

Open APIs
for Open
Minds

FIWARE: Making MIMs happen!

Juanjo Hierro

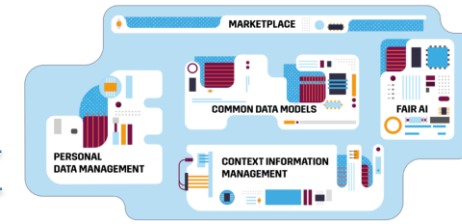
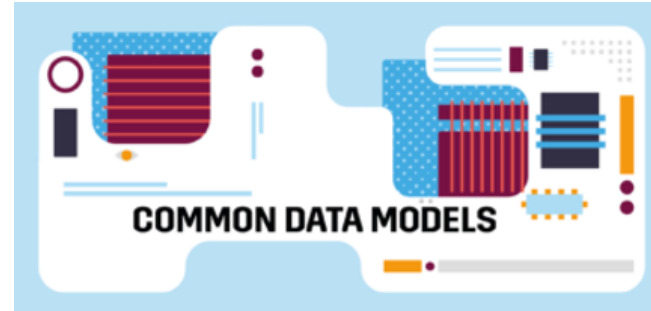
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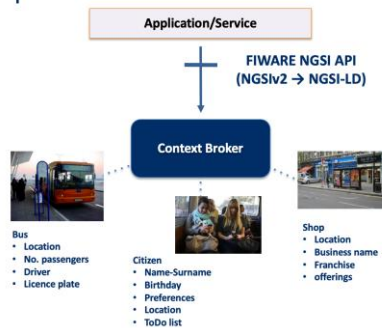
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FIWARE: Materializing MIMs



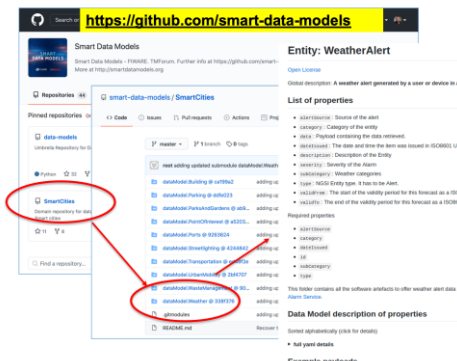
Digital Twin Data API: ETSI NGSI-LD



- NGSI-LD is a simple yet powerful REST API
- Simple: simple operations are rather simple, what you would expect in a RESTful API
 - Entity types, entities, attributes have a path
 - You perform standard GET, POST, PUT, PATCH, DELETE operations
- Yet powerful: powerful operations supported
 - Geo-queries
 - Subscription / Notification
 - Pull/Push styles for gathering data
 - Multiple data "renderings" (key value, normalized, GeoJSON) (key value, normalized, GeoJSON)
 - Temporal operations
 - Federation mechanisms

Digital Twin Data Models: Smart Data Models initiative

- FIWARE Foundation is collaborating with relevant organizations towards definition of common data models for multiple application domains
 - Smart Cities
 - Smart Health
 - Smart Energy
 - Smart Environment
 - Smart Manufacturing
 - ...
- Defined data models rely on well-established "de-facto" standards (e.g., schema.org, SAREF, IEC CIM in Energy or UNE 178503 for Tourism)

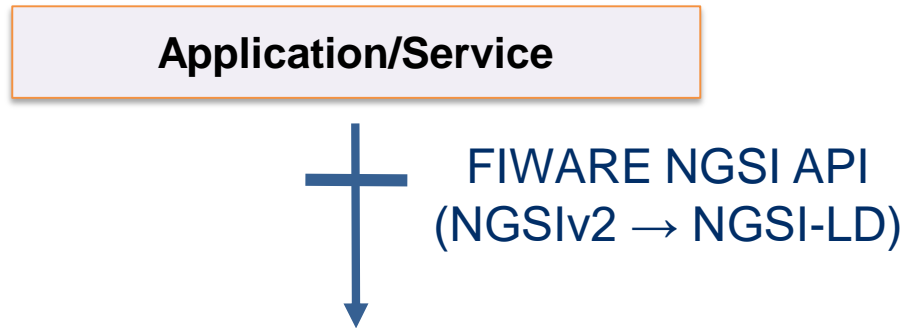


Data Marketplace and Publication/Brokering Services

- Data Marketplace Services:
 - Supports the definition of offerings around digital assets:
 - Data Files
 - Right-time Data Access Services
 - Right-time Data Processing Services (AI, BigData, ...)
 - Integral part of a data service offering description:
 - Context / Digital Twin models supported
 - NGSI-LD endpoints used for data exchange
 - Terms and conditions: access/usage policies, pricing models, ...
 - Advanced pricing and revenue sharing support: free, one-time payment, subscriptions, pay-per-use, discounts
 - Data providers can instantiate their own marketplace or rely on global independent Marketplace services
 - Relying on TM Forum Business Ecosystem Open APIs
- Data Publication/Brokering Services:
 - Data portal supporting DCAT-AP and publication of data resources linked to offerings in the Marketplace – able to harvest open data
 - NGSI-LD as basis for discovery of data resources (modeled as entities with DCAT-AP properties)



