Tecnologias para IoT

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Formanda em engenharia de computação

Bolsista do LIT (Laboratório de Inovação Tecnológica)

- Sistemas embarcados
- Robótica
- IoT

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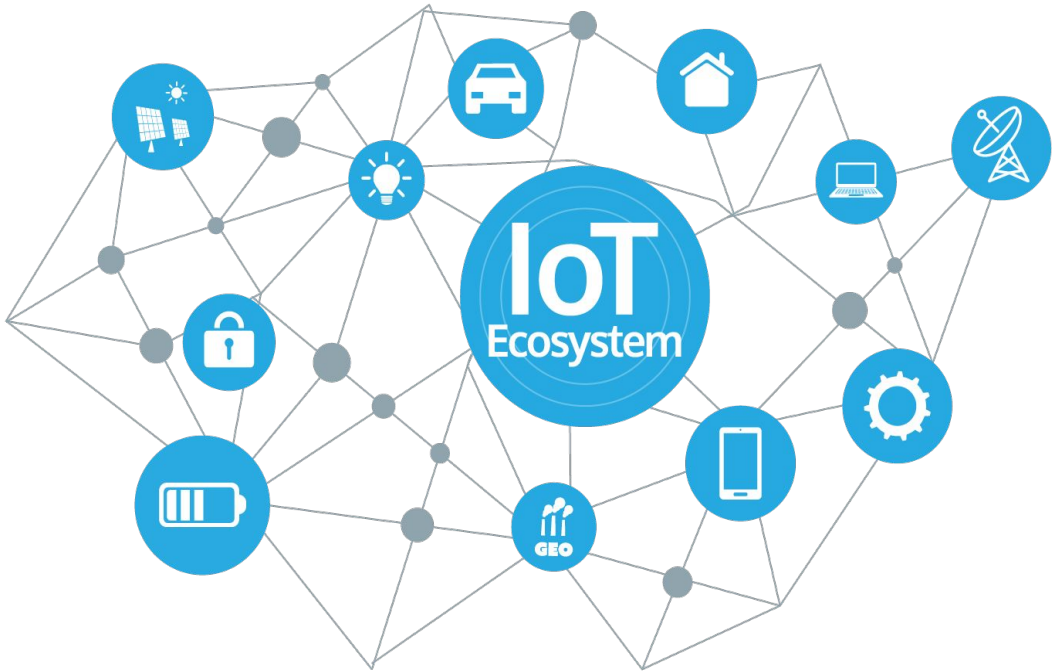

O que é IoT?

Um sistema de sensores onipresentes conectando o mundo físico à Internet.

É uma rede de objetos físicos que possuem tecnologia embarcada, sensores e conexão com a rede e é capaz de coletar e transmitir dados.

Mas afinal, que “coisas” são essas?

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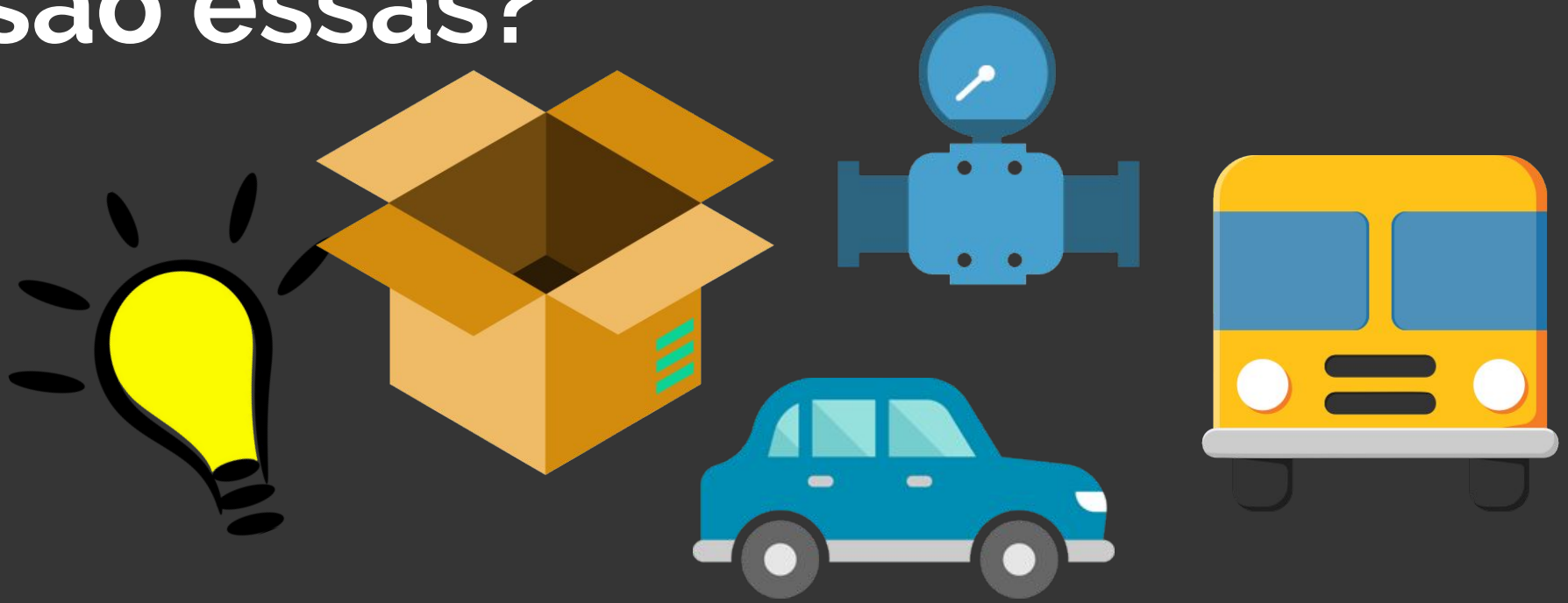
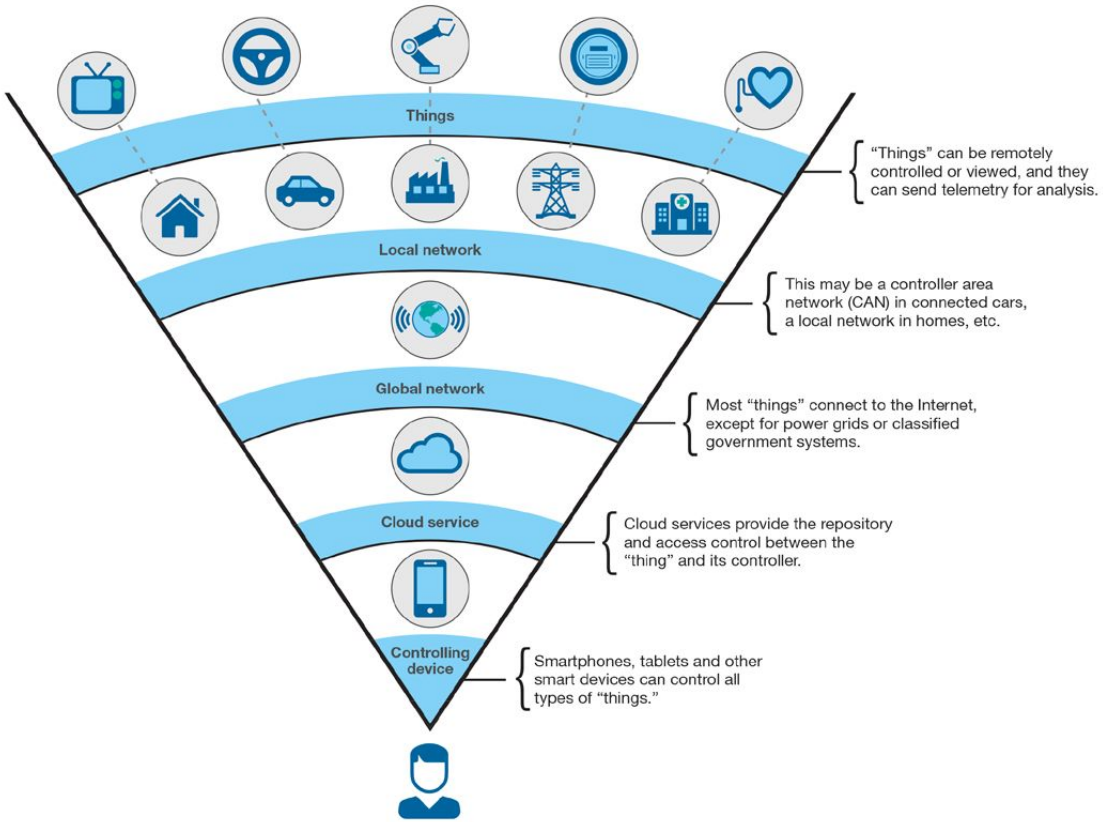


Mas afinal, que “coisas” são essas?

pode ser qualquer coisa!

