

ASDF

Virtual interim

2020-12-14

Note Well

- You will be recorded
- Be nice, and be professional
- The IPR guidelines of the IETF apply:
see <http://ietf.org/ipr> for details.

Repo: <https://github.com/ietf-wg-asdf/asdf-working-group-notes>

Notes: <https://codimd.ietf.org/notes-ietf-109-asdf>

Note Well

This is a reminder of IETF policies in effect on various topics such as patents or code of conduct. It is only meant to point you in the right direction. Exceptions may apply. The IETF's patent policy and the definition of an IETF "contribution" and "participation" are set forth in BCP 79; please read it carefully.

As a reminder:

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Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- [BCP 9](#) (Internet Standards Process)
- [BCP 25](#) (Working Group processes)
- [BCP 25](#) (Anti-Harassment Procedures)
- [BCP 54](#) (Code of Conduct)
- [BCP 78](#) (Copyright)
- [BCP 79](#) (Patents, Participation)
- <https://www.ietf.org/privacy-policy/> (Privacy Policy)

Agenda

- Introduction, meeting logistics, agenda bashing (10 min)
- ASDF status update (chairs) (10min)
- SDF 1.1 wrap-up
- W3C Web of Things - demo and collaboration
- AOB

Administrative

- CodiMD for notes <https://codimd.ietf.org/notes-asdf-2020-12-14>
- Webex <https://ietf.webex.com/ietf/j.php?MTID=m0d089a7c8ac2d5a188c733c8107cb390>
- Note takers
- AOB?

Status update

- **Status:** ASDF WG was chartered in October
- **Chairs:** Michael Richardson and Niklas Widell
- **Progress so far:**
 - Unofficial hallway meeting — SDF 1.0 tutorial: https://youtu.be/_8i6X4AxuOk
 - Virtual interim 01 — **SDF 1.0 draft adopted** as [draft-ietf-asdf-sdf](#)
 - IETF 109 with Hackathon - work on SDF 1.1
- **Meeting plans:**
 - Virtual interim 02 on today - wrap up 1.1 for adoption

