

# Eclipse Thingweb

EclipseCon Europe, Ludwigsburg, Germany, Sep 2017

# Web of Things: Applications

Horizontal application layer for the IoT similar to the World Wide Web for the Internet

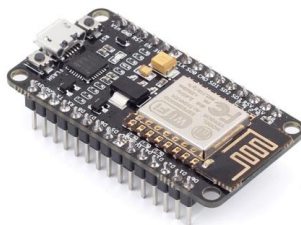
## Internet of Things: Connectivity



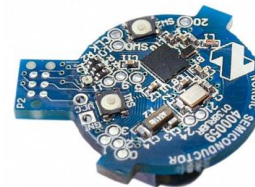
IEEE 802.15.4



Ethernet



Wi-Fi



Bluetooth



LoRa

...

## Web of Things in the W3C

### W3C<sup>®</sup> WoT Interest Group (IG)

<https://www.w3.org/2016/07/wot-ig-charter.html>

Co-chairs: Siemens AG, Huawei

- Started spring 2015
- ~200 participants
- Informal work, outreach
- Exploration, validation
- “PlugFests” with running code
- “OpenDays” with internal and external speakers
- Liaisons and collaborations with other organizations and SDOs

### W3C<sup>®</sup> WoT Working Group (WG)

<https://www.w3.org/2016/12/wot-wg-2016.html>

Co-chairs: Siemens AG, Panasonic Corp., Intel Corp.

- Started end of 2016
- ~100 participants
- Normative work
- Work on deliverables
- W3C Patent Policy for royalty-free standards
- Only W3C Members and Invited Experts
- “First Public Working Drafts” published 14 Sep 2017
- “Candidate Recommendations” expected Dec 2018

# W3C WoT Mission: Complement by **Describing** instead of Prescribing



Web of Things: “glue in between”

