# W3C Web of Things Summary and Status Update

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W3C Web of Things (WoT)

- W3C Working Group goal: Adapting web technologies to IoT
- Already published: Thing Description (TD) metadata format
  - TD describes the available interactions (network API) of a Thing
- New deliverables in progress, including Discovery
  - How does a potential user obtain the TD for a Thing?
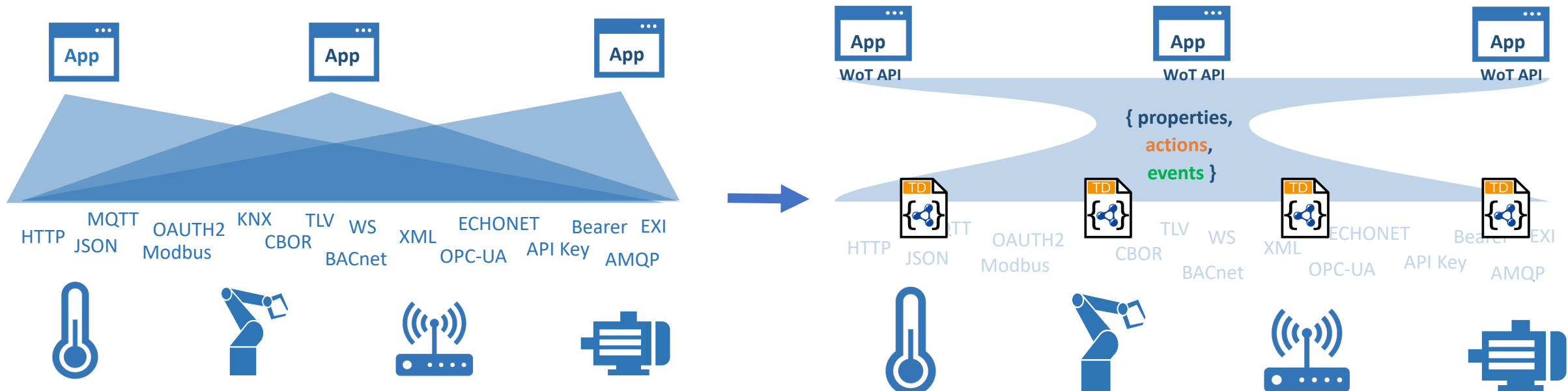
Descriptive Interoperability: TDs

WoT Architecture

- Constraints
  - "Things" must have a TD
  - Must use URIs, IANA media types, etc.
- Thing Description Affordances
  - Describes WHAT the possible choices are
  - Describes HOW to interact with the Thing

Handle = Affordance

What?   How?