Arquitetura

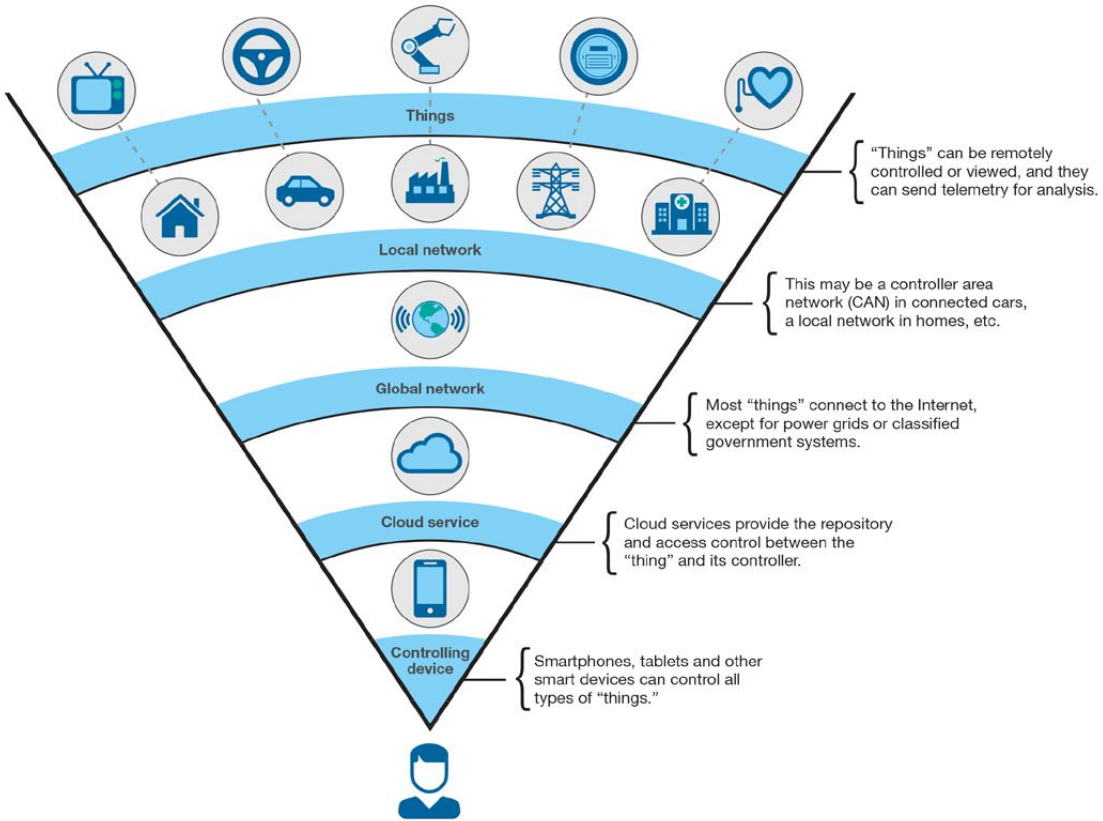


Coisas

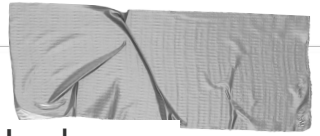
Rede

Plataforma

Aplicação final



Arquitetura



Hardware =

Sensores +

Atuadores +

Placa de controle

Rede =

tipo de comunicação

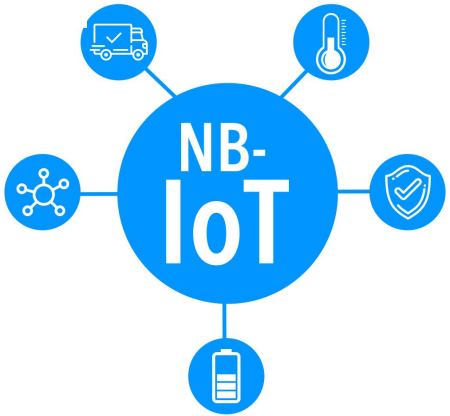
Plataforma =

Middleware

Aplicação final =

dashboard, aplicativo...

Tecnologias



Hardware, gateway, plataforma:

Sigfox

NB IoT

Sigfox

Fundada em 2009

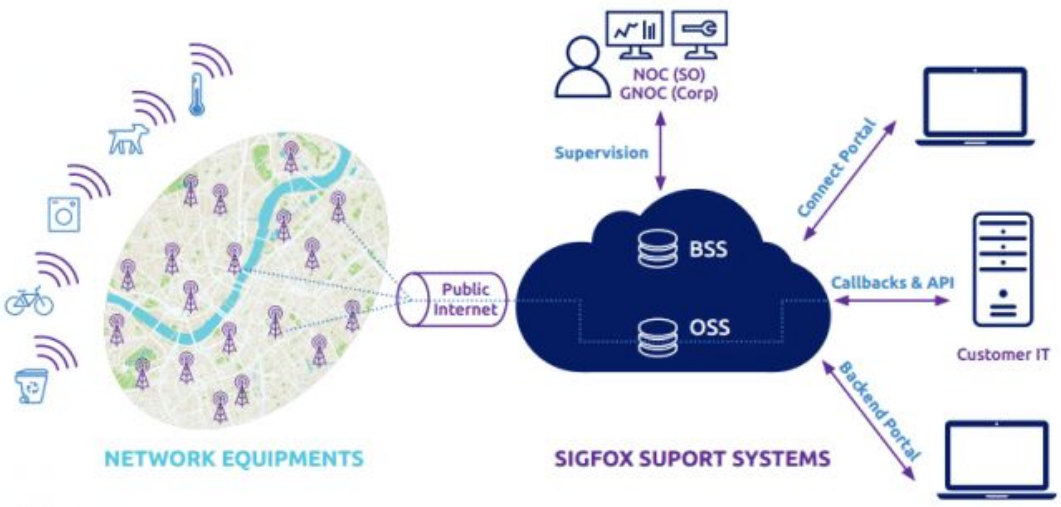
Representante no Brasil: WND

Lançada oficialmente em setembro de 2017 no Brasil

A cobertura estimada para o fim de 2018 é de mais de 150M de pessoas.

