Andrei Ciortea, Rem Collier, Alessandro Ricci,
Antoine Zimmermann

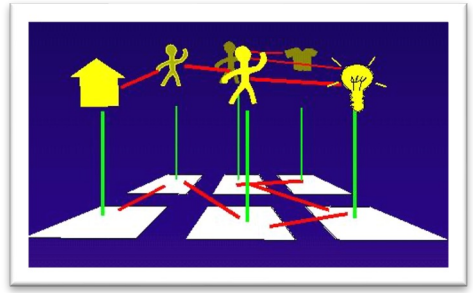
Introduction to the WebAgents CG

★ W3C TPAC 2023, Seville, 11–15 September ★

Agents on the Web

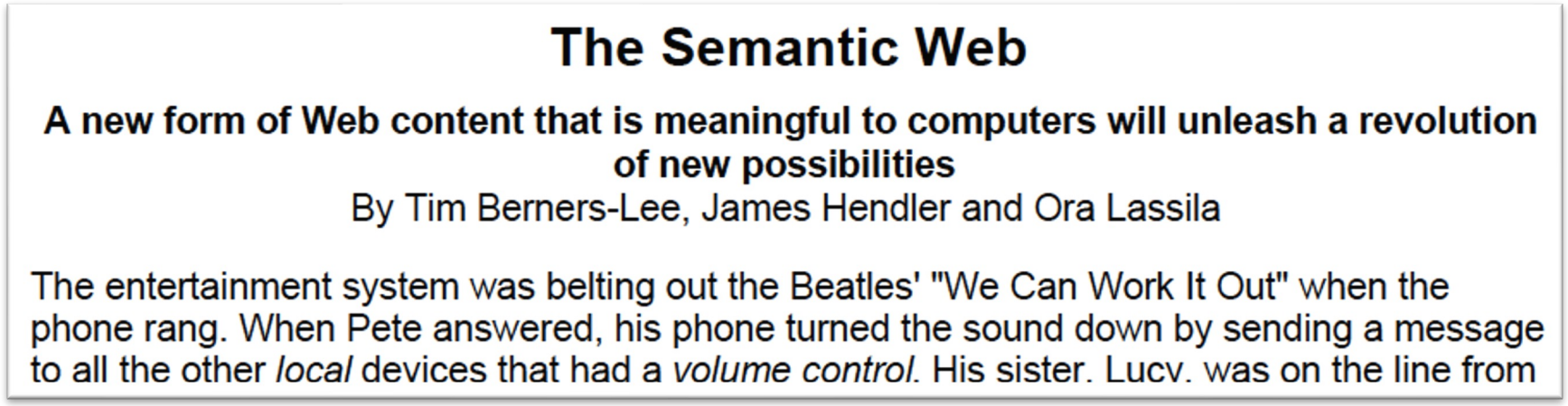
"(...) in fact documents on the web describe **real objects** and **imaginary concepts**, and give particular **relationships** between them. (...) This means that machines, as well as operating on the web information, **can do real things**."

Sir Tim Berners-Lee, WWW 1994



https://www.w3.org/Talks/WWW94Tim/

Agents on the Web



The Semantic Web

A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities

By Tim Berners-Lee, James Hendler and Ora Lassila

The entertainment system was belting out the Beatles' "We Can Work It Out" when the phone rang. When Pete answered, his phone turned the sound down by sending a message to all the other *local* devices that had a *volume control*. His sister. Lucv. was on the line from

Tim Berners-Lee, Jim Hendler, Ora Lassila. Scientific American, 2001.

A Letter from the Edito

Where Are All the Intelligent Agents?

