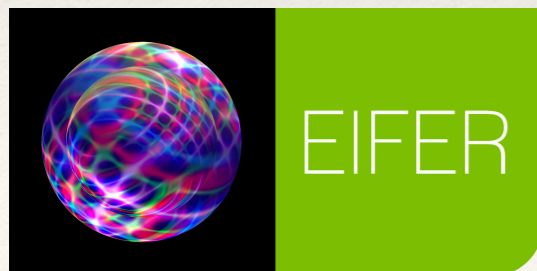


*CityGML Utility Network ADE Workshop. Karlsruhe, Germany, 6-8 December 2017*

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# Bridging the Utility Network ADE and FIWARE data models

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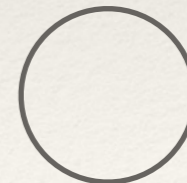
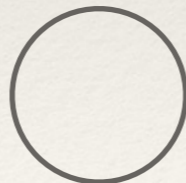
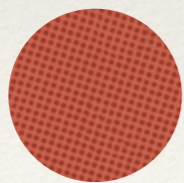
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# Outlines

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- ❖ Introduction on FIWARE
- ❖ Mapping the FIWARE Device Data Model
- ❖ Integrating the Data Models in Utility Network ADE

# Introduction on FIWARE



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# FIWARE

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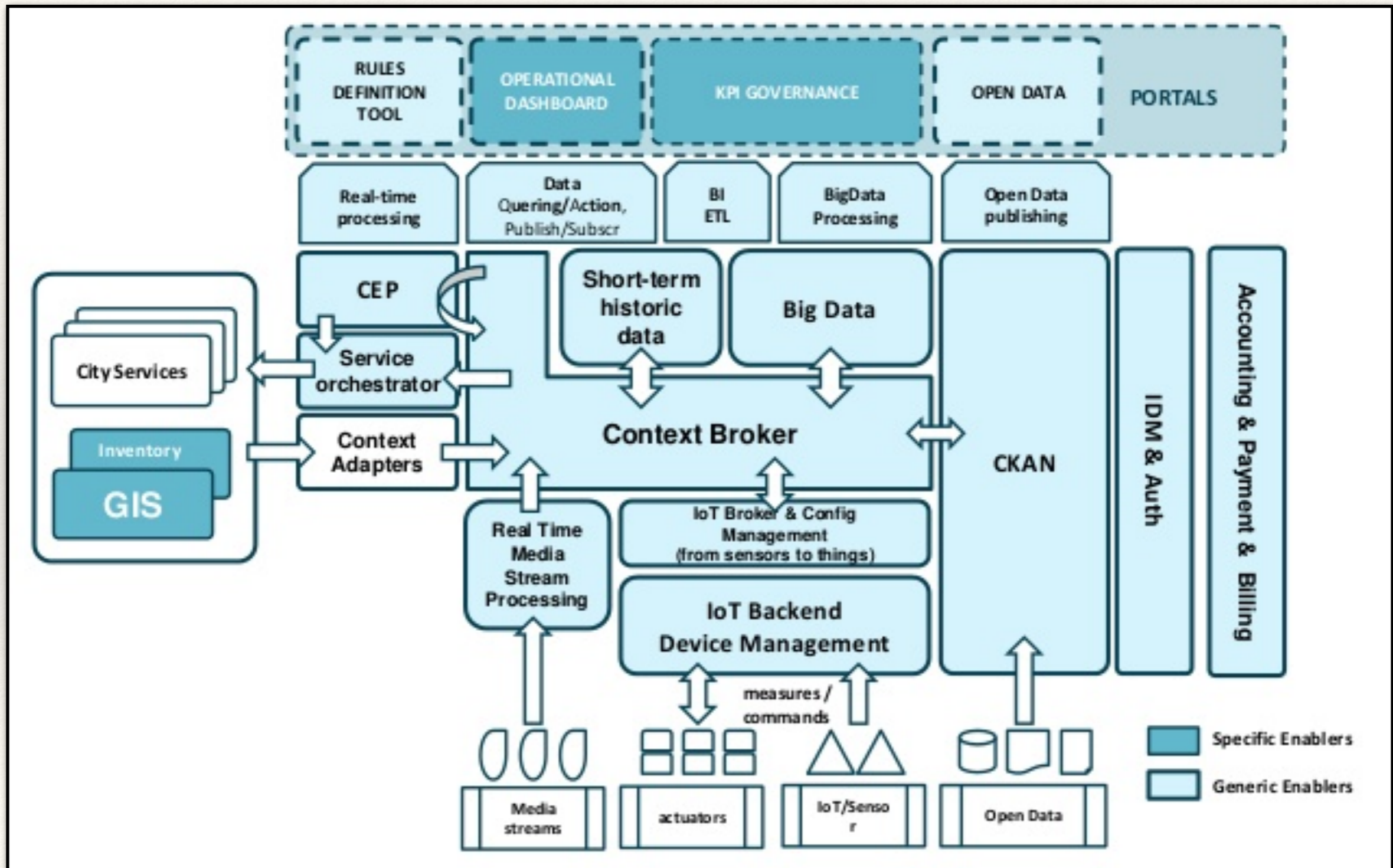
- ❖ **What is?**

