subscribeToCommands();
}
```

Add the handler

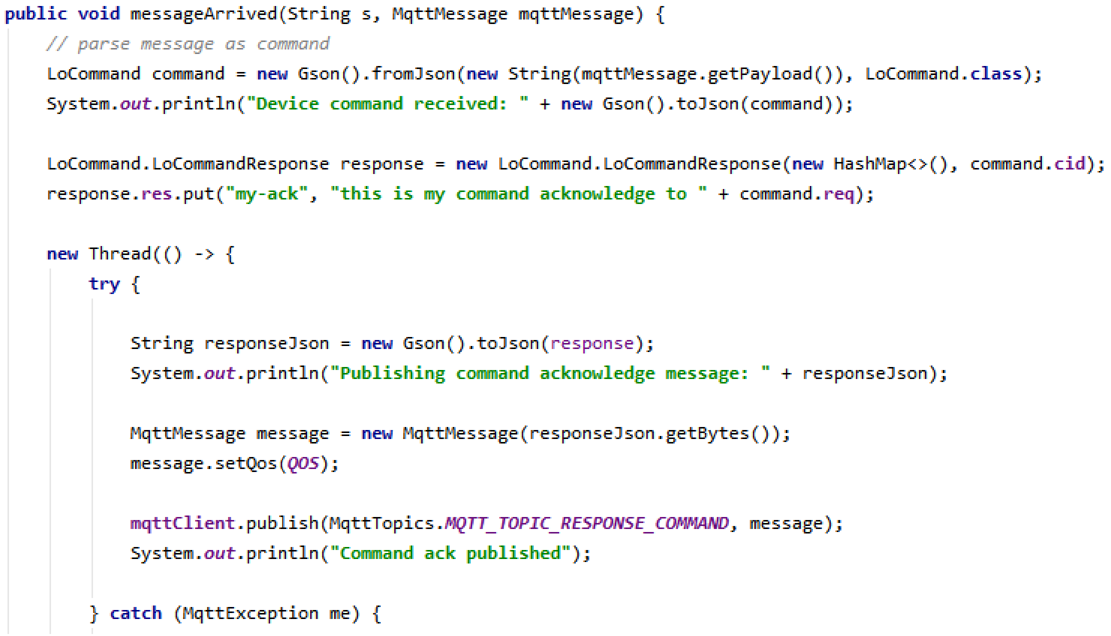


```
public void subscribeToCommands() throws MqttException {
    // register callback (to handle received commands)
    mqttClient.setCallback(this);

    // Subscribe to data
    mqttClient.subscribe(MQTT_TOPIC_SUBSCRIBE_COMMAND);
    System.out.println("Device commands subscribed.");
}
```

Subscribe to the topic
« dev/cmd »

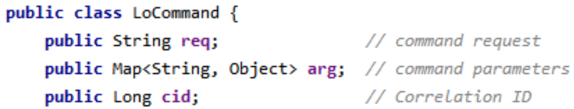
Small introduction : make a device simulator in Java

Collect and answer a command



```
public void messageArrived(String s, MqttMessage mqttMessage) {
    // parse message as command
    LoCommand command = new Gson().fromJson(new String(mqttMessage.getPayload()), LoCommand.class);
    System.out.println("Device command received: " + new Gson().toJson(command));

    LoCommand.LoCommandResponse response = new LoCommand.LoCommandResponse(new HashMap<>(), command.cid);
    response.res.put("my-ack", "this is my command acknowledge to " + command.req);

    new Thread(() -> {
        try {

            String responseJson = new Gson().toJson(response);
            System.out.println("Publishing command acknowledge message: " + responseJson);

            MqttMessage message = new MqttMessage(responseJson.getBytes());
            message.setQos(QOS);

            mqttClient.publish(MqttTopics.MQTT_TOPIC_RESPONSE_COMMAND, message);
            System.out.println("Command ack published");

        } catch (MqttException me) {
```

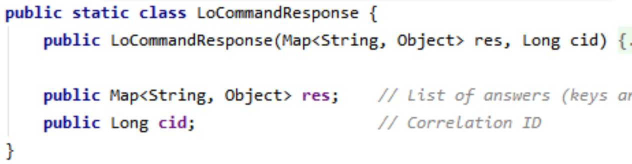
Get (and apply) the remote command



