

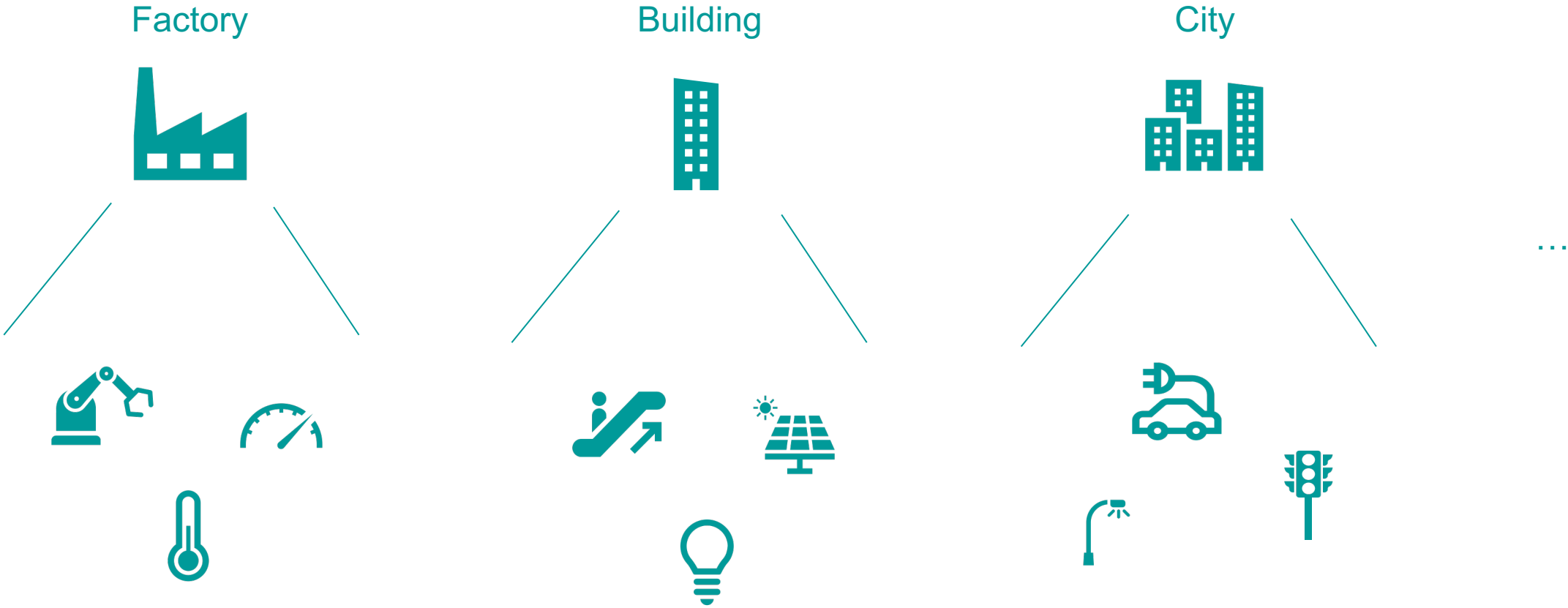
Insight into W3C Web of Things

Dr. Sebastian Käbisch, Siemens AG

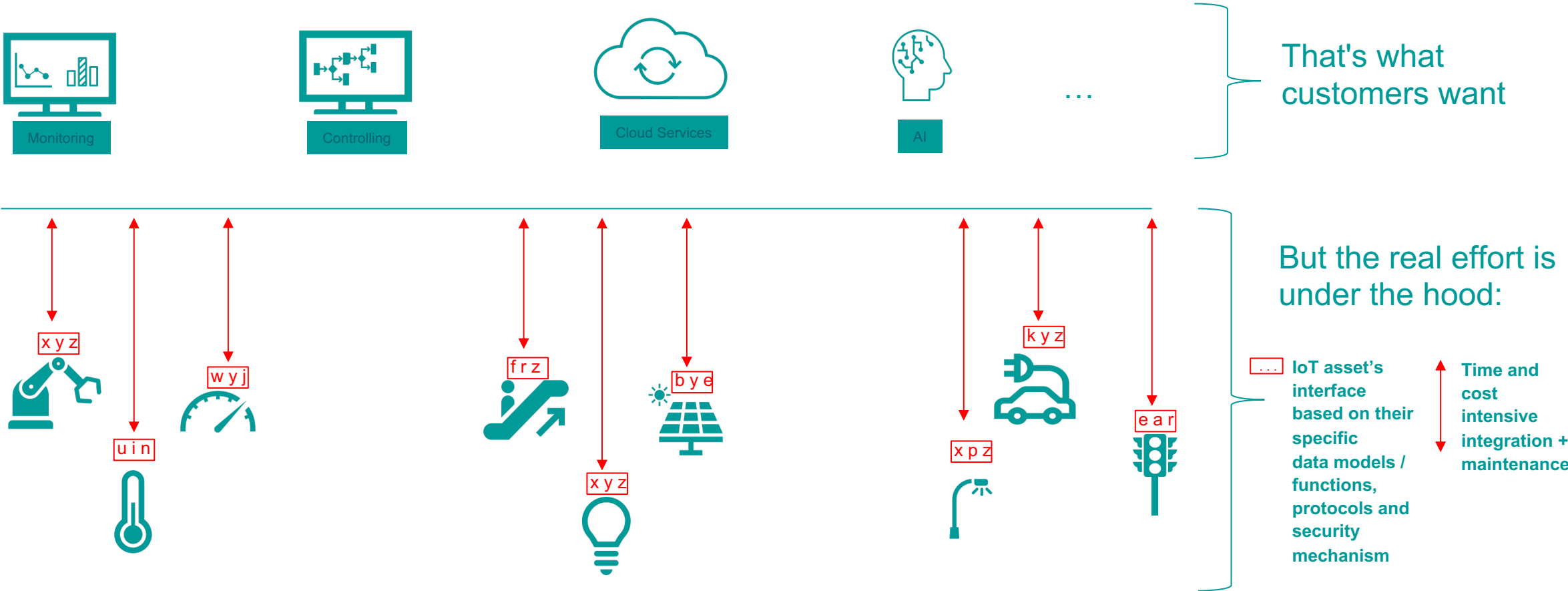
W3C in Europe, 6. Februar 2024



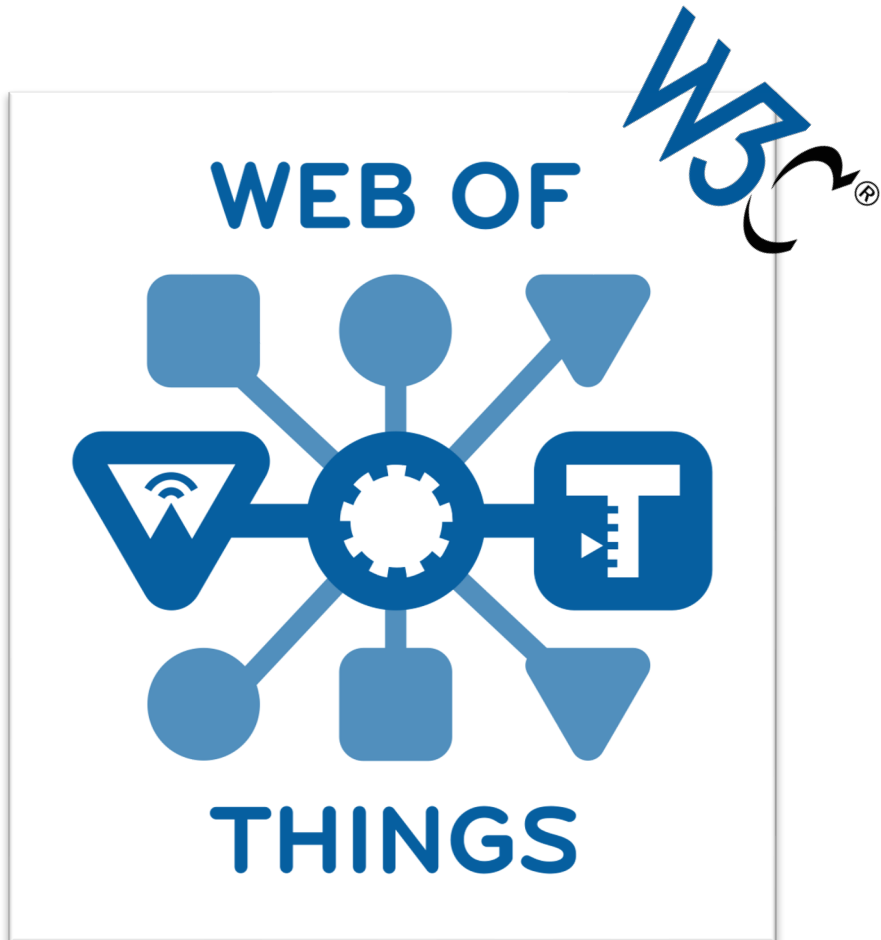
It's about the *Things* that are used in application domains



There is a common problem if you want to use Things *smart*



Enter the W3C Web of Things (WoT)



- IT-Friendly technologies, reuse established Web standards
- Protocols agnostics
- Adapts to any application domain
- Local, Edge, Cloud
- Key technology: Standardized *Device Description Language* called **WoT Thing Description**
- Co-chairs + Team contact:
Michael McCool (Intel), Michael Koster (Invited Expert),
Sebastian Käbisch (Siemens), Kazuyuki Ashimura (W3C)

