Autonomous Agents on the Web (WebAgents) Community Group

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

MARCH 9, 2026

WebAgents CG Co-Chairs

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Basic Info

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

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

GitHub: https://github.com/w3c-cg/webagents/

Calendar: https://www.w3.org/groups/cg/webagents/calendar/

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.).

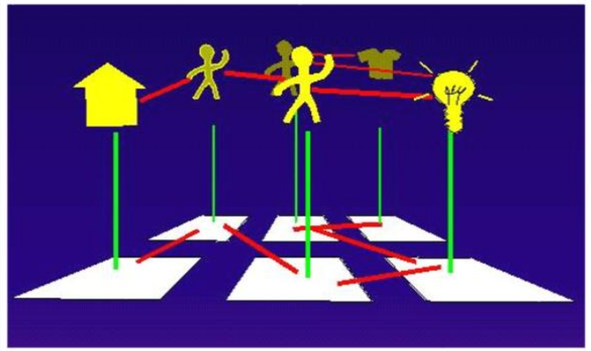
Today’s Agenda

Motivation & Driving Forces

Activity Overview

Interoperability Task Force

Motivation: Visions of Agents on the Web



Sir Tim Berners-Lee 1994
http://www.w3.org/Talks/WWW94Tim/

The Semantic Web

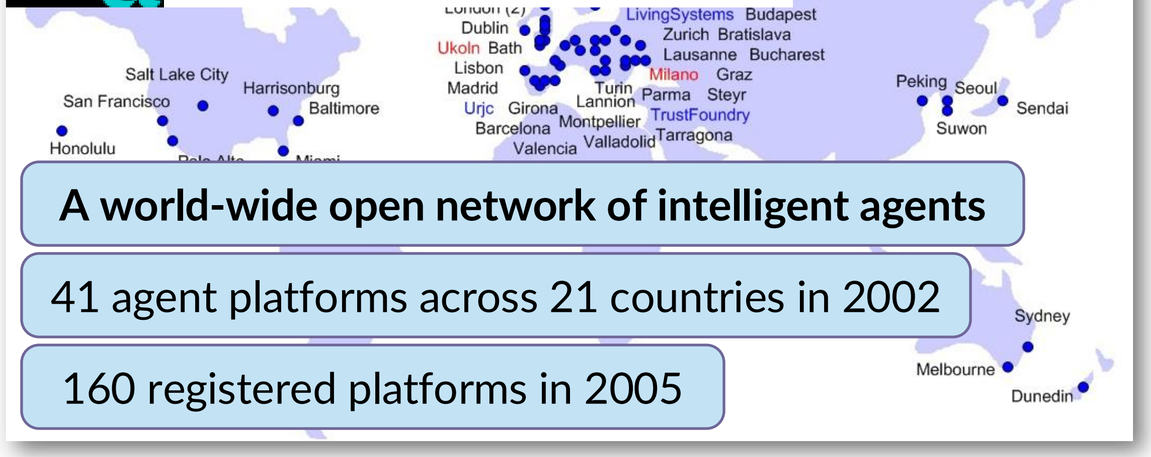
A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities

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

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

Foundation for Intelligent Physical Agents (FIPA)



A world-wide open network of intelligent agents

41 agent platforms across 21 countries in 2002

160 registered platforms in 2005

AgentCities
(Wayback Machine; April 3, 2007)

DARPA Control of Agent Based Systems (CoABS): bring together heterogenous technologies to autonomously respond to dynamic and evolving scenarios

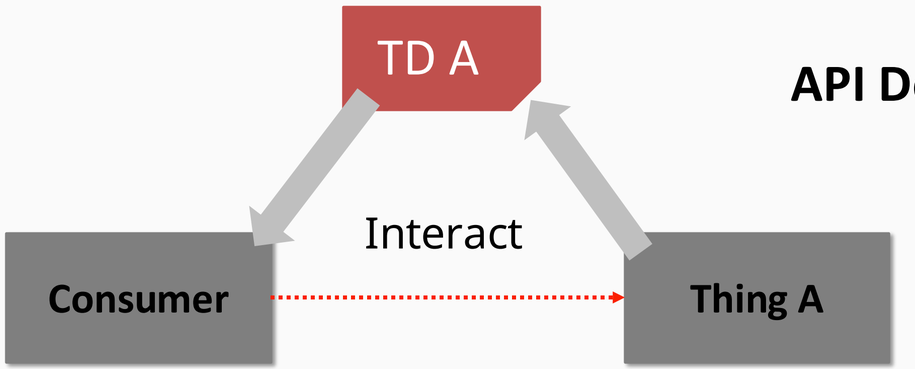
DARPA Agent Mark-up Language (DAML):