Pull

Turn

Open

Door = Thing
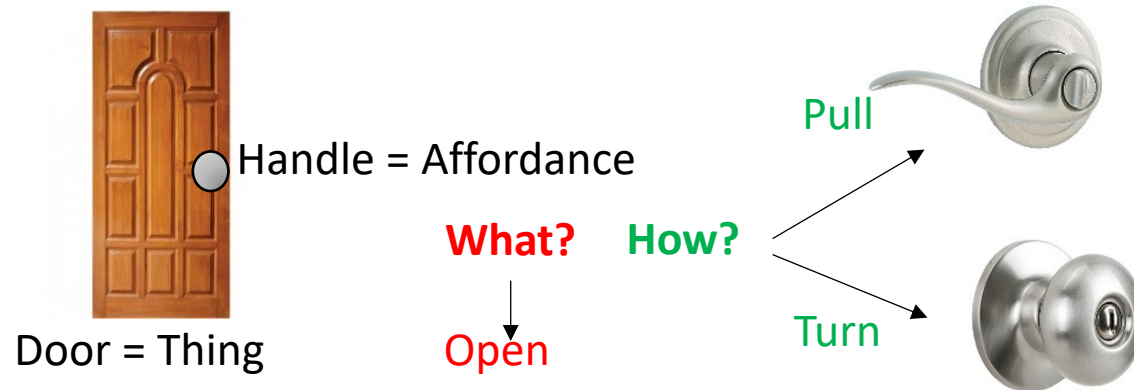
WoT Thing Description (TD)

```
{
  "@context": [
    "https://www.w3.org/2022/wot/td/v1.1",
    { "iot": "http://iotschema.org/" }
  ],
  "id": "urn:dev:org:32473:1234567890",
  "title": "MyLEDThing",
  "description": "RGB LED torchiere",
  "@type": ["Thing", "iot:Light"],
  "securityDefinitions": {
    "default": {"scheme": "bearer"}
  },
  "security": ["default"],
  "properties": {
    "brightness": {
      "@type": ["iot:Brightness"],
      "type": "integer",
      "minimum": 0,
      "maximum": 100,
      "forms": [ ... ]
    }
  },
  "actions": {
    "fadeIn": {
      ...
```
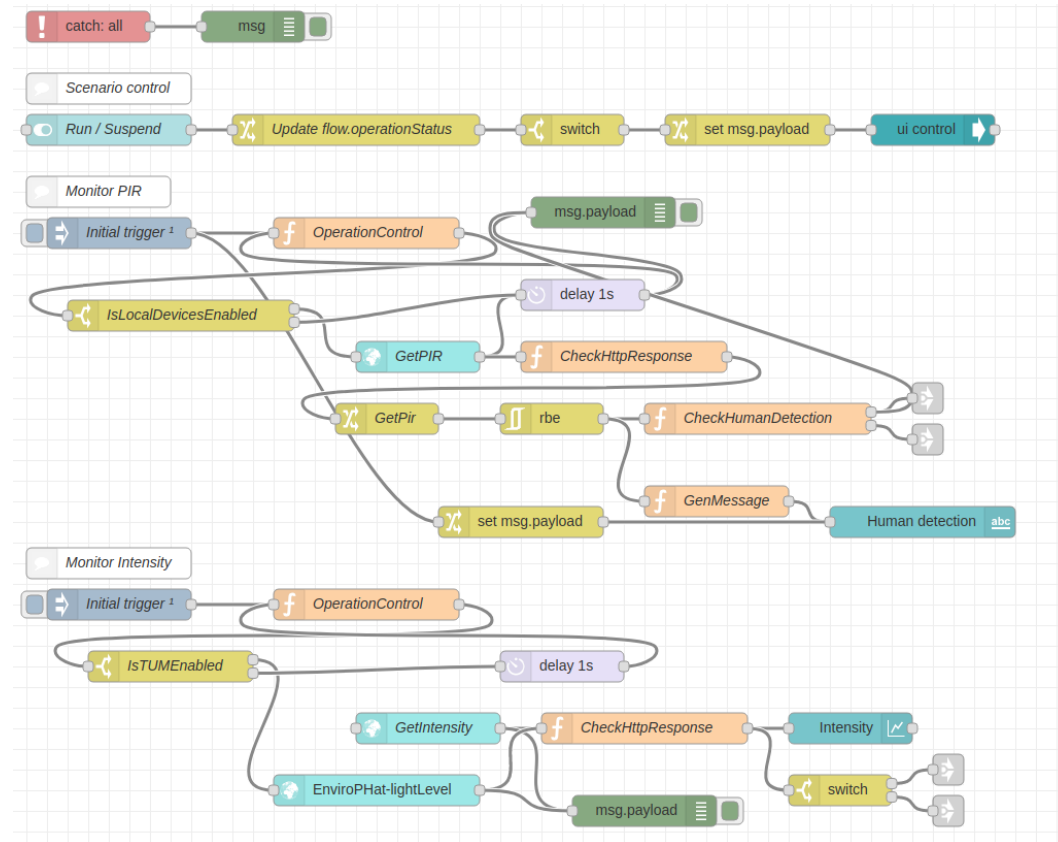
Discovery

Goal: Obtain TD of interest

- Not limited to local network
- Scalable to many TDs
- Need to preserve privacy
- Phased access:
    1. Introduction: open
    2. Exploration: controlled
- Searchable via JSON Path, XPath, or SPARQL

- Future work:
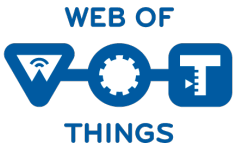   - Find "nearby" Things using geospatial data

