

SMART CITIES

PLATAFORMAS ABIERTAS, DATOS ABIERTOS



Ing. Gustavo Giannattasio MBA, PMP. Consultor Arnaldo C. Castro
IEEE Smart Cities Steering Committee, IEEE IoT Steering Committee



ARNALDO C. CASTRO S.A.
TECNOLOGÍA/INNOVACIÓN/PROYECTOS/SERVICIO

¿ PORQUÉ PLATAFORMAS ABIERTAS ?

- **MOTIVACIONES BÁSICAS**

- EVITAN DEPENDER DE UN PROVEEDOR DE APLICACIONES
- SIMPLIFICAN LICENCIAMIENTOS
- MENSAJERIA ESTÁNDAR CON SENSORES
- MENSAJERÍA ESTÁNDAR CON APLICACIONES
- PORTABILIDAD E INTEROPERABILIDAD ENTRE PLATAFORMAS

- **MOTIVACIONES AVANZADAS**

- PROMUEVEN LA INNOVACIÓN
- PROMUEVEN LA COMPETENCIA Y AHORROS
- PERMITEN ABRIR SOLUCIONES A DESARROLLADORES

- **OTROS BENEFICIOS**

- MODULARIDAD VERSUS “TODO O NADA”
- PERMITEN DIFERENTES MODELOS DE NEGOCIO
- PUEDEN CONVIVIR CON APLICACIONES PROPIETARIAS



¿ PORQUÉ PLATAFORMAS ABIERTAS ?

The image displays a comprehensive grid of logos organized into three main sections:

- Applications (Verticals):** This section is divided into columns for Personal (Wearables, Fitness, Health, Entertainment, Sports, Toys, Elderly), Home Automation (Hubs, Security, Kitchen, Pets, Garden, Trackers), Vehicles (Automobiles, Autonomous, UAVs, Space, Bicycles/Motorbikes), Enterprise (Healthcare, Retail, Payments/Loyalty, Smart Office, Agriculture, Infrastructure), and Industrial Internet (Machines, Energy, Supply Chain, Robotics, Industrial Wearables).
- Platforms & Enablement (Horizontal):** This section includes Software, Full Stack, Connectivity, Security, Open Source, Interfaces (Virtual Reality, Augmented Reality, Other), 3D (Printing/Scanning, Content/Design), and various other enabling technologies.
- Building Blocks:** This section is divided into Hardware (Processors/Chips, Sensors, Parts/Kits, Charging), Software (Cloud, Mobile OS), Connectivity (Protocols, M2M), Telecom, WiFi, Alliances, Consultants/Services, Partners, Retail, Incubators, Manufacturing, and Funding.

Open Source

¿ PORQUÉ OPEN DATA ?

Open Data as Urban Innovation



<http://www.dublindashboard.ie/pages/index>



<http://amsterdamsmartcity.com/projects/detail/id/68/slug/smart-citysdk>

- Open data central to open innovations in cities
- Open data is powering a new civic movement that is changing the way citizens experience cities (<http://www.data.gov/cities/>)



¿ PORQUÉ OPEN DATA ?

Smart City ICT Architecture

On top applications and services for citizens & administration

Central data collection with integrated and open-standard APIs for building on open-data

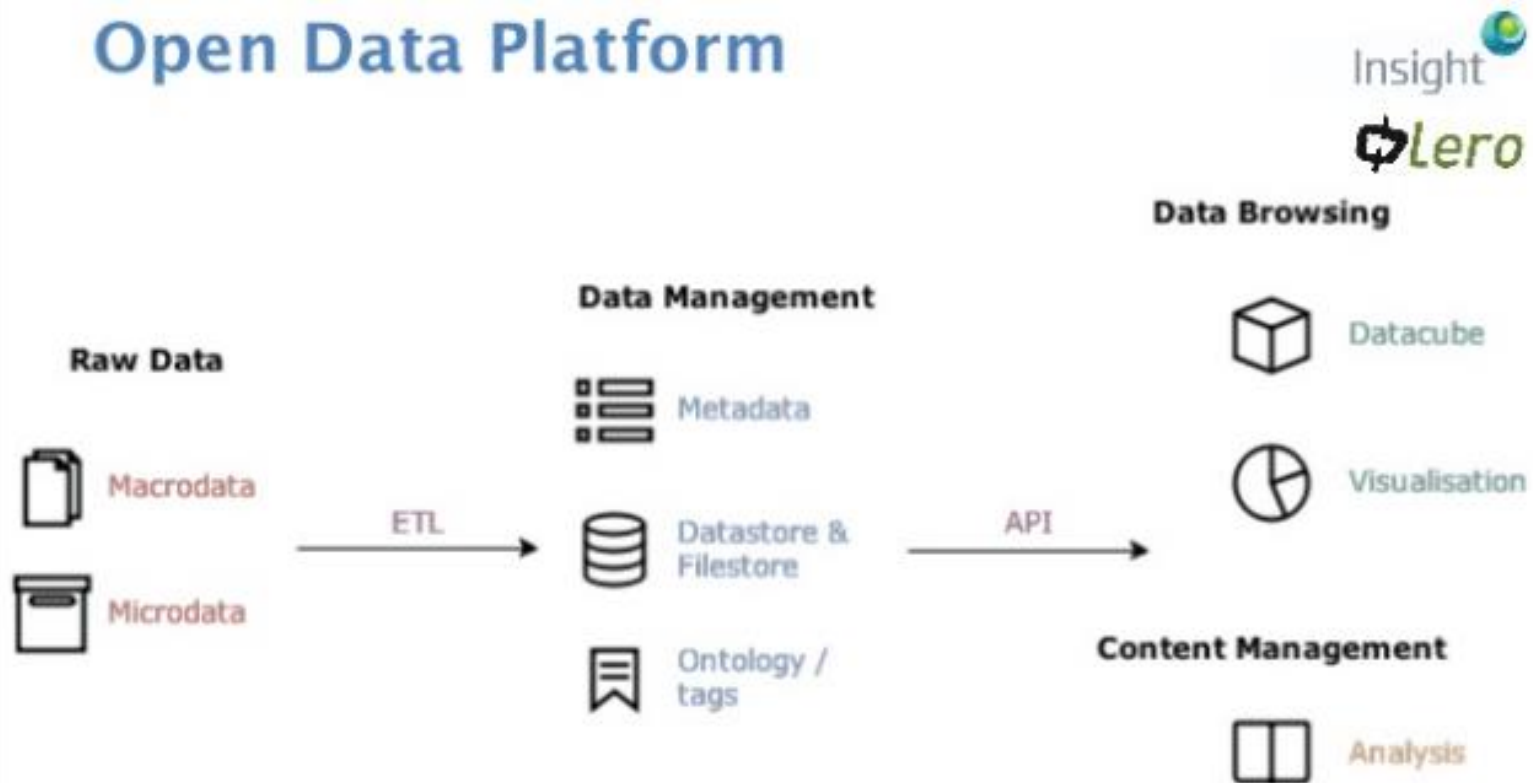
Data extraction, processing, storage, and analytics at distributed points

Context – aware sensors and networked devices



¿PORQUÉ OPEN DATA?

Open Data Platform



- Various data and software components form part of an overall open data platform

¿PORQUÉ OPEN DATA?



¿PORQUÉ OPEN DATA?

FEATURES	CKAN	DKAN	SOCRATA	PUBLISH MY DATA	INFO WKBENCH	ENIGMA	JUNAR	ODS	CALLIM	DATATK	SMWIKI
DATA, METADATA & FILE FORMAT STANDARDS	●	●	●	●	●	●	●	●	●	●	●
SEARCH & INDEXING	●	●	●	●	X	●	●	●	X	●	●
SOCIAL MEDIA, SHARING & COLLABORATION	●	●	●	●	●	X	●	●	●	X	●
PUBLISHING WORKFLOW	●	●	●	●	●	●	●	●	●	●	●
HARVESTING, FEDERATION & CATALOGUE	●	●	●	●	X	X	●	●	●	X	●
DATA ANALYSIS	●	●	●	X	●	●	●	●	X	●	X
VISUALISATION	●	●	●	X	●	X	●	●	X	X	●
PERSONALISATION	●	●	●	●	●	X	●	●	●	●	●
CUSTOMISATION	●	●	●	●	●	NA	●	●	●	●	●
LICENSING FOR DATASET	●	●	●	●	X	X	X	●	X	X	●
ACCESSIBILITY	●	●	●	●	●	NA	●	●	●	●	●
EXTENSIBILITY	●	●	●	●	●	●	●	●	●	●	●
TECHNICAL ENVIRONMENT	Python	PHP, Drupal	Scala	Ruby on rails	Java & Web apps	NA	Java & Python	NA	Java	PHP	PHP
OTHERS	Good manual Simple to use	Easy to use platform	Tracking & Measure of performance	Flexible, cloud-based, easy to use	R stat, support transparency, linked data	Reliable, scalable, large OD Analyses	Track & measures user impact on OD	Remote web services; easy deployment	Guides, videos, tutorial. Linked data	Deal with fraud, aids transparency	None



¿PORQUÉ OPEN DATA?

Sant Feliu de Llobregat CA | ES |

Ajuntament de Sant Feliu de Llobregat Portal de dades obertes

Home Datasets What's Open Data? Links Contact Terms of use MIRCouncil Site

Open Data Sant Feliu de Llobregat aims to make available to the companies the public data that manages in formats easily received. Any individual or company can analyze, reuse and redistribute these data to generate new services. This also allows the public to improve transparency and open government, while promoting wealth creation through an intelligent management of resources (smart government).

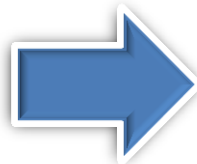
More information

Outstanding datasets

- Age groups of population CSV ODATA
- Companies CSV ODATA PDF
- Contractor profile HTML CSV ODATA
- Data meteorological stations of Ajuntament de Sant Feliu de Llobregat CSV ODATA

Recent updated datasets

- Data meteorological stations of Ajuntament de Sant Feliu de Llobregat CSV ODATA
- List of daily events CSV ODATA
- Vehicles census CSV ODATA
- Age groups of population CSV ODATA



bigov Open Data

What if all the data that is in municipalities is turned into economic development?

- ✓ Economic and innovation promotion
- ✓ Increased transparency
- ✓ Universal access to data
- ✓ Ordering and structuring the Administration information

bigov OpenData offers new business opportunities for companies in the city, making available open public data kept by public authorities and authorities. Open Data portal transforms certain information, previously only accessible at a corporative level, into open data information. This means it is open to the public and can be turned it into an asset for new business creation and promotion

IoT OPEN SOURCE SDK



Liota: Driving IoT App Development

BY **VMWARE STAFF** ON June 22, 2016

IOT, TECHNOLOGY TRENDS

The Internet of Things (IoT) is happening now. It's a **wave that CIOs need to catch** and ride to the fullest.

