

W3C WoT and NGSI-LD Concepts

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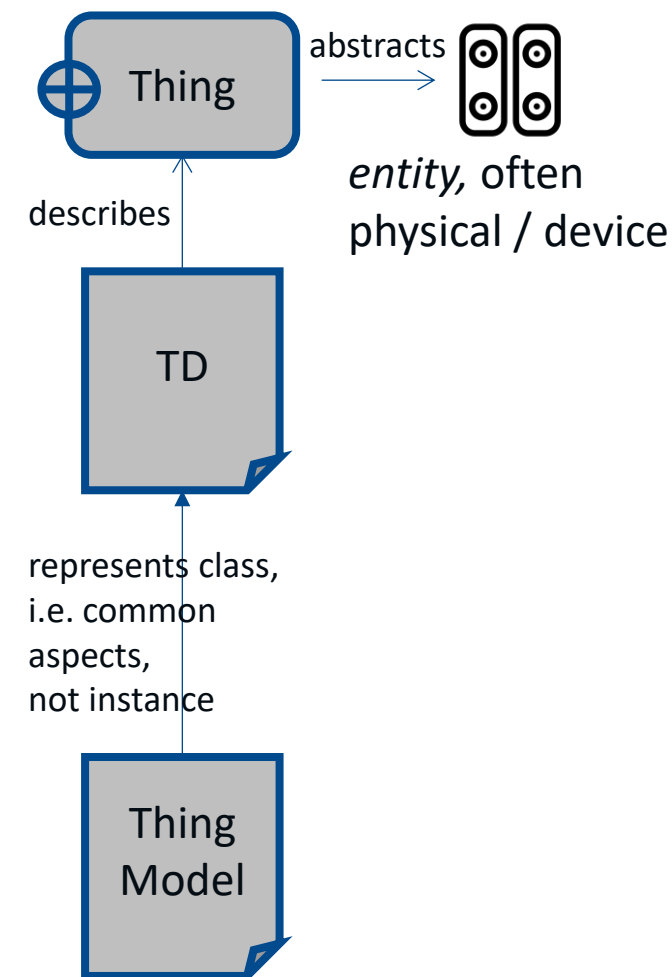
For: W3C Web of Things

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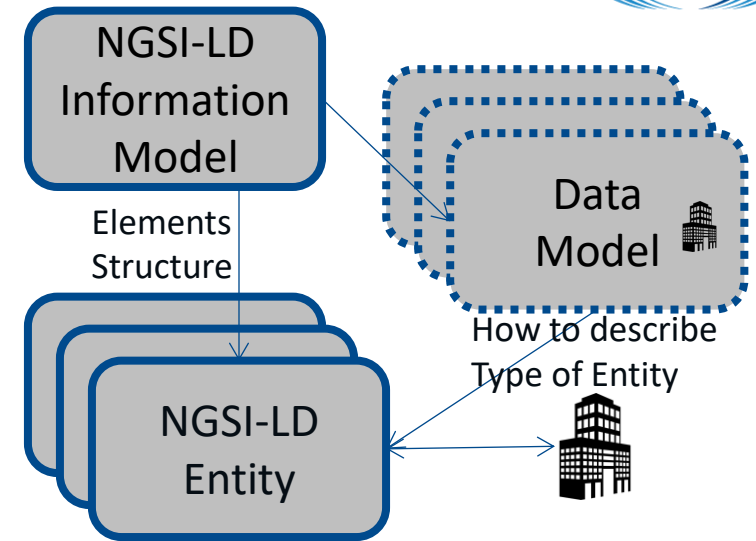
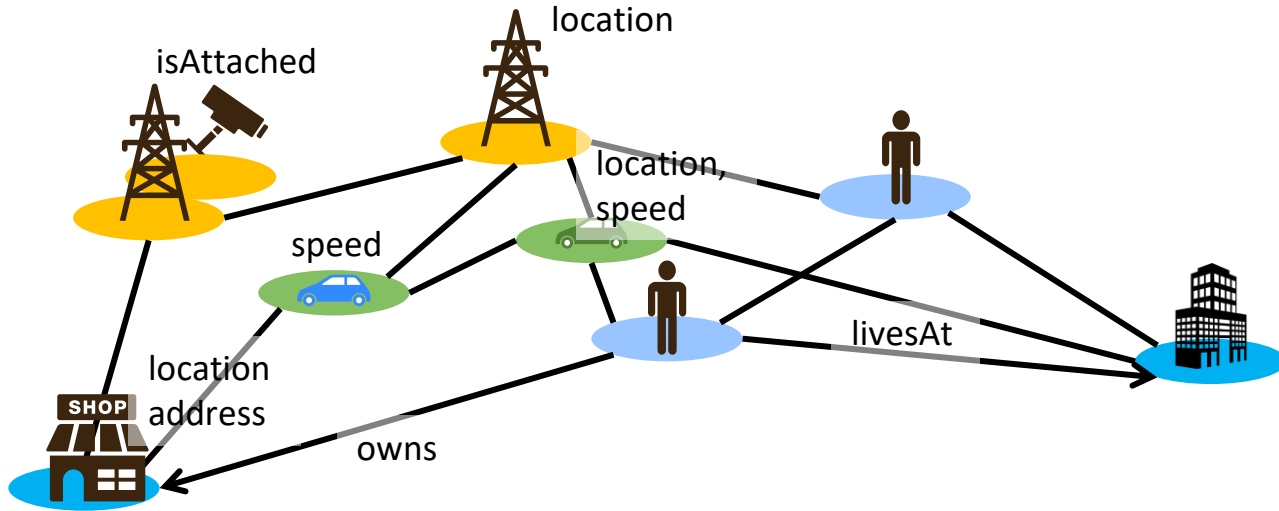