Rede dedicada baseada em rádio

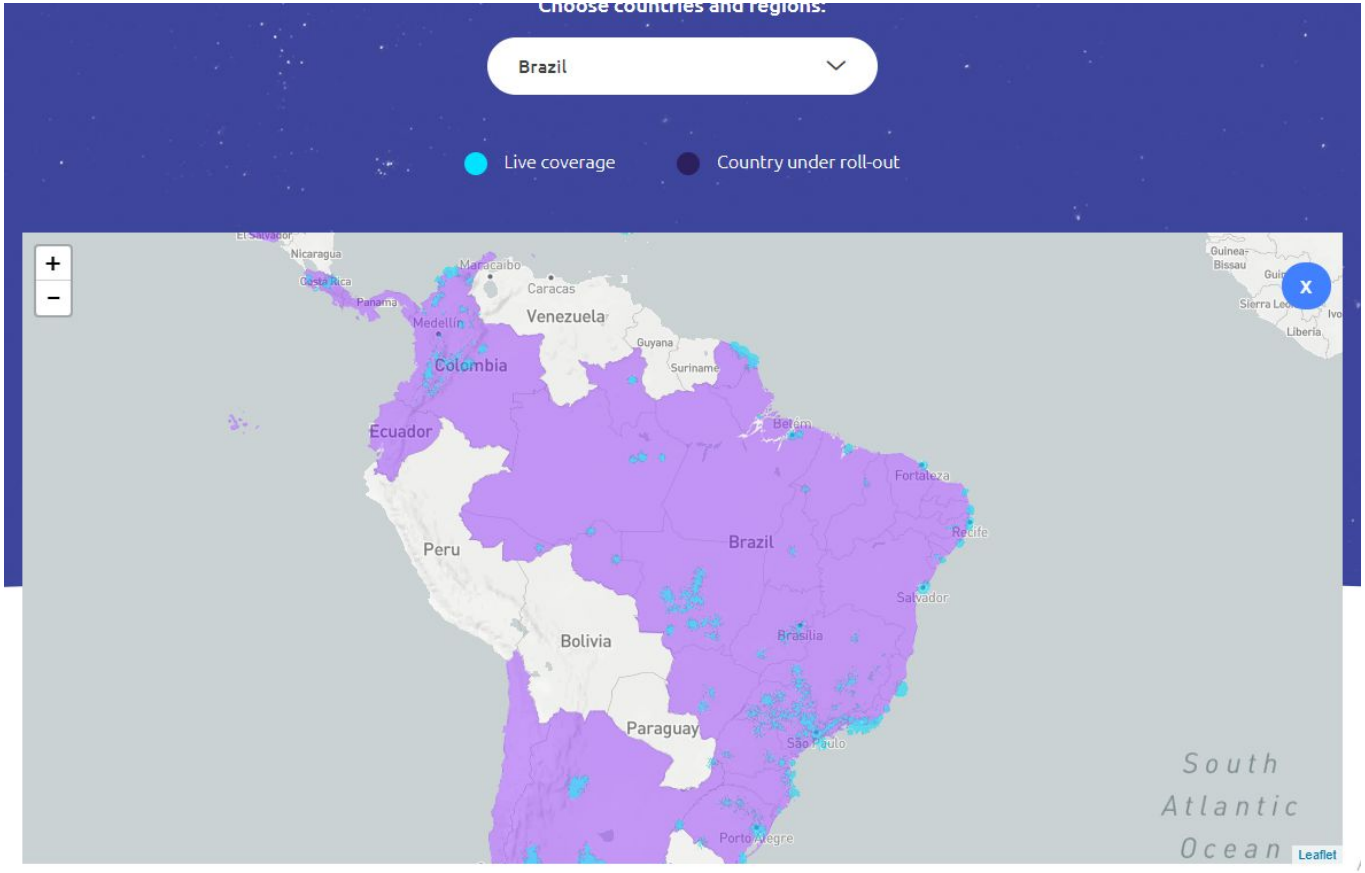
Arquitetura



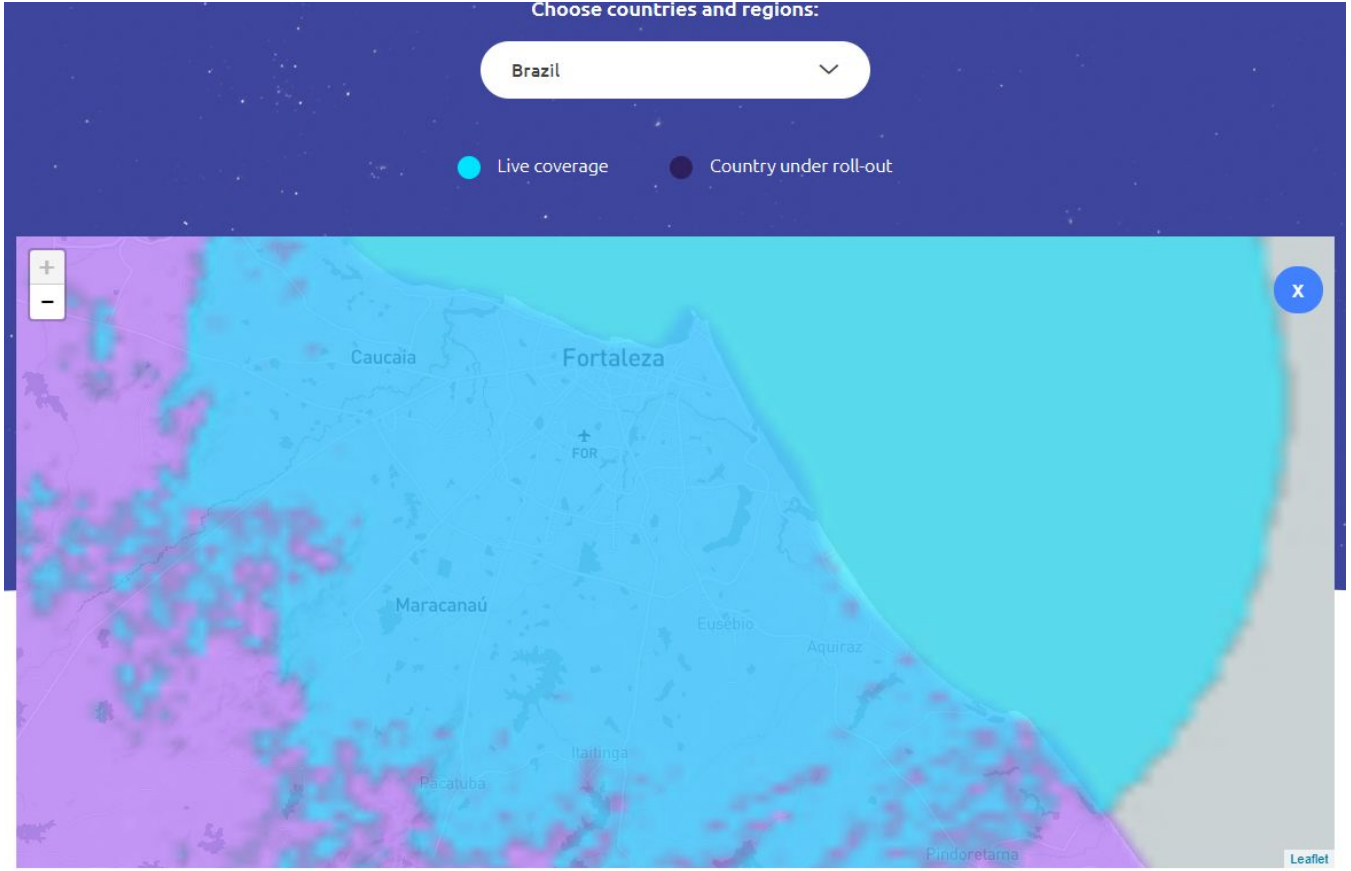
12 bytes, excluindo payload headers de uplink

8 bytes excluindo payload headers de downlink

- Um dispositivo desperta e emite uma mensagem usando sua antena de rádio,
- Várias estações base Sigfox na área recebem a mensagem,
- Estações base enviam a mensagem para o Sigfox Cloud,
- O Sigfox Cloud envia a mensagem para a plataforma de back-end de um cliente.