Recently, VMware took a first step in its IoT journey. We are furthering our commitment to developers as well as makers of devices and gateway providers through the launch of Liota (Little IoT Agent). Liota is a vendor-neutral, open-source SDK for building secure IoT gateway data and control orchestration

Fuente: <https://www.vmware.com/ciovantage/article/liota-driving-iot-app-development>

OASC



The 5th wave launch will take place at Smart City Expo World Congress in Barcelona, Spain, with new cities and countries lined up. The event will take place on November 15-17, 2016. Save-the-date and make sure to secure your tickets [here](#). More information will follow soon or contact us: info@oascities.org

Read the OASC FAQ for more info about the conditions applied for joining the initiative. The 4th wave was launched on February 16 in Puebla, Mexico, during the Smart City Expo. Here's a map of the OASC cities. A list follows below the map.



Open & Agile Smart Cities initiative principles

- **API:** Adoption of a lightweight, open-licene standard API to gather, publish, query and subscribe-to in-time context information describing the state of the city. *Specifically, the **FIWARE NGSI API will serve as a first common API** which the supporters will implement.*
- **Data model:** Adoption of a simple initial standard data model required for effective interoperability when exchanging context information. *Specifically, **CitySDK**, which is available through the FIWARE NGSI API, functions as a basis*
- **Open Data Platform:** Adoption of a flexible, easily-distributable open data publication platform which any organisation can set up at a low cost if it is not already being used. *Specifically, **CKAN will serve as the initial standard platform** for publication of datasets or NGSI API resources. CKAN is already integrated and extended as part of the FIWARE Reference Architecture*

Partnership for Open Data

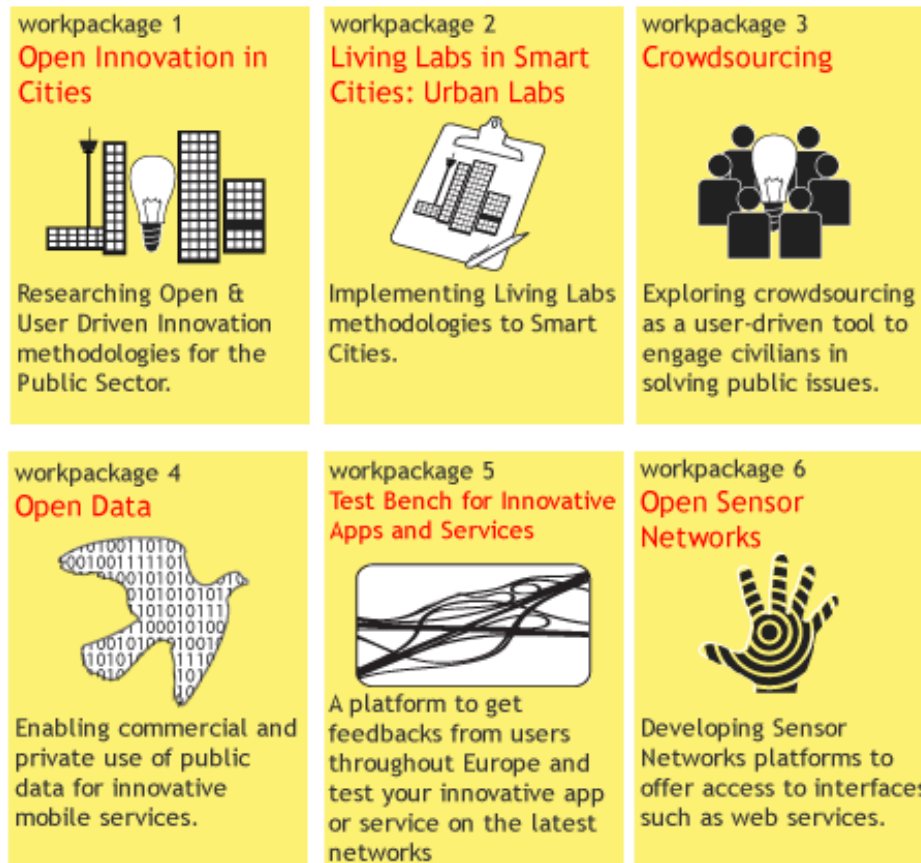
How can open data enhance global development?

In 2014, The World Bank joined forces with the Open Data Institute and Open Knowledge in a project designed to help policy-makers, NGOs and citizens in developing countries to understand and harness the benefits of open data.

As part of the project, we produced several technical reports, white papers and case studies:



Open Cities is a project co-founded by the European Union that aims to validate how to approach Open & User Driven Innovation methodologies to the Public Sector in a scenario of Future Internet Services for Smart Cities





SCOPE: A Smart-city Cloud-based Open Platform and Ecosystem

SCOPE, a Smart-city Cloud-based Open Platform and Ecosystem, is creating a cloud platform that exposes the digital pulse of the city for innovators to develop smart-city services. It is based on a unique new eco-system of stakeholders, technology, organizations and information. SCOPE is a National Science Foundation Partnerships for Innovation (NSF PFI) project at Boston University and in close collaboration with its partners



Toward an Open Cloud Marketplace

Vision and First Steps

Azer Bestavros and Orran Krieger, Boston University

The Open Cloud Exchange (OCX) is envisioned as a public cloud marketplace

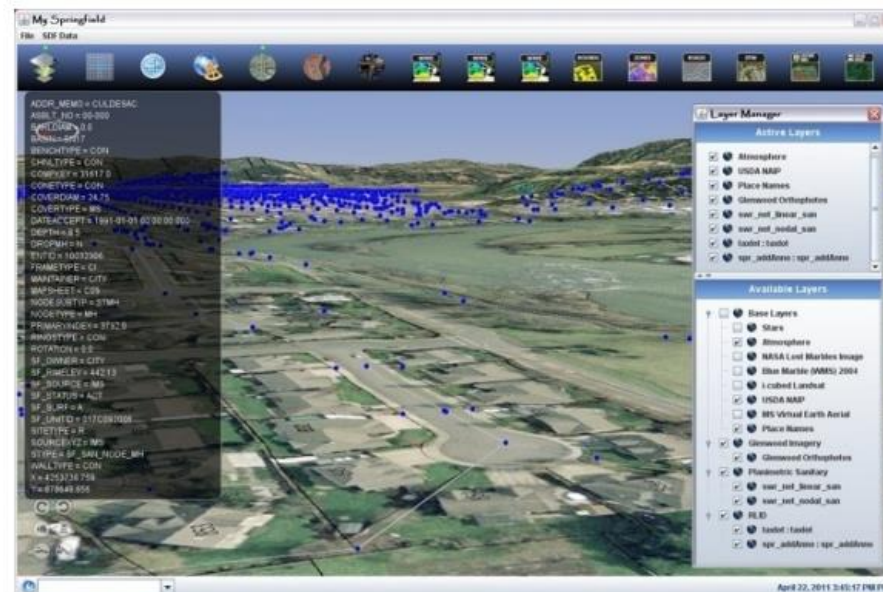


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OPENCITYSMART

ICA Commission on Open Source Geospatial Technologies

Building up Open Source, Open Standards, Open Data research for bridging the digital divide



The City of Springfield has implemented a rich geovisualization and analysis site called My Springfield that was built open source software.

Fuente: <http://opensourcegeospatial.icaci.org/2016/02/opencitysmart-the-open-platform-for-smart-cities>



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Smart Citizen ^{v2 BETA}

Open source technology for citizens
political participation in smarter cities

GO TO THE PLATFORM

DISCOVER THE SMART CITIZEN KIT





Intelligent City Software & Solutions

[Home](#)[Applications](#)[About](#)[Participate](#)[Feedback](#)[Blog](#)

An Open Repository of Solutions for Intelligent Cities

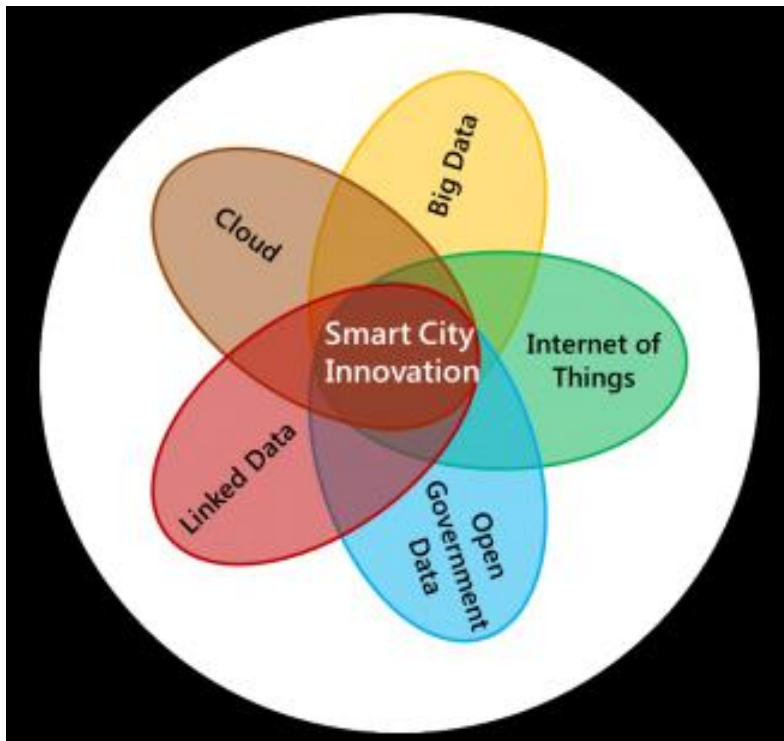
ICOS website supports a community offering software and solutions in the field of intelligent cities / smart cities. The community will serve to showcase existing projects, provide a forum for discussing projects and processes, and guide developers' groups in applications' creation, contribution, and release.

[+ Submit your Application](#)[or stay informed](#)

URENIO Research has created ICOS Community in order to promote the adoption of open source solutions for Smart / Intelligent cities. URENIO is a university laboratory for the promotion of research and supply of scientific and technological services. URENIO is part of the Department of Urban and Regional Planning in the Faculty of Engineering, Aristotle University of Thessaloniki.

CPaaS

Europe, Japan team boost smart cities with open data project



OBJECTIVE 1: DEVELOP AN OPEN SOCIAL CITY PLATFORM

OBJECTIVE 2: DEPLOY THE CITY PLATFORM AS A SERVICE SOLUTION

OBJECTIVE 3: EMPOWER THE CITIZEN TO HER DATA

OBJECTIVE 4: VALIDATE THE PLATFORM WITH USE CASES PROVIDING PUBLIC VALUE

OBJECTIVE 5: DEVELOP BLUE PRINTS FOR THE ADAPTATION AND TRANSFER OF SOLUTIONS TO OTHER CITIES

OBJECTIVE 6: CREATE IMPACT IN CITIES

AN OPEN PLATFORM FOR THE SMART CITY.



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BI & BDA OPEN SOURCE

FAQs | [cust](#)



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network ▾

newsroom ▾

A photograph showing several people in business suits gathered around a table, looking at a tablet displaying various data visualizations including bar charts and pie charts. The scene is brightly lit, suggesting a professional office environment.