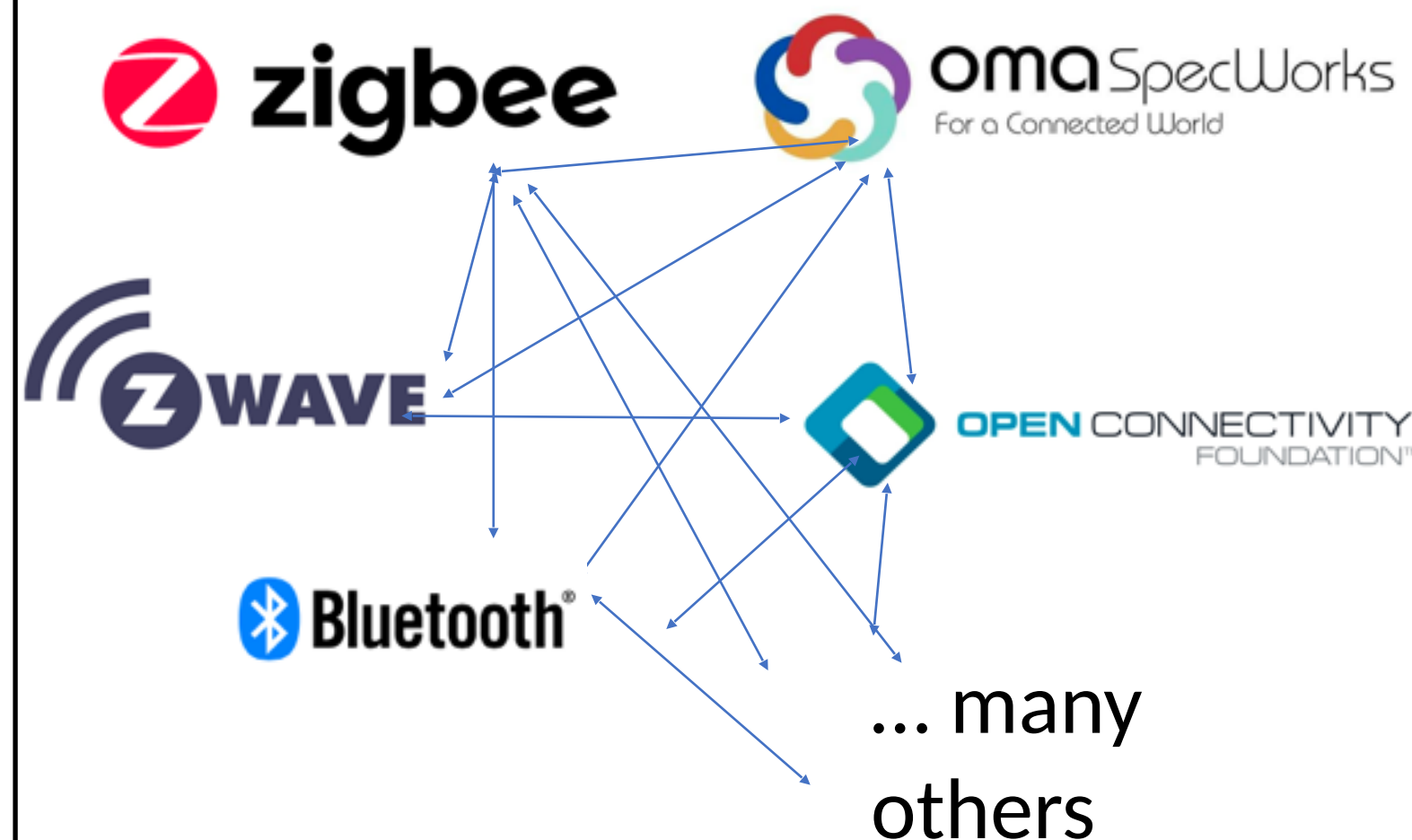
WG procedures

- Decisions on mailing list: <https://www.ietf.org/mailman/listinfo/asdf>
- Work on Github: <https://github.com/ietf-wg-asdf>
 - Use Issue tracker for issues (new features and fixes)
- Schedule (doodle) regular virtual interims between virtual physical meetings
- Plan to release intermediate “Implementation Drafts” of SDF
 - E.g., to be used by OneDM as update target for toolchains

One Data Model in a nutshell

The problem

Several standardised data models

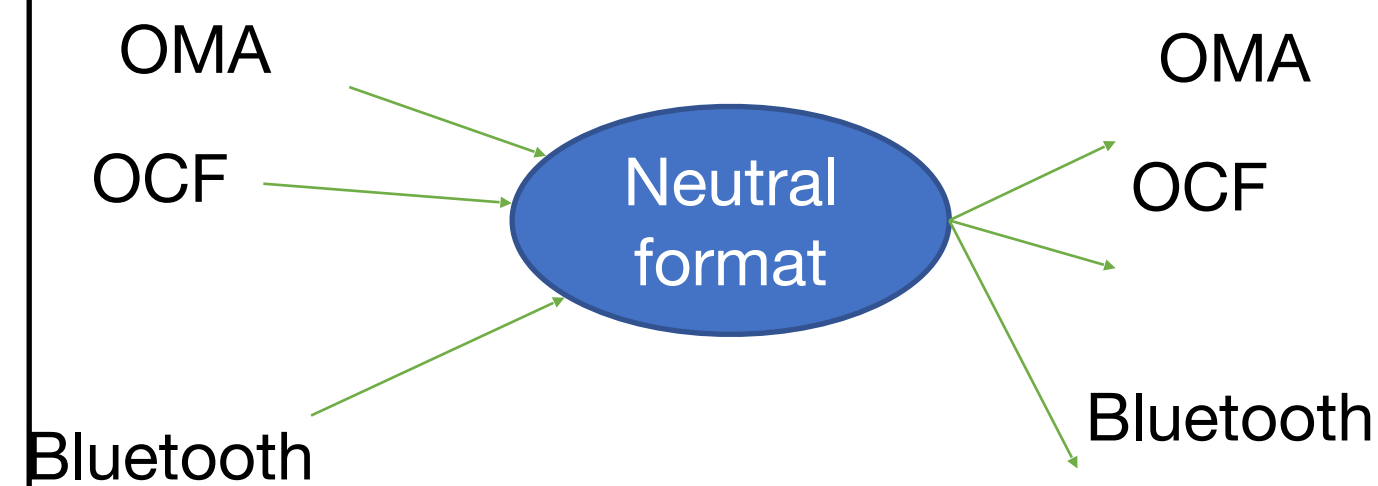


Lack of semantic interoperability across ecosystems → high integration cost

Potential Solutions

❑ Everyone join my (or your) ecosystem → *does not work*

✓ Facilitate translation between ecosystems via a neutral format



One Data Model

✓ Neutral format: Semantic Definition Format (SDF), now destined for IETF

✓ Create toolchains SDF ↔ ecosystems

✓ Create set of adopted device models for wider re-use

✓ <https://onedm.org/>

ASDF Outreach

- Value of ASDF increases with increased adoption of SDF by organisations doing IoT data models
- Outreach so far (beyond OneDM)
 - ASDF presented to DMSE (LwM2M) group in OMA SpecWorks
 - SDF proposed to ISO/IEC JTC1 SC41 for IoT Thing modeling
 - W3C Web of Things (initial discussion this meeting)
- **If your organisation works with IoT data models — talk to us!**

Towards SDF 1.1

Objective: Agree on 1.1 this year

- Use knowledge gained from using 1.1
- Create github issues
- Create PRs with needed changes
- Discuss and accept
- Do a “last-call” (almost, but not entirely unlike a WGLC) for SDF 1.1
- Publish next I-D version marked as “implementation draft”

#3, #4

- #3: reuse (and reference naming scheme)
 - SDF 1.0 seems to work here; tested; clarified naming convention
- #4: composite types
 - Decided to reuse type=object/required/properties from JSO^(*)
 - Also for input and output types of actions, events
- Issues closed by originator
- No further comments; does WG agree?

