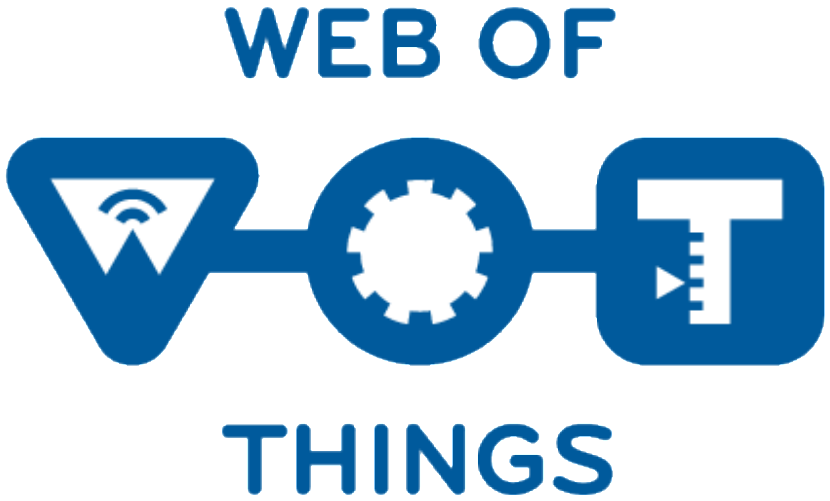


WoT and SDW Joint Meeting

Michael McCool

27 September 2024

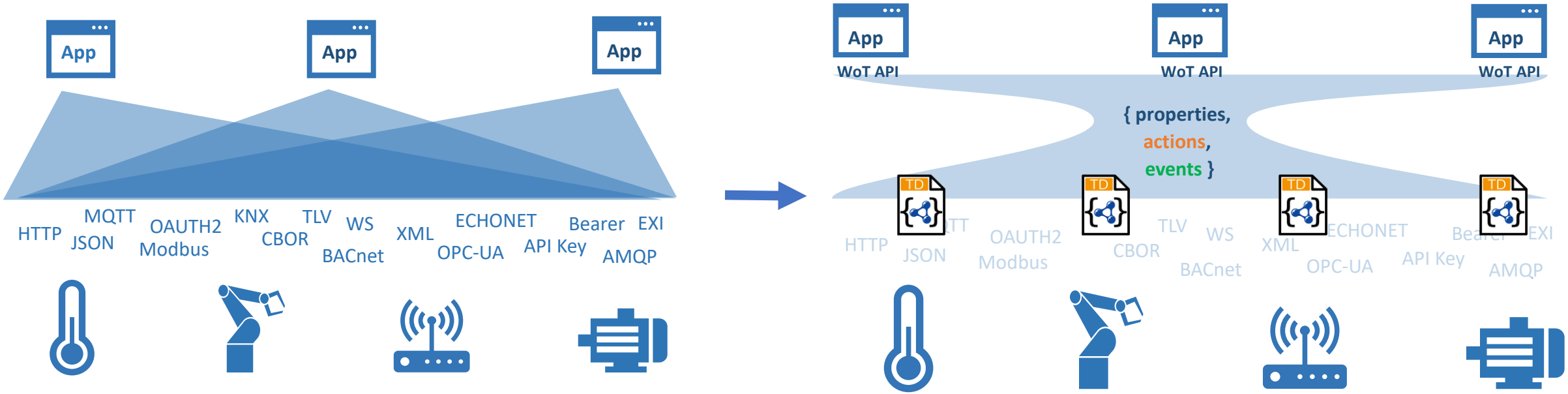
TPAC 2024

Agenda

- Speaker: Michael McCool, WoT/Intel (30m)
  - Spatial discovery and spatial metadata in TDs
  - Relationship to FIWARE and NGSI-LD
- Speaker: Rob Atkinson, SDW/OGC (30m)
  - SDW re-charter
  - GeoDCAT deliverable
  - potential for related WoT profiles
  - FIWARE model examples
    - see https://github.com/smart-data-models/SmartCities
- Discussion (30m)

W3C Web of Things (WoT)

