

# Internet of Things

Concrete experiences on Liferay Platform

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Human

Editorial   Collaboration   Social

Enterprise

Vertical   Legacy

M2M

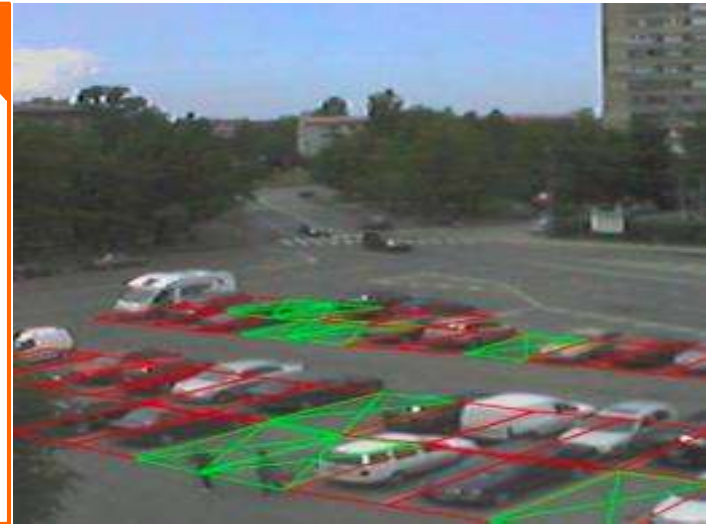
Device   .... 50B in 2020 !!

# PARKING & ASSET MANAGEMENT

## Application:

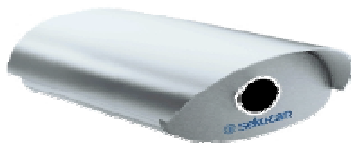
The customer, an Italian municipality, was looking for a way to improve the customer experience with regards to finding free parking slots in the cities car parks.

In order to get a constant “real-time” view on where, how many parking slots are available in the cities open space car parks, an intelligent video camera solution was requested.



## Product:

**SekuCAM**  
Smart Camera System



**HW / SW**  
Development  
Services

## Key Success Factors:

- ③ Rugged design
- ③ Easy configuration
- ③ SW Application available
- ③ Cloud client for easy integration in other applications

# PEOPLE FLOW

## Application:

In order to monitor, analyze, visualize and manage people flows and correlate that information with environmental monitoring data (air quality, electro-magnetical emissions) some of the largest Software conferences in the world, deployed a people counting solution and environmental sensors at the conference venue.



## Product:

**ReliaGATE 50-21 with  
PCN-1000 &  
ReliaSENS 18-12**



**ESF  
EC  
Dashboards by  
partners**

## Key Success Factors:

- ③ PCN features & technology (e.g. stereoscopic vision)
- ③ Complete set of M2M building blocks offered
- ③ Java centric development of device application
- ③ Effective integration into BIRT
- ③ Complete end-to-end solution with Actuate team, competence and products
- ③ Flexible and competent project team

# THERMO DEVICE

## Application:

The Customer required a solution for

- a) **end users to remote control** their own thermo-devices;
- b) for **technical assistance operators** to perform **remote diagnostics**;
- c) for **R&D, Service, Marketing departments of the Customer** to **develop & sell new products and services**.



- WebAppl
- MobAppls
- Dashboards



## Key Success Factors:

- ③ service-oriented business model
- ③ cost effectiveness
- ③ Real time data for all actors
- ③ ad-hoc solutions
- ③ worldwide footprint

# CASE: FUEL FEED





[www.smc.it](http://www.smc.it)

