The W3C Voice Interaction Community Group:
Standards for Interoperable Voice Applications

Deborah Dahl

Conversational Technologies

dahl@conversational-technologies.com

Co-Chair

W3C Voice Interaction Community Group

The landscape of conversational interaction platforms is large and growing

NVIDIA Jarvis

IBM Watson

Google Assistant

Apple SiriKit

Microsoft LUIS

Samsung Bixby

Rasa

Nuance Mix

Mycroft

Alexa Skills Kit

These platforms are the basis of thousands of voice applications

They enable users to access an incredible amount of information

But applications don't have any way to cooperate

Each application is independent and self-contained

The problem

- Applications can't communicate or share data
- Application development work can't be shared

Compare Voice Applications to the World Wide Web

	The Web	Voice Applications
Authoring language for applications	Standard HTML, CSS, JavaScript	Proprietary
Move between applications	Follow links	Only on the same platform (sometimes)
Applications can run on different platforms	Any standard browser can run any application	No
Finding applications	Search engines	No
Format for sending data	HTTP(S)	Proprietary

What if applications could communicate like web pages
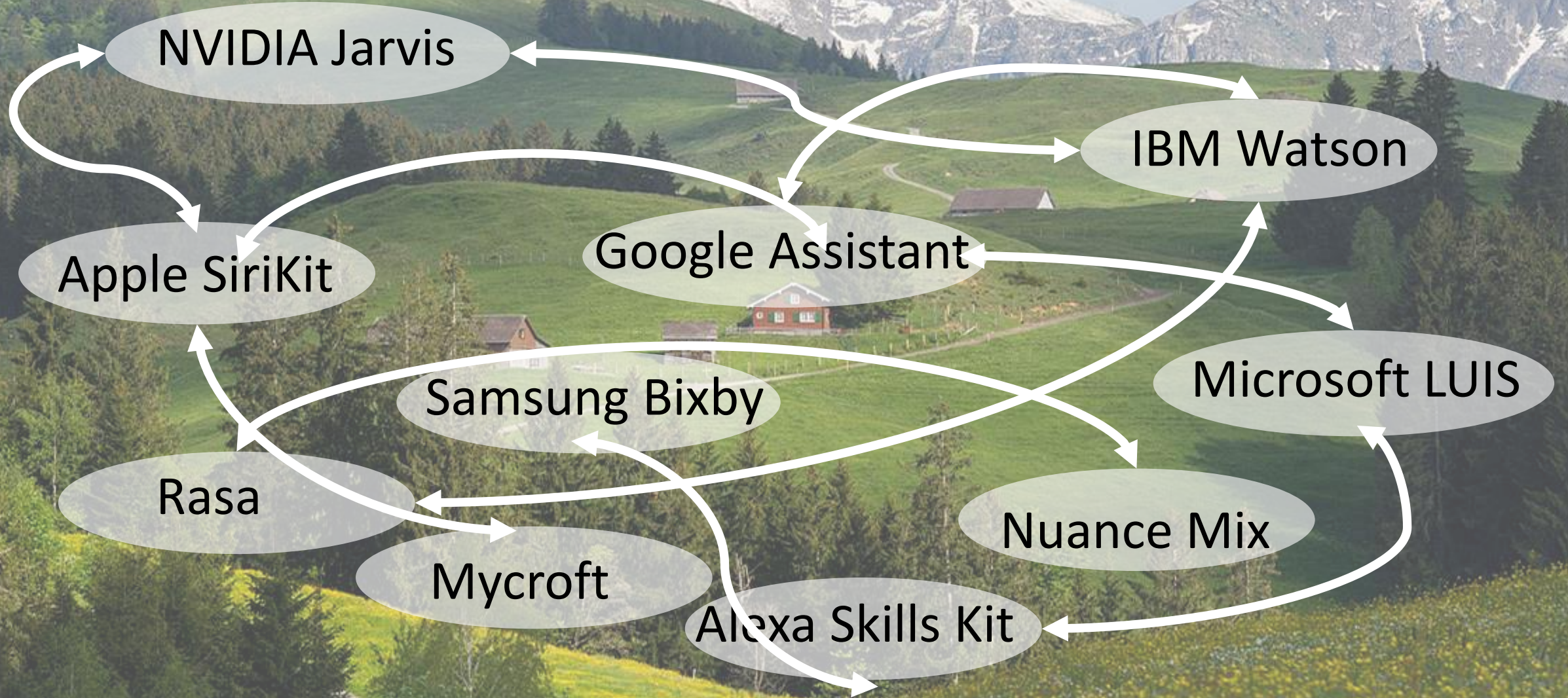
Goals of the Voice Interaction Community Group

- Promote interoperability of interactive voice applications through standards

- Current activities
  - JSON Representation of Semantic Information
  - Intelligent Personal Assistant Architecture: Architecture and Potential for Standardization Version 1.0
  - Intelligent Personal Assistant Architecture: Intelligent Personal Assistant Interfaces

Problem 1: Each platform has its own format and vocabulary for semantic results

- Entities, slots, concepts

- Intents

- Scores and confidence

- Alternative results (nbest)

Proposal for Problem I: JSON Representation of Semantic Information

- Represent semantics of user inputs in a common format

- Make it easier to change toolkits if necessary

- Promote development and back-end integration tools

- Reduce training time for developers

- https://w3c.github.io/voiceinteraction/voice%20interaction%20drafts/emmaJSON.htm

