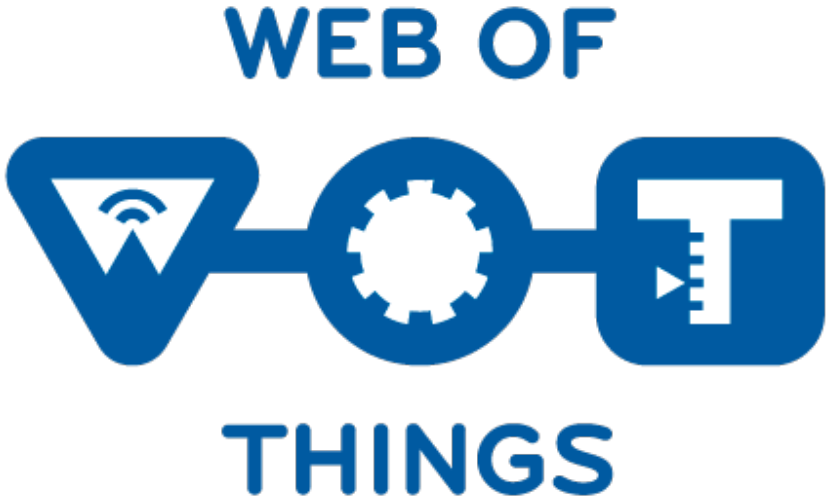

Node-RED – WoT-Discovery Integration and Thing Orchestration

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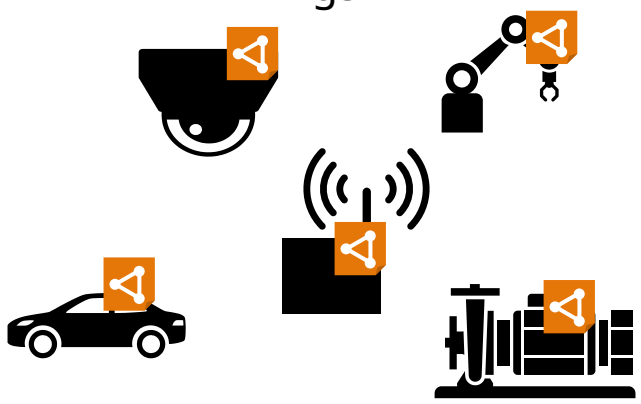
2021.10.1

Node-RED – WoT Discovery Integration

We updated a query interface on Node-RED WoT-Discovery plugin so that it can query TDD using SPARQL.

```
PREFIX td: <https://www.w3.org/2019/wot/td#>
PREFIX dc: <http://purl.org/dc/terms/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
SELECT DISTINCT ?id ?title ?desc
WHERE {
    ?id rdf:type td:Thing;
        dc:title ?title;
        dc:description ?desc.
    FILTER(contains(?desc, "${req.body.query}")).
}
LIMIT 100
```

