

Private Public Partnership Project (PPP)

Large-scale Integrated Project (IP)



D10.6 Documentation and training material related to FIWARE Instances Operation

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1.1 Executive Summary

This document accounts for different types of documentation and training material produced by the FIWARE Consortium related to the FIWARE Instances Operation.

This deliverable is linked to Task 10.6, whose objective is twofold: on one hand the evolution of the FIWARE Testbed to become the FIWARE Lab and, on the other hand, the open up of the FIWARE Lab to third parties. Within this last mentioned scope, a series of activities related to dissemination, public training and exploitation were performed in order to support UC projects and SMEs involvement as well in phases II and III of the FI-PPP.

Since the public launch of FIWARE Lab (formerly known as Open Innovation Lab - OIL, introduced with amendment #4 in April 2013 and actually ready from July 2013) in September 2013, during the London Campus Party different initiatives were carried out on a huge scale in order to support the Phase II Trials, as well as Phase III Accelerators in the usage FIWARE Lab, which means, in general, in the uptake of the FIWARE technologies.

Within this document will be drawn an excursus among all activities and documentation produced in order to foster and train on the usage of the FIWARE Lab instances for experimentation, starting from the FIWARE Lab portal going on to the dedicated training material published to the FIWARE Academy and also sketching out dissemination initiatives that are actually detailed in the dissemination reports produced and submitted during Y3 of the project.

All these productions dealing with the FIWARE Lab can be listed and catalogued as follows:

Permanent Documentation & Training channels

- FIWARE Lab portal
- FIWARE Catalogue
- FIWARE Wiki
- FIWARE Academy
- FIWARE Lab helpdesk
- FIWARE Forge
- FIWARE Website (blog)
- FIWARE youtube channel
- Slideshare.net
- Stackoverflow

Live Events

- Webinars
- Workshops
- Campus Party
- Hackatons
- Startup Weekends
- Presentations at public events

1.2 About This Document

This deliverable gives an overview of different activities performed and training material published and divulged related to the FIWARE Lab since its beginning.

A wide range of initiatives and documentation of different kinds are illustrated, which have been put in place by the FIWARE Consortium since the summer of 2013 until the end of the FIWARE project, to spread the knowledge of and to train to the usage of FIWARE Lab, above all to support the Phase II Trials and, in the last months of the project, Phase III Accelerators.

1.3 Intended Audience

The document targets the EC, the FI-PPP community, stakeholders and any kind of users interested in approaching FIWARE Lab to have an overview of the training material produced and that can be publicly accessible.

1.4 Structure of this Document

This document dedicates a section (or subsection) to each one of the web platforms or communication channels dealing with FIWARE Lab identified in the above Executive Summary.

1.5 Acknowledgements

This document refers to a number of tools that collect documentation about FIWARE Lab and that will continue to be constantly updated.

1.6 Keyword list

FIWARE Lab, FIWARE Instance Operation, Generic Enabler Implementation, FIWARE Academy, FIWARE Lab portal, FIWARE Catalogue.

1.7 Changes History

Release	Major changes description	Date	Editor
v1	Final draft version	2015-02-06	E-IIS
v2	Review and further contributions	2015-02-11	TID, UPM
v3	Final review	2015-02-12	TID, E-IIS

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2 FIWARE Academy

2.1 Overview

The FIWARE Academy (formerly known as FIWARE eLearning Platform), available at edu.fiware.org, is a tool collecting education and training material produced within the FI-PPP projects on FIWARE technologies. The Academy complements the usual *live* training channels, like webinars or workshops, by delivering the training material *on-demand*. This modality allows the user an asynchronous interaction, choosing among a list of pre-packaged lessons the needed one. These lessons are produced to be SCORM compliant.

2.1.1 Statistics

The increase of interest on the FIWARE Academy, also due to the initial phase of the FIWARE Accelerator Programme, is demonstrated by the growing trend of the number of page-views and users over time.

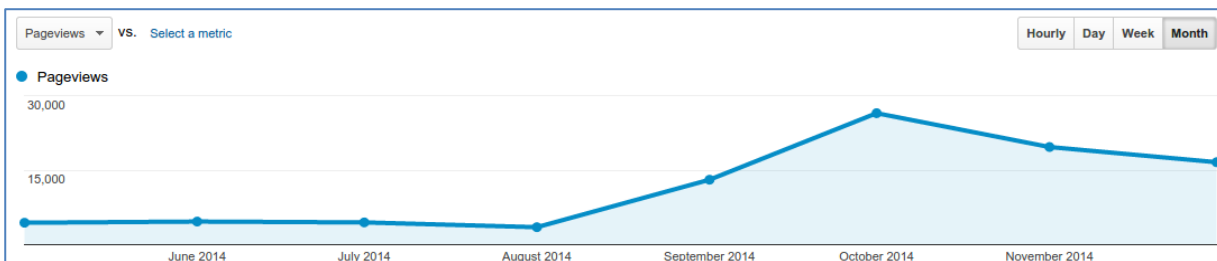


Figure 1 – Page views by month

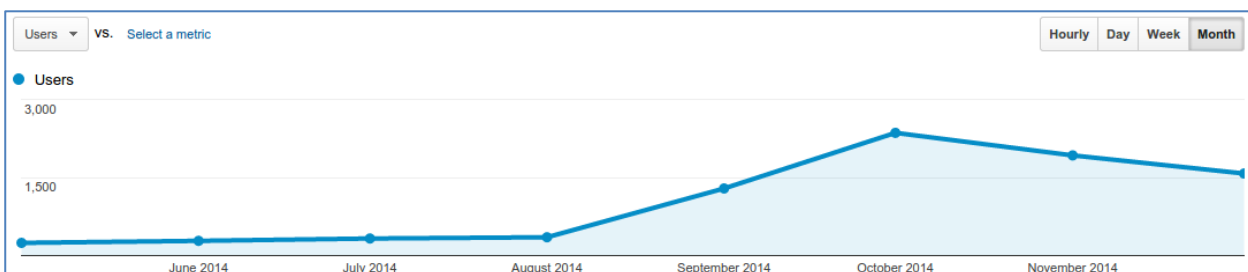


Figure 2 - Users by month

2.2 What's there: Academy for FIWARE Lab

2.2.1 Applications and Services Ecosystem and Delivery Framework

Store (WStore)