100% Open Source Business Intelligence and Big Data analytics

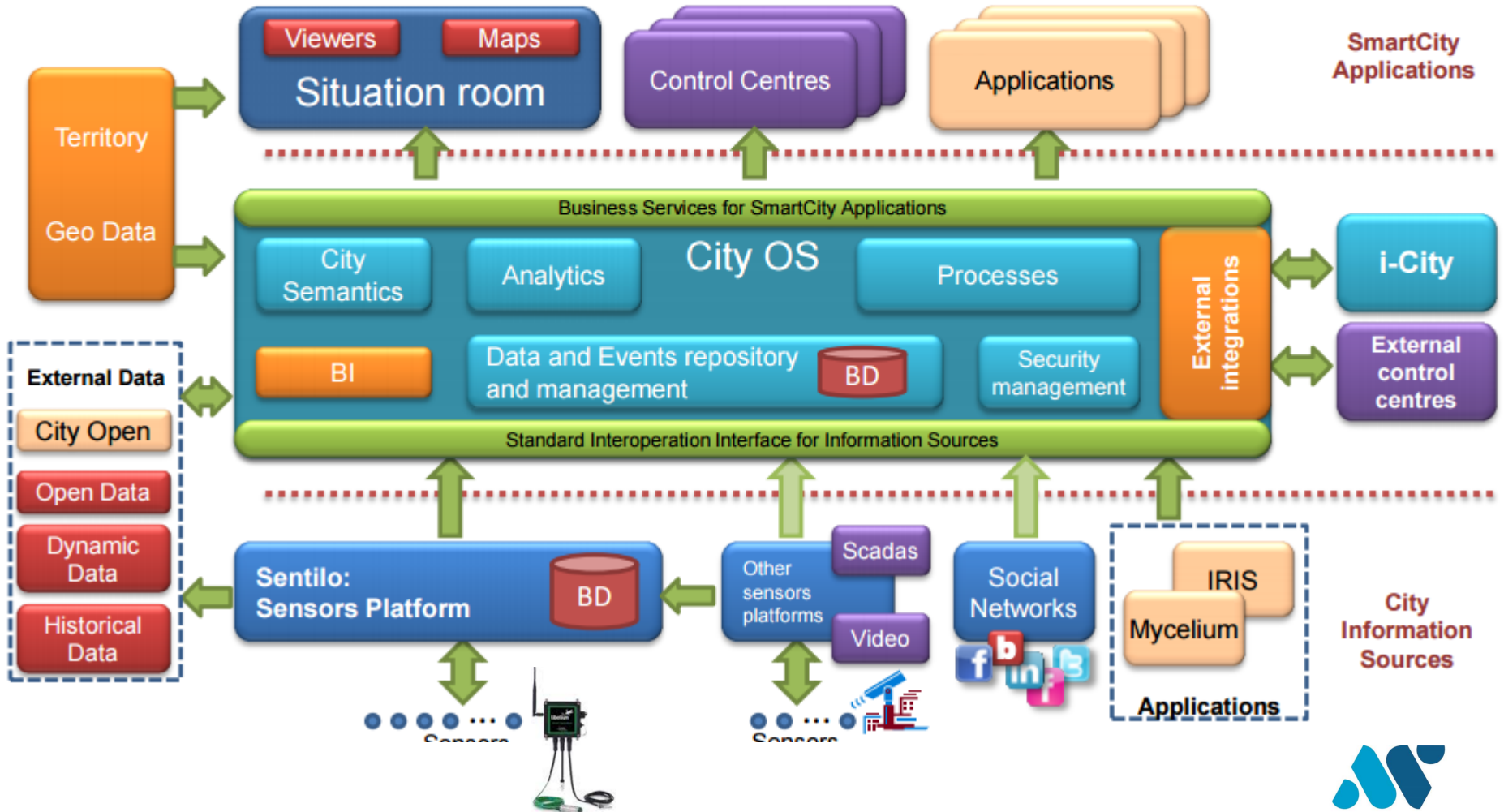
Turn your data into knowledge, for effective decision making!



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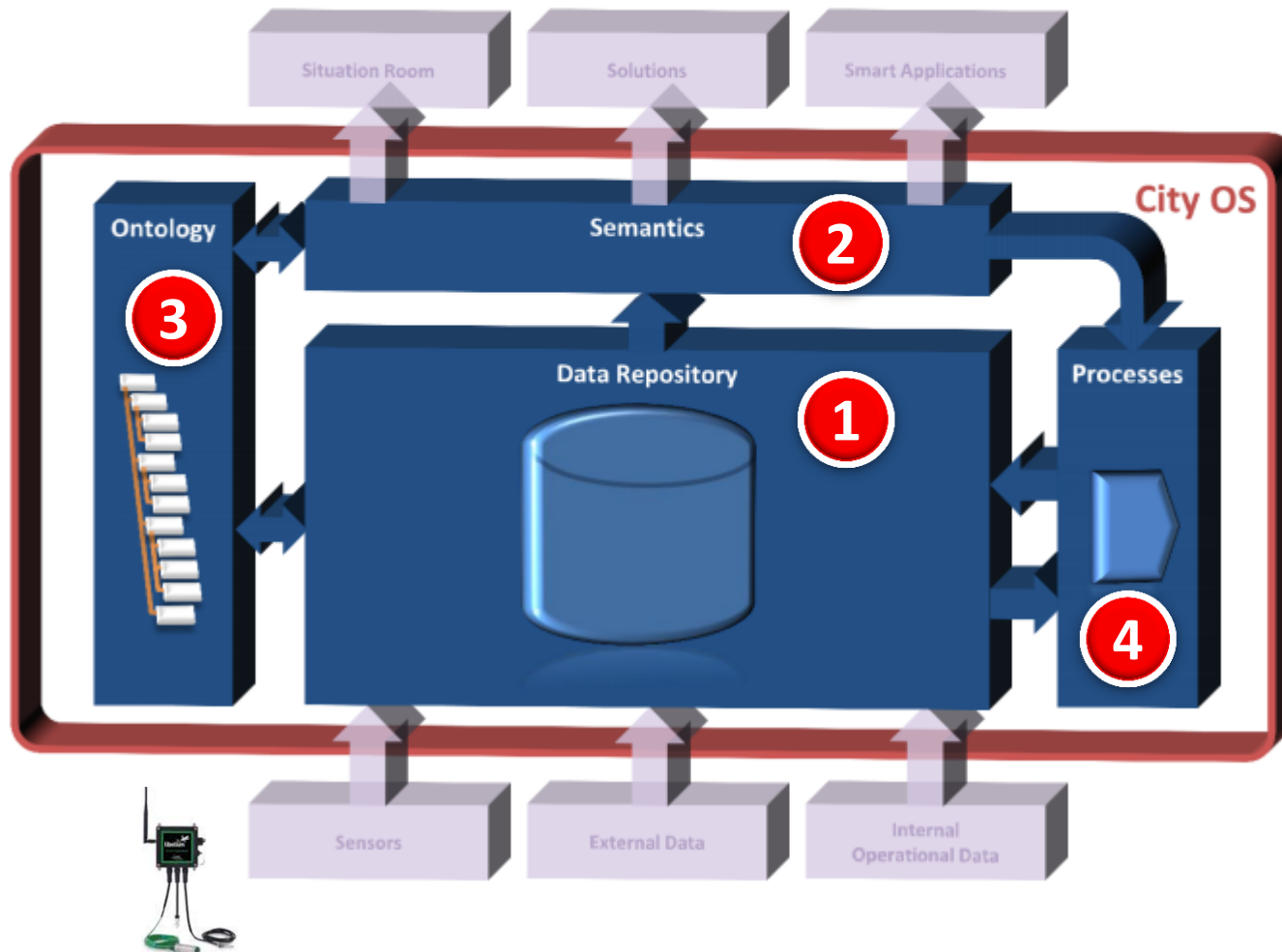
City OS Architecture - Concepts



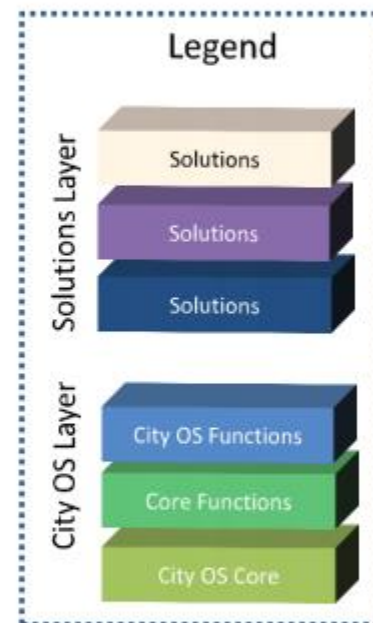
Conceptual Structure of City OS

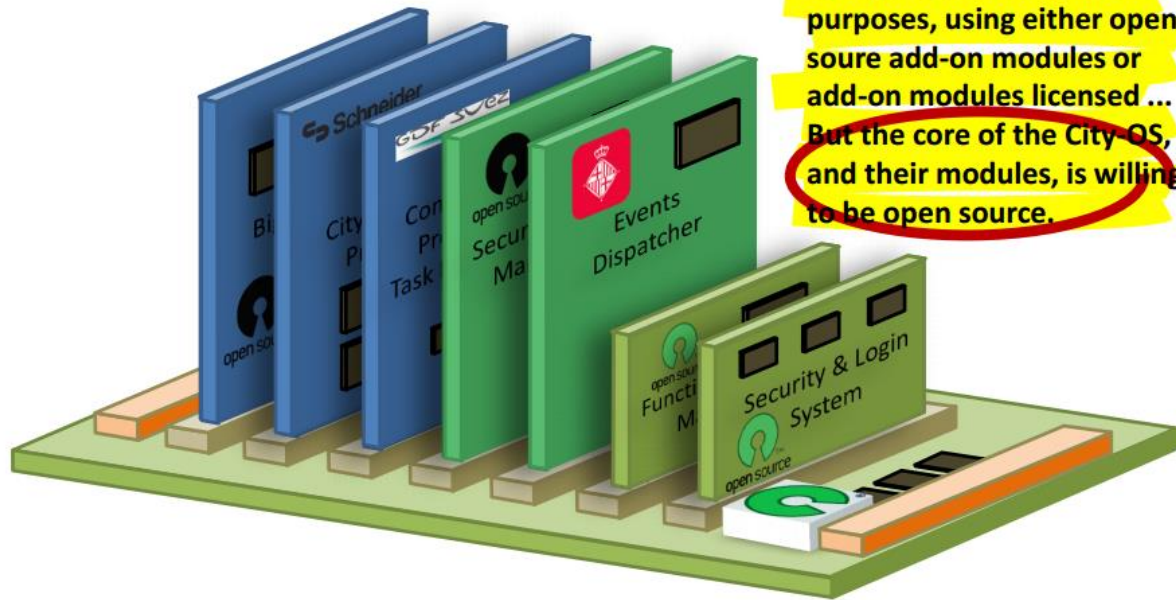


It consists of four main elements: A main data repository, A semantics to unify and globalize access to data, an ontology to organize data and a data process container.