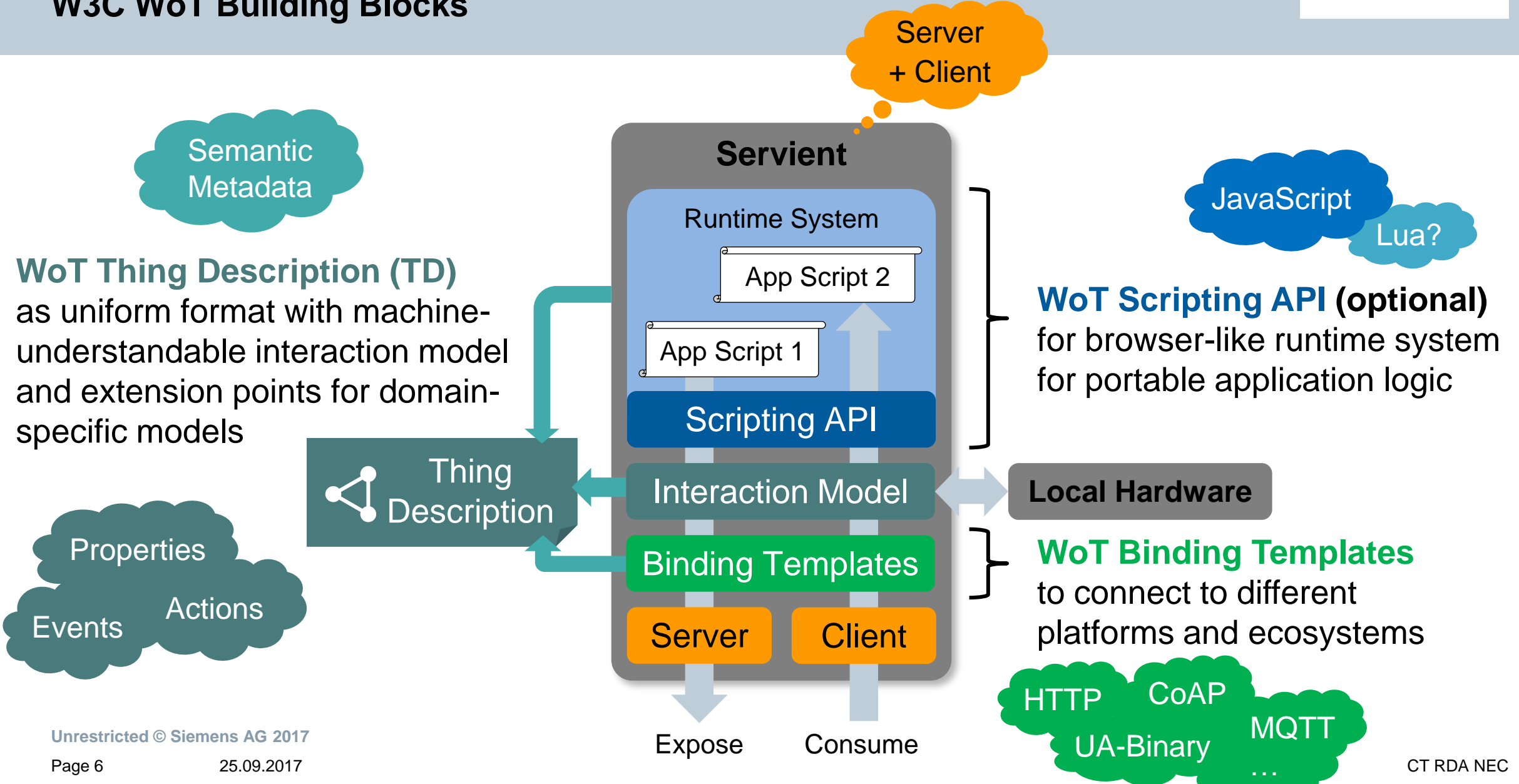


# W3C WoT Member Organizations

