

Discovery: Updates in Introduction Mechanisms

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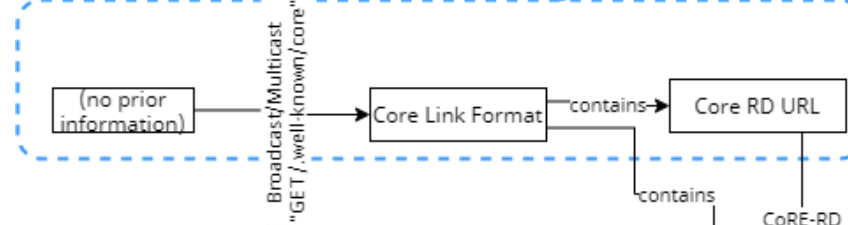
Overview

- Introduction Mechanism:
 - The way to find an URL which points to TD of Thing or Thing Description Directory.
 - Currently, five mechanism are described in draft specification.

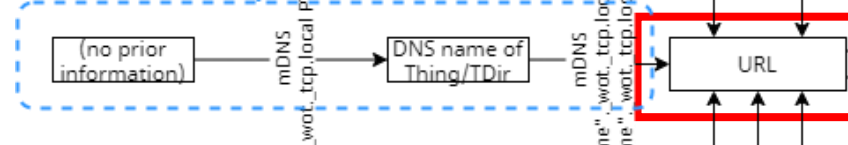
Introduction

Exploration

5.4 CoRE Resource Directory



5.3 DNS-SD / mDNS



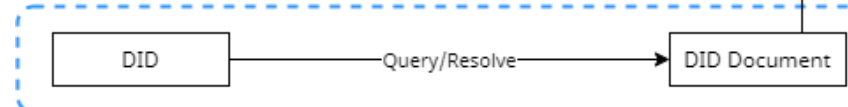
5.1 Direct



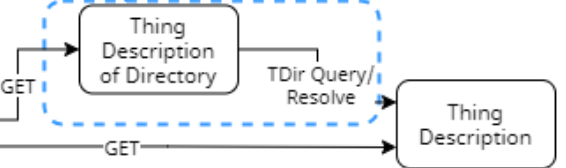
5.2 Well-Known URIs



5.5 Decentralized Identifier



6. Exploration Mechanisms



Updates since last vF2F

- No significant changes.
 - Correct type usage in CoRE Link:
 - Endpoint type(et) -> Resource type(rt)
 - See: Issue [w3c/wot-discovery#120](https://www.w3.org/2015/07/wot-discovery/#issue120)
 - Editorial changes:
 - added “8. IANA Considerations” chapter

Call for Implementations

- Direct
 - (if there is a written TD URL and it can be fetched, can we say, “this mechanism is implemented.”?)
- Well-known URIs
 - Hitachi’s myRasPiLED
 - <https://github.com/w3c/wot-testing/blob/main/events/2021.03.Online/TDs/Hitachi/README.md>
- DNS-based Service Discovery
 - Hitachi’s myRasPiLED
 - <https://github.com/w3c/wot-testing/blob/main/events/2021.03.Online/TDs/Hitachi/README.md>
 - Fraunhofer LinkSmart
 - <https://github.com/w3c/wot-testing/blob/main/events/2020.06.Online/prototypes/linksmart.md>
 - Node-RED nodegen autopopulation server (mDNS version)
 - <https://github.com/w3c/wot-testing/tree/main/events/2020.09.Online/prototypes/Hitachi>
- CoRE Link Format and CoRE-RD
 - Phillip Blum’s fork of RIOT-OS?
 - <https://github.com/Citrullin/RIOT/commit/4c9901f>
- DID Documents
 - None.

Appendix

Direct

- Any mechanism that result in a single URL.
 - Bluetooth beacons, Matrix barcodes, and written URL.
- A GET on all such URLs MUST result in a TD.



