

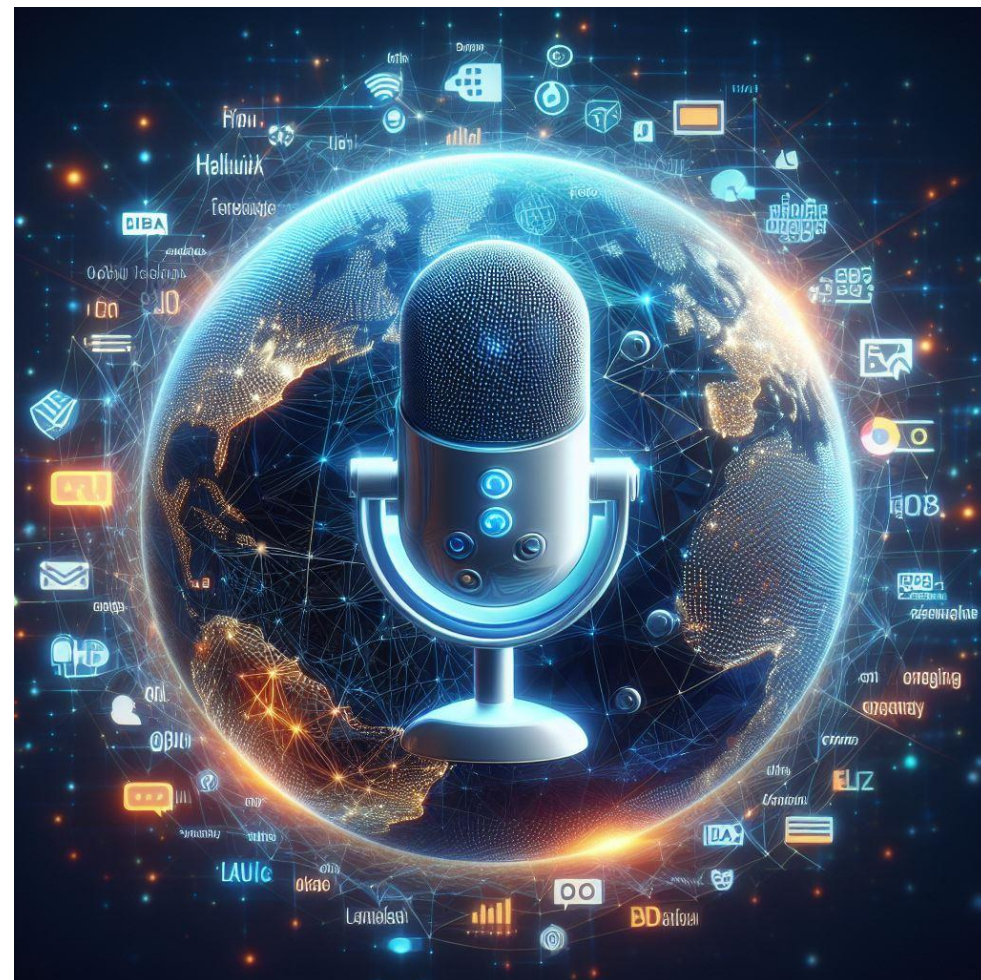


Conversational Assistants that Converse with Each Other:

The LFAI & Data Foundation Open Voice
Interoperability Initiative

Deborah Dahl

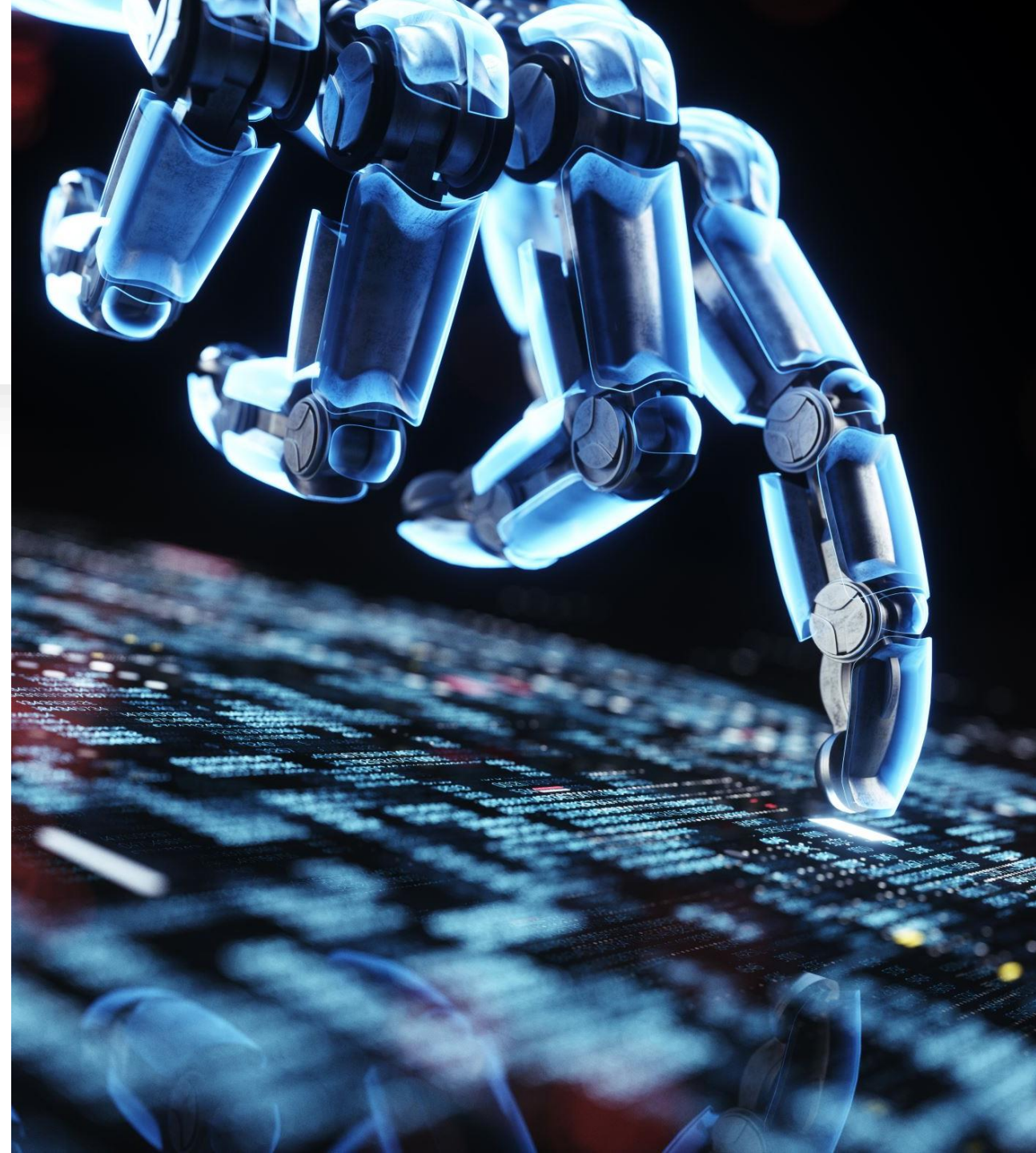
Principal, Conversational Technologies
Senior Advisor, Open Voice
Interoperability Initiative



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Problem

- There are millions of chatbots and voice bots (conversational assistants) in the world
- Hosted on mobile phones, smart speakers and websites
- Hosted by many organizations –government, business, and non-profit
- Each one is independent of the others, even within an organization
- Each one has its own expertise
- This leads to:
 - implementation complexity
 - duplication of effort
 - friction for users



Why Not Voice That Works Like the Web?

Compare today's conversational assistance to the worldwide web.


In the worldwide web, web pages and websites communicate with each other using standards such as *http* and *html*.

From any browser to any destination.

Conversational assistants should be able to connect and communicate through *standard messages and formats*. Conversational AI, open and freely accessible, like the web.

- For users, more sources, more ideas, more content.
- For innovators and entrepreneurs, more opportunity.
- For enterprise users, more investment efficiency (*build once, use everywhere*), increased vendor choice, and direct connection to customers.

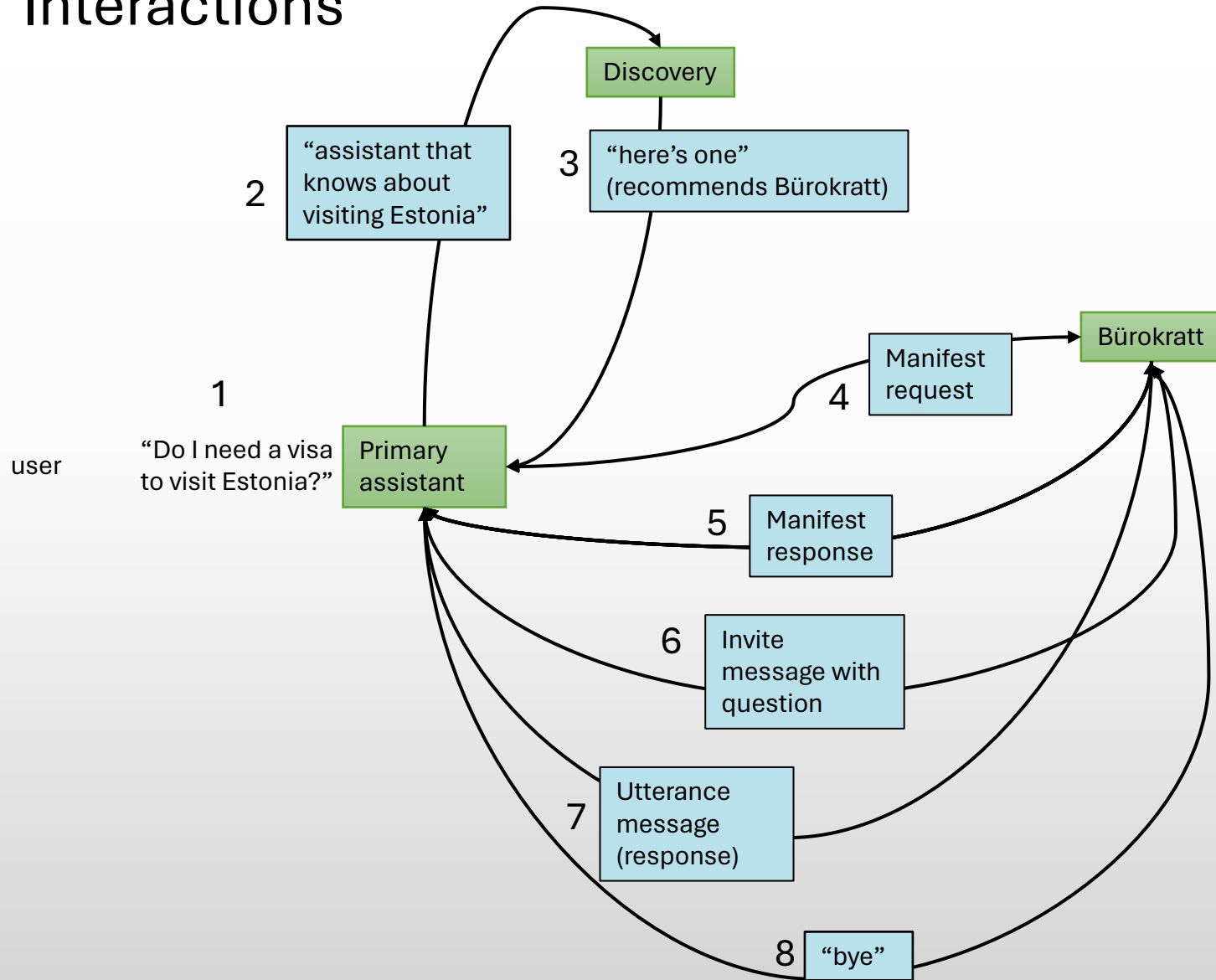
The Open Voice Interoperability Initiative is developing these standards.