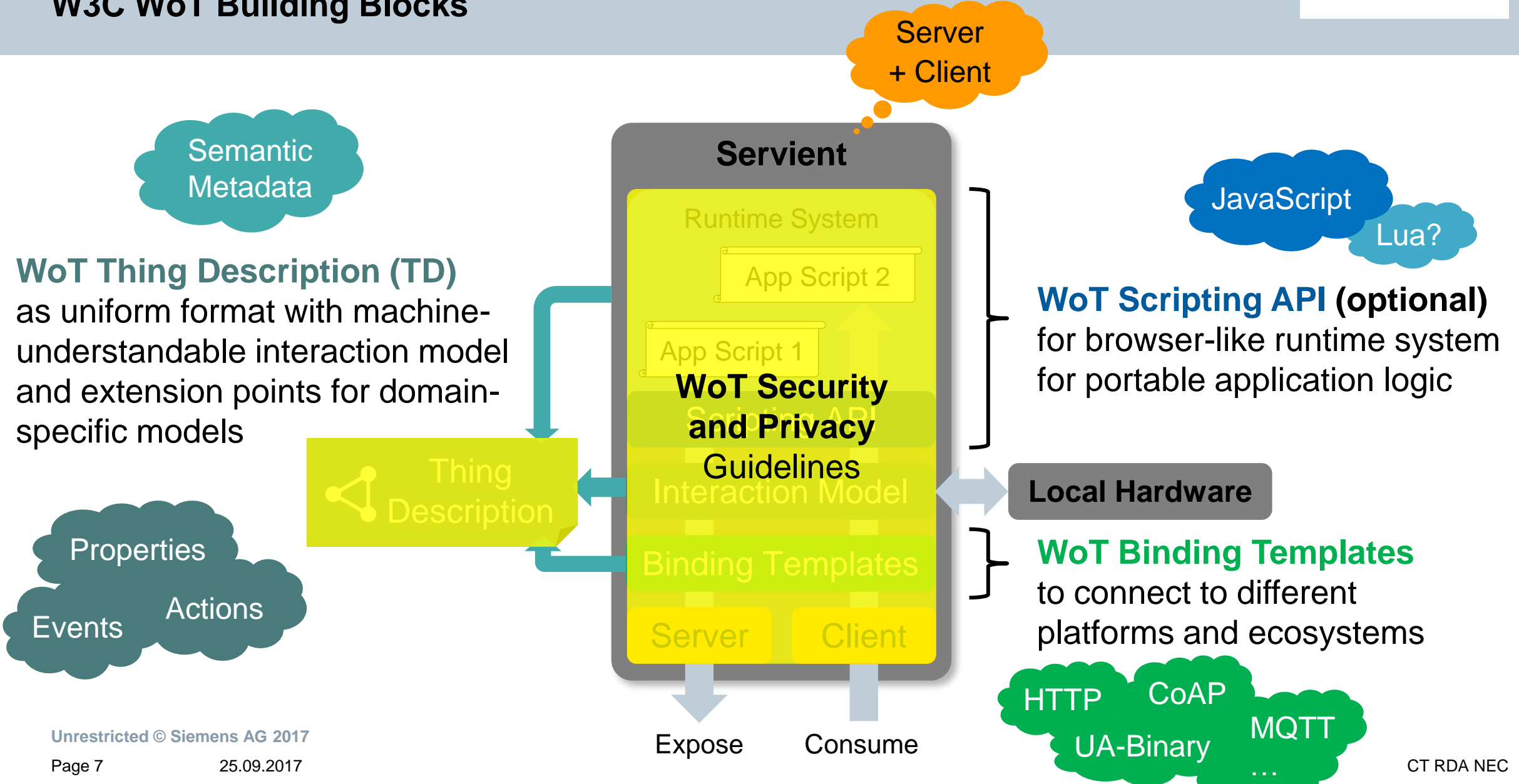
Web of Things: "glue in between"