MIM-1: ETSI NGSI-LD



Bus

- Location
- No. passengers
- Driver
- Licence plate



Citizen

- Name-Surname
- Birthday
- Preferences
- Location
- ToDo list



Shop

- Location
- Business name
- Franchise
- offerings



- Relevance presence in EU's rolling plan on ICT standardization (2016-2021)
- Adoption by Bureau of Indian Standards (BIS)
- Driven-by-implementation approach in evolution of the standard
- Multiple implementations available under the FIWARE Catalogue
- Gaining position as standard API for access to Digital Twin data

Promote NGSI-LD (MIM-1) as standard Digital Twin API

MIM-2: Data Models

The screenshot shows the GitHub repository for Smart Data Models. The URL <https://github.com/smart-data-models> is highlighted in yellow. The repository is titled "Smart Data Models" and is described as "Smart Data Models - FIWARE. TMForum. Further info at https://github.com/smart-data-models. More at http://smartdatamodels.org".

The "SmartCities" repository is highlighted with a red circle. It is described as "Domain repository for data models for Smart cities" and has 11 stars and 8 forks. A red arrow points from this repository to the "WeatherAlert" entity description.

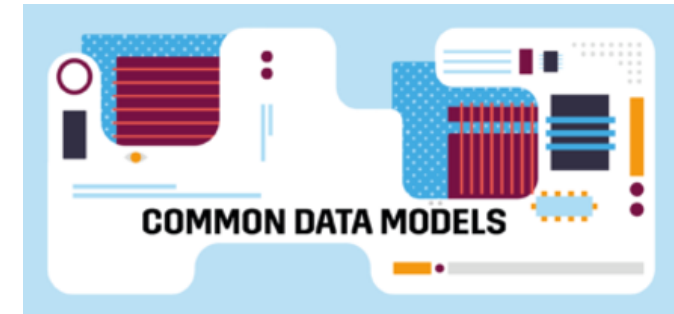
The "WeatherAlert" entity description is shown on the right. It is titled "Entity: WeatherAlert" and has a global description: "A weather alert generated by a user or device in a given location". The "List of properties" includes:

- alertSource : Source of the alert
- category : Category of the entity
- data : Payload containing the data retrieved.
- dateIssued : The date and time the item was issued in ISO8601 UTC format
- description : Description of the Entity
- severity : Severity of the Alarm
- subcategory : Weather categories
- type : NGSI Entity type. It has to be Alert.
- validFrom : The start of the validity period for this forecast as a ISO8601 format
- validTo : The end of the validity period for this forecast as a ISO8601 format

The "Required properties" section lists:

- alertSource
- category
- dateIssued
- id
- subcategory
- type

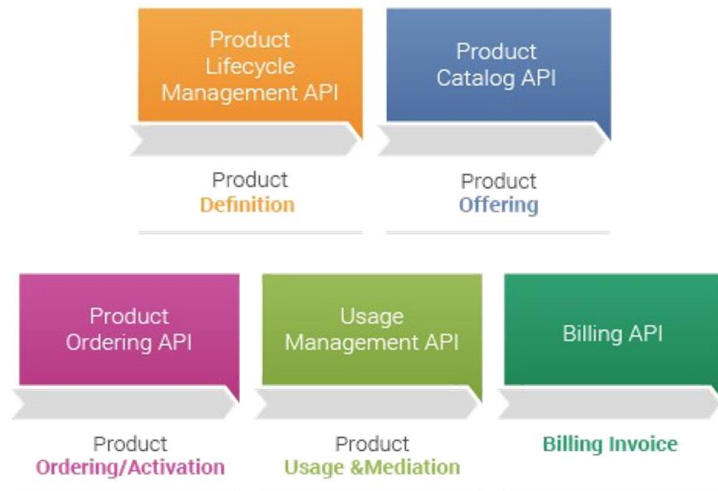
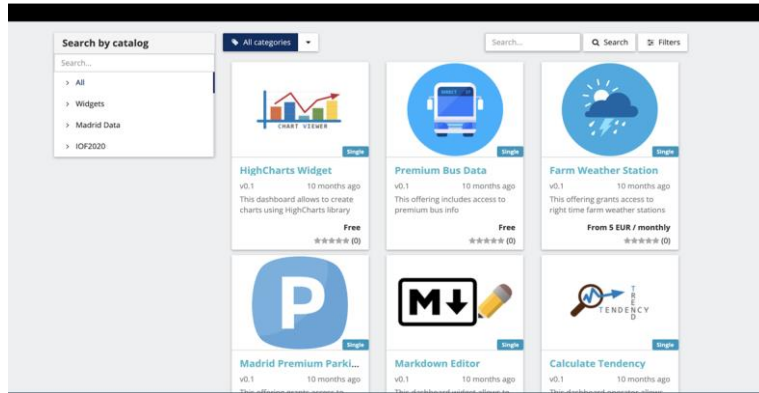
The "Data Model description of properties" section is also visible, with a note: "This folder contains all the software artefacts to offer weather alert data in NGSI-LD Alarm Service."