<http://edu.fiware.org/course/view.php?id=104>

The Store GE and its reference implementation WStore provides users an integrated shop for selling digital assets including services, APIs, datasets, Apps, Mashups, etc.. It is for consumers as well as for developers

of FI-applications and services and for end-to-end management of offerings and sales. The scope of WStore focuses on selling enterprise-level apps, datasets, APIs and services, with integrated support for complex pricing models, accounting, charging, billing and revenue sharing. The different digital assets can be offered jointly through a single portal, thus enhancing their respective value.

This course represents the basis of WStore delving then into those aspects related to each of the user roles in WStore and into those aspects related with developers that want to extend capabilities of an application with the features offered by WStore.

Application Mashup Generic Enabler (WireCloud)

<http://edu.fiware.org/course/view.php?id=53>

The Application Mashup Generic Enabler provides users with a cutting-edge end-user development framework to develop application mashups by integrating heterogeneous data, application logic and UI web components to create value added instant applications. The WireCloud platform is the reference implementation of the GE.

This course explains what WireCloud is and how to work with it from its different roles/perspectives: end user, developer and administrator.

Repository RI - SoPeCo Performance Test

<http://edu.fiware.org/course/view.php?id=22>

This course is a tutorial to demonstrate how to test the Repository RI with the SoPeCo (Software-Performance-Cockpit). It consists of six lessons:

- Add the SoPeCo Jar to the build path of a Java Project and extend the AbstractMeController.
- Define input parameters and metrics to be observed.
- Implement the actual experiment (call the Repository GE).
- Implement the RMI access point for SoPeCo.
- Configure the Experiment in the SoPeCo WebUI and start the MEController. Then run the experiment.
- Download and analyze your results.

Marketplace RI - Pricing Engine Extension - Simulation-based Pricing Decision Support

<http://edu.fiware.org/course/view.php?id=21>

This is an optional extension that provides “simulation-based Pricing Decision Support” functionalities to the marketplace.

This component can - and should - be used by FI-PPP partners, it is not available for partners that are not in the PPP Consortium. The software binary is available for FI-PPP internal users and access to this component is given upon request.

The FIWARE Pricing Simulator supports the decision-making processes involved in the pricing choices that a software developer (in the FIWARE environment) must make for its offerings. Any such developer using the FIWARE marketplace to sell his/her artefacts can employ the FIWARE Pricing Simulator to conduct a pricing analysis and to take pricing decisions with regard to the software and services he/she sells through the FIWARE marketplace.

This course demonstrates the functionality and the usage of the FIWARE Pricing Simulator.

Apps and Services Overview

<http://edu.fiware.org/course/view.php?id=52>

This course introduces the application and services ecosystem chapter of FIWARE and gives the context of the related Generic Enablers. This presentation is useful to understand how the different components are

designed to work together. Although this course was initially thought for FI-PPP distribution only, this version can be as well consumed by FI-PPP external interested parties.

2.2.2 Cloud Hosting

Monitoring GE

<http://edu.fiware.org/course/view.php?id=114>

This video tutorial explains how to use FIWARE Monitoring Generic Enabler, a GE allowing gathering data from heterogeneous monitoring systems in order to constantly check the status and performance of the cloud infrastructure. The FIWARE monitoring GE is intended to be integrated with the existing monitoring tools already used by users.

Software Deployment and Configuration (Sagitta)

<http://edu.fiware.org/course/view.php?id=48>

PaaS Manager (Pegasus)

<http://edu.fiware.org/course/view.php?id=47>

This is a video guide on how to use Blueprint Templates. This course combines together the tutorials of two GEs: the PaaS Manager and the Software Deployment and Configuration (SDC) and it is shared between both of them.

Data Center Resource Management (DCRM)

<http://edu.fiware.org/course/view.php?id=25>

This training course illustrates:

- A high-level introduction of the context of DCRM within the FIWARE project, its main features and some reference links to the specification and APIs.
- How to use DCRM to start a virtual machine from an existing disk image, how to access it using a key pair and security groups, how to customize it and, finally, how to save it as a virtual server snapshot.
- How to install and configure DCRM Controller and Compute components.
- How to install Pivot.
- DOVE Installation.

How to create chef recipes for FIWARE GEs

<http://edu.fiware.org/course/view.php?id=24>

This training course illustrates:

- The usage of Blueprint Templates and Blueprint Instances for deploying GEs in FIWARE.
- The usage of Chef in FIWARE for installing and configuring GEs.
- Some examples about the generation of chef recipes.

2.2.3 Data/Context Management

Complex Event Processing (IBM Proactive Technology Online)

<http://edu.fiware.org/course/view.php?id=58>

This is a webinar presenting the CEP GE of FIWARE. It introduces the CEP (Complex Event Processing) concepts and goals, describes the CEP instance, the IBM Proactive Technology Online, and explains how to interact with it.

This webinar aims at giving a better understanding of the CEP GE, so that the user will be able also to decide when the CEP GE should be used and how to use it.

Big Data Analysis (Cosmos)

<http://edu.fiware.org/course/view.php?id=69>

This training course illustrates:

- What is the Big Data and Open Data and how much data is there.
- The Hadoop reference.
- Cosmos Big Data as the FIWARE proposal.
- Cluster services (from WebHDFS to Cygnus).
- Cosmos open datasets powered by Smart Cities.
- How to create clusters (getting roman legion).
- How to exploit the data (incremental approach).

