Wishi: Describing IoT Standards

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IoT Standards Description

- Goal – describe key features of IoT standards (info and meta models) in a consistent manner
  - High-level description of purpose, scope, and approach
  - NOT the inner workings (spec rehash)
  - NOT a judgement – just state their choices explicitly
  - For better landscape understanding and comparisons, selections
- Wishi question: Should we do this?
  - Create a working document, wishi owns and maintains
  - Agree on the common description criteria
  - Optionally describe standards that we consider representative, list tbd
    - Incrementally, start with description of adopted criteria
  - Solicit participation of the SDOs of interest – contributions and feedback
    - But wishi retains editorial control (not a self-contributed wiki, but maybe an interim one)

Describing IoT Standards

- Specs should state (rather than having readers deduce)
  - Objective – what is it intended for? (start with charter)
    - E.g. M2M communications, smart home, AI enabling (aggregations)
  - Domain – if specific targeted, such as home appliances, industrial automation, buildings
    - Common claim - it (will) work for everything, but state the initially defined model set
  - Level of definition
    - Information Model, including interactions?, for specific IoT things, objects
    - Or meta-description for mapping specific (defined elsewhere) definitions
  - Ontology used?
    - None?
    - If used or planned, defines its own (describe), or uses an external one (which?)

Describing IoT Standards, cont2

- Specs should state, continued 2
  - Environmental assumptions
    - What is assumed for the spec to operate(required, specified or recommended)
      - Communication and transport protocols
      - Serialization format
      - Naming
      - Discovery
      - Security and authentication
      - Onboarding, …
    - Specifically, what is mandated (common framework), recommended
      - By implication, what is left out
    - Assumed or implied (code) binding time
      - E.g. design time – follow the same specification, works with the specified object types
      - or run-time - discover, probe, interact based on findings, some added flexibility
      - Mission creep – ability to work with previously unseen node types (and interactions?) based on discovery and their self-descriptions (complexity vs. usefulness?)

Describing IoT Standards, cont3

- Should state, continued 3
- Interoperability assumptions
  - we are it, “wdnnsi”
  - Working with other specifications, formal interop specification or affinity
    - Which?
    - How? - through pairwise translations (bridges) or meta-specification (which?)
    - Level of interoperability – e.g. data exchanges only (OK for aggregation), or data + interactions, run-time data and control, M2M between heterogeneous nodes
- Would be nice to know
  - Metadata handling – built in, fixed, extensible, separate overlay?
  - New object specifications – crowdsourcing or (workgroup) defs only
  - API specifications, if applicable
  - Licensing requirements and arrangements
  - Preferred languages and tools
  - Available reference implementations
    - E.g. machine-readable thing/object specifications
    - Framework implementation (for frameworks), supported platforms
  - Other defined, supported? features, such as cloud and platform interfaces

Terminology (Interoperability?)

- Using same words with different meaning
- Makes understanding and comparisons difficult

Generic	IPSO	OCF	Haystack	WoT (W3C)	OPC UA
Physical thing, modeled	object	resource	entity	thing (description)	object
Attribute, value	resource	property	tag	property	property

Discussion and Decision

- Reducing this to practice
  - wishi could decide to be an honest broker for such a document and description
  - Start with the common criteria
  - Description of terminology – inconsistent, need a “decoder ring”
  - Working document, updated as necessary
  - Working mode tbd, preferably in close interaction and with feedback on descriptions provided (sanctioned?) by the SDOs themselves
- Q & A
  - Do we want to do this?
    - Minimal version – criteria and terminology only
    - Fuller version – with standards descriptions, selection tbd
  - What is missing, superfluous in the strawman checklist?
  - Next steps, if applicable

Next Steps

- Iterate on the common criteria
- Start the document
  - Criteria and terminology description
  - Start with a few sample standards, e.g. IPSO, OCF, WoT
    - Rinse and repeat
      - Update the terminology table to cover entries
      - Iterate for consistency of descriptions
      - Add new standard descriptions
  - At some point (sufficient initial standards covered) “publish” rev 0.x
  - Keep going
  - Consider making it an IETF info document?

Users and Usage Modes

- Opt - define (or keep in mind?) typical users and usage modes
  - U1: researcher, practitioner – the lay of the land (what's out there)
  - U2: IoT system designer/architect
    - I know my requirements and domain, want to pick (the closest) specification of info/data model and standard with suitable architectural style and assumptions
    - IoT info model requirements may include
      - Future-proof across installations
      - Want to keep my data if my system is modified or ported to another platform
      - Work with other domains, legacy systems?
  - U3: system implementer (partly designer/architect too) – limited support
    - What my nodes need to support? (environmental assumptions)
    - What else do I need to provide (outside of specification?)
    - What happens at what stage?
      - Design time
      - Run-time
    - Any tools and languages to use, reference implementations?
  - U4: (technical?) executive