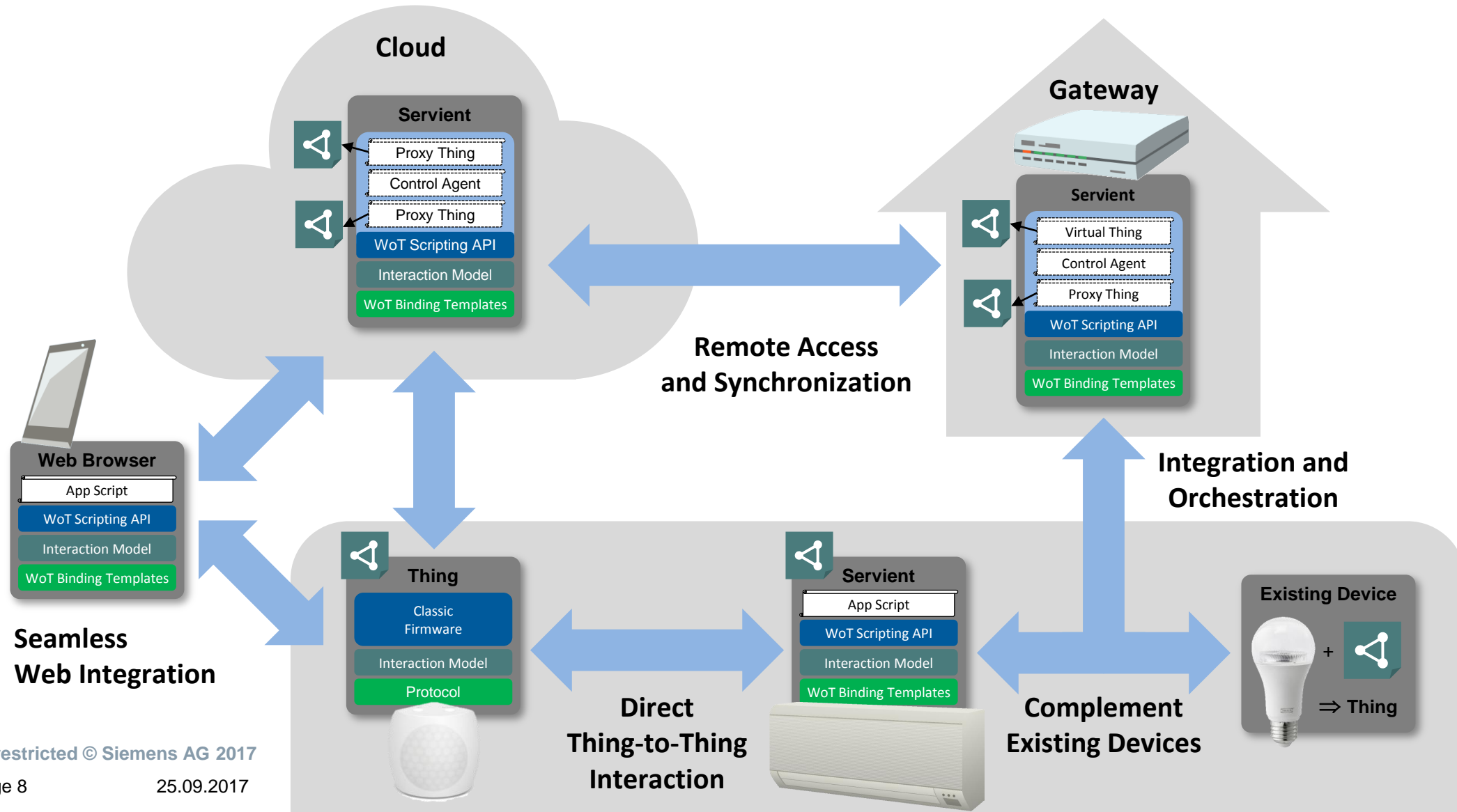
# W3C WoT Building Blocks



# W3C WoT Building Blocks