- Published February 12, 2019

Problem 2: Platforms can't cooperate

- Applications are mostly self-contained
- Sometimes they can hand off interaction to another application on the same platform
- Can't hand off to applications on other platforms

Proposal for Problem 2: Intelligent Personal Assistant Architecture

Architecture and Potential for Standardization Version 1.0

- Define architectural components of an Intelligent Personal Assistant Architecture ecosystem

- https://w3c.github.io/voiceinteraction/voice%20interaction%20drafts/paArchitecture.htm

- Published March 24, 2020

W3C Intelligent Personal Assistant Architecture
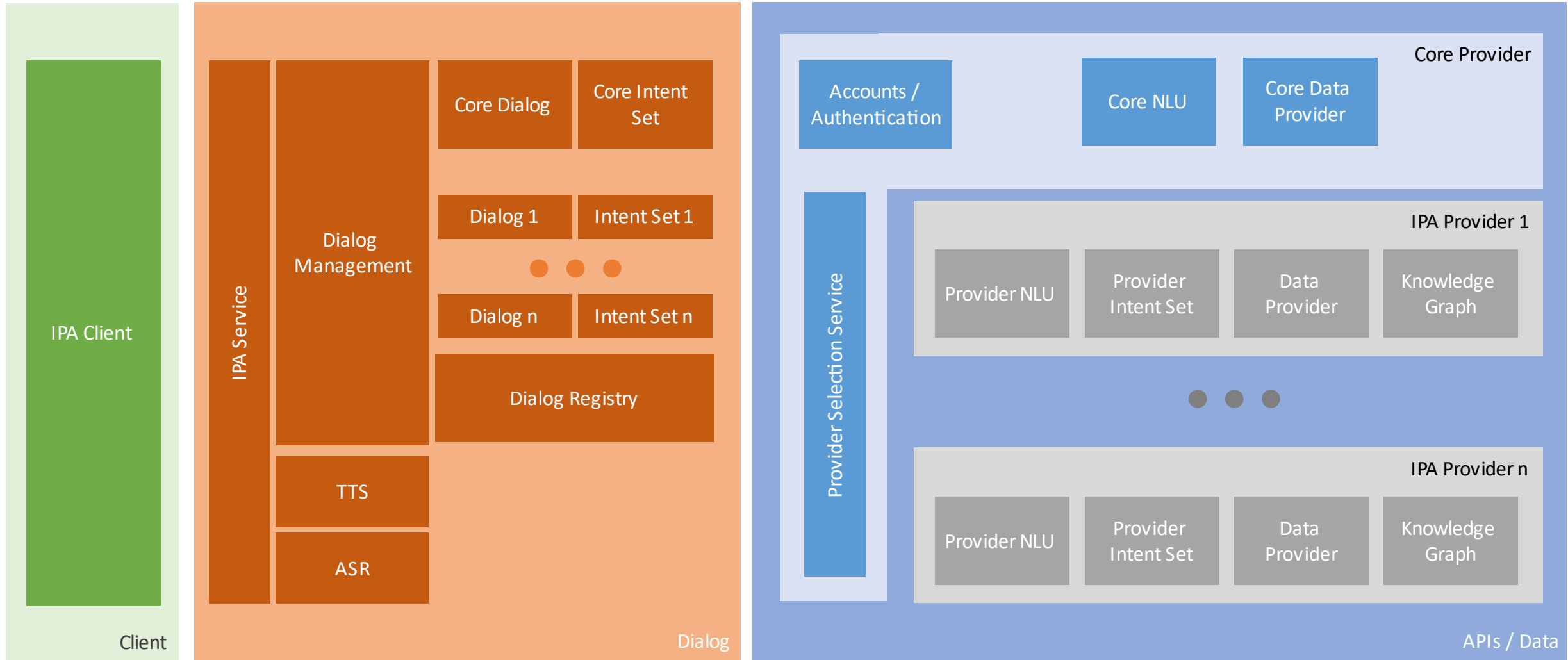
Use Case: Travel Planning

A user plans a trip to an international conference and needs visa information and airline reservations.
- The user asks an assistant (IPA Client, on the left of the diagram) about visa requirements
  - The IPA answers the question directly, getting the information from a web service that it knows about via the corresponding Data Provider.
  - Or, the generic IPA will identify a visa expert assistant application from the dialog registry.
    - It connects the user with the visa expert, one of the IPA providers on the right side.
    - The visa expert finds out from the user the dates and purposes of travel
    - informs the user of the visa process.
- Once the user has found out about the visa, she tells the IPA that she wants to make airline reservations.
  - If she wants to use a particular service, or use a particular airline, she would say "I want to book a flight on American".
    - The IPA will either connect the user with American's IPA
    - Or, if American doesn't have an IPA, will inform the user of that fact.
    - If the user doesn't specify an airline, the IPA will find a general flight search IPA
  - The flight search IPA helps the user find appropriate flights.

Intelligent Personal Assistant Architecture
Intelligent Personal Assistant Interfaces

- Define standard interfaces between architectural components

- Just getting started, not published yet

- Draft available at:
  - https://w3c.github.io/voiceinteraction/voice%20interaction%20drafts/paInterfaces.htm

Summary

- The goal of the W3C Voice Interaction Community Group is to define standards that will make intelligent assistant applications interoperable

- Three activities are ongoing
  - JSON Representation of Semantic Information
  - Architecture
  - Interfaces