Publish/Subscribe Broker (Orion Context Broker)

<http://edu.fiware.org/course/view.php?id=44>

This course is an introduction to the usage of the Orion Context Broker, implementation of the Publish/Subscribe Broker GE and the Backend Configuration Manager GE.

The Orion Context Broker is a must when developing a Data/Context scenario. The Orion Context Broker fulfils the need of a component in the architecture that is able to mediate between consumer producers (e.g. sensors) and the context consumer applications (e.g. a smartphone application taking advantage of the context information provided by the sensors).

Stream Oriented Generic Enabler (Kurento)

<http://edu.fiware.org/course/view.php?id=62>

This course introduces the Stream Oriented Generic Enabler, a framework devoted to simplify the development of complex interactive multimedia applications through a rich family of APIs and toolboxes. The Stream Oriented Generic Enabler provides a set of robust end-to-end interoperable multimedia communication capabilities to deal with the complexity of transport, encoding/decoding, processing and rendering tasks in an easy and efficient way.

Kurento is an implementation of the FIWARE Stream Oriented Generic Enabler. In a nutshell, Kurento makes possible the development of complex interactive multimedia communications in a fast, simple and easy way.

2.2.4 Advanced middleware and interfaces to Network and Devices

Openflow Network Interface and Control (OFNIC)

<http://edu.fiware.org/course/view.php?id=72>

This Webinar is an overview of OFNIC (Openflow Network Interface and Control), which is an implementation of the NetIC Generic Enabler Open Specifications; it is a distributed Software Defined Network (SDN) controller for OpenFlow-enabled network. It enables the abstraction and virtualization of network resources and functionalities.

2.2.5 Internet of Things (IoT) Services Enablement

Protocol Adapter (MR CoAP)

<http://edu.fiware.org/course/view.php?id=64>

This course introduces the Gateway Protocol Adapter, a GE that is capable to handle one of the protocols used by IoT Devices that are accepted in FIWARE. This particular protocol adapter is to translate a specific protocol, namely CoAP over 6LoWPAN, into unique FIWARE internal calls. The protocol adapter is designed to work with IBMs Moterunner platform and communicates via 6LoWPAN and uses CoAP as application layer protocol.

IoT Template Handler GE

<http://edu.fiware.org/course/view.php?id=61>

Enterprise systems nowadays are built on service-oriented architectures, and business processes in such systems are modelled as an orchestration of underlying services. Therefore, in order to integrate the IoT into business process systems, it is necessary to service-enable IoT resources (e.g. the sensors and actuators that are used to interact with the physical environments) and to interact with them via business processes that are IoT aware.

Backend Configuration Manager (IoT Discovery)

<http://edu.fiware.org/course/view.php?id=40>

This course is an overview of the Backend Configuration Manager GE, IoT Discovery implementation. The IoT Discovery focuses on semantically-annotated IoT descriptions. The API provides two main modules:

- Sense2Web Linked-data platform
- NGSI-9 Server

NEC IoT Broker introductory course

<http://edu.fiware.org/course/view.php?id=33>

This course shows what the IoT Broker GE does and how to use it in Internet-of-Things installations. Furthermore, it contains an introduction to the NGSI data model and operations, supported by the IoT Broker GE in interplay with the Configuration Management GE.

Gateway Data Handling (EspR4fastData)

<http://edu.fiware.org/course/view.php?id=36>

This course introduces the Gateway Data Handling GE, which is the first stage of intelligence, transforming data into events thanks to smart but simple rules. It collects raw or NGSI data, transforms them to value-added application relevant events, then finally propagates them towards the subscribers.

2.2.6 Security

Page path Security Monitoring (Scored Attack Paths)

<http://edu.fiware.org/course/view.php?id=85>

The scoring application provides tools to security operators for assessing the risk and impact of attack paths. This application is written in Java and has a Web client interface.

This course gives an insight on how the tool works, and explains how to use this application.

Security Monitoring (MulVAL Attack Path Engine Web Application)

<http://edu.fiware.org/course/view.php?id=84>

The MulVAL Attack Path Engine Web Application is an implementation of the Security Monitoring GE, is part of the overall Security Management System in FIWARE and as such is part of each and every FIWARE instance.

This course shows a full scenario about a risk assessment using MulVAL attack path engine web application.

The topics dealt with by this course are:

- What is an attack graph (new approach of risk assessment).
- Difference between a classical vulnerabilities assessment and our approach.
- What kind of infrastructure can be supported by this engine.
- What is a network topology.
- How to generate an attack graph.
- How to analyze the result of the attack graph.

Security Monitoring (Remediation)

<http://edu.fiware.org/course/view.php?id=83>

This training course on the Security Monitoring includes:

- An introduction to the remediation application.
- How to understand the detail of an attack path and to select the one to remediate.
- How to remediate the selected attack path and choose the appropriate remediation candidate.

Identity Management (KeyRock)

<http://edu.fiware.org/course/view.php?id=79>

This webinar illustrates the Identity Management (KeyRock) that is the central component providing a bridge between IdM systems at connectivity-level and application-level. The Identity Management covers a number of aspects involving users' access to networks, services and applications, including secure and private authentication from users to devices, networks and services, authorization & trust management, user profile management, privacy-preserving disposition of personal data, Single Sign-On (SSO). The webinar explains how to create an account and how to manage users, organizations and applications. Furthermore, Identity Management is used for authorising foreign services to access personal data stored in a secure environment using roles and permissions. In "How to authenticate your users in your apps using FIWARE Account" tutorial is explained with detail the way to do that.