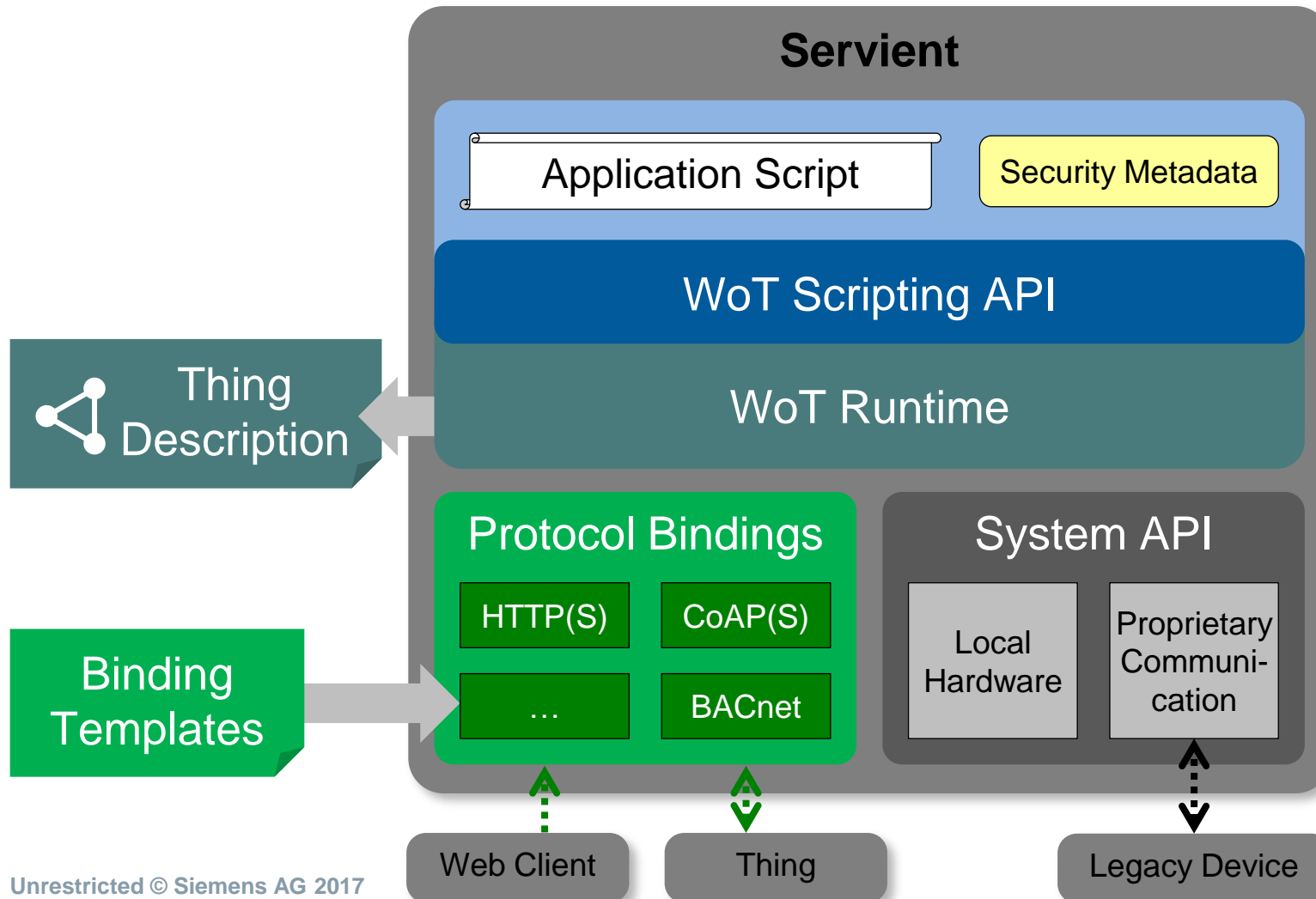
# W3C WoT Abstract Architecture: Not Thing-to-Cloud, but Things and Cloud