Open Voice Interoperability Project Goals

- Enable independent conversational assistants on diverse platforms to communicate
- Reduce friction for users so that they don't have to visit multiple assistants to get the information they need
- Enable multiple legacy assistants within an enterprise to interact, even if they were developed on different platforms

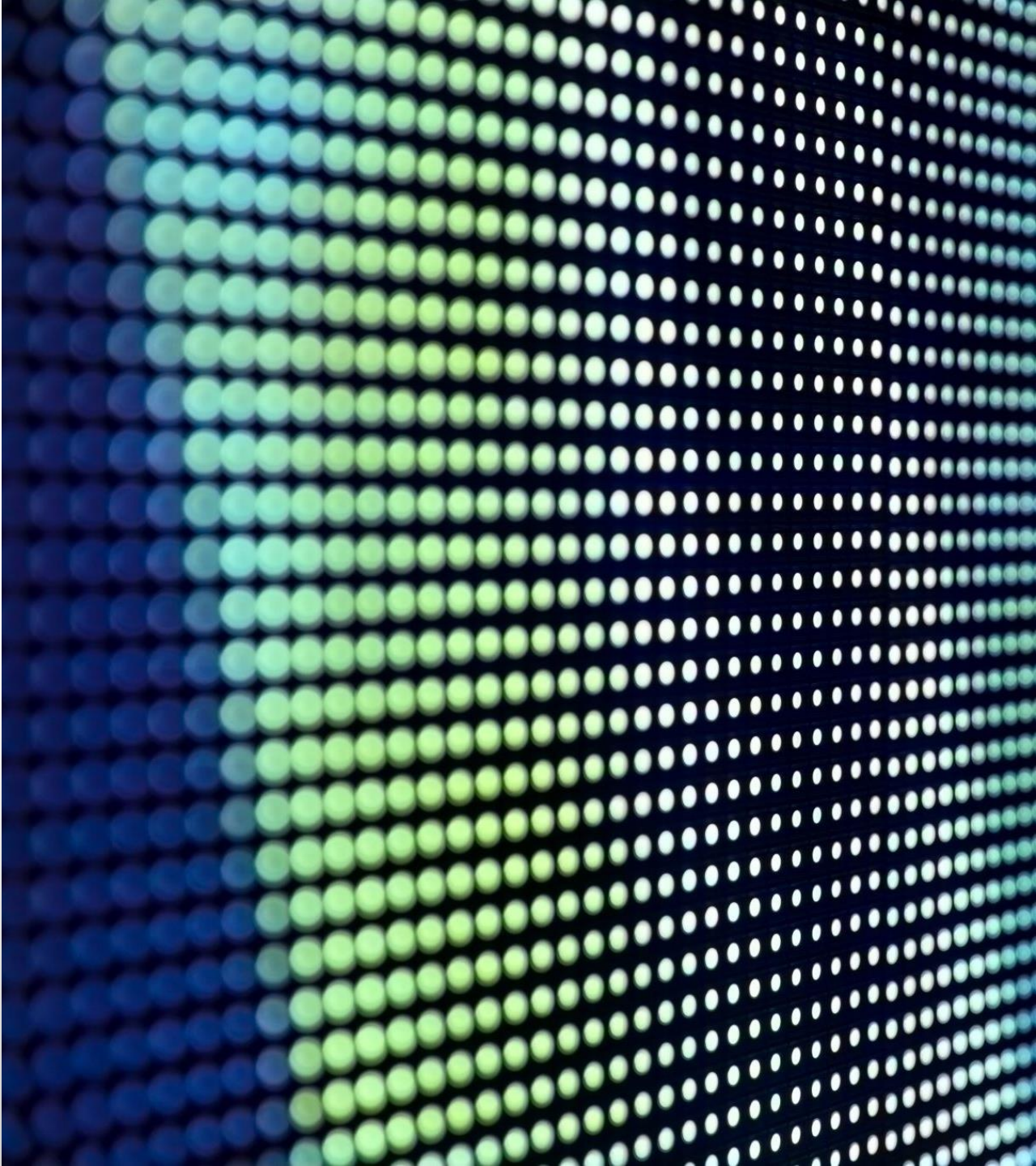
Life Cycle of Interoperable Assistant Interactions