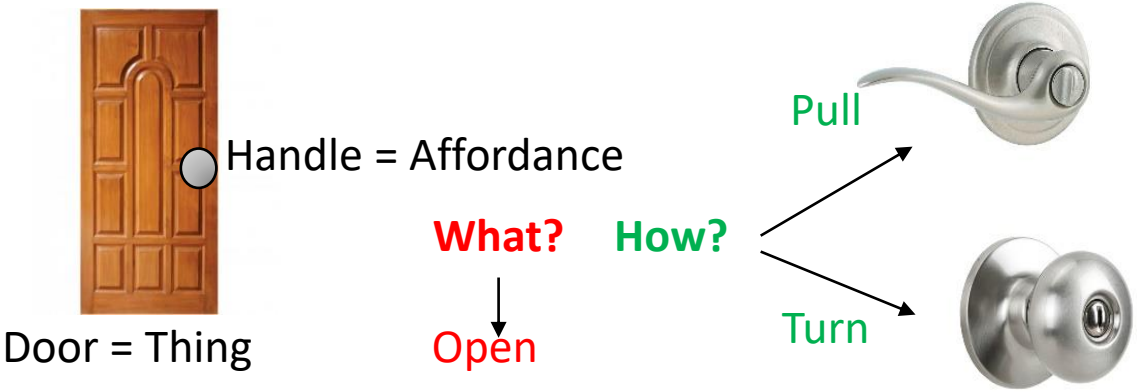
- W3C Working Group goal: Adapting web technologies to IoT
- Already published: Thing Description (TD) metadata format
  - TD describes the available interactions (network API) of a Thing
- New deliverables in progress, including Discovery
  - How does a potential user obtain the TD for a Thing?



Descriptive Interoperability: TDs

WoT Architecture

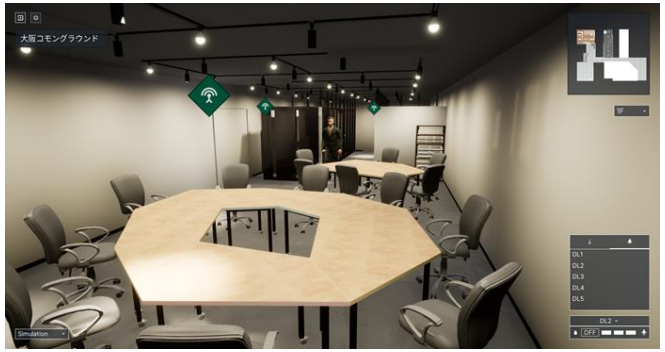
- Constraints
  - "Things" must have a TD
  - Must use URIs, IANA media types, etc.
- Thing Description Affordances
  - Describes WHAT the possible choices are
  - Describes HOW to interact with the Thing



WoT Thing Description (TD)

```
{
  "@context": [
    "https://www.w3.org/2022/wot/td/v1.1",
    { "iot": "http://iotschema.org/" }
  ],
  "id": "urn:dev:org:32473:1234567890",
  "title": "MyLEDThing",
  "description": "RGB LED torchiere",
  "@type": ["Thing", "iot:Light"],
  "securityDefinitions": {
    "default": {"scheme": "bearer"}
  },
  "security": ["default"],
  "properties": {
    "brightness": {
      "@type": ["iot:Brightness"],
      "type": "integer",
      "minimum": 0,
      "maximum": 100,
      "forms": [ ... ]
    }
  },
  "actions": {
    "fadeIn": {
      ...
```

Applications



https://www.takenaka.co.jp/news/2021/05/02/

Takenaka Corporation

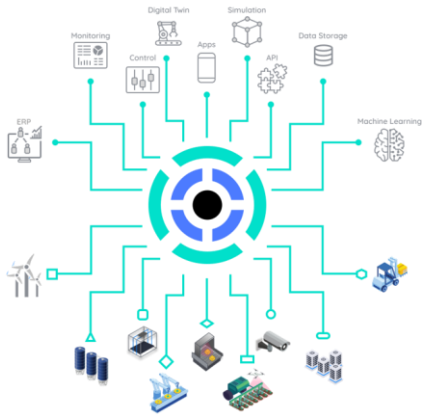
- CGLL Platform - BIM

https://new.siemens.com/global/en/products/buildings/automation/desigo.html

https://www.evosoft.com/en/digitalization-offering/saywot/

Siemens

- Desigo CC – BIM
- Say WoT!



