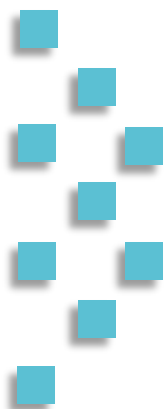




D6.4 Webinars and eLearning materials

Natacha Amorsi (OiEau), Manon Miau (OiEau)

31/07/2020



This project has received funding from the European Union's
Horizon 2020 research and innovation programme under
Grant agreement No. 821036.



Disclaimer

This document reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Intellectual Property Rights

© 2020, Fiware4Water consortium

All rights reserved.

This document contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

This document is the property of the Fiware4Water consortium members. No copying or distributing, in any form or by any means, is allowed without the prior written agreement of the owner of the property rights. In addition to such written permission, the source must be clearly referenced.

Project Consortium



Executive Summary

The deliverable n°6.4 *Webinars and eLearning materials* presents the webinars and related materials put into place by Fiware4Water partners in order to promote, exchange and gather perception from potentials end-users and the peer communities. The deliverable will be issued three times over the duration of the project at month 12, 24 and 35. This document is linked to Work Package 6 Task 6.1 Communication and Dissemination of Project Outcomes.

According to Fiware4Water description of work, 9 webinars should be held over the entire duration of the project. During the first year, three of them were accomplished and led by EGM as well as a developers' workshop.

Webinars provided an excellent way to exchange with the audiences through a virtual interactive presentation. They allowed to communicate the different aspects, benefits, progress and perspectives of Fiware4Water digital solutions.

E-Learning materials refer to learning materials developed for the Internet. It is a solitary experience for learners who are alone as they read through the material. In this context, the expected E-Learning materials will actually be the materials used during the various webinars proposed throughout the project, as well as their video recordings all available on www.fiware4water.eu. Some other e-learning activities and applications are led within WP3 Smart Applications and Devices dedicated to the Demo case on smart metering and citizen engagement.

From the Work Package n°6 perspective, an e-book and a MOOC will be delivered during the second half of the project that will complete F4W e-learning materials and be maintained available after F4W is over.

From now on, the focus of the forthcoming webinars will slightly change to also include Fiware4Water Demo networks and promote digital solutions as well as to explain the opportunities that the SMEs challenges will provide for the water utilities and developers.

All the webinars organised on behalf of F4W are available on <https://www.fiware4water.eu/deliverables#webinars>

Related Deliverables

- D6.1: Fiware4Water communication and dissemination strategy towards a water smart society, M6: The strategy plan will focus on how Fiware4Water outcomes promotion will be implemented to reach out the targeted groups (water utilities, SMEs, industrials users, local authorities, policy makers and citizen) with clear indications on the planning, materials and channels to be used. It will be co-built with WP1 requirements and WP5 social and economic impacts, targeting the sustainability of the project. It will also plan branding strategy.
- D6.2: Communication kit including a website, social media and leaflets, M05+: The project will prepare a logo and branding material, set up a project website (portal), create social media accounts (e.g. Twitter and LinkedIn), prepare project brochures etc. as a communication kit.
- D6.3: E-newsletter, M09, M18, M27: Regular update of the progress of the project (every 9 months), to be disseminated via the partners' networks

Document Information

Programme	H2020 – SC0511-2018
Project Acronym	Fiware4Water
Project full name	FIWARE for the Next Generation Internet Services for the WATER sector
Deliverable	D6.4: Webinars and eLearning materials
Work Package	WP6: Ecosystem building for communication and dissemination strategies and activities
Task	Task 6.1: Communication and dissemination of project outcomes (OiEau, all) M1-M36
Lead Beneficiary	P1: OiEau
Author(s)	Natacha Amorsi, Manon Miau (OiEau)
Contributor(s)	
Quality check	Franck Legall (EGM)
Planned Delivery Date	M12 (06/20)
Actual Delivery Date	M14 (07/20)
Dissemination Level	Public

Revision history

Version	Date	Author(s)/Contributor(s)	Notes
Draft1	20/07/2020	Manon Miau (OiEau)	
Draft2	27/07/2020	Natacha Amorsi (OiEau)	
Final	29/07/2020	Natacha Amorsi (OiEau)	
Final 2	15/02/2021	Natacha Amorsi (OiEau)	Feedbacks the review taken into accounts