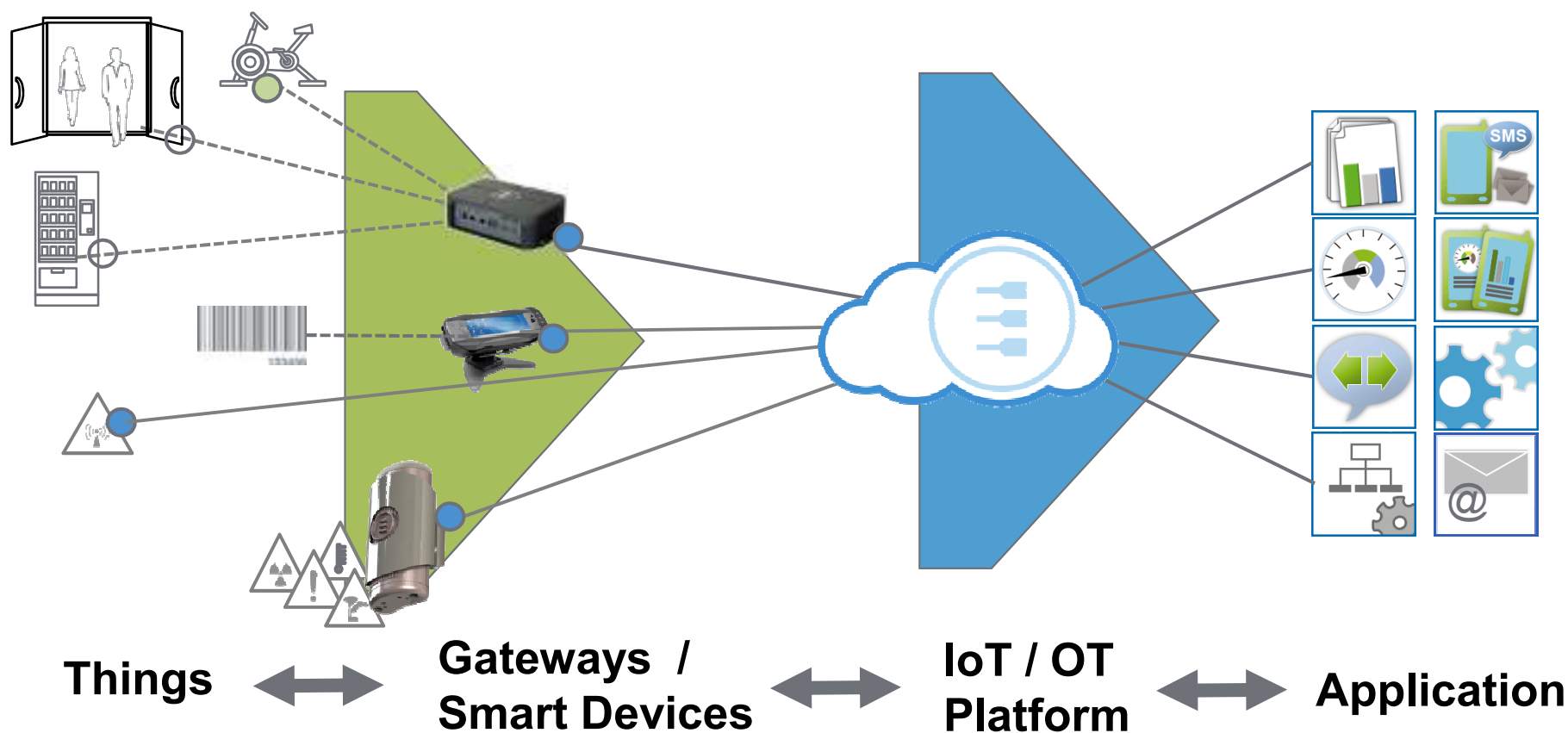
**LIFERAY**  
SYMPOSIUM 

LIFERAY

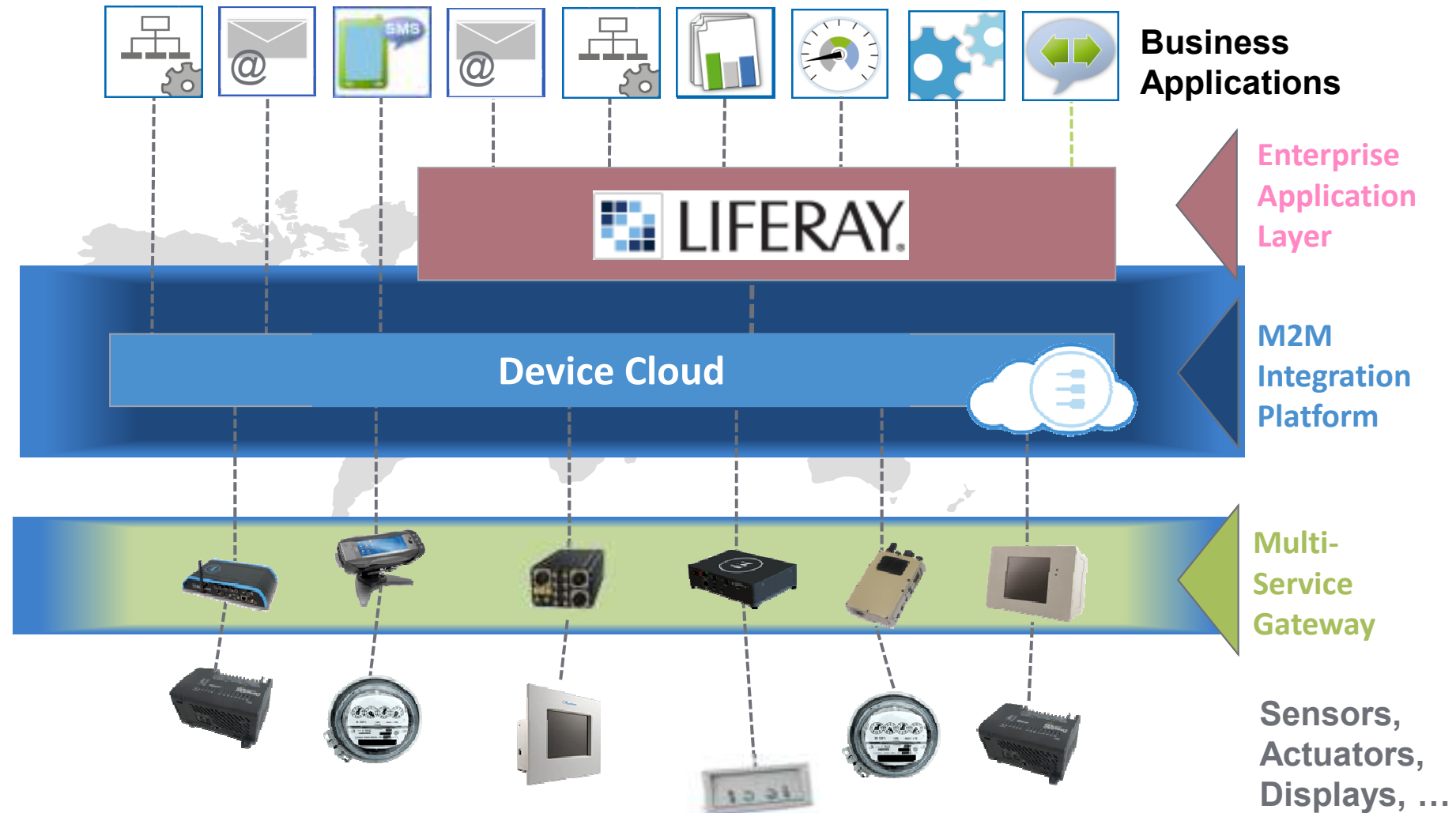
Un'unica  
Piattaforma Tecnologica



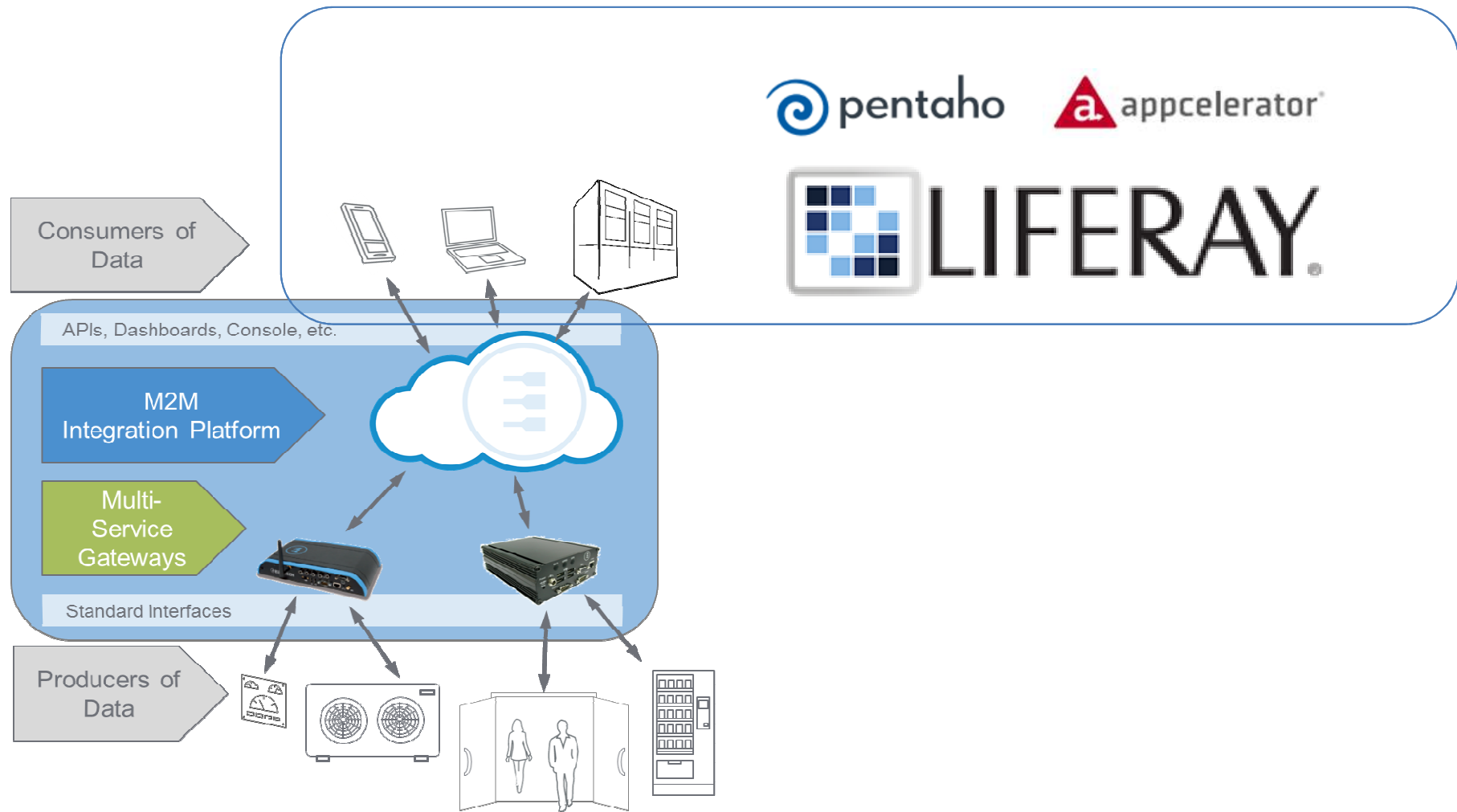
