ACCELERATE YOUR IOT ADOPTION

THE NGSI-LD CROSS DOMAIN ONTOLOGY

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Trust open standards and specifications

25+ FP/H2020 projects since 2010

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IOT ENGINEERING
INTERNET OF THINGS (IOT)
Artificial Intelligence

- Data platforms
- Predictive systems
- Decision-making apps
**DATA IN THE CONTEXT OF WATER MANAGEMENT**

**Heterogeneous data**
- Format
- Speed
- Bandwidth
- Security

**Data processors**
- IA
- Hydro model
- ML

**Data cloud**
- Query Notification

**Data producers**

**Interoperable interfaces**
- Open
- Extensible
- Secured

**Data consumers**
- PLC
- SCADA
- Hypervisor

**Different scales**
- Within a network
- Within a treatment plan
- At regional scale

**Accelerating IoT Adoption**
**CONTEXT INFORMATION MANAGEMENT**

Context Information Management \(\rightarrow\) Linked Data

Context Information = data contextualised

- **Space**
- **Time**
- **In relation to other data**

A pipe
- has a location
- has an installation date
- is connected to other parts
NGSI-LD

Connect data producers & data consumers
Query capabilities: “what is the diameter of pipe123”?
Subscription “Notify me of any value hitting a threshold within a geographical area”

A distributed / federated architecture

A cross-domain model

Basis to interconnect domain specific models (i.e. SAREF4Water; Foaf,...)

Under active specification In ETSI ISG CIM (Industry Specification Group on Context Information Management)
Linked Data is a method of web publication in which each individual piece of data is:

- Uniquely identified using HTTP URIs (that is, URLs, or 'web addresses'),
- Available both as 'machine readable' data and as 'human readable pages, and
- Linked to other resources.

```json
{
"@context": "https://json-ld.org contexts/person.jsonld",
"@id": "http://dbpedia.org resource/John Lennon",
"name": "John Lennon",
"born": "1940-10-09",
"spouse": "http://dbpedia.org resource/Cynthia Lennon"
}
```
**ENTITY-RELATIONSHIP MODEL (AS RDFS)**

- Entities are linked through relationships
- Entities, relationships have properties
  + Relationships on relationships
  + Properties on properties
- Creates a navigable property graph
Information Model (as UML) - NGSI LD

NGSI-LD Entity
- + id: URI
- 1..* has Relationship
- has Subject
- 1

NGSI-LD Property
- + propertyId: URI
- 0..* has Subject
- 0..*

NGSI-LD Relationship
- + relationshipId: URI
- 1

NGSI-LD Value
- + dataType: URI
- 0..*
Example built from the EPANET configuration file
INSTANTIATING AN EPANET CONFIGURATION FILE
GOING BEYOND — INFORMATION MODEL

Connecting other ontologies (domain specific, security, ...)

Composition capabilities (i.e. sub-network)

Complex geo and time properties
FURTHER RESOURCES


Join FIWARE community: [https://www.fiware.org/](https://www.fiware.org/)


Have a look on existing NGSI-LD water related models:

THANK YOU

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