

iot.schema.org

WoT Status Review

October 26, 2018

Topics

- Work on automating consumed and exposed APIs
- SSN Workshop
- Charter
- Explainer and introductory slides
- Integration with schema.org
- Definition tools
- Work on modeling target ecosystems
- Developer-user tools
- Going forward

Presentation on Node-RED and Semantic Interoperability

- (Darko)

SSN Workshop at ICSW2018

- Presented iot.schema.org at the SSN Workshop last week
- Presentation is in the teleconferences folder
- Discussion:
 - Action, Event, Property terms are badly overloaded
 - When will the definitions be available on schema.org?
 - How do we create and use definitions?
 - What tools are available for definitions and annotation
 - How do we use definitions with existing device ecosystems?

SSN Workshop (contd)

- Presentations on Automotive, Building Management, Home Care use cases
- Clear focus on Feature of Interest concepts
- Gap analysis for Semantic IoT
 - Taxonomy of Observable Properties
 - FoI Vocabularies
 - Sensor/Actuator Vocabulary
 - Vocabulary for processes and procedures

Organization

- W3C CG Charter
- Introductory materials
 - Explainer
 - Slide set for introduction
 - SSN workshop slides
- Integration with schema.org
 - May not be a sub-domain, e.g. become part of schema.org
 - We need to enable the schema browser for iotschema definitions

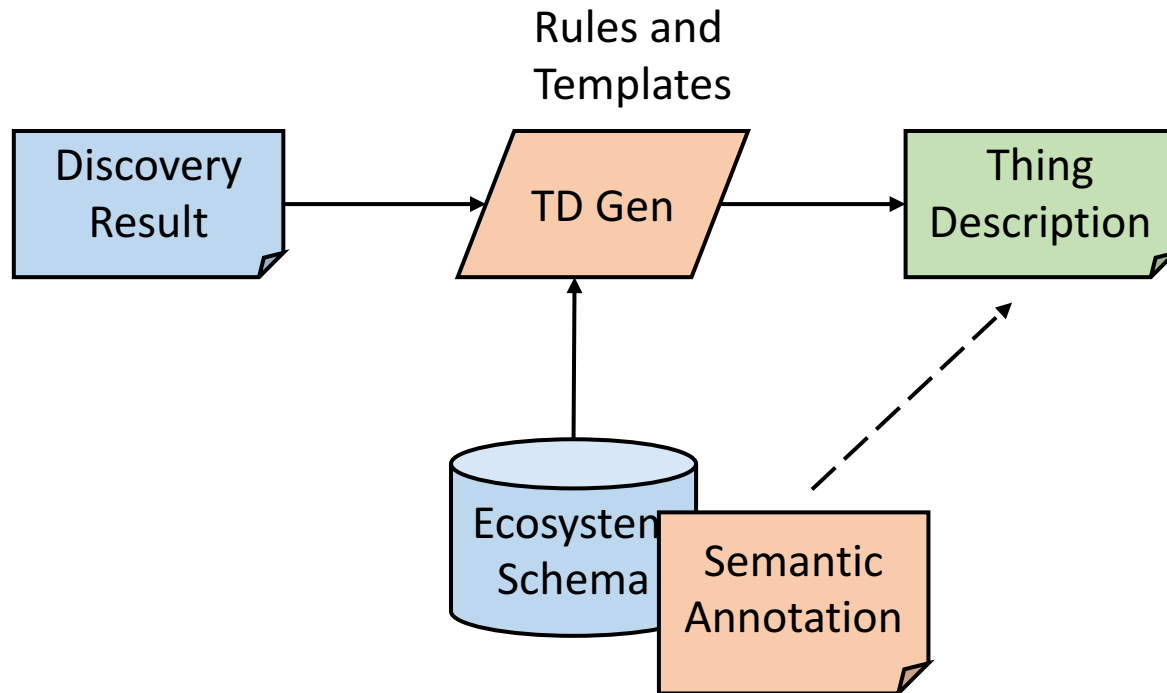
Developer tools

- How to create and maintain definitions
- How to use definitions in deployed systems
- **How to apply definitions to existing device ecosystems and Fol definitions**
 - OMA LWM2M
 - OCF
 - W3C WOT Thing Description
 - Genivi VSS
 - Haystack/Brick
 - What about Amazon Alexa, SmartThings, etc.
 - Other APIs using OAS/Swagger, HAL, JSON Hyperschema

