Associate Professorship of Embedded Systems and Internet of Things
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# W3C WoT Plugfest - Testbench

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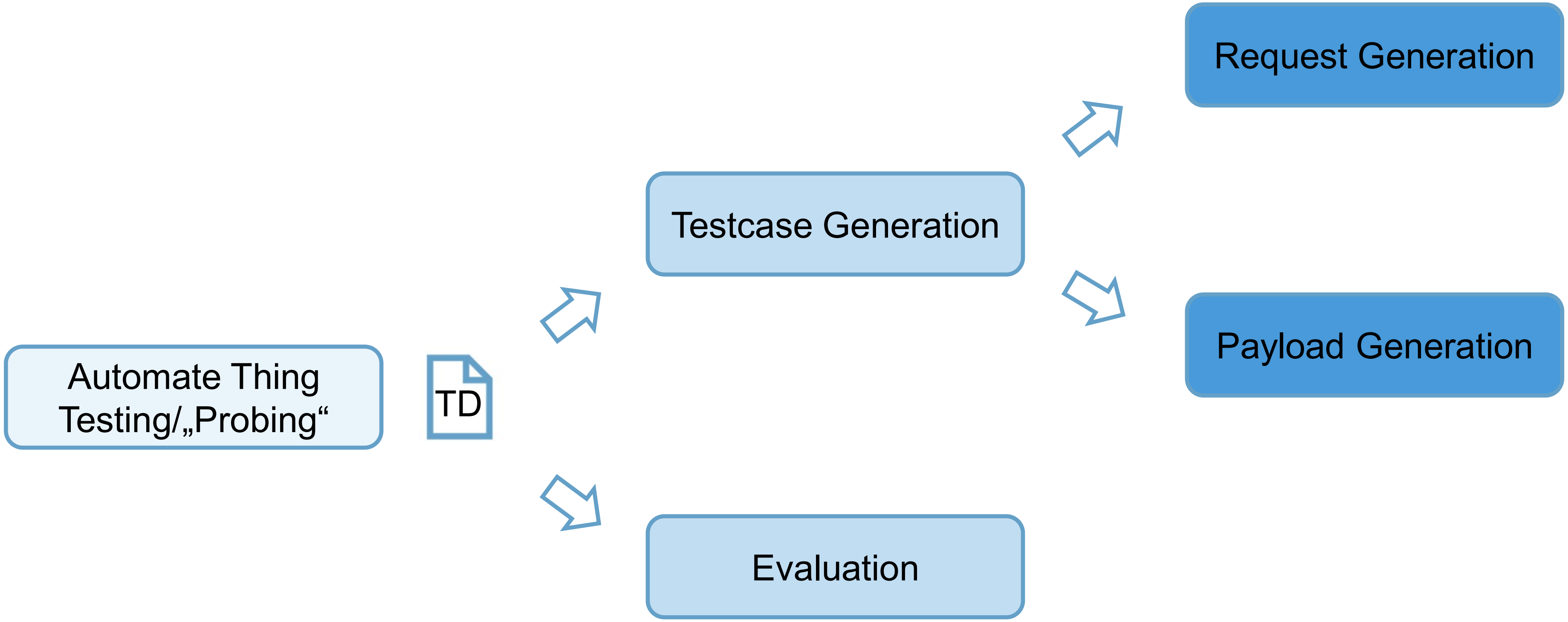
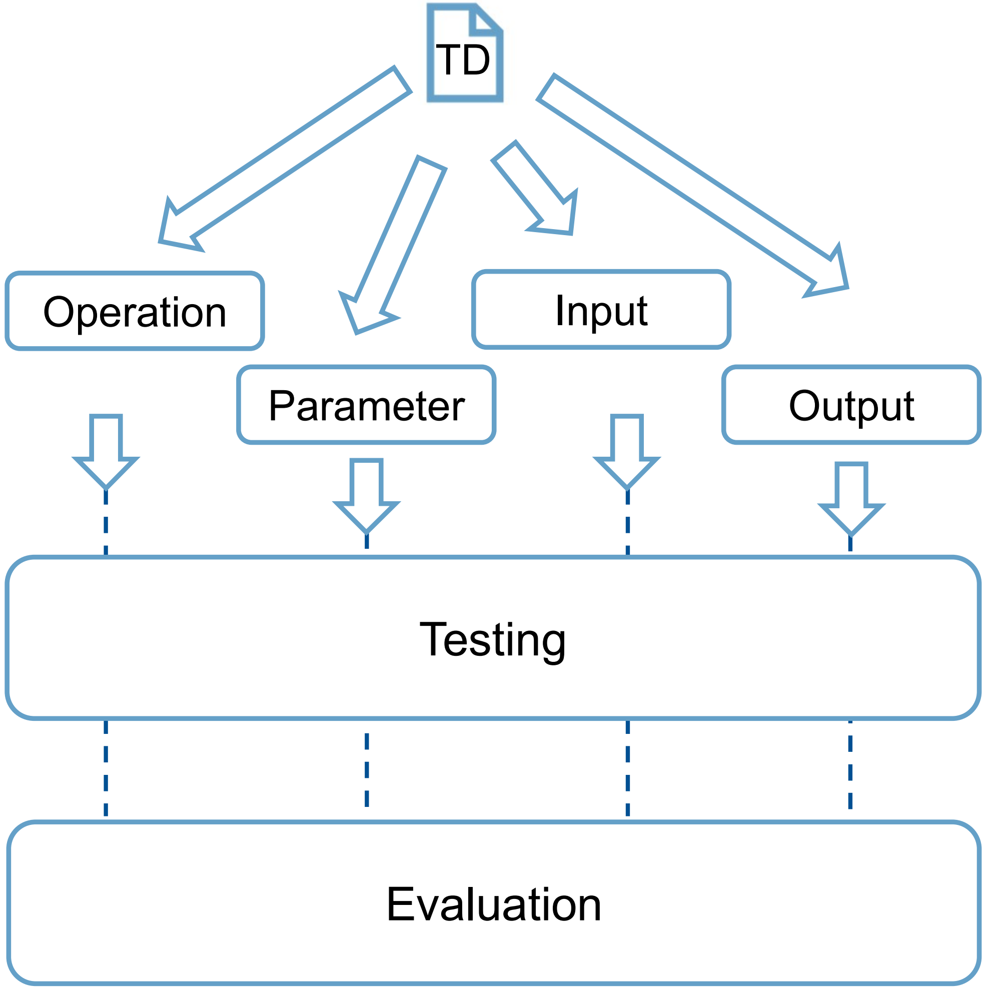
Associate Professorship of Embedded Systems and Internet of Things