- ❖ An open platform containing APIs to ease development of Future Internet applications.

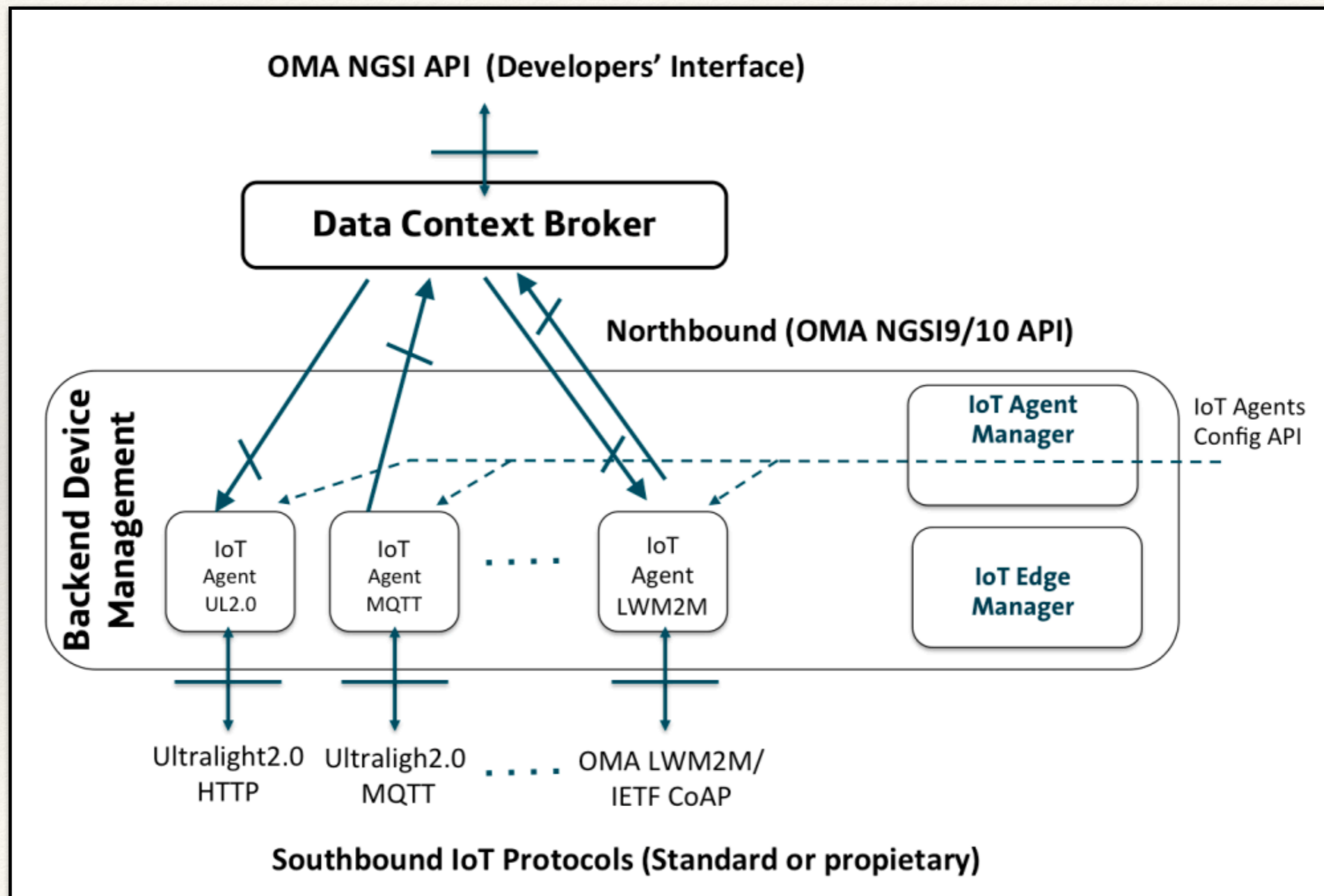
- ❖ **What offers?**

- ❖ An Open Stack-based cloud service
  - ❖ Different Generic Enablers, to be used as services in different applications:
    - ❖ Data and Context Management
    - ❖ Big Data analysis
    - ❖ IoT management
    - ❖ Security
    - ❖ Advanced Web interfaces
    - ❖ Video processing
    - ❖ Others

# FIWARE overall architecture



# Integrating devices in FIWARE



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# Integrating devices in FIWARE

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- ❖ **Backend device management:**

- ❖ IoT Agents

- ❖ A bridge between the Data Context Broker and the devices.
    - ❖ There should be a different agent for every single device protocol to be supported.
    - ❖ 3 predefined agents. A generic IoT agent to create custom agents is also provided.

- ❖ IoT Agent Manager

- ❖ It assists in the creation and monitoring of the different IoT agents.

- ❖ **Data context broker**

- ❖ Saves contextual information from varied sources.

- ❖ Information is represented as entities:

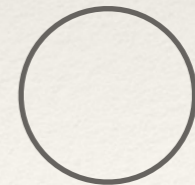
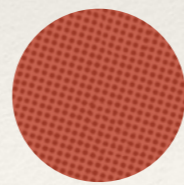
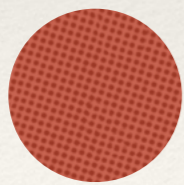
- ❖ Custom entities

- ❖ Predefined entities: the FIWARE Data Models.

- ❖ Communication with users via NGSI-2 RESTful API

- ❖ Communication with IoT agents via NGSI 9/10 RESTful API

# Mapping the FIWARE Device Data Model





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# FIWARE Data Models

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- ❖ An attempt to harmonize data models for Smart City, FIWARE-based applications: <https://www.fiware.org/data-models/>
- ❖ Thought to be used together with Data Context Broker and NGSI-2 RESTFul API
- ❖ Include predefined data models for devices:
  - ❖ *Device* entity
  - ❖ *DeviceModel* entity

