One Data Model Network Function Blocks

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COINRG Interim Meeting

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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

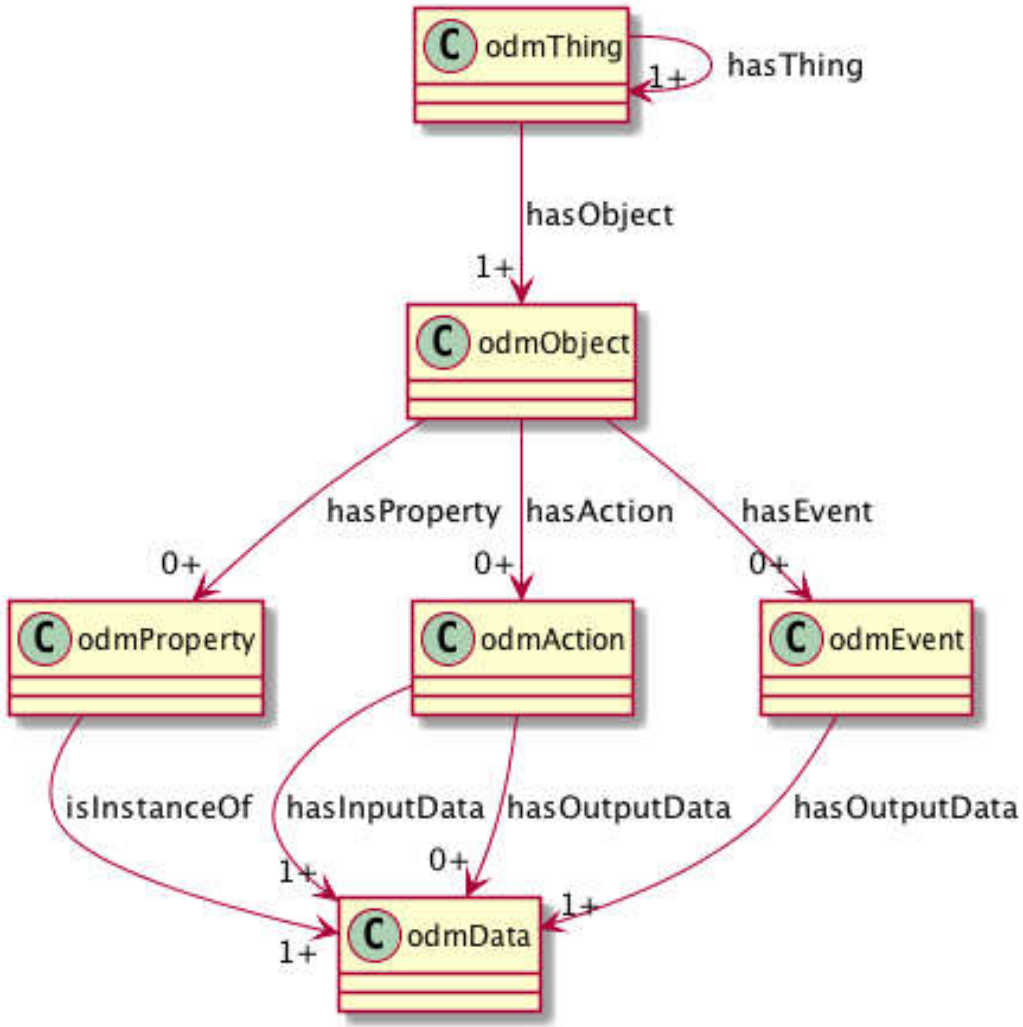
- OMA LWM2M
  - Translation to/from OMA LWM2M (XML MOD) files
- OCF
  - Translation to/from OCF (Swagger 2.0) files
- BT SIG
  - Considering use for developer entry point, working on example definitions
- Driving toward IETF Standardization of SDF
- Common agreement to publish models under BSD license
- 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