https://netzo.io/

Netzo

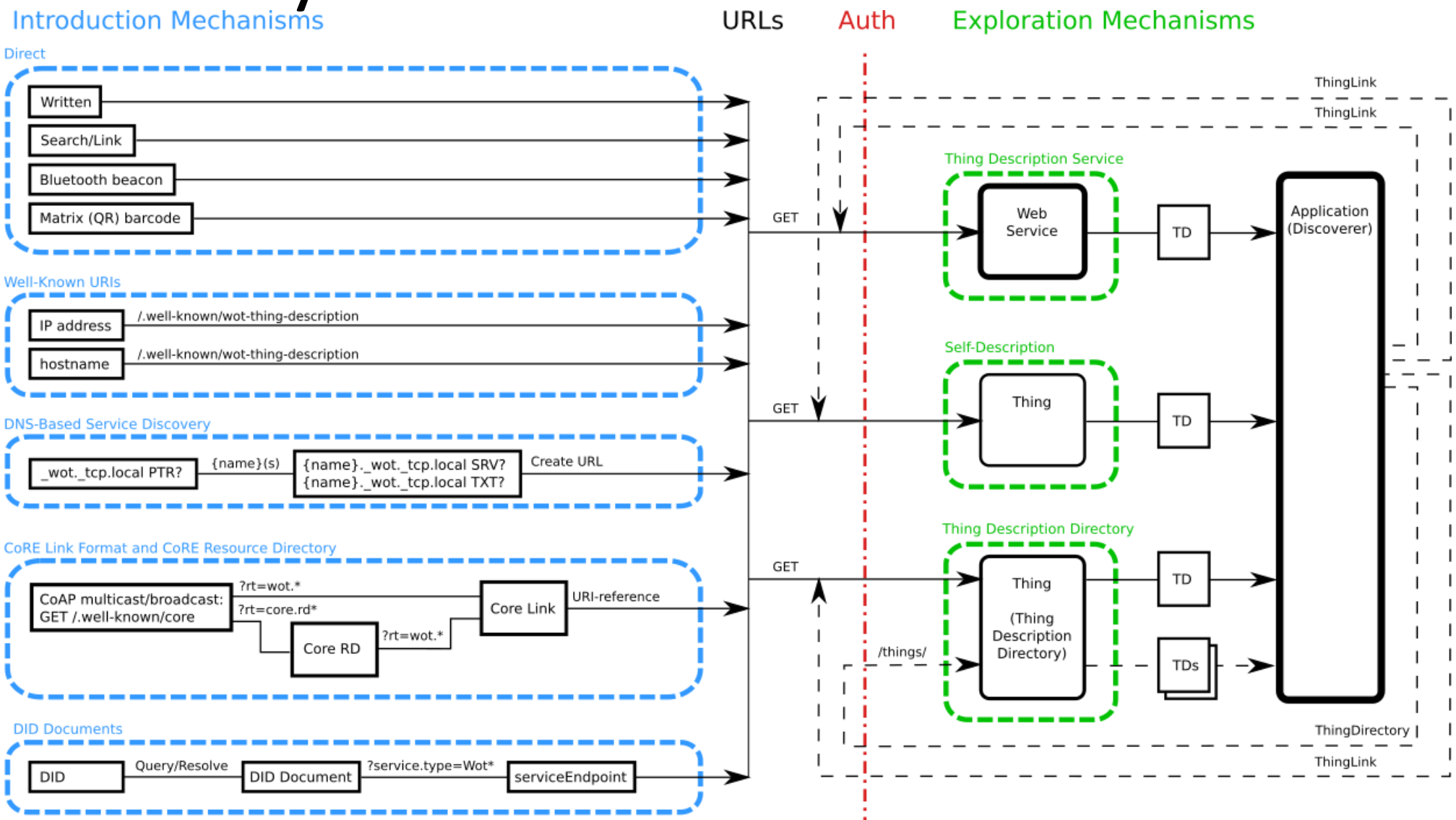
- IoT Data Hub
- Dashboards

https://www.eclipse.org/ditto/2022-03-03-wot-integration.html

Bosch

- Eclipse Ditto - Digital twin

Discovery


Introduction Mechanisms
URLs
Auth
Exploration Mechanisms
Direct
Written
Search/Link
Bluetooth beacon
Matrix (QR) barcode
Well-Known URIs
IP address
/.well-known/wot-thing-description
hostname
/.well-known/wot-thing-description
DNS-Based Service Discovery
_wot._tcp.local PTR?
{name}(s)
{name}._wot._tcp.local SRV?
{name}._wot._tcp.local TXT?
Create URL
CoRE Link Format and CoRE Resource Directory
CoAP multicast/broadcast:
GET /.well-known/core
?rt=wot.*
?rt=core.rd*
Core RD
?rt=wot.*
Core Link
URI-reference
DID Documents
DID
Query/Resolve
DID Document
?service.type=Wot*
serviceEndpoint
GET
GET
GET
/things/
ThingLink
ThingLink
Thing Description Service
Web Service
TD
Self-Description
Thing
TD
Thing Description Directory
Thing
(Thing Description Directory)
TD
TDs
Application (Discoverer)
ThingDirectory
ThingLink

Key Geospatial Data Issues in TDs

1. Location data may be static or dynamic
   → Use links to identify source of data
   - Use link to point at source of location data
   - Link can point to self, e.g. current TD, for static location data
   - Link can point to affordance, e.g. a property, for dynamic location data
   - Link can point to another TD if location data provided by another Thing
2. Location data can have various representations and options
   - Coordinate-based (e.g. latitude/longitude)
   - Semantic (e.g. room/floor in a building)
   - Optional data (e.g. velocity, elevation)

   → Use semantic annotations to identify fields in data
3. Time of last update may be important
   → Optional last-update field/semantic annotation

Example TDs using Geolocation

- Simple static installation, using schema.org
- Static installation, using modular (proposed) geolocation ontology
- Dynamic installation, using internal geolocation resource
- Dynamic installation, using separate geolocation service