W3C WoT Concepts

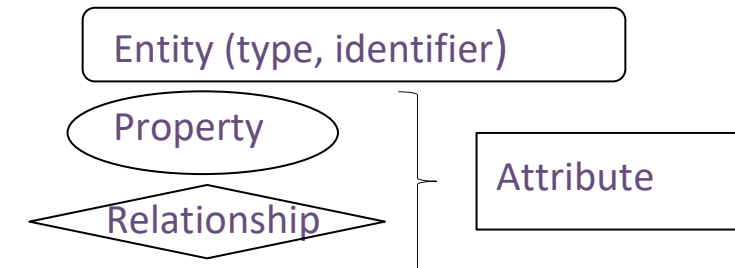
- **Thing:** An abstraction of a physical or a virtual *entity* whose **metadata** and **interfaces** are described by a **WoT Thing Description**, whereas a virtual entity is the composition of one or more Things.
- A Thing represents an instance.
- **[WoT] Thing Description (TD):** Structured data describing a Thing. A WoT Thing Description comprises general metadata, domain-specific metadata, Interaction Affordances (which include the supported Protocol Bindings), and links to related Things. The WoT Thing Description format is the central building block of W3C WoT.
- ⊕ **Interaction Affordance:** Metadata of a Thing suggesting how Consumers may interact with the Thing. There are many types of potential affordances, but W3C WoT defines three types of Interaction Affordances: **Properties**, **Actions**, and **Events**. A fourth Interaction Affordance is **navigation**, which is already available on the Web **through linking**.
- **Thing Model:** A Thing Model is a description for a class of Things that have the same capabilities. It describes the Properties, Actions, and Events and common metadata that are shared for an entire group of Things. Compared to a Thing Description, a Thing Model does not contain enough information to identify or interact with a Thing instance.



NGSI-LD Information Model (Property Graph)