Applying iot.schema.org definitions to existing ecosystems

- Existing definitions in some machine-readable format
 - XML, JSON-Schema, JSON, others e.g. YAML
- Annotate the definitions with Semantic terms to describe affordances
 - JSON-LD schema can be annotated as in WOT TD
 - Other annotation techniques (WISHI Research)
 - Use existing definition or create new definitions
- Generate hypermedia controls from the annotated definitions
 - TD Generator
 - Other annotations of instances

Process



Annotation of a JSON Schema fragment using JSON-LD

```
{  
  "type": "object",  
  "properties": {  
    "name": "bri",  
    "@type": ["iot:LevelData" ],  
    "type": "integer",  
    "min": 0,  
    "max": 254  
  }  
}
```

- Annotated schema is used to generate hypermedia controls for instances
- E.g. a link with a target attribute containing the annotation

Going Forward

- Set up the CG
- schema.org integration
- Accept definitions for target ecosystems
 - LWM2M/IPSO (Ericsson), OCF, SmartThings
- Would like to work with IIC to create testbeds for semantic interoperability

Upcoming Teleconferences

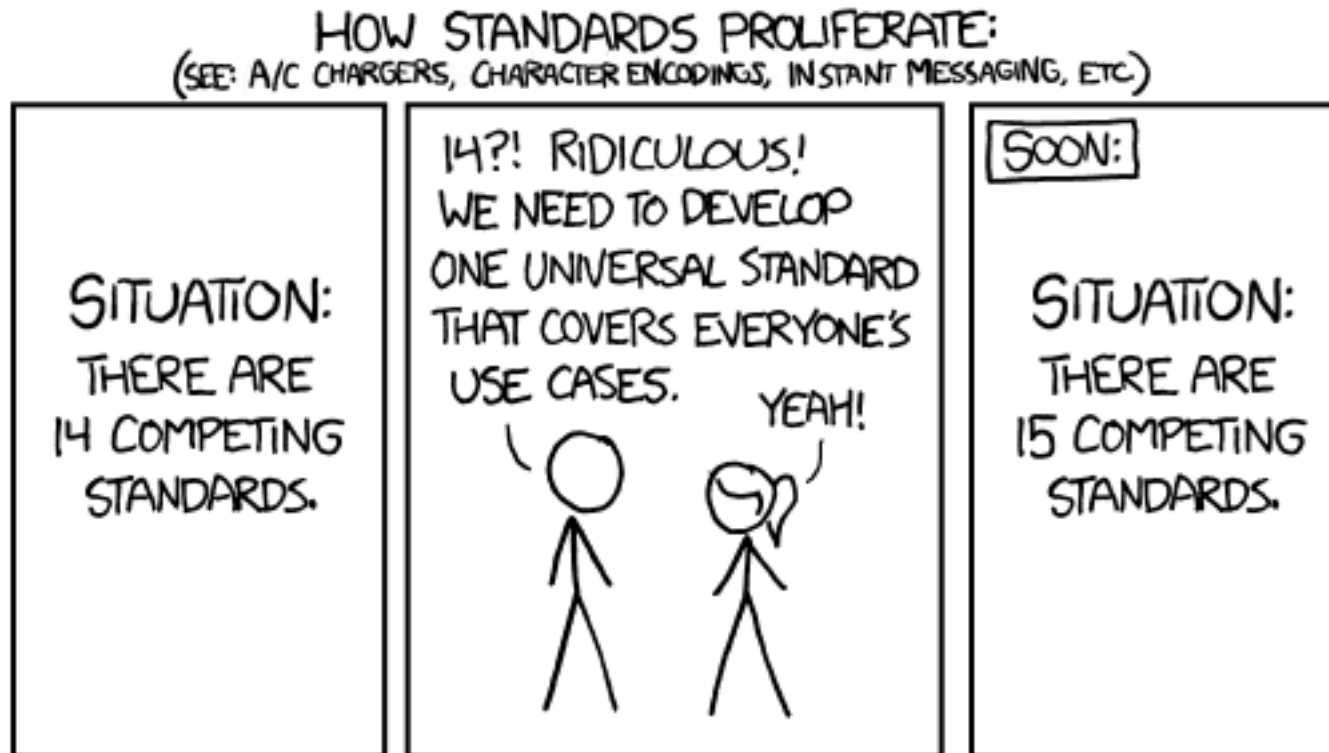
- Dr. Amelie Gyrard – Semantic Web of Things
 - Industry-wide survey of existing definitions
- Bruce Nordman – Lawrence Berkeley Laboratory
 - Device descriptions for energy monitoring