Table of content

Executive Summary	1
List of figures	5
List of tables	5
List of Acronyms/Glossary.....	5
Introduction	6
I. Overall picture	7
I.1. Pre-set objectives	7
I.2. Schedule	7
II. Webinars	8
II.1. First series of Webinars	8
II.2. Webinar #1: FIWARE Ecosystem for water management	9
II.3. Webinar #2: Data models for water management	10
II.4. Webinar #3: The EPANET Water network simulator	11
II.5. F4W Developers' workshop	11
III. eLearning materials	12
III.1. F4W developers' workshop	12
III.2. Webinars materials	12
IV. Communication relay.....	13
IV.1. Event promotion and teasing	13
IV.2. eLearning material communication	14
Conclusion and Perspectives	15
Annexe 1: Overview of engagement during the webinars	16
Annexe 2: Webinars materials	17
Annexe 3: Developers' Workshop material.....	18

List of figures

Figure 1: Answers to the survey for FIWARE offer presentation	9
Figure 2: Answers to the survey for EPANet presentation.....	9
Figure 3: Answers to the survey for Data model presentation	9
Figure 4: FIWARE ecosystem presentation Figure 5: Introduction to NGSI presentation	10
Figure 6: Existing Data Models landscape presentation Figure 7: SAREF4WATER presentation.....	10
Figure 8: NGSI-LD cross domain ontology presentation	11
Figure 9: EPANet water network simulator presentation	11
Figure 10: Workshop material.....	12
Figure 11: Tweet post-events 1/4 Figure 12: Tweet post-events 2/4	13
Figure 13: Tweet post-events 3/4 Figure 14: Tweet post-events 4/4	13
Figure 15: Developers' Workshop Twitter post Figure 16: Developers' Workshop LinkedIn post ..	14

List of tables

Table 1: Anticipated webinars and E-Learning materials.....	7
Table 2: Presentation of F4W webinars	8

List of Acronyms/Glossary

F4W	Fiware4Water project
Work Package	WP
EGM	Easy Global Market
ICT	Information and Communication Technology
KPI	Key Performance Indicator

Introduction

Fiware4Water (F4W) Work Package 6 (WP6) is dedicated to the Ecosystem building for communication and dissemination strategies and activities. This deliverable refers to the organisation of F4W webinars and e-learning materials related to WP6 Task 6.1 Communication and Dissemination of Project Outcomes. Deliverable n°6.4 Webinars and e-learning materials present the series of webinars organised by the partners over the first year of the project as well as their related e-learning materials. The deliverable was initially planned for month 12 (June 2020). Due to the Covid situation and its impact on the work day of OiEau staff (leader of the deliverables), delays have been encountered and agreed by the European Commission.

Over the duration of the project and according to the F4W communication strategy, at least 9 webinars should be put into place over the duration of the project. At year 1 of the project, 3 webinars were organised by the partners on behalf of F4W.

Webinars refer to all forms of interactive seminar-like meetings held over the Internet, live teaching sessions offering a broad range of various topics followed by a question-and-answer session from the participants. Webinars often aim to promote a new product, a service or to present an offer. They are an excellent way to exchange with an audience through a virtual interactive presentation. In our case, the use of webinars will allow to communicate the different aspects, benefits and results of the project to a wider audience with limited economic and spatial constraints and also gather their perceptions and feedbacks.

A dedicated section on F4W has been created to gather all the webinars organised on behalf of F4W:
<https://www.fiware4water.eu/deliverables#webinars>

These types of webinars are even more important today as they save travel and limit sanitary constraints due to COVID19 while maintaining the connection with stakeholders.

E-Learning materials, on the other hand, refer to learning materials developed for the Internet. It is a solitary experience for learners who are alone as they read through the material. In this context, the expected E-Learning materials will actually be the materials used during the various webinars proposed throughout the project, as well as their video recordings all available on www.fiware4water.eu. Some other e-learning activities and applications are led within WP3 Smart Applications and Devices dedicated to the demo case on smart metering and citizen engagement.

From the WP6 perspective, an e-book and a MOOC will be delivered during the second half of the project that will complete F4W e-learning materials and be maintained available after F4W is over.

The first section reminds the pre-set objectives as described in the description of work. Section II presents the three webinars organised by EGM, which dealt with the Fiware ecosystem presentation and F4W settings. Section II explains where the materials is now available. Finally, section IV highlights how these webinars and e-learnings have been promoted through F4W specific communication actions.

I. Overall picture

I.1. Pre-set objectives

As described in the description of work, partners will deliver a number of webinars and e-learning materials during the three years of the project (2019-2022). The purpose of these on-line events is to present the progress of the project to specific targets (developers, SMEs, researchers, water utilities, citizens, etc.), gather feedbacks and provide insight to implement iterations of the project development, testing and evaluation. All recorded sessions from these various webinars held during the project will be collected on F4W website and remain available after the end of the project.

According to the KPIs set at the beginning of the project, a number of 9 webinars are planned for the entire duration of the project. Apart from this indication, no numerical targets have been set for the e-learning materials.