# Eclipse Thingweb

# “node-wot”: Servient Reference Implementation



## Technology

- TypeScript
- Node.js

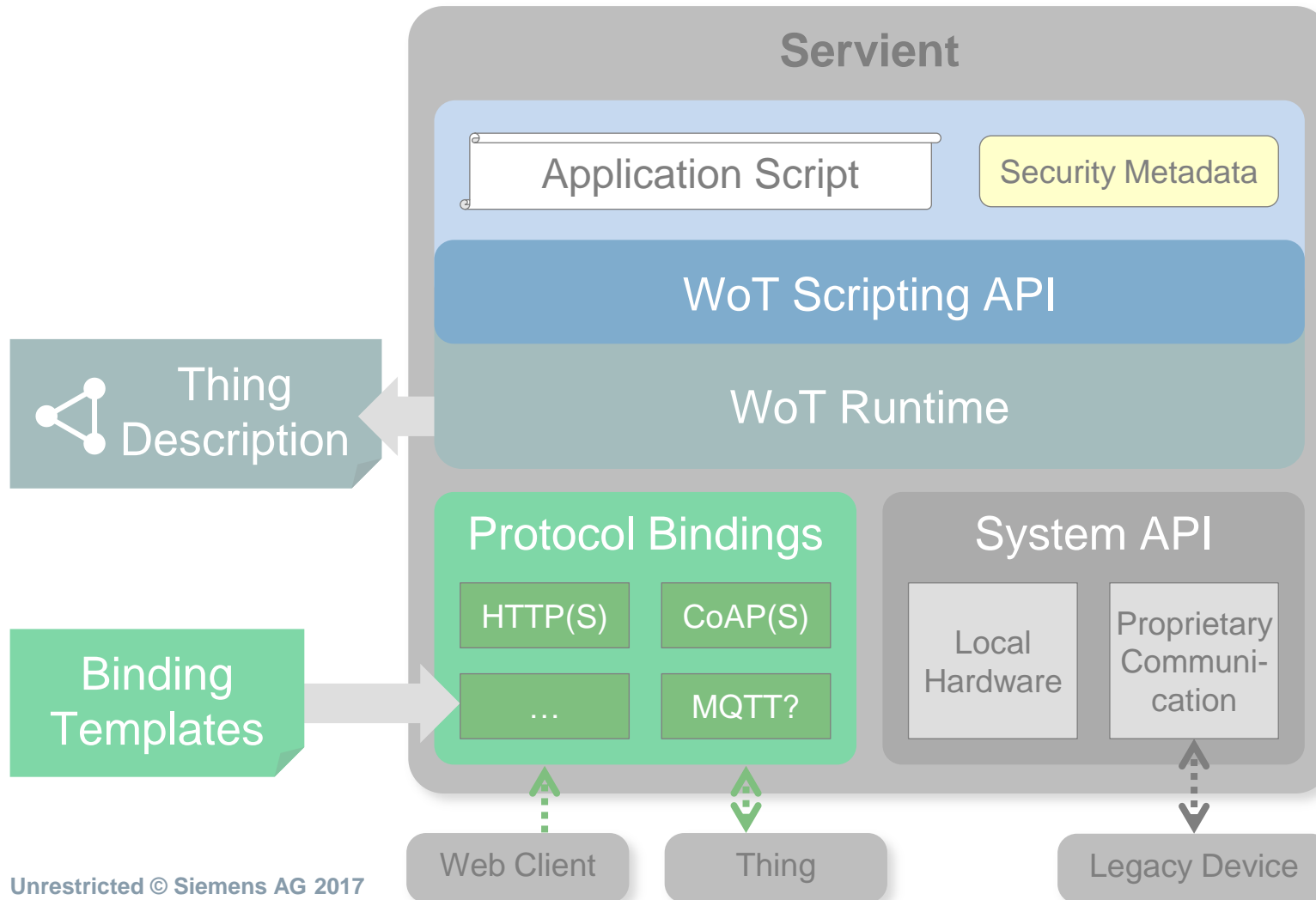
## Implements

- WoT Scripting API with JavaScript runtime system
- WoT Thing Description parser and generator
- WoT Binding Templates implementation plug-ins (“Protocol Bindings”)
- Media Type Handlers

