



CONFERENCE & EXPO
JUNE 20 - 22, 2018
PORTLAND, OREGON

SUPPORTED BY
GLOBAL CITY
TEAMS CHALLENGE
NIST



FIWARE Action Cluster:

Protecting User Data in the Smart City scenario

Jose Gonzalez

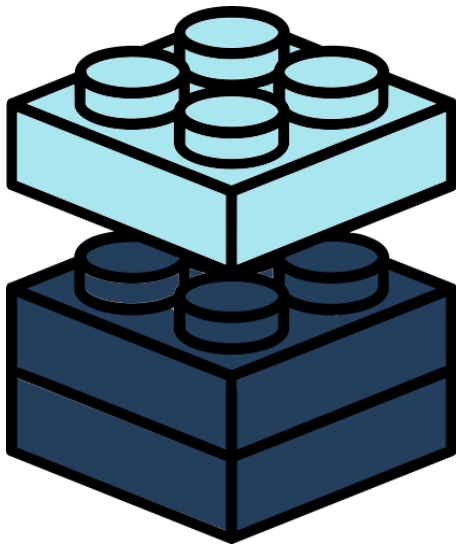
FIWARE International Growth Manager

jgonzalez@interinnov.eu



WHAT IS FIWARE?

FIWARE Service



Standard Interface (NGSI)