SSN Workshop Exit Keynote (condensed)

ISCW 2018

October 9, 2018

This is the Problem being solved:

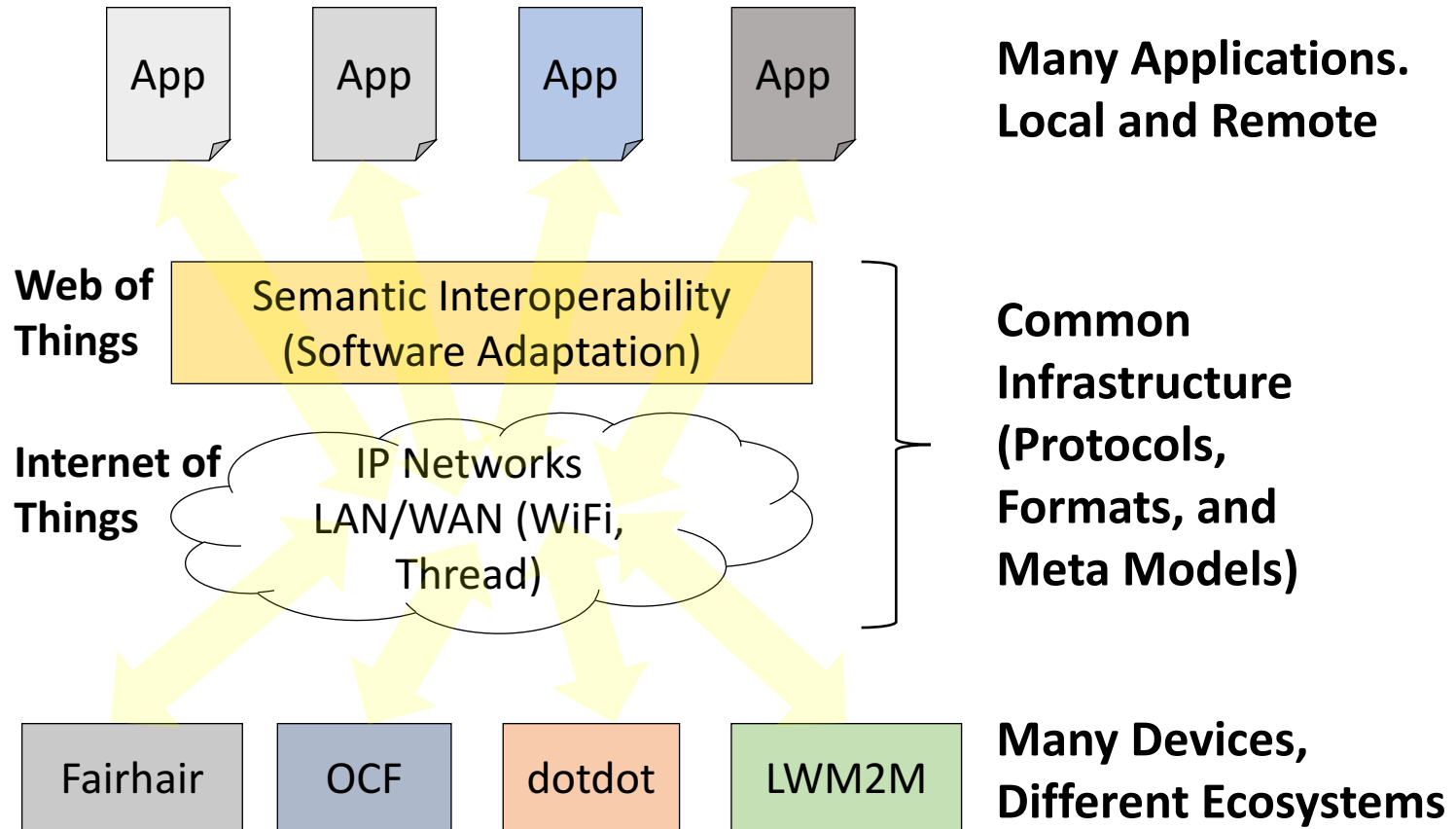


Source: <https://xkcd.com/927/>

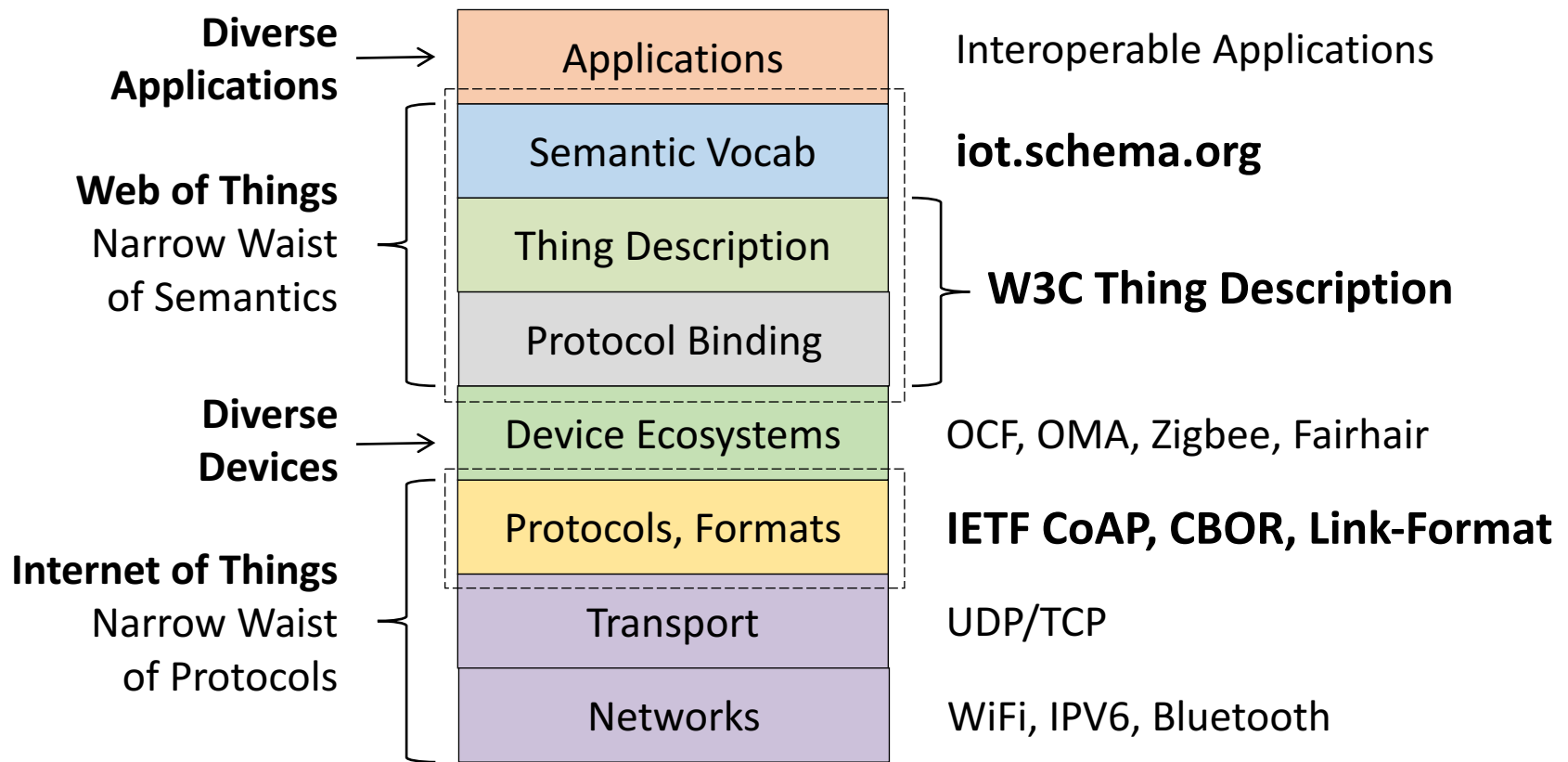
Problem being solved – Semantic Interoperability for IoT

- Acknowledge the diversity of IoT device ecosystems
 - Not another device standard
 - Adaptive to diverse protocol, language, and data models
 - Distill the common and stable operational features
 - Second "narrow waist" for systems above IP networks
- Address the ease of use of Semantic Web for IoT and use of IoT for Semantic Web
 - Not another IoT ontology
 - A conceptual layer that models connected things in relation to existing ontologies

Narrow Waist in System Design



Diverse Devices and Applications, Common Protocols and Semantics



Integration with other Ontologies

Enables Well-Characterized interactions with Physical Entities

Feature of Interest, O&M
Situation, Provenance



iot.schema.org
Definition

Software
Affordances



Quantities, Units, Shapes,
Property Value Constraint

Connect things to the real world

