

# FIWARE Platform/FIWARE Lab/FIWARE Ops

How and why to use them!

Poznan, 23<sup>rd</sup> October 2014

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[www.fiware.org](http://www.fiware.org)  
[@Fiware](https://twitter.com/Fiware) 



# Internet: a transformation engine



## Navigation, Calling a taxi (Uber), Recruiting (LinkedIn)...



# Understanding FIWARE (Open Standard Platform)

advanced OpenStack-based Cloud + rich library of Generic Enablers



**The next computer**



Driven by implementation



Sustainability ensured



**Yes WE'RE OPEN**



# Why an open standard platform is required

- Avoid vendor lock-in:
  - Standard Southbound APIs for sensor providers
  - Standard Northbound APIs offered to applications
  - Portability across platform providers
  - Interoperability of apps on top of different providers
- Larger community of developers (critical mass, economies of scale)
  - True innovation
  - More competition, leading to cost savings
- Not any standard is enough
  - Modularity
  - Allow different business models
  - Integration with standard open data platform
  - Non-intrusive (smooth integration with legacies)



# FIWARE Generic Enablers (GEs)

- A FIWARE Generic Enabler (GE):
  - set of general-purpose **platform functions** available through **APIs**
  - Building with other GEs a [FIWARE Reference Architecture](#)
- [FIWARE GE Specifications](#) are open (public and royalty-free)
- **FIWARE GE implementation (FIWARE GEi):**
  - Platform product that implements a given GE Open Spec
  - There might be multiple compliant GEis of each GE Open Spec
- **One open source reference implementation** of each FIWARE GE (**FIWARE GERi**):
  - Well-known open source license
  - Publicly available [Technical Roadmap](#) updated in every release
- Available FIWARE GEis, GERis and incubated enablers are published on the [FIWARE Catalogue](#)



# FIWARE major differential features

## Cloud



- Federation of infrastructures (private/public regions)
- Automated GE deployment

## Data/Services De



- Complete Context Management Platform
- Integration of Data and Media Content

## IoT



- Easy plug&play of devices using multiple protocols
- Automated Measurements/Action  $\leftrightarrow$  Context updates

## Apps



- Visualization of data (operation dashboards)
- Publication of data sets/services

## Web UI



- Easy incorporation of advanced 3D and AR features
- Visual representation of context information

## Security



- Security Monitoring
- Built-in Identity/Access/Privacy Management

## I2ND



- Advanced networking (SDN) and middleware
- Interface to robots



# Take the most of infrastructures while keeping costs lower and under control

## Cloud Enablers



**PaaS Management**  
**Software Deployment and Configuration SDC**  
**Cloud Proxy Job Scheduler**  
**Object Storage**  
**Monitoring**  
**Edgelet Management**  
**IaaS Data Center Resource Management DCRM**  
**IaaS Service Management SM**