# ANATOMIA DI UNA SOLUZIONE IOT



# ENTERPRISE APPLICATION LAYER



# ENTERPRISE APPLICATION LAYER



IL CASUS

Monitoraggio Ambientale

# Environmental Monitoring

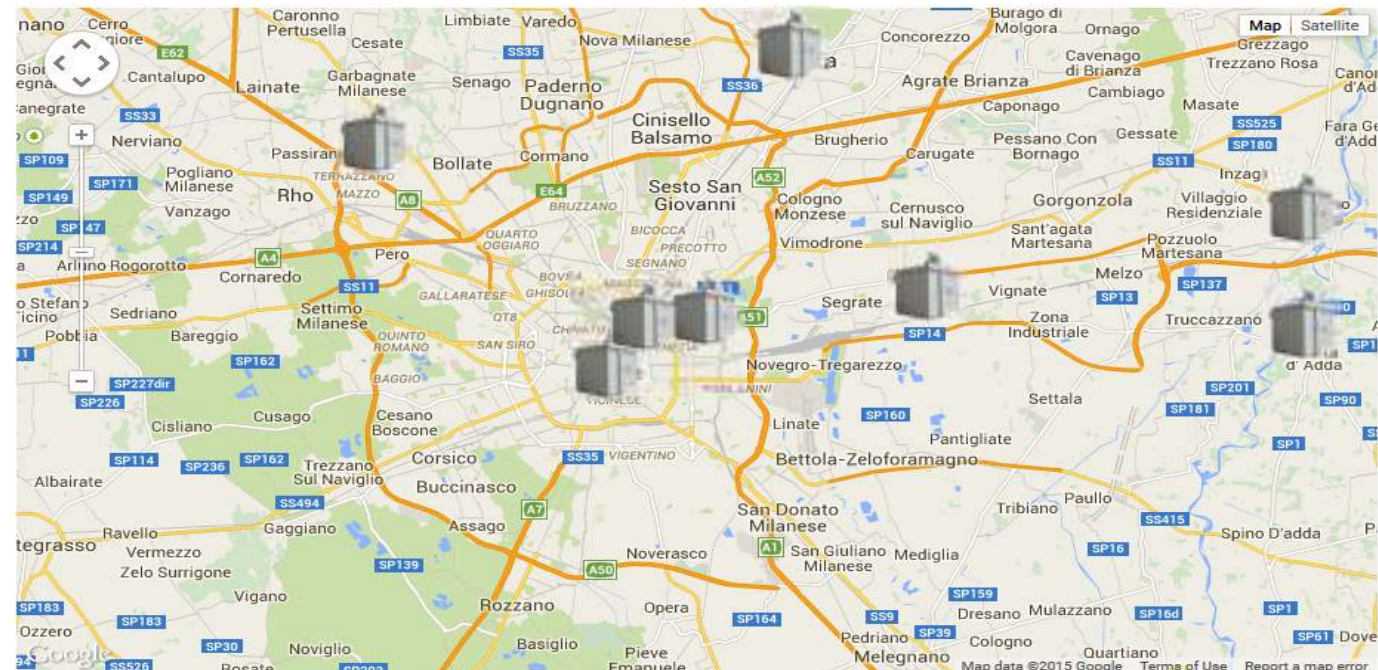


Reference System

Milan:

Population: 1.336.364

Surface: 181,67 km<sup>2</sup>



Reference systems: 8

1 reference system every 167,045 persons

Estimated equivalent budget

- Upfront: 1.600.000 EUR
- Yearly Maintenance: 1.600.000 EUR

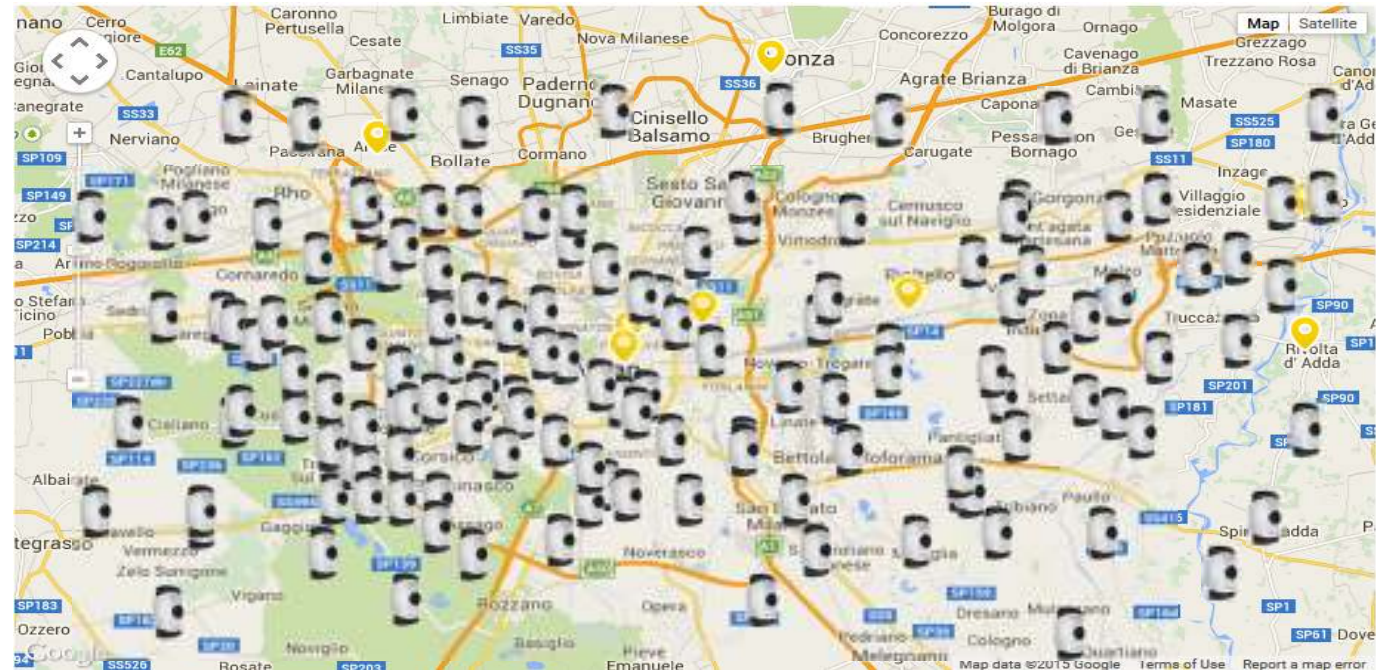


# Environmental Monitoring



*Indicative System*

Milan:  
Population: 1.336.364  
Surface: 181,67 km<sup>2</sup>



Reference systems: 8  
1 reference system every 167,045 persons

Estimated equivalent budget

- Upfront: 1.600.000 EUR
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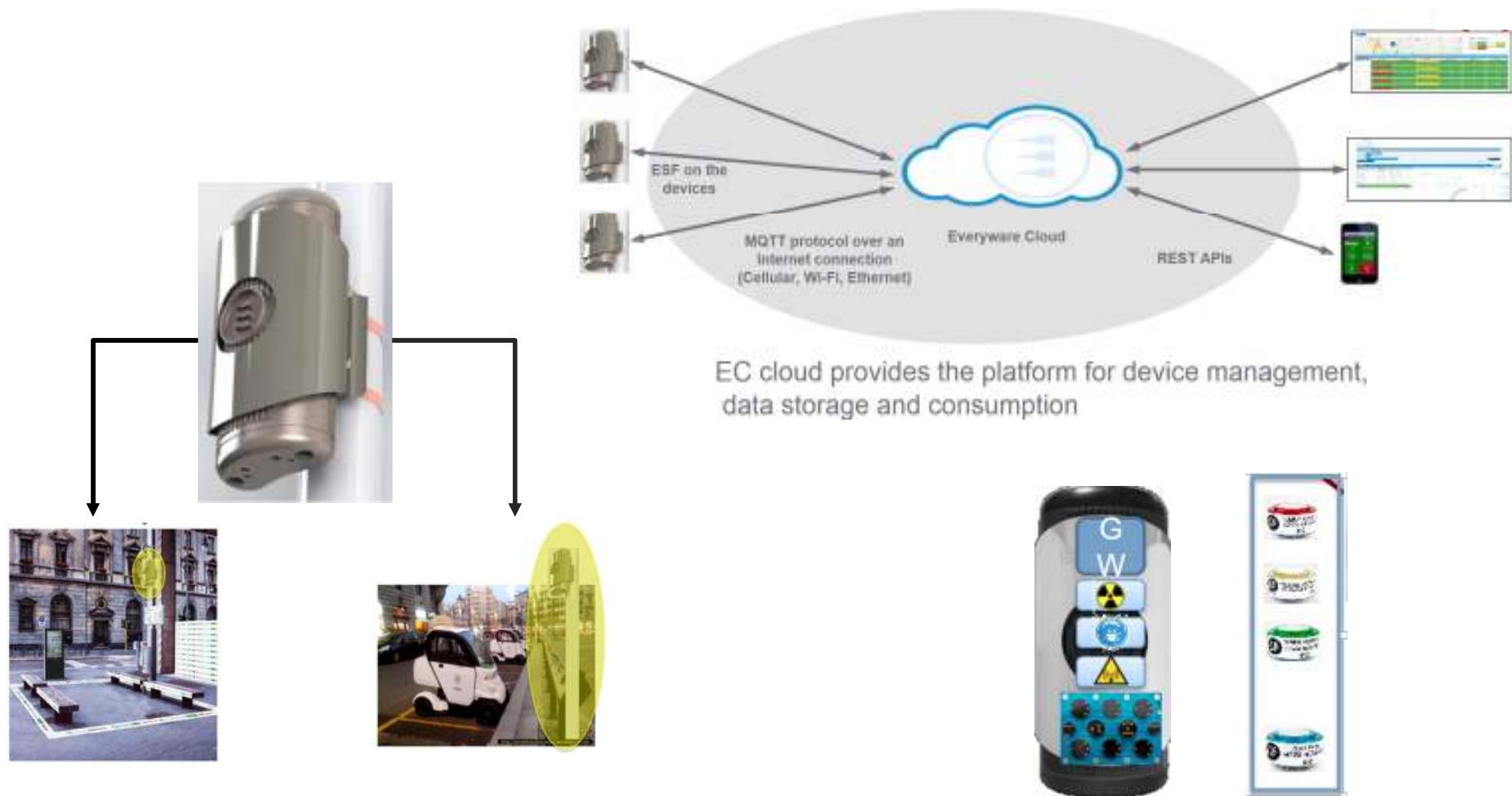
142 ReliaSENS systems  
1 reference system every 9,411 persons