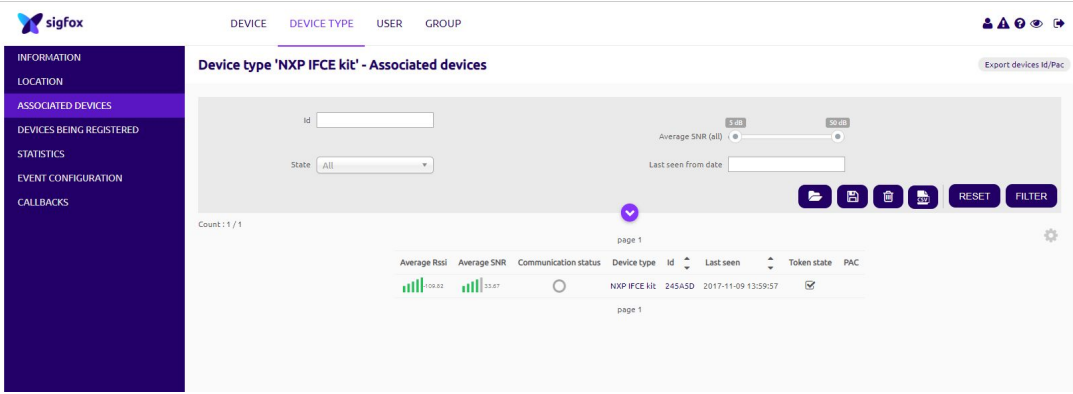


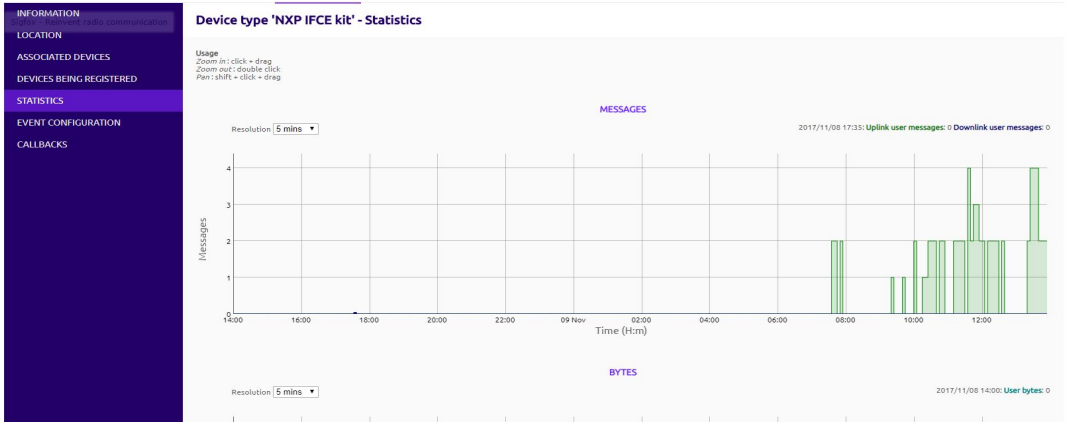
https://www.sigfox.com/en/coverage



https://www.sigfox.com/en/coverage

Acessar o serviço sigfox



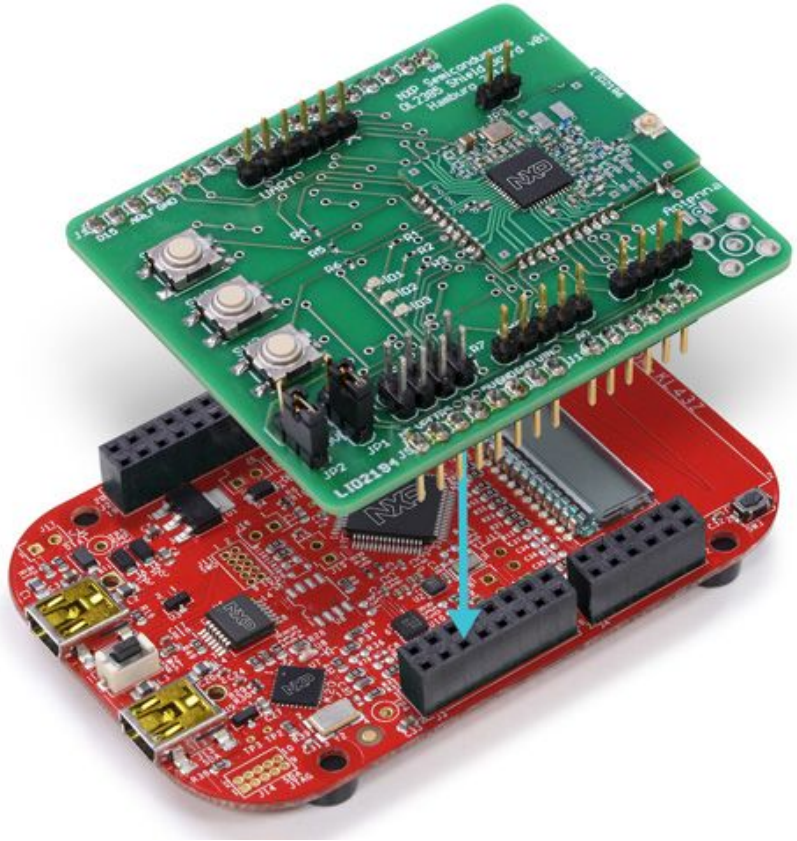


https://backend.sigfox.com/welcome/news

- Serviço de assinatura
  - Planos a partir de 1 dólar por ano
- Até 140 mensagens de uplink por dia;
- Até 4 downlinks por dia

Acesso à:

- A rede pública Sigfox,
- O Sigfox Cloud, onde você pode ver e gerenciar todos os seus dispositivos na rede



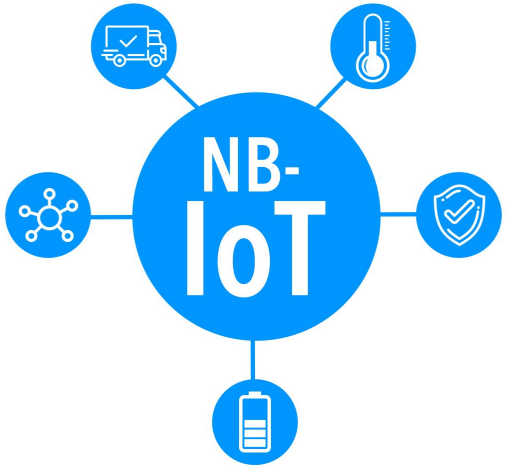
Development Kit com KL43Z

https://bit.ly/2NQf1Bk

Hardware

Os chipsets compatíveis são:

- Texas Instruments : CC1120, CC1125, CC1310, CC1350
- Silicon Labs : EFR, EZR, SI446X
- Semtech : SX1272, SX1276
- OnSemi : AX8052
- STMicro : Spirit 2 SPII
- Microchip : ATA8520E
- NXP : OL2385
- M2COM : M2C8001

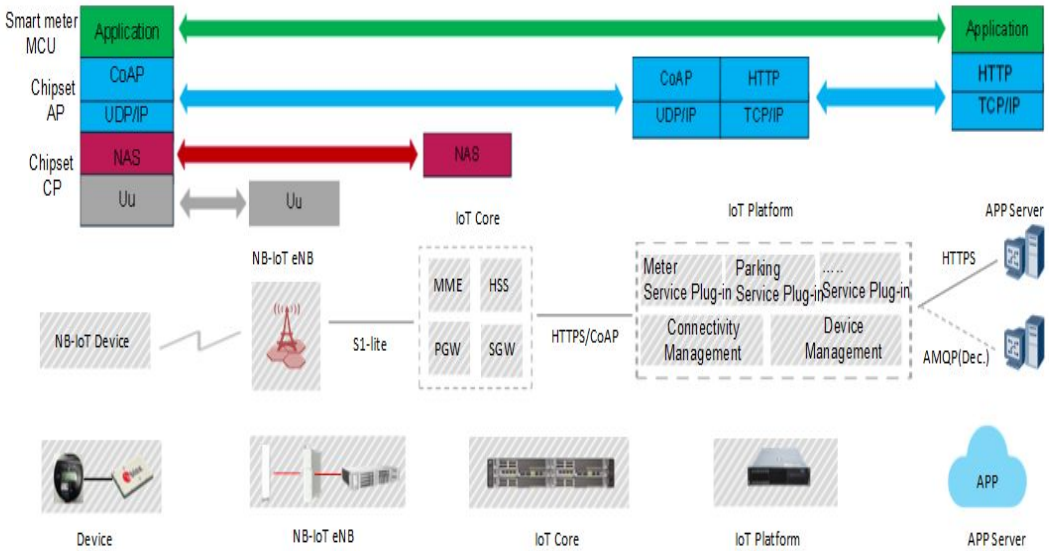


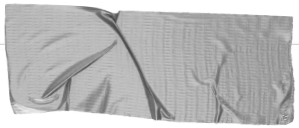
NB IoT

É um padrão de tecnologia de rádio LPWAN (Low Power Wide Area Network) desenvolvido pela 3GPP para permitir a conexão de ampla gama de dispositivos e serviços celulares

Primeira rede comercial NB-IoT no Brasil foi lançada pela Tim em MG.

Arquitetura

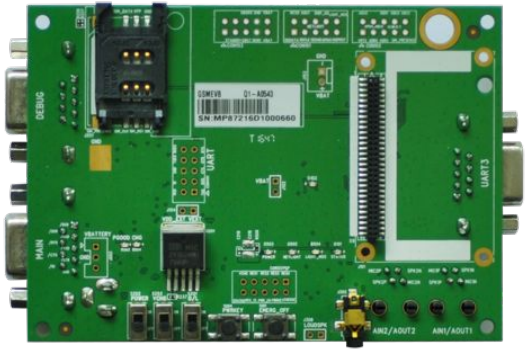




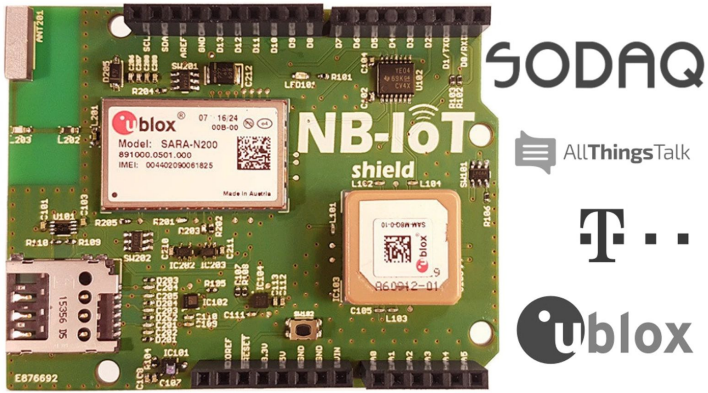
- As coisas são conectadas a um eNodeB.
- Um núcleo IoT troca informações com terminais NB-IoT e encaminha dados relacionados aos serviços NB-IoT para a plataforma IoT
- A plataforma IoT encaminha os dados para um aplicativo de serviço necessário para processamento.