Helped kick-start the **Semantic Web**

Signaled a shift from custom-built middleware to **leveraging the Web's existing infrastructure**

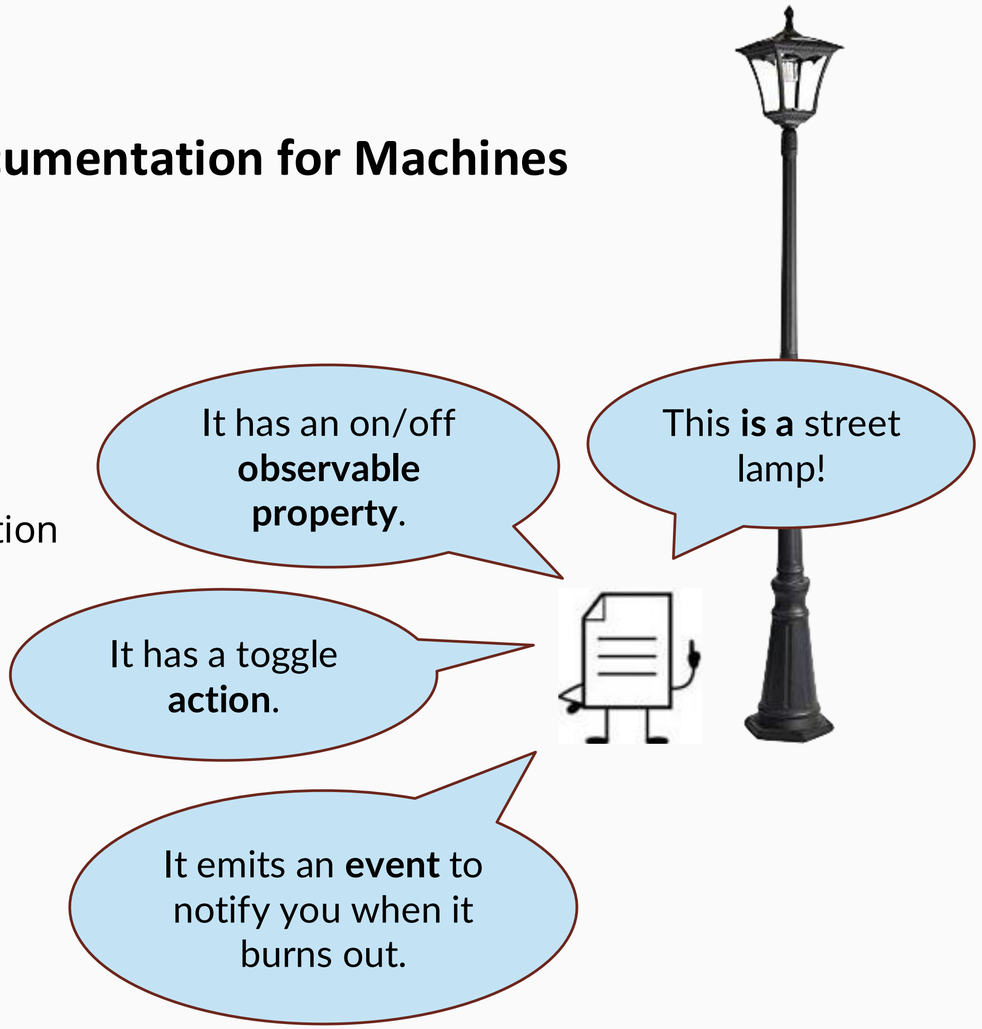
https://web.archive.org/web/20240621071356/http://fipa.org/
https://web.archive.org/web/20070403205629/http://www.agentcities.org/Network/

