

Google Home Midterm Presentation

Mehmet Kardan, Hanna Köb, Mathias Meinschad, Daniel Linter

University of Innsbruck - SIT

April 26, 2020

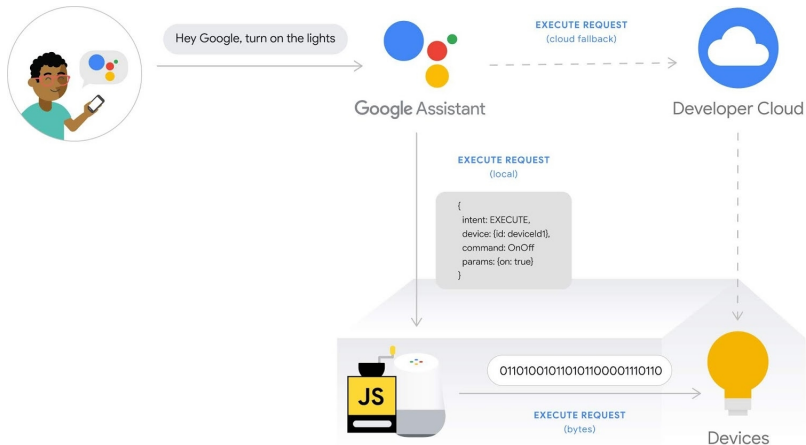
Overview

- 1 Overview
- 2 Execution Path
- 3 Developer Console
- 4 Dialogflow
 - Intents
 - Entities
 - Fulfillment
 - Connecting to our GraphDB
 - Webhook Service
- 5 Compatible Devices
- 6 Live Demo



- Founded by Google in 2016
- Development through Google's developer console and Dialogflow
- Creating skills pretty easy
- No programming skills required

Execution Path



Developer Console

The screenshot shows the Google Actions Console interface. At the top, there's a navigation bar with 'Overview', 'Develop' (selected), 'Test', 'Deploy', and 'Analytics'. The user is logged in as 'OcSeminarGroup3'. On the left, a sidebar lists 'Invocation' (selected), 'Actions', 'Theme customization', 'Account linking', and 'Backend services'. The main area is titled 'Invocation' and contains a configuration panel for an action named 'Intelligent Textbook'. The panel has two sections: 'Display name' and 'Google Assistant voice'. The 'Display name' section has a text input field with 'Intelligent Textbook' and a 'Click to hear the pronunciation of your name' button. The 'Google Assistant voice' section has a dropdown menu set to 'Female 1' and a checked checkbox for 'Match user's language setting'. A 'Save' button is in the top right corner of the main area.

Actions Console

Overview **Develop** Test Deploy Analytics

OcSeminarGroup3

Invocation

Save

English [Modify languages in Settings](#)

Display name

Choose a name for your Action. Users say or type this name to begin interacting with it. [Help](#)

Intelligent Textbook

Click to hear the pronunciation of your name

Modify the pronunciation if it doesn't sound right

Google Assistant voice

Select the type of voice you want to use for your app. [Help](#)

Female 1

☒ Match user's language setting

- Gives an overview of your skill
- Specifies general settings
- Gives the user the ability to test their skill
- Deployment of the skill

- Service developed and provided by Google
- Natural language tool to create conversational user interfaces for apps, chatbots, etc.
- By adding 'Training phrases' Dialogflow automatically trains the machine learning model

Concepts

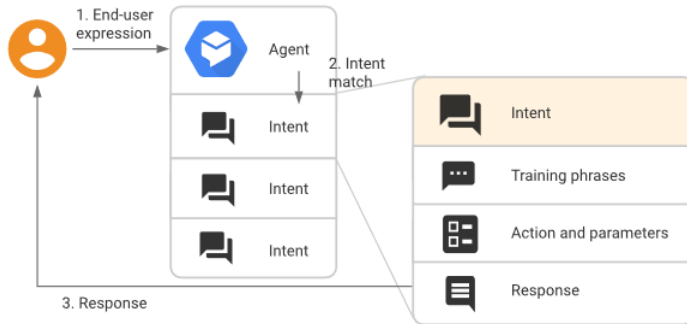
- Intents

- Each intent describes an intent a user might have
- E.g. check prices, get opening hours or book a repair
- By communicating with the interface, Dialogflow classifies the user's intent and performs the associated action
- An intent can require some parameters such as a date in order to book a repair

- Entities

- Each intent parameter has a type and therefore belongs to an entity
- There are predefined system entities for dates, colors, addresses, etc.
- Define entities to make Dialogflow 'understand' your vocabulary
- E.g. Entity 'bike-type' with the instances road bike and mountain bike

Intents



Intents cont'd

The screenshot displays the Google Dialogflow console interface for configuring an intent named 'annotation differences'. The left sidebar shows the project 'OcSeminarGroup3' and the 'Intents' section is selected. The main area is divided into three sections: Training phrases, Action and parameters, and Responses.