# Managing, processing and analyzing private and open data at large scale

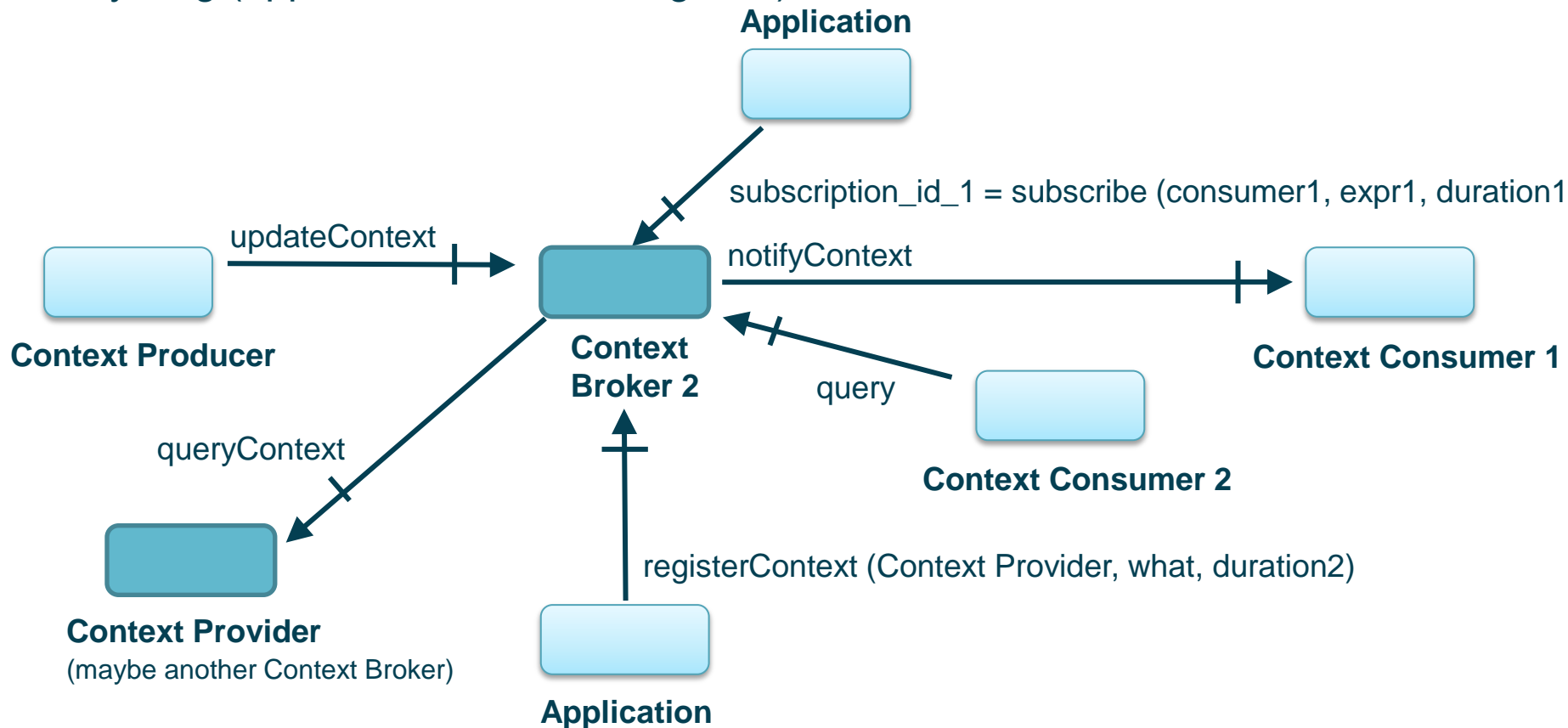
## Data /Context Enablers

**Semantic Annotation** **Big Data Analysis**  
**Complex Event Processing CEP** **Meta-Data Preprocessing**  
**Publish Subscribe Broker** **Compressed Domain Video Analysis**  
**Advanced Communication Middleware**  
**Media Enhanced Query Broker** **Location Platform**  
**Semantic Application Support**



# Simple yet powerful interaction model

- OMA NGSI Context Management is about management of Context data (aka Context Information)
- Context Information is always relevant to “entities”, although entities can be anything (applications, users, things, ...)



# Easing connection to the physical world

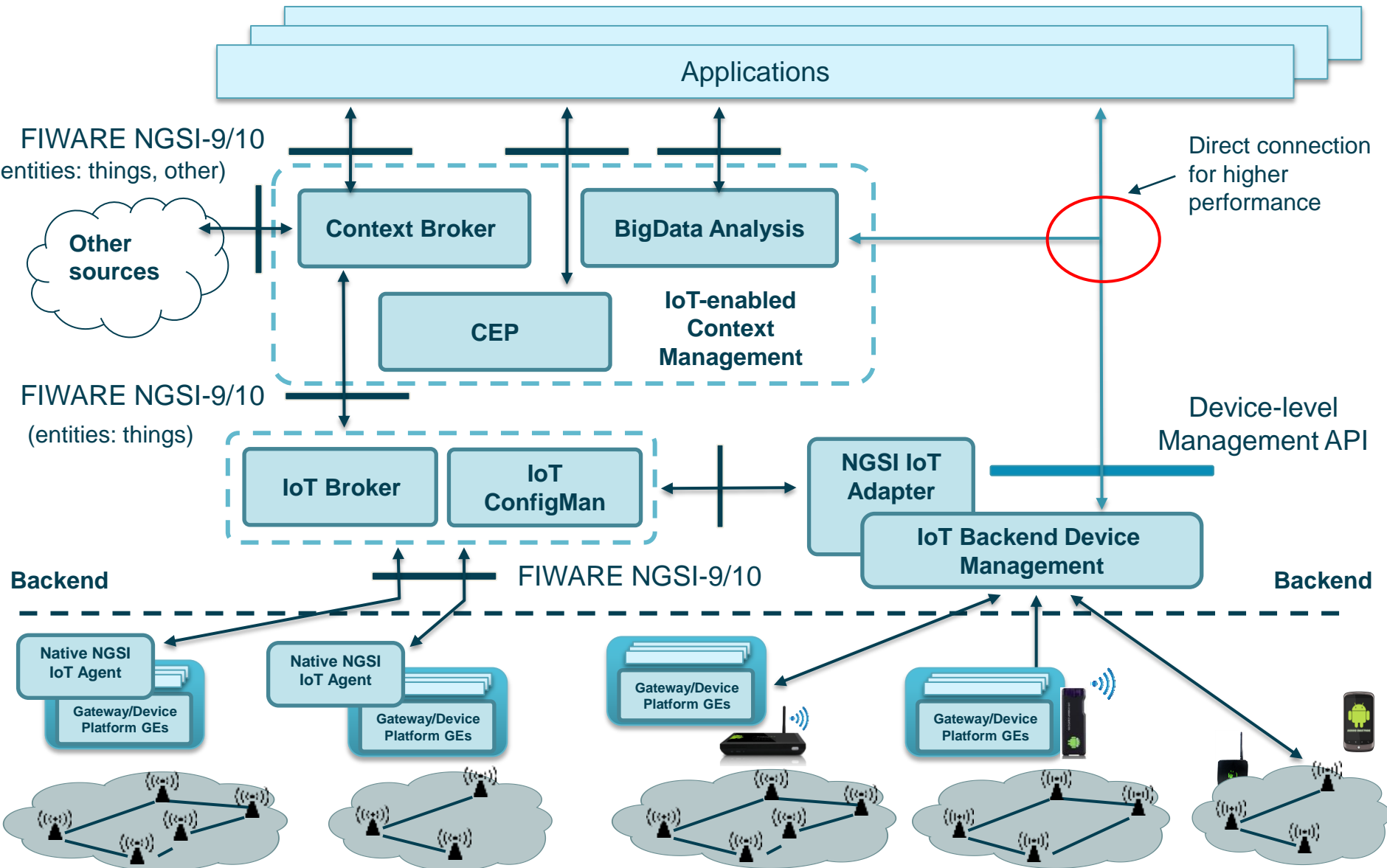
## IoT Chapter Enablers

Gateway Protocol Adapter  
Gateway Device Management  
Backend Configuration Management

Gateway Data Handling  
Backend Device Management  
Backend IoT Broker



# FIWARE IoT & Context/Management altogether



# Benefit from open innovation

## Reaching target users, monetize

### Apps Chapter Enablers

Repository  
Marketplace Store  
Light Semantic Composition  
Revenue Sharing System Business Calculator  
Service Composition Service Mashup  
Application Mashup Mediator  
Business Modeler  
Registry