Acessar o serviço NB-IoT

- Parcerias com as operadoras
- Fortaleza ainda não possui cobertura
- Plataformas de IoT
  - IoT Accelerator (Ericsson)
  - OceanConnect (Hauwei)



Quectel GSM/NB-IoT EVB Kit



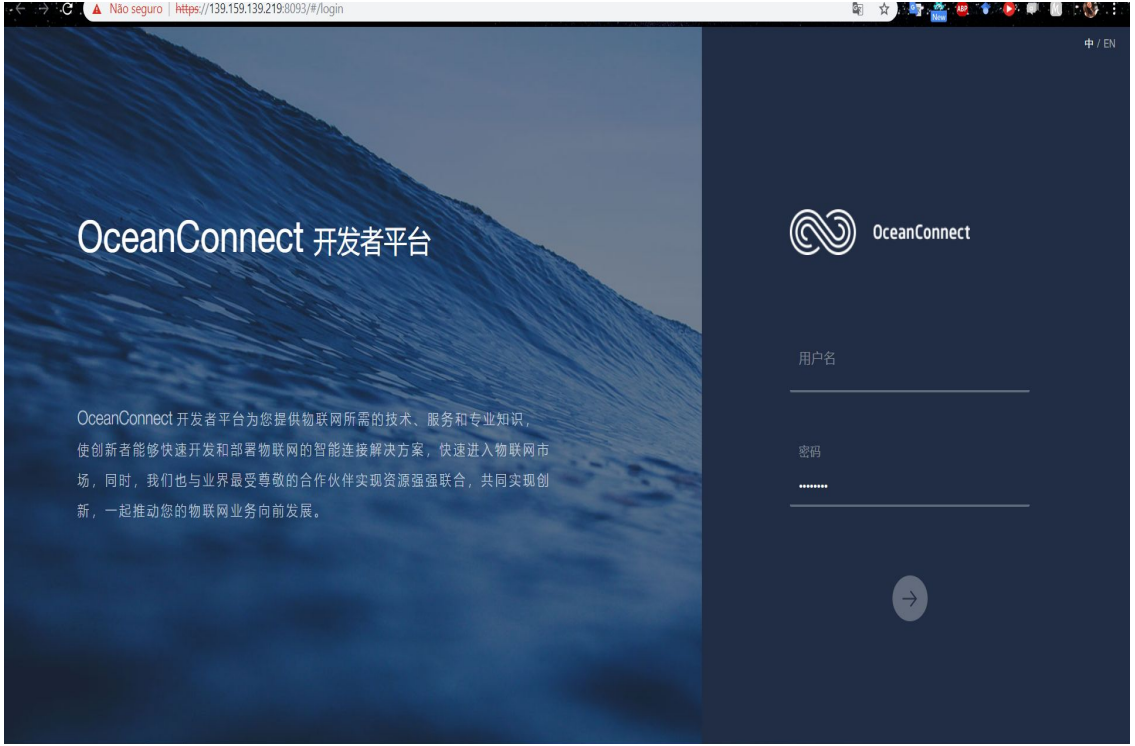
Sara N2

Hardware

Os chipsets compatíveis são:

- BC95
- UBLOX Sara N2

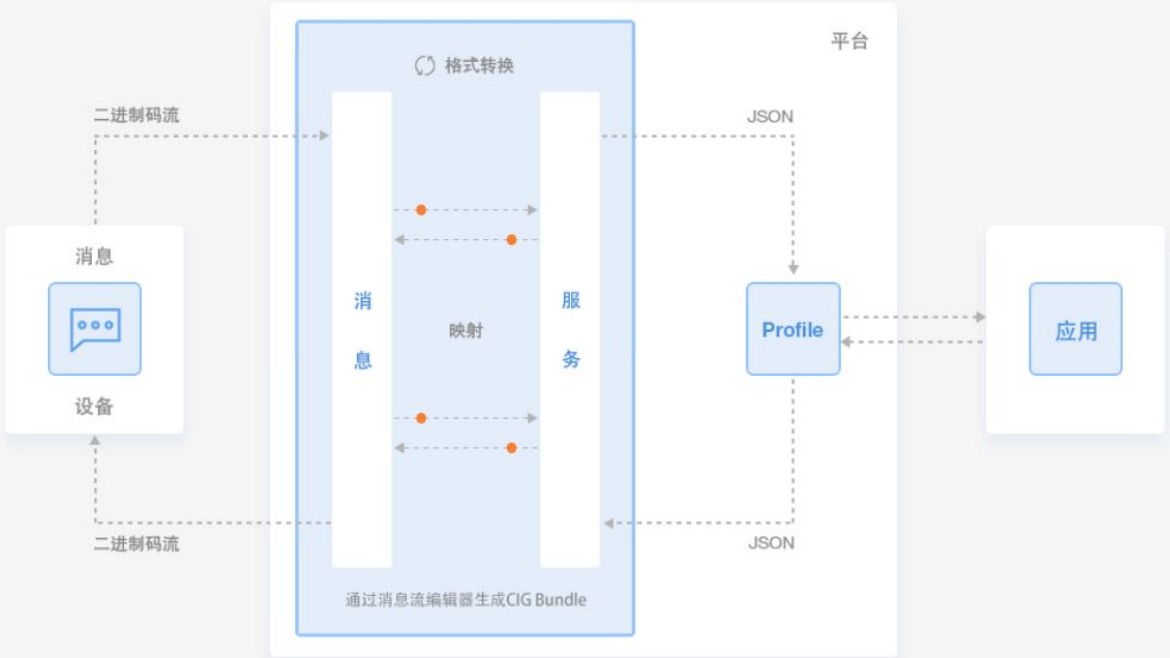
Huawei - OceanConnect



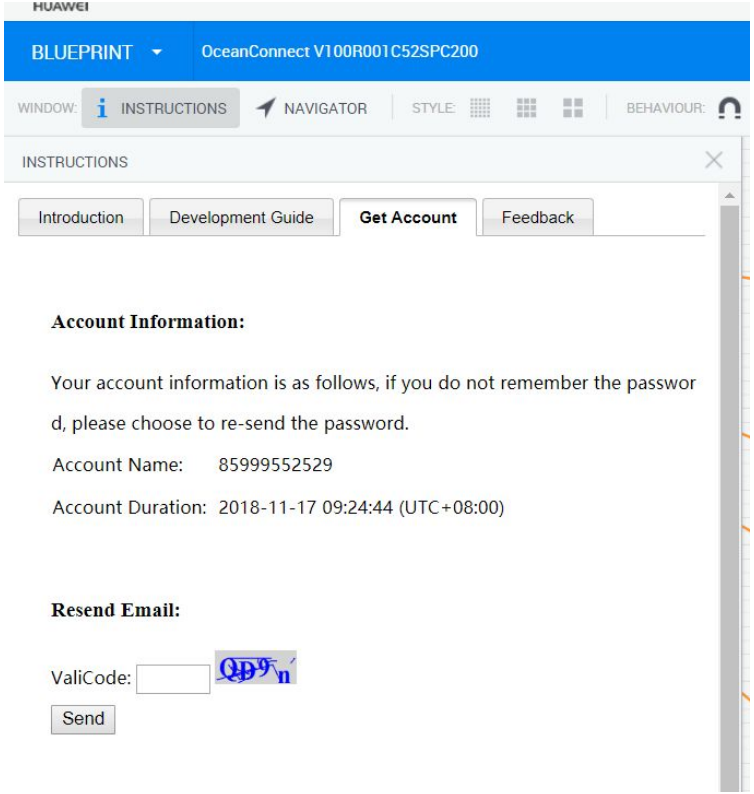
https://developer.huawei.com/ict/en/site-oceanconnect

- O Huawei OceanConnect é um ecossistema aberto baseado em tecnologias de IoT, computação em nuvem e Big Data.
- OceanConnect fornece mais de 170 APIs abertas
- Oferece simulador de dispositivos
- Discriminação do protocolo
- Lista de mensagens, dispositivos conectados