QR code that contains an URL

`'http://ktom5stack.local/.well-known/wot-thing-description'`

Well-known URI

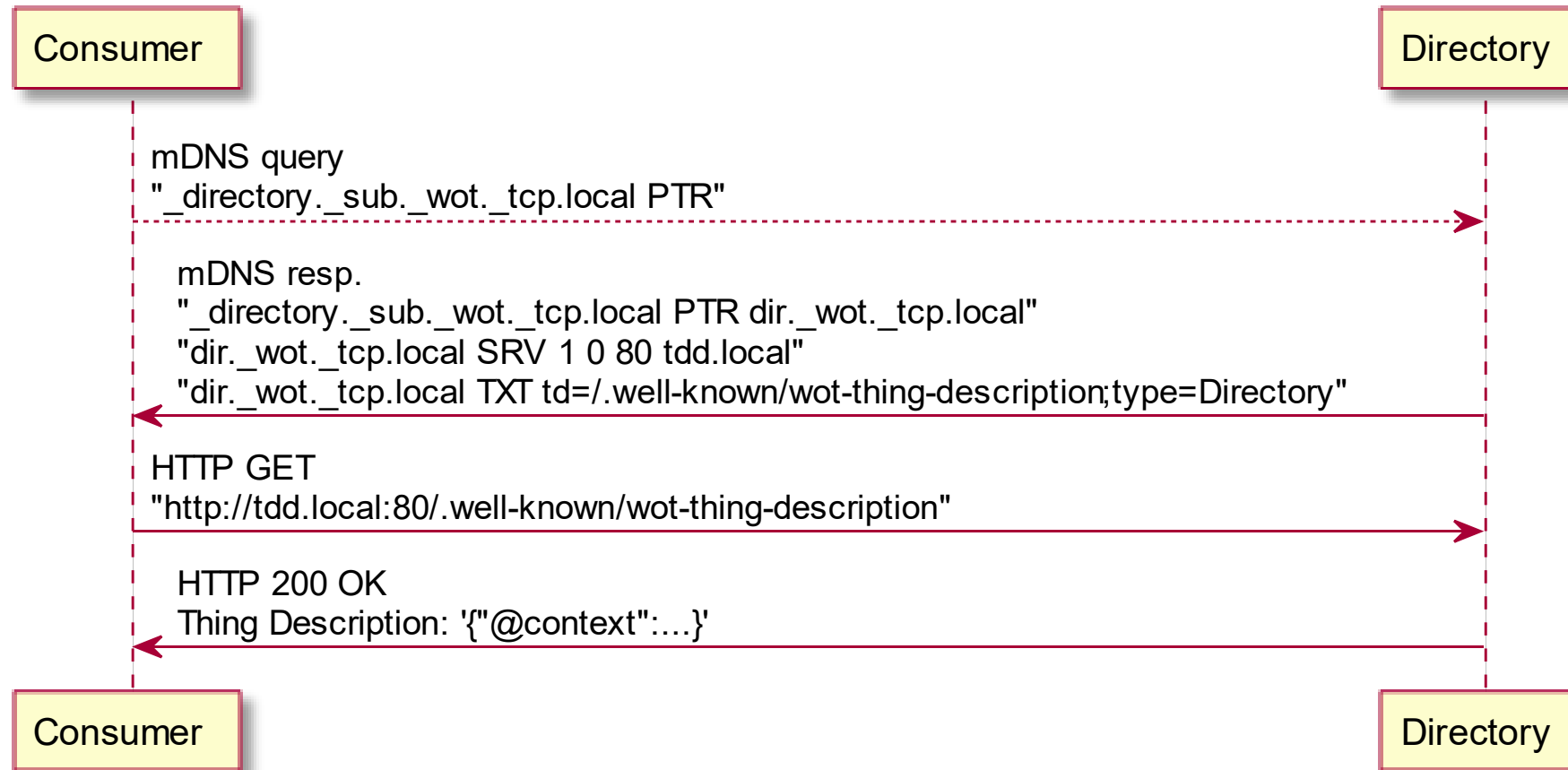
- RFC8615: Well-Known Uniform Resource Identifiers (URIs)
- Thing or Directory Service can host their Thing Description as a site-wide metadata
- “wot-thing-description” (tentative) for URL suffix
 - Example 1: a Consumer heuristically get a FQDN of some site: tdd.example.com, then issue HTTP request
`GET https://tdd.example.com/.well-known/wot-thing-description`
to try to retrieve a Thing Description
 - Example 2: Broadcast/multicasting CoAP request
`GET /.well-known/wot-thing-description`

DNS-based service discovery (1/2)

- DNS-based Service Discovery (RFC6763)
- Multicast DNS (RFC6762)
- Use (multicast) DNS query to discover Things or Directory Services
- DNS-SD Service Instance Name:
 - *<Instance>.<Service>.<Domain>*
- *<Service>* MUST be:
 - Thing: *_wot._tcp* (HTTP or HTTPS) or *_wot._udp* (CoAP)
 - Directory Service: *_directory._sub._wot._tcp* or *_directory._sub._wot._udp*
- When Consumer resolves above domain name, it receives following TXT records:
 - **td**: Absolute pathname of the Thing Description of the Things or Directory Service
 - **type**: Type of the Things Description, i.e. **Thing** or **Directory**.

DNS-based service discovery (2/2)

- Example sequence of Directory Discovery by mDNS



CoRE Resource Directory (CoRE-RD)

- draft-ietf-core-resource-directory-25
- We can use CoRE-RD as an introduction mechanism of Thing or Directory Service.
- Link for a Thing Description is stored as a CoRE Link (RFC6690).
- ~~Endpoint type(et)~~ Resource type(rt):
 - TD for Thing: **wot.thing**
 - TD for Directory Service: **wot.directory**