# Ensuring Privacy, Security and Trust

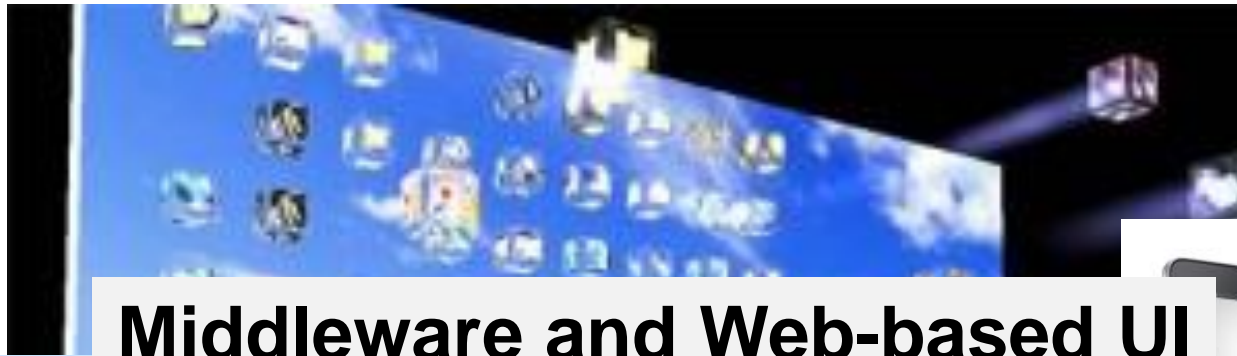


## Security Enablers

**Database Anonymizer**      **Identity Management**  
**Privacy Enhanced Identity Management**  
**Context-based Security and Compliance**      **Content-based Security**  
**Data Handling**      **Android Flow Monitoring**  
**Access Control**      **Malware Detection Service**  
**Security Monitoring**



# Offering rich web-based user interfaces



## Middleware and Web-based UI



**Virtual Designer**

**2D/3D UI**

**Real-Virtual Interaction**

**POI Data Provider**   **Display as a Service**   **2D-3D Capture**

**Augmented Reality**   **Cloud Rendering**

**GIS Data Provider**   **Advanced Middleware**



# Access from everywhere, taking the most of the network and capabilities of devices



## I2ND Enablers

**Network Information and Control NetIC**

**Service Capability Connectivity and Control S3C**

**Connected Devices Interfacing CDI**

**Cloud Edge CE**

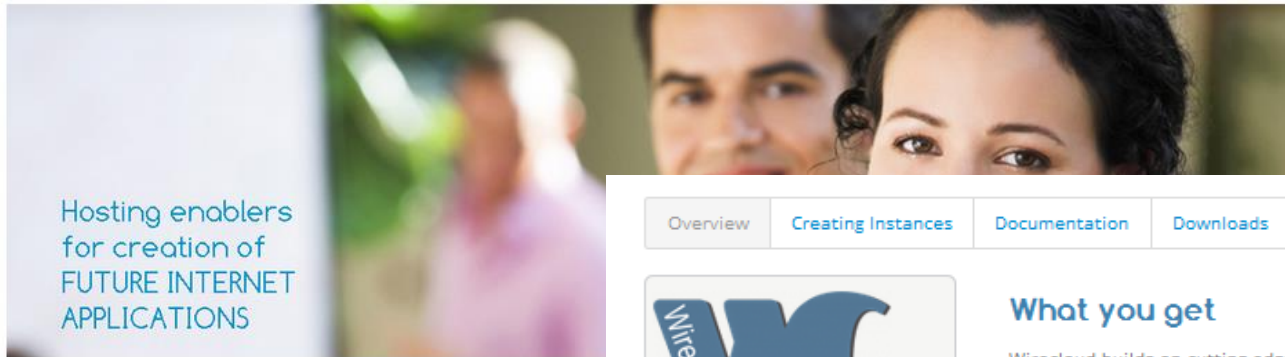
**Robotics**





# The FIWARE Catalogue

■ [catalogue.fiware.org](http://catalogue.fiware.org) a kind of executive summary per Generic Enabler




Welcome to the FI-WARE Catalogue! Here you will find all the info a Generic Enabler Implementation.

## About the Catalogue



## View the Enablers



**Chapter:**  
Applications/Services Ecosystems and Delivery Framework

**Version:**  
3.4.2

**Updated:**  
2014-10-08

**Contact Person:**  
Javier Soriano (UPM)  
Dr. Javier Soriano  
(jsoriano@fi.upm.es) School of Computer Science Universidad Politécnica de Madrid Campus de Montegancedo s/n 28660 Boadilla del Monte, Madrid (Spain)

## What you get

Wirecloud builds on cutting-edge end-user development, RIA and semantic technologies, providing a mashup platform aimed at leveraging the long tail of the Internet of Services.

Web application mashups integrate heterogeneous data, application logic, and UI components to create coherent and value-adding composite applications. They are targeted at leveraging the development, DIY, and shareability. They typically serve a specific situational (i.e. immediate) need and have a high potential for reuse. Is this "situational" character which preclude them to be offered as a generic enabler.

**Note:** Wirecloud is at the core of the FIWARE infrastructure and is therefore intended to be used for configuring a new instance of the FIWARE instance node. It is not intended to be deployed as a generic enabler. [Use the global instance of Wirecloud provided in the FIWARE Lab.](#) Nevertheless, we provide recipes and blueprints to install it in the Cloud portal (using the PaaS Manager), as a generic enabler.

## Why to get it

Web application mashups can be manually developed using conventional web programming skills and, hence, target end users, being them citizens, knowledge workers, etc.

By using Wirecloud you have access to the following key features:

- Innovate through experimentation by choosing the best suited widgets, operators, and services from an ever-growing distributed catalogue
- The wiring editor allows you to easily connect widgets in a mashup to create a full application
- The piping editor allows you to easily connect widgets to back-end services or data sources, filters, aggregators, adapters, etc.



