

Interworking between Web of Things and t2trg/CoRE

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Working Items in new WoT-WG charter and t2trg/CoRE activity

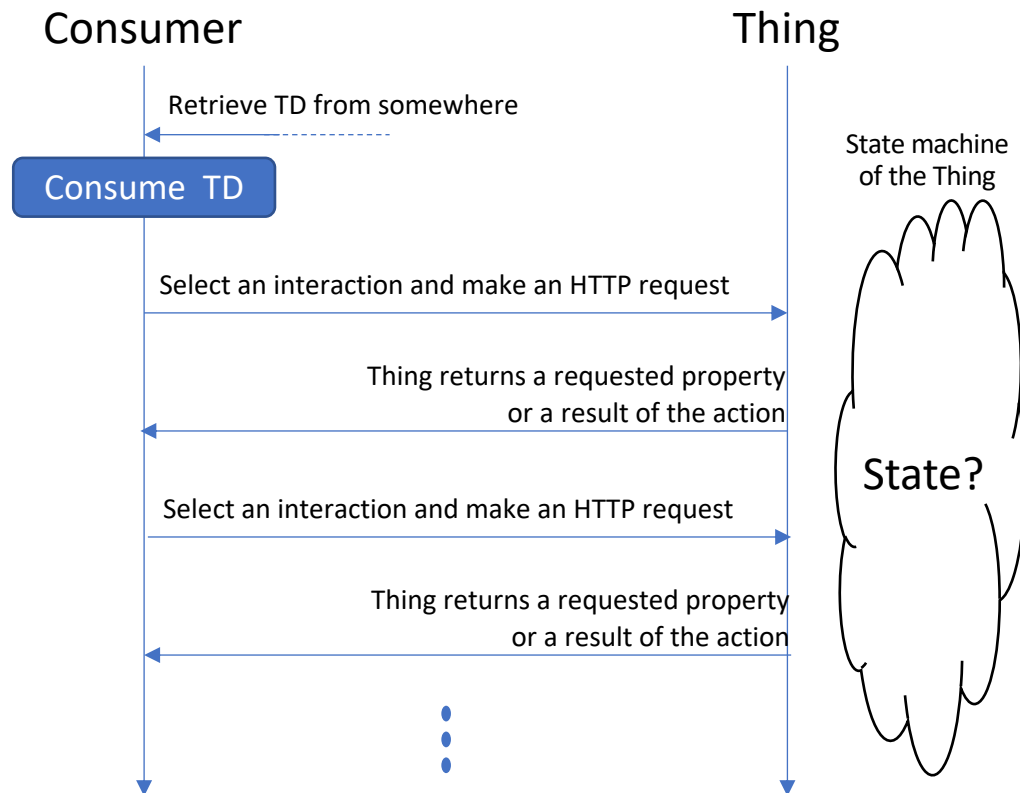
For new WG charter work items, WG starts collecting use cases and extracting requirements. The workshop/hackathon is a good opportunity to investigate how to interwork with t2trg/CoRE, as a case study for the work items.

Current Charter Draft:

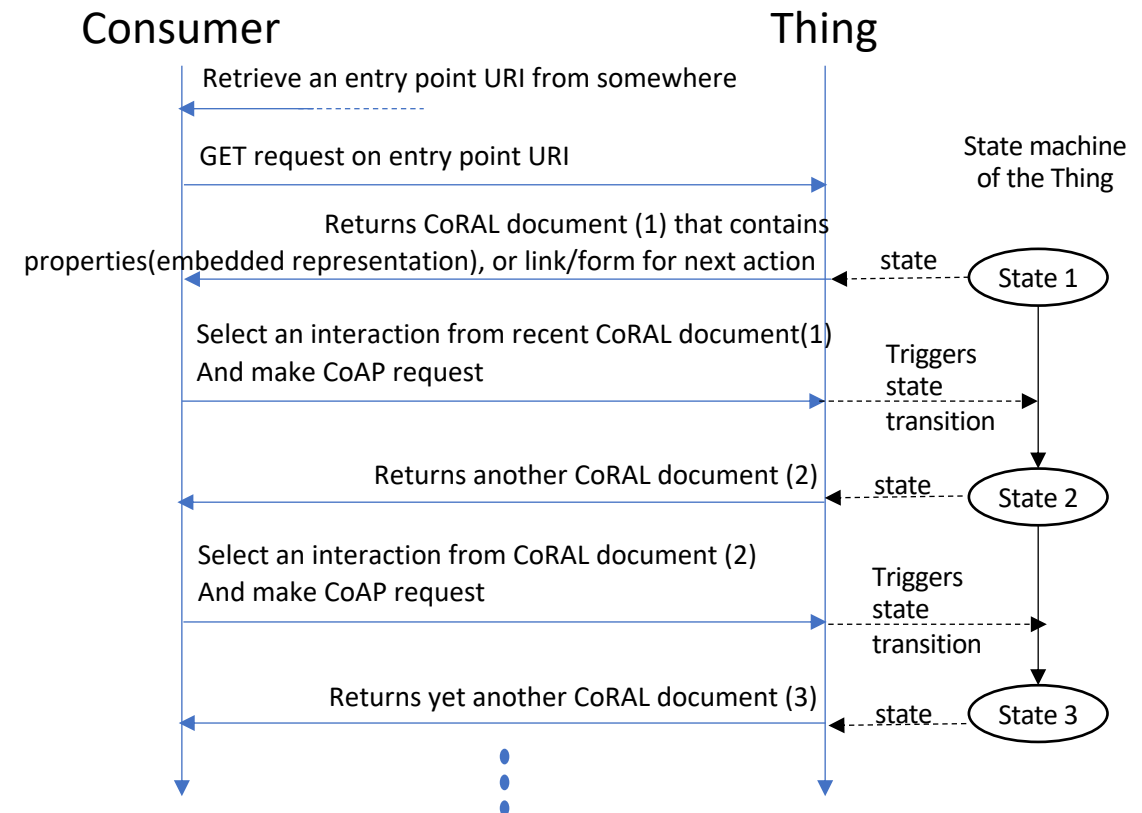
- <http://w3c.github.io/wot/charters/wot-wg-charter-draft-2019.html>
- 2.5 Complex Interactions
 - How to describe a CoRAL-based device?
- 2.6 Discovery, 2.8 Onboarding
 - We can use a CoRE-RD framework for one of discovery mechanism to retrieve WoT Thing Description and Thing.
- 2.10 Security Schemes
 - Use of OSCORE, ACE etc.
- 2.12 Protocol Vocabulary and Bindings, 2.13 Observe Defaults
 - Use of CoAP Observe

Complex Interactions (1/2): Differences

- (Current) WoT Thing Description contains all interactions that a thing provides, regardless of current state of the Thing.



- CoRE/CoRAL takes pure HATEOAS approach, i.e. an CoRAL document may contain interactions that are meaningful in current state.



Complex Interactions (2/2): Possible approach

- How to interact pure RESTful-style thing from WoT consumer?
 1. Static TD: Introduce a concept of “State Machine” to Thing Description
 - TD describes all possible interactions of the Things.
 - Designate feasible interactions of each state using state machine.
 - Interaction with a Thing triggers a state transition in Consumer’s state machine.
 2. Dynamic TD: Consumer updates its internal Thing Description dynamically, based on a response from the Thing
 - Based on recent Thing Description, an application select a feasible interaction.

Discovery

- CoRE proposes several discovery and directory mechanisms.
 - Discover Things by CoAP multicast on well-known URI (`/.well-known/core`)
 - Discovery of Resource Directory is similar approach (i.e. use `/.well-known/core/?rt=core.rd*`)
 - Moreover, IPv6 Authoritative Border Router Option, DHCP, DNS-SRV can be used for discovery of Things and RDs
- Can we use these mechanism to retrieve Thing Description?
- (This work does not intend to propose that this is THE discovery mechanism of Web of Things. Just a case study.)

Ideas for IETF Hackathon

- Implementing WoT TD discovery based on CoRE-RD.
 - Discover Resource Directory based on multicast
 - `coap://("all CoRE resource directories" address)/.well-known/core?rt=core.rd*`
 - Register TD to CoRE-RD
 - POST `coap://rd.example.com/rd?ep=(Thing-ID)`
 - Content-Format: `application/td+json` (Content-format ID is t.b.d., in the 256-9999 range)
 - Retrieve TD from CoRE-RD
 - GET `coap://rd.example.com/rd-lookup?rt=MyLampThing`
 - Accept: `application/td+json`
 - Using retrieved TD, interact with the Thing (e.g. generate Node-RED node, etc.)
 - Interaction protocol: HTTP(S), CoAP(S)