```
public class LoCommand {
    public String req;                  // command request
    public Map<String, Object> arg;     // command parameters
    public Long cid;                    // Correlation ID
```

Prepare the acknowledge

Send the acknowledge on « dev/cmd/res »

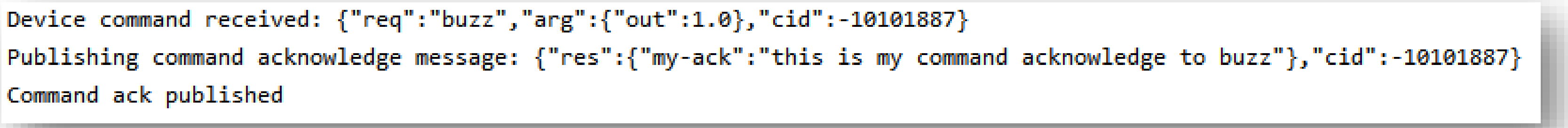


```
public static class LoCommandResponse {
    public LoCommandResponse(Map<String, Object> res, Long cid) {

    public Map<String, Object> res;     // List of answers (keys ar
    public Long cid;                    // Correlation ID
}
```

Small introduction : make a device simulator in Java

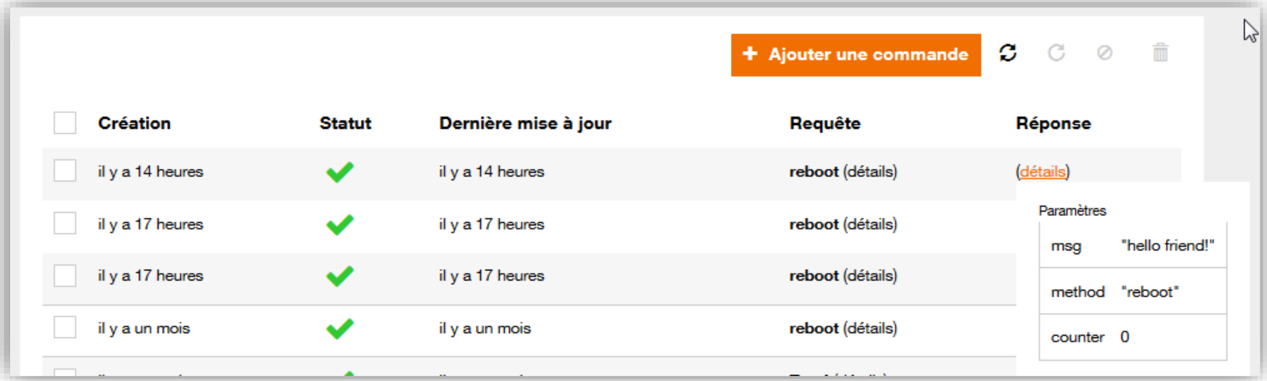
Collect and answer a command

The result in the console