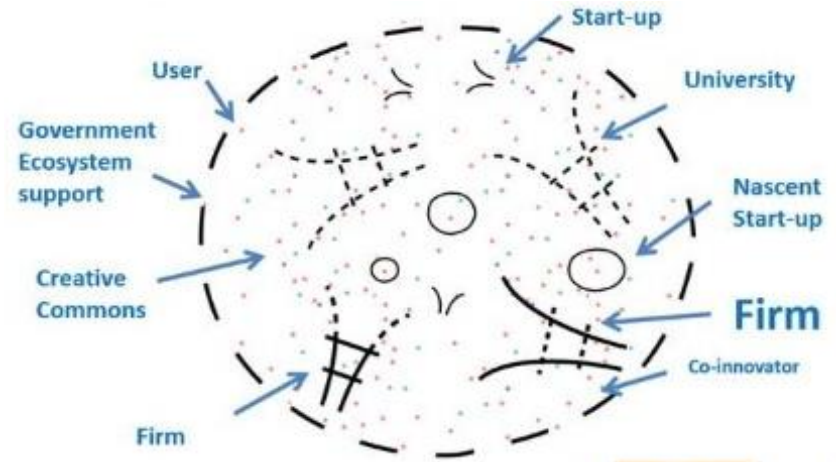
# Going from clusters to ecosystems

## Cross-fertilization between sectors; avoid silos

- Leading to a more powerful platform offering (based on common functionalities; develop once and reuse as much as you can)
- Then, translating the sectorial knowledge into domain-specific platforms



# Ecosystem and platform: two tied concepts



**Open Standard  
Platform**



**Sustainable Open  
Innovation Ecosystem**



# FIWARE Lab: the “meeting point” where innovation takes place



## App Customers and Data providers

- Connect to entrepreneurs
- Put their data at work
- Bring new innovative services to end users
- Be more efficient
- Social Reputation

## Entrepreneurs, Developers

- Develop once for a large market
- Easily meet potential customers
- Marketing, promotion
- Ability to test with real data and end users
- Simple yet powerful APIs that accelerate product development



## FIWARE Technology Providers

- “Coopetitive” approach
- Connect to entrepreneurs: jointly exploit the opportunities

- 4,2 M€ promotion campaign
  - Campus Party events
  - Startup Weekend events
  - Chambers of Commerce
  - 870 K€ in prizes
- 100 M€ of funding devoted to entrepreneurs in phase 3 of the FIWARE program




# The FIWARE Lab Portal

## FIWARE Lab

FIWARE Lab is a working instance of FIWARE available for experimentation.

You will be able to setup the basic virtual infrastructure needed to run applications that make use of the APIs provided by FIWARE Generic Enablers deployed as a Service either globally or by you (as private instance).

<http://lab.fiware.org>

 **Need Help?**  
Ask a question.

 **FIWARE Lab nodes**  
Learn about FIWARE Ops.

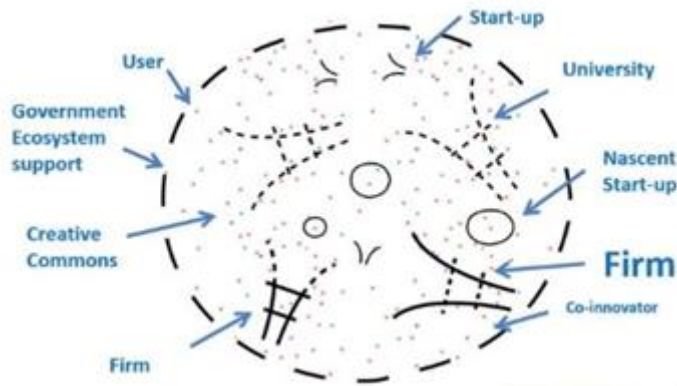
## Images

Name	Type	Status	Visibility	Container Format	Disk Format	Actions
CentOS-6.5-x64	baseimages	active	public	OVF	QCOW2	<a href="#">Launch</a>
Ubuntu Server 14.04.1 (x64)	baseimages	active	public	OVF	QCOW2	<a href="#">Launch</a>
Ubuntu12.04-server-x86_64	baseimages	active	public	OVF	QCOW2	<a href="#">Launch</a>
CentOS-6.3-x86_64	baseimages	active	public	OVF	QCOW2	<a href="#">Launch</a>
wstore-img	fiware:apps	active	public	OVF	QCOW2	<a href="#">Launch</a>
wirecloud-img	fiware:apps	active	public	OVF	QCOW2	<a href="#">Launch</a>
repository-image-R3.2	fiware:apps	active	public	AMI	AMI	<a href="#">Launch</a>
marketplace-ri-R2.3	fiware:apps	active	public	AMI	AMI	<a href="#">Launch</a>



A live instance of FIWARE available to developers for **free experimentation**

Not only platform, tools...this is **powered by data!**



# Data in FIWARE Lab



## Welcome to FIWARE Lab Data

Welcome to the FIWARE Lab Data Portal, a data portal for cities and organizations to offer Data to be used by developers and entrepreneurs for experimentation.

**"SMART CITIES ARE OF STRATEGIC INTEREST FOR ALL OF US"**  
FI-WARE for Smart Cities

### Groups

Gestione del territ... (193)

Welfare (162)

Economia (114)

Demografia (91)

Conoscenza (67)

Amministrazione (59)

Ambiente (18)

Turismo (15)

Mobilita (13)

Meteo (10)

Show More Groups

### Tags

agenda 21 (82)

CSV

### FiWare CitySDK Lisbon Tourism Information

FiWare CitySDK Lisbon Tourism Information

CSV

### evolucion abonos demo sevilla CF

demo sevilla para carga de datasets

CSV

### Valencia carga electrica

Copia de Valencia Carga Eléctrica para pruebas

CSV

### fiware-gtfs-carris

GTFS data for CARRIS (Lisbon bus agency)

CSV

# Support and coaching



Home Available Courses My Courses



e-Learning Platform



## 1 Select a Category

Cloud Hosting (2)  
Data/Context Management  
Internet of Things (IoT) Services Enablement (1)  
Applications and Software Ecosystem and Delivery

## 2 Select a Course

FI Application Project Management  
This course introduces the... and usage of the FI Application...  
FI-CODE, to create and manage... based FI application projects, with...