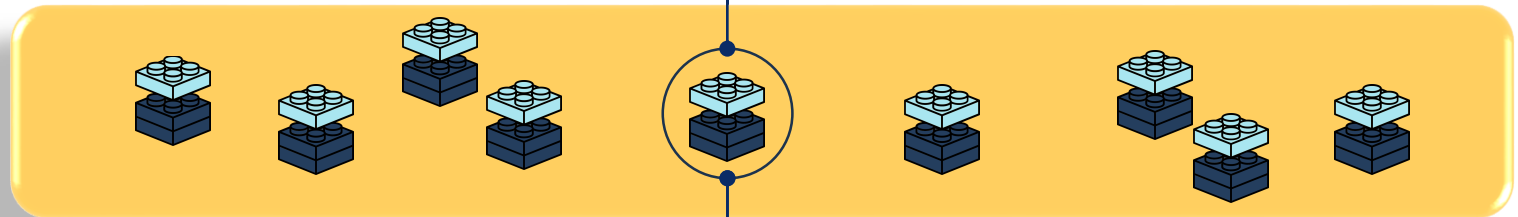
Open Source Technology



FIWARE Platform

42
Open Source
Services

Vertical
Markets



Modular

Interoperable





Action Cluster: Green Route – Mexico City

SMART 

 INFOTEC

 Tecnológico
de Monterrey

 hop
ubiquitous

ubiwhere
SUITING THE FUTURE

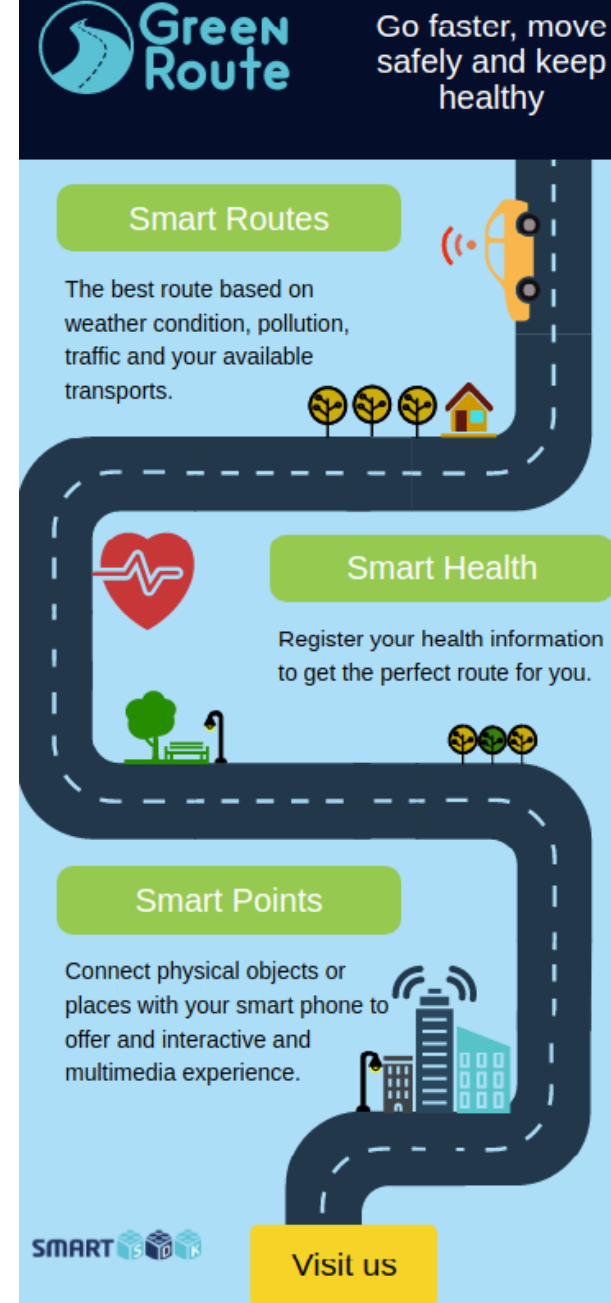
Green Route

MOTIVATION

- Support the mobility of citizens in high polluted cities, like Mexico City
- Improve quality of life and foster environmental friendly behaviors

GOAL

- Help the final user determine the best route to reach a destination
- Take into account the conditions and external factors




Green Route
Go faster, move safely and keep healthy

Smart Routes
The best route based on weather condition, pollution, traffic and your available transports.

Smart Health
Register your health information to get the perfect route for you.

Smart Points
Connect physical objects or places with your smart phone to offer an interactive and multimedia experience.

SMART 

Visit us

The infographic features a winding road path that connects three main sections. The top section, 'Smart Routes', shows a yellow car on a road with icons for weather, pollution, and traffic. The middle section, 'Smart Health', features a red heart with a pulse line and a park bench. The bottom section, 'Smart Points', shows a city skyline with a smartphone icon. The overall design is clean and modern with a light blue background and green accents.

Overview

Smart Cities

396+ Blanca Vázquez

- Home
- Alerts
- My Events
- Groups
- Plan your trip
- Create alert

Trip Options

Start: (19.41997, -99.16054)
End: (19.39536, -99.12003)

Depart: 6:34pm 07/12/2017 Now

Travel by: Transit

Maximum walk: 750.0(m. Presets:

Preferred Routes: (None) Edit...

Weight:

Banned routes: (None) Edit...

Wheelchair accesible trip:

Plan Your Trip

Air Quality Parameters		
Parameter	Value	AQI
Temperature (T):	19 °C	-
Relative Humidity (RH):	65 %	-
Particle Pollution (PM10):	nr µ	NaN
Sulfur Dioxide (SO2):	3 PPB	4
Nitrogen Dioxide (NO2):	44 PPB	41
Ozone (O3):	39 PPB	31
Carbon Monoxide (CO):	1.0 PPM	11

Health Concerns:
Air quality is considered satisfactory, and air pollution poses little or no risk.

Route Planning

- Home
- Plan my trip
- Earthquake information
- Subscription to Groups
- Alerts
 - Generate alerts
 - Show my alerts
 - Show all alerts
- Statistics