Internal Structure of City OS

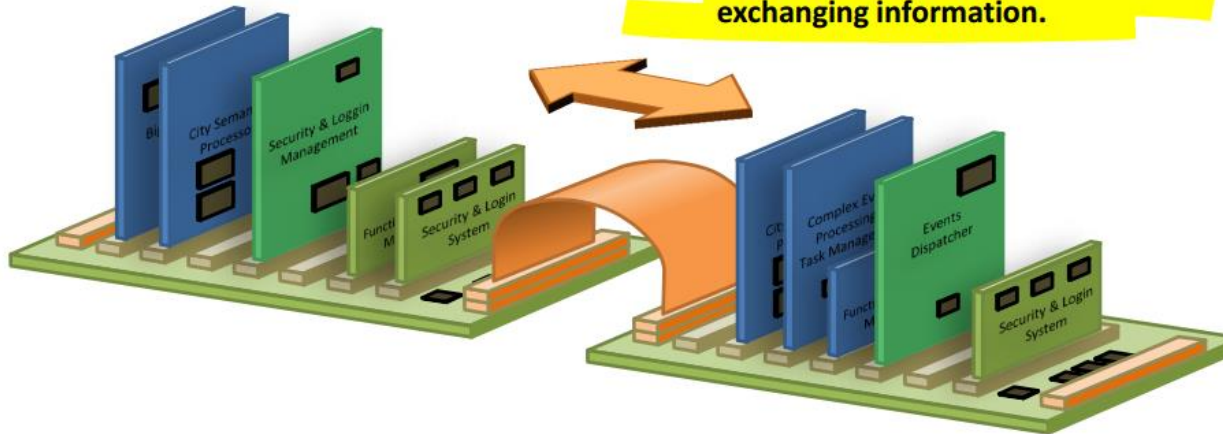




Each City-OS can be configured for different purposes, using either open source add-on modules or add-on modules licensed ... But the core of the City-OS, and their modules, is willing to be open source.

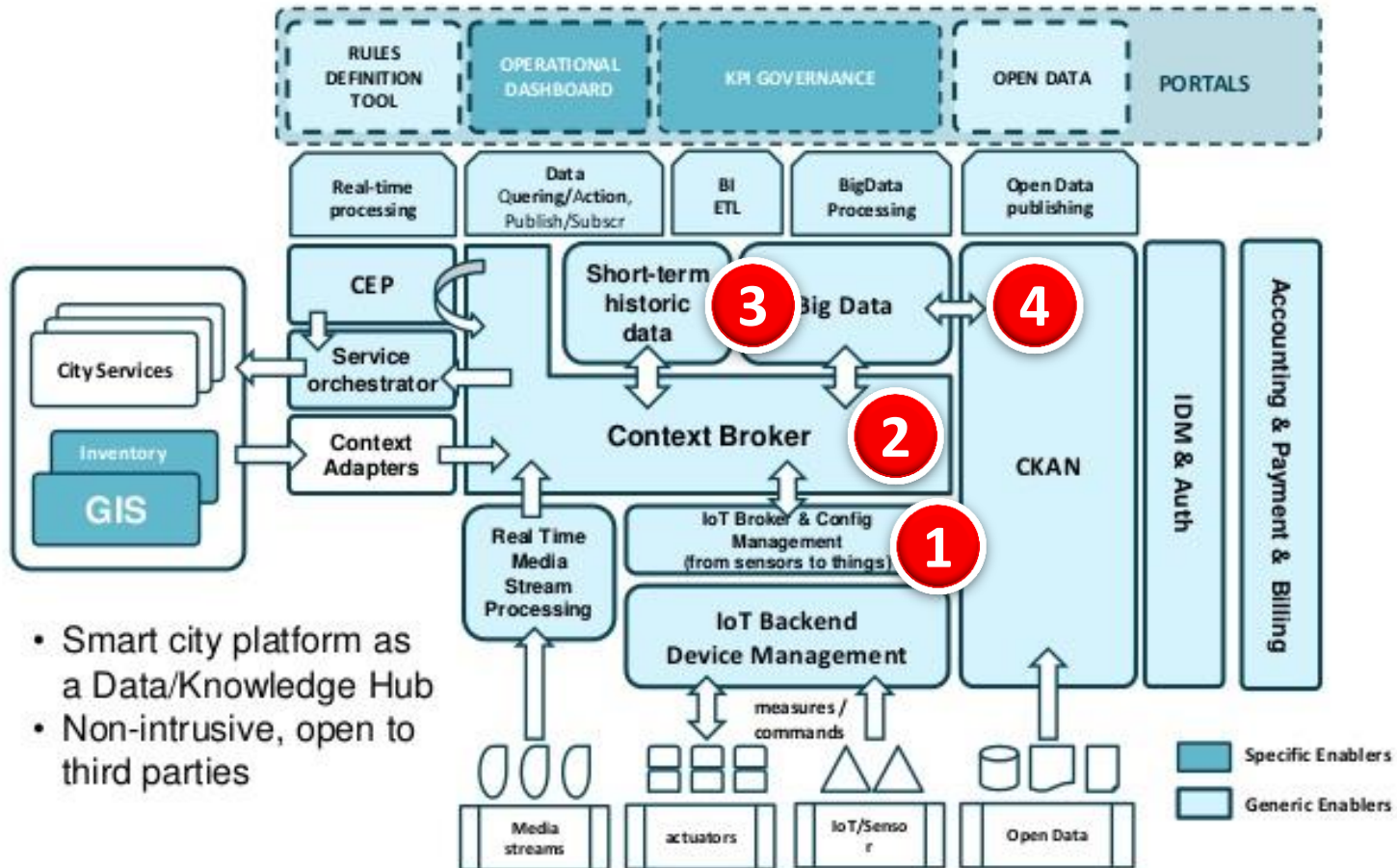
The CityOS from different cities may have different functionalities.

But they have the ability to communicate with each other by exchanging information.



FIWARE

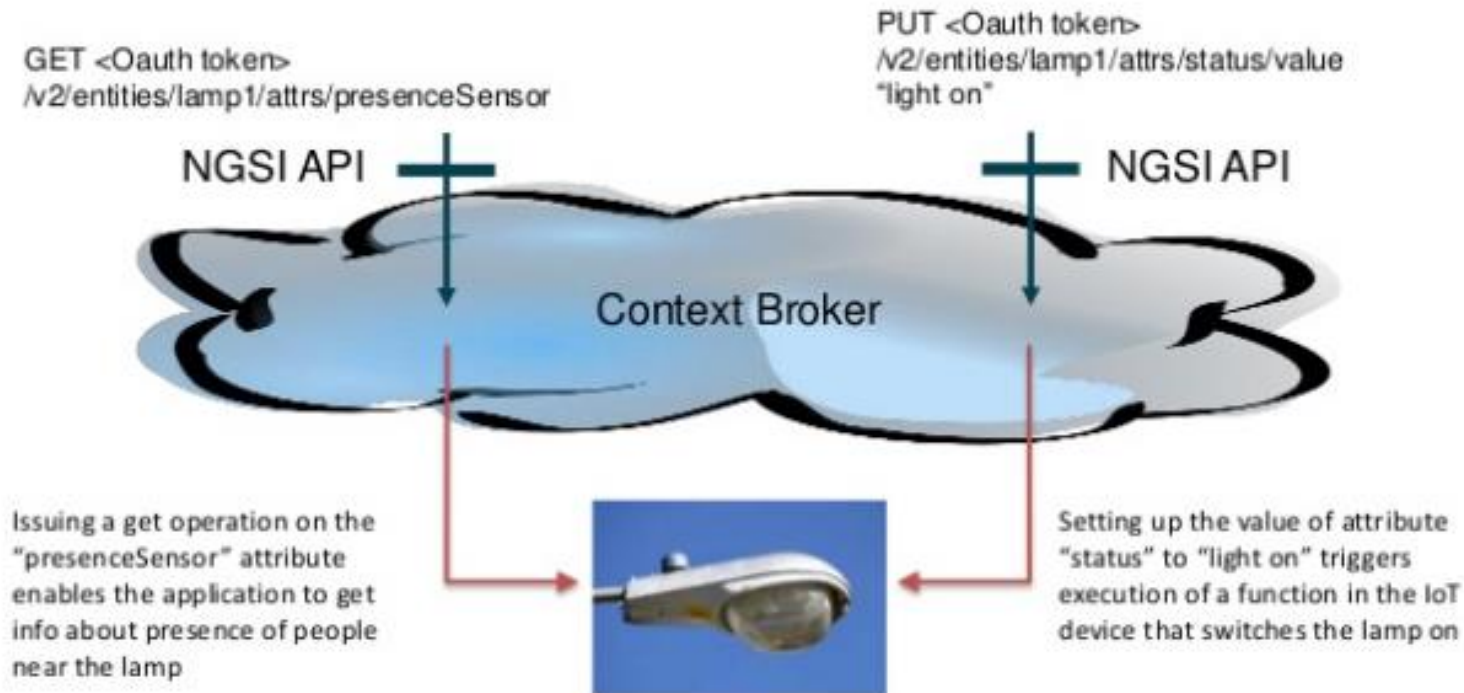
Envisioned target Smart City platform



NGSI OMA

FIWARE NGSI: "The SNMP for IoT"

- Capturing data from, or Acting upon, IoT devices becomes as easy as to read/change the value of attributes linked to context entities using a Context Broker



NEXT GENERATION SERVICES INTERFACE

OPEN MOBILE ALLIANCE

NGSI-9/10 API specification documents



OMA-TS-NGSI Context Management-V1 0-20100803-C

OMA Approved Version 1.0 – 29 May 2012

- Definition of NGSI-9 and NGSI-10 operations and their parameters
- Definition of data structures to represent context information
- Only abstract definitions

OMA NGSI 10 RESTful binding

"FIWARE NGSI 10"

- definition of resource structure and interaction verbs
- done within FIWARE

OMA NGSI 9 RESTful binding

"FIWARE NGSI 9"

- definition of resource structure and interaction verbs
- done within FIWARE

FIWARE NGSI 9/10 xml schema files

- defined by FIWARE
- xml schema files for data structures and operations of NGSI 9 and 10
- can be used for validation of NGSI xml files

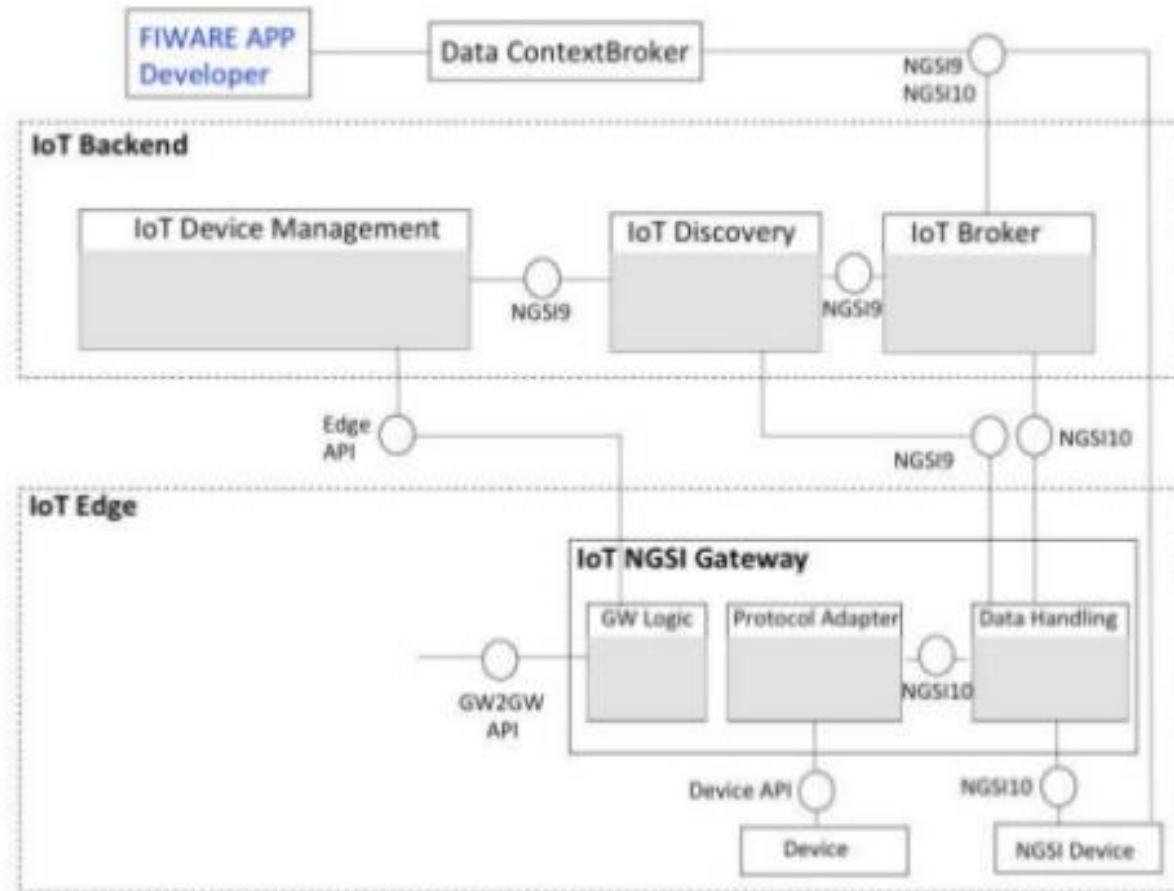
Associations Concept

- how to use NGSI to express associations between Entities
- defined by IoT Chapter of FIWARE



