WoT Week 2024

Autonomous Agents on the Web (WebAgents) CG

Andrei Ciortea, Rem Collier, Ege Korkan, and Antoine Zimmermann

"(...) 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/
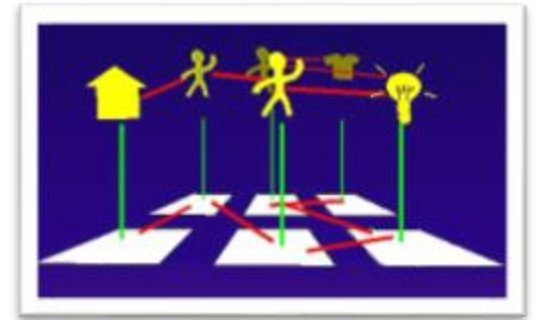
The Semantic Web

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, Lucy, was on the line from the doctor's office: "Mom needs to see a specialist and then has to have a series of physical therapy sessions. Biweekly or something. I'm going to have my agent set up the appointments." Pete immediately agreed to share the chauffeuring.

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

A Letter from the Editor

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,
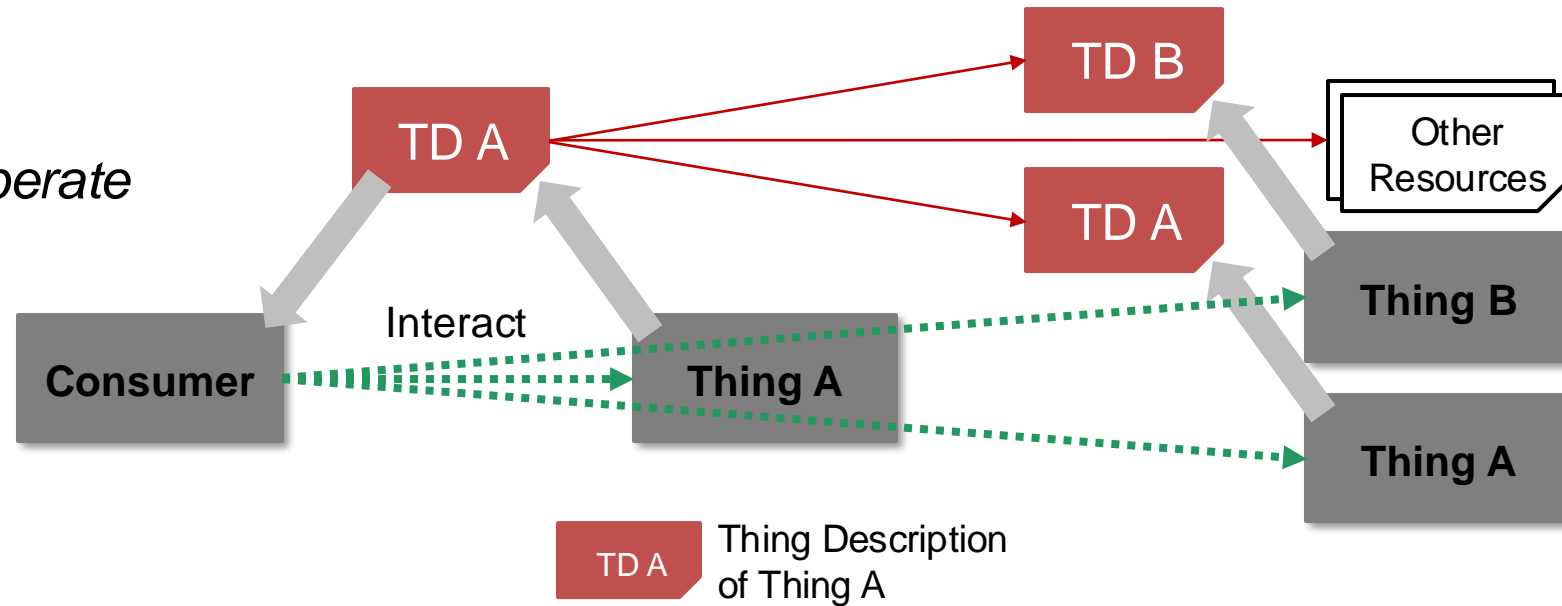IEEE Intelligent Systems, 2007

Expert Opinion

The Agents Are All Busy Doing Stuff!