Access Control (OAUTH-API-AZ)

<http://edu.fiware.org/course/view.php?id=57>

This course teaches how to use the FIWARE Security Generic Enabler "Access Control" and how to achieve advanced REST API Access Control with the help of the Identity Management Generic Enabler. The course illustrates the core concepts of the predominant standards used in the solution: OAuth and XACML, i.e. OAuth Resource owner, Client Application and Authorization Server for OAuth; the Policy Decision Point (PDP), the Policy Administration Point (PAP), and Policy Enforcement Point (PEP) for XACML. Moreover, information are given on how to integrate a REST application with the FIWARE Identity Management GE and Access Control GE in order to achieve advanced OAuth-XACML-based access control.

How to authenticate your users in your apps using FIWARE Account

<http://edu.fiware.org/course/view.php?id=63>

Main topics addressed within this training are:

- Introduction to FIWARE Account and OAuth 2.0 - key concepts.
- Registration on FIWARE Account - how to create organizations and manage roles of users.
- Making secure web applications - to authenticate users with their username and password in FIWARE Account.
- Adaptive applications - how to authenticate users of a given application with their username and password in the FIWARE Account.
- Deployment of a FIWARE PEP Security Proxy in front of a backend to secure requests to APIs.

2.2.7 Advanced Web-based User Interface

2D/3D capture GE

<http://edu.fiware.org/course/view.php?id=103>

2D/3D capture is a client library run within the browser; it enables easy methods for web applications to capture various environmental sources, including microphone, device camera, device sensors (magnetometer, accelerometer, compass). This means that this GEi is primarily meant for mobile devices.

The course is structured as follows:

- An overview;
- Implementation;
- Reference server implementation;
- Some examples;
- References to needed resources (code, release delivery, installation and administration guide, user and programmers guide).

3D-UI (WebTundra)

<http://edu.fiware.org/course/view.php?id=101>

The training course includes an introductory Bootcamp presentation on 3D UI WebTundra GE plus an asset guide collecting links to needed resources (source and examples).

Synchronization GE

<http://edu.fiware.org/course/view.php?id=111>

This course illustrates the core technologies used within the Synchronization GE. It deals with the scene data model, shows how to run the server and explains how to use WebTundra client with Synchronization server.

Virtual Characters GE

<http://edu.fiware.org/course/view.php?id=112>

This lesson deals with the technologies that are behind the Virtual Characters GE, giving a brief summary of the components used by the Virtual Character. The course explains the Virtual Character Data Model and shows code samples of Virtual Characters.

Augmented Reality Generic Enabler

<http://edu.fiware.org/course/view.php?id=98>

This is a presentation slideshow giving an overview on Augmented Reality Generic Enabler and all needed references to sources, User and programmes guide.

3D-UI (XML3D)

<http://edu.fiware.org/course/view.php?id=97>

This training course is about how to get started with XML3D, dealing with the basics of XML3D. It gives an introductory overview of the 3D-UI-XML3D.

POI Data Provider Generic Enabler

<http://edu.fiware.org/course/view.php?id=96>

This course introduces to the general benefits of Points of Interest system as well as to the specific benefits of FIWARE POI Data Provider Generic Enabler. It also shows how to develop a web client to utilize a FIWARE POI Data Provider Generic Enabler.

2D-UI

<http://edu.fiware.org/course/view.php?id=93>

This training course shows how to install and to configure the 2D-UI GE. It also includes a programmer's guide to the 2D-UI GE.

Cloud Rendering

<http://edu.fiware.org/course/view.php?id=92>

This course explains how to install and configure the Cloud Renderer GE. Within this course can be found both a user and a programmer's guide to Cloud Rendering GE.

Interface Designer

<http://edu.fiware.org/course/view.php?id=91>

This training course illustrates the needed steps to install and configure Interface Designer. It includes also a complete user guide to the Interface Designer GE.

Geographical Information System Data Provider

<http://edu.fiware.org/course/view.php?id=88>

This training course gives an introductory overview of GIS (Geographical Information System Data Provider) and illustrates the GIS GE Bootcamp.

Real Virtual Interaction GEi

<http://edu.fiware.org/course/view.php?id=87>

This course is an introduction to RVI GEi and includes also a presentation on real virtual interaction Bootcamp.

2.2.8 Development Tools

Unit Funcional Testing Framework

<http://edu.fiware.org/course/view.php?id=32>

The Unit Funcional Testing Framework (aka UFT Framework) is a framework to test REST services. These tests can be executed directly from the Eclipse IDE or as part of a continuous integration process.

This course shows how to use the Unit Funcional Test Framework.

Fusion Forge Project & User Management

<http://edu.fiware.org/course/view.php?id=30>

This lesson explains the features provided by the Fusion Forge Project & User Management plugin, included as part of FI-CoDE. This plugin enables FI-CoDE users to create, manage and delete projects and users in an external Fusion Forge directly through the FI-CoDE environment.

FI Application Project Management

<http://edu.fiware.org/course/view.php?id=27>

FIA Project Management Plugin enables FI-CoDE users to create Future Internet Applications that use instances of FIWARE Generic Enablers.

This lesson describes the features of the FI Application Project Management plugin included in FI-CoDE. It also explains how to install this plugin and use it to create a FI application project, how to select FIWARE enablers and instances as dependencies for the project and how to access runtime information (i.e. endpoint of the enabler instance).

Software Performance Cockpit

<http://edu.fiware.org/course/view.php?id=26>

This course provides a tutorial that demonstrates how to use SoPeCo (Software Performance Cockpit) to evaluate a software system using the example of the Repository GE (Generic Enabler).

FusionForge Connector

<http://edu.fiware.org/course/view.php?id=20>

The FusionForge connector provides the tasks and tickets management functionality for the Eclipse Mylyn plugin: how to retrieve, edit and create tickets and tasks in a remote FusionForge instance directly from Eclipse IDE.

This presentation covers the installation steps and how to use the main functionalities provided by the connector and supported by the Mylyn plugin.