Directions

Oriente 101, Ángel Albino Corzo, Ampliación Mártires de Río Blanco, Gt

Lázaro Cárdenas, Guerrero, Mexico City, Cuauhtémoc, Mexico City, 063

Depart at

Date: 12/13/2017 02 : 23

Max Walking (meters): 1000

Mode: Transit

- Transit
- Bicycle Only
- Bicycle & Transit
- Walk Only
- Drive Only

Calculate

Itineraries Found

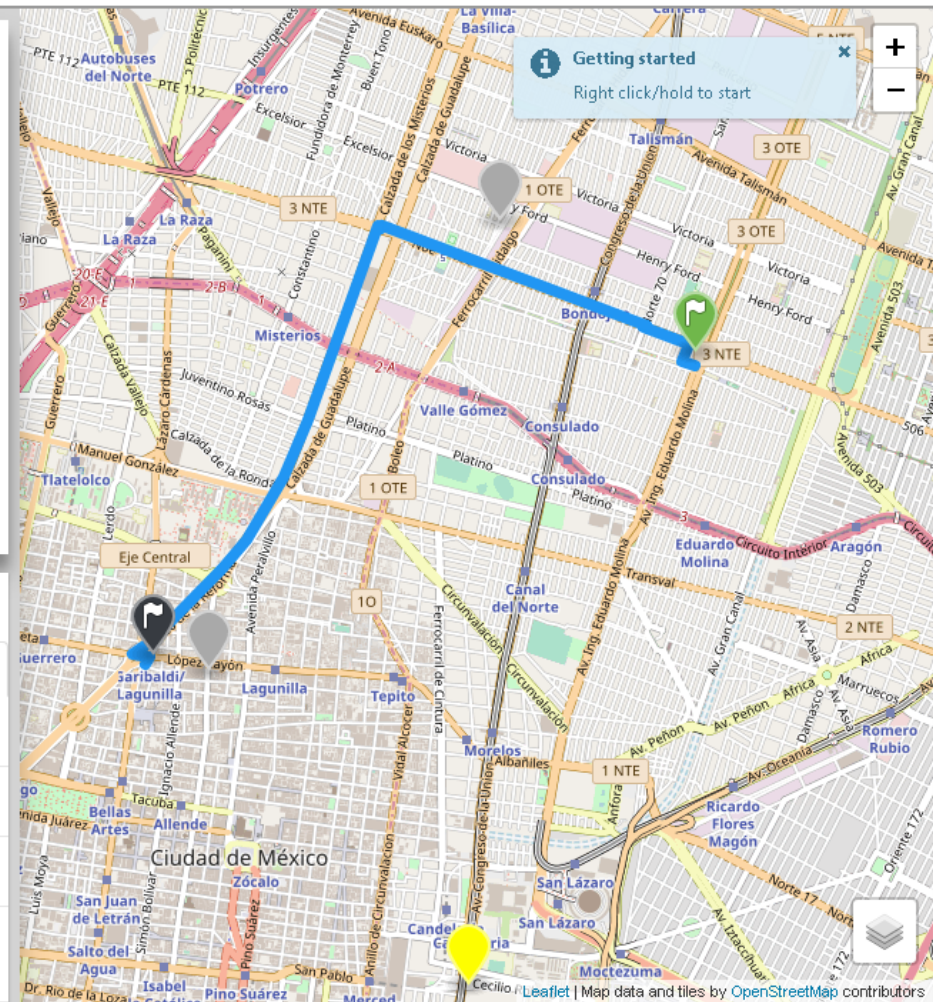
Itinerary

Walk 535 m (6 min)

RTP: Aragón - Panteón San Isidro (Noche Bus)

Walk 25 m (0 min)

RTP: Centro Comercial Santa Fe - La Villa/Cantera por Palmas (Noche Bus)



Route Planning: Car + Bike

- Home
- Plan my trip
- Earthquake information
- Subscription to Groups
- Alerts
- Generate alerts
- Show my alerts
- Show all alerts
- Statistics