## 3 Log in as Guest (if necessary)

Some courses may allow guest access.

Log in as guest

## 4 Select the Course Topic

### 1. Data Collection

#### Data Collection

This tutorial explain how to set Eclipse and Trace Ana...  
in order to collect the SAR and TCPDump data used by Trac...

## 5 Confirm the Course Topic

Mode:  Preview  Normal

Start

## 6 Start the Course

START

### Watch all our WEBINARS

Learn how to use our most popular  
Generic Enablers in just a few steps



# The FIWARE e-Learning Platform

- [edu.fiware.org](http://edu.fiware.org) lets you discover Generic Enablers Features
- You can find detailed courses per Generic Enabler

You are not logged in. (Login)

Home Available Courses My Courses My Dates My Activities News

Navigation  
Home  
Courses

## Welcome

Welcome to the FI-WARE eLearning platform, where you can find training courses, lessons and many other contents regarding FI-WARE technology.

Feel free to start browsing our offering from the [categories](#) listed below, or from the Available Courses section (main menu bar), click on them and access the lessons.

Few quick steps and you can easily get access to all the public coursed published in this platform.

- 1 Select a Category**
  - Cloud Hosting (2)
  - Data/Context Management
  - Internet of Things (IoT) Services Enablement (1)
  - Applications and Services Ecosystem and Delivery
- 2 Select a Course**
  - FI Application Project Management
  - This course introduce the... and usage of the FI Application I FI-CODE, to create and m...
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  - Data Collection
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October 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	



# What can you do with FIWARE?



350 connected sensors for the management of public resources through a single connectivity platform and enhancing various areas such as **transport, energy efficiency and environmental services**



**HELP TAXI DRIVERS**



**REAL-TIME FORECAST**

# Success Stories? Get inspiration!



**Building Streaming Media Applications with FI-WAR...**

41 visualizaciones Hace 1 mes



**Creating Interactive 3D Applications and Shared...**

20 visualizaciones Hace 1 mes



**The FI-Content use case project - Social and...**

14 visualizaciones Hace 1 mes



**Naevatec (Kurento Generic Enabler) - Interview with...**

23 visualizaciones Hace 1 mes



**Magic Box Interview with Javier Herrero at CeBIT...**

27 visualizaciones Hace 1 mes



**Thorsten Sandfuchs (SAP) interview at CeBIT 2014**

22 visualizaciones Hace 1 mes



**FI-WARE Business Framework by Thorsten...**

24 visualizaciones Hace 1 mes



**Connecting to the Internet of Things (IoT) with FI...**

23 visualizaciones Hace 1 mes



**Connecting to the Internet of Things (IoT) with FI...**

12 visualizaciones Hace 1 mes



**FI-WARE and FI-Content in the EU Future Internet...**

33 visualizaciones Hace 1 mes



**Magic Box & FI-WARE, Javier Herrero at CeBIT...**

15 visualizaciones Hace 1 mes



**CeBIT Future Talks 2014**

15 visualizaciones Hace 1 mes



**SmartTaxi: The Value for a Developer - FI-WARE in...**

119 visualizaciones Hace 2 meses



**FI-LAB: A guide to the most exciting Future Internet...**

133 visualizaciones Hace 2 meses



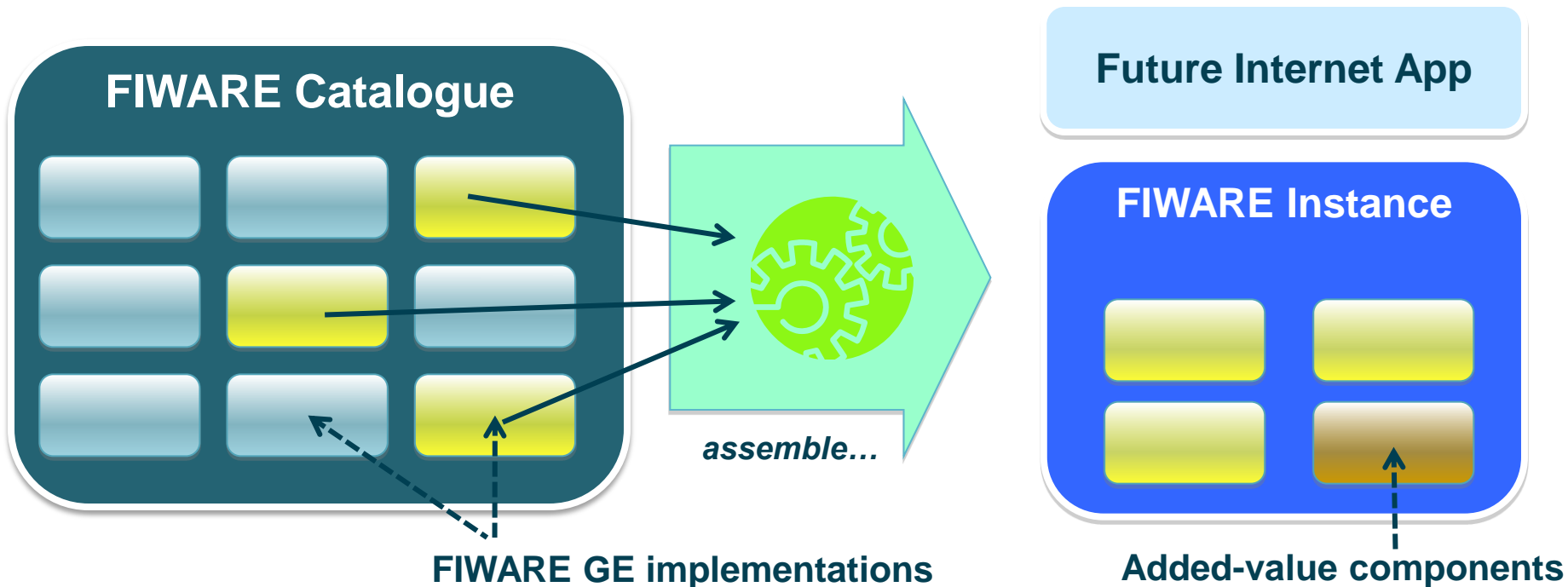
**FI-OPS: access from everywhere in Europe by...**