I.2. Schedule

Webinars and e-learning materials are perceived as communication and engagement tools to be activated at the best moment according to the progress and needs of the project. The project is broadly divided into three main inter-related blocs: the demo cases, the demo networks and the SMEs challenges. For each of these bloc, it is anticipated to put into place webinars to create a special moment to present the state of progress and engage with the targeted audiences. During the first year of the project, webinars dealt with the demo cases and the technologies that will be developed. From 2021, the focus will move towards the potential duplication of these technologies through the demo networks. In parallel, the SMEs challenges will create the opportunities to trigger specific development according to specific needs identified by the demo cases and the partners.

Table 1: Anticipated webinars and E-Learning materials

Date	Type	Theme	Target	Objectives
September 2020	Webinar	Fiware technical webinars	SMEs, developers, water managers DW2020, partners DW2020, partners	Smart Water Management using FIWARE Smart Data Models for Water
September 2020	Webinar	Business	SMEs, developers, water managers	Tackle the market transfer of water digital solutions
October 2020	Webinar	F4W-Reference Architecture	Partners	Overall presentation of F4W-RA
January/February 2021	Webinar	F4W-Reference Architecture	Challenges participants	Overall presentation of F4W-RA

II. Webinars

II.1. First series of Webinars

During the first year of the project, a first series of 3 webinars was organised by EGM to present F4W, the FIWARE platform and the data models (<https://www.fiware4water.eu/news/first-series-f4w-webinars>).

Table 2: Presentation of F4W webinars

Webinar	Date	Number of participant	Organisation	Partners involved
FIWARE Ecosystem for water management	25/11/2019	Between 35 to 53	EGM	FIWARE Foundation ; EGM
Data models for water management	26/11/2019	Between 35 to 53	EGM	University of Exeter ; Universidad Politécnica de Madrid ; EGM
The EPANET Water network simulator	27/11/2019	Between 35 to 53	EGM	University of Exeter

These webinars on ICT solutions for water management were organised with the participation of other F4W partners such as the FIWARE Foundation and the University of Exeter. They were also conducted with the involvement of other projects such as aqua3S, NAIADES and SCOREwater, all members of the DigitalWater2020 synergy group¹. The ICT4Water cluster was also involved in the development of these events, as was the Lotus project, which is working on innovative low-cost technology for water quality monitoring and water resource management for urban and rural water systems in India.

The 3 webinars mainly targeted EU projects. They were an opportunity to exchange with other projects and professionals from the water and IT sector, to present their respective activities, solutions and to show the usefulness of digital solutions for the water sector. According to EGM, the various exchanges made during these webinars have contributed to a much more efficient modelling and digitisation of data enabling the implementation of innovative solutions in the water sector.

Generally speaking, these webinars have a relatively high average engagement and interest rate (63%; 59%; 63%) (Annexe 1). According to a survey conducted by EGM at the end of each webinar, the presentations globally helped attendees to have a better understanding of each topics presented.

¹ The Synergy Group DigitalWater2020 is composed of the EU projects funded under the same European programme and gathers F4W, DWC, Naiades, ScoreWater as well as Aqua3S funded by a different programme but addressing digital water issues; the group has been official launched in May 2020 and is structured with 5 tasks forces (www.fiware4water.eu).

1 of 3. Did that webinar allowed to increase your understanding of the FIWARE offer ?

Multiple choice with single answer

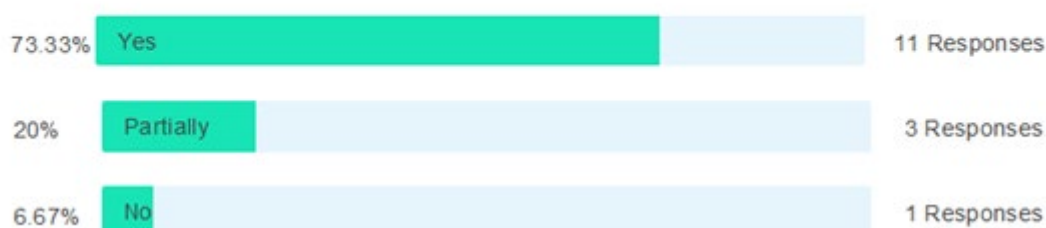


Figure 1: Answers to the survey for FIWARE offer presentation

1 of 2. Did that webinar allowed to increase your understanding of the EPANET Simulator ?