PROSA: An Online Monitoring and Testing Tool

<http://edu.fiware.org/course/view.php?id=19>

This course introduces to PROSA, which is a tool for continuously monitoring and visualizing the response times of constituent services in a composition during runtime. PROSA can be configured to invoke the composed services by online testing (testing them during their operation) to gather additional response times when needed.

REST Client Generator

<http://edu.fiware.org/course/view.php?id=17>

The REST Client Generator is an Eclipse plugin that, starting from the web service description available in WADL format (formal description of the RESTful services), is able to create the java source code that wraps the interaction between the application and the remote services.

This course shows how to install and use the REST Client Generator plug-in for Eclipse.

Trace Analyzer

<http://edu.fiware.org/course/view.php?id=29>

Trace Analyzer is an Eclipse-based framework for collecting, analyzing, and visualizing performance data.

This tutorial explains how to set Eclipse and Trace Analyzer in order to collect the SAR and TCPDump data used by Trace Analyzer.

NGSI TestServer

<http://edu.fiware.org/course/view.php?id=60>

The FIWARE NGSI10 TestServer allows testing the software intended to interact with various IoT Generic Enablers using the FIWARE NGSI10 binding, such as the IoT Broker Generic Enabler. This course provides an introduction to the NGSI Test Server, its purpose and its usage. It illustrates the NGSI standard and what the FIWARE NGSI RESTful binding is and how to use the hosted version of the test server from a Web browser.

3 FIWARE Lab portal

3.1 Overview

The new enhanced version of the FIWARE Lab portal - available at lab.fiware.org - is up and running since October 2013. It is a very direct and easy way for developers to create their applications by using the live instances of FIWARE. It is a unique entry point, centralizing interaction with users, of all tools and channels needed to self experiment the FIWARE virtual infrastructure supporting their trials.

3.2 What's there

The FIWARE Lab portal is a real help for those who want quickly start in using FIWARE, it gives access to available Generic Enablers instances. It is not only a mean to register users' applications and run them, but brings also together references to the various tools to make use of the APIs of FIWARE Generic Enablers and to the main and primary means to get information and knowledge about FIWARE technologies.

Through four permanent tabs in the menu, the Portal allows users to browse among:

- Cloud - provides management of all Cloud resources, including images, instances, blueprints and software.
- Store - allows the users to publish service offerings and/or to acquire other service of interest.
- Mashup - links to the next-generation application mashup platform.
- Data - links to the FIWARE Lab Data Portal. The data portal in FIWARE Lab is a fully integrated CKAN instance intended to provide a catalogue for open datasets and open data endpoints. The main contributions to the data in that catalogue are cities and their third party collaborators, as a result of the Smart City activities carried out in FIWARE. The CKAN portal authentication is federated with FIWARE Lab, and it has been integrated with the FIWARE Store and Context Broker (NGSI10) APIs.
- Account - a wizard to register new applications and organizations. This portal shows a front page, for non-authenticated users, which highlights four links that are thought to guide the user in experimenting this environment, even if for the first time:
 - the FIWARE Catalogue
 - the FIWARE Academy (eLearning)
 - the helpdesk
 - the FIWARE Lab nodes
- Help&Info - collects all needed info and links for asking questions and gather information.

The link to the FIWARE Catalogue (catalogue.fiware.org/enablers) is essential for those developers wanting to orientate themselves among FIWARE GEis and to choose the right one useful to their application. It provides important information like how to install the GEis (Installation Manual) and a how to start using them (User & Programmers guide). Last, but not least, FIWARE Catalogue gives the possibility to know the different versions available and redirects to the repository from which can be downloaded the different versions of components.

A concrete action towards a business approach to the FIWARE Lab is the reference to FIWARE Lab nodes, linking to FIWARE Ops (fiware.org/fiware-operations), a set of tools that help Platform Providers in the deployment, setup and operation of FIWARE instances.

The FIWARE Academy (edu.fiware.org/) is crucial for all those users that, even at different level of knowledge, approach the FIWARE Lab and want to use FIWARE technologies.

These three links, together with the helpdesk contact, are always accessible to provide all the needed information to start using FIWARE Lab.

3.3 Direct support

Special highlight must be given to the support that users can receive by means of different channels to solving their problems while using the FIWARE infrastructure or searching for more detailed information.

First, the user can benefit at any time from a set of explanatory videos accessible through the Info&Help permanent tab link in the menu. For each of the four areas - Cloud (Blueprints, Instances, Object Storage), Store, Mashup, Data - video tutorials, textual and visual explanations are available.

Second, a channel to contact directly the FIWARE Lab team is ready to use by means of the “Need help?” link. This Help Desk service initially worked just through email exchanges, but the FIWARE help mailbox was later on linked to a JIRA repository of tickets as well.

In addition, users in need to address issues, doubts and any questions related to the FIWARE Lab (and, of course to FIWARE technologies in general) can also use the Stackoverflow channel (<https://stackoverflow.com/questions/tagged/fiware>), available since April 2014. This channel is not strictly related to the official channels behind the FIWARE project, but it’s indeed a means helping in creating and supporting the FIWARE community, encouraging, as a forum, discussions, exchange of ideas around the FIWARE platform.

4 FIWARE Catalogue

4.1 Overview

The FIWARE Catalogue, available at catalogue.fiware.org, is one of most relevant and consolidated entry point to the FIWARE technology; there it's published how this technology is available in the FIWARE Lab. All the entries in the Catalogue are publicly available (no registration required) and are structured following a common template in order to simplify the communication to the users.

At the time of writing, the number of entries by chapter, available in the FIWARE Catalogue, are summarized in the following table:

Chapter	N° entries
Applications and Services Ecosystem and Delivery Framework	5
Cloud Hosting	7
Data/Context Management	4
Advanced middleware and interfaces to Network and Devices	1
Internet of Things (IoT) Services Enablement	6
Security	4
Advanced Web-based User Interface	11
Development Tools	9

4.1.1 Statistics

Here are reported some indicators that demonstrate the increase, over the year 2014, of the interest on FIWARE technology by end users.