Estimated equivalent budget

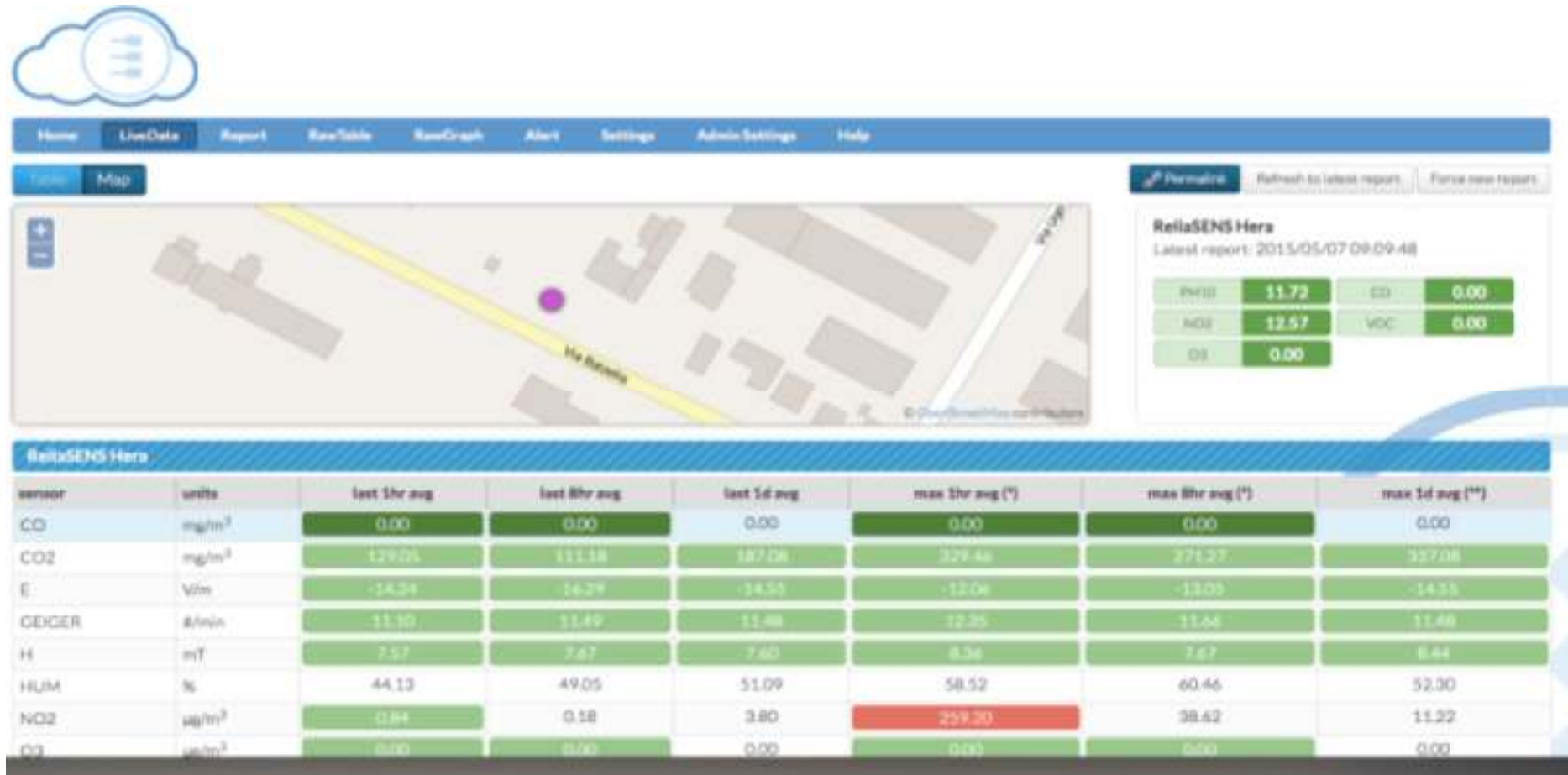
- Upfront: 1.600.000 EUR
- Yearly maintenance: 213.000 EUR



# RELIANSENS



# LIFERAY – APPLICATION LAYER



# LIFERAY – APPLICATION LAYER

## Live data

Table Map



ReliaSENS 18-13 (ETH Ltd)  
Latest report: 2015/10/05 16:05:52

PM10 $\mu\text{g}/\text{m}^3$	12.99	CO $\text{mg}/\text{m}^3$	0.77
NO2 $\mu\text{g}/\text{m}^3$	3.82	VOC ppb	0.10
O3 $\mu\text{g}/\text{m}^3$	0.00		

ReliaSENS 18-13 (ETH Ltd)							
sensor	units	last 1hr avg	last 8hr avg	last 1d avg	max 1hr avg (-)	max 8hr avg (-)	max 1d avg (-)
CO	$\text{mg}/\text{m}^3$	0.77	N.A.	N.A.	N.A.	N.A.	N.A.
CO2	$\text{mg}/\text{m}^3$	357.35	N.A.	N.A.	N.A.	N.A.	N.A.
DIAG_ATM		1444054010024.00	N.A.	N.A.	N.A.	N.A.	N.A.
EM_E	mT	304.30	N.A.	N.A.	N.A.	N.A.	N.A.
EM_H	dBV/m	-7.48	N.A.	N.A.	N.A.	N.A.	N.A.
GEIGER_C	count	8.57	N.A.	N.A.	N.A.	N.A.	N.A.
H2S	ppm	0.08	N.A.	N.A.	N.A.	N.A.	N.A.
NO	ppm	0.03	N.A.	N.A.	N.A.	N.A.	N.A.
NO2	$\mu\text{g}/\text{m}^3$	3.83	N.A.	N.A.	N.A.	N.A.	N.A.
O3	$\mu\text{g}/\text{m}^3$	0.00	N.A.	N.A.	N.A.	N.A.	N.A.
PM_1	$\mu\text{g}/\text{m}^3$	1.34	N.A.	N.A.	N.A.	N.A.	N.A.
PM_10	ppm	15.08	N.A.	N.A.	N.A.	N.A.	N.A.
PM_2.5	ppm	3.76	N.A.	N.A.	N.A.	N.A.	N.A.
SO2	ppm	0.23	N.A.	N.A.	N.A.	N.A.	N.A.