```
Device command received: {"req":"buzz","arg":{"out":1.0},"cid":-10101887}
Publishing command acknowledge message: {"res":{"my-ack":"this is my command acknowledge to buzz"},"cid":-10101887}
Command ack published
```

The result in the portal



☐	Création	Statut	Dernière mise à jour	Requête	Réponse
☐	il y a 14 heures	✓	il y a 14 heures	**reboot** (détails)	(détails)
☐	il y a 17 heures	✓	il y a 17 heures	**reboot** (détails)	
☐	il y a 17 heures	✓	il y a 17 heures	**reboot** (détails)	
☐	il y a un mois	✓	il y a un mois	**reboot** (détails)	

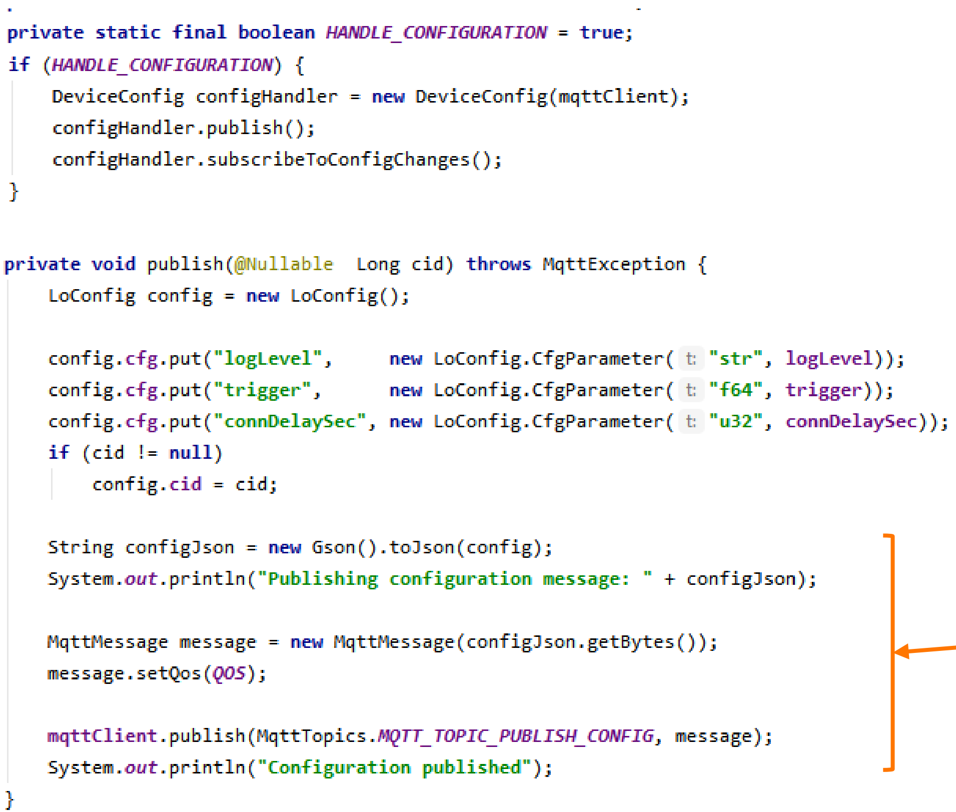
Paramètres

msg	"hello friend!"
method	"reboot"
counter	0

Code Samples

Small introduction : make a device simulator in Java

Handle configuration updates



```
private static final boolean HANDLE_CONFIGURATION = true;
if (HANDLE_CONFIGURATION) {
    DeviceConfig configHandler = new DeviceConfig(mqttClient);
    configHandler.publish();
    configHandler.subscribeToConfigChanges();
}

private void publish(@Nullable  Long cid) throws MqttException {
    LoConfig config = new LoConfig();

    config.cfg.put("logLevel",      new LoConfig.CfgParameter( t: "str", logLevel));
    config.cfg.put("trigger",       new LoConfig.CfgParameter( t: "f64", trigger));
    config.cfg.put("connDelaySec", new LoConfig.CfgParameter( t: "u32", connDelaySec));
    if (cid != null)
        config.cid = cid;

    String configJson = new Gson().toJson(config);
    System.out.println("Publishing configuration message: " + configJson);

    MqttMessage message = new MqttMessage(configJson.getBytes());
    message.setQos(QOS);

