W3C WoT WG
Thing Description
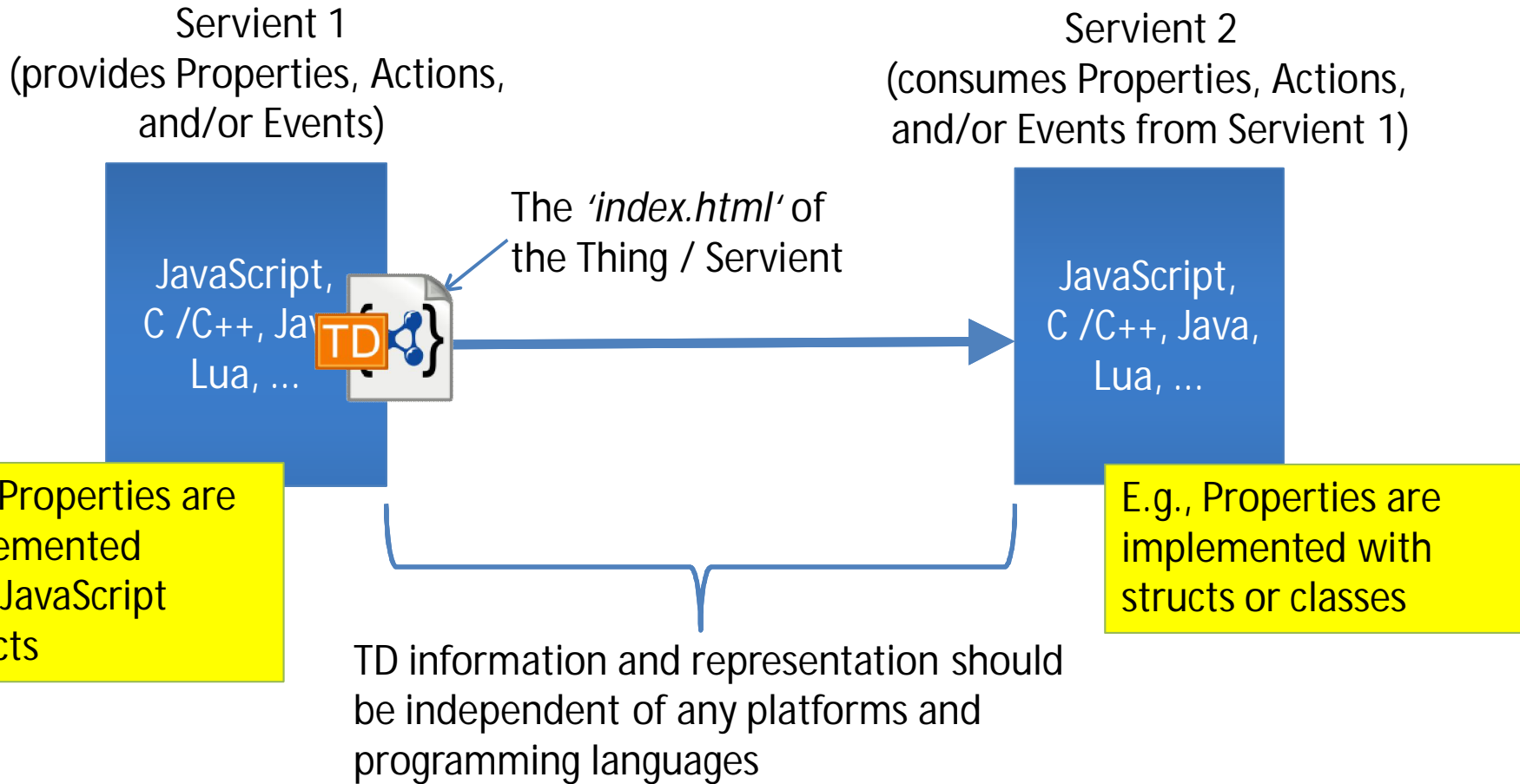# Information Model

May 2017
Osaka

Sebastian Käbisch

Agenda

1. TD Basic Assumption and current working assumption
2. TD Model
   - Requirements
   - TD model proposals
3. Next steps

4. TD lifecycle (Kajimoto-san) à 09:45am

WoT TD Basic Assumption

Servient 1
(provides Properties, Actions,
and/or Events)

Servient 2
(consumes Properties, Actions,
and/or Events from Servient 1)

JavaScript,
C /C++, Java,
Lua, ...

The *'index.html'* of
the Thing / Servient

TD

JavaScript,
C /C++, Java,
Lua, ...