20 visualizaciones Hace 2 meses

[www.youtube.com/user/FIWARE](http://www.youtube.com/user/FIWARE)

# FIWARE Instances

- Future Internet Applications run on top of “FIWARE Instances” that are built by “FIWARE Instance Providers” upon:
  - selection of FIWARE GEIs (products) from the FIWARE Catalogue
  - assembly of selected FIWARE GEIs with added-value components

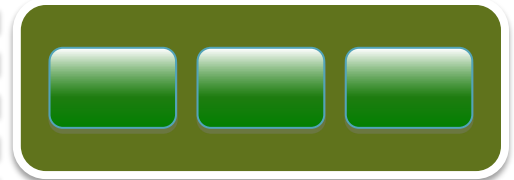
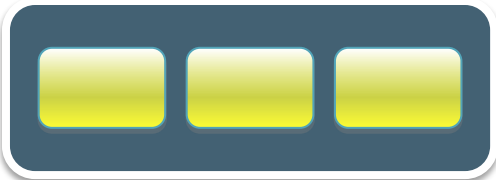
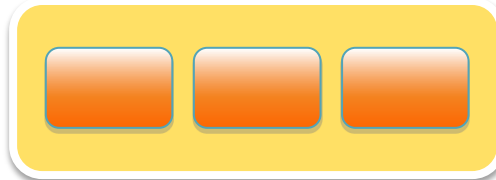