Multiple choice with single answer

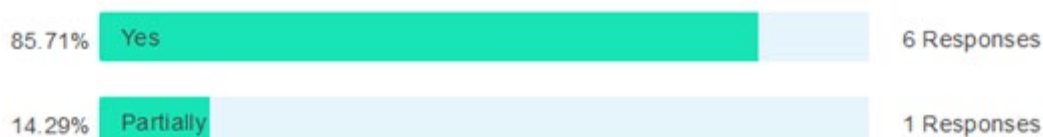


Figure 2: Answers to the survey for EPANet presentation

1 of 3. Did that webinar allowed to increase your understanding of on-going activities on data modelling in the water domain ?

Multiple choice with single answer



Figure 3: Answers to the survey for Data model presentation

However, this study had a relatively low response rate, with only 20, 19 and 32% of attendees responding.

II.2. Webinar #1: FIWARE Ecosystem for water management

The first webinar of this series was held on Monday, November 25, 2019 from 9:30 to 10:30 CET and gathered 47 attendees. The main objective of the session was to provide participants with a comprehensive understanding of the FIWARE offering and advice on how to further exploit the capabilities of this platform.

The webinar proceeded as followed:

- An overview of the FIWARE ecosystem by Fernando Lopez (FIWARE Foundation), to understand the FIWARE architectural paradigm and overall ecosystem (catalogue of enablers, the labs, data models, and the community) (Figure 1)
- An example of interaction with a NGSI-LD broker by Benoit Orihuela (EGM), to understand how to interact with a FIWARE broker, using the latest Linked Data evolution of the interface specification (NGSI-LD) (Figure 2)

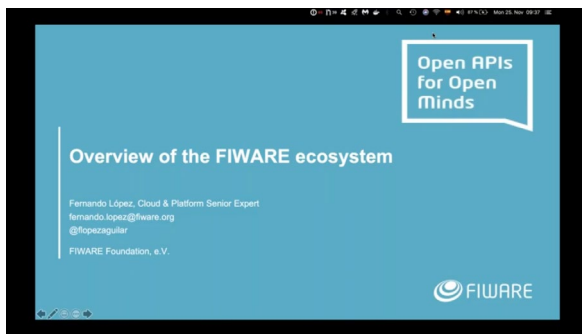


Figure 4: FIWARE ecosystem presentation



Figure 5: Introduction to NGSI presentation

The two presentations presented during this webinar and its recording have been sent to participants and are available online.

FIWARE ecosystem overview presentation: <https://www.fiware4water.eu/deliverables#webinars>

Introduction to NGSI presentation: <https://www.fiware4water.eu/deliverables#webinars>

II.3. Webinar #2: Data models for water management

The second webinar was held on Tuesday 26 November 2019 from 9:30 to 10:30 CET and gathered 53 attendees. The objective of the session was to present and discuss ongoing work in the area of data modelling for water management.

The webinar proceeded as follows:

- A presentation of existing models for water management by Albert Chen (University of Exeter) to give an overview of the current landscape of data models in water systems (Figure 3)
- A presentation of the SAREF4WATER semantic model by Raúl García Castro (Universidad Politécnica de Madrid) for IoT management in water system (Figure 4)
- A presentation of the NGSI-LD cross domain ontology: Franck Le Gall (EGM) to give an overview of the NGSI-LD cross domain ontology as a basis to exchange context information across domains./p> (Figure 5)

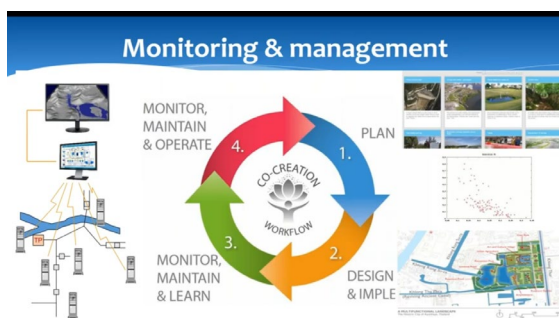


Figure 6: Existing Data Models landscape presentation

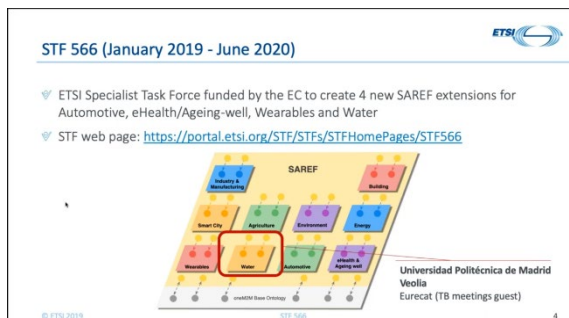


Figure 7: SAREF4WATER presentation

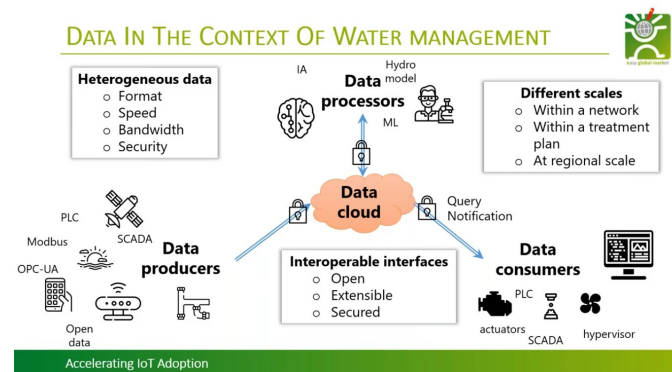


Figure 8: NGSI-LD cross domain ontology presentation

The three presentations presented during this webinar and its recording have been sent to participants and are available online.

