One Data Model
Network Function Blocks

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What is One Data Model?

• A liaison organization of SDOs, Device vendors, IoT Platform operators, and IoT experts

• Goal is to harmonize IoT semantic models across SDOs and vendors

• Initially – a common "language" for IoT semantic models, usable by application domain experts

• Eventually - convergence of semantic definitions for common IoT device types, standardization and broad adoption of the language
Status

- OMA LWM2M
  - Translation to/from OMA LWM2M (XML MOD) files
- OCF
  - Translation to/from OCF (Swagger 2.0) files
- BT SIG
  - Considering use for developer entry point, working on example definitions
- Driving toward IETF Standardization of SDF
- Common agreement to publish models under BSD license
- Playground repository with prototype CI and population of initial definitions
What is a semantic model – Practical IoT Semantics

• Abstract meta-model for IoT device affordances, behavior, and context
  • Decoupled from network bindings, protocol-agile
  • Common categories for affordances
  • Common categories for constraints
  • Common format for definitions

• Initial focus on affordances to normalize device-facing interactions across SDOs and vendors

• Behavioral and contextual models also are needed but not in the initial scope
ODM Meta-Model

• Thing Class to compose Objects
• Reusable Objects
  • Property, Action, and Event Affordances
• Reusable Data Types
SDF - Simple Definition Format

{
  "info": {
    "title": "Example file for ODM Simple JSON Definition Format",
    "version": "20190404",
    "copyright": "Copyright 2019 Example Corp. All rights reserved.",
    "license": "http://example.com/license"
  },
  "namespace": {
    "st": "http://example.com/capability/odm#"
  },
  "defaultNamespace": "st",
  "odmObject": {
    "Switch": {
      "odmProperty": {
        "value": {
          "type": "string",
          "enum": ["on", "off"]
        }
      },
      "odmAction": {
        "on": {},
        "off": {}
      }
    }
  }
}
IoT Device Model

Application Affordances

- Properties
- Actions
- Events

Thing

- Objects
Function Block Model

Input
Affordances

Properties
Actions
Events

Function
Objects

Output
Affordances

Properties
Actions
Events
Industrial Controls – IEC 61499 Function Block
Function Block Extensions to SDF

• Function Block class
• Input and output affordances
• Behavioral constructs
  • State Machines
  • Logic and Rules
  • Scenes and Settings
  • Algorithms – PID
  • Stateless – Lambda Functions
Protocol Binding

• Define content formats for affordance representations
• Define payload formats for network exchanges
• Define protocol mappings and option settings
• Define network addresses and URLs of instances
• W3C Thing Description, OpenAPI/Swagger
What next?

• Complete OneDM initial deliverables
• Standardize SDF
• Work on behavior and context extensions to SDF

https://github.com/one-data-model
https://github.com/one-data-model/language
https://github.com/one-data-model/playground