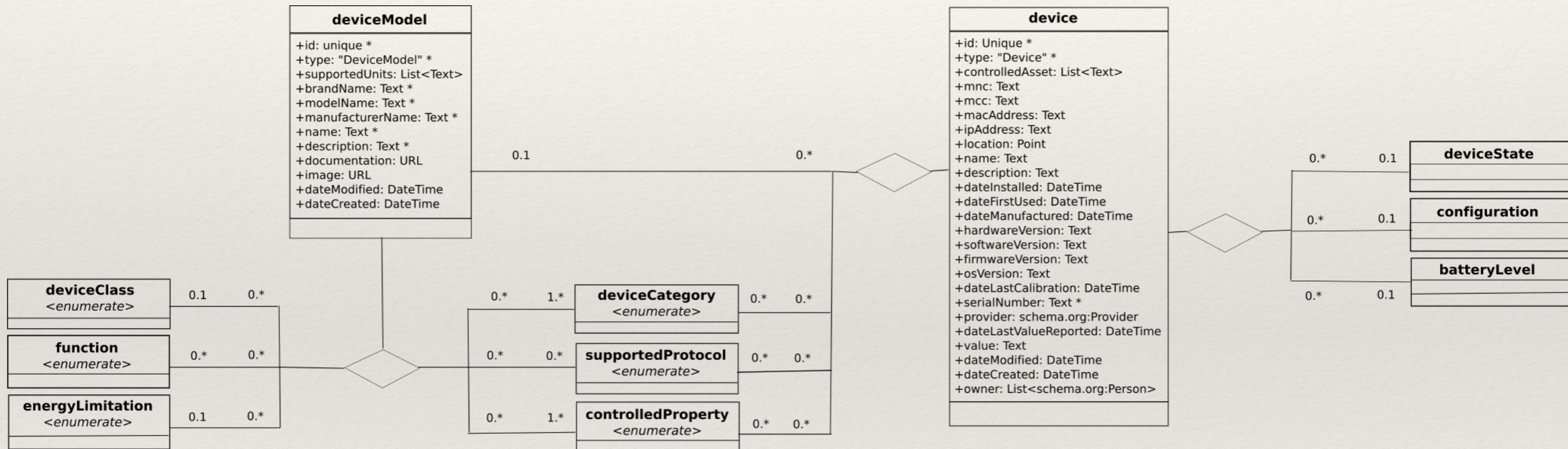
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# *Device and DeviceModel* entities

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- ❖ Designed in cooperation with GSMA and operators.
- ❖ They allow to represent devices of different nature.
- ❖ *Device*: represents a single electronic apparatus which performs a particular task.
- ❖ *DeviceModel*: represents the common properties for multiple instances of the same type of *Device*:
  - ❖ Functionalities, category, supported protocols, etc.
- ❖ Concepts coming from SAREF ontology / ETSI standards.

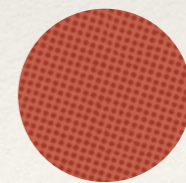
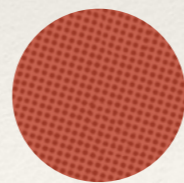
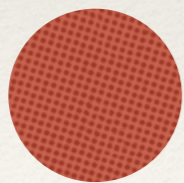
# Mapping *Device* and *DeviceModel*