Driving Forces: The W3C Web of Things



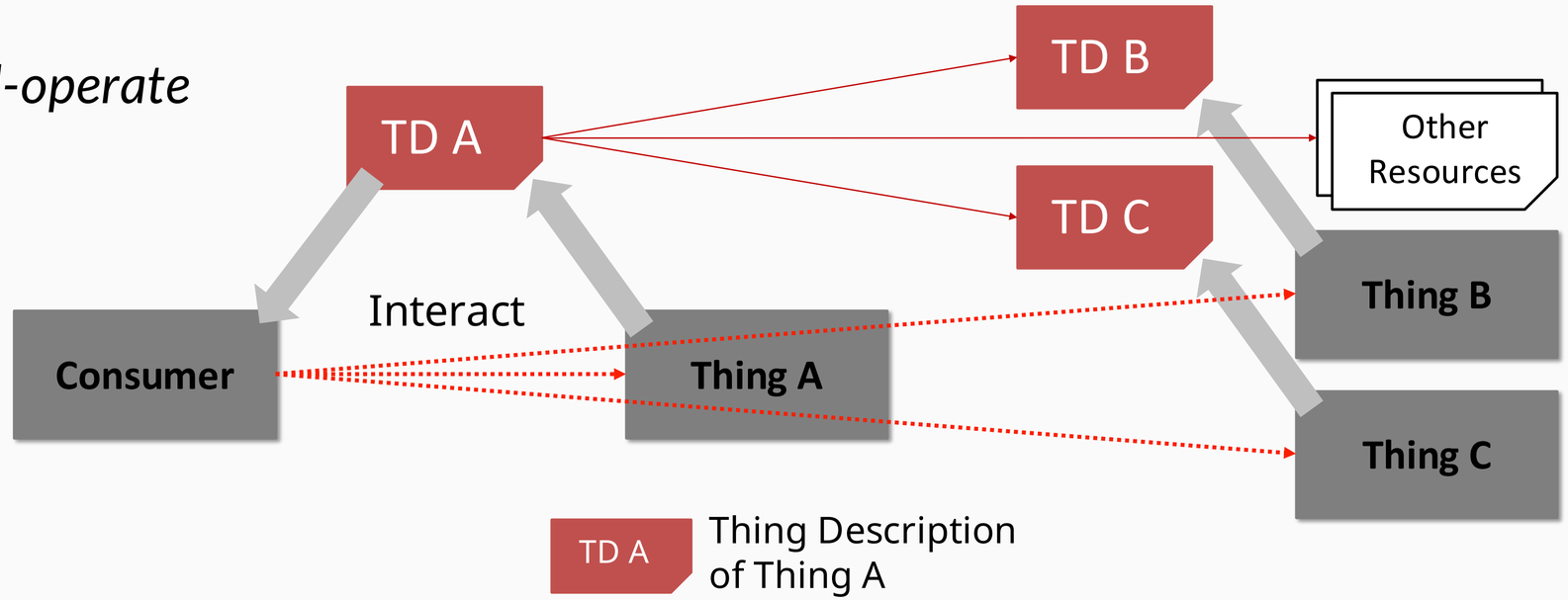
API Documentation for Machines

TD A Thing Description of Thing A



Driving Forces: The W3C Web of Things

Ideally:
arrive-and-operate



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

Driving Forces: The W3C Web of Things

Ideally:
arrive

How to represent resources and their affordances in a way that is **meaningful** to consumers?

How to design consumers able to ***plan***, ***learn***, and ***adapt*** in order to achieve their tasks by ***navigating*** the hypermedia and ***deciding*** at run time?

How can consumers **interact** and **coordinate** with one another in a shared WoT environment?

How to **control** and **govern** autonomous consumers?