# The Testbench: Main Goals



# Testbench



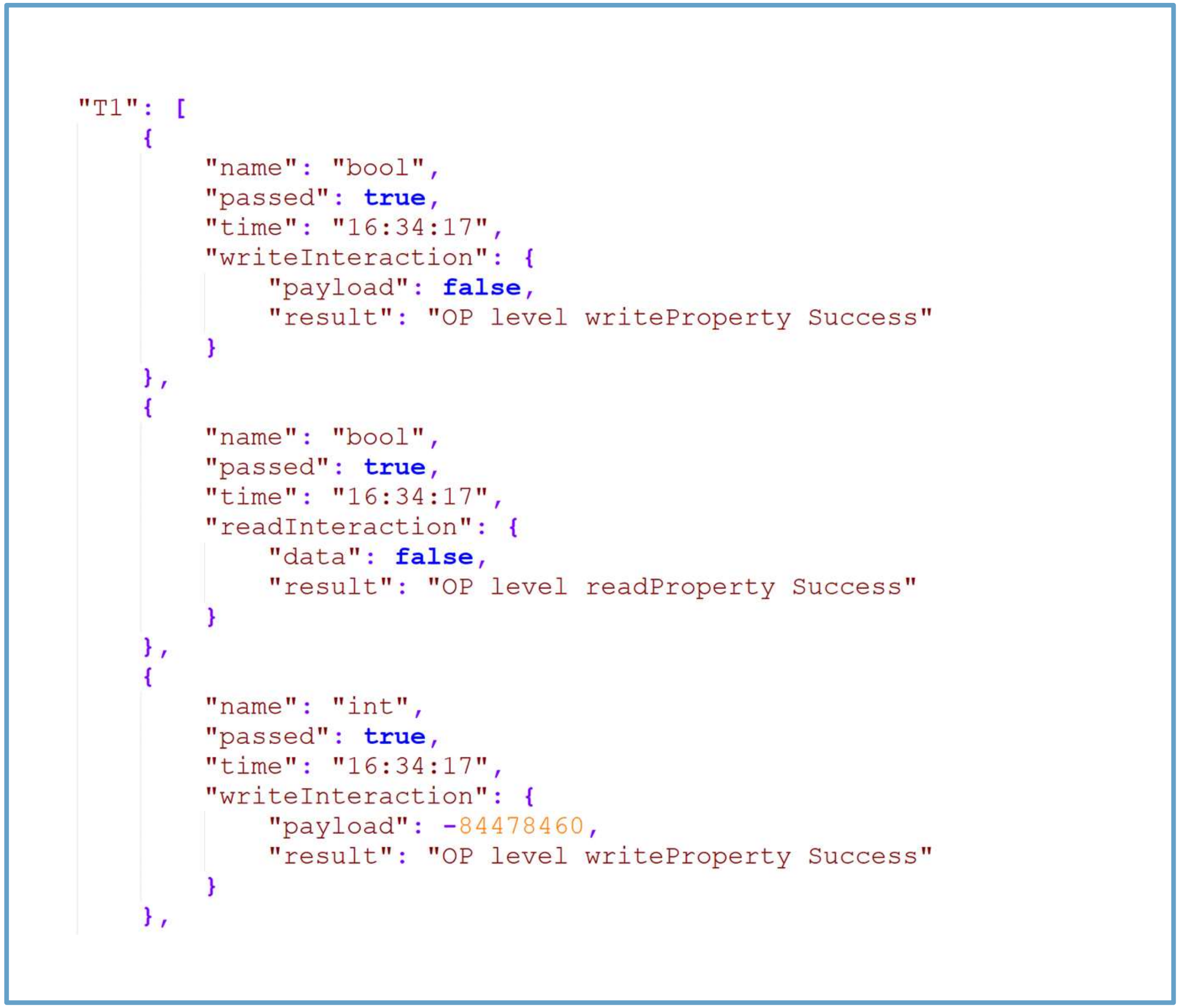
# Test Report

T1: Operation Coverage

T2: Parameter Coverage

T3: Input Coverage

T4: Output Coverage



```
"T1": [
    {
        "name": "bool",
        "passed": true,
        "time": "16:34:17",
        "writeInteraction": {
            "payload": false,
            "result": "OP level writeProperty Success"
        }
    },
    {
        "name": "bool",
        "passed": true,
        "time": "16:34:17",
        "readInteraction": {
            "data": false,
            "result": "OP level readProperty Success"
        }
    },
    {
        "name": "int",
        "passed": true,
        "time": "16:34:17",
        "writeInteraction": {
            "payload": -84478460,
            "result": "OP level writeProperty Success"
        }
    },
```

# Things I have interacted with during the Plugfest

| Things | Reachable | Tested |
|---|---|---|
| Siemens | True | True |
| NHK | True | True |
| Intel | False | False |
| Hitachi | True | True |
| Unibo Farm | True | True |
| TUM | True | True |
| ECHONET | True | True |
| Fujitsu | False | False |

# Siemens

| Things | Reachable | Tested | Passed | Reason |
|---|---|---|---|---|
| counter | True | True | 95% | Image data could not be generated (T3) |
| eCar | False | False | 0% | IP was not IPv6 or VPN (T1) |
| SmartCoffee | True | True | 85% | Discrepance between written value and read value of property Affordances (T3) |
| SolarPower | True | True | 100% | ---- |
| TestThing | True | True | 100% | ---- |

# NHK

| Things | Reachable | Tested | Passed | Reason |
|---|---|---|---|---|
| DisplayEmu | True | True | 95% | power Affordance writeproperty did not get accepted<br>(T1 & T2 & T3) |
| SpeakerEmu | True | True | 95% | power Affordance writeproperty did not get accepted.<br>(T1 & T2 & T3) |

# Hitachi

| Things | Reachable | Tested | Passed | Reason |
|---|---|---|---|---|
| accelerometer | True | True | 100% | ---- |
| LED | True | True | 30% | Thing did not respond in most testcases (T3) |