Existing models for water management presentation:

<https://www.fiware4water.eu/deliverables#webinars>

SAREF4WATER semantic model presentation: <https://www.fiware4water.eu/deliverables#webinars>

NGSI-LD cross domain ontology presentation: <https://www.fiware4water.eu/deliverables#webinars>

II.4. Webinar #3: The EPANET Water network simulator

The third and final webinar of this series was held on Wednesday, November 27, 2019 from 9:30 to 10:30 CET and gathered 35 attendees. This webinar was presented by the University of Exeter and focused exclusively on the EPANET simulator. The presentation was given by Fanlin Meng (University of Exeter). The objective of this session was to provide the participants with a comprehensive understanding of the EPANET Water System Simulator.

Water Distribution Network

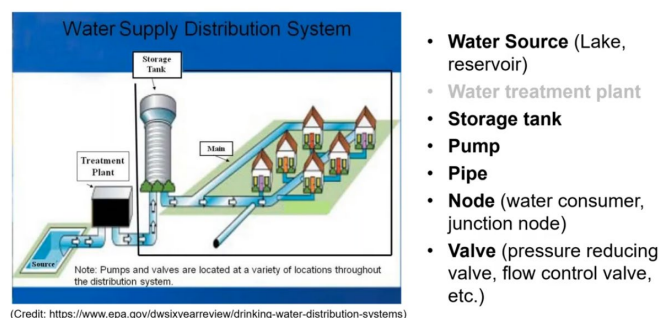


Figure 9: EPANet water network simulator presentation

The webinar presentation and recording have been sent to participants and are available online.

EPANet water network simulator presentation:

<https://www.fiware4water.eu/deliverables#webinars>

II.5. F4W Developers' workshop

This workshop was organised on February 2, 2020 by EGM within the framework of the F4W and Aqua3S projects. It aimed at introducing developers with the FIWARE ecosystem in general and more specifically with the NGSI-LD standard, giving inputs on where and how to start developing on the

FIWARE platform, what is its position in the big picture of F4W and what are the expected benefits. (Workshop material: <https://bit.ly/39gDHij>). This workshop gathered 14 participants.

Information Model - Highlights

- **NGSI Entity** → Physical or virtual object.
 - It has (one) **Entity Type**.
 - Uniquely identified by an **Entity Id** (URI)
- Entity has zero or more **attributes** identified by a **name**
 - **Property** --> Static or dynamic characteristic of an entity
 - *GeoProperty* (geospatial context)
 - *TemporalProperty* (time context)
 - **Relationship** → Association with a Linked entity (unidirectional)
- Properties have a **value**
 - An NGSI value can be a single value (Number, String, boolean), or complex (Array, Structured Value)
- Relationships have an **object**
 - A URI which points to another entity (target of the relationship). Target can be a collection.




Figure 10: Workshop material

III. eLearning materials

III.1. F4W developers' workshop

The workshop material is available on the Fiware4Water website in the Document section (<https://www.fiware4water.eu/deliverables>) and with an article by EGM in the News section. (<https://www.fiware4water.eu/deliverables#webinars>) (Annexe 3)

III.2. Webinars materials

All webinar recording videos are available as eLearning materials on F4W website. An article has been written to explain the events and content of the webinars. (<https://www.fiware4water.eu/news/first-series-f4w-webinars>).

These materials are also available on EGM's website with all the presentations used during the webinars by the speakers. (<http://www.eglobalmark.com/fr/egm-et-ses-partenaires-contribuent-a-la-numerisation-de-leau/>). At the end of the webinars, in addition to the publication of all online content, the recording video and presentation was sent to all participants.

IV. Communication relay

IV.1. Event promotion and teasing

In terms of communication, all three events were promoted by e-mail. As they were mainly aimed at EU projects, invitations were sent to the coordinators of F4W, aqua3S, NAIADES, SCOREwater and LOTUS projects, which in turn sent the information to their respective consortia.