Training phrases

Search training phrases

- 99 Add user expression
- 99 Explain the difference between a semi-automatic editing, manual editing, and automatic annotation
- 99 What is the difference between semi-automatic editing, manual editing, and automatic annotation

Action and parameters

Enter action name

REQUIRED	PARAMETER NAME	ENTITY	VALUE	IS LIST
<input type="checkbox"/>	Enter name	Enter entity	Enter value	<input type="checkbox"/>

+ New parameter

Responses

DEFAULT GOOGLE ASSISTANT +

Text Response

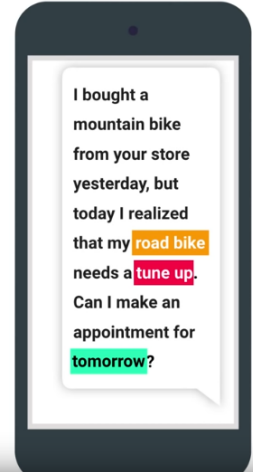
- 1 Response from knowledge graph

Try it now

Please use test console above to try a sentence.

See how it works in Google Assistant

Entities



I bought a
mountain bike
from your store
yesterday, but
today I realized
that my **road bike**
needs a **tune up**.
Can I make an
appointment for
tomorrow?

road bike
tune up
tomorrow
2017-11-09

System entities

@sys.time
@sys.date

Developer entities


@service-option

- Tune up
- Repair
- Tire change
- Upgrade

@bike-type

- Road bike
- Mountain bike
- Beach cruiser
- Racing bike
- Fixed gear bike
- Cross bike

Entities cont'd

 Dialogflow

OCSeminarGroup3

on

Intents

Entities

Knowledge [beta]

Fulfillment

Integrations

Training

Validation

History

Analytics

Prebuilt Agents

Small Talk

> Docs

Standard Free

Upgrade

Support

NLP_tasks

SAVE

☒ Define synonyms ? ☐ Regex entity ? ☐ Allow automated expansion ☒ Fuzzy matching ?

tokenization	tokenization
stemming	stemming
lemmatization	lemmatization
sentence boundary disambiguation	sentence boundary disambiguation
named entity recognition	named entity recognition
part of speech tagging	part of speech tagging, part-of-speech tagging
chunking	chunking
syntactic parsing	syntactic parsing
semantic role labelling	semantic role labelling
coreference resolutions	coreference resolutions, co-reference resolutions, co reference resolutions

Click here to edit entry

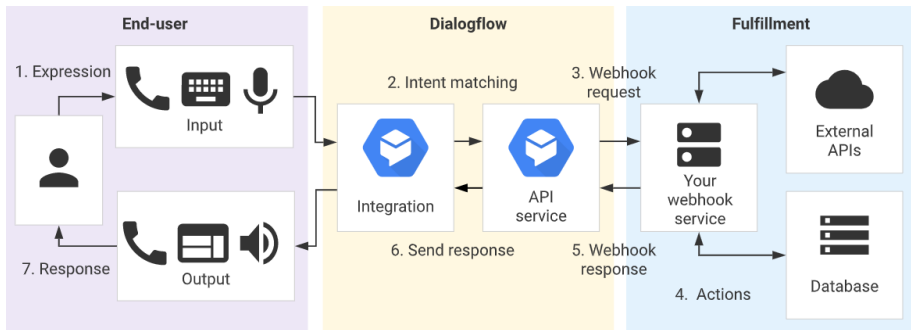
+ Add a row

Try it now

Please use test console above to try a sentence.

See how it works in Google Assistant.

Fulfillment



Connecting to our GraphDB

Problem

Dialogflow doesn't allow direct connection to a database like Mycroft etc.

Solution

- Dialogflow sends a webhook request message that contains information about the matched intent, the action, the parameters, and the response defined for the intent.
- Our service then performs the needed database query.
- Our service sends back a webhook response containing the response to be sent to the end-user.