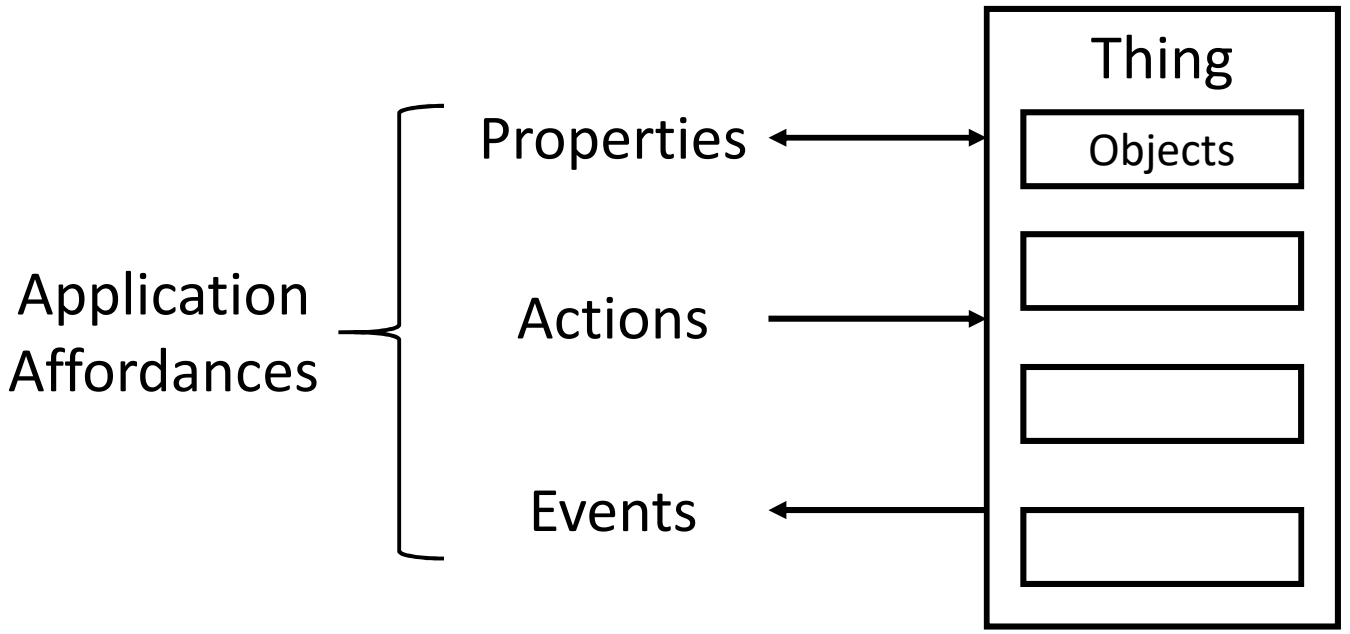
- Thing Class to compose Objects
- Reusable Objects
  - Property, Action, and Event Affordances
- Reusable Data Types



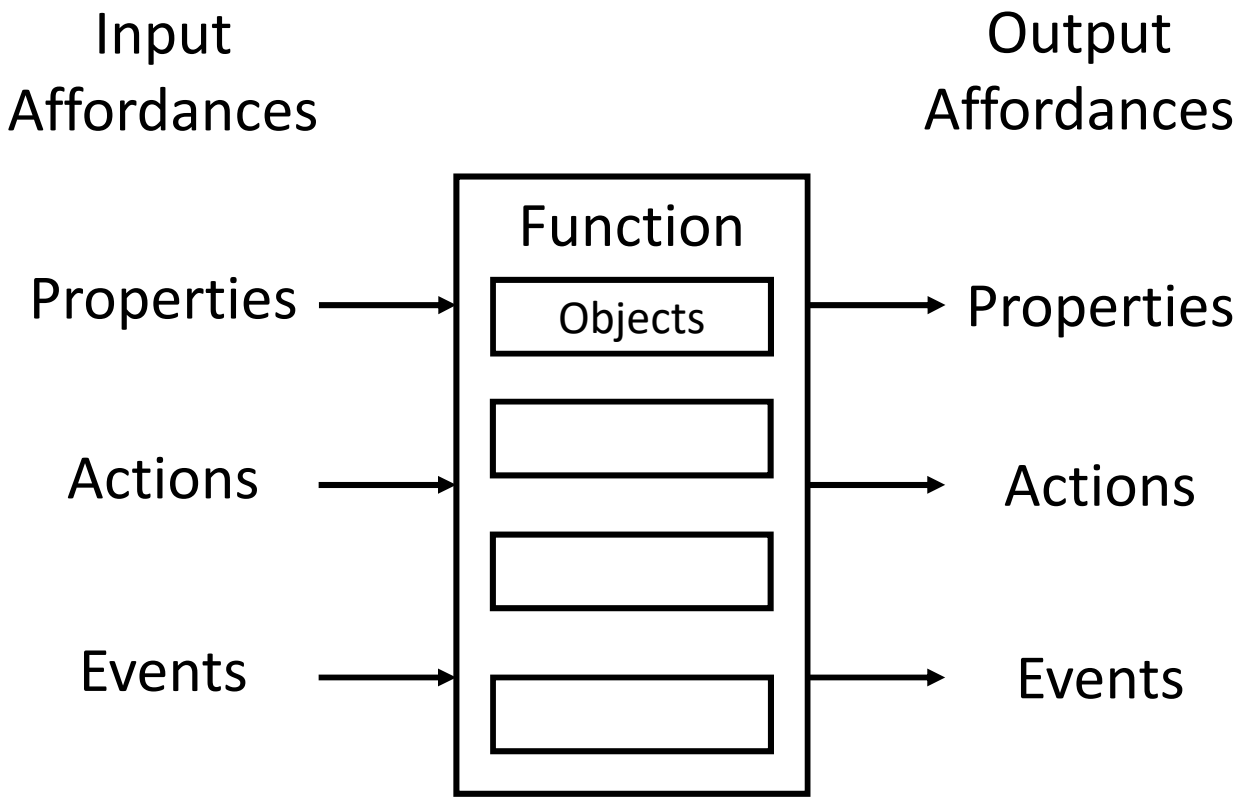
SDF - Simple Definition Format

```
{
  "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": {}
      }
    }
  }
}
```