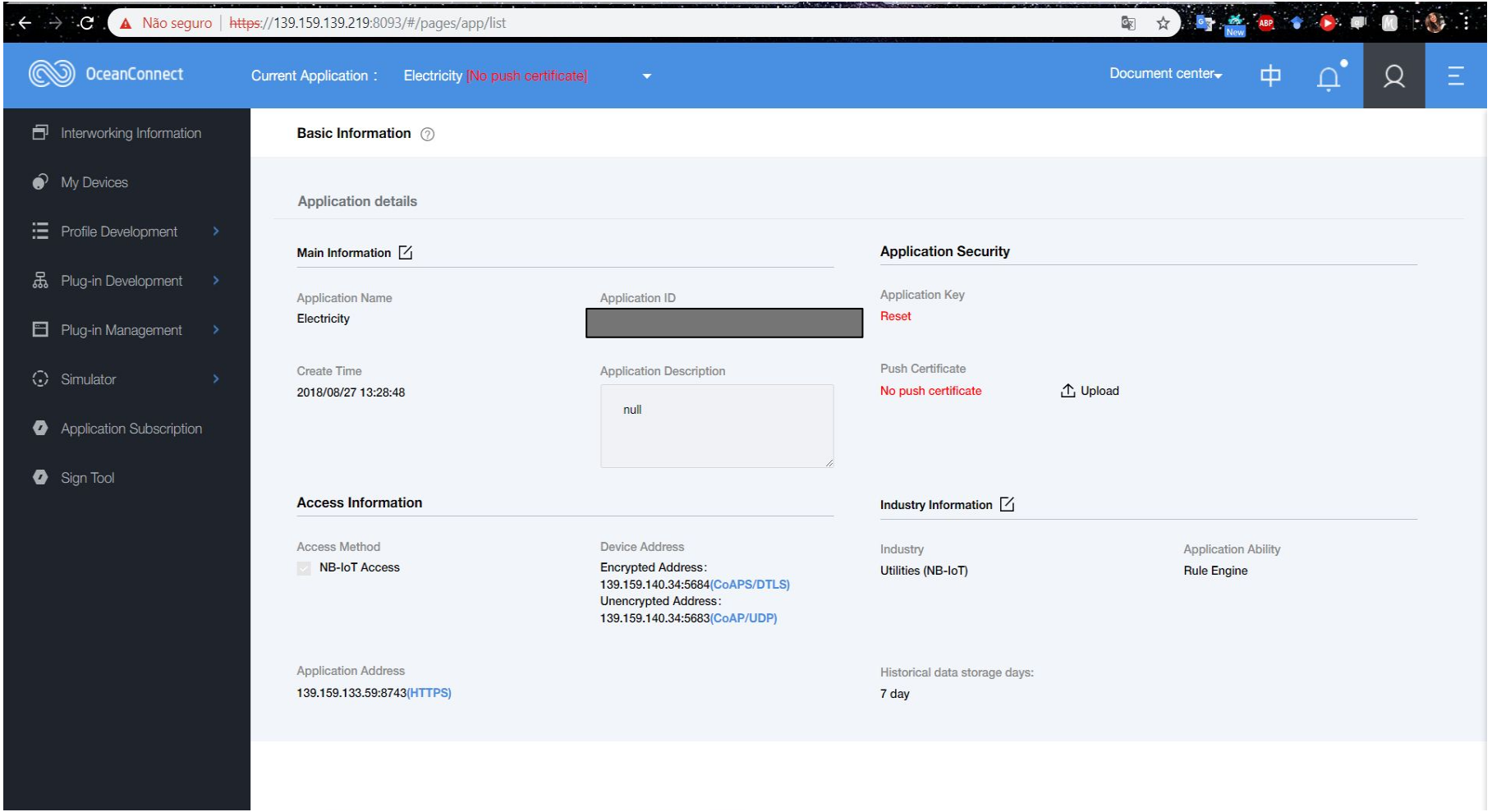
Through the graphical way to achieve the device's binary bitstream to IoT platform JSON format message conversion, at the same time, the platform issued control commands encoded into the device's binary bitstream format.