WoT Thing Description

Standardized machine and human readable device interface descriptions

```

1 {
2   "@context": "https://www.w3.org/2022/wot/td/v1.1",
3   "title": "Siemens SENTRON PAC4200",
4   "base": "modbus+tcp://192.168.10.100:502/1/",
5   "description": "The SENTRON PAC4200 is a measuring device",
6   "support": "https://support.industry.siemens.com/dl/dl-media/595/3",
7   "securityDefinitions": {
8     "nosec_sc": {
9       "scheme": "nosec"
10    }
11  },
12  "security": "nosec_sc",
13  "properties": {
14    "voltage_l1_n": {
15      "title": "Voltage L1-N",
16      "type": "number",
17      "unit": "V",
18      "forms": [
19        {
20          "href": "40001?quantity=2",
21          "contentType": "application/octet-stream",
22          "modv: function": "readHoldingRegisters",
23          "modv: type": "xsd:float",
24          "modv: mostSignificantByte" : true,
25          "modv: mostSignificantWord" : true,
26        }
27      ]
28    },
29    "voltage_l2_n": {
30      "title": "Voltage L2-N",
31      "type": "number",
32      "unit": "V",
33      "forms": [
34        {
35          "href": "40003?quantity=2",
36          "contentType": "application/octet-stream",

```



W3C Recommendation

Web of Things (WoT) Thing Description

W3C Recommendation 9 April 2020 (Link errors corrected 23 June 2020)



- This version:**
<https://www.w3.org/TR/2020/REC-wot-thing-description-20200409/>
- Latest published version:**
<https://www.w3.org/TR/wot-thing-description/>
- Latest editor's draft:**
<https://w3c.github.io/wot-thing-description/>
- Implementation report:**
<https://w3c.github.io/wot-thing-description/testing/report.html>
- Previous version:**
<https://www.w3.org/TR/2020/PR-wot-thing-description-20200130/>
- Editors:**
 Sebastian Kaebisch (Siemens AG)
 Takumi Kamiya (Fujitsu Laboratories of America)
 Michael McCool (Intel)
 Victor Charpenay (Siemens AG)
 Matthias Kovatsch (Huawei)
- Participate:**
[GitHub w3c/wot-thing-description](#)
[File a bug](#)
[Commit history](#)
[Pull requests](#)
- Contributors:**
[In the GitHub repository](#)
- Repository:**
[We are on GitHub](#)
[File a bug](#)

Please check the [errata](#) for any errors or issues reported since publication.

See also [translations](#).

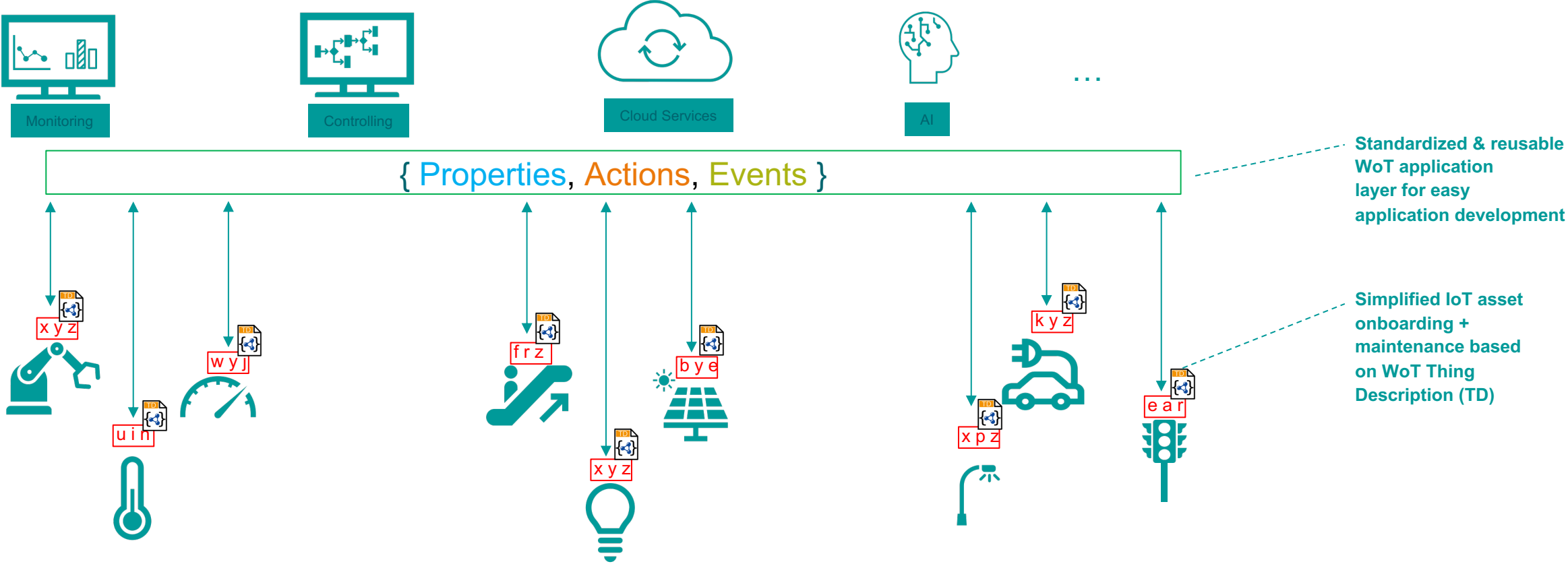
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Abstract