    mqttClient.publish(MqttTopics.MQTT_TOPIC_PUBLISH_CONFIG, message);
    System.out.println("Configuration published");
}
```

Add the handler

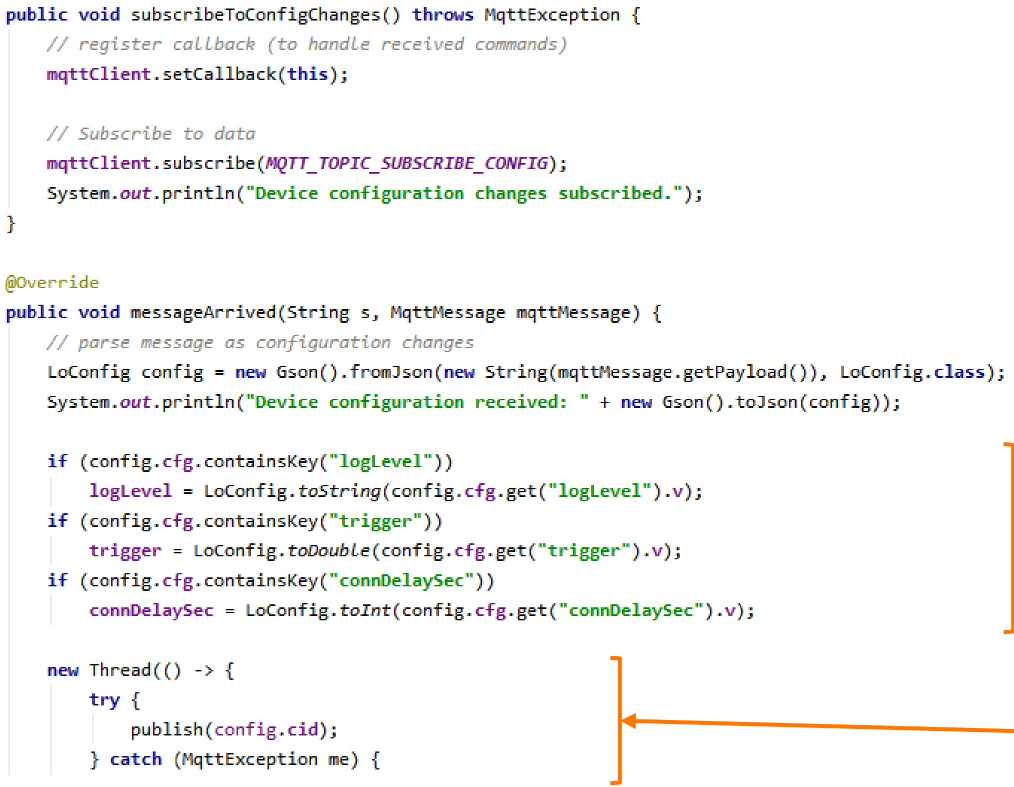
Declare present parameters

Send the message on « dev/cfg »

Code Samples

Small introduction : make a device simulator in Java

Handle configuration updates



```
public void subscribeToConfigChanges() throws MqttException {
    // register callback (to handle received commands)
    mqttClient.setCallback(this);

    // Subscribe to data
    mqttClient.subscribe(MQTT_TOPIC_SUBSCRIBE_CONFIG);
    System.out.println("Device configuration changes subscribed.");
}

@Override
public void messageArrived(String s, MqttMessage mqttMessage) {
    // parse message as configuration changes
    LoConfig config = new Gson().fromJson(new String(mqttMessage.getPayload()), LoConfig.class);
    System.out.println("Device configuration received: " + new Gson().toJson(config));

    if (config.cfg.containsKey("logLevel"))
        logLevel = LoConfig.toString(config.cfg.get("logLevel").v);
    if (config.cfg.containsKey("trigger"))
        trigger = LoConfig.toDouble(config.cfg.get("trigger").v);
    if (config.cfg.containsKey("connDelaySec"))
        connDelaySec = LoConfig.toInt(config.cfg.get("connDelaySec").v);