Directions

Elektra, Telurio, Valle Gómez, Mexico City, Cuauhtémoc, Mexico City, 06

Moras, Centro Urbano Presidente Alemán, Benito Juárez, Mexico City, 0

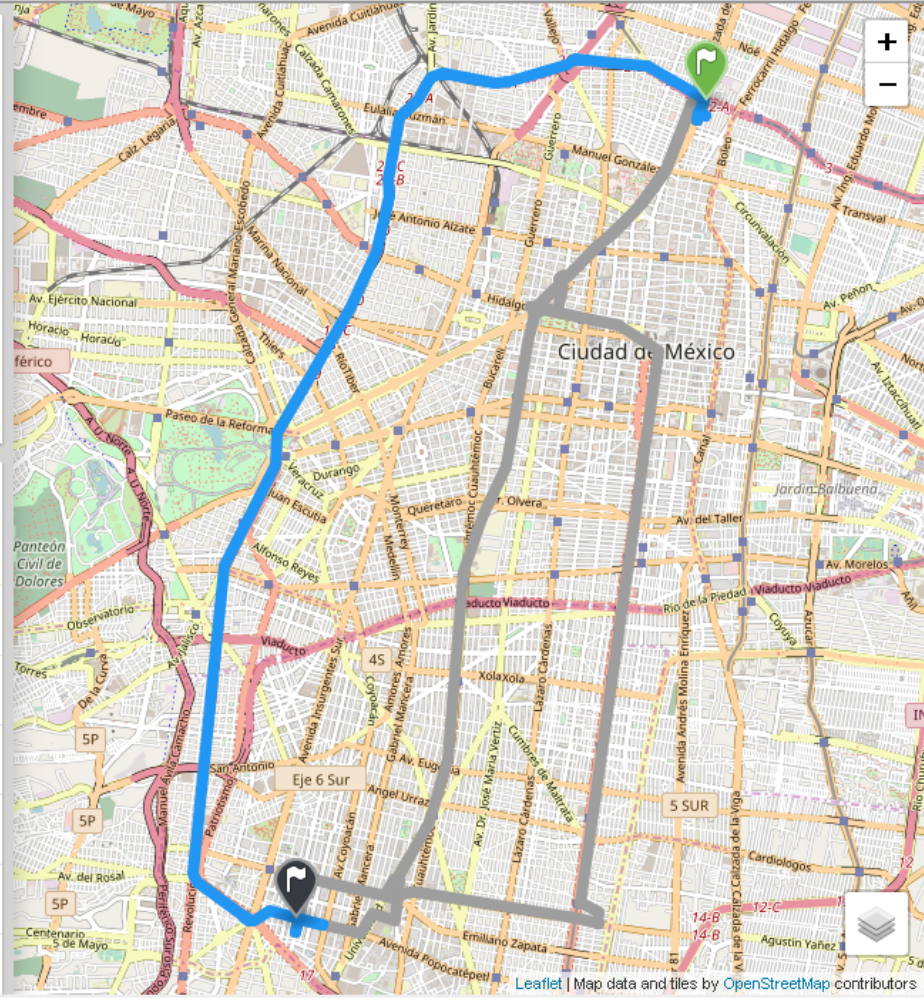
Leave Now Options

Max Walking (meters): 10 Mode: Bicycle & Transit

Calculate

Itineraries Found

Itinerary 1	Itinerary 2	Itinerary 3
Bicycle 80 m (0 min)		
Walk 81 m (0 min)		
RTP: Reclusorio Norte - Metro Hidalgo/Alameda Central		
Walk 444 m (5 min)		
RTP: Circuito Bicentenario (Noche Bus)		
Walk 56 m (0 min)		



Health Profile

Smart Cities

303650

Hugo Estrada

Home

Plan my trip

Earthquake information

Subscription to Groups

Alerts

Generate alerts

Show my alerts

Show all alerts

Statistics

Health profile

Register / Edit health data (Data marked with * are required)

The objective of Green Route is to help the final user to determine the best route to follow to reach a destination, taking into account your health condition. Please, we invite you to indicate your current health status, this information will be used to generate a route according you health condition.

Health state

Asthma

Asthma level



- Severe persistent asthma
 - Symptoms of a cough, wheeze, chest tightness or difficulty breathing continuously.
 - Severely limit daily physical activities
 - Nighttime symptoms frequently
- Moderate persistent asthma
- Mild persistent asthma
- Mild intermittent asthma

Cancel

Save

Health Profile

Smart Cities

303690

Hugo Estrada

Home

Plan my trip

Earthquake information

Subscription to Groups

Alerts



Generate alerts

Show my alerts

Show all alerts

Statistics

Health profile

Register / Edit health data (Data marked with * are required)

The objective of Green Route is to help the final user to determine the best route to follow to reach a destination, taking into account your health condition. Please, we invite you to indicate your current health status, this information will be used to generate a route according you health condition.