# Modularity; integration with legacies

Domain-specific platforms = FIWARE + specific enablers



Domain specific enablers

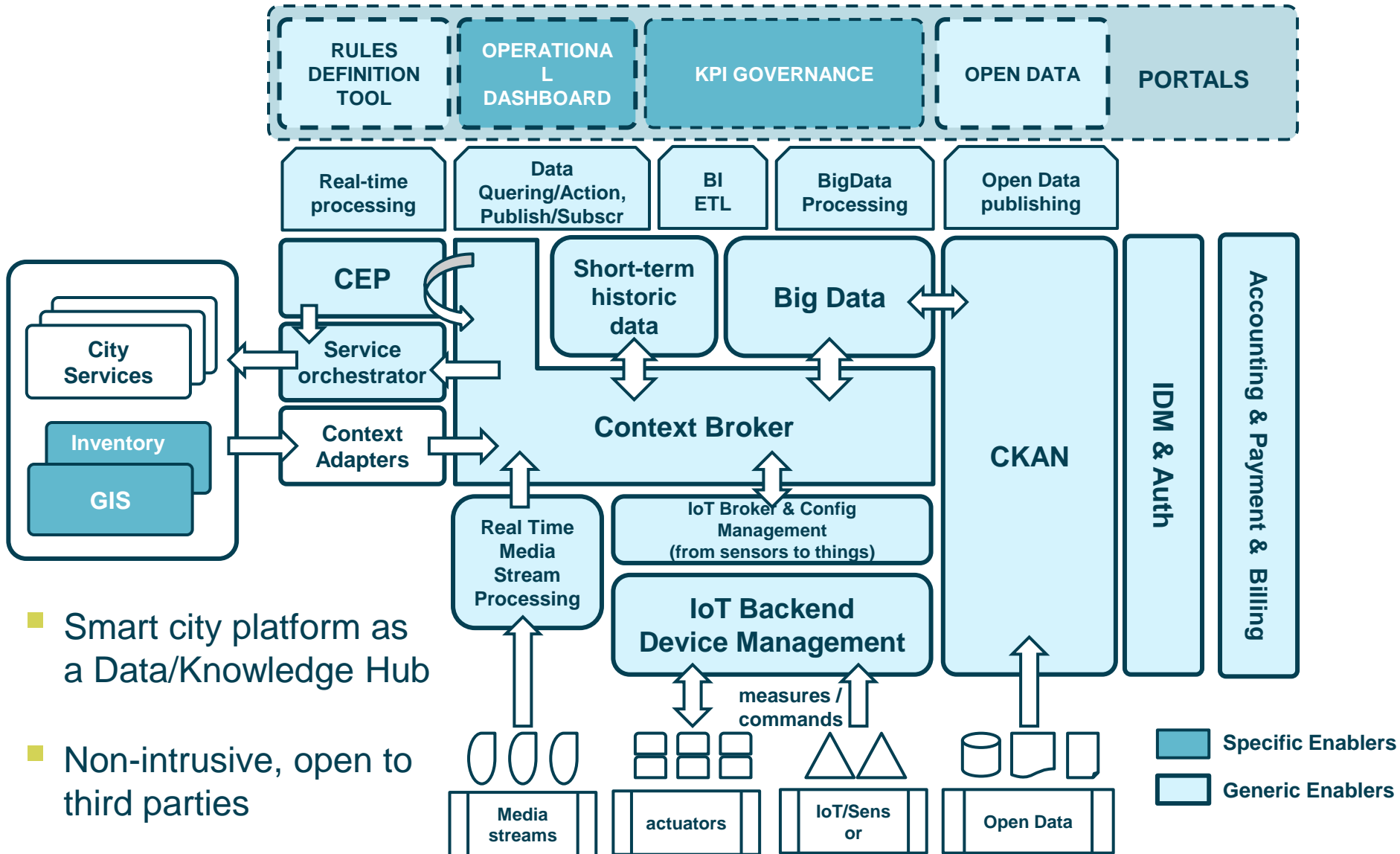


FIWARE



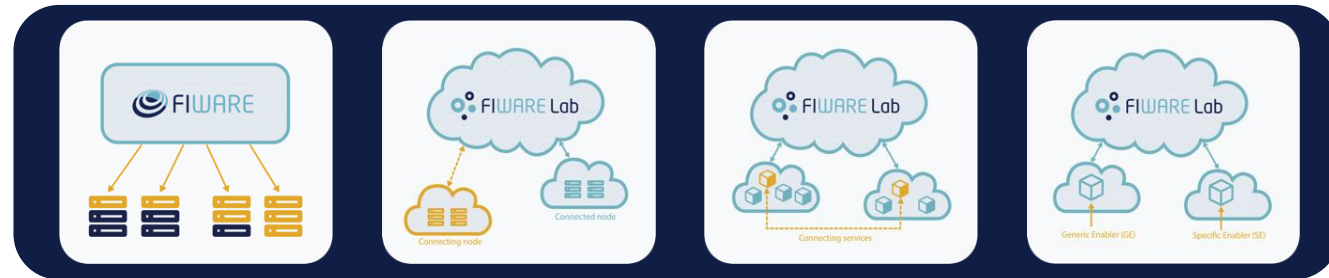


# Example: Smart City platform



- Smart city platform as a Data/Knowledge Hub
- Non-intrusive, open to third parties

# What is and what can you do with FIWARE Ops



**FIWARE Ops**  
Easing your operations

**Deployment**

**Federation Management**

**Connectivity Management**

**Service Offer Management**

1

2

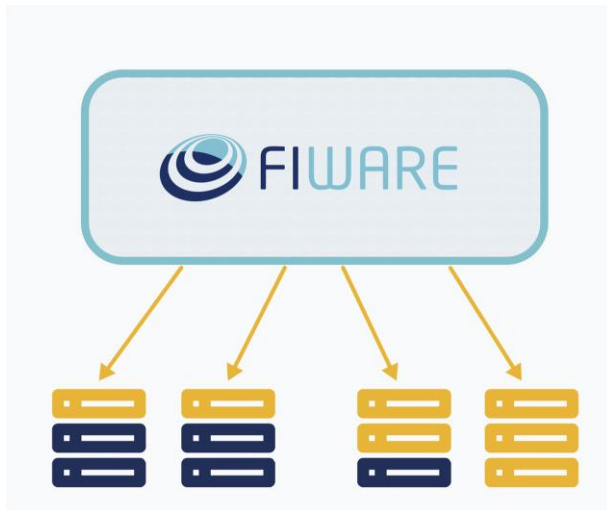
3

4

# What can you do with FIWARE Ops?

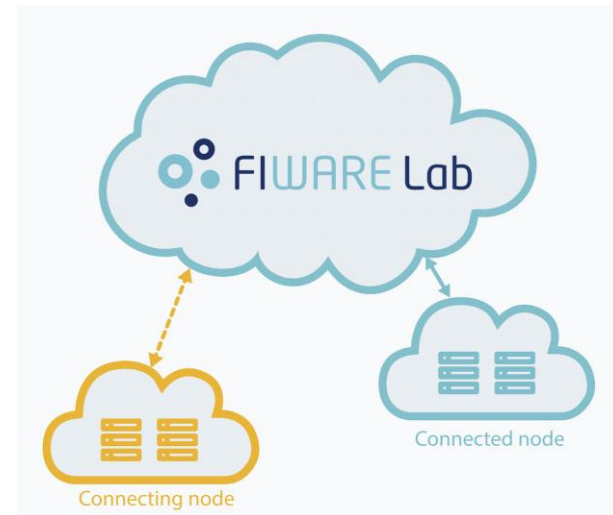
## Deployment

- Deploy a new FIWARE node and provide the basics for its federation with other nodes of an existing FIWARE instance



## Federation Management

- Federate a FIWARE node to an existing FIWARE instance and monitor the status of the different services through a global operation portal



# What can you do with FIWARE Ops?

## Connectivity Management

- Manage service connectivity across different FIWARE nodes allowing for highly distributed cloud applications

## Service Offer Management

- Register and deploy additional enablers and infrastructure services in an existing FIWARE node