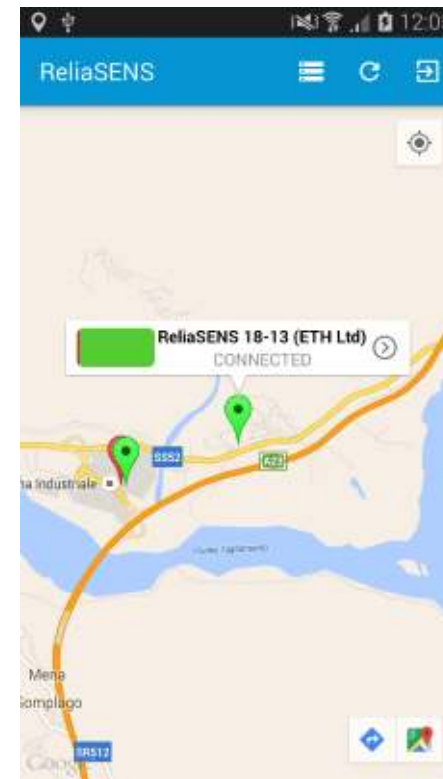
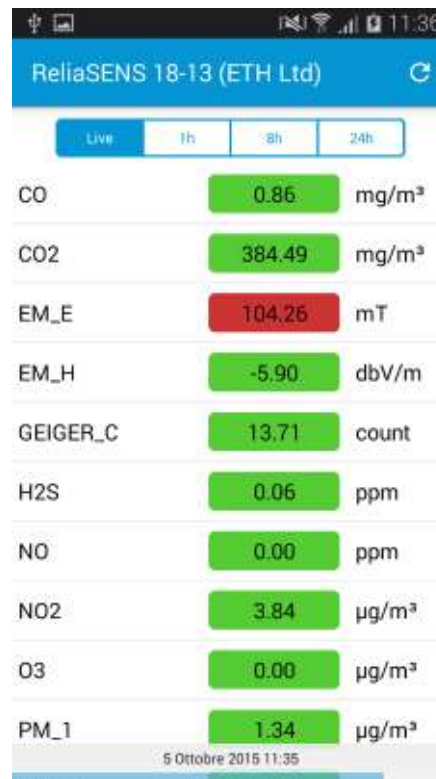
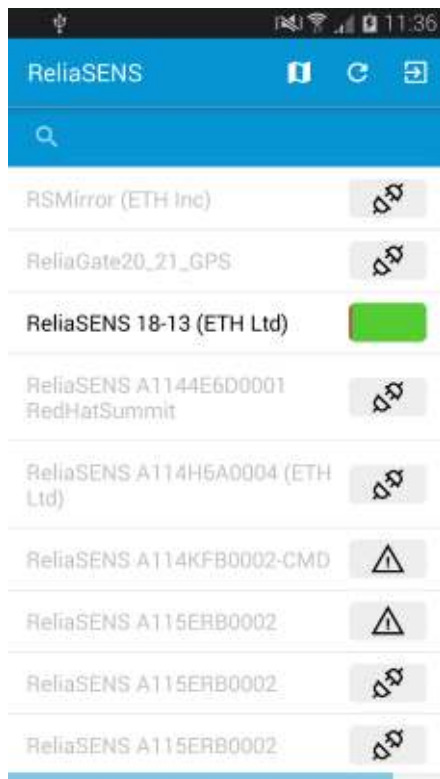
# LIFERAY – APPLICATION LAYER

## Live data

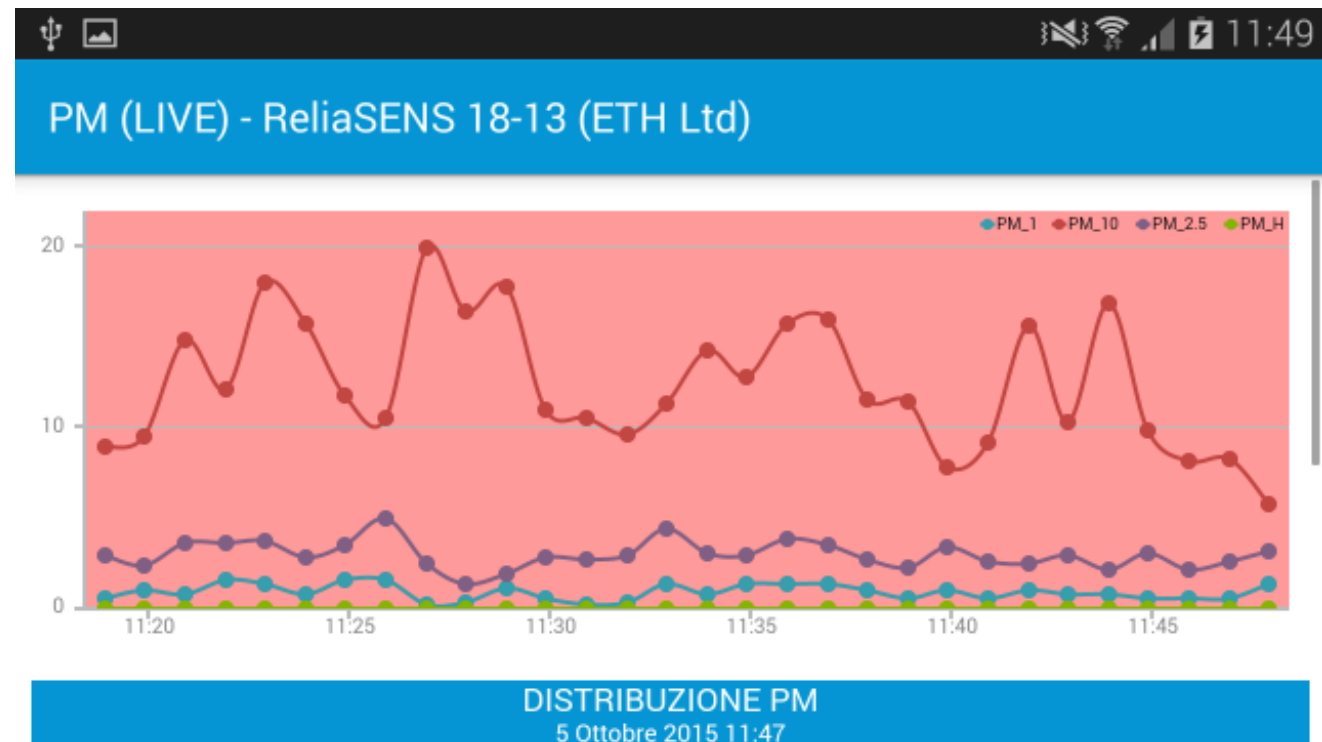
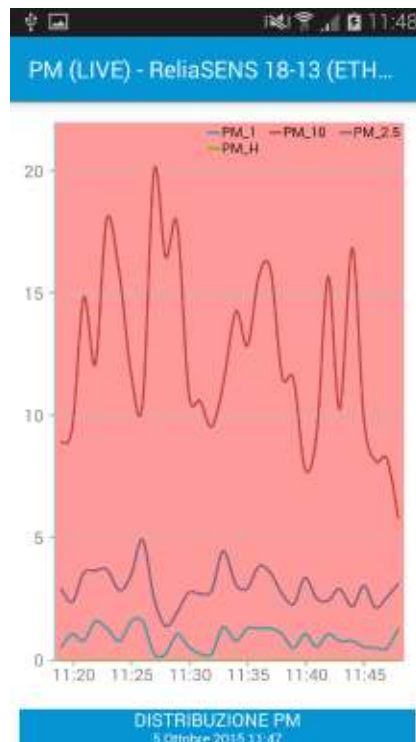
Table Map