## Roadmap

- Multi-tenancy security

# “Thingweb-java”: Servient Implementation in Java



## Technology

- Java
- NanoHttpd, Californium

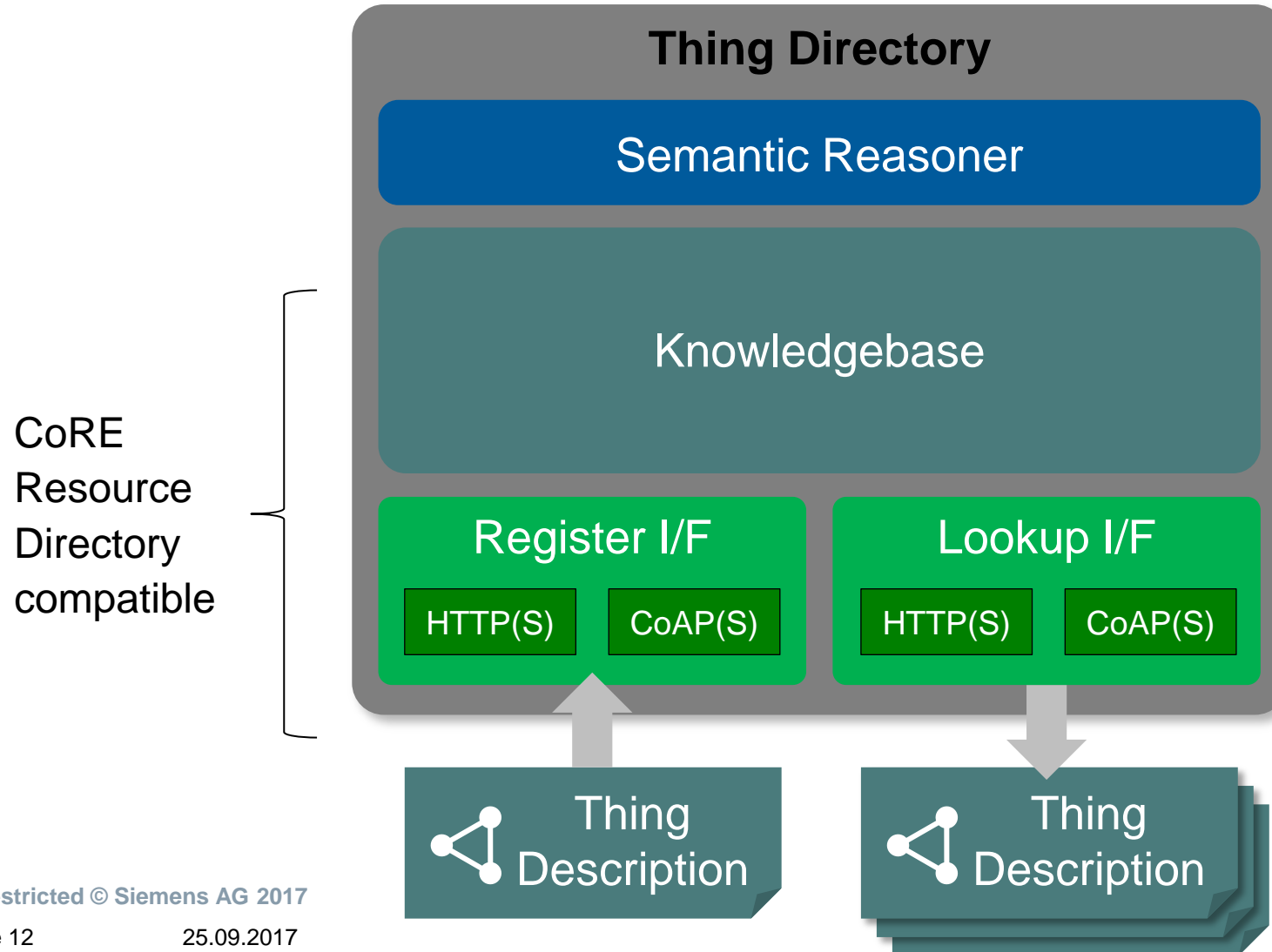
## Outdated

- Issues with JavaScript runtime

## Roadmap

- Get back on track
- Focus on Protocol Bindings

# “Thingweb Directory”: Thing Directory



## Technology

- Java
- Apache Jena

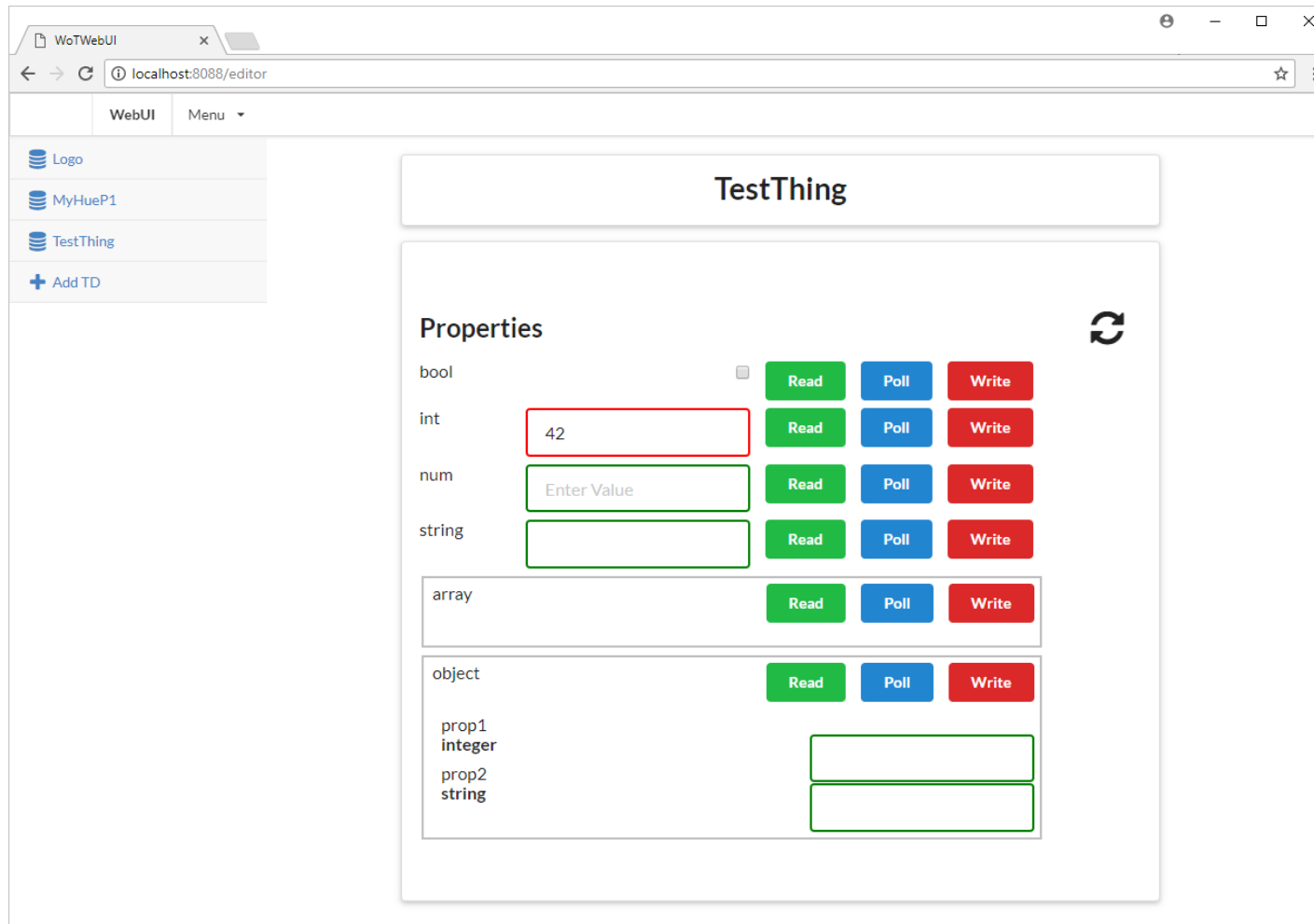
## Implements

- WoT Thing Directory for TD registration and lookup
- HTTP and CoAP interface
- SPARQL endpoint for rich queries

## Roadmap

- Domain model interface
- Query builder
- CoRE Link-Format support

# “WebUI”: TD Visualizer and WoT User Agent



## Technology

- Javascript, HTML, CSS
- AngularJS

## Implements

- WoT Thing Description visualizer (node-wot parser)
- WoT Binding Templates implementations HTTP+CoAP

## Roadmap

- Widget manager
- More Protocol Bindings

# W3C WoT Demo at IoT Playground

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.

Siemens SIMATIC 300 rack components including a SIMATIC 300 station with a color display and a SIMATIC 300 power supply unit.



# W3C WoT Resources



## W3C WoT Resources

### W3C WoT Wiki

- <https://www.w3.org/WoT/IG/wiki>  