### WHAT'S NEXT

Dashboard to support node operation activities such as quota management

Enhancement of the Multi-region network controller to support BOD

Status dashboard integrated with the Help Desk

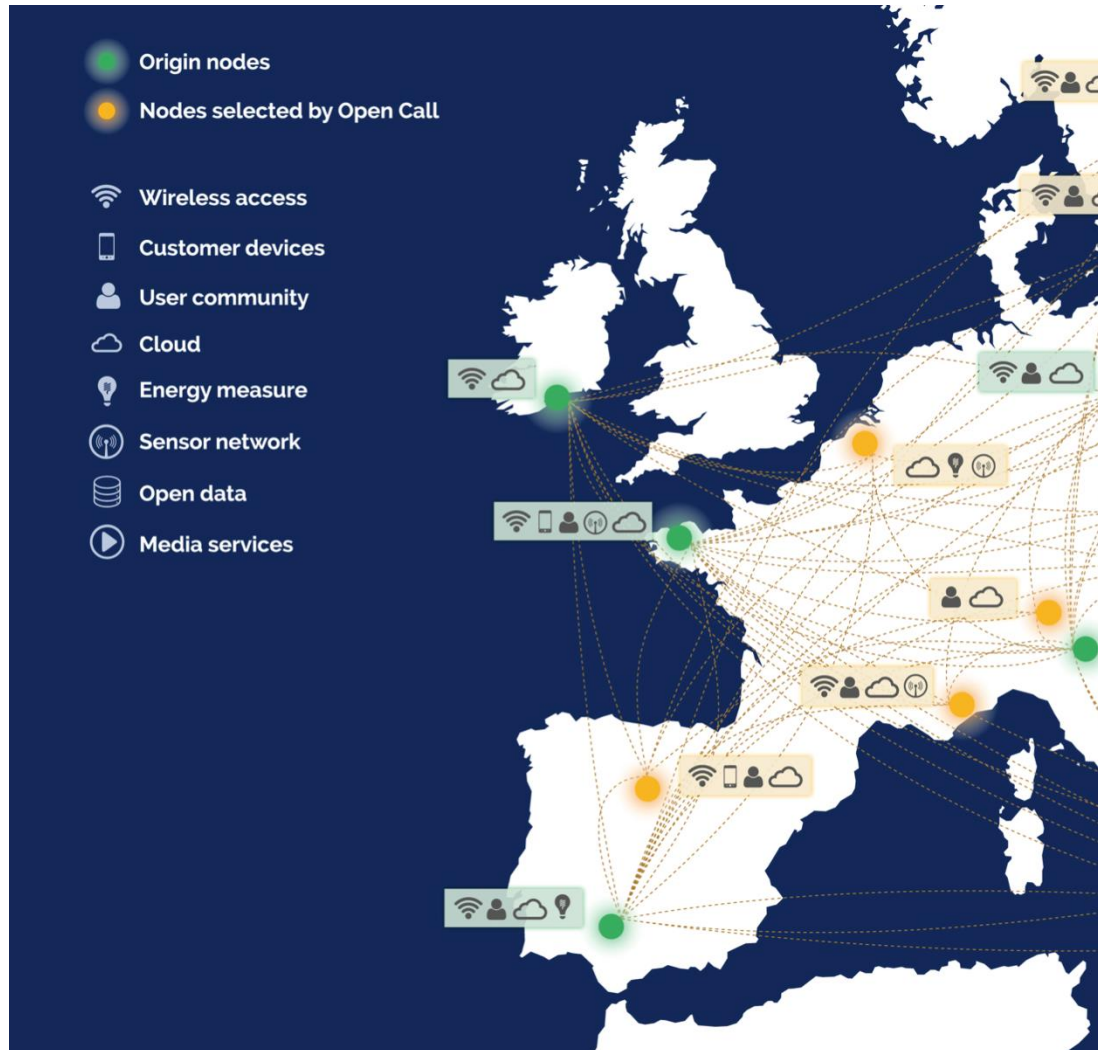
Support in the Infrastructure Toolbox for set-up of FI-Lab master node

SLA Management Dashboard for FI-Lab node operators

**And more to come!**



# FIWARE Ops is the tool used to build operate and expand FIWARE Lab



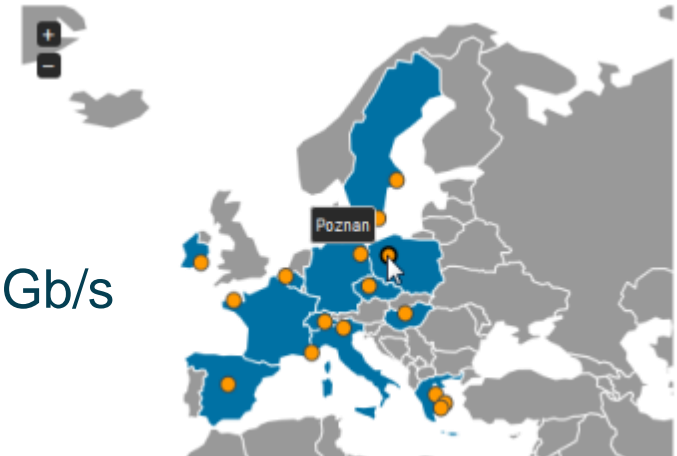
- Availability of 5 nodes (end of March 2014) with 500+ cores, 1TB+ Ram, 100TB+ HD
- Additional 12 nodes (April / September 2014) with 1000+ cores, 2TB+ Ram, 200TB+ HD
- Level 1 and Level 2 support for the nodes
- Showcases for developers, infrastructures, smart businesses

# A FIWARE node in Poznan @ PSNC



## ■ Parameters of PSNC node

- CPUs: 120 cores
- RAM: 156 Gb
- Storage: 7.5 Tb
- Connection to XIFI: 10 Gb/s



## ■ Software installed on PSNC

- ITBox ver. 1.3.2.1,
- Nogios ver. 3.4.1,
- OpenStack ver. 2013.1.4 (Grizzly)

More info: <http://infographic.lab.fi-ware.org>

# The FIWARE Programme in Summary...

- Has the goal of capturing opportunities derived from the new wave of digitalization of life and businesses
- Strategy based on building an ecosystem that will work as catalyst for capturing the opportunities. Lead standardization in Smart Cities and IoT (Internet of Things)
- The four main pillars are:



A generic, open standard platform which serves the needs of developers in multiple domains



A meeting point where innovation takes place, and opportunities can be incubated

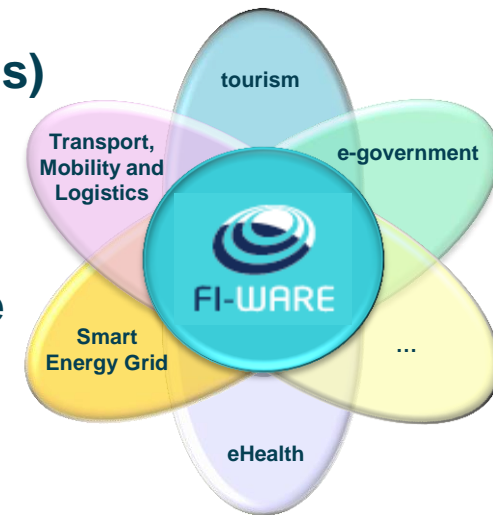


A program that funds developers and entrepreneurs, and ignites roll-out of the ecosystem



The suite of tools that ease deployment and operation of FIWARE instance nodes

- **Global footprint: open to regions sharing the ambition**



# Thanks!



[www.fiware.org](http://www.fiware.org)  
@Fiware 