After the events, a post was made by EGM on its Twitter account to promote the recording of these webinars and to provide access to the presentation links. This tweet was retweeted by FIWARE and the NAIADES projects via their own Twitter accounts.



Figure 11: Tweet post-events 1/4



Figure 12: Tweet post-events 2/4

2/4



Figure 13: Tweet post-events 3/4

Figure 14: Tweet post-events 4/4

IV.2. eLearning material communication

The eLearning material that is the presentation of the Developers' Workshop has been promoted by the Fiware4Water project through Twitter and LinkedIn posts. The Twitter post was retweeted by EGM.



Figure 15: Developers' Workshop Twitter post



Figure 16: Developers' Workshop LinkedIn post

Conclusion and Perspectives

During the first year of the project, 3 of the 9 webinars planned as part of the communication and dissemination strategy were held. They were an opportunity to present the solutions proposed by the project and to open on a discussion on the digitalisation of the water sector and the existing tools at. These events were also an opportunity to ensure synergies, both between the different partners of the project, but also with other projects and external clusters.

Concerning the e-learning materials, for the moment only EGM has been able to produce content on behalf of Fiware4Water. However, as the project is still in its early stage, other eLearning materials should be developed when first concrete results can be shared such as the eBook and the MOOC on behalf of WP6 and applications on behalf of WP3.

Apart from the webinars organised by Fiware4Water, other similar activities are already planned. The Fiware4Water project will participate in 2 webinars organized by FIWARE in September 2020. Several project partners are also presenting the project and its solutions/approaches at various external events and webinars. All this information on dissemination and communication is available in the deliverable n°6.7 - Communication Report

Annexe 1: Overview of engagement during the webinars

Webinar ID		Webinar Title	Webinar Type		Time and Date		Audience			Attendance Metrics	
Webinar ID	Title	Type	Day	Date	Start Time	Duration	Registrants	Attendees	Avg. Attendance Rate (%)	Avg. Interest Rating (#)	Avg. Attentiveness (#)
530930299	The EPANET Water network simulator	CLASSIC	Wed	11/27/2019	09:01:05 AM CET	1 hour 1 minute	62	35	56%	63	47.49
325853875	Data models for water management	CLASSIC	Tue	11/26/2019	09:00:51 AM CET	1 hour 42 minutes	73	53	73%	59	38.58
256208827	FIWARE Ecosystem for water management	CLASSIC	Mon	11/25/2019	09:01:55 AM CET	1 hour 33 minutes	56	47	84%	63	44.26

Annexe 2: Webinars materials

Webinar #1: FIWARE Ecosystem for water management; Webinar #2: Data models for water management; Webinar #3: The EPANET Water network simulator materials are available on F4W website: <https://www.fiware4water.eu/news/first-series-f4w-webinars>

Annexe 3: Developers' Workshop material



ACCELERATE YOUR IOT ADOPTION

F4W DEVELOPERS' WORKSHOP

www.eglobalmarket.com



PLAN

What is the question again ?

As a data producer : where do I push my data ?

As an app developer: where do I consume available information?

As a use case provider: what is the added value of the F4W approach compared to what I have in house ?

As a F4W project: where is all of this deployed ? By use cases or centrally ?

Bootstrapping NGSI-LD API integration Page 2

INTRODUCTION

FIWARE vs NGSI-LD

FIWARE: a foundation emerged from an EU program

- Animating a community of developers & users (800+ SMEs, ...)
- Maintaining a catalog of Open Source generic enablers to create end-to-end solutions
- Developing data models in cooperation with TMForum
- Contributing to the development of the ETSI NGSI-LD specification it builds upon

ETSI NGSI-LD: a specification built within ETSI standardisation body

- A RESTful API to handle context information
- A cross-domain data model to exchange context information across domains
- Retro-compatibility with former NGSIv2 (still maintained in FIWARE, not considered in F4W)

Bootstrapping NGSI-LD API integration Page 3

RESOURCES

FIWARE ecosystem: open-source enablers, community

www.fiware.org

Standards

ETSI ISG CIM (NGSI-LD standardisation)

Bootstrapping NGSI-LD API integration

API & MODEL



Bootstrapping NGSI-LD API integration Page 5

REQUIREMENTS

Handle data heterogeneity

- Data sources: IoT, open data, proprietary, document, ...
- Data format: within and across domains