(IG/WG organizational information)

### W3C WoT Interest Group

- <https://www.w3.org/2016/07/wot-ig-charter.html>  
(charter)
- <https://lists.w3.org/Archives/Public/public-wot-ig/>  
(mailing list)
- <https://github.com/w3c/wot>  
(technical proposals)

### W3C WoT Working Group

- <https://www.w3.org/2016/12/wot-wg-2016.html>  
(charter)
- <https://www.w3.org/WoT/WG/>  
(dashboard)

### W3C WoT Editor's Drafts

- <https://github.com/w3c/wot-architecture/>
- <https://github.com/w3c/wot-thing-description/>
- <https://github.com/w3c/wot-scripting-api/>
- <https://github.com/w3c/wot-binding-templates/>

### W3C WoT First Public Working Drafts

- <https://www.w3.org/TR/2017/WD-wot-architecture-20170914/>
- <https://www.w3.org/TR/2017/WD-wot-thing-description-20170914/>
- <https://www.w3.org/TR/2017/WD-wot-scripting-api-20170914/>

### Proposal

- <https://projects.eclipse.org/proposals/eclipse-thingweb>

### Initial Contribution

- <https://github.com/thingweb/>

# Contact



**Dr. Matthias Kovatsch**  
Senior Research Scientist  
CT RDA NEC EMB-DE

Phone: +49 (173) 5288856

E-mail: [matthias.kovatsch@siemens.com](mailto:matthias.kovatsch@siemens.com)

**siemens.com**