iotschema.org

re-charter discussion

February 18, 2020

iotschema re-charter

- iotschema provides an RDF integration pattern for common application semantics, using categories that are well-aligned with WoT TD
  - schema.org will not benefit from integration of IoT affordances – rather, vertical domain vocabularies
- iotschema set out to attract product vendors to adopt a common format and entry point for iot information models
  - One Data Model liaison group has achieved this with respect to IoT device information models

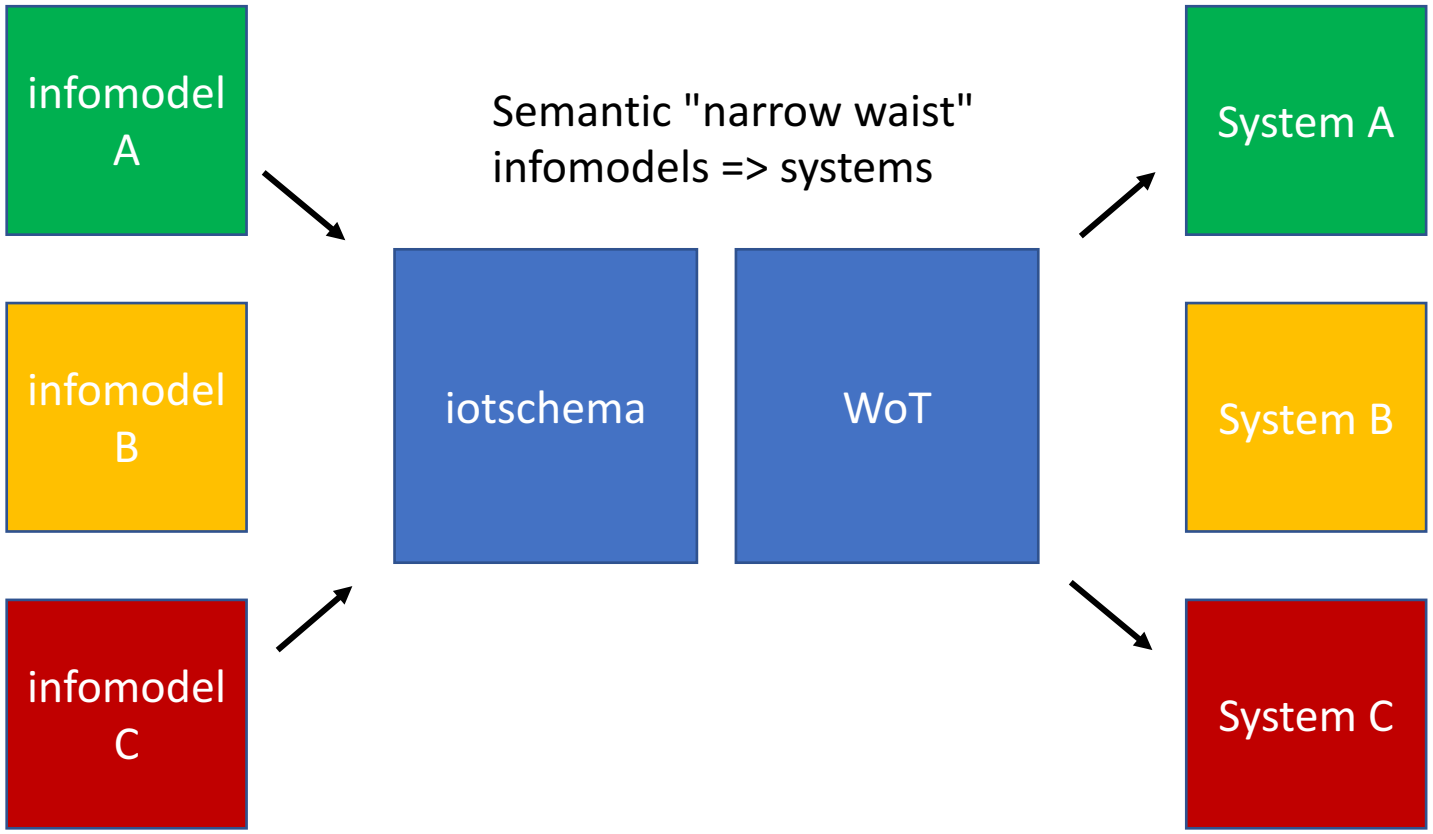
iotschema benefits

- Common information models provide more benefit to system integrators that need to work across vendors and verticals
- WoT use cases are more aligned with system integration
  - Where OneDM and SDF provide a common translation format for device data models, iotschema provides **common RDF integration patterns** for multiple ecosystems that can be used in WoT deployments
- iotschema can represent and integrate quantities and features of interest from diverse information model sources

iotschema + WoT benefits

- WoT is an integration language
- iotschema is the semantic database
- data models from different ecosystems can be mapped to common iotschema concepts and exposed using WoT TD
- System integrations e.g. digital twin, can adapt to diverse field devices using common semantic affordances defined in iotschema

Any model with any system



Next steps

- System integrators using WoT would benefit from common tools and formats
- Developer tools can layer on top of WoT to provide semantic APIs to help with discovery, and for mapping affordances and data
- Continue to deploy in WoT plugfests
- Develop use cases to illustrate the benefits of semantic integration
- Is there interest going forward; will people adopt it?
- Can we build a new consortium?