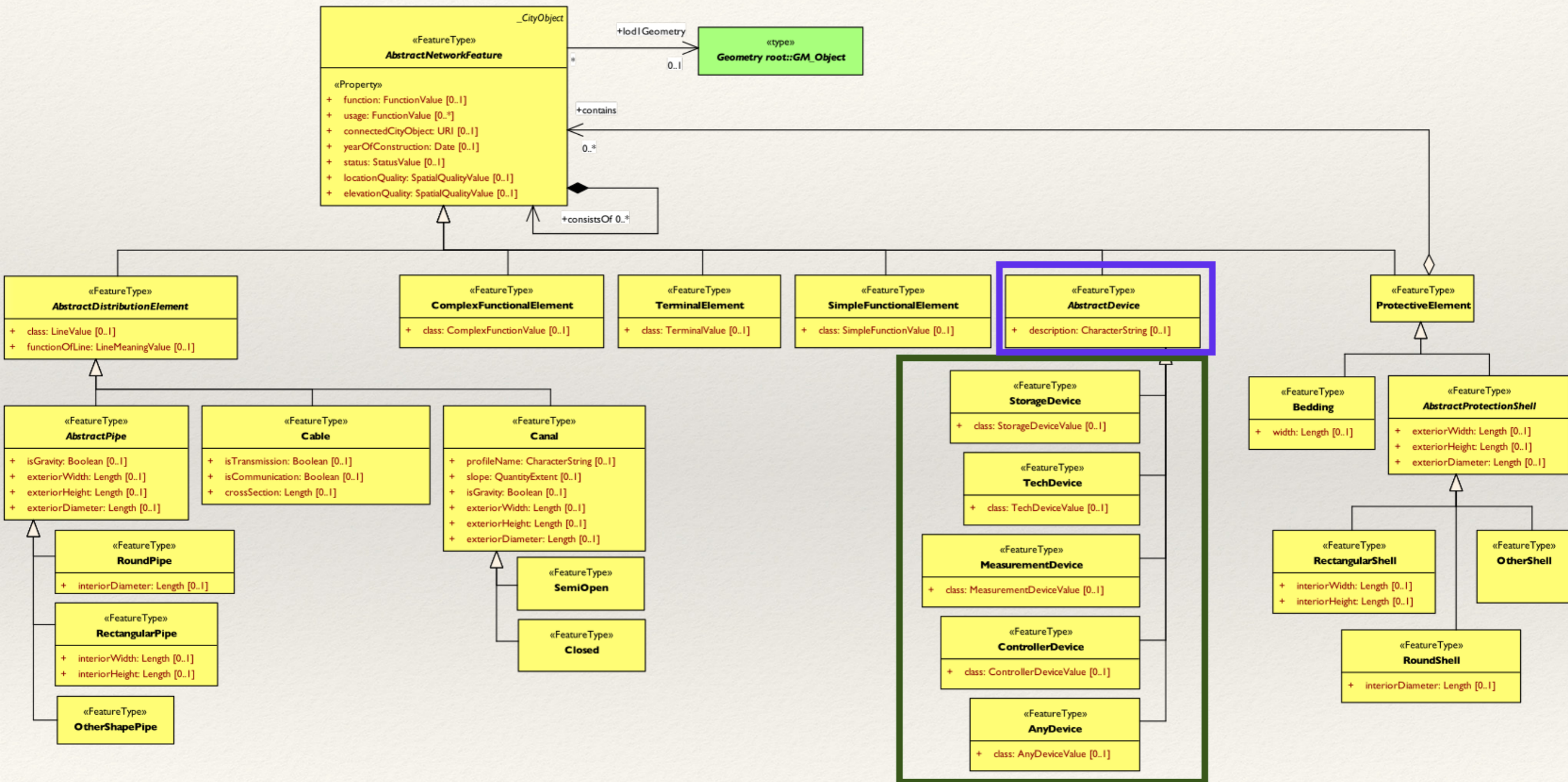
# Data model sub-entities and enums

<b>deviceCategory</b> <enumerate> sensor actuator meter HVAC network multimedia	<b>deviceClass</b> <enumerate> C0 C1 C2	<b>controlledProperty</b> <enumerate> temperature humidity light motion fillingLevel occupancy power pressure smoke energy airPollution noiseLevel weatherConditions precipitation windSpeed windDirection barometricPressure solarRadiation depth pH conductivity conductance tss tds turbidity salinity orp cdom waterPollution location speed heading weight waterConsumption gasConsumption electricityConsumption
<b>function</b> <enumerate> levelControl sensing onOff openClose metering eventNotification	<b>supportedProtocol</b> <enumerate> lul20 mqtt lwm2m http websocket onem2m sigfox lora nb-iot ec-gsm-iot lte-m cat-m 3g grps	
<b>energyLimitation</b> <enumerate> E0 E1 E2 E9	<b>configuration</b> + config: StructuredValue + dateModified: DateTime	
<b>deviceState</b> + level: int(0-1) + timestamp: DateTime	<b>batteryLevel</b> + state: Text + timestamp: DateTime	

# Integrating the data models in Utility Network ADE



# Device data model and Utility Network ADE



Thanks for your attention!