Handle legacy: do not replace but connect

Allow flexibility

- Deploy new services/use cases/apps when needed

Handle scalability and data protection

- Distributed/federated approaches

Ease adoption

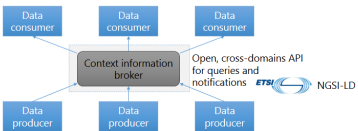
- Developers' friendliness

Allow batch & stream processing, ML, IA

Bootstrapping NGSI-LD API integration

ALL IS ABOUT CONTEXT INFORMATION EXCHANGE

Data contextualised in time, space and relations to other data

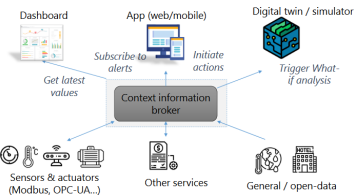


Open, cross-domains API for queries and notifications

ETSI NGSI-LD

Bootstrapping NGSI-LD API integration

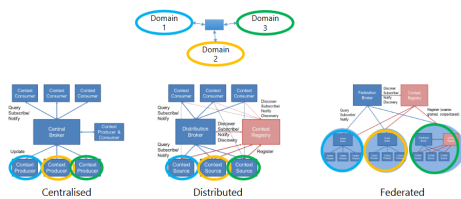
USAGE EXAMPLE



Icons made by Freepik, ghatpuc, wchaleai from www.flaticon.com

Bootstrapping NGSI-LD API integration

NGSI-LD DEPLOYMENT ARCHITECTURES



Pictures courtesy of ETSI

Bootstrapping NGSI-LD API integration

CAN WE (OR YOU) „KEEP IT SIMPLE“ ?

ETSI ISG CIM NGSI-LD API FEATURES (+LIMITS)

- Information Model is Graph-based & information-centric**
 - Core concepts include Entities and Relationships
 - Entities can have Properties and Relationships
 - Relationships/Properties can also have Properties, Relationships
- Referencing of defined/hierarchical vocabularies/ontologies**
 - All terms are unambiguously defined
 - Allows users to reference their familiar information definitions
- Model and Query language (is constrained so more predictable)**
 - Federation of (independent) information sources, anywhere
 - Queries: based on entity type or ID, can filter results, can constrain geographic scope, constrained not to traverse graph (only one level at a time)

Source: ETSI ISG CIM

5

Information Model - Highlights

- **NGSI Entity** → Physical or virtual object.
 - It has (one) **Entity Type**.
 - Uniquely identified by an **Entity Id** (URI)
- Entity has zero or more **attributes** identified by a **name**
 - **Property** → Static or dynamic characteristic of an entity
 - GeoProperty (geospatial context)
 - TemporalProperty (time context)
 - **Relationship** → Association with a Linked entity (unidirectional)
- Properties have a **value**
 - An NGSI value can be a single value (Number, String, boolean), or complex (Array, Structured Value)
- Relationships have an **object**
 - A URI which points to another entity (target of the relationship). Target can be a collection

FIWARE

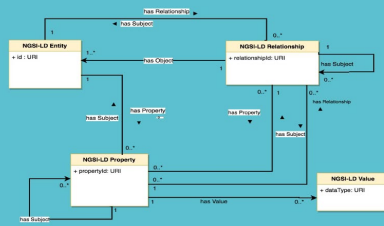
Information Model – Highlights (II)

- Cross-Domain, core properties for giving context to your information are defined in a mandatory way, to be used by API operations (e.g. geo queries)
 - **location** → Geospatial location, encoded as **GeoJSON**.
 - **observedAt** → Observation timestamp, encoded as **ISO8601** (*timestamp*)
 - **createdAt** → Creation timestamp (of entity, attribute), *dateCreated* in NGSIv2
 - **modifiedAt** → Update timestamp (of entity, attribute), *dateModified* in NGSIv2
 - **unitCode** → Units of measurement, encoded as mandated by **UNCEFACT**.
- Recommended practice
 - Use URIs to identify your entities.
 - A URN schema is provided off-the-shelf. It enables to know in advance what entity type an id refers to
 - urn:ngsi-id:<Entity_Type_Name>:<Entity_Identification_String>

14

FIWARE

Information Model (as UML) – NGSI LD



12

FIWARE

JSON-LD (RDF friendly) representation (a.k.a. NGSI LD)

```

{
  "id": "urn:ngsi-id:offstreetParking:Downtown1",
  "type": "offstreetParking",
  "availableSpotNumber": {
    "type": "Integer",
    "value": 121,
    "observedAt": "2017-07-29T12:05:02Z",
    "reliability": {
      "type": "Reliability",
      "value": 0.7
    },
    "providedBy": {
      "type": "offstreetParking",
      "object": "urn:ngsi-id:offstreetParking:Downtown1",
      "providedBy": {
        "type": "urn:ngsi-id:Person:Bob"
      }
    }
  },
  "location": {
    "type": "Point",
    "value": {
      "type": "Point",
      "coordinates": [-8.5, 41.2]
    }
  },
  "context": [
    "http://uri.etsi.org/ngsi-ld/coreContext.jsonld",
    "http://example.org/cim/commonContext.jsonld",
    "http://example.org/cim/vehicle.jsonld",
    "http://example.org/cim/parking.jsonld"
  ]
}