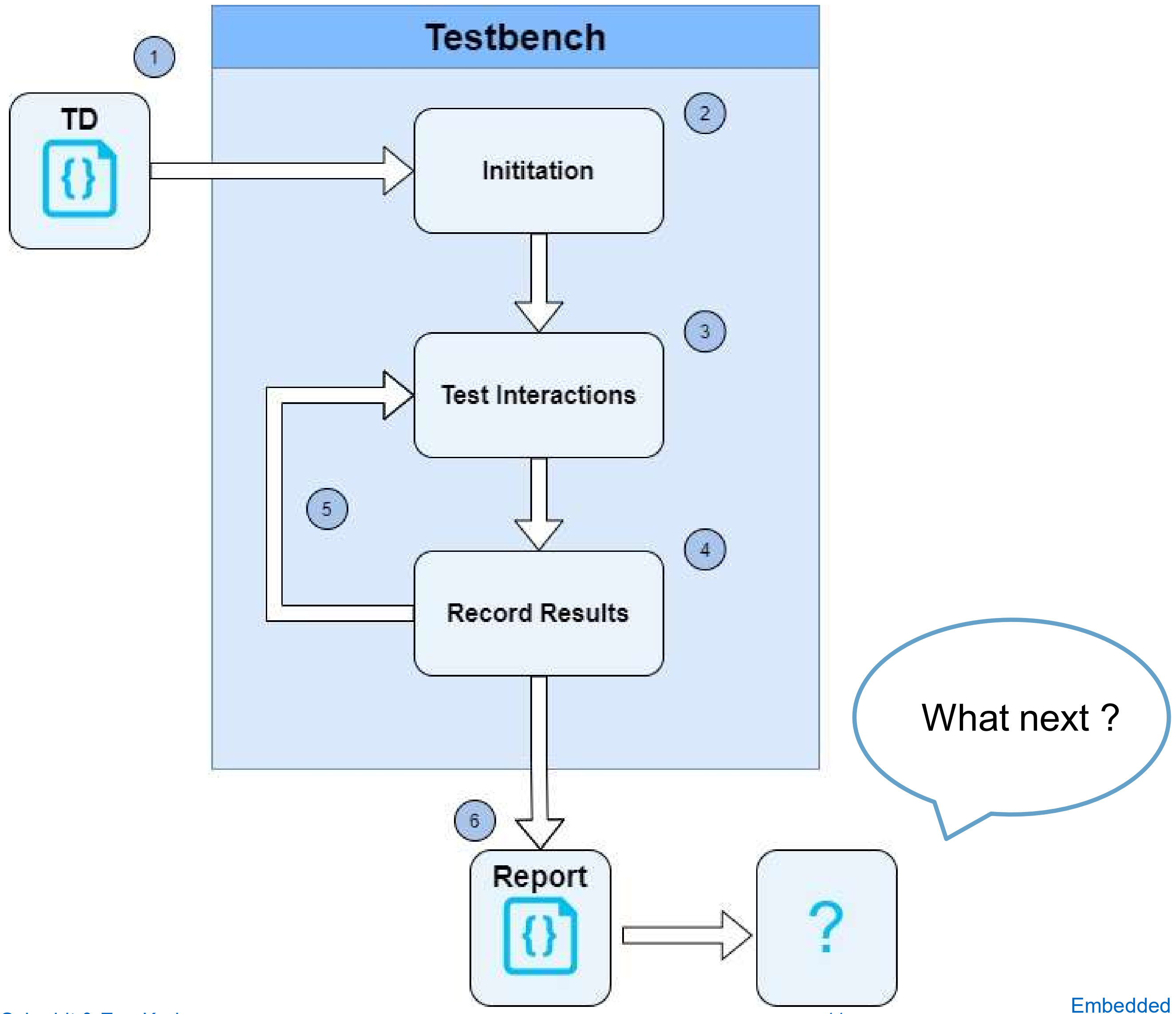
# Unibo Farm

| Things | Reachable | Tested | Passed | Reason |
|---|---|---|---|---|
| Sprinkler | True | True | 50% | CoAP testcases did not execute correctly. The Thing did not respond to CoAP requests.<br>(T1) |
| SoilSensor | True | True | 50% | Same as above. |

# ECHONET

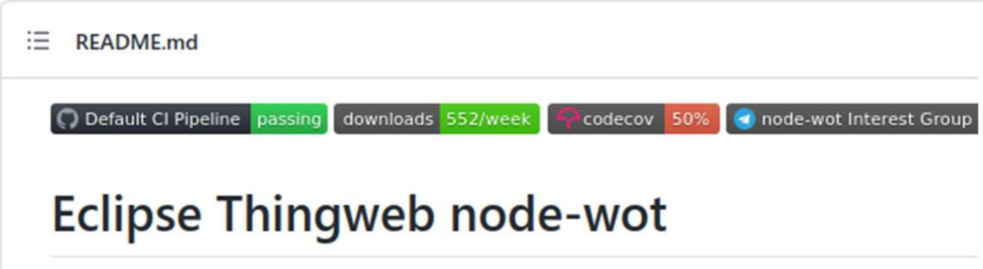
| Things | Reachable | Tested | Passed | Reason |
|---|---|---|---|---|
| Lighting | True | True | 100% | -- |
| Airconditioner | True | True | 100% | -- |
| Lightsensor | True | True | 100% | -- |
| Temperature sensor | True | True | 100% | -- |