NGSI OMA

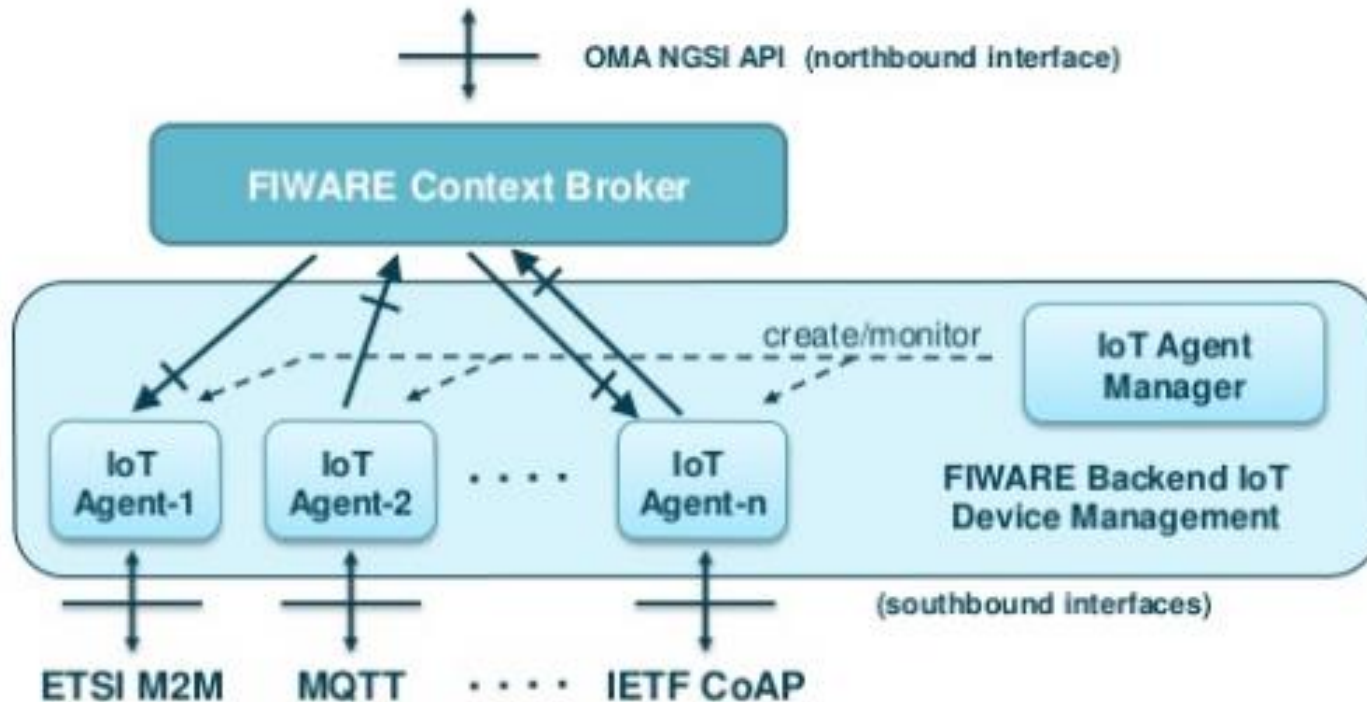
IoT Scenario II: NGSI Native Scenario



IoT BROKER

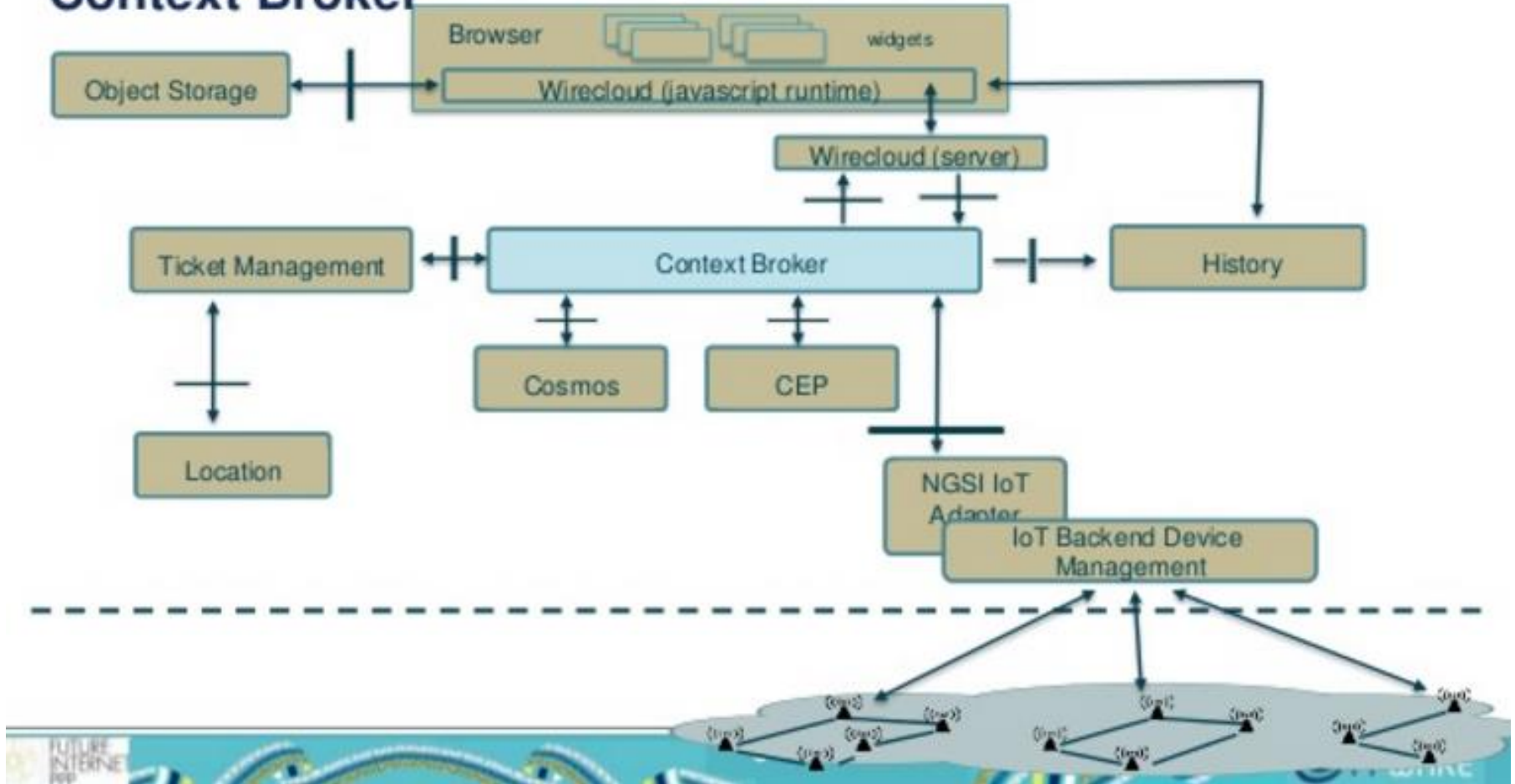
Integration with sensor networks

- The FIWARE backend IoT Device Management GE enables creation and configuration of NGSI IoT Agents that connect to sensor networks
- Each NGSI IoT Agent can behave as Context Consumers or Context Providers, or both