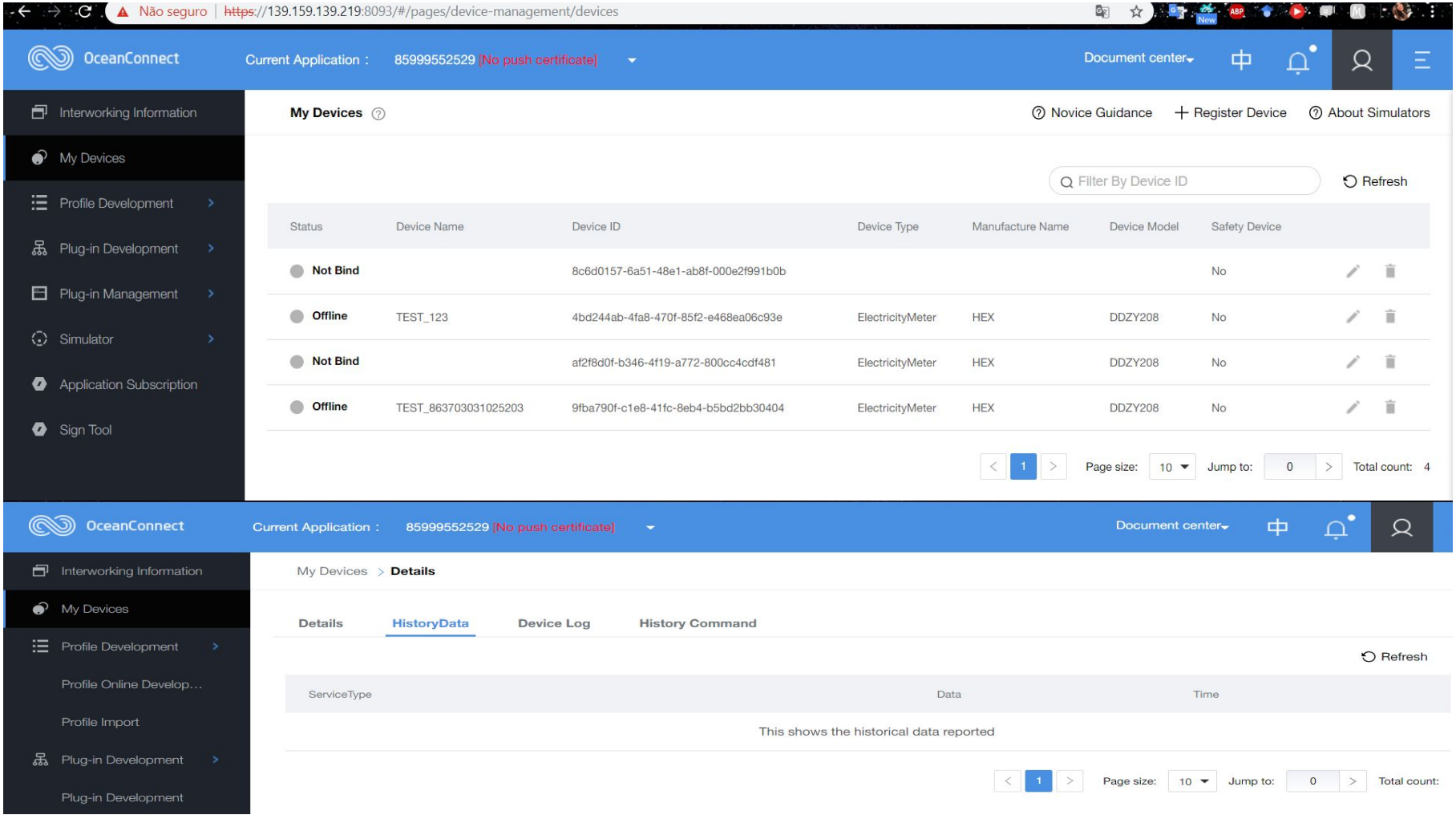


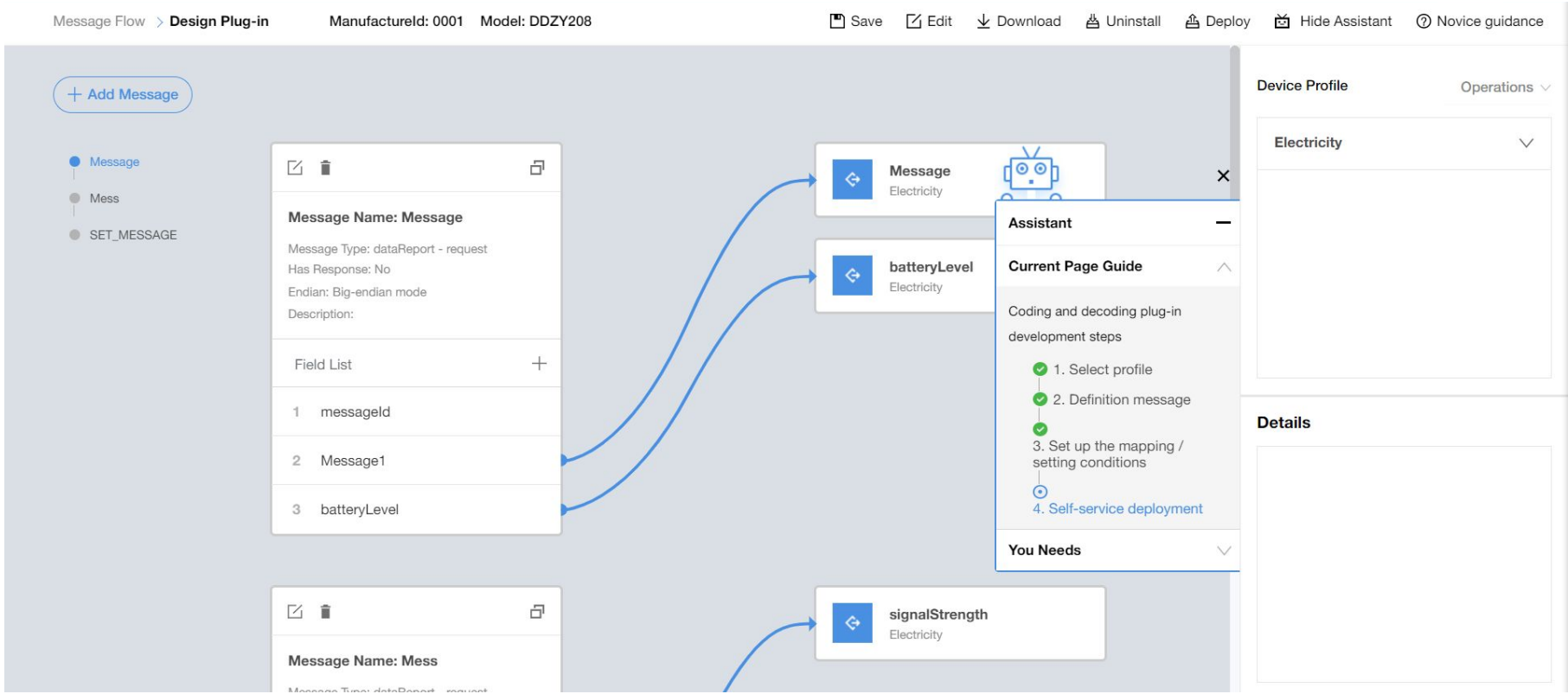
Huawei - OceanConnect

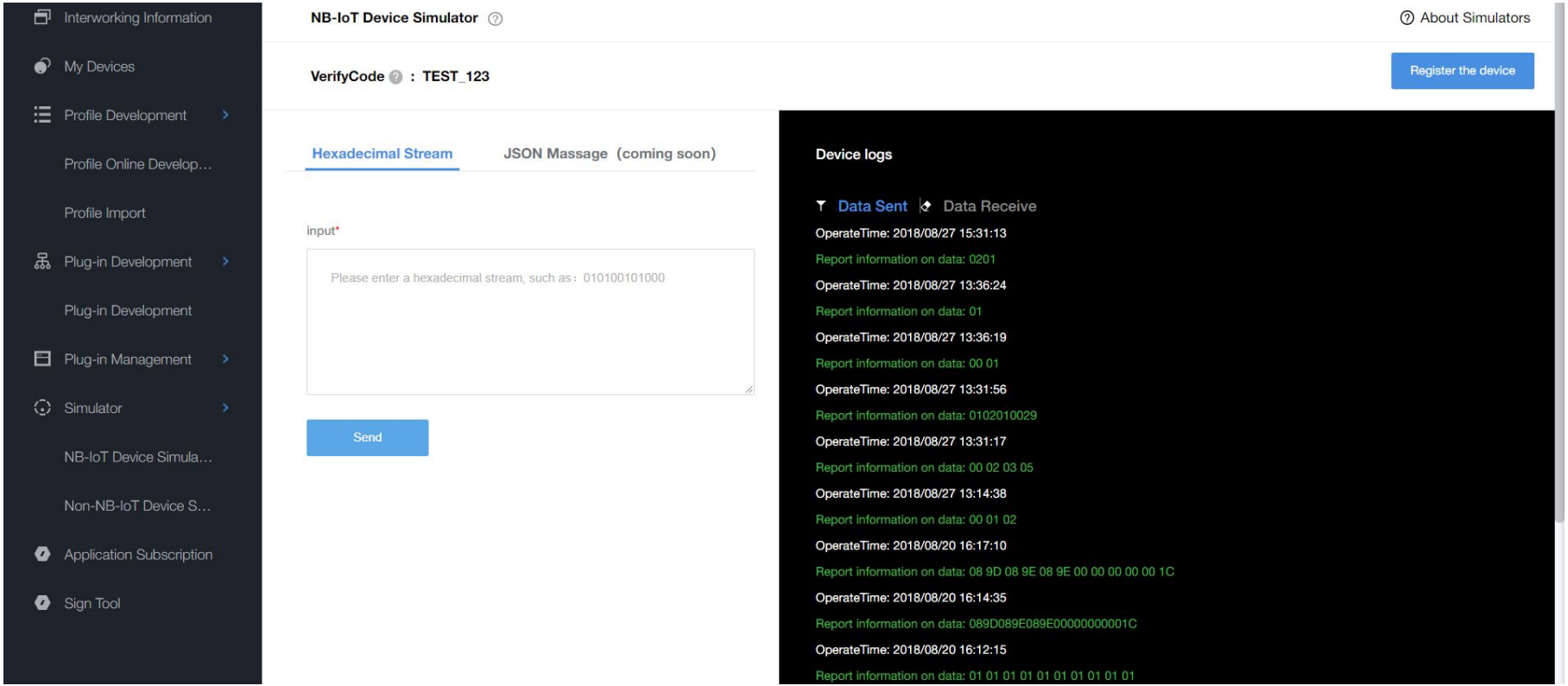


- Criar conta na huawei
- Acessar o link https://bit.ly/2NMano0
- Solicitar acesso a Ocean Connect
- As credenciais são enviadas por email

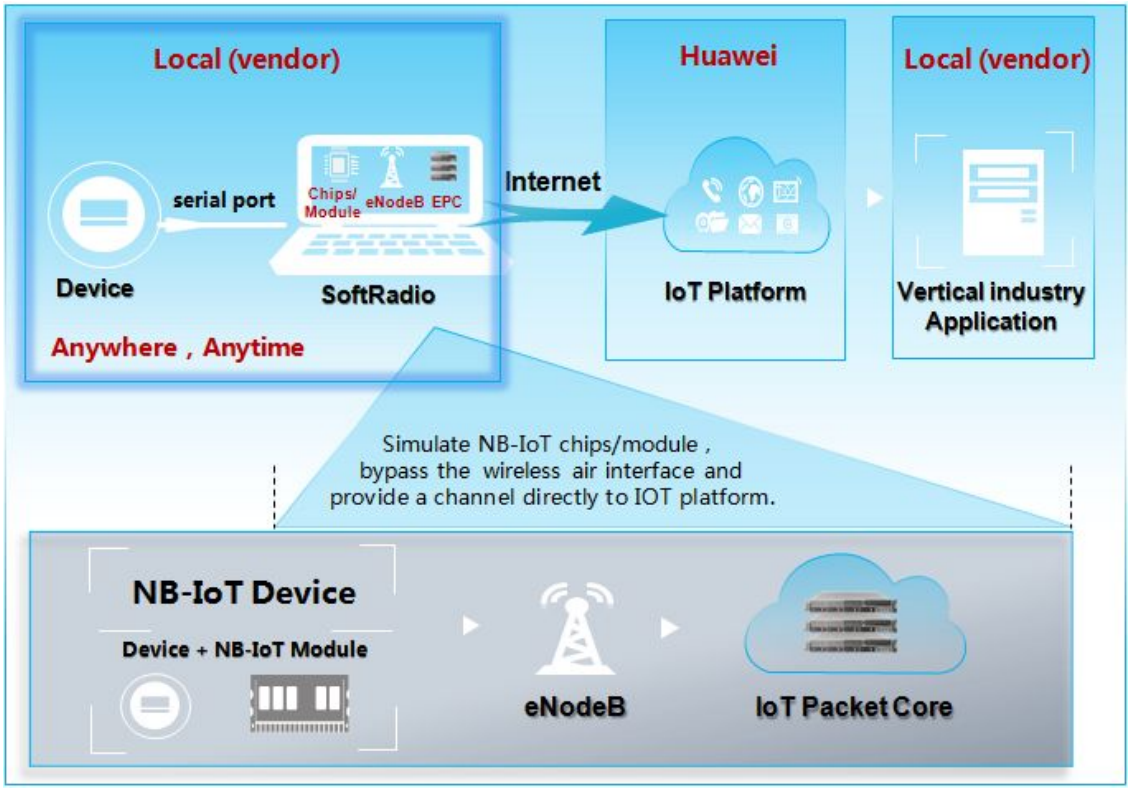

Não seguro | https://139.159.139.219:8093/#/pages/app/list
OceanConnect
Current Application : Electricity [No push certificate]
Document center
Interworking Information
My Devices
Profile Development
Plug-in Development
Plug-in Management
Simulator
Application Subscription
Sign Tool
Basic Information
Application details
Main Information
Application Name
Electricity
Application ID
Create Time
2018/08/27 13:28:48
Application Description
null
Application Security
Application Key
Reset
Push Certificate
No push certificate
Upload
Access Information
Access Method
NB-IoT Access
Device Address
Encrypted Address:
139.159.140.34:5684(CoAPS/DTLS)
Unencrypted Address:
139.159.140.34:5683(CoAP/UDP)
Application Address
139.159.133.59:8743(HTTPS)
Industry Information
Industry
Utilities (NB-IoT)
Application Ability
Rule Engine
Historical data storage days:
7 day