The W3C Web of Things
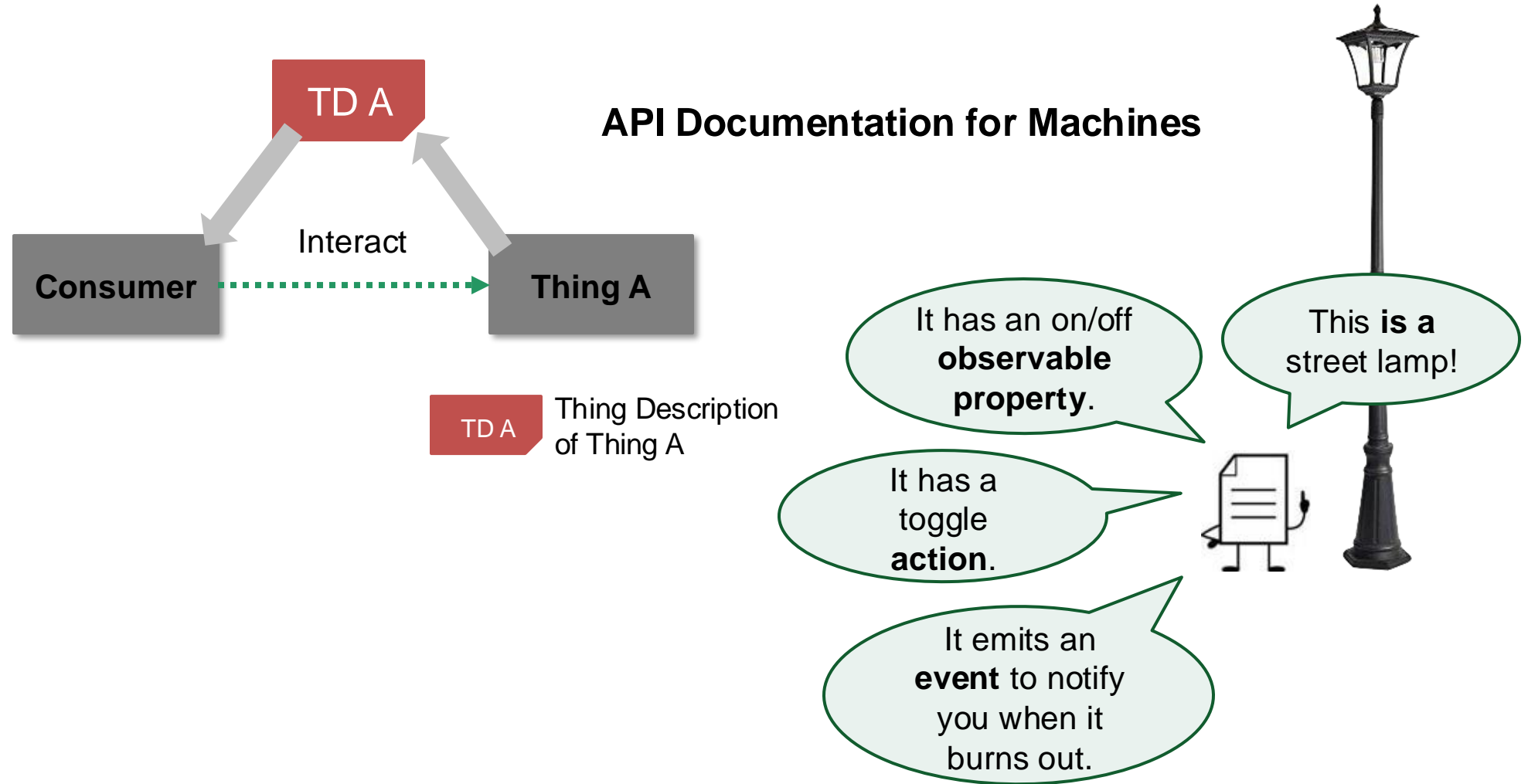
The W3C Web of Things

Ideally: *arrive-and-operate*

Matthias Kovatsch et al. (eds.), Web of Things (WoT) Architecture, W3C Recommendation, 2020.

Ideally:
arrive-ar...

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

How to **design** software agents able to **learn**, **plan**, 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?

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

Dagstuhl Seminar 21072: "Autonomous Agents on the Web"

Feb. 2021

Dagstuhl Seminar 21072
Autonomous Agents on the Web
(Feb 14 – Feb 19, 2021)

https://www.dagstuhl.de/21072

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

W3C WebAgents Community Group

March 2023

AUTONOMOUS AGENTS ON THE WEB COMMUNITY GROUP
This community group is interested in the design of Web-based Multi-Agent Systems (MAS) for the deployment of world-wide hybrid communities of people and artificial

Dagstuhl Seminar 23081
Agents on the Web
(Feb 19 – Feb 24, 2023)

https://www.dagstuhl.de/23081

Sep. 2023

TPAC 2023

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

WebAgents CG: Charter

Autonomous Agents on the Web (WebAgents) Community Group Charter

This is the charter for the W3C Autonomous Agents on the Web (WebAgents) Community Group (CG).