1. User asks a question of the primary assistant
2. If the primary assistant can't answer, it looks for another assistant that can
3. A Discovery system recommends an assistant with the appropriate expertise (Bürokratt)
4. The primary assistant asks Bürokratt for a description of its abilities (manifest)
5. Bürokratt sends its manifest
6. The primary assistant reviews the manifest, decides that Bürokratt will be able to answer the question and invites Bürokratt to join the conversation
7. Bürokratt answers the question
8. The conversation is over, Bürokratt says "goodbye"

Project History

- Project born of 2017-2018 MIT-Intel-Capgemini research.
- Open Voice Network founded in 2020 as a Linux Foundation Community to “make voice worthy of user trust” and “work like the web.”
- The Open Voice Interoperability Initiative joined the LFAI & Data Foundation as a new project in November 2023, along with Trustmark



Project Activities

1. Specifications
2. Code
3. Collaborations
4. Implementations
5. Contributors
6. Roadmap

1. Specifications

- Dialog Events
- Conversation Envelope
- Manifest (Coming soon!)



2. Code: The Sandbox

Hands-on with the specifications

[Startup Page](#) [Settings](#) [Create New Assistant](#)

Choose an Assistant: 2: wizard ▼

[Bare Invite](#)

[Invite w/ WHISPER](#)

wizard's Settings

Assistant Name:


Assistant ID:

Voice Index:
 [Load Voices](#)

Light Color:

Marker Color:

Service Name:

Service Address: 

Auth Code:

Content Type:

[Update Assistant Settings](#)



OVON Sandbox

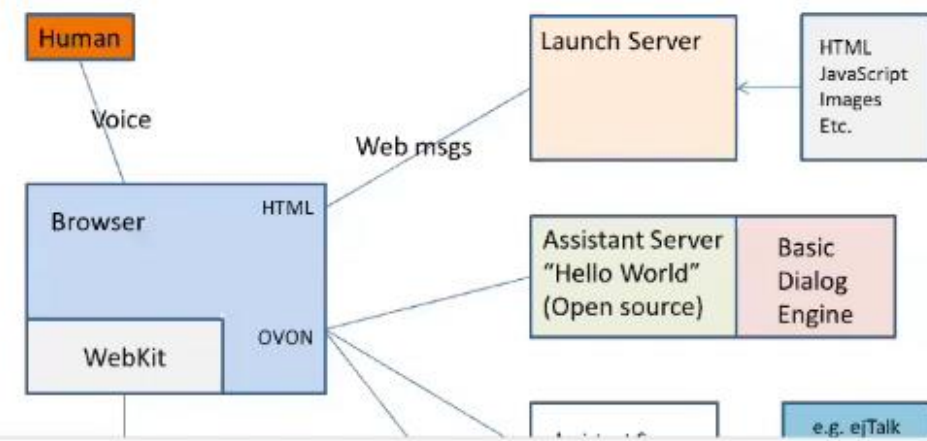
Enter the name you want the assistants to address you by:

Emmett

Start Sandbox

OVON Sandbox

Localhost Servers



Conversation Envelope and Dialog Events

SENT:

```
{
  "ovon": {
    "conversation": {
      "id": "convoID8403984"
    },
    "schema": {
      "version": "0.9.0",
      "url": "not_published_yet"
    },
    "sender": {
      "from": "Debbie"
    },
    "responseCode": {
      "code": 200,
      "description": "OK"
    },
    "events": [
      {
        "eventType": "utterance",
        "parameters": {
          "dialogEvent": {
            "speakerId": "Debbie",
            "span": {
              "startTime": "2024-03-21T20:35:05.234Z"
            },
            "features": {
              "text": {
                "mimeType": "text/plain",
                "tokens": [
                  {
                    "value": "which planet has more moons, Mars or Jupiter"
                  }
                ]
              }
            }
          }
        }
      }
    ]
  }
}
```


Message
returned from the
other assistant

RECEIVED:

```
{
  "ovon": {
    "conversation": {
      "id": "convoID8403984"
    },
    "sender": {
      "from": "https://www.asteroute.com/ovontest"
    },
    "responseCode": 200,
    "events": [
      {
        "eventType": "utterance",
        "parameters": {
          "dialogEvent": {
            "speakerId": "wizard",
            "span": {
              "startTime": "2024-03-21 20:35:06.039699686 +0000 UTC"
            },
            "features": {
              "text": {
                "mimeType": "text/plain",
                "tokens": [
                  {
                    "value": "Jupiter"
                  }
                ]
              }
            }
          }
        }
      }
    ]
  }
}
```