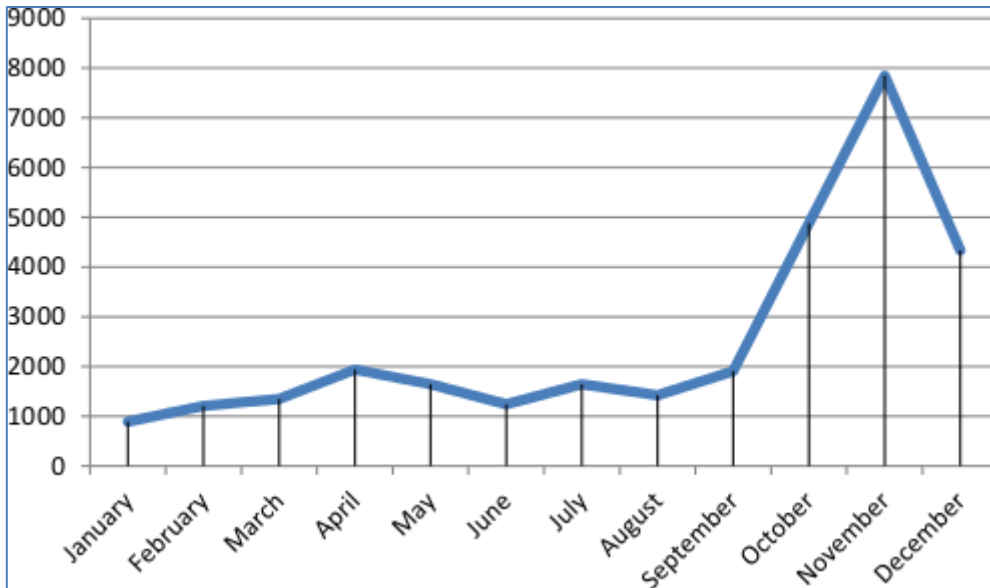


Figure 3 - Page views by month

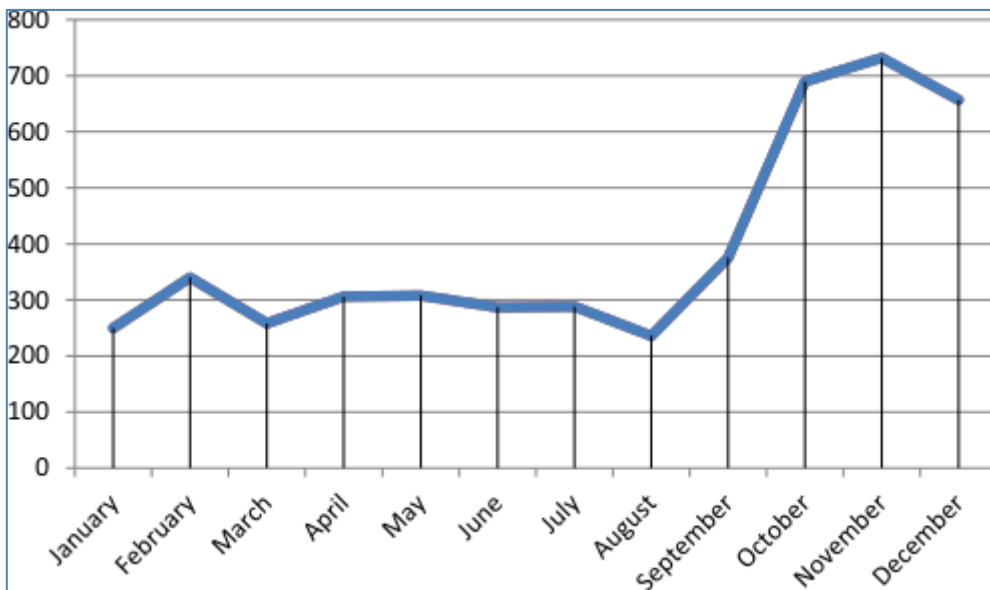


Figure 4 - Visits by month

4.2 What’s there: Catalogue for FIWARE Lab

For what regards the availability of a given Generic Enabler implementation within the FIWARE Lab, every GEi entry reports two dedicated tabs:

- Instances;
- Creating instances.

The *Instances* tab contains all the information needed to get access to a global instance of that GEi (if available) and in some cases to the dedicated instances created for the Use Case projects of Phase II. The global instance of a GEi represents an installation that can serve multiple users, ensuring the proper isolation between different accounts (multi-tenant service).

In case the GEi is not multi-tenant and available as global instance, everyone interested in incorporating that GEi in the development process has to create a personal instance of that GE implementation. The *Create Instances* tab contains the documentation on how to obtain an installation usually taking advantage from different automated options:

- Deploying in FIWARE Lab a dedicated GE instance based on an image (FIWARE Lab account needed);
- Deploying a dedicated GE instance in a private virtual infrastructure (based on automatic scripts);
- Deploying in FIWARE Lab a dedicated GE instance based on blueprint templates for this GE (FIWARE Lab account needed).

To help users in understanding how the GEis are made available, every GEi entry reports its licence under the Terms and conditions tab.

5 Additional channels

5.1 Wiki, Forge & Website

The FIWARE wiki (wiki.fiware.org) and the Forge (forge.fiware.org/projects/fiware/) are the two basic tools to learn about and practically get the APIs provided by FIWARE Generic Enablers to develop applications that can be run and experimented on the FIWARE Lab infrastructure. Within those two sites is available the last updated documentation about GEIs, GE open specifications APIs, the installation and administration guides, user and programmer guides, the FIWARE architecture description. The Forge is one of the places from where to download software packages, although github is starting to be used as well.

The info published to the Wiki (in html version) and to the Forge (pdf version) is publicly available also to non-registered users.