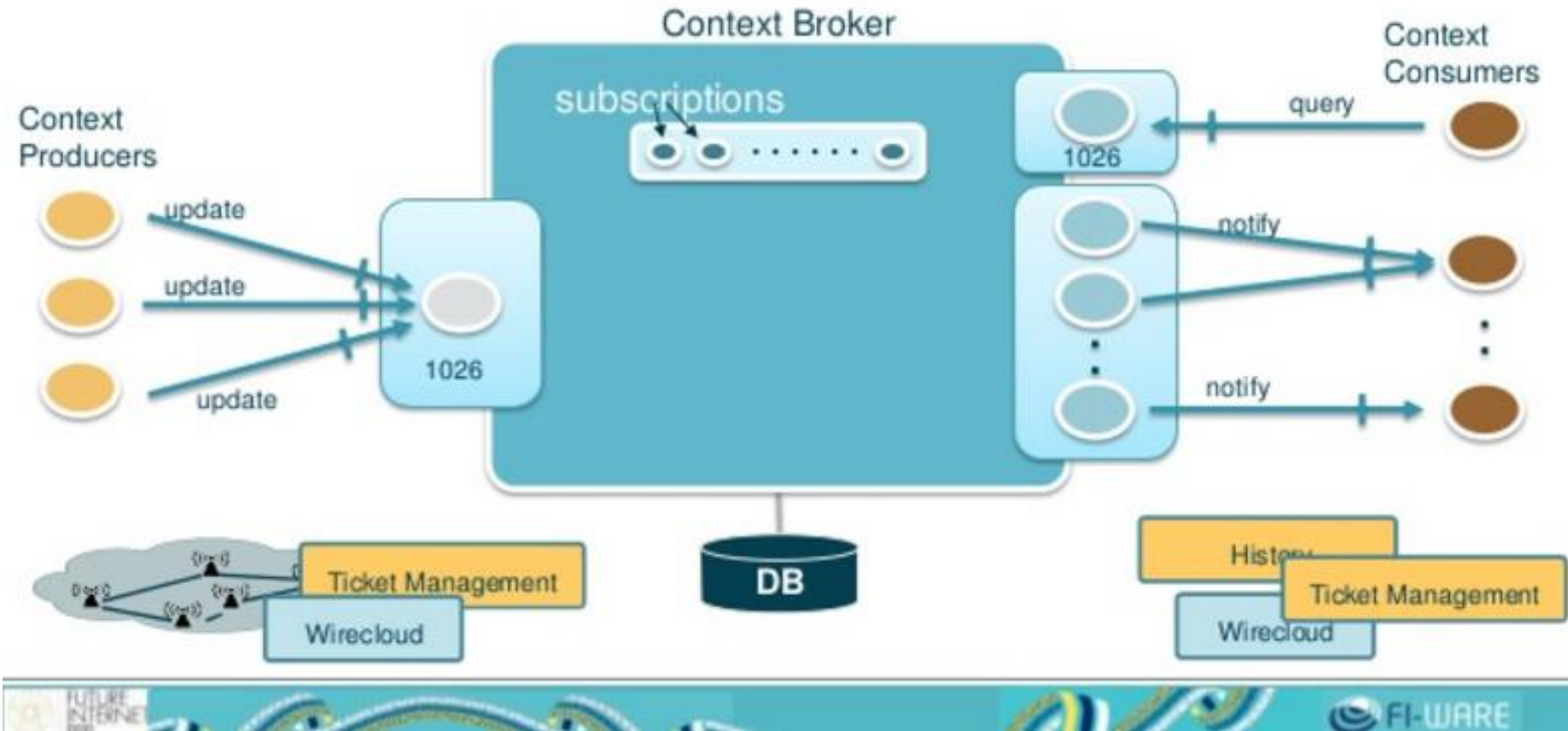
FIWARE

Context Broker



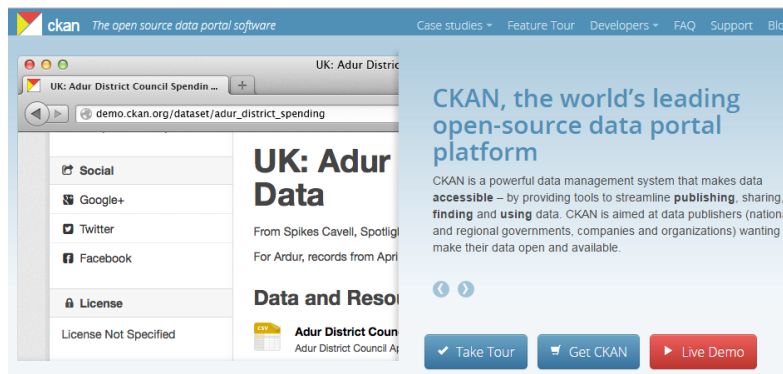
FIWARE CONTEXT BROKER

Taking a closer look



FIWARE

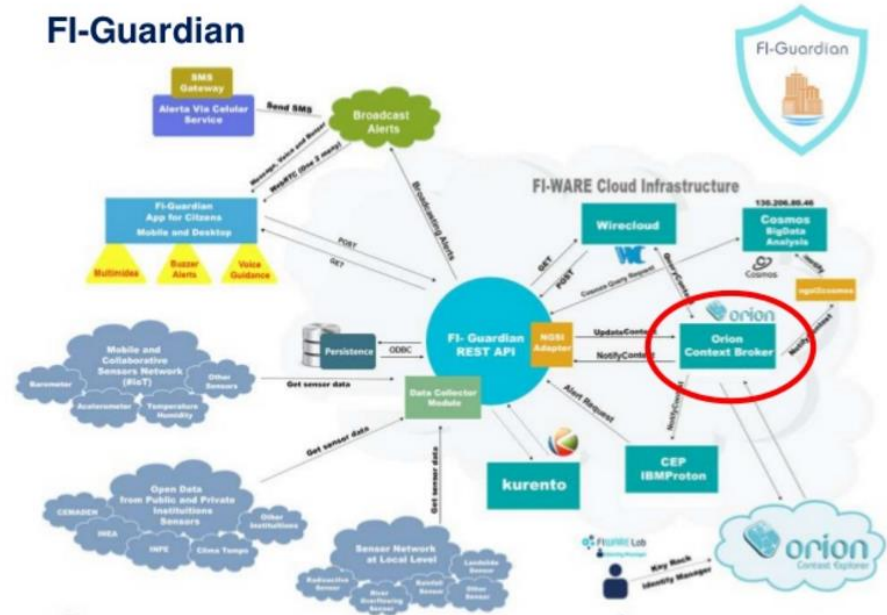
Open Data publication



VM9 FI-GUARDIAN



FI-Guardian

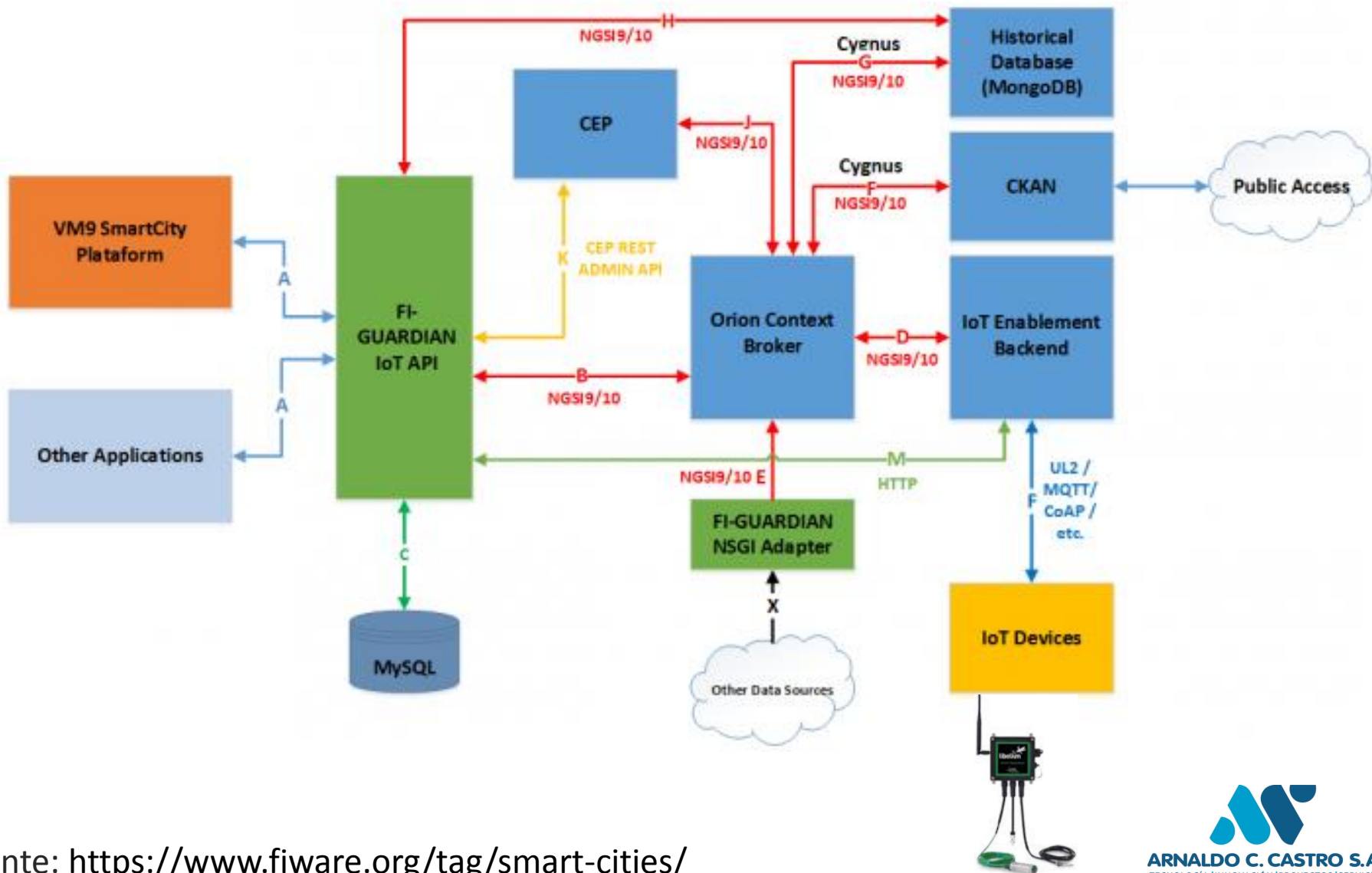


A Prefeitura de Nova Friburgo-RJ, através da Secretaria do Meio Ambiente e Desenvolvimento Urbano Sustentável, oferece a população um conjunto de Serviços de forma Online

[CRIE SUA CONTA E FAÇA SUAS SOLICITAÇÕES ONLINE](#)



VM9 FI-GUARDIAN



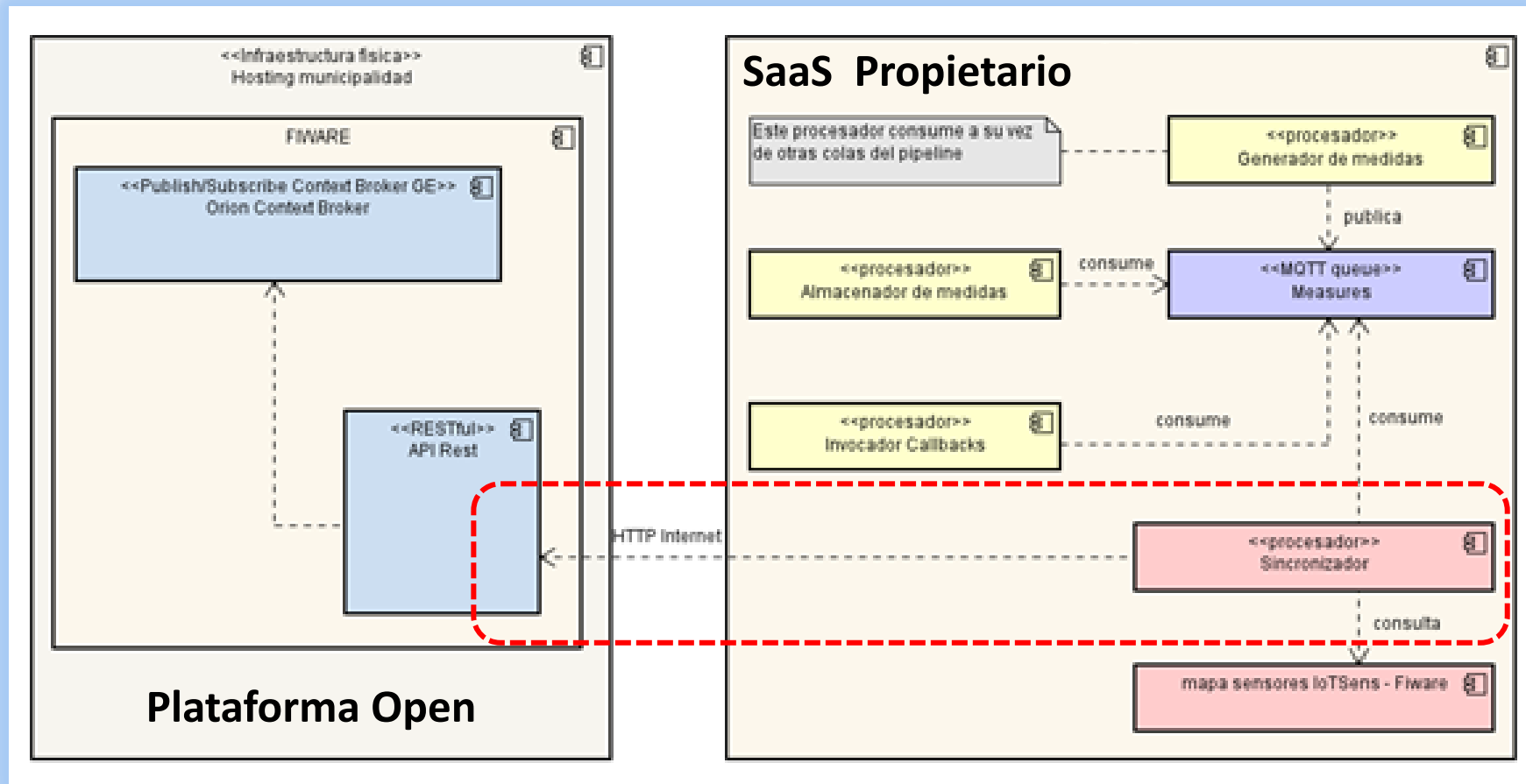
¿QUE HACER CON APLICACIONES PROPIETARIAS EXISTENTES ?