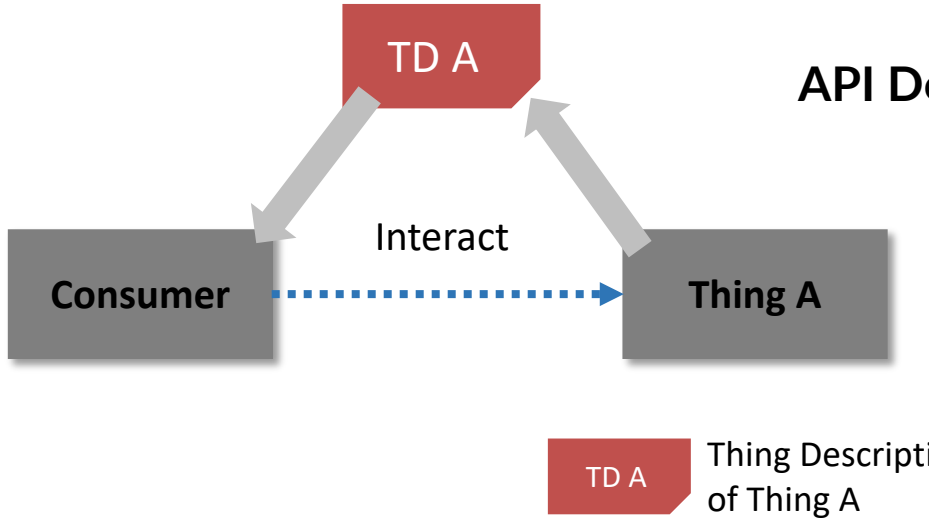
"The rest of the ideas in that article are now seeing widespread deployment, but I ask again: **where are all the agents**?"
James Hendler, IEEE Intelligent Systems, 2007

"Once **dynamic** and **open** systems become the norm, they'll need to adopt agent technologies as fundamental."
Peter McBurney and Michael Luck,
IEEE Intelligent Systems, 2007