Things



Sync script
Collects
TDs

Thing
Description
Directory

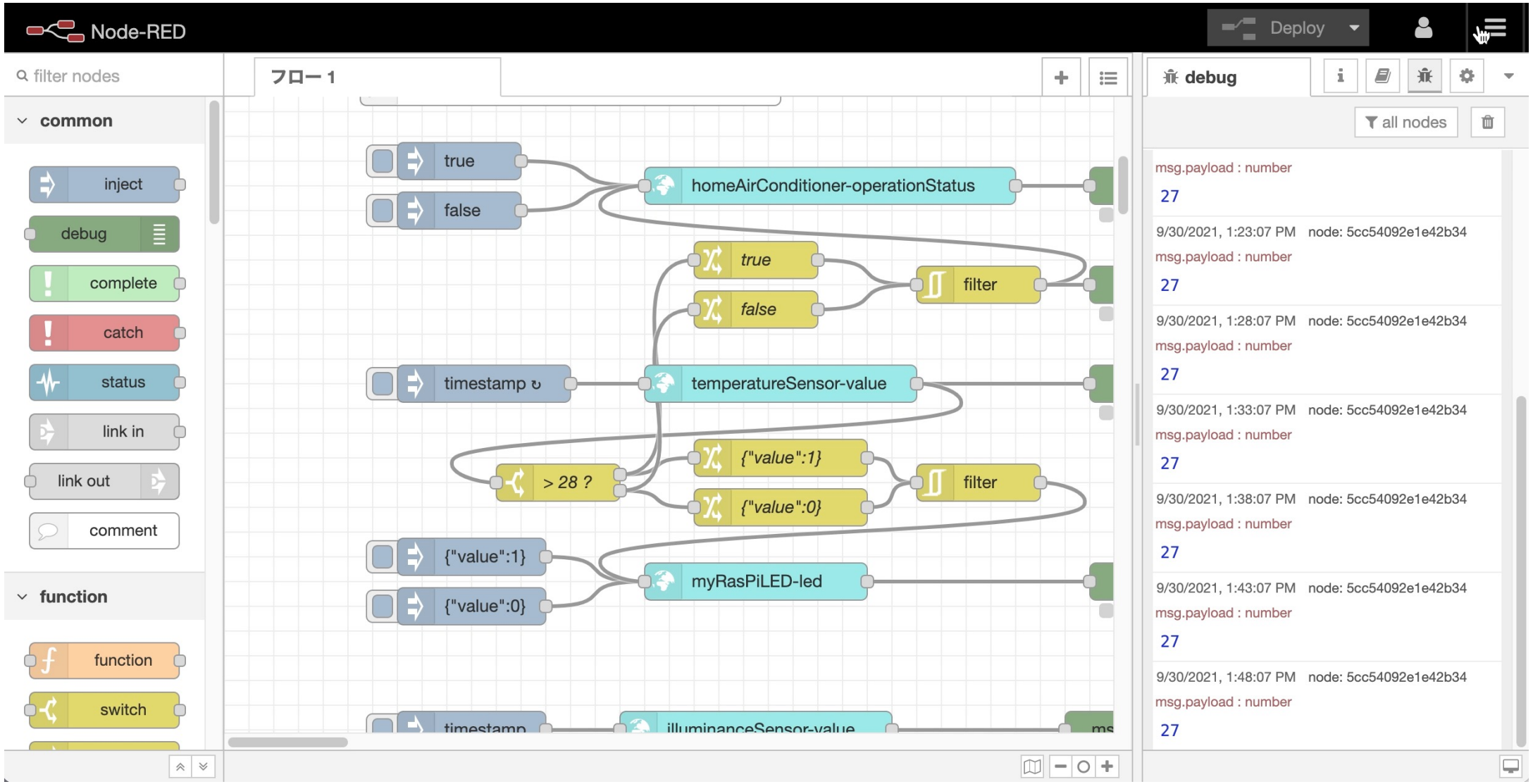
Siemens/Logilab

Retrieve
TDs
using
SPARQL
Query

Node-RED

Integrated
Query interface

Generating
Node from TD
(Node Generator)


Node-RED
Deploy
filter nodes
フロー 1
debug
common
inject
debug
complete
catch
status
link in
link out
comment
function
function
switch
true
false
homeAirConditioner-operationStatus
true
false
filter
timestamp
temperatureSensor-value
> 28 ?
{"value":1}
{"value":0}
filter
{"value":1}
{"value":0}
myRasPiLED-led
all nodes
msg.payload : number
27
9/30/2021, 1:23:07 PM node: 5cc54092e1e42b34
msg.payload : number
27
9/30/2021, 1:28:07 PM node: 5cc54092e1e42b34
msg.payload : number
27
9/30/2021, 1:33:07 PM node: 5cc54092e1e42b34
msg.payload : number
27
9/30/2021, 1:38:07 PM node: 5cc54092e1e42b34
msg.payload : number
27
9/30/2021, 1:43:07 PM node: 5cc54092e1e42b34
msg.payload : number
27
9/30/2021, 1:48:07 PM node: 5cc54092e1e42b34
msg.payload : number
27

Issues / Discussion / Lessons Learned

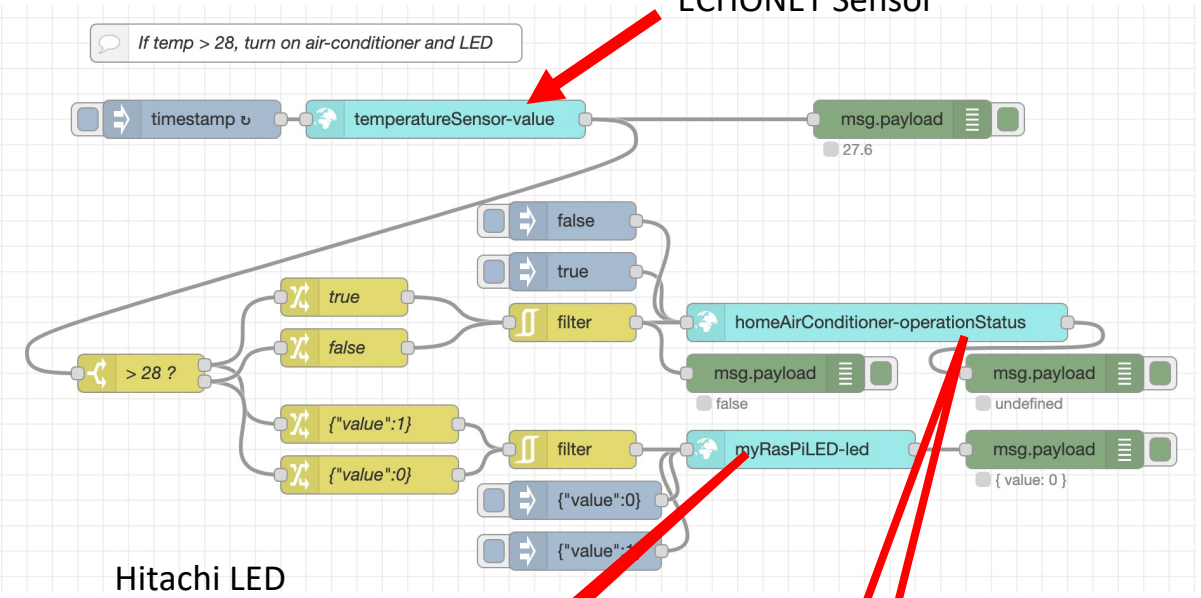
- Round-tripping issues
  - Invalid `securityDefinitions` (w3c/wot-thing-description#1193)
  - `title` and `description` are converted to `titles` and `descriptions`
    - Node generator assumes that all TDs have a `title`.