W3C Web of Things (WoT) WG/IG
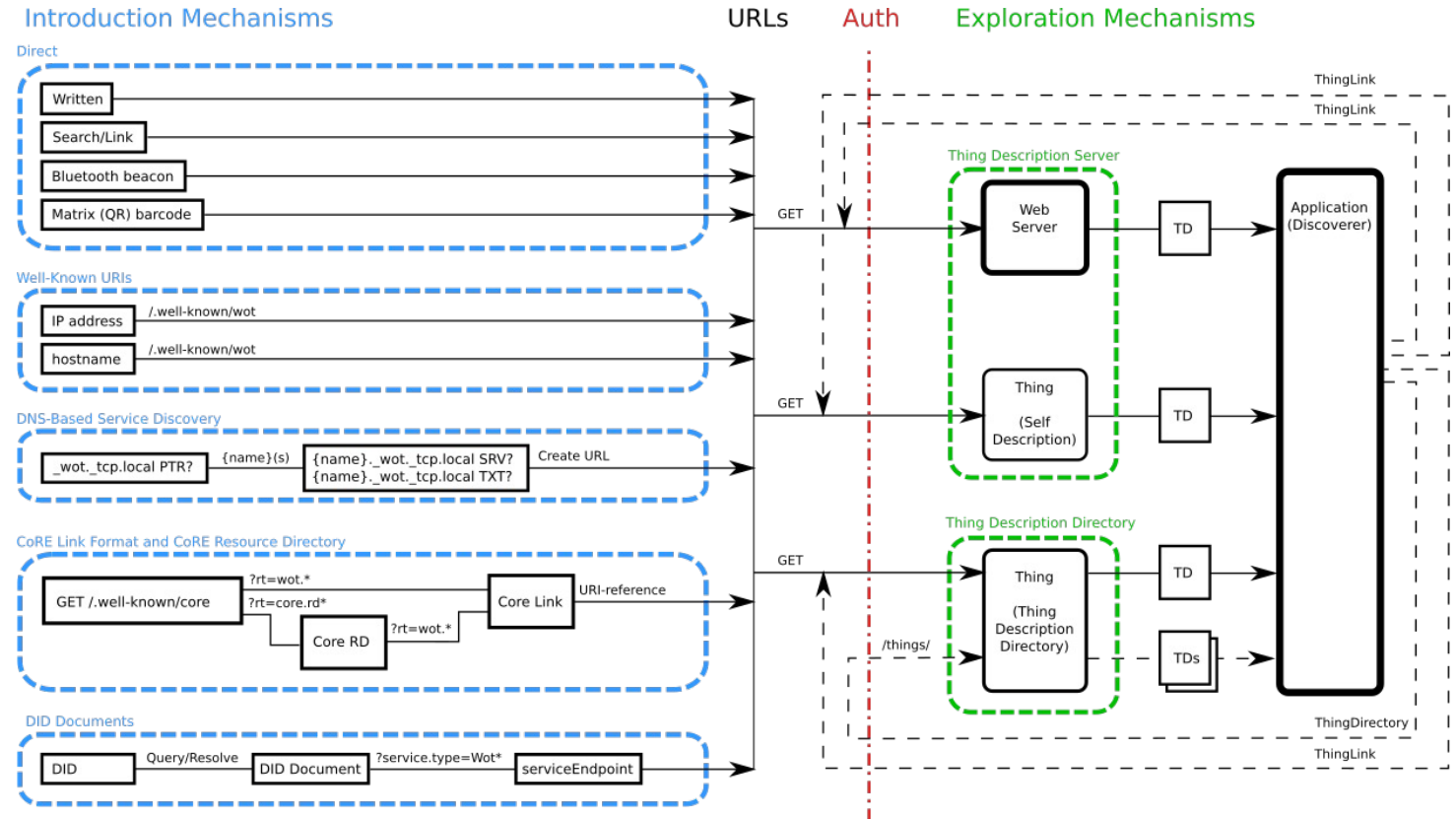
Orchestration

node-wot/Scripting API

Node-RED/node-gen

THINGWEB

```javascript
WoTHelpers.fetch( "coap://localhost:5683/counter" ).then( async (td) => {
  // using await for serial execution (note 'async' in then() of fetch())
  try {
    const thing = await WoT.consume(td);
    console.info( "=== TD ===" );
    console.info(td);
    console.info( "==========" );

    // read property #1
    const read1 = await thing.readProperty( "count" );
    console.info( "count value is" , await read1.value());

    // increment property #1 (without step)
    await thing.invokeAction( "increment" );
    const inc1 = await thing.readProperty( "count" );
    console.info( "count value after increment #1 is" , await inc1.value());

    // increment property #2 (with step)
    await thing.invokeAction( "increment" , {'step' : 3});
    const inc2 = await thing.readProperty( "count" );
    console.info( "count value after increment #2 (w/ step 3) is" , await inc2.value());

    // decrement property
    await thing.invokeAction( "decrement", undefined, {
      formIndex: getFormIndexForDecrementWithCoAP(thing);
    } );
    const dec1 = await thing.readProperty( "count" );
    console.info( "count value after decrement is" , await dec1.value());

  } catch(err) {
    console.error( "Script error:", err);
  }

}).catch( (err) => { console.error( "Fetch error:", err); });
```

Deliverables

New/Updated Normative Documents:

- Architecture 1.1: https://github.com/w3c/wot-architecture

- Thing Description 1.1: https://github.com/w3c/wot-thing-description

- Discovery: https://github.com/w3c/wot-discovery

- Profiles: https://github.com/w3c/wot-profile

New/Updated Informative Documents:

- Binding Templates: https://github.com/w3c/wot-binding-templates

- Scripting API: https://github.com/w3c/wot-scripting-api

- Use Cases and Requirements: https://github.com/w3c/wot-usecases

Community Resources:

- Web Site: https://www.w3.org/WoT/

Recent Activity

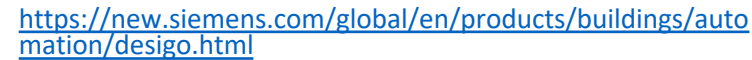- Plugfest/Testfest: Aug 29-Sept 2
  - https://github.com/w3c/wot-testing/tree/main/events

- New Commercial Usages
  - Takenaka Construction – Smart Building Information Management systems
  - Netzo – IoT dashboards and device management

- Directory Implementations
  - WoT Hive, LogiLab (SPARQL based), Fraunhofer LinkSmart, TinyIoT

- IETF Relationships: JSON Path, CoreRD, COSE/JOSE, ASDF

- Under Discussion:
  - New Charters/New Deliverables/Updates to existing specifications
  - Geolocation, Onboarding, Historical data: proposals/deliverable-proposals

Applications

Takenaka Corporation

- CGLL Platform - BIM

Siemens

- Desigo CC – BIM

- Say WoT!

Bosch

- Eclipse Ditto - Digital twin

Netzo

- IoT Data Hub

- Dashboards

Resources and Contacts

https://www.w3.org/WoT

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