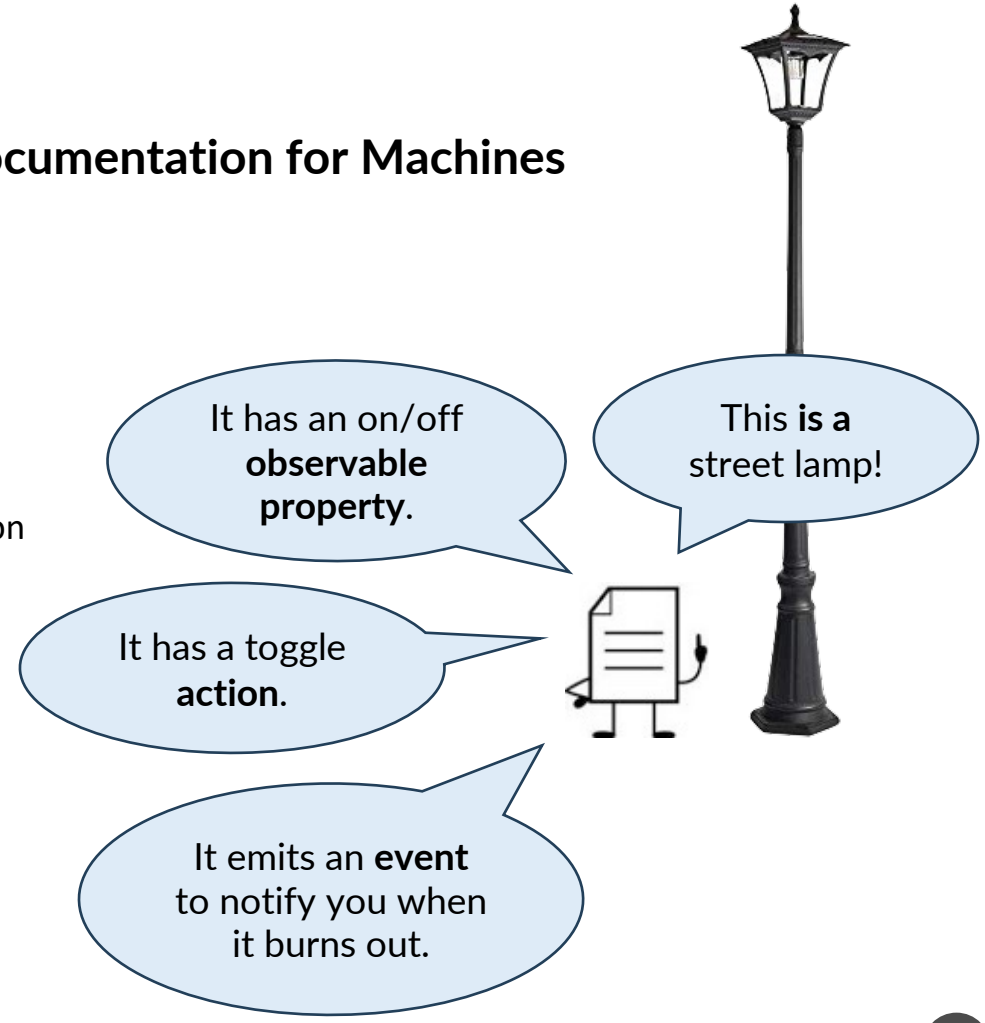
Expert Opinion

The Agents Are All Busy Doing Stuff!