- `@context` and `@type` are needed to register a TD to TDD.

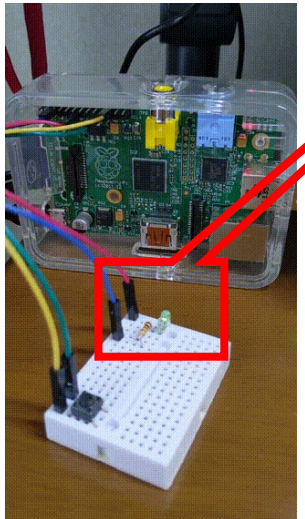
- Need a better UI that leverages the power of SPARQL
  - The current implementation simply does a keyword search of `description` in TD.

Orchestrating Things using Node-RED

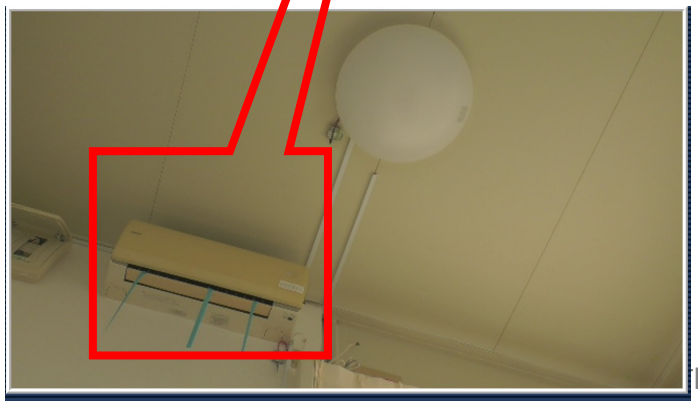
Thermostat



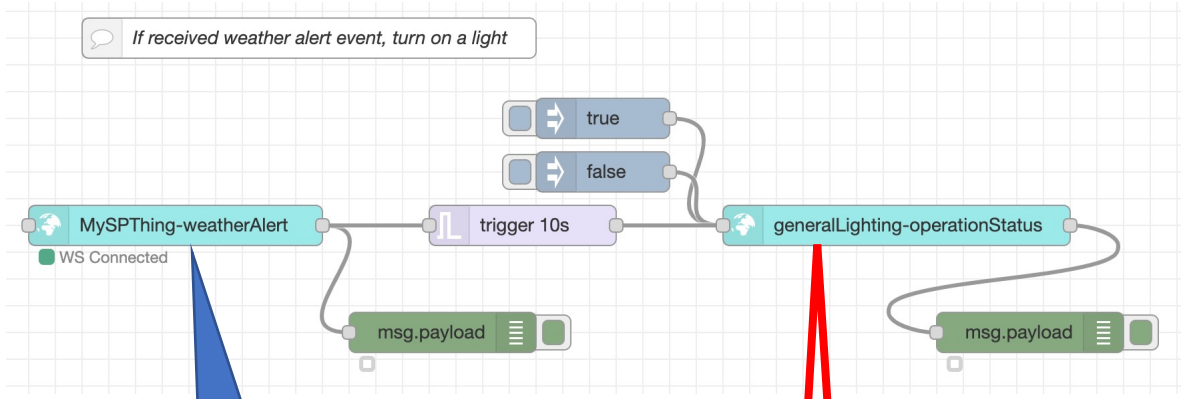
Hitachi LED



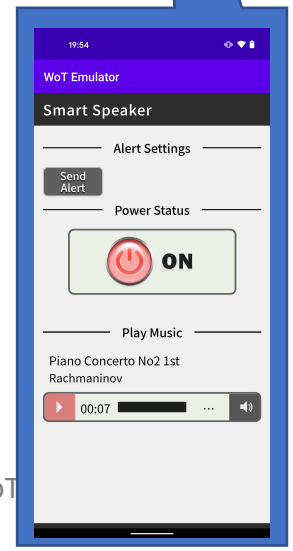
ECHONET Aircon



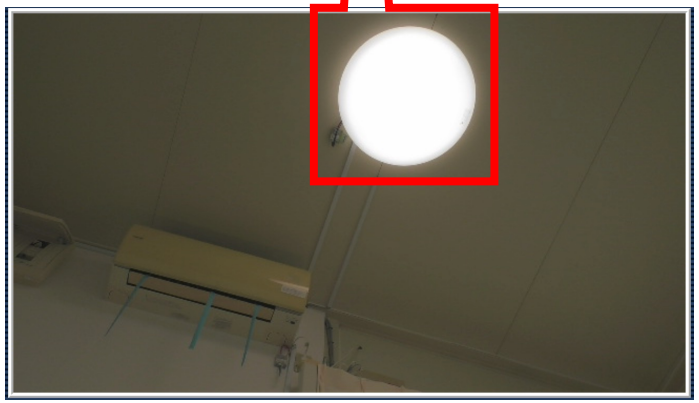
Visual alert



NHK Smart Speaker



ECHONET Light



Issues / Discussion / Lessons Learned

- Direct access to ECHONET Lite web API
  - In this plugfest, we can access ECHONET device via gateway (WoT-ECHONET Lite Web API Intermediary).
    - Gateway removes an encapsulating object from a response payload.
  - If we describe ECHONET Lite Web API using TD, we can also directly access to ECHONET Lite Web API.