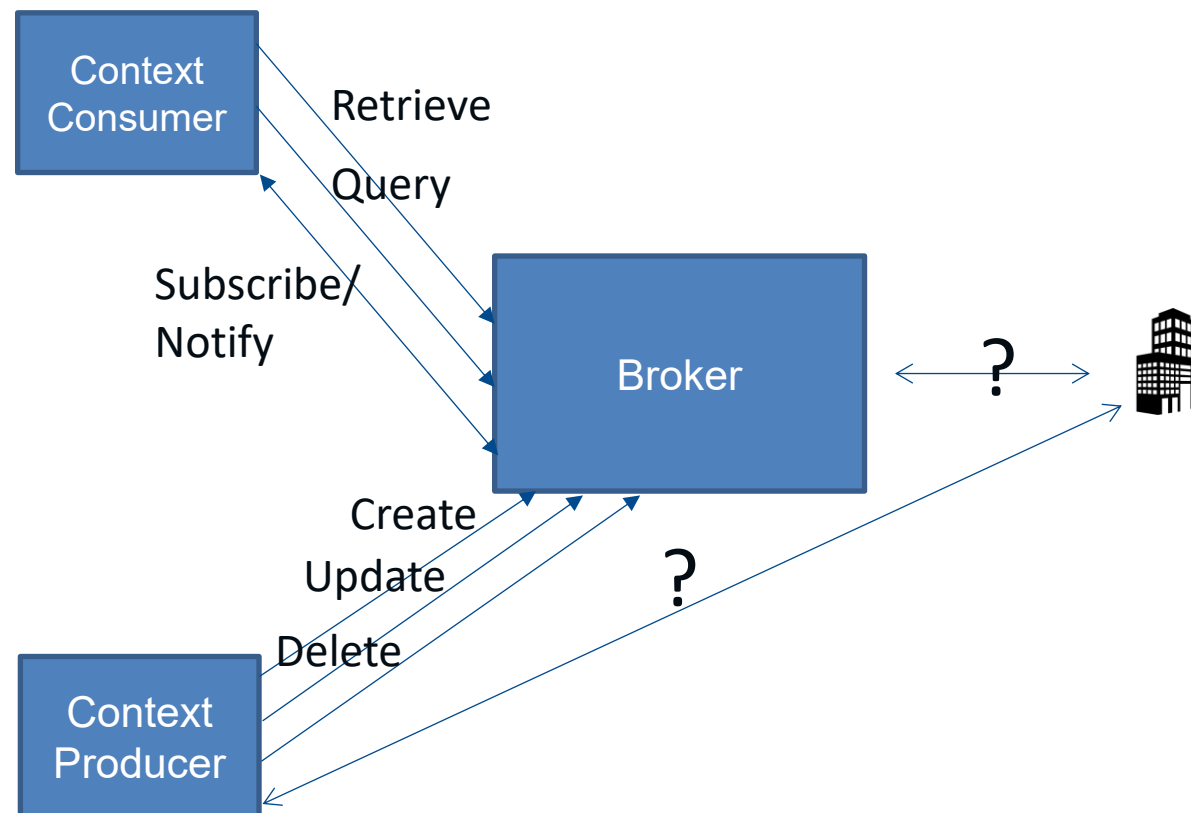


- **Core concept: Entity** – represents physical or virtual real-world asset / (simple) Digital Twin
- ➔ NGSI-LD Entity represents an instance providing dynamic and static information
- Abstract NGSI-LD information model: Entity has Properties and Relationships (to other Entities)
- Data Model (out-of-scope of ETSI ISG CIM): describes what Entity Types exist and which Properties and Relationships an instance with a specific Entity Type can have



NGSI-LD API

- Retrieve Entity (representation)
- Query Entities (discover and retrieve all fitting entities)
- Subscribe (for changes of entities, notification is sent when conditions apply)
- Create Entity (representation)
- Update Entity (whole entity, fragment, individual property)
- Delete Entity (representation)
- Actuation: currently only based on convention – application acts as producer and updates property abstracted device acts as consumer, i.e. subscribes and is notified about change,



Comparison

- (NGSI-LD) **Entity** ~ (W3C) **Thing** – but **focus of Thing is on interaction**, whereas **Entity can purely be data / a description** (I can model a table in a room without providing any interaction functionality.)
 - **W3C Thing Description is about a single instance, interaction relates to individual aspects** (single property, single event, single action)
 - NGSI-LD typically targets **complete Entity representations**, i.e. properties and relationships are not represented alone, but always within their respective Entities
 - NGSI-LD API supports **query**, i.e. **discovery and retrieval of (multiple) Entities in a single step**
- **Thing Description** can only describe **certain aspects of NGSI-LD API** with respect to a **specific Entity**, i.e.
- Read/Update property
 - Subscribe to change (event)
 - [Trigger action], once service execution in NGSI-LD API has been specified (alignment with W3C action desired)