# What is next ?


Testbench
1
TD
2
Inititation
3
Test Interactions
5
4
Record Results
What next ?
6
Report
?

# Motivation

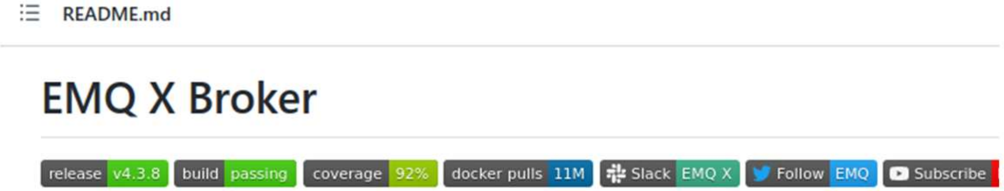
Many code repositories contain badges about the build status or test coverage:



README.md

Default CI Pipeline passing | downloads 552/week | codecov 50% | node-wot Interest Group

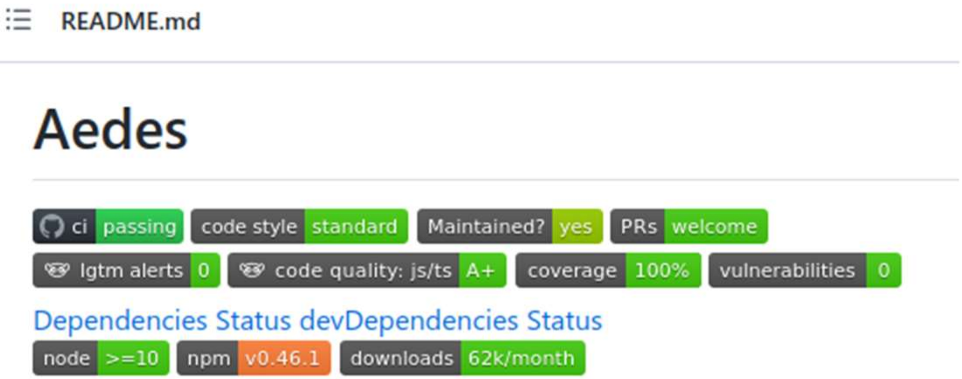
## Eclipse Thingweb node-wot



README.md

## EMQ X Broker

release v4.3.8 | build passing | coverage 92% | docker pulls 11M | Slack EMQ X | Follow EMQ | Subscribe



README.md

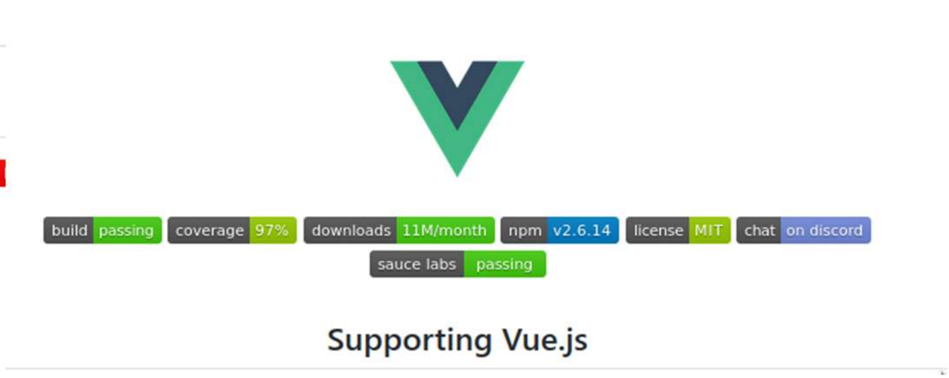
## Aedes

ci passing | code style standard | Maintained? yes | PRs welcome

lgtm alerts 0 | code quality: js/ts A+ | coverage 100% | vulnerabilities 0

Dependencies Status devDependencies Status

node >=10 | npm v0.46.1 | downloads 62k/month



build passing | coverage 97% | downloads 11M/month | npm v2.6.14 | license MIT | chat on discord