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

Web Architecture and the Web of Things

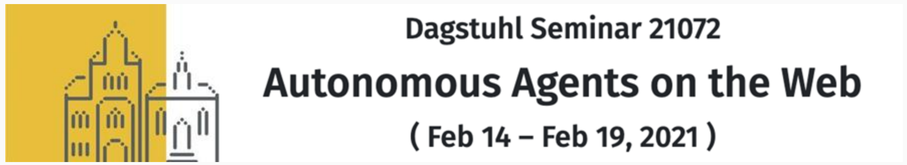
Semantic Web and Linked Data

Autonomous Agents and Multi-Agent Systems

Revival: 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"

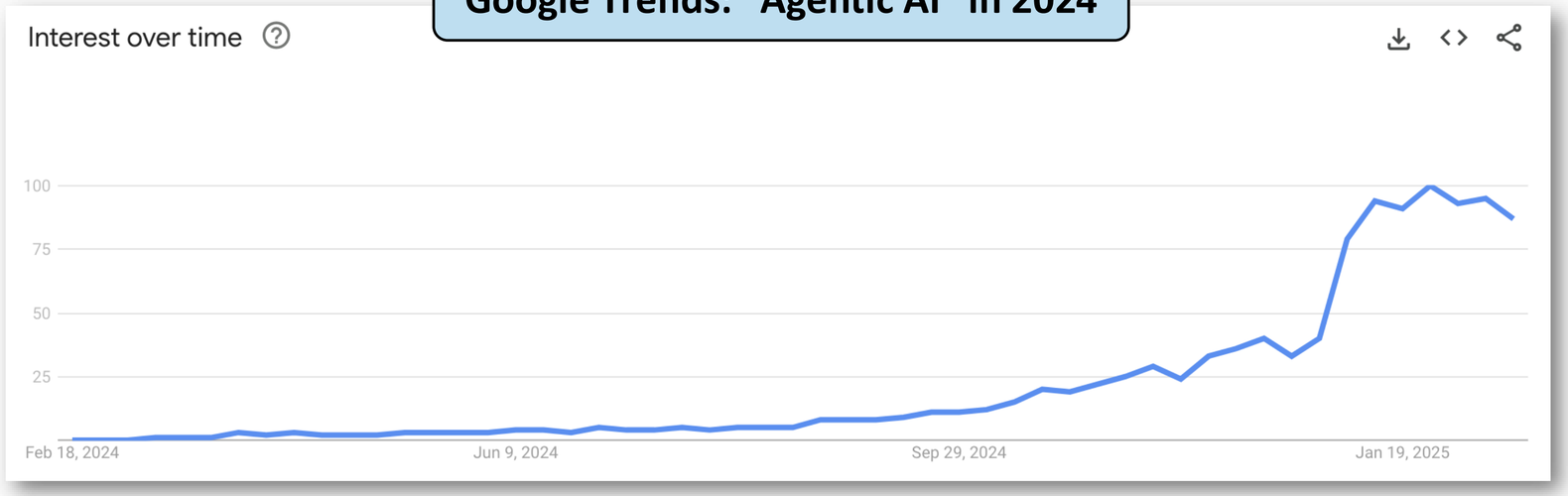
https://www.dagstuhl.de/23081

March 2023 — W3C WebAgents Community Group

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

Driving Forces: 2025 – The Year of Agents

Google Trends: “Agentic AI” in 2024



https://trends.google.com/trends/

LLM-based agents are still **task-specific** (like previous generations of agents)

⇒ **need for open networks** of agents combining complementary abilities

⇒ **rapid emergence of protocols** for tool discovery & use and agent–to-agent interaction

Partial reliance on Web standards for interoperability

Protocol landscape unclear: alignments, misalignments, overlaps

Today’s Agenda

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Activity Overview

Interoperability Task Force

Activity Overview

Active mailing list

Bi-weekly meetings with alternating timeslots

Hybrid Meetings (TPAC 2023, EUMAS 2024, WoT Week 2024, ECAI 2025, TPAC 2025)

Three Task Forces:

- Use Cases
- Manageable Affordances
- Interoperability

Interoperability Task Force

W3C Community Group Draft Report

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WebAgents Community Group Report on Interoperability for Agents on the Web

Draft Community Group Report 09 February 2026

6 3 ReSpec

Latest published version:
none

Latest editor's draft:
https://w3c-cg.github.io/webagents/TaskForces/Interoperability/Reports/report-interoperability.html

Editors:
Andrei Ciortea (Inria and University of St.Gallen)
Rem Collier (University College Dublin)

Authors:
Jérémy Lemée (University of St.Gallen)
Danai Vachtsevanou (University of St.Gallen)
Your Name

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

Abstract

Advances in large language models (LLMs) that can follow instructions an... autonomous agents and multi-agent systems. Like previous generations... designed for specific tasks, highlighting the need for open networks of ag... abilities to tackle more complex problems. New protocols are rapidly em...

https://bit.ly/webagents-interop

What should be the **role of the Web** in the emerging landscape of Agentic AI?