    new Thread(() -> {
        try {
            publish(config.cid);
        } catch (MqttException me) {
```

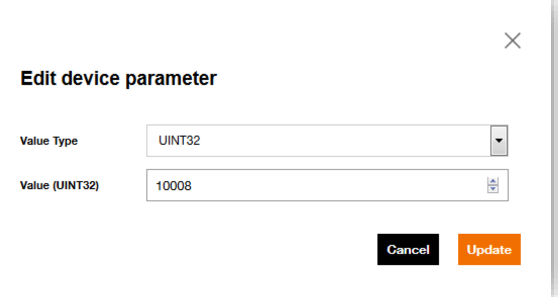
Subscribe to the topic « dev/cfg/upd »

Apply new parameters remotely set

Acknowledge by publishing current parameters

Handle configuration updates : Live Objects portal

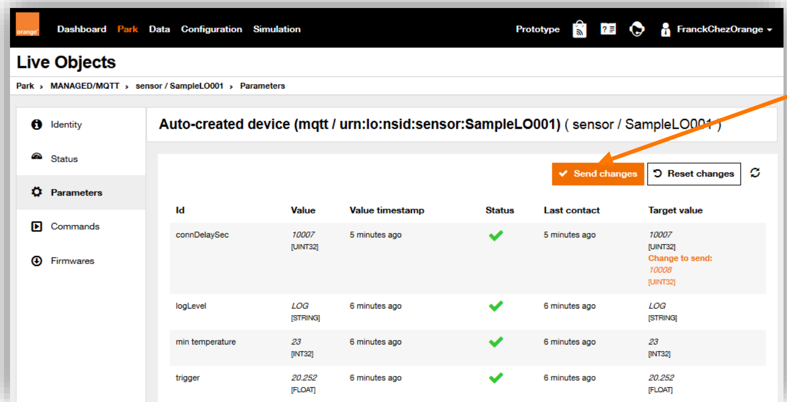
Change a parameter



Edit device parameter

Value Type	UINT32
Value (UINT32)	10008

×
Cancel
Update



Dashboard
Park
Data
Configuration
Simulation
Prototype
FranckChezOrange

Live Objects

Park › MANAGED/MQTT › sensor / SampleLO001 › Parameters

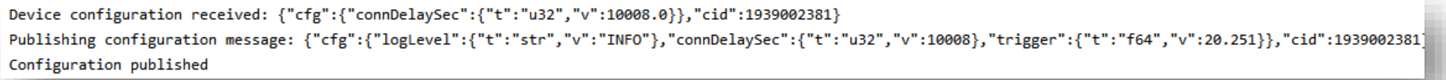
Identity
Status
Parameters
Commands
Firmwares

Auto-created device (mqtt / urn:lo:nsid:sensor:SampleLO001) (sensor / SampleLO001)

Send changes
Reset changes

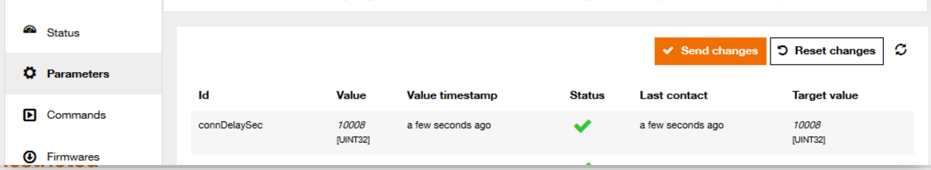
Id	Value	Value timestamp	Status	Last contact	Target value
connDelaySec	*10007* [UINT32]	5 minutes ago	✓	5 minutes ago	*10007* [UINT32] **Change to send:** *10008* [UINT32]
logLevel	*LOG* [STRING]	6 minutes ago	✓	6 minutes ago	*LOG* [STRING]
min temperature	*23* [INT32]	6 minutes ago	✓	6 minutes ago	*23* [INT32]
trigger	*20.252* [FLOAT]	6 minutes ago	✓	6 minutes ago	*20.252* [FLOAT]

Click on "Send Changes"