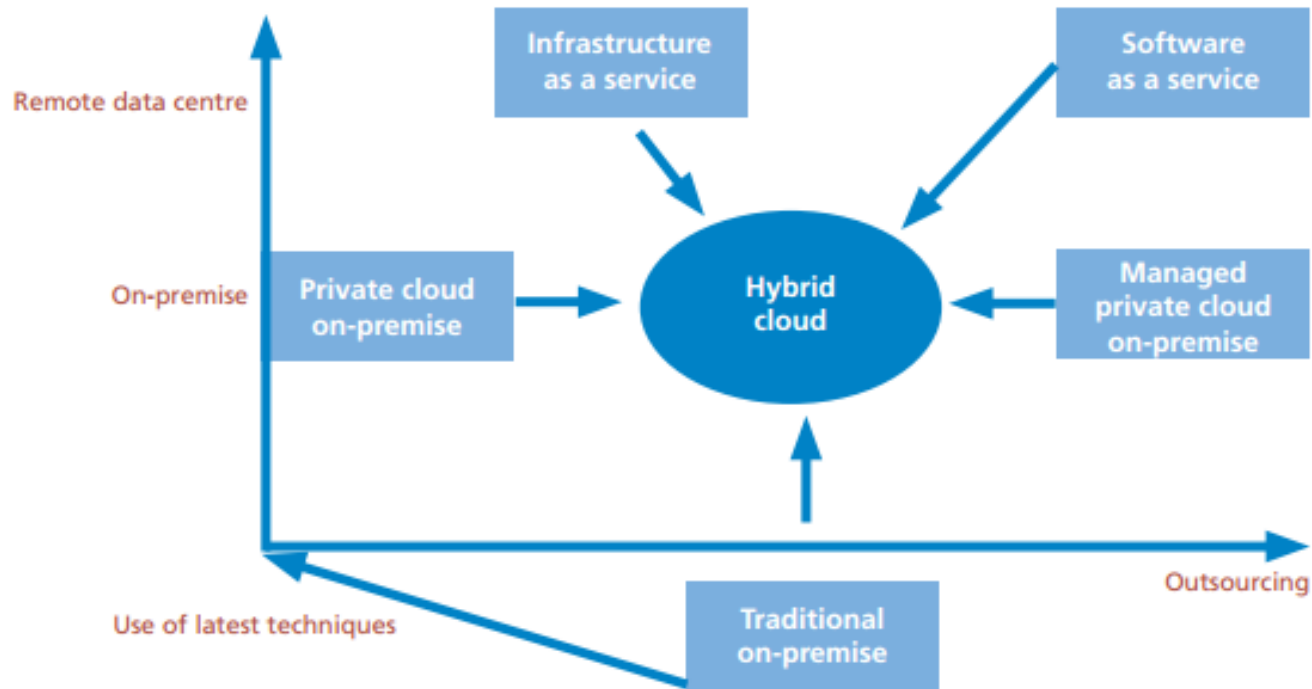
¿DOS MUNDOS INDEPENDIENTES Ó COOPERATIVOS?



¿MUNDOS VINCULADOS Y COOPERATIVOS?

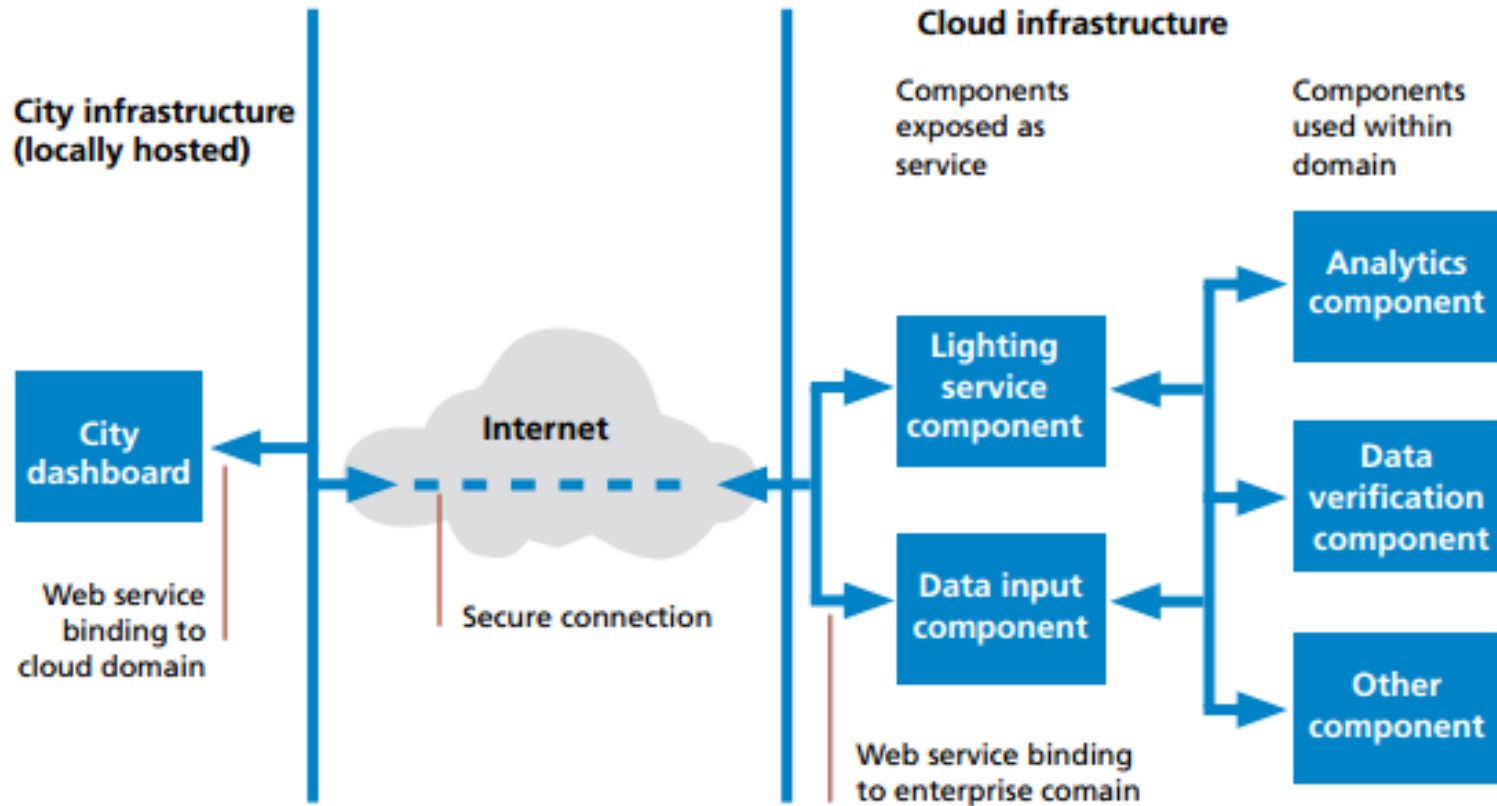


MACHINA RESEARCH REPORT 2016



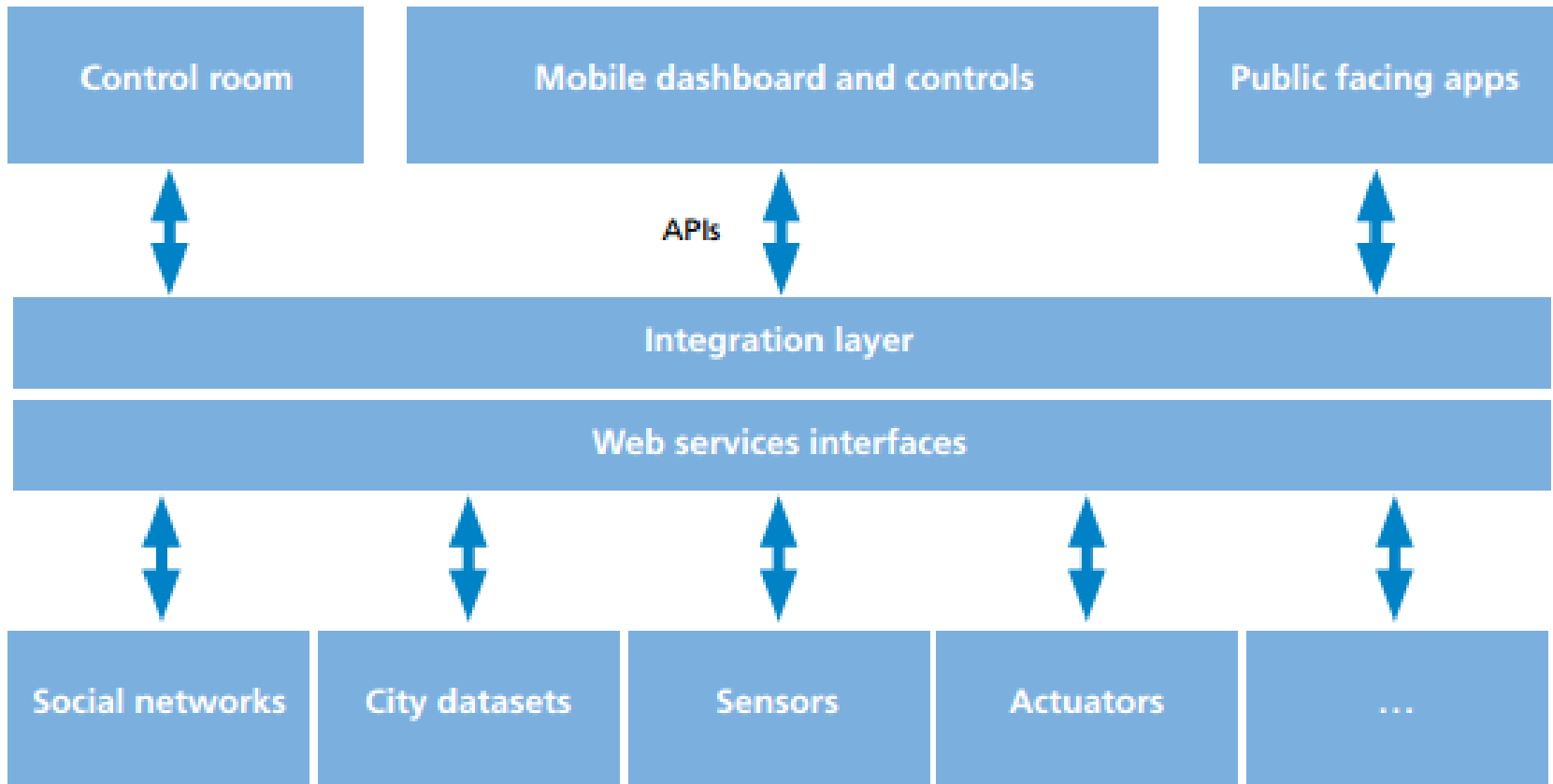
TRES DIMENSIONES DE ANÁLISIS, ¿IN HOUSE, REMOTO, OUTSORCING?