sauce labs passing

## Supporting Vue.js

# TD “Badges”

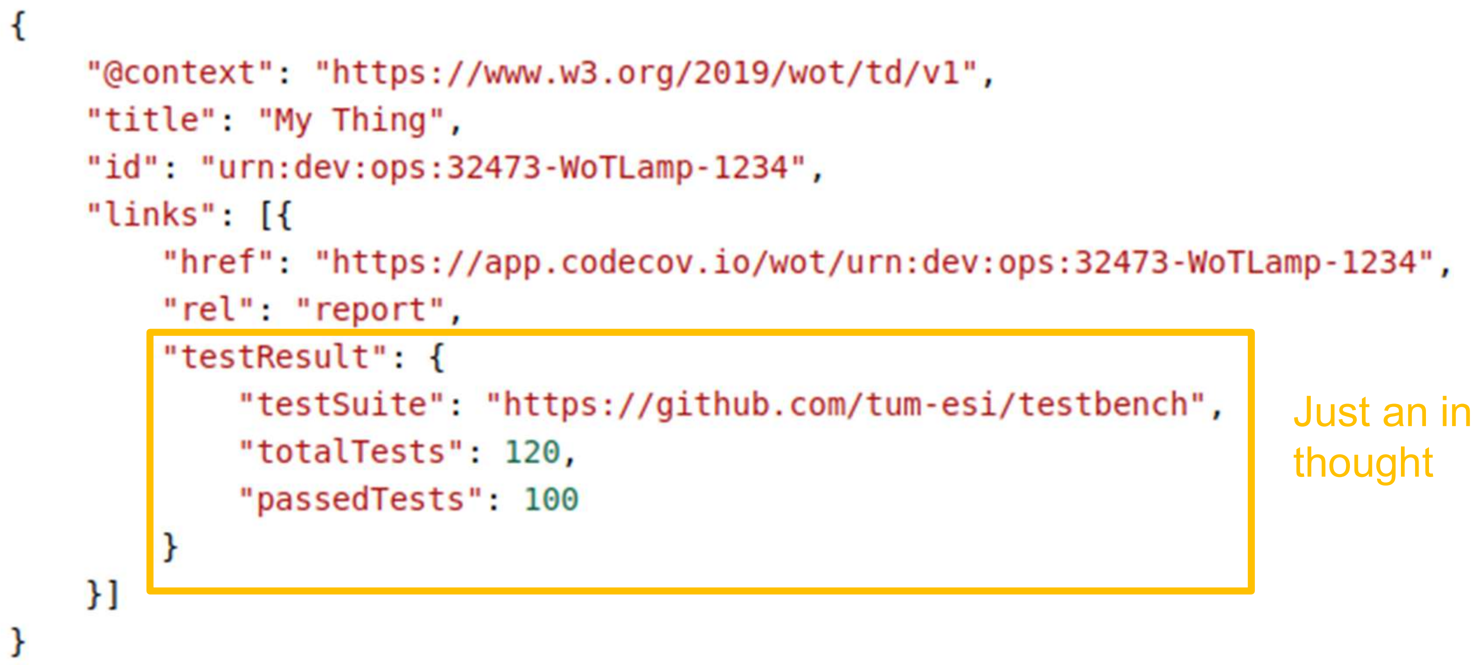
Can we have such information in TDs? Why?

- Gives confidence to Consumers that every affordance can be used
- Motivates Thing implementors to do better and compliant implementations

How is it done for repositories?

- Badges give a quick image/result
- Link to a provider of the feature (code coverage, build)
  - Can be external
  - Has full information

# TD “Badges”: Example



```
{
    "@context": "https://www.w3.org/2019/wot/td/v1",
    "title": "My Thing",
    "id": "urn:dev:ops:32473-WoTLamp-1234",
    "links": [{
        "href": "https://app.codecov.io/wot/urn:dev:ops:32473-WoTLamp-1234",
        "rel": "report",
        "testResult": {
            "testSuite": "https://github.com/tum-esi/testbench",
            "totalTests": 120,
            "passedTests": 100
        }
    }]
}
```