```
Device configuration received: {"cfg":{"connDelaySec":{"t":"u32","v":10008.0}},"cid":1939002381}
Publishing configuration message: {"cfg":{"logLevel":{"t":"str","v":"INFO"},"connDelaySec":{"t":"u32","v":10008},"trigger":{"t":"f64","v":20.251}},"cid":1939002381
Configuration published
```

Config update received and answered



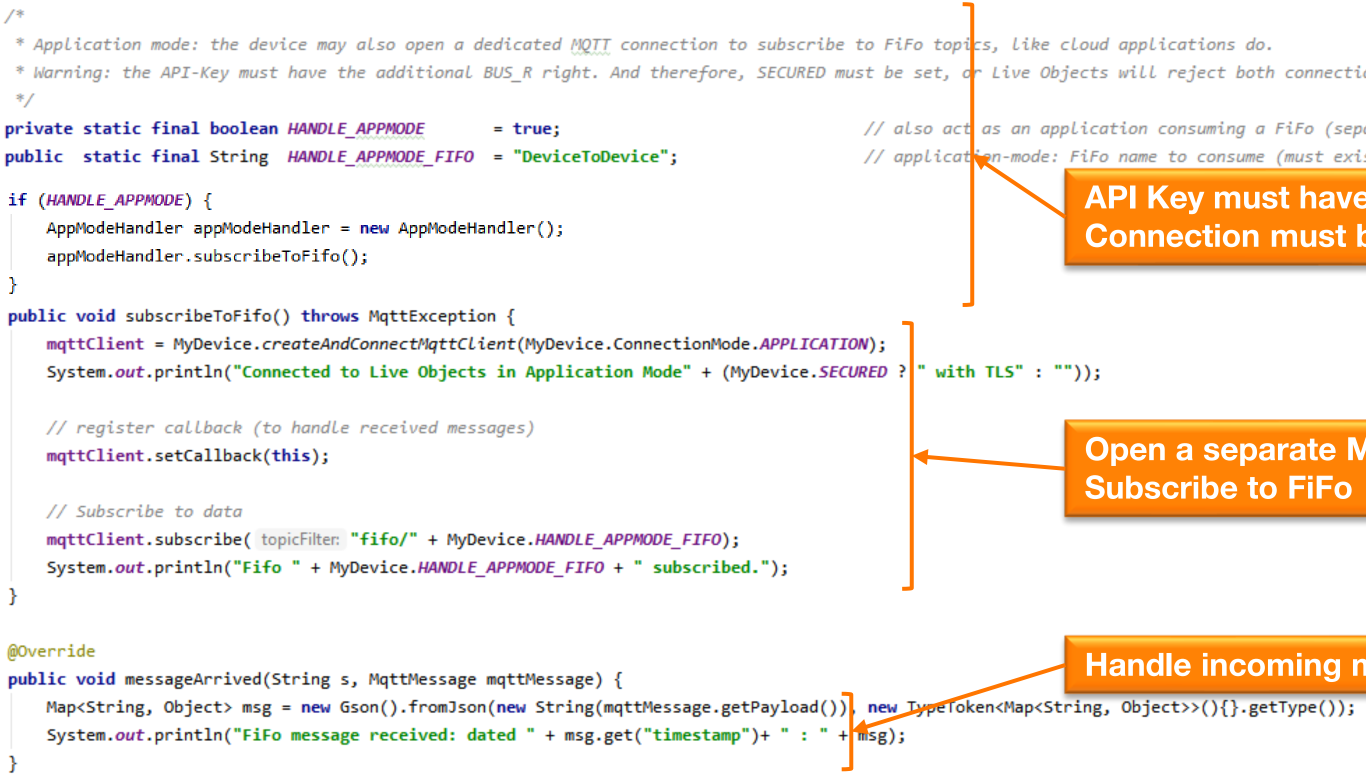
Identity
Status
Parameters
Commands
Firmwares

Auto-created device (mqtt / urn:lo:nsid:sensor:SampleLO001) (sensor / SampleLO001)

Send changes
Reset changes

Id	Value	Value timestamp	Status	Last contact	Target value
connDelaySec	*10008* [UINT32]	a few seconds ago	✓	a few seconds ago	*10008* [UINT32]

Collect real time data with MQTT



```
/*
 * Application mode: the device may also open a dedicated MQTT connection to subscribe to FiFo topics, like cloud applications do.
 * Warning: the API-Key must have the additional BUS_R right. And therefore, SECURED must be set, or Live Objects will reject both connections.
 */
private static final boolean HANDLE_APPMODE       = true;                          // also act as an application consuming a FiFo (separate MQTT connection) ?
public  static final String  HANDLE_APPMODE_FIFO  = "DeviceToDevice";              // application-mode: FiFo name to consume (must exist in Live Objects)

if (HANDLE_APPMODE) {
    AppModeHandler appModeHandler = new AppModeHandler();
    appModeHandler.subscribeToFifo();
}
public void subscribeToFifo() throws MqttException {
    mqttClient = MyDevice.createAndConnectMqttClient(MyDevice.ConnectionMode.APPLICATION);
    System.out.println("Connected to Live Objects in Application Mode" + (MyDevice.SECURED ? " with TLS" : ""));

    // register callback (to handle received messages)
    mqttClient.setCallback(this);