MACHINA RESEARCH REPORT 2016



CITY DASHBOARD COMO SaaS

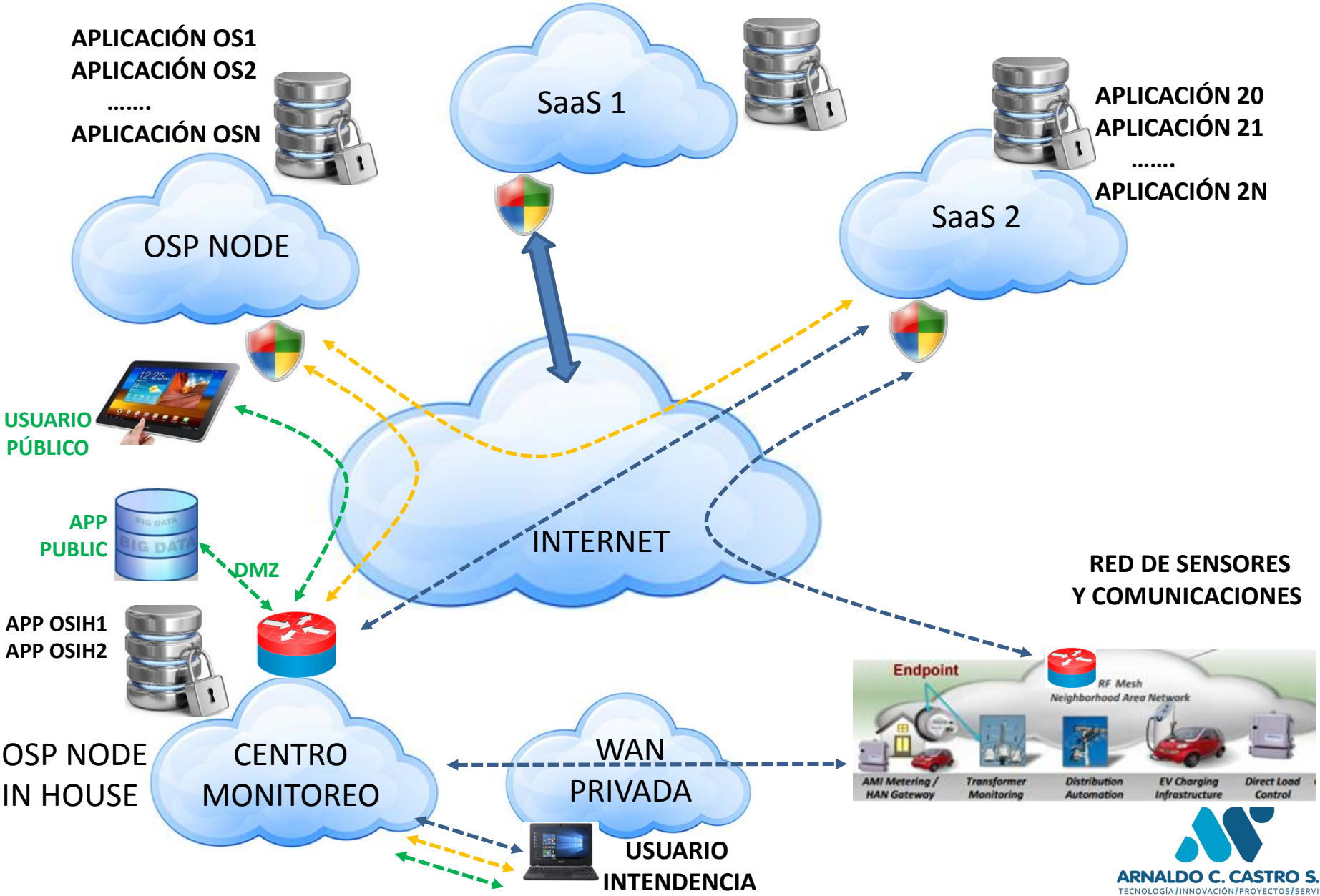
MACHINA RESEARCH REPORT 2016



ESTATEGIAS CLOUD POSIBLES

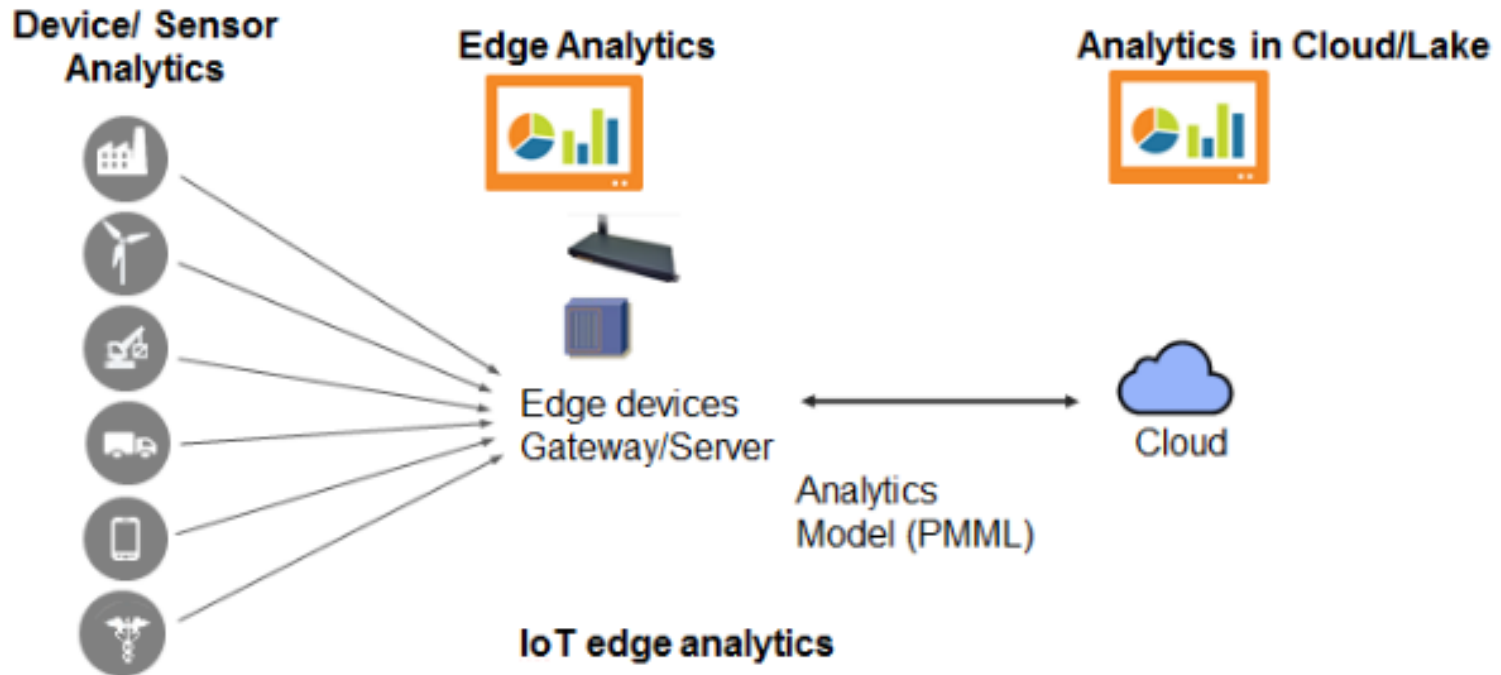
APLICACIÓN OS1
APLICACIÓN OS2
.....
APLICACIÓN OSN

APLICACIÓN 20
APLICACIÓN 21
.....
APLICACIÓN 2N



NUEVOS PARADIGMAS

EDGE ANALYTICS



ESTRATEGIA PARA SMART CITIES

ALGUNAS PREGUNTAS A PLANTEARSE

- ¿ES ESCALABLE LA INFRAESTRUCTURA?
- ¿ESTÁ DISPONIBLE TODA LA CONECTIVIDAD NECESARIA?
- ¿SE DISPONE DEL PERSONAL CAPACITADO?
- ¿HAY SOPORTE DISPONIBLE DE TERCER NIVEL?
- ¿ES EL DISEÑO LO SUFICIENTEMENTE SEGURO ANTE ATAQUES?
- ¿ES ACCESIBLE EL SISTEMA AUN EN CONDICIONES ADVERSAS Ó ALTO TRÁFICO?
- ¿HAY ALTA DISPONIBILIDAD?, ¿HAY CONTINGENCIA?
- ¿SE PUEDEN INTEGRAR SOLUCIONES EXISTENTES Y POTENCIALMENTE FUTURAS?
- ¿QUE ESTÁNDARES ADHIERE?
- -----





IEEE Second International Smart Cities Conference (ISC2 2016)

Improving the citizens quality of life
12-15 September 2016 | Trento - Italy



Workshops

☐ FIWARE: making smart cities to happen

Organizers:

- **Stefano De Panfilis**, Engineering Ingegneria Informatica S.p.A., FIWARE

FIWARE and smart cities

Lanfranco Marasso, Engineering Ingegneria Informatica S.p.A.

FIWARE overview

Stefano De Panfilis, Engineering Ingegneria Informatica S.p.A.

Coffee break

Creating a context aware application

Davide Dalle Carbonare, Pasquale Vitale, Engineering Ingegneria Informatica S.p.A.

The FIWARE Foundation

Dario Avallone, Engineering Ingegneria Informatica S.p.A.





ENGINEERING

Engineering Ingegneria Informatica S.p.A.

Who we are



Engineering is the major Italian Information Technology Group and a leading IT multinational in Italy, Europe and Latin America. It is ranked as the fifth Company in its sector over the Italian Market according to annual revenues. In 2013, gross revenues reached € 822.8 M, of which near 15% came from the international market and EBITDA totaled € 100.8 M. The company now employs nearly 7,300 professionals and boasts a customer portfolio of over 1,700 firms, with operations in 35 offices in Italy and 6 abroad.

Outstanding Business Expertise

Comprehensive Software Solutions

State of the Art IT Infrastructure

- 12.6% EBITDA Margin
- € 37 M Net Cash
- € 53 M Net Profit
- € 580 M Market Cap
- € 394 M Shareholders Equity
- Strongly **diversified** customer base, Public and Private, from Large to Small
- 70% market share** in CRM Utilities segment
- 90%** coverage of Regional Healthcare systems
- Indisputable **leader** in Compliance and Regulatory Reporting for Banks
- Pioneer in **CLOUD and Open Source** platforms development





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ENGINEERING

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