The W3C Web of Things

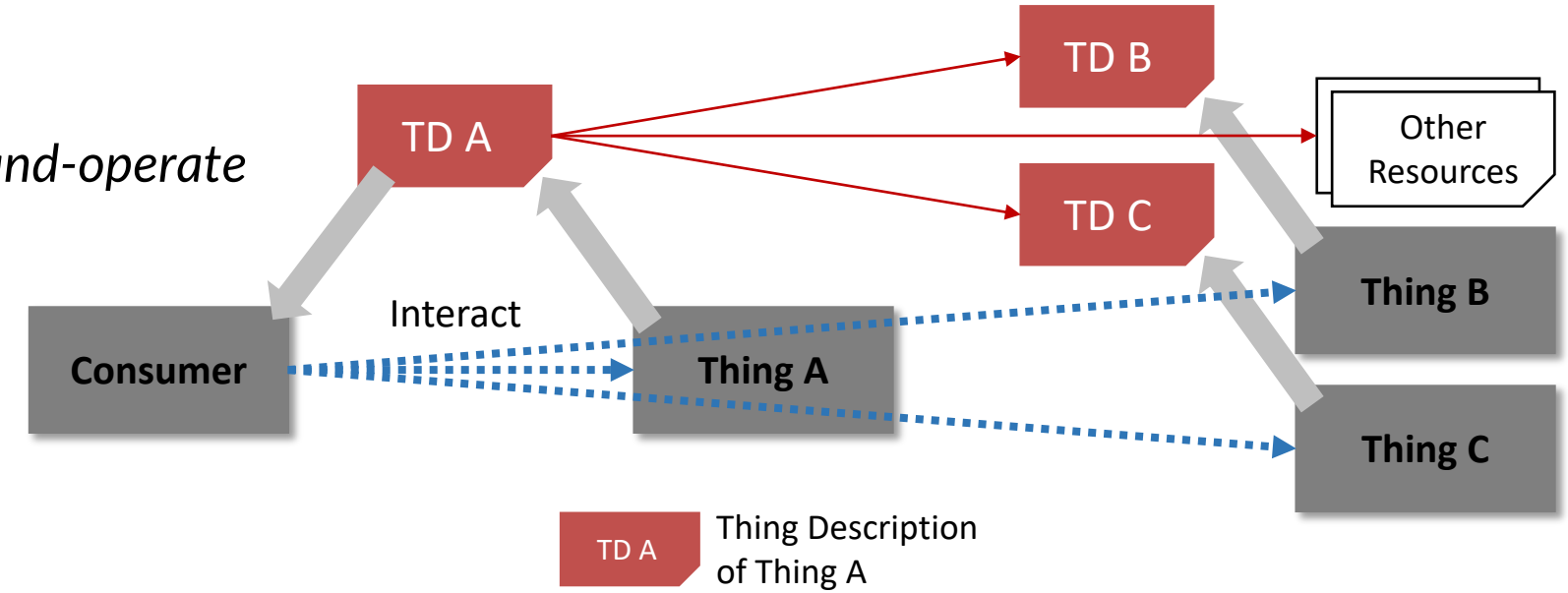


API Documentation for Machines



The W3C Web of Things

Ideally:
arrive-and-operate



Lagally et al. (eds.), Web of Things (WoT) Architecture 1.1, W3C Recommendation, 2023.

The W3C Web of Things

How to design hypermedia-based environments that ***support autonomous behavior***?

How to design software agents able to ***plan***, ***learn***, and ***adapt*** in order to achieve their tasks through ***flexible autonomous use of hypermedia***?

How to design, represent, and reason about ***interactions*** among autonomous agents, people, and any other resources on the Web?

How to design and ***govern communities*** of autonomous agents and people on the Web?

Lagally et al. (eds.), Web of Things (WoT) Architecture 1.1, W3C Recommendation, 2023.

Web Architecture and the Web of Things

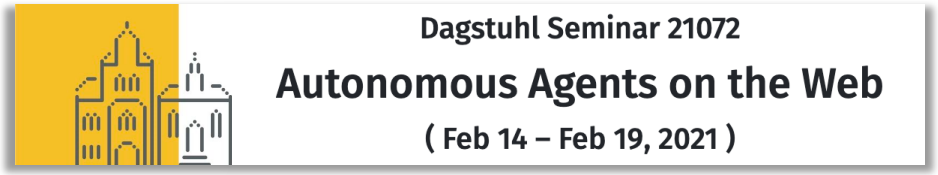
Semantic Web and Linked Data

Autonomous Agents and Multi-Agent Systems

Agents on the Web: Community

May 2019 — HyperAgents 2019 @ TheWebConf 2019

Feb. 2021 — Dagstuhl Seminar 21072: "Autonomous Agents on the Web"



https://www.dagstuhl.de/21072

Feb. 2023 — Dagstuhl Seminar 23081: "Agents on the Web"

https://www.dagstuhl.de/23081

March 2023 — W3C WebAgents Community Group

https://www.w3.org/community/webagents/

WebAgents CG: Draft Charter

Goals

This CG aims to investigate the design of a new class of Web-based Multi-Agent Systems (MAS) that:

- inherit the beneficial architectural properties of the Web (Internet-scalability, evolvability, simplicity, etc.),
- preserve the beneficial properties of MAS (adaptability, openness, robustness, etc.), and
- are human-centric (support transparency, usability, accountability, etc.).

We are especially interested in the use of Linked Data and Semantic Web standards for weaving a hypermedia fabric that mediates uniform interaction among heterogeneous entities: people, artificial agents, (low-power) devices, digital services, knowledge repositories, etc. — for this reason, we refer to this new class of Web-based MAS as Hypermedia MAS. This community group brings together experts actively contributing to advances in autonomous agents and MAS, the Web Architecture and the Web of Things, Semantic Web and Linked Data, and Web standards in general — as well as any other areas that could contribute to this approach for distributed intelligence on the Web.

In particular, the WebAgents CG aims to:

- Collect relevant background materials to support the transfer of knowledge across the various areas of expertise relevant to Hypermedia MAS.
- Collect use cases for Hypermedia MAS from the broader community.
- Collect references to relevant technologies and implementation experience from the broader community.
- Facilitate experimenting with Hypermedia MAS by collecting relevant tutorials, organizing hackathons and challenges, and promoting playgrounds for developers.

Today's Agenda

CET	Agenda
11:30-11:45	Introduction to the W3C Web of Things
11:45-12:00	Introduction to the WebAgents CG
12:00-13:00	Open Discussion