E.g., Properties are
implemented
with JavaScript
objects

E.g., Properties are
implemented with
structs or classes

TD information and representation should
be independent of any platforms and
programming languages

TD Current Working Assumption

```json
{
  "@context": ["http://w3c.github.io/wot/w3c-wot-td-context.jsonld",
                { "sensor": "http://example.org/sensors#" }
              ],
  "@type": "Thing",
  "name": "MyTemperatureThing",
  "interactions": [
    {
      "@type": ["Property", "sensor:Temperature"],
      "name": "temperature",
      "sensor:unit": "sensor:Celsius",
      "outputData": {"valueType": { "type": "number" }},
      "writable": false,
      "links": [{
        "href": "coap://mytemp.example.com:5683/",
        "mediaType": "application/json"
      }]
    }
  ]
}
```

W3C Editor's Draft 06 March 2017
https://w3c.github.io/wot-thing-description/

TD Context
- minimal vocabulary set
- standardized by W3C WoT

'External' Context
- enrich definitions within TD with additional semantics
- is not to be standardized by W3C WoT
- reuse existing domain specific or unspecific vocabularies, e.g., from schema.org, OneM2M,....
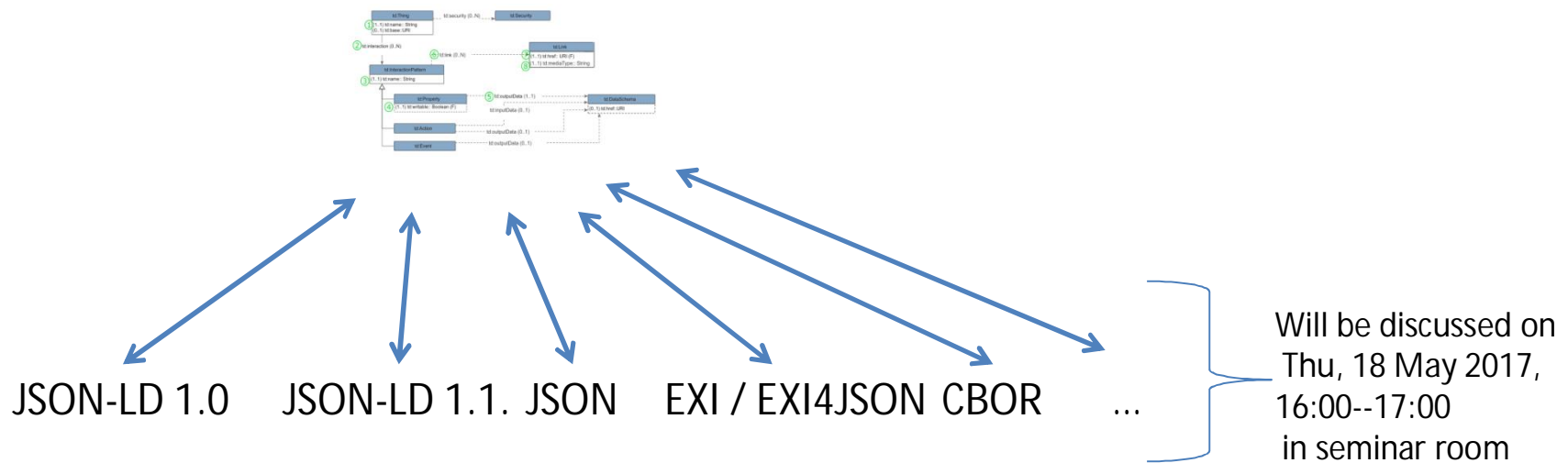
Data Schema Definition
- per default IETF JSON Schema
- working on semantic annotations

TD Model Requirements

- Should be independent of any serializiation format
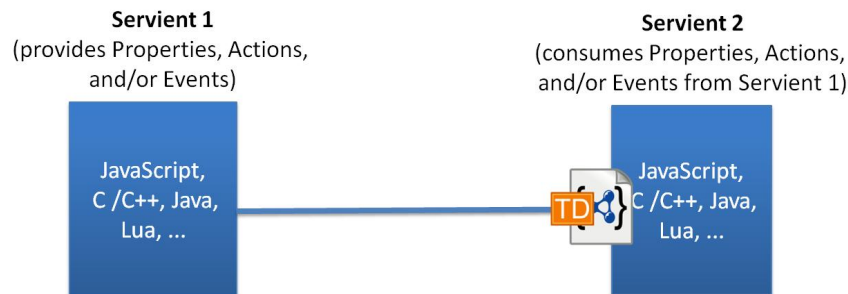

JSON-LD 1.0   JSON-LD 1.1. JSON   EXI / EXI4JSON CBOR   ...