device ▲	status ▼	PM10 $\mu\text{g}/\text{m}^3$ ▼	CO $\text{mg}/\text{m}^3$ ▼	NO2 $\mu\text{g}/\text{m}^3$ ▼	VOC ppb ▼	O3 $\mu\text{g}/\text{m}^3$ ▼
ReliaSENS 18-13 (ETH Ltd)	connected	12.99	0.77	3.82	0.10	0.00
ReliaSENS A1144E6D0001 RedHatSummit	disconnected	24.52	2.93	0.00	0.00	0.00
ReliaSENS A114H6A0004 (ETH Ltd)	disconnected	N.A.	N.A.	N.A.	N.A.	N.A.
ReliaSENS A114KFB0002-CMD	missing	N.A.	0.00	N.A.	N.A.	2504.20
ReliaSENS A115ERB0003	disconnected	N.A.	N.A.	N.A.	N.A.	N.A.
ReliaSENS Amaro	connected	10.50	0.00	21.05	0.00	6.00
ReliaSENS Arrow (Booth) A115AGB0002	missing	N.A.	N.A.	N.A.	N.A.	N.A.
ReliaSENS Arrow (Phoenix)	connected	0.15	0.00	0.00	0.00	0.00
ReliaSENS Arrow (Phoenix) A115AGB0001	missing	N.A.	N.A.	N.A.	N.A.	N.A.
ReliaSENS GoldenSample	disconnected	39406.64	1445.59	2826.48	1.80	2826.48
ReliaSENS Hera	disconnected	N.A.	N.A.	N.A.	N.A.	N.A.
ReliaSENS Lyon	connected	8.18	N.A.	N.A.	0.00	0.00
ReliaSENS MKT01014	missing	N.A.	N.A.	N.A.	N.A.	N.A.

# LIFERAY – APPLICATION LAYER

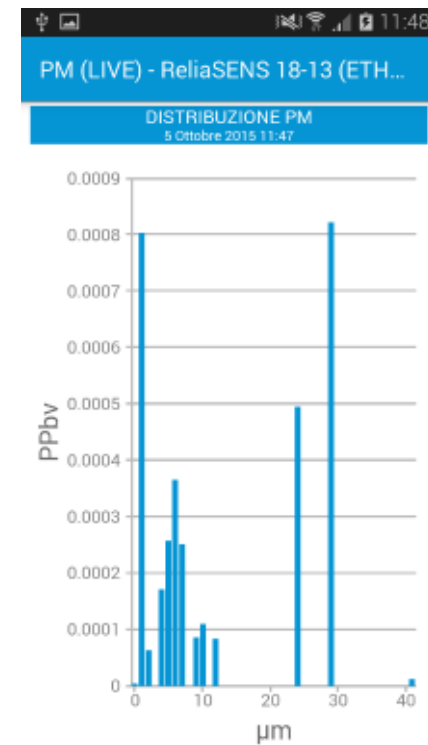
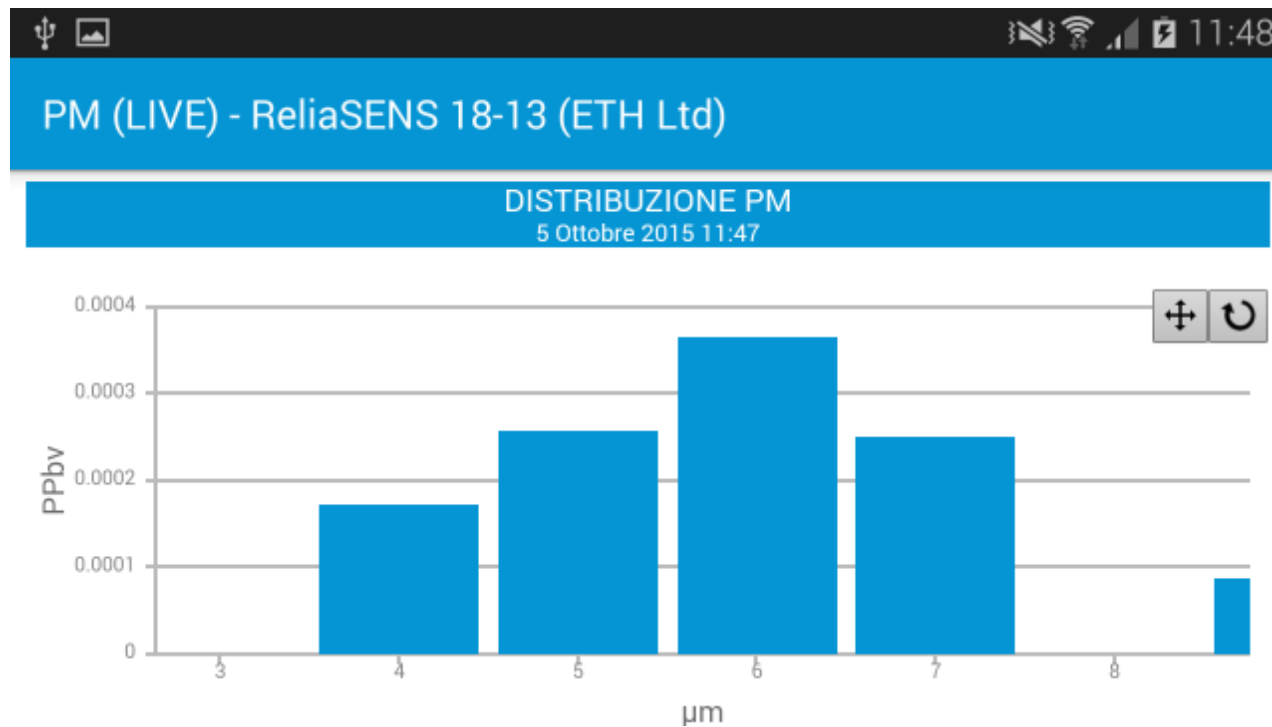