Although this is not the document where to report about the FIWARE website, it has to be mentioned as it is in strict relation to the dissemination activities to spread the knowledge, and, thus, the uptake, about the FIWARE Lab. fiware.org is not only a means for having published news about the launch of FIWARE Lab, its further evolutions and all the related events, but also for having a dedicated section - in its blog - to post anything specifically related to FIWARE Lab here: <http://www.fiware.org/tag/fiwarelab/>

5.2 YouTube & Slideshare

The FIWARE youtube channel (<https://www.youtube.com/user/FIWARE>), actually described and detailed within the dissemination reports, has to be mentioned at least also here, since it gathers a numbers of video tutorials (constantly updated) explaining what the FIWARE Lab is and how to start using it. Those videos are a useful, easy and friendly means to start approaching the FIWARE infrastructure, and can be specially found within a dedicated playlist (eleven video tutorials up to now) “What is the FIWARE Lab and how to use it”, available at: https://www.youtube.com/playlist?list=PLR9e1AI9JscS9ob4U0TssbLaX6U_Rbc3Z

In addition, two set of specific slideshows, on FIWARE Lab and its tools, were produced and shared through the FIWARE slideshare.net section (slideshare.net/FI-WARE/).

It's worth noticing that more than 7.000 entries are published there and can be found by combining these three keywords: FI-WARE, FI-LAB, FI-PPP; most of the training material in form of slides is produced and published directly by FIWARE Architects and it's available from their personal slideshare profiles.

6 Training and dissemination events

6.1 Webinars

A series of webinars on FIWARE GEIs were organized and held (by partners involved in technical Chapters) during the first months of project Y3 addressing mainly UC projects needs to deepen their knowledge about specific aspects of FIWARE technologies.

More detailed information on the focus and participants of those webinars are added here to what is already reported within the dissemination reports.

A detailed list of held webinars is given below; attendees were representatives from FI-Content, FI-Space, Finesce, FI-STAR, FITMAN, XiFi.

(CHAPTER) FIWARE GEs	Nr of webinars/When	Links to content
(APPS) Application Mashup	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2570/WirecloudWebinar_Jun2013.pdf http://youtu.be/O7gugYzbtDY
(APPS) Apps and services - Overview session (mission and vision)	2 webinars in MAY, JUN 2013	https://forge.fiware.org/docman/view.php/7/2530/2013-05-WP3_business_framework_FI-PPP-webinar_PPP_ONLY.pdf https://forge.fiware.org/docman/view.php/7/2529/Recording+FI-WARE+Webinar+Call+WP3+Business+Framework_FI_PPP_DISTRIBUTION_ONLY.flv
(APPS) Business Framework (BM/BE+Store+RSS)	webinar in JUN 2013	https://forge.fiware.org/docman/view.php/7/2642/WP3+Business+Framework+Webinar_v1.5.pptx http://youtu.be/gSebBr-fN5k
(APPS) Light Semantic Composition	2 webinars in JUN 2013	Not available on forge.fiware.org
(APPS) Marketplace, Registry, Service Description Repository	2 webinars in MAY, JUN 2013	https://forge.fiware.org/docman/view.php/7/2663/sap_enablers_webinar_2.ppt
(APPS) Mediator GE	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2611/FIWARE-Mediator-GE_TI_THALES_+complete_final.pptx
(CLOUD) Allocation of Object Storage (see note 2)	2 webinars in MAY, JUN 2013	(will be available approx. June 5th - adding some further data first based on q&a's)
(CLOUD) Allocation of single VMs (image instances) (see note 2)	webinar in JUN 2013	https://forge.fiware.org/docman/view.php/7/2563/FIWARE_DCRM_webinar_20130606.pdf
(CLOUD) Deployment of SW on single VMs (see notes 2, 7)	2 webinars in JUN 2013	Not available on forge.fiware.org

(CLOUD) Job Scheduling (see note 2)	2 webinars in JUN, JUL 2013	https://forge.fiware.org/docman/view.php/7/2613/2013-06-13+FI-WARE_Job+Scheduler+GE_Webinar-slides.pdf 1st webinar: http://www.youtube.com/watch?v=8oWOpblupXw 2nd webinar: http://www.youtube.com/watch?v=2249AN8a3c0
(CLOUD) Management of Blueprints (see note 2, 8)	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2549/PaaS+Manager+presentation+v1+%282013-04-06%29.pdf https://forge.fiware.org/docman/view.php/7/2582/PaaS+Manager+webinar+%282013-04-06%29.mov
(CLOUD) Monitoring components in FIWARE Lab	1 webinar in JUL 2014	http://edu.fiware.org/course/view.php?id=114
(CLOUD) Scalability Manager (This component was renamed during 2014 to Policy Manager)	1 webinar in NOV 2013	http://youtu.be/10bDVSHHFbc
(CLOUD) Policy Manager	1 webinar in DEC 2014	http://es.slideshare.net/geonexus/policy-managerpresentation-v1
(DATA) Complex Event Processing (CEP)	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2584/CEP-Webinar-R2.pdf
(DATA) Compressed Domain Video Analysis	2 webinars in JUN 2013	Not available on forge.fiware.org
(DATA) Location	2 webinars in MAY, JUN 2013	https://forge.fiware.org/docman/index.php?group_id=7# (presentation pending approval)
(DATA) Media-enhanced Query Broker	2 webinars in JUN 2013	https://forge.fiware.org/docman/index.php?group_id=7# (presentation pending approval)
(DATA) Publish/Subscribe Broker (see note 5)	2 webinars in JUN 2013	Not available on forge.fiware.org
(DATA) Middleware	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2564/KIARA_FI-WARE_Advanced-Middleware_webinar_2013-06-06.pdf
(DATA) Publish/Subscribe Broker	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2616/FIWARE_R2_TI_PubSubContextBrokerGE_webinar_12062013.pdf Examples used in demo: https://forge.fiware.org/docman/view.php/7/2609/FIWARE_R2_TI_PubSubContextBrokerGE_Webinar_examples.ppt
(DATA) Semantic Annotation	2 webinars in JUN 2013	Not available on forge.fiware.org
(DATA) Orion Context Broker	4 webinars in JUN, JUL 2013 and JAN, APR 2014	http://www.slideshare.net/fermingalan/orion-context-broker-webinar-2013-0530 http://www.slideshare.net/fermingalan/orion-context-broker-webinar-2013-0619 http://www.slideshare.net/fermingalan/orion-context-broker-webinar-2014-0122