Não seguro | https://139.159.139.219:8093/#/pages/device-management/devices
OceanConnect
Current Application : 85999552529 [No push certificate]
Document center
Interworking Information
My Devices
Profile Development
Plug-in Development
Plug-in Management
Simulator
Application Subscription
Sign Tool
My Devices
Novice Guidance
Register Device
About Simulators
Filter By Device ID
Refresh
Status
Device Name
Device ID
Device Type
Manufacture Name
Device Model
Safety Device
Not Bind
8c6d0157-6a51-48e1-ab8f-000e2f991b0b
No
Offline
TEST_123
4bd244ab-4fa8-470f-85f2-e468ea06c93e
ElectricityMeter
HEX
DDZY208
No
Not Bind
af2f8d0f-b346-4f19-a772-800cc4cdf481
ElectricityMeter
HEX
DDZY208
No
Offline
TEST_863703031025203
9fba790f-c1e8-41fc-8eb4-b5bd2bb30404
ElectricityMeter
HEX
DDZY208
No
Page size: 10
Jump to: 0
Total count: 4
OceanConnect
Current Application : 85999552529 [No push certificate]
Document center
Interworking Information
My Devices
Profile Development
Profile Online Develop...
Profile Import
Plug-in Development
Plug-in Development
My Devices > Details
Details
HistoryData
Device Log
History Command
Refresh
ServiceType
Data
Time
This shows the historical data reported
Page size: 10
Jump to: 0
Total count:


Message Flow
Design Plug-in
ManufactureId: 0001
Model: DDZY208
Save
Edit
Download
Uninstall
Deploy
Hide Assistant
Novice guidance
Add Message
Message
Mess
SET_MESSAGE
Message Name: Message
Message Type: dataReport - request
Has Response: No
Endian: Big-endian mode
Description:
Field List
1 messageId
2 Message1
3 batteryLevel
Message
Electricity
batteryLevel
Electricity
Assistant
Current Page Guide
Coding and decoding plug-in development steps
1. Select profile
2. Definition message
3. Set up the mapping / setting conditions
4. Self-service deployment
You Needs
Message Name: Mess
signalStrength
Electricity
Device Profile
Operations
Electricity
Details


Interworking Information
My Devices
Profile Development
Profile Online Develop...
Profile Import
Plug-in Development
Plug-in Development
Plug-in Management
Simulator
NB-IoT Device Simula...
Non-NB-IoT Device S...
Application Subscription
Sign Tool
NB-IoT Device Simulator
About Simulators
VerifyCode : TEST_123
Register the device
Hexadecimal Stream
JSON Massage (coming soon)
input*
Please enter a hexadecimal stream, such as: 010100101000
Send
Device logs
Data Sent
Data Receive
OperateTime: 2018/08/27 15:31:13
Report information on data: 0201
OperateTime: 2018/08/27 13:36:24
Report information on data: 01
OperateTime: 2018/08/27 13:36:19
Report information on data: 00 01
OperateTime: 2018/08/27 13:31:56
Report information on data: 0102010029
OperateTime: 2018/08/27 13:31:17
Report information on data: 00 02 03 05
OperateTime: 2018/08/27 13:14:38
Report information on data: 00 01 02
OperateTime: 2018/08/20 16:17:10
Report information on data: 08 9D 08 9E 08 9E 00 00 00 00 00 1C
OperateTime: 2018/08/20 16:14:35
Report information on data: 089D089E089E00000000001C
OperateTime: 2018/08/20 16:12:15
Report information on data: 01 01 01 01 01 01 01 01 01 01

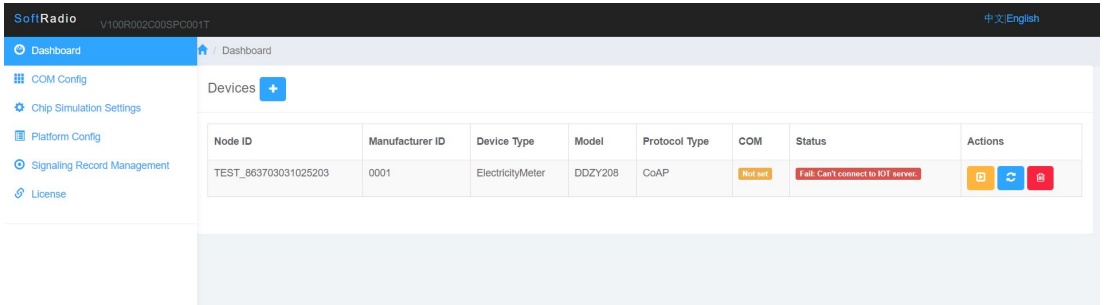
Huawei - SoftRadio



https://developer.huawei.com/ict/en/site-iot/article/softradio

- Simula o Device NB-IoT
- Comunica com a OC
- Recebe mensagens do front

Huawei - SoftRadio



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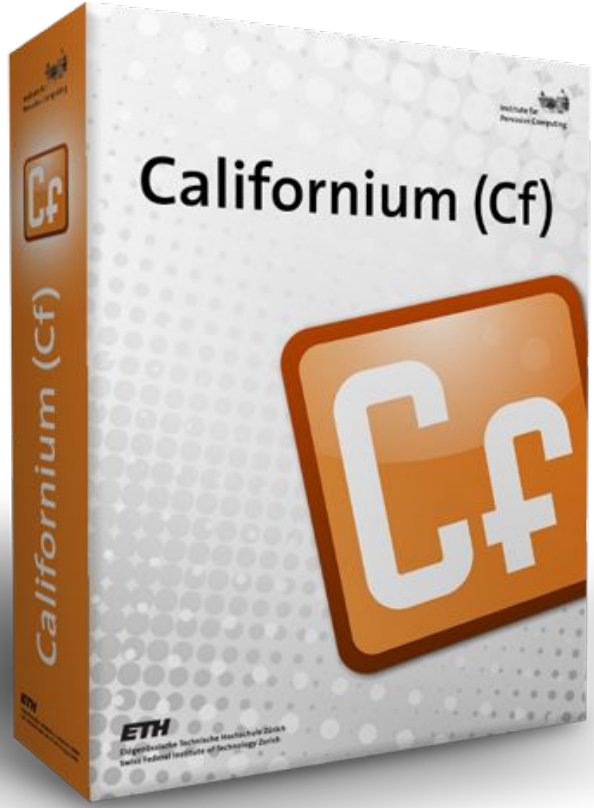

Alternativas...

- O protocolo utilizado deve ser CoAP
  - O protocolo de aplicação restrita (CoAP) é um protocolo de transferência da Web especializado para uso com nós restritos e redes restritas na Internet das Coisas.

- Californium CoAP Framework

  Java

Mais sobre NB-IoT com OC

e entire NB-IoT process(SoftRadio) [Copy the link]

逆光飞翔 Moderator H Released on 2018-3-6 09:39:33 View the author 1#

Latest reply: 2018-04-10 23:17:59 4069 23

For most NB-IoT developers, before development, you can experienceNB-IoT data report and command Delivery process which will be helpful to understand NB-IoTsolutions.
This article will guide the developers to use the existing Demo toquickly experience the entire NB-IoT process by SoftRadio.

1 Prepare Resources

1.1 Platform Resources

There are two ways to apply for IoT platform resources:
1. Apply to join the IoT solution partner plan. You will receive the access to IoT platform resources in the approval opinion after the application is approved. Please download the following MAR cooperation user guide: http://developer.huawei.com/ilink/esdk/download/HW_484969
2. Reserve OceanConnect environment of Huawei RemoteLab.http://esdkremotelab.huawei.com/RM/Topology?c=f45f1c52-cf10-4a90-82fe-2f40f4666702

1.2 SoftRadio

SoftRadio can simulate module + eNodeBs + core network. The website for downloading the SoftRadio software (including the SoftRadio installation package and SoftRadio User Guide) on the HUAWEI DEVELOPER is as follows:

https://developer.huawei.com/ict/forum/thread-48337.html

Perguntas?

Obrigada :)