# LIFERAY – APPLICATION LAYER

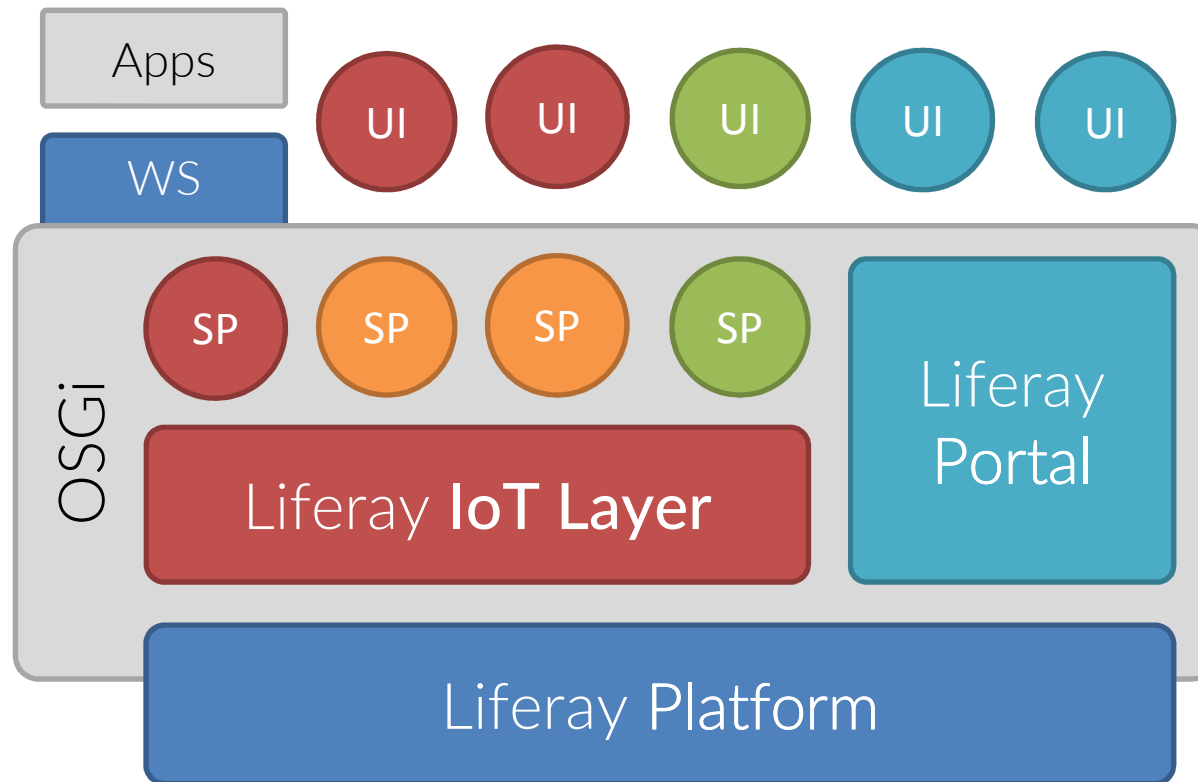




# LIFERAY – APPLICATION LAYER



# ARCHITETTURA



Standard Protocols



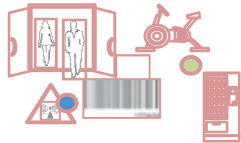
Project Specific



Marketplace

# LIFERAY IOT ASSET MANAGEMENT

## Devices



Manual Configuration / Automatic Provisioning

## Sensors



Manual Configuration / Autom. Detection

## Metrics

CO	mg/m <sup>3</sup>
CO2	mg/m <sup>3</sup>
DIAG_ATM	
EM_E	mT
EM_H	dBV/m

Numeric / Images / Triggers / ...

## Raw Data

PM10	11.72
NO2	12.57
O3	0.00

On Demand / Round Robin / Time-range /  
Snapshot / Persisted / Push Real-time / ...

# ASSET PUBLISHER



ReliaSENS 18-13 (ETH Ltd)  
Latest report: 2015/10/05 16:05:52

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ReliaSENS 18-13 (ETH Ltd)							
sensor	units	last 1hr avg	last 8hr avg	last 1d avg	max 1hr avg (+)	max 8hr avg (+)	max 1d avg (++)
CO	$\text{mg}/\text{m}^3$	0.77	N.A.	N.A.	N.A.	N.A.	N.A.
CO2	$\text{mg}/\text{m}^3$	357.35	N.A.	N.A.	N.A.	N.A.	N.A.
DIAG_ATM		1444054010024.00	N.A.	N.A.	N.A.	N.A.	N.A.
EM_E	mT	394.30	N.A.	N.A.	N.A.	N.A.	N.A.
EM_H	dBV/m	-7.48	N.A.	N.A.	N.A.	N.A.	N.A.
GEGER_C	count	8.57	N.A.	N.A.	N.A.	N.A.	N.A.
H2S	ppm	0.08	N.A.	N.A.	N.A.	N.A.	N.A.
NO	ppm	0.03	N.A.	N.A.	N.A.	N.A.	N.A.
NO2	$\mu\text{g}/\text{m}^3$	3.83	N.A.	N.A.	N.A.	N.A.	N.A.
O3	$\mu\text{g}/\text{m}^3$	0.00	N.A.	N.A.	N.A.	N.A.	N.A.
PM_1	$\mu\text{g}/\text{m}^3$	1.34	N.A.	N.A.	N.A.	N.A.	N.A.
PM_10	ppm	16.08	N.A.	N.A.	N.A.	N.A.	N.A.
PM_2.5	ppm	3.76	N.A.	N.A.	N.A.	N.A.	N.A.
SO2	ppm	0.23	N.A.	N.A.	N.A.	N.A.	N.A.



Community Excellence Award 2015

For outstanding contributions to the Liferay Community

Q & A

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