Health state

Asthma

Asthma level



- Severe persistent asthma
- Moderate persistent asthma
- Mild persistent asthma
- Mild intermittent asthma
 - Symptoms of a cough, wheeze, chest tightness or difficulty breathing less than twice a week
 - Do not interfere with normal activities
 - Nighttime symptoms less than twice a month

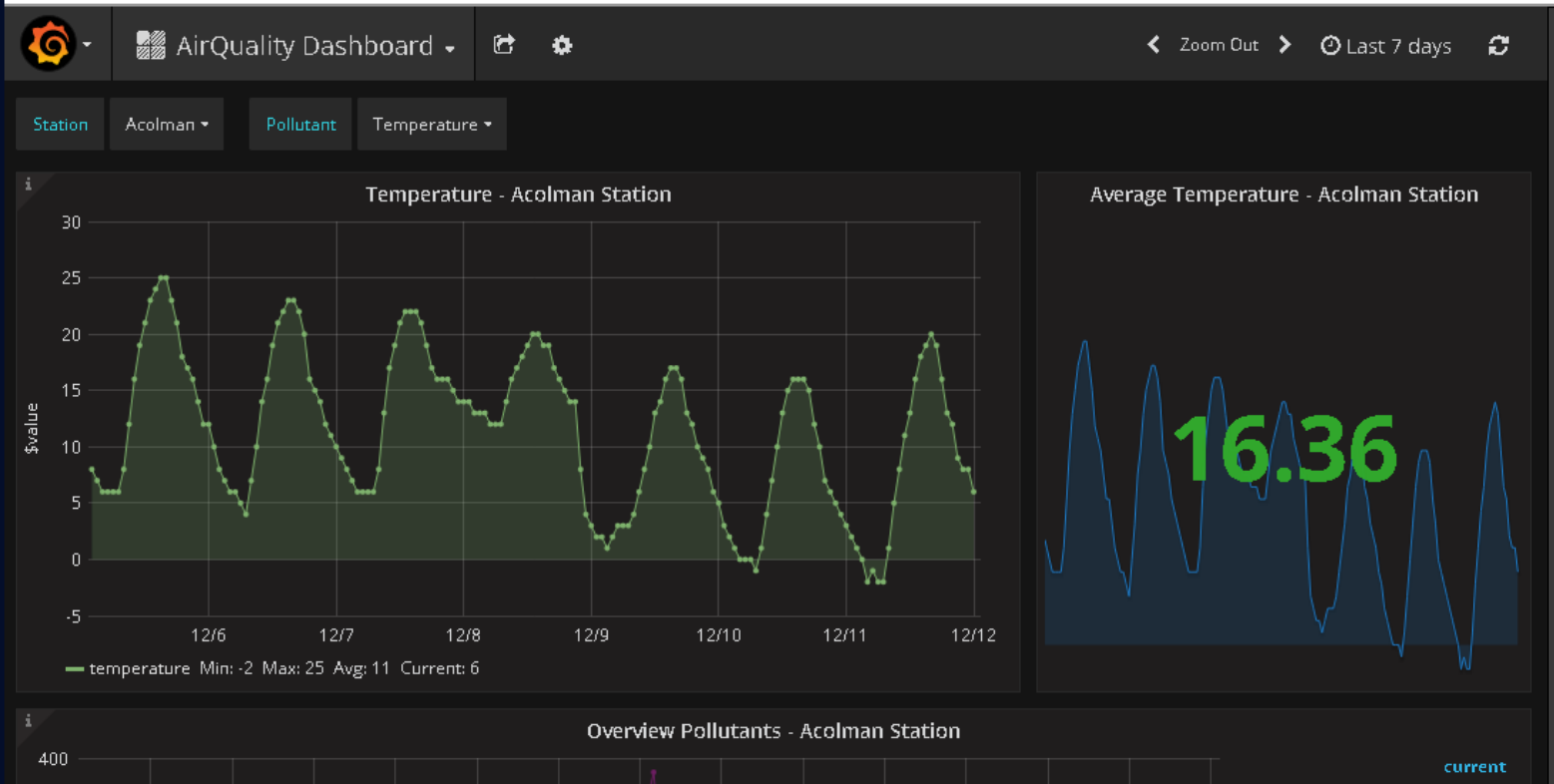
Cancel

Save

- Home
- Plan my trip
- Earthquake information
- Subscription to Groups
- Alerts
- Statistics

Statistics - Historical Data

Display a complete visualization of historical data collected by 47 Air Quality stations distributed along Mexico City since January 2017. Review the behaviour of Air Quality conditions as a time-series sequence according to a specific pollutant, station and an overview of the chosen pollutant across all the stations.



Trials

University Campus

- 30+ Routes
- 22 Geographical Zones

Public Transport

- Smart Spots in 5+ Bus Routes
- Environmental data
- User mobility
- Usage



DATA ENCRYPTION

Encryption in Smart Apps

- Data must be secured and encrypted to ensure privacy
 - Routes
 - Location
 - Personal health data
- **Developers** require an encryption layer on their smart apps
- **Users** demand a secure method to store and use their data

NGSI Encryption

MOTIVATION

Provide a FIWARE service capable to encrypt sensitive information shared and stored in NGSI format