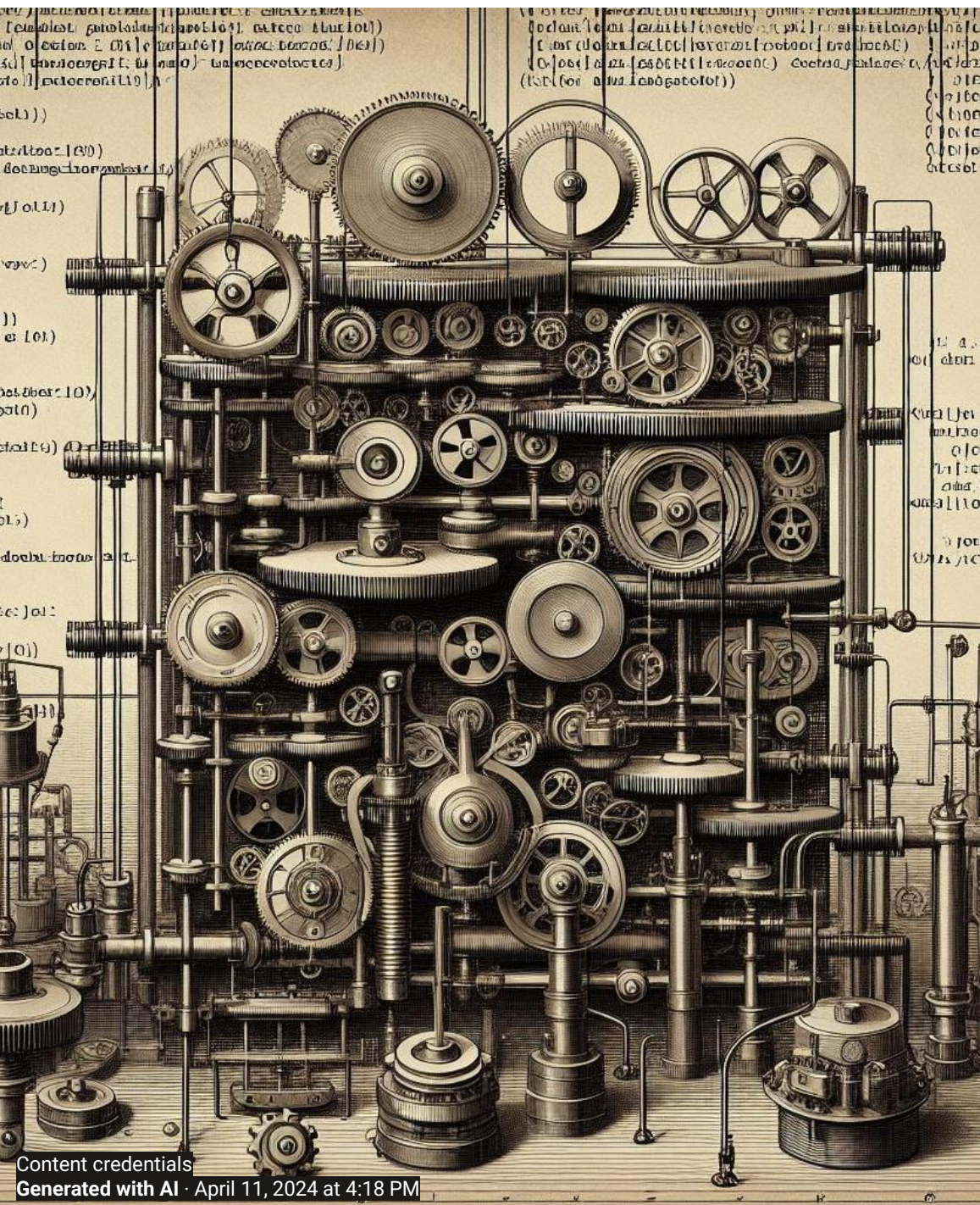
Sandbox Version 2.0 is available!

- More robust
- Improved Sequence Diagram page for better analytics
- Added events to handle transfers to different assistants
- <https://github.com/open-voice-interoperability/open-voice-sandbox>