W3C WoT simplifies the IoT application development



Concentrate on the business logic, hide protocol specifics

```
const TD_PATH = "file:///TDs/Siemens/Sentronpac.td.jsonld";

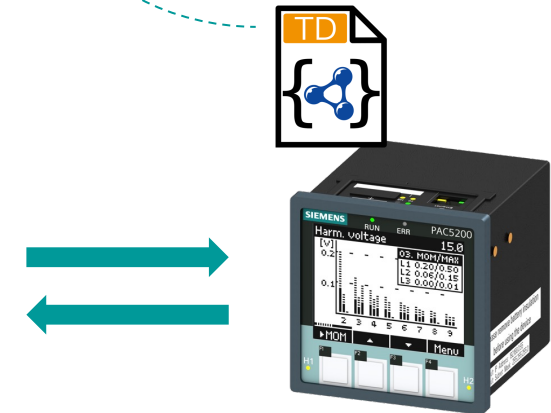
const sentronTD = WoT.fetch(TD_PATH)
let sentron = WoT.consume(sentronTD)

setInterval(()=>{

  let totActPw = sentron.readProperty("Total_Active_Power")

  // adjust metering rate based on the hour
  if (time.getUTCHours() > 20){
    sentron.invokeAction("changeRate",1)
  } else {
    sentron.invokeAction("changeRate",0)
  }

}, 10000) // read every 10 seconds
```

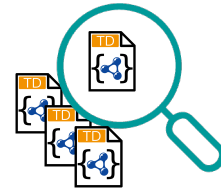


<https://github.com/eclipse-thingweb/node-wot>

There is more that WoT offers



WoT Architecture: Definitions of WoT basic principles such as **Properties**, **Actions**, **Events**



WoT Discovery: Recommendations for discovery strategies to explore TDs based on different use cases and network circumstances

API

WoT Scripting API:
Common programming interface to interact with the Things



WoT Bindings Templates:
Enable a TD to be adapted to a specific protocol, data payload formats or platforms



WoT Security and Privacy Guidelines:
Helps developers with secure and privacy-compliant deployment

WoT adoptions (European view)

Industry Adoptions



...

Start-ups



...

SDOs & Foundations



...

Visit <https://www.w3.org/WoT/> for more details (Specifications, developer area, tutorials, ...)

The screenshot shows the W3C Web of Things website. At the top, there is a navigation bar with the W3C logo and the text 'Web of Things'. Below the navigation bar, the main content area is divided into several sections. On the left, there is a 'W3C Web of Things' section with a brief description of the project. To the right of this is a 'WoT Videos »' section with a video thumbnail. Below the main description, there are six icons representing different aspects of the project: Working Group, Interest Group, Community Groups, Task Forces, Developers, and Documentation. On the right side of the main content area, there is a 'Web of Things' social media section with a Twitter icon and the text 'wot@w3c.social'. At the bottom of the page, there is a footer with copyright information: 'Copyright © 2024 World Wide Web Consortium. W3C® liability, trademark and permissive license rules apply.'

The screenshot shows the 'Developer Resources' page on the W3C Web of Things website. The page features a grid of eight icons representing different resource categories: TD Tooling, WoT Development Tools, Runtimes for TD Exposers, Runtimes for TD Consumers, TD Directories, WoT Software and Middleware, Other Tooling, and Online Things. Each icon is accompanied by its respective category name. The page also includes a brief introduction to the developer resources and a list of specific tools under the 'TD Tooling' category.

TD Tooling

- Tools that allow editing and validation of TDs or that allow parsing them in programming language specific environments.
- Thing Description Playground - Reference TD Validation suite with additional tools such as OpenAPI generation, linting and more.
 - Eclipse Edi(TD)or - Web based Editor for easy creation and visualization of Thing Descriptions and Thing Models.

Contact

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