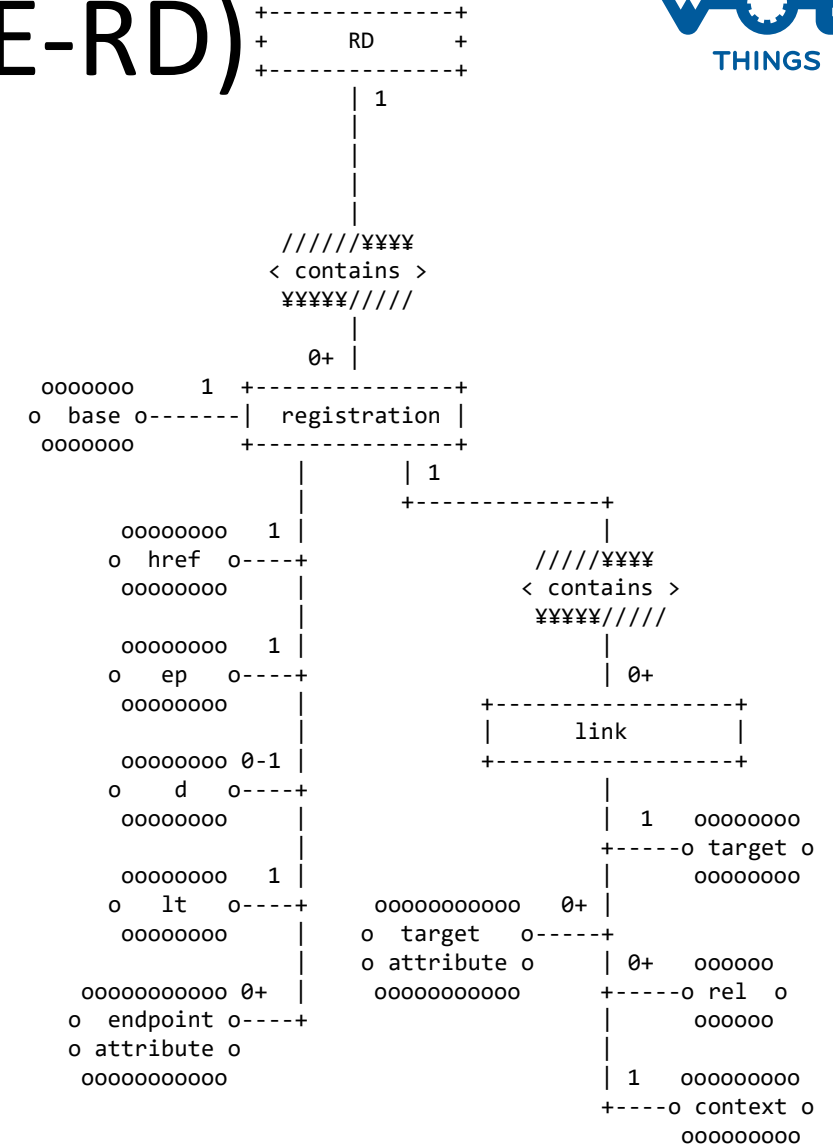
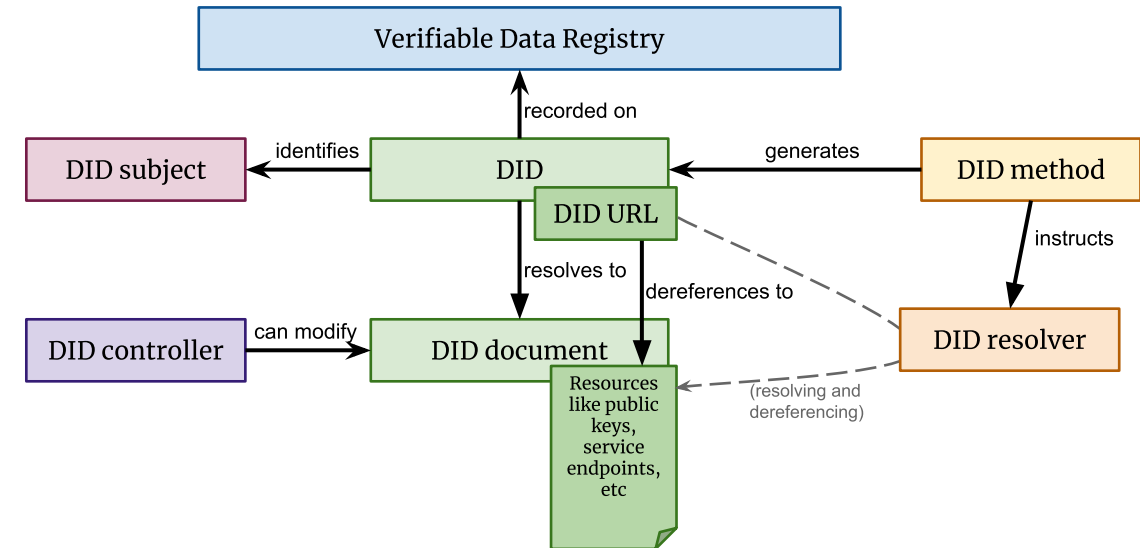


Figure 3: ER Model of the content of the RD

Decentralized Identifier (DID)

- DID can be used for pointing a Thing Description of Thing or Thing Directory.
- DID is resolved to DID documents, by DID resolver.
- DID document can contain a Service Endpoint which point to Thing or Thing Directory



```
{ ...
  "service": [{
    "id": "did:example:wotdiscoveryexample#td",
    "type": "WotThingDescription",
    "serviceEndpoint": "https://wot.example.com/td"
  }]
}
```

Example Service Endpoint description in DID document