What are the **relevant standards** within and maybe also outside the W3C?

What are the **standardization gaps** (if any)?

Interoperability Task Force

1996

Is It an Agent, or Just a Program?:
A Taxonomy for Autonomous Agents

Stan Franklin and Art Graesser

Institute for Intelligent Systems, University of Memphis, Memphis, TN 38152, USA
stan.franklin@memphis.edu
graesser@cc.memphis.edu

Abstract

The advent of software agents gave rise to much discussion of just what such an agent is, and of how they differ from programs in general. Here we propose a formal definition of an autonomous agent which clearly distinguishes a software agent from just any program. We also offer the beginnings of a natural kinds taxonomy of autonomous agents, and discuss possibilities for further classification. Finally, we discuss subagents and multiagent systems.

1 Introduction

On meeting a friend or colleague that we haven't seen for a while, or a new acquaintance, some version of the following conversation often ensues:

W3C Community Group Draft Report

WebAgents Community Grou
Interoperability for Agents on

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Latest published version:

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§ 2. Terminology

Agent* or *Autonomous Agent
An entity situated in an environment that perceives its environment and acts on it, over time, in pursuit of its goals. For a detailed discussion of agent definitions, see [*FRANKLIN96*].

Agent Interaction Protocol
A specification of communication among two or more agents that states who can say what to whom and when — for example, as message sequence diagrams [*AUML*] or information flows [*BSPL*].

Augmented Language Model
A language model augmented with abilities such as reasoning, tool use, information retrieval, or storing context across interactions. Unlike an agent, an augmented language model does not actively pursue goals and is not situated in an environment. See also [*TMLR23*] and [*ANTHROPIC24*].

LLM Agent* or *Language Agent
An agent that relies on an LLM to guide their internal processes and interactions with the environment, while maintaining control over how they accomplish tasks [*ANTHROPIC24*][*COALA23*]. [This is the sort of agent people think about when they talk about Agentic AI.]