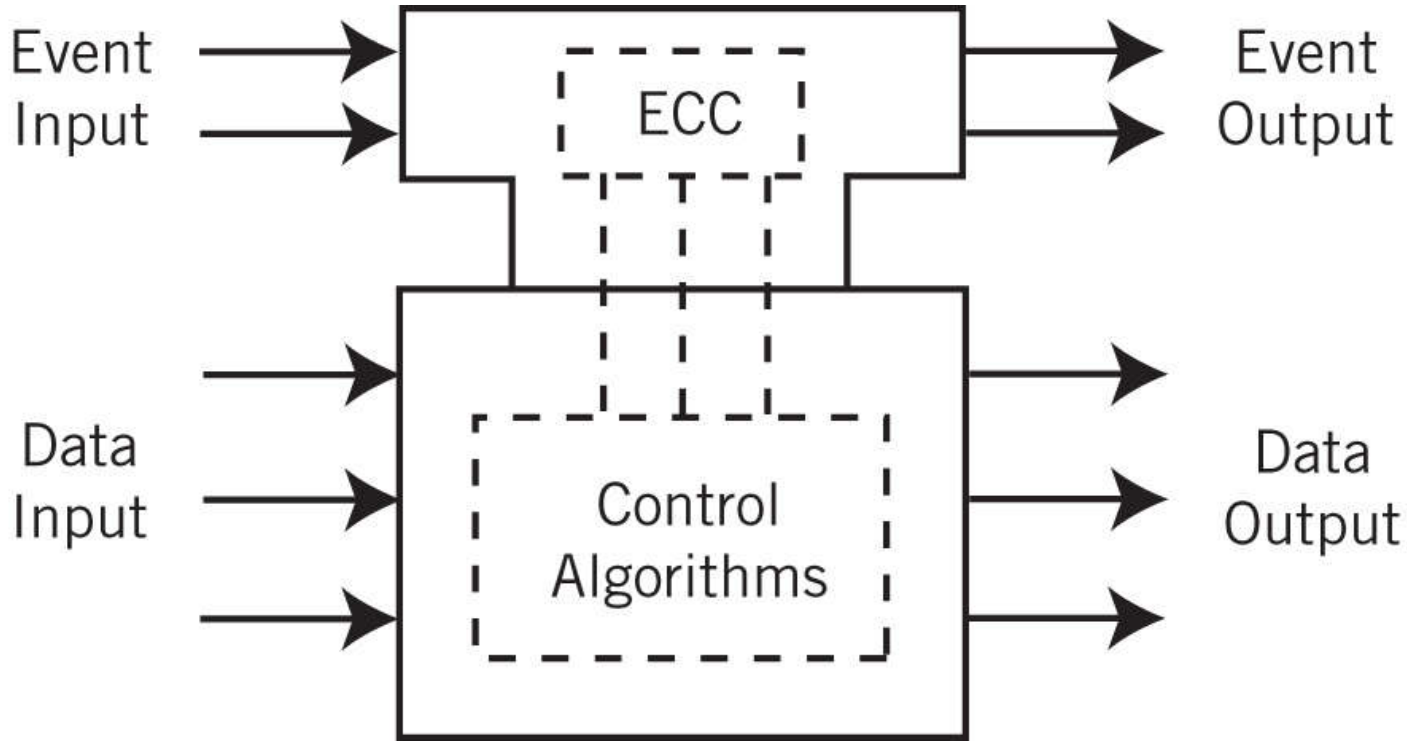
IoT Device Model



Function Block Model



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