- The Smart Data Models initiative (github, web) provides a library of curated standard-based model descriptions in JSON/JSON-LD compatible with NGSI-LD
- Fast-growing community since its creation:
 - 650+ data models
 - 70+/100+ orgs/individuals contributing
- Endorsement by relevant organizations: FIWARE, IUDX, TM Forum, OASC

Contribute to Smart Data Models initiative to ensure a healthy development of MIM-2

MIM-3: Marketplace functions

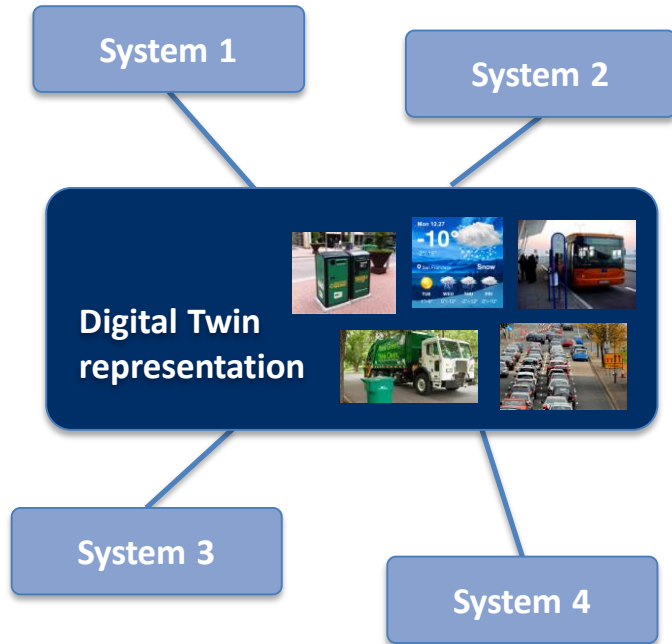


- Working implementation of Marketplace services based on TM Forum APIs ready and mature (TRL 6+)
- Pilots in the past (e.g., SynchroniCity)
- Components have evolved to facilitate integration with distributed IAM frameworks (necessary for data spaces)
- Projects using it today:
 - KI Marktplatz (AI Marketplace)
 - i4Trust (FIWARE lighthouse for data spaces)

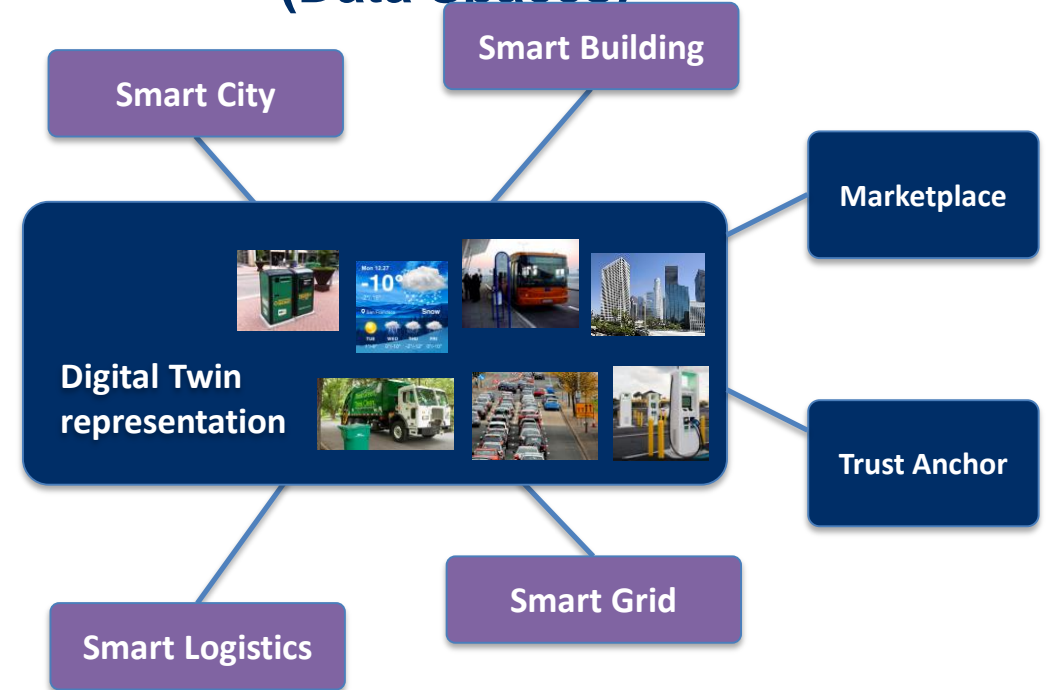
Incorporate MIM-3 as basis for your Data Space
Marketplace Services

MIMs 1-3: Essential elements for data spaces

Integrating systems and data within organizations (system of systems)



Sharing Data across organizations (Data Spaces)



Summary

- Promote NGSi-LD (MIM-1) as standard Digital Twin API
- Contribute to Smart Data Models initiative to ensure a healthy development of MIM-2
- Incorporate MIM-3 as basis for your Data Space Marketplace Services
- Shouldn't we address definition of a MIM coping with Identity and Authorization Management?

Thank you!

<http://fiware.org>

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