^(*) json-schema.org, a
“schema language” for JSON

#7

- #7: Clarify semantics of sdfRef with other qualities
- 1.0 does not say much; some examples use sdfRef + local overrides (e.g., to set labels and default values)
- TODO: accept usage in examples; add text to Section 4.4:
All qualities given in addition to sdfRef override qualities in referenced...
- Remaining sub-Issue: Removing qualities (e.g., by setting to null)?

#2, #5

- Data shapes often specify a selection of possible values
 - Solved for single values (), ranges ()
 - Less clear for more diverse selections
- JSO has two major constructs:
 - “enum” : [value1, value2, value2] (“validation keyword”) (note that values don’t need to be of the same “type”)
 - “anyOf”: [schema1, schema2, schema3] (“subschema keyword”)

Common usage of selections

- **“type”: “string”, “enum”: [“ant”, “bee”, “cat”, “dog”, “elk”]**
- **“type”: “number”, “enum”: [1, 2, 3]**
- Mixes of these (e.g., numbers + scalemin/scalemax/previous)
“anyOf”: [{“type”: “number”}, {“type”: “string”, “enum”: [“min”, “max”]}]
- Strings usually, numbers often really stand for semantic categories
No place to define that category

Data Model vs. Information Model

- SDF reuses syntax from a **data modeling** format (json-schema.org => JSON) to do **information modeling**
 - Convenient, as there are few information modeling languages around
 - Dangerous, as it moves the mindset of the specifier to protocol bindings
- SDF defines additional “qualities” (specification JSON object members) to capture some of the information modeling aspects
- Is this a place where SDF needs to act?

sdfChoice proposal (PR #8)

- Do not artificially distinguish between values and ranges/other types
- Use a single new keyword: “sdfChoice”, with named<dataqualities>
- Provide a named schema per alternative

```
"sdfChoice": {  
  "ant": { "description":  
    "eusocial insects of the family Formicidae";  
    "http://purl.org/ontology/wo/family": ... }  
  "bee": { "description": "Anthophila"},  
  "cat": { "description": "Felidae, including lions"}  
}
```

sdfChoice proposal (PR #8)

- Covers anyOf as well:
- Use a single new keyword: “sdfChoice”, with named<dataqualities>
- Provide a named schema per alternative

```
"type": "number",  
"sdfChoice": {  
  "minrange": { "const": 0, "description": ... },  
  "maxrange": { "const": 255, "description": ... },  
  "preset-value": { "minimum": 1, "maximum": 254 }  
}
```

sdfChoice summary

- Single “discriminated union” structure
- Replaces “enum” and “anyOf” from JSO
 - Full data shaping capability for each alternative
- Adds a discriminator for either
 - Can be used as the data value (simple enum case)
 - Can discriminate between overlapping subtypes

Other proposals

- Mirror one of the JSO structure, add missing parts around (via references)

```
"sdfData": {  
  "SwitchState": {  
    "enum": [  
      "on",  
      "off"  
    ],  
    "sdfAny": {  
      "on": {  
        "label": "On",  
        "description": "The powered or functionally active state",  
        "default": "true"  
      },  
      "off": {  
        "label": "Off",  
        "description": "The un-powered or functionally inactive state",  
        "default": "false"  
      }  
    }  
  }  
}
```

- No new information in “enum” section

The term “choice”

- Except for “variety”, all synonyms for “choice” both mean
 - (1) The set of alternatives from which one can be selected
 - (2) One such alternative
- range*, variety, selection, assortment, option*, alternative, choice
(* taken for something else)
- “choice” is the only monosyllabic word
(can use “alternative” or “selection” for (2) to balance that :-)

Discussion

- How important is mimicking JSO here?
 - Pro:
 - People who don't know SDF might recognize something and think they know what's going on
 - Con:
 - Lots of noise
 - More work for converter writers
 - Code needed for handling potential contradictions/conflicts

Next steps

- Write PR for #7
- Agree on solution(s) for #2, #5; write PR (or start from #8)
- Publish a -02 once these PRs are accepted and issues are closed
 - This week (W51)
- “Last-call” SDF 1.1 in WG
- Publish a -03 based on last-call results (W1)

W3C Web of Things (WoT)