```

18

FIWARE

Simplified representation (keyValues)

```

{
  "id": "urn:ngsi-id:offstreetParking:Downtown1",
  "type": "offstreetParking",
  "name": "Downtown One",
  "availableSpotNumber": 121,
  "totalSpotNumber": 200,
  "location": {
    "type": "Point",
    "coordinates": [-8.5, 41.2]
  },
  "context": [
    "http://uri.etsi.org/ngsi-ld/coreContext.jsonld",
    "http://example.org/cim/parking.jsonld"
  ]
}

```

Equivalent in NGSI-LD and NGSIv2

19

FIWARE

SUBSCRIPTION



NGSI-LD API = Queries & Notifications

- Periodic
- On change
- On event
 - > Query based
 - > Geoproperties (near, within, ...)

```

The process that defines the query language in NGSI-LD is described below (it has been validated using
http://uri.etsi.org/ngsi-ld/geoQuery and can be requested by implementers)
...

```

See <https://fiware-tutorials.readthedocs.io/en/latest/subscriptions/index.html>

Bootstrapping NGSI-LD API integration

Page 18

NGSI-LD API OPERATIONS



General Operations

- Entity create
- Entity update
- Entity partial update
- Entity delete
- Entity retrieval
- Queries
- Subscriptions

Registry Operations

- CSRegistryEntry create
- CSRegistryEntry update
- CSRegistryEntry partial update
- CSRegistryEntry delete
- CSRegistryEntry retrieval
- CSRegistryEntry query
- CSRegistryEntry subscription

Batch Operations

- Batch Entity Creation
- Batch Entity Create/Update (Upsert)
- Batch Entity Update
- Batch Entity Delete

Temporal Operations

- Create/Update Temporal Entity Representation
- Add Attributes to Temporal Entity Rep.
- Delete Attribute from Temporal Entity Rep.
- Modify Attribute Instance in Temporal Entity Rep.
- Delete Attribute Instance from Temporal Entity Rep.
- Delete Temporal Entity Representation
- Retrieve Temporal Entity Evolution
- Query Temporal Entity Evolution

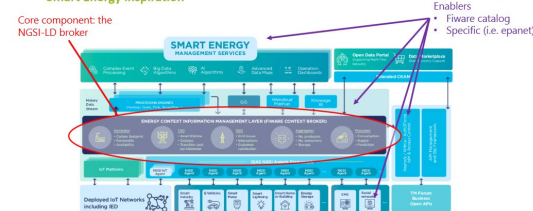
Bootstrapping NGSI-LD API integration

Page 19

OVERALL FIWARE "ARCHITECTURE"



Smart Energy inspiration



http://www.fiware.org/en/about-fiware/

Bootstrapping NGSI-LD API integration

Page 22

HOW TO START



Bootstrapping NGSI-LD API integration

Page 21

1ST STEP: CHOOSE A NGSI-LD CONTEXT BROKER



Options

1. Implement your own
2. Deploy one available off the shelves
 - > CSIRO-LD
 - > SCORPIO
 - > STELLIO (EGM)
3. Consume a end-point made available by a partner/project

Note: NGSI-LD specification:

- Allows for time-series requests
- Does not impose anything on storing the history

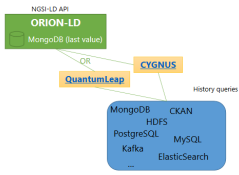
Bootstrapping NGSI-LD API integration

Page 24

NGSI-LD BROKERS DEPLOYMENT STRATEGIES

ORION-LD

- **By default: keep only last value**
- **With additional enablers**
 - > Store short term history
 - > Store long term history



<https://fiware-academy.readthedocs.io/en/latest/core/orion-ld/index.html>
<https://github.com/FIWARE/context.Orion-LD>

Bootstrapping NGSI-LD API integration Page 25

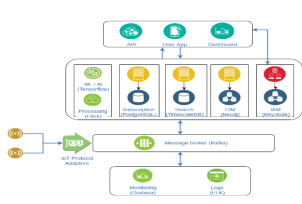
INTERACTING WITH NGSI-LD API

Demo + Q&A

Bootstrapping NGSI-LD API integration Page 28

NGSI-LD BROKERS DEPLOYMENT STRATEGIES


STELLIO



Endpoint available
 Plan for public release before June 2020

Bootstrapping NGSI-LD API integration Page 27

THANK YOU



Franck Le Gall
 COO
 Tel: +33.6.20.03.54.20
 E-mail: Franck.le-gall@eglobalmark.com

www.eglobalmark.com