    // Subscribe to data
    mqttClient.subscribe( topicFilter: "fifo/" + MyDevice.HANDLE_APPMODE_FIFO);
    System.out.println("Fifo " + MyDevice.HANDLE_APPMODE_FIFO + " subscribed.");
}

@Override
public void messageArrived(String s, MqttMessage mqttMessage) {
    Map<String, Object> msg = new Gson().fromJson(new String(mqttMessage.getPayload()), new TypeToken<Map<String, Object>>(){}.getType());
    System.out.println("FiFo message received: dated " + msg.get("timestamp")+ " : " + msg);
}
```

API Key must have BUS_R additional rights
Connection must be secured

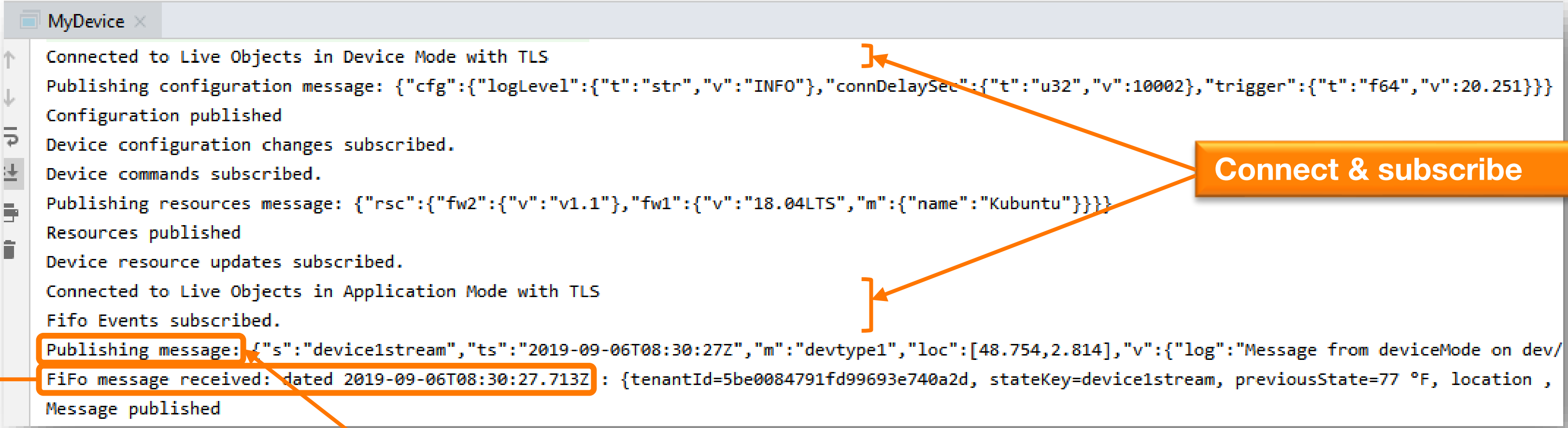
Open a separate MQTT connection
Subscribe to FiFo

Handle incoming messages

...

Collect real time data with MQTT

The result in the console



```
Connected to Live Objects in Device Mode with TLS
Publishing configuration message: {"cfg":{"logLevel":{"t":"str","v":"INFO"},"connDelaySec":{"t":"u32","v":10002},"trigger":{"t":"f64","v":20.251}}}
Configuration published
Device configuration changes subscribed.
Device commands subscribed.
Publishing resources message: {"rsc":{"fw2":{"v":"v1.1"},"fw1":{"v":"18.04LTS","m":{"name":"Kubuntu"}}}}
Resources published
Device resource updates subscribed.
Connected to Live Objects in Application Mode with TLS
Fifo Events subscribed.
Publishing message: {"s":"device1stream","ts":"2019-09-06T08:30:27Z","m":"devtype1","loc":[48.754,2.814],"v":{"log":"Message from deviceMode on dev/
FiFo message received: dated 2019-09-06T08:30:27.713Z : {tenantId=5be0084791fd99693e740a2d, stateKey=device1stream, previousState=77 °F, location ,
Message published
```

Connect & subscribe

Message published

Message received from an other device, or Live Objects events

Thank you

for your attention