3. Collaborations

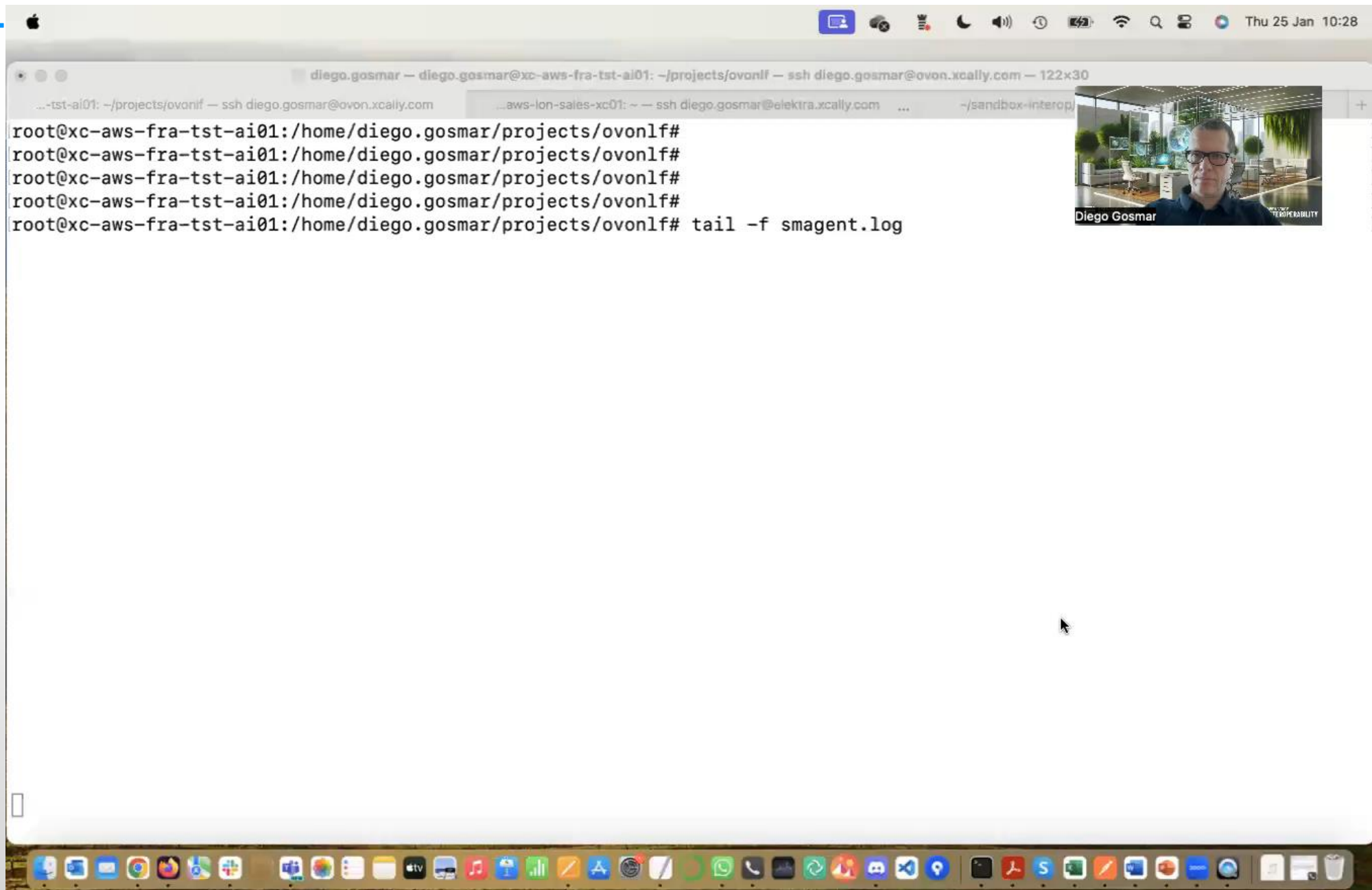
- Finishing up:
 - Estonia Information Systems Authority: Government Agency with many cooperating assistants providing digital government services
- Several others just getting started



4. Open Voice Compliant Implementations

Name	Organization	Capabilities
Sandbox	LF AI & Data Open Voice	User interface to assistants and sample assistants
Smart Library	XCALLY	Information about books
Bürokratt	Government of Estonia	Access to Estonian government services
Wizard	ManMadeWeb	General information provided by an LLM

Smart Library





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5. Current Contributors

- Estonia RIA Team: Rainer Turner, Vassili Moskaljov, Georg Kivi
- David Attwater, TalkMap
- Leah Barnes, LFAI & Data Open Voice Interoperability Initiative
- Emmett Coin, ejTalk
- Diego Gosmar, XCALLY
- Olga Howard, PBS
- Simon Kingaby, Deloitte
- Noreen Whyssel, Decision Fish
- Allan Wylie, ManMadeWeb



6. Roadmap

- Add assistant manifest and assistant discovery to specifications
- Add detail to Dialog Event and Conversation Envelope specifications
- New specifications for context and history of conversations
- Specifications for multimodal collaboration



More information





More information

- Introduction to the Interoperability Initiative
<https://openvoicenetwork.org/interoperability-initiative/>
- Github
<https://github.com/open-voice-interoperability>
- Specifications
<https://github.com/open-voice-interoperability/docs/tree/main/specifications>
- Sandbox Code
<https://github.com/open-voice-interoperability/sandbox>
- Open Voice Discord
 - <https://discord.gg/QGKaUBrm>

Webinars



- June 15, 2023

Dialog Events - Negotiation and Delegation Protocols for Collaborating Conversational Assistants