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.

WebAgents CG: Charter

Scope of Work

To achieve its goals, the WebAgents CG pursues the following activities:

- Organizing events such as hackathons, plugfests, workshops, etc.

- Writing Community Group Reports on the findings of the CG.

- Curating online materials to help promote the work of the CG and to support experimenting with Hypermedia MAS.

- Creating liaisons with other groups at the W3C (Community, Interest, and/or Working Groups) that are relevant to the topics explored in this CG.

- Creating liaisons with the research community and the industry.

Use Cases TF

Manageable Affordances TF

On-going Task Forces

☐ ⊙ **12 Open** ✓ 3 Closed   Author ▾   Label ▾   Projects ▾   Milestones ▾   Assignee ▾   Sort ▾

☐ ⊙ **[Use Case TF] Semi-Automated Warehouse** `use case`   💬 4
　 #41 opened on Apr 10 by samubura

☐ ⊙ **[Manageable Affordances TF] Context-Based Authorized Access to Thing Affordances** `scenario`   💬 4
　 #40 opened on Mar 30 by asorici

☐ ⊙ **[Use Case TF] Scheduling medical treatment (from Berners-Lee et al., 2001)** `use case`   💬 1
　 #36 opened on Mar 10 by scranefield

☐ ⊙ **[Manageable Affordances TF] Digital physical rehabilitation** `scenario`   💬 1
　 #32 opened on Feb 15 by jpcik

☐ ⊙ **[Manageable Affordances TF] Blind and Light actions in Smart Home**
　 #31 opened on Feb 15 by egekorkan

☐ ⊙ **[Manageable Affordances TF] Safety Checks in Industrial Motor Driver**
　 #30 opened on Feb 15 by egekorkan

☐ ⊙ **[Manageable Affordances TF] Local Device Discovery** `scenario`
　 #29 opened on Feb 15 by egekorkan

☐ ⊙ **[Manageable Affordances TF] Events in Automation Systems** `scenario`
　 #28 opened on Feb 14 by codepasta

W3C Community Group Draft Report

DRAFT — UNOFFICIAL

TABLE OF CONTENTS

Abstract

Status of This Document

1. Introduction

2. Motivating Scenarios

3. Requirements

4. Gap Analysis

5. Practical Experience

6. Conformance

WebAgents Community Group Report on Manageable Affordances

Draft Community Group Report 06 June 2024

Latest published version:
https://www.w3.org/webagents-man-aff/

Latest editor's draft:
https://w3c-cg.github.io/webagents/

Editor:
Your Name

Feedback:
GitHub w3c-cg/webagents (pull requests, new issue, open issues)

Copyright © 2024 the Contributors to the WebAgents Community Group Report on Manageable Affordances Specification, published by the Autonomous Agents on the Web Community Group under the W3C Community Contributor License Agreement (CLA). A human-readable summary is available.

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Abstract

This is a Community Group report on identified scenarios for Manageable Affordances in the Web.

WebAgents CG: Charter

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Use Cases TF

Manageable Affordances TF

Out of Scope

Under this initial charter, the work of the WebAgents CG is in an exploratory phase — and the scope of the relevant topics also needs to reflect the interests of CG members.

The WebAgents CG aims to maintain its complementarity with other CGs. For instance, while many of the topics related to the overall objective of this CG draw from (Decentralized) AI research, its main focus is primarily on architectures for and the engineering of Hypermedia MAS. Other W3C groups might be better suited for other AI-related topics (e.g., see the Cognitive AI CG, the AI Knowledge Representation CG, or the Human-Centric AI CG). The WebAgents CG provides a unique forum for everyone interested to integrate these aspects for exploring and designing large-scale, open, long-lived, and decentralized Web-based systems of people and intelligent (artificial) agents.

The WebAgents CG @ WoT Week 2024

CET	Agenda
16:00-16:15	Welcome & Review of CG Activity
16:15-16:45	Updates & Feedback from the PlugFest
16:45-17:45	Open Discussion: • Challenges & Opportunities • Interoperability TF
17:45-18:00	Conclusions and Next Steps

Any Questions / Comments / Doubts / Concerns?

Images

https://freepik.com