NGSI Encryption

APPROACH

A step-by-step GUI to encrypt/decrypt data

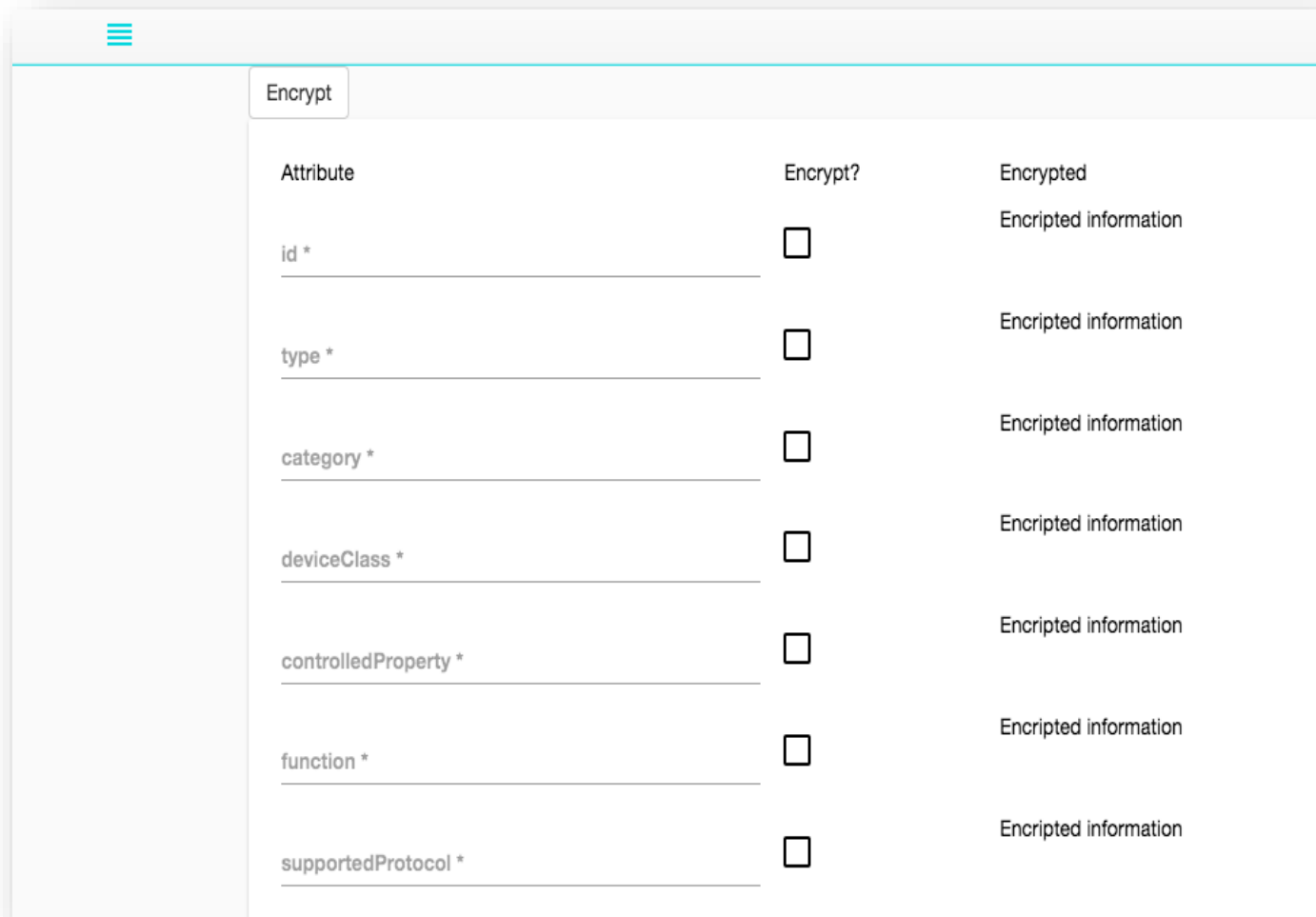


NGSI Encryption

- Tied to available data models
 - Weather
 - Parking
 - Waste Management
 - Indicators
- API Form based on REST services
 - Implementing a POST method with a predefined structure
 - Encrypts attributes in a JSON file
- Anonymization techniques to preserve privacy while using useful data for statistical analysis



NGSI Encryption



The screenshot shows a web interface with a menu icon in the top left and a tab labeled 'Encrypt'. Below the tab is a table with three columns: 'Attribute', 'Encrypt?', and 'Encrypted'. The table lists several attributes, each with a checkbox in the 'Encrypt?' column and the text 'Encrypted information' in the 'Encrypted' column.

Attribute	Encrypt?	Encrypted
<u>id *</u>	<input type="checkbox"/>	Encrypted information
<u>type *</u>	<input type="checkbox"/>	Encrypted information
<u>category *</u>	<input type="checkbox"/>	Encrypted information
<u>deviceClass *</u>	<input type="checkbox"/>	Encrypted information
<u>controlledProperty *</u>	<input type="checkbox"/>	Encrypted information
<u>function *</u>	<input type="checkbox"/>	Encrypted information