		http://www.slideshare.net/fermingalan/orion-context-broker-webinar-20140401
(DATA) Semantic Application Support	2 webinars in MAY, JUN 2013	Not available on forge.fiware.org
(DATA) Cosmos BigData	JUN, JUL 2013 and JAN, APR 2014	http://www.slideshare.net/FranciscoRomeroBueno/fi-ware-cosmosv4?qid=cc6caf17-ed99-4b58-b4fa-1ae6b1dce75&v=qf1&b=&from_search=1 http://www.slideshare.net/FranciscoRomeroBueno/fiwarecosmosv7tech?qid=cc6caf17-ed99-4b58-b4fa-1ae6b1dce75&v=qf1&b=&from_search=6 http://stream.globalplaza.org/videos/fi-ware/Webinar_1_4_2014-04.mp4
(I2ND) Network Information and Control (NetIC)	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2626/I2ND_NetIC_webinar_June-2013.pdf
(I2ND) Service Connectivity Capability and Control (S3C)	Webinar in JUL 2013	Not available on forge.fiware.org
(IOT) (Backend) Configuration Management	Webinar in JUL 2013	Not available on forge.fiware.org
(IOT) (Backend) IoT Broker	2 webinars in MAY, JUN 2013	Not available on forge.fiware.org
(IOT) (Gateway) Protocol Adapter	2 webinars in MAY 2013	Not available on forge.fiware.org
(IOT) NGSI Test Environment for testing client NGSI conformance	Webinar in JUN 2013	Not available on forge.fiware.org
(IOT)(Backend) Configuration Management	2 webinars in MAY, JUN 2013	https://forge.fiware.org/docman/view.php/7/2528/Orion+Context+Broker+webinar+2013-05-30.pdf https://forge.fiware.org/docman/view.php/7/2639/Orion+Context+Broker+webinar+2013-06-19.pdf http://youtu.be/tzjCA1Uhhe8
(IOT)(Gateway) Data Handling	2 webinars in JUN 2013	Not available on forge.fiware.org
(SECURITY) Access Control	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2665/AccessControlGE.Webinar.2013-06-14.zip
(SECURITY) Content-based Security (Opt)	2 webinars in MAY, JUN 2013	Not available on forge.fiware.org
(SECURITY) Context-based Security & Compliance	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/19/2627/Webinar_FI-WARE_Context-basedSecurity%26Compliance.ppt
(SECURITY) Security Monitoring	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/7/2555/FI-WARE+Security+Monitoring+GE+webinar+V2.pdf

(SECURITY) Data Handling	2 webinars in JUN 2013	https://forge.fiware.org/docman/view.php/19/2662/Webinar_Data+Handling+Generic+Enabler_R2.pptx
(SECURITY) DB Anonymizer (Opt)	2 webinars in MAY, JUN 2013	http://catalogue.fiware.org/sites/default/files/storage/enablers/20130531-FI-WARE-DBAnonymizer-GE-V2.pdf
(SECURITY) Identity Management	4 webinars in JUN 2013	Not available on forge.fiware.org
(SECURITY) Privacy	Webinar in JUL 2013	https://forge.fiware.org/docman/view.php/7/2776/2013-07-18+Privacy+GE+Webinar+Slides.odp
(SECURITY) Secure Storage	2 webinars in JUL 2013	Not available on forge.fiware.org

6.2 Other events

Since the launch of FIWARE Lab a huge number of events, of different types, focused on presenting, explaining and experimenting on this infrastructure. Although this is not the place where to enumerate all participations to live events focusing on FIWARE Lab (as this is in the scope of dissemination activities, already reported in the dissemination deliverables), at least it's worth to summarize most relevant events related to the live instance of FIWARE.

- ✓ The first Campus Party (SEP 2013) in London, where FIWARE Lab was actually presented, the second one, very important since it involved the Latin American community was in Brazil (FEB 2014), the third one in Mexico (JUN 2014) was one of the most attended one (more than 10.000 participants). On these events three dedicated deliverables have been produced within the dissemination activities (see the documents coded D12.4a,b,c under the folder "FIWARE Deliverables" in https://forge.fiware.org/docman/?group_id=7).
- ✓ The Smart Cities workshop (OCT 2013) in Santander.
- ✓ Hackathons were organized during the Campus Party in Mexico and the Santander event.
- ✓ Challenge was organized during the Campus Party Brazil (FEB 2014).
- ✓ The Smart Cities World Expo in Barcelona (NOV 2013).
- ✓ The more than 160 Startup Weekends that reached more than 12.000 attendees only in 2014 (as detailed in the two dedicated dissemination documents coded D12.8 and D12.9 under the folder "FIWARE Deliverables" in https://forge.fiware.org/docman/?group_id=7).

7 Conclusions

Last months of the FIWARE project, since September 2014, were carried out dedicating to the handover to FI-Core and the intense liaisons with the PH III Accelerators, most of them launching the first round of Open Calls.

The knowledge and experience gained through performing all these training activities during the FIWARE project will be even more fruitful during the FIWARE continuation project, which establishes dedicated teams of coaches that, exploiting also the outcomes of the training performed on the FIWARE Lab, will concretely and efficiently bring the FIWARE technologies within the productive fabric of business entities in Europe and beyond.