<https://www.youtube.com/watch?v=UfxVqlgsWo8&pp=ygUSb3BlbiB2b2ljZSBuZXR3b3Jr>

- September 20, 2023

The Conversational Envelope: A Universal API for Conversational Assistants

<https://www.youtube.com/watch?v=19FsUa72ojk&t=2s>

- February 8, 2024

Introducing the Open Voice Interoperability Sandbox

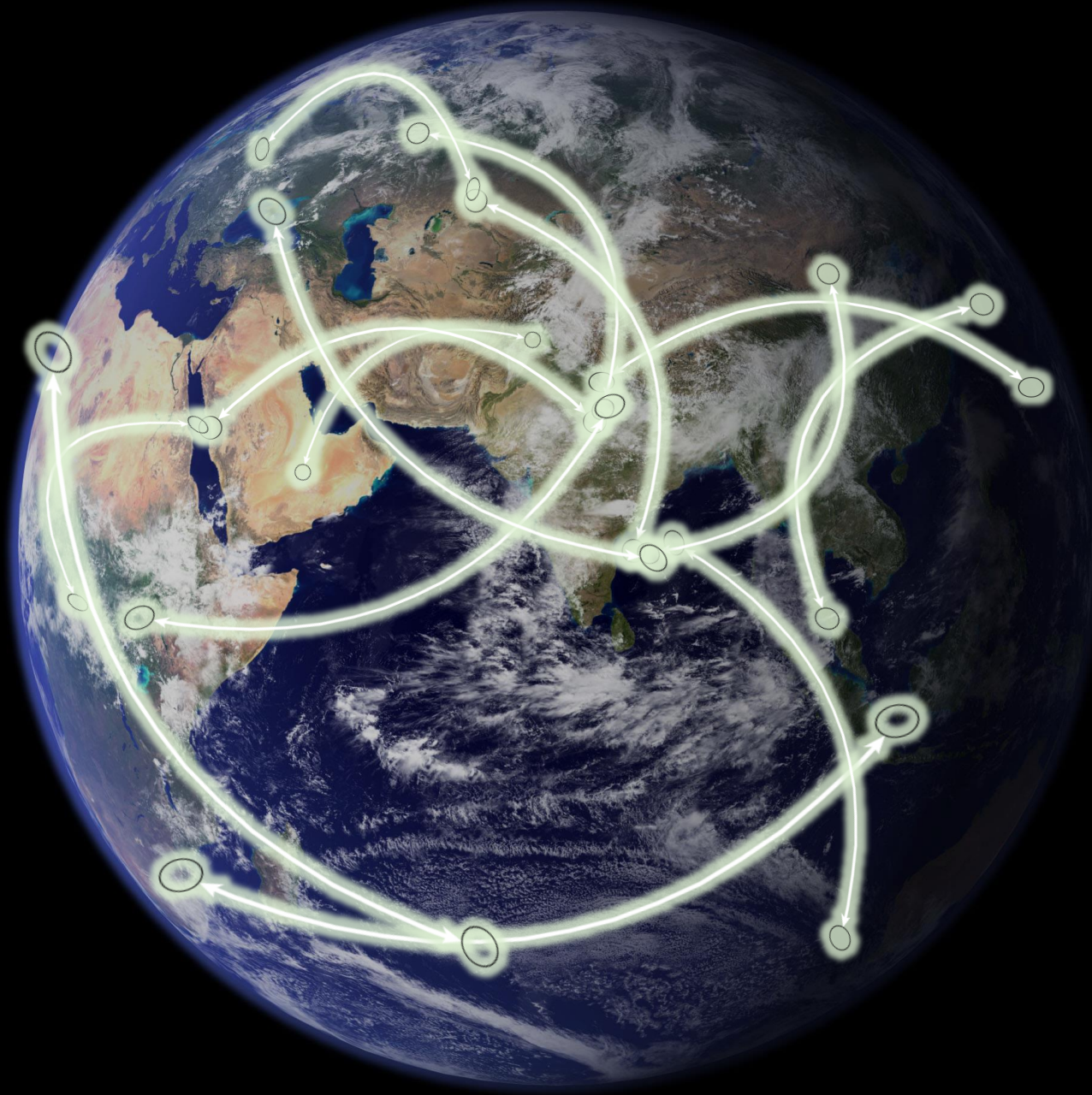
<https://www.youtube.com/watch?v=NCGnhYrZKqk&t=14s>

- March 14, 2024

Interoperability in Action: Using Open Voice Interoperability Specifications with the Estonia Bürokratt Government Services System

<https://lnkd.in/e2rQXgUh>

The Vision:
A global network
of cooperating
conversational
assistants



Additional Topics/Backup

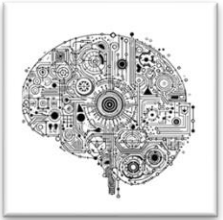
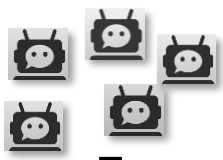
In The Era of Large Language Models: Do We Need Conversational AI Interoperability?

- According to Cyberprotection Magazine, only 4% of web content is accessible through search engines (<https://cyberprotection-magazine.com/the-web-layers-introduction-to-surface-deep-and-darknet>),
- This is the “surface web.”
- The rest is password protected or behind a paywall, usually at enterprise sites.
- **Implication:** Only information from the surface web can be incorporated into public LLMs like Chat-GPT, which are based on web scraping.
- **Implication:** 96% of web content is not available from public LLMs.
- Enterprise assistants will need to communicate outside of public LLM’s.