Will be discussed on
Thu, 18 May 2017,
16:00--17:00
in seminar room

- TD model should be very clear and understandable by developer that have different backgrounds (e.g., embedded, web, and semantic web developer)
  à hard to meet

TD Model Requirements (cont)

- Define a compact and minimal vocabulary / item set which can be always be expect when a TD is consumed
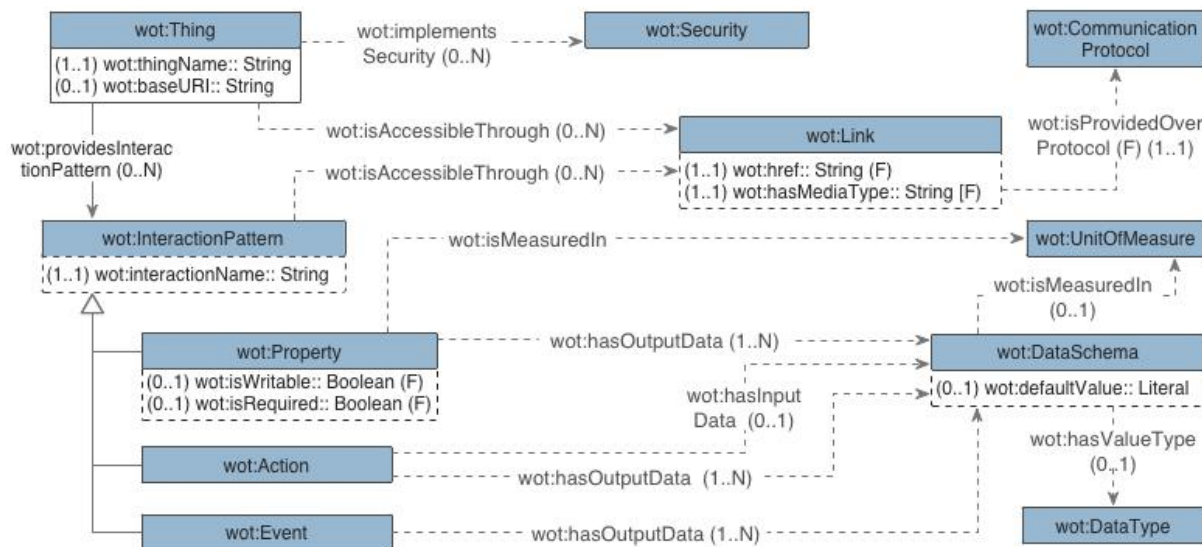

Servient 1
(provides Properties, Actions, and/or Events)

JavaScript, C /C++, Java, Lua, ...

Servient 2
(consumes Properties, Actions, and/or Events from Servient 1)

JavaScript, C /C++, Java, Lua, ...

TD

Having hooks for
- WoT's interaction models properties, actions, and events
- communication metadata
- semantics
- security

- Be extendable, e.g., for additional domain specific context knowledge (semantics, communication, security requirements)

Current Situation in TD Web Meetings

- Shall the TD model based on semantic web convention?
  - interactionName vs. name, providesInteractionPattern vs. interaction, ...
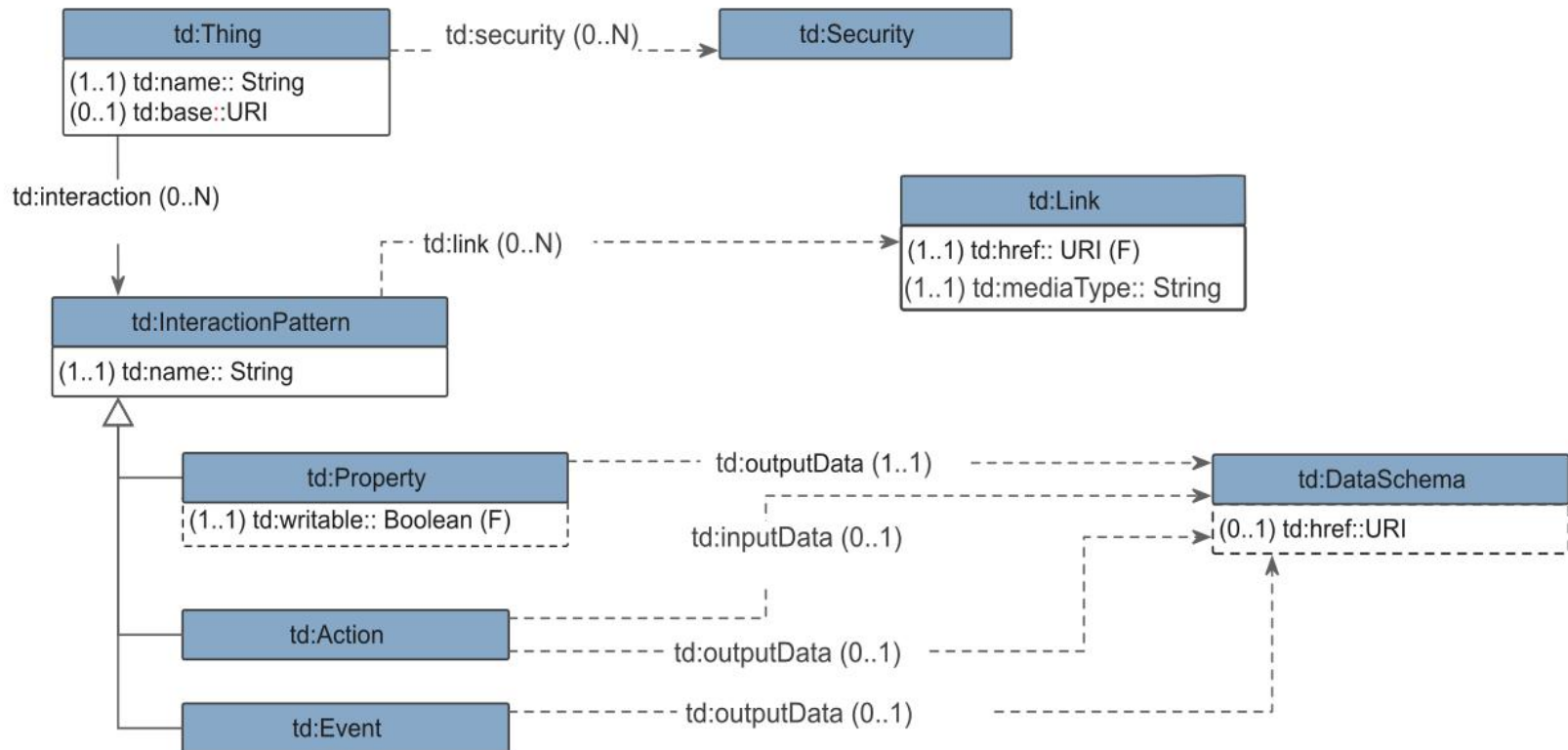 - see proposal from María Poveda Villalónet et al., http://iot.linkeddata.es/def/wot/index-en.html