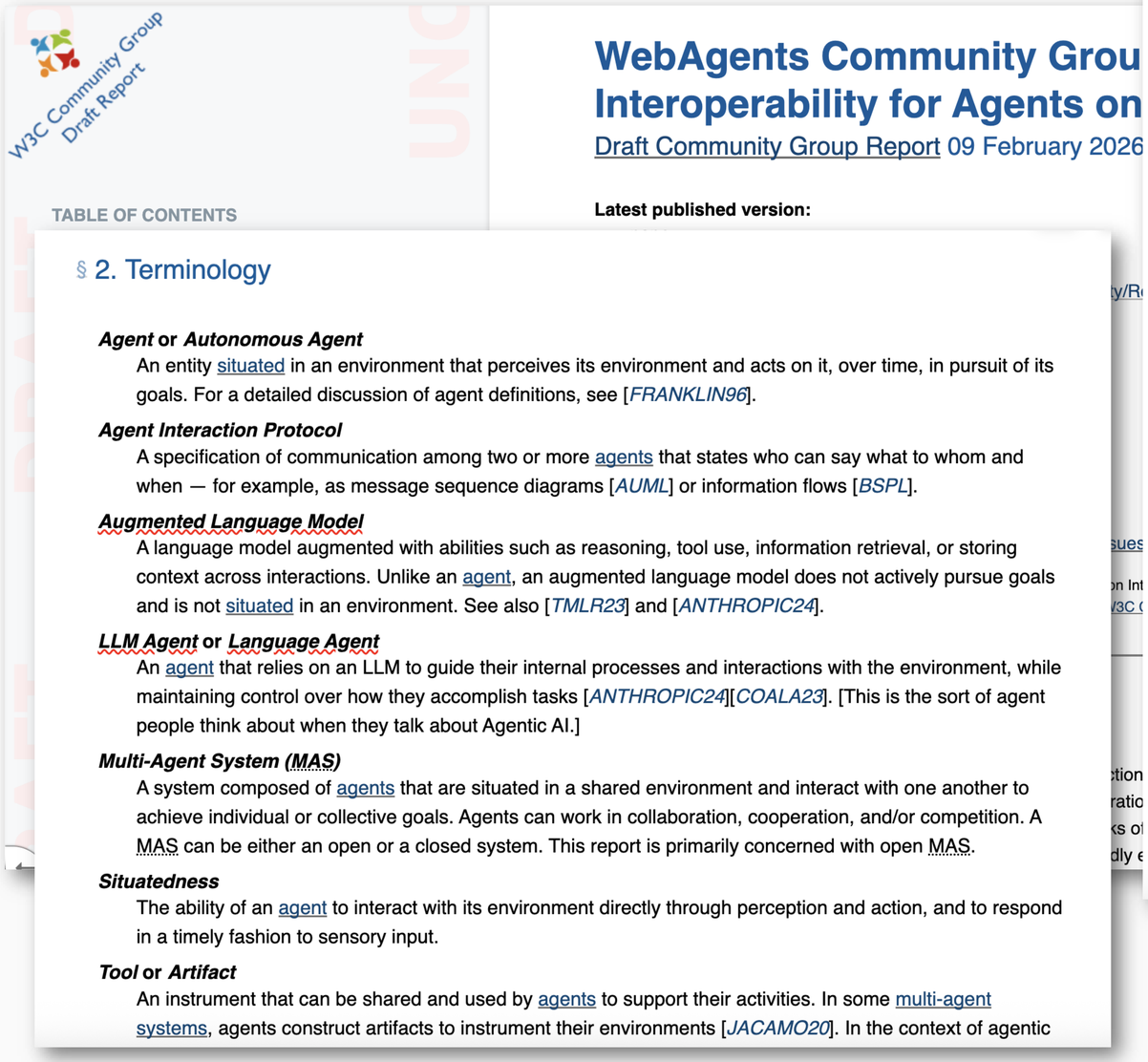
Multi-Agent System (MAS)
A system composed of agents that are situated in a shared environment and interact with one another to achieve individual or collective goals. Agents can work in collaboration, cooperation, and/or competition. A MAS can be either an open or a closed system. This report is primarily concerned with open MAS.

Situatedness
The ability of an agent to interact with its environment directly through perception and action, and to respond in a timely fashion to sensory input.

Tool* or *Artifact
An instrument that can be shared and used by agents to support their activities. In some multi-agent systems, agents construct artifacts to instrument their environments [*JACAMO20*]. In the context of agentic

tions and use tools have renewed interest in
rations of agents, LLM-based agents are
ks of agents that complement each other's
dly emerging to allow agents to discover and

