FIWARE: Making MIMs happen!

Juanjo Hierro
CTO
FIWARE Foundation
juanjo.hierro@fiware.org, @FIWARE
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
  - Geocovers
  - Subscription / Notification
  - Pull/Push-style for gathering data
  - Multiple data "teelers" (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, EABEF, EBG CM 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 management
    - Right-time Data Access services
    - Rights-based data processing services (e.g., analytics)
    - Integrated part of a data service offering description
  - Based on digital twin models supported
  - NGSI-LD entities used for data exchange
  - Time and location awareness
  - Pricing models
  - Advanced pricing and revenue sharing support: fixed, per-time payment, subscriptions, one-time, discounted
  - Data providers can instantiate their own marketplace or rely on global independent Marketplace services
  - Relaying 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 Marketplaces – 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

- 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
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)

- System 1
- System 2
- System 3
- System 4

Digital Twin representation

Sharing Data across organizations (Data Spaces)

- Smart City
- Smart Building
- Smart Logistics
- Smart Grid

Marketplace
Trust Anchor
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!

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Juanjo Hierro
FIWARE Foundation CTO
juanjose.hierro@fiware.org
www.slideshare.net/JuanjoHierro