Current Situation in TD Web Meetings

- outcome of the extra TD model web meeting (also see https://www.w3.org/2017/04/26-wot-td-minutes.html)

  à to have many adopters (also from non semantic web developer) TD instances should be very close to an introduced TD model
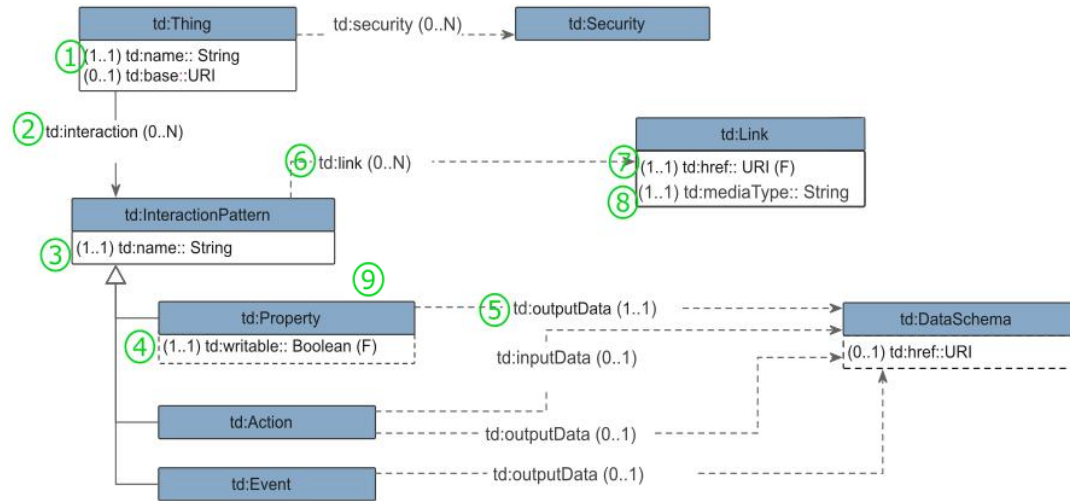 à avoid mapping introduction between TD instances and TD model

TD Model Proposal

TD Model with Instances

TD Model

Sample instances in different formats

```
{
  "@context": ["http://w3c.github.io/wot/w3c-wot-td-context.jsonld"],
  "@type": "Thing",
  "name": "MyTemperatureThing",
  "interaction": [
    {
      "@type": ["Property"],
      "name": "temperature",
      "writable": false,
      "outputData": { "type": "number" },
      "link": [{
        "href" : "coap://mytemp.example.com:5683/temp",
        "mediaType": "application/json"
      }]
    }
  ]
}
```

```
{
  "name": "MyTemperatureThing",
  "property": [
    {
      "name": "temperature",
      "writable": false,
      "outputData": { "type": "number" },
      "link": [{
        "href" : "coap://mytemp.example.com:5683/temp",
        "mediaType": "application/json"
      }]
    }
  ]
}
```

JSON-LD   JSON