Interoperability Task Force



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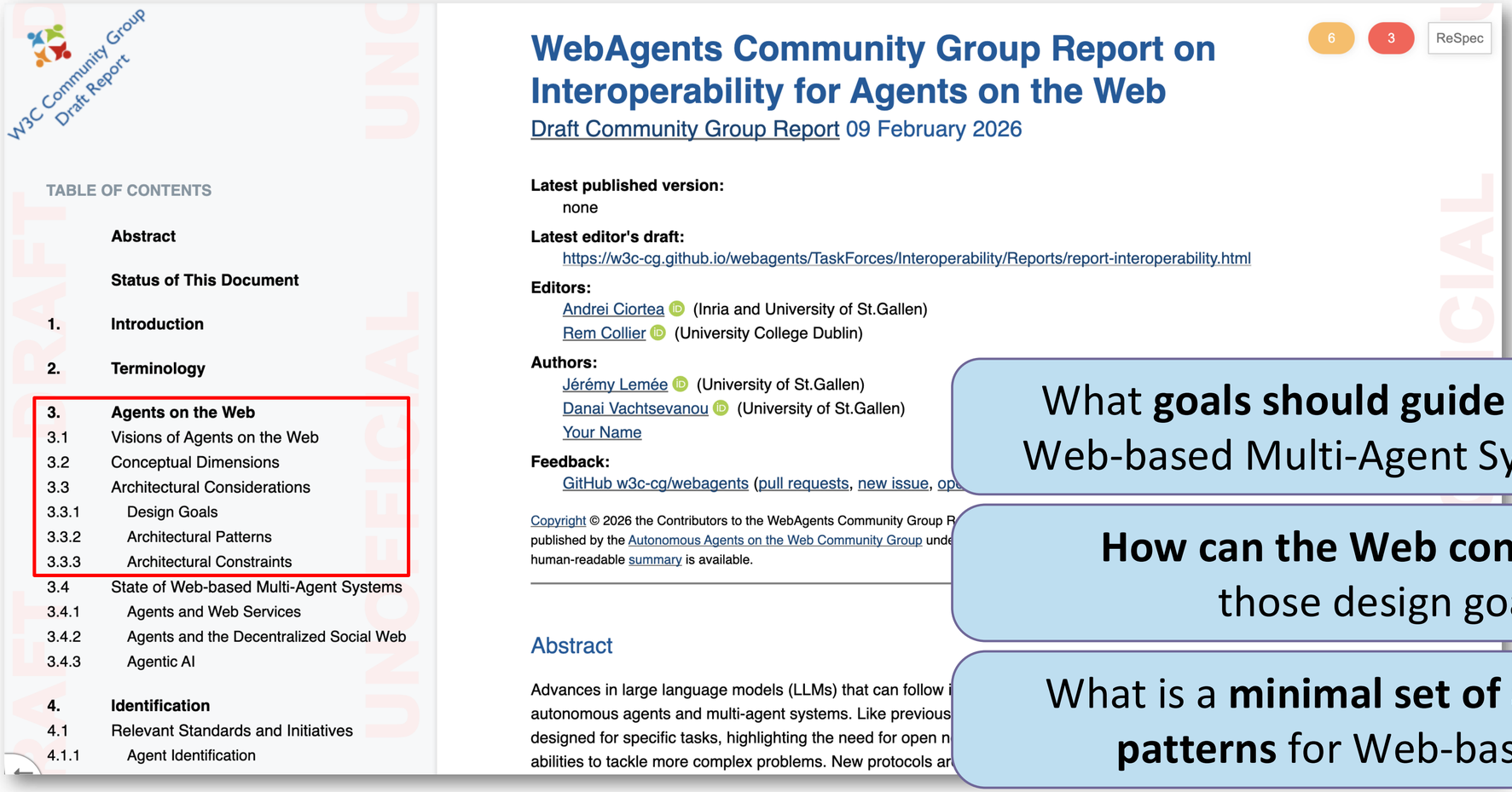
	Relevant Concepts	Agent Interaction	Tool Use	Identifiers	Descriptions	Discovery Mechanisms	Arch. Style
MCP	Tool, Resource, Prompt	N/A	Function calling	Strings (Tools and Prompts), URIs (Resources)	Tool definition, Resource descriptions, Prompt definitions, (JSON)	Directories (via */list)	Client-Server with streaming RPC connectors (JSON-RPC 2.0, Streamable HTTP)
A2A	Agent Card, Task	Task invocation	N/A	Strings?	Agent Card, Task description, (JSON)	Well-known URIs, Directories	Async. Client-Server with streaming RPC connectors and webhooks (JSON-RPC 2.0, HTTP+SSE)
ANP	Agent, Agent Description, Communication Protocol	Communication protocols with protocol negotiation	N/A	W3C DID with custom Web-based Agent DID Method	Agent Description (RDF/JSON-LD)	Directories	Peer-to-Peer? (WebSocket subprotocol)
LMOS	Agent, Agent Group, Tool, Agent Description, Tool Description	Message passing? (in principle: TD interaction affordances)	Property Affordances, Event Affordances, Action Affordances (W3C WoT TD)	Uniform identifiers (IRIs, W3C DIDs)	Agent Description, Tool Description (W3C WoT TD; JSON, RDF/JSON-LD)	DNS-SD/mDNS, Well-known URIs, Directories (W3C WoT Discovery)	W3C WoT Arch.? with protocol bindings for HTTP and WebSocket subprotocol

Interoperability Task Force



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Abstract

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designed for specific tasks, highlighting the need for open n
abilities to tackle more complex problems. New protocols ar