Open questions

- What are requirements across WoT use cases?
- What are priorities, models, tools, formats?
- Verticals are in different points in standardization
- What is the venue? Can we use the WoT CG to incubate this?
- Move toward a W3C activity, work with VSS Ontology, etc.

Technical backup

- Meta-information model survey across IoT
- iotschema ontology

Meta-model survey – Common Affordance Semantics

Information	OneDM SDF	WoT TD	iotschema	ZCL/dotdot	OCF	SmartThings	LWM2M	Weave	Vorto	UPnP	BLE Mesh	Azure DTDL	oneM2M	OPC UA
Governing body	OneDM Liaison	W3C	W3C/schema.org	Zigbee Alliance	OCF	SmartThings	OMA SpecWorks	Google/Nest	Eclipse	OCF	BT Sig	Microsoft	oneM2M	OPC
Tools License	BSD	Many		Proprietary	BSD	Proprietary		Apache2	Eclipse			MIT	Apache2.0	
Models License	BSD	No Models		BSD	BSD	Proprietary	OMA	Apache2				CC Attr. 4.0		
representation language	JSON	LSON-LD	JSON-LD	XML	JSON	JSON	XML	WDL	vortolang	XML	XML	JSON-LD	XML	XML
Content Format	sdf+json	td+jsonld	jsonld	zcl+xml	swagger+ json	json	mod+xml	text	text	upnp+xml	xml	jsonld	sdt+xml	
Reference	https://github.com/one-data-model/language	https://www.w3.org/TR/wot-thing-description/	https://github.com/iot-schema-collab/iotschema	https://zigbeealliance.org/wp-content/uploads/zip/dotdot-ip-package.zip	https://openconnectivity.org/developer/specifications/	https://docs.smartthings.com/en/latest/capabilities-reference.html	http://www.openmobilealliance.org/wp/omna/lwm2m/lwm2mregistry.html	https://openweave.io/guides/weave-primer/schema	https://github.com/eclipse/vorto/tree/development/docs	https://openconnectivity.org/developer/specifications/upnp-resources/upnp/	https://www.bluetooth.com/specifications/mesh-specifications/	https://github.com/Azure/IoTPlugandPlay/tree/master/DTDL	http://www.onem2m.org/tr-0039/ipe-and-sdt	https://opcfoundation.org/developer-tools/specifications-unified-architecture

Terminology	OneDM SDF	WoT TD	iotschema	ZCL/dotdot	OCF	SmartThings	LWM2M	Weave	Vorto	UPnP	BLE Mesh	Azure DTDL	oneM2M	OPC UA
Composed Instance	Thing/Thing	Thing	Thing/Thing	Device/EP	Platform/Device	Fingerprint	Registration	Device	Info Model	Device	Device	Capability Model	Device	Device, Server
Atomic Functionality Unit	Object	(Thing)	Capability	Cluster	Resource	Capability	Object	Trait	Function Block	Service	Model	Interface	ModuleClass	Object
Externalized state item	Property	Property	Property	Attribute	Property	Attribute	Resource	Property	Config, Status	State Variable	Attribute	Property	Data Point	Attribute, Variable
External method accepted	Action	Action	Action	Command	POST	Command	Executable Res.	Command	Operation	Action	Write	Command	Action	Method, Program
External signal emitted	Event	Event	Event	Report	Observe data	Device Event	Observe data	Event	Event	Event	Report	Telemetry	Event	Event, Alarm
Reusable data type	Datatype	Datatype	Datatype	Datatype	OAS definition	Datatype	Reusable Res.	Datatype	Datatype	Datatype	Datatype	schema	xsd types	register types

Network Binding	OneDM SDF	WoT TD	iotschema	ZCL/dotdot	OCF	SmartThings	LWM2M	Weave	Vorto	UPnP	BLE Mesh	Azure DTDL	oneM2M	OPC UA
Data Schema	JsonSchema	JsonSchema	External	XML	OAS 2.0	Mapping Files	SenML	WDL	External	XML	XML	DTDL	XSD	
Protocol Binding	External	TD Forms	External	ZCL Commands	OAS 2.0	Device Handlers	CoAP	WDM	External	UPnP defined	BLE GATT	External	External	
Protocols		MQTT,HTTP, CoAP		Zigbee Pro, CoAP	CoAP	Many	CoAP	WDM		HTTP	BLE			

iotschema UML with iotThing class