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Traditional
Conversational AI



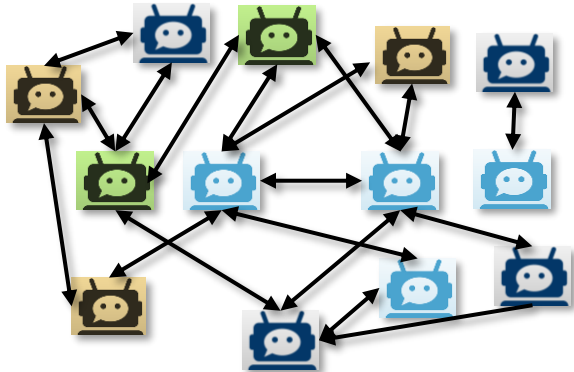
GenAI



Smarter, GenAI,
siloed
Conversational
AI



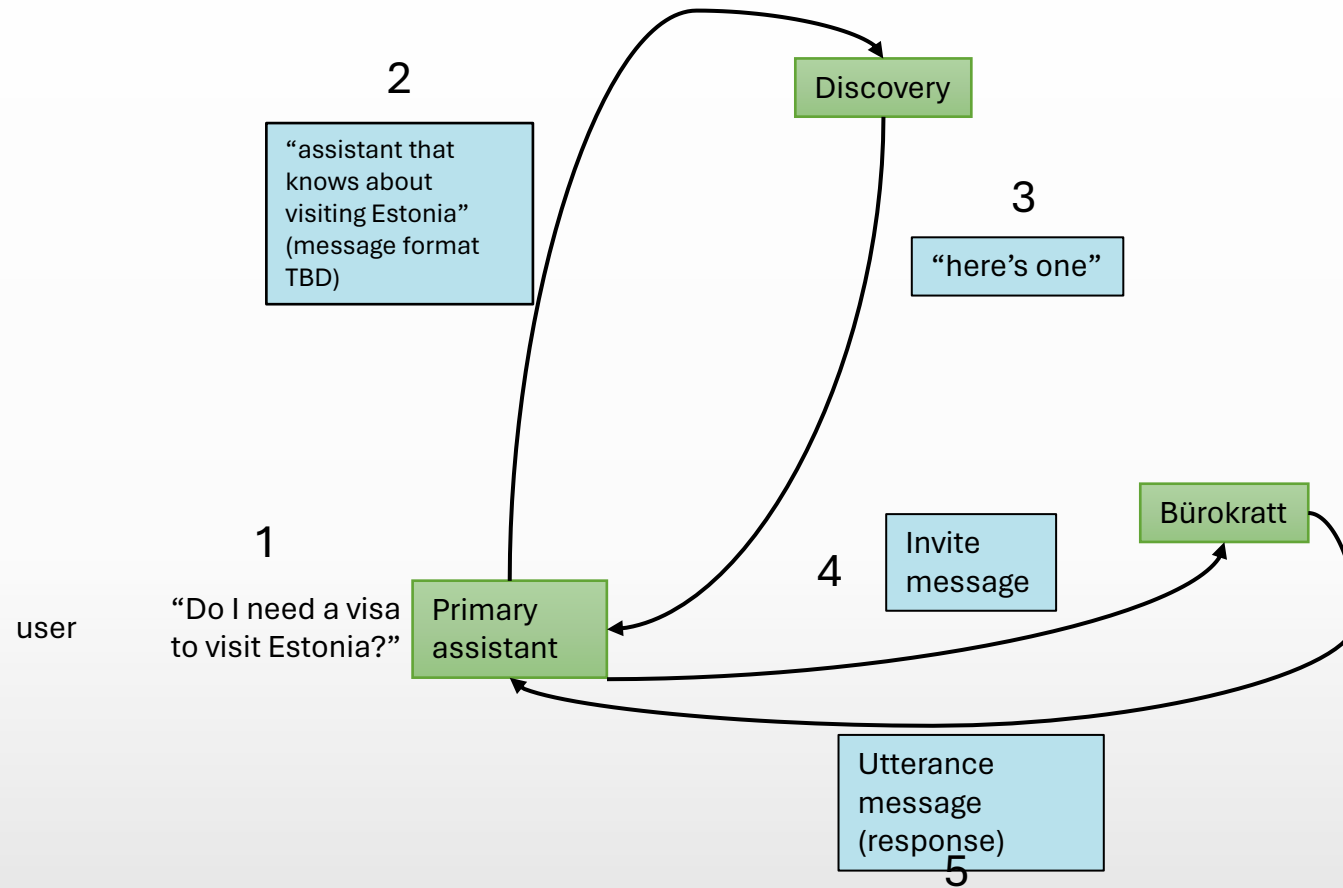
Smart,
GenAI,
Cooperating,
Conversational
AI



How does GenAI relate to interoperability?

- Open Voice and GenAI are complementary
- GenAI has made it significantly easier to build conversational systems, so there will be more of them
- However, each conversational system is still independent
- There is no GenAI solution for enabling conversational systems to collaborate
- Open Voice specifications treat each conversational AI system as a black box – the specifications cover communication **between** conversational AI systems, regardless of how they do their internal work
- Open Voice specifications can work with any conversational system – GenAI or traditional

Toward discovering assistants, high level



Toward discovering assistants, details