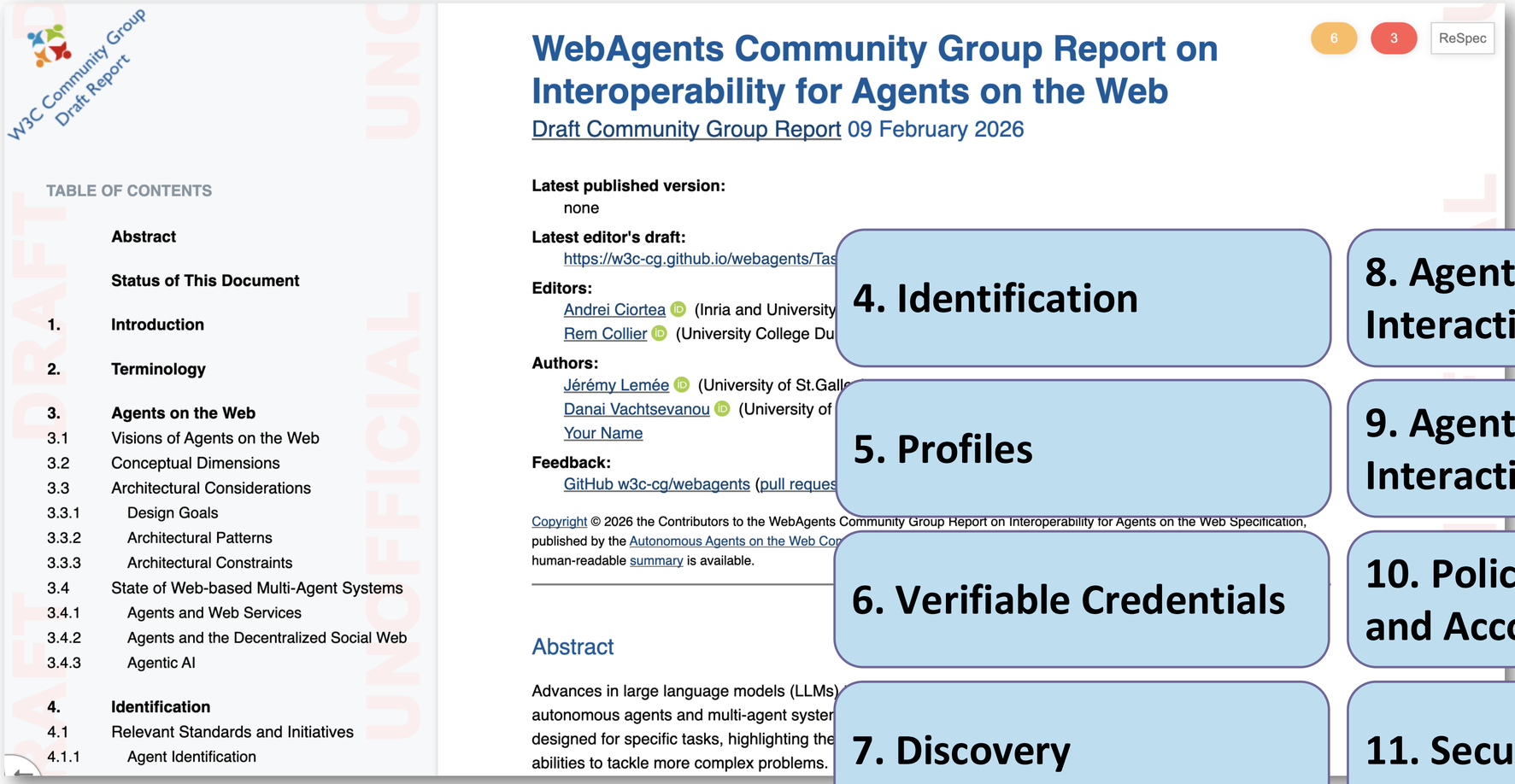
What **goals should guide** the design of Web-based Multi-Agent Systems (MAS)?

How can the Web contribute to those design goals?

What is a **minimal set of architectural patterns** for Web-based MAS?

What **architectural constraints** do we need in order to fully leverage the Web?

Interoperability Task Force



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4. Identification

8. Agent-to-Agent Interaction

5. Profiles

9. Agent-Environment Interaction

6. Verifiable Credentials

10. Policies, Norms, and Accountability

7. Discovery

11. Security and Privacy

12. Conclusions: A Roadmap for Agents on the Web

Thank you!

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