<u>supportedProtocol *</u>	<input type="checkbox"/>	Encrypted information

NGSI Encryption

- *Encryption method*
 - Base64. Encoding method for representing data using printable characters
 - Reverse. Encryption method based on string manipulation
- *Attribute*. Each corresponding attribute is listed and can be modified
- *Encrypt checkbox*. The user can select whether the attribute is encrypted or not
- *Encrypted*. Represents the encrypted value of the corresponding attribute

NGSI Encryption

JSON generated

```
1
2 {
3   "model" :
4     {
5       "id": "Alert:1",
6       "type": "Alert",
7       "alertType": "Weather condition",
8       "eventObserved": "Heat wave",
9       "location": {
10        "type": "feature",
11        "coordinates": [-3.712247222222222, 40.423852777777775]
12      },
13       "dateTime": "2017-01-02T09:25:55.00Z",
14       "description": "Extreme danger: heat stroke is imminent.",
15       "refuser": "",
16       "refDevice": "Device1"
17     },
18   "attributes": {"1": "0", "2": "0", "3": "0", "4": "0", "5": "1", "6": "0", "7": "0", "8": "0", "9": "1"},
19   "method": "sum"
20 }
21
```



FIWARE
CAN
MAKE IT
EASY

Jose Gonzalez

FIWARE International Growth Manager

jgonzalez@interinnov.eu