- Dynamic installation, geolocation service

Discovery extensions:

- Spatially-aware introduction mechanisms (e.g. ext. DNS-SD or DID)
- Query mechanisms for Directories (GeoSPARQL and/or JSONPath ext.)

Goals/Proposal

1. Identify Geospatial information
   - In TDs (static)
   - Available from Things directly (dynamic)
2. Find TDs using Geospatial search
   - Geospatial queries in Discovery

Note:

- Currently we don’t even have a mandatory query language in WoT Discovery (waiting for JSON Path to get finalized…)
- WoT Discovery update deferred to next charter (waiting for TD 2.0 to be finalized…)
- Also want to align with NGSI-LD binding (in progress)

→ Proposal: work on data model (1) first, publish Note for incubation and testing, consider geospatial Discovery (2) in next round of standardization.

ETSI ISG CIM

- ETSI: https://www.etsi.org/
- ISG CIM:
  - https://www.etsi.org/committee/cim
  - Industry Specification Group (ISG)
    cross cutting
    Context Information Management (CIM)
- Deliverable of interest: NGSI-LD
  - Context Information Management (CIM): NGSI-LD API
  - “aims to enable applications to discover, access, update and manage data and context information from many different sources”
- Related stakeholders:
  - FiWare: https://www.fiware.org/
    - https://fiware-datamodels.readthedocs.io/en/stable/ngsi-ld_howto/

Liaison Activity

- Simple Liaison Established
  - Kazuyuki “Kaz” Ashimura as contact
- Bi-weekly calls planned starting October 14
  - Open to all WoT IG/WG members
- Draft goals: wot: proposals/liaisons/ngsi-ld.md

  “… evaluate the potential of using W3C WoT Things Models for the description of NGSI-LD entity types as well as specifying how default WoT Things Descriptions can be derived from WoT Things Models using the NGSI-LD API as the form to interact with Things.”

- Potential for an “NGSI-LD API binding” with applicability to FiWare
- Applicable especially to Smart City and Smart Building use cases

Discussion

Resources and Contacts

https://www.w3.org/WoT

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