Just an initial thought

```
{
        "@context": "https://www.w3.org/2019/wot/td/v1",
        "title": "My Thing",
        "id": "urn:dev:ops:32473-WoTLamp-1234",
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                "testResult": {
                        "testSuite": "https://github.com/tum-esi/testbench",
                        "totalTests": 120,
                        "passedTests": 100
                }
        }]
}
```
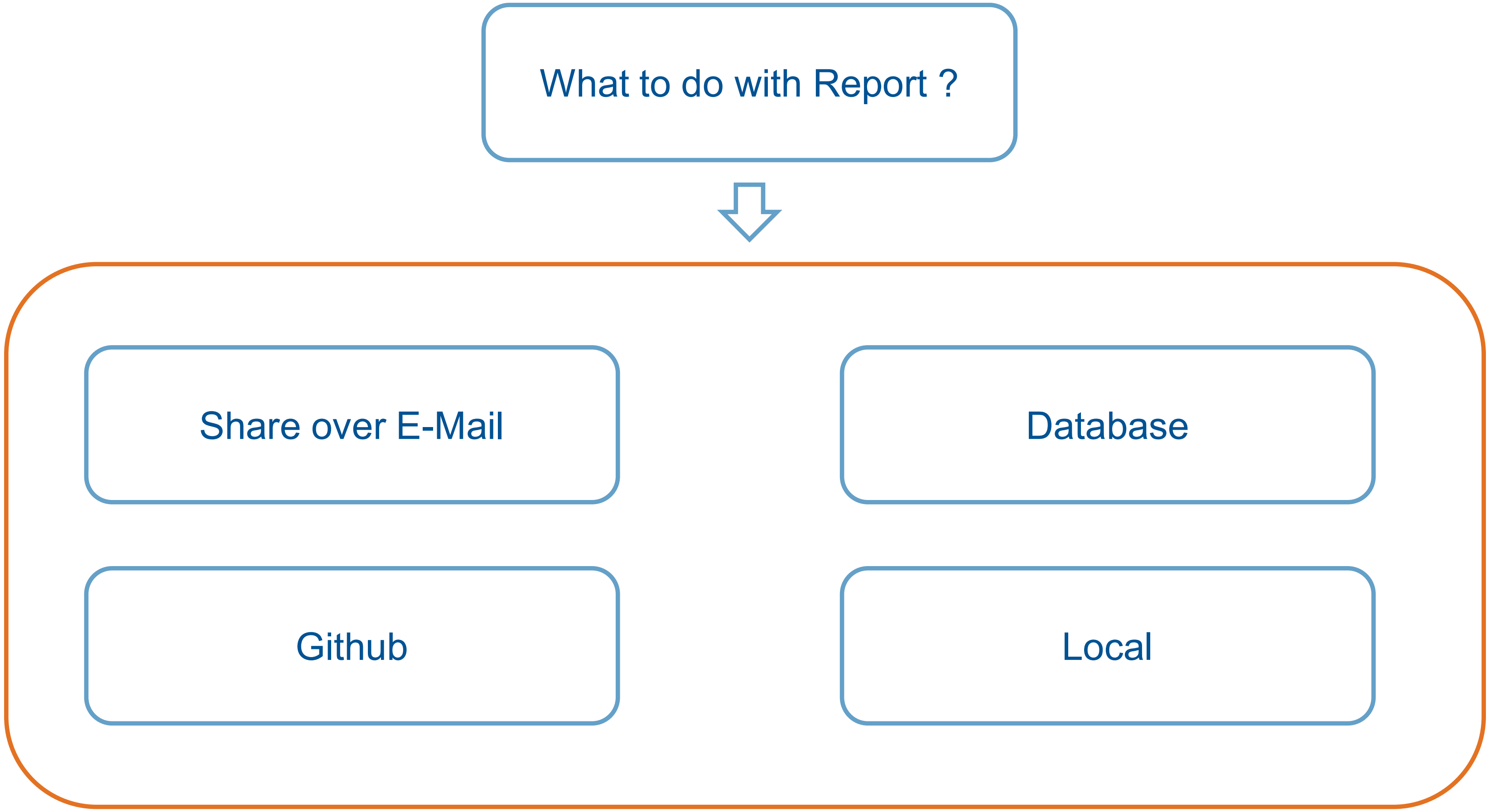

# Discussion



What to do with Report ?

Share over E-Mail

Database

Github

Local

# WoT-Testbench

https://github.com/tum-esi/testbench

# Results

All the results are on GitHub
https://github.com/w3c/wot-testing/pull/193
and can be sent to the owners.