  - Between DD and TD, the scope specified by each schema is different. By adding the encapsulating object schema when converting DD to TD, it is possible to access ECHONET Lite Web API directly … ?

■ リクエスト (request)

```
GET /elapi/v1/devices/<device id>/properties/rgb HTTP/1.1
```

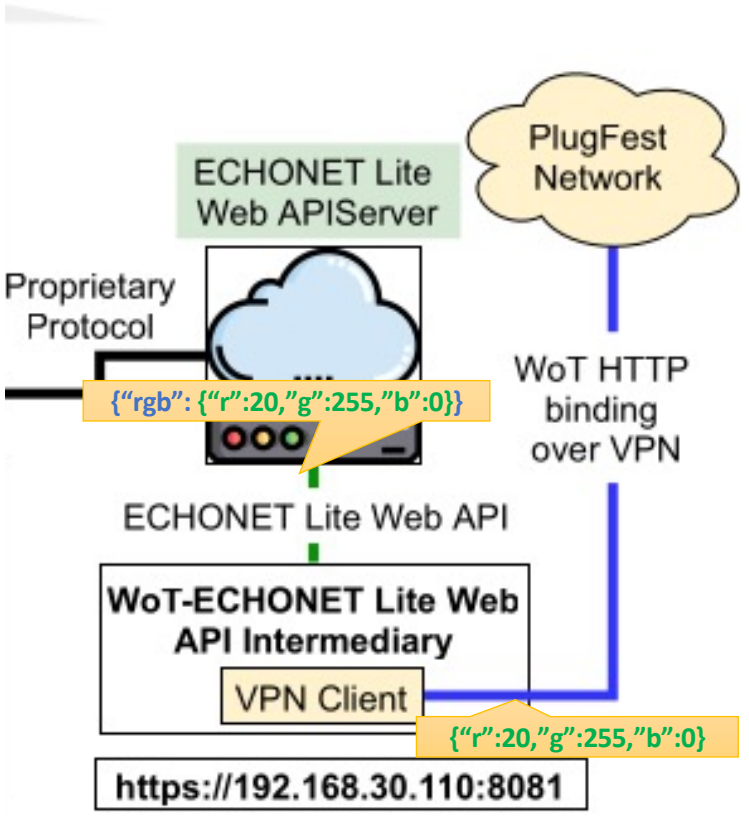
■ レスポンスが object の場合 (When the response is object)

```
{
    "rgb": {
        "r": 20,
        "g": 255,
        "b": 0
    }
}
```

ECHONET Lite Web API Device Description (DD) describes the schema of this part

WoT Thing Description (TD) describes the schema of this part

https://echonet.jp/wp/wp-content/uploads/pdf/General/Download/web_API/ECHONET_Lite_Web_API_Specs_v1.1.3.pdf



https://github.com/w3c/wot-testing/blob/main/events/2021.09.Online/Projects/ECHONET/20210917_Plugfest_ECHONETControllerUpdated.png