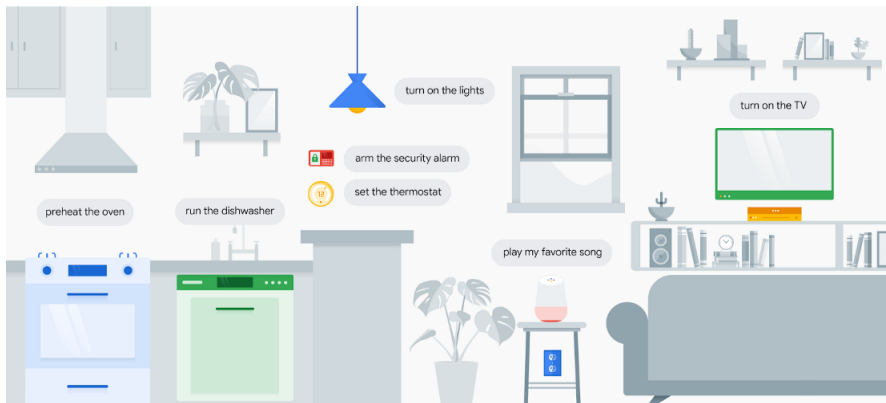
Features

- Supports Mutual TLS authentication.
- Body of request and response is a simple JSON object.
- Supports contexts and sessions, follow-up events and custom payloads.
- Response can be a text, card, event or a Google Assistant response.

Limitations

- Response must occur within 10 seconds for Google Assistant applications or 5 seconds for other application, else it will timeout.
- The response must be less than or equal to 64 KiB in size.

Compatible Devices

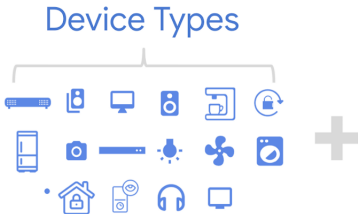


Google Smart Home

- Google & IoT Devices
 - Accessing to third-party IoT devices through Google Assistant
 - Use *Actions* as Natural Language Understanding
 - Communication between *Google Assistant* and IoT devices handled via cloud services.
 - *Home Graph* to store information of connected devices

Device Types & Traits

Traits



Attributes - SYNC

Defines configuration options for traits.

States - QUERY & EXECUTE

Defines the real-time state of the device.

Commands - EXECUTE

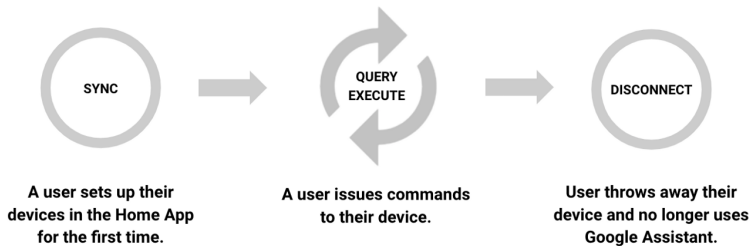
Used to change the state or perform a function on the device.

- Various device types (air purifier to yogurt maker)
- Capabilities of a device \Rightarrow traits

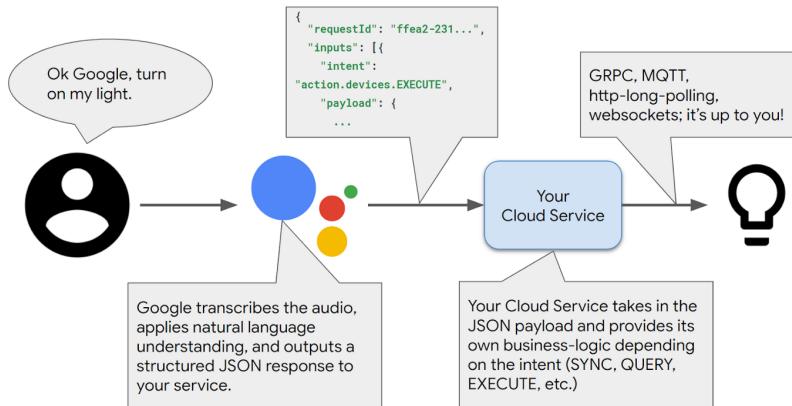
Sample Trait Schema

Device	Device type	Suggested device traits
Light	<code>action.devices.types.LIGHT</code>	<code>action.devices.traits.OnOff</code> <code>action.devices.traits.Brightness</code> <code>action.devices.traits.ColorSetting</code>
Fan	<code>action.devices.types.FAN</code>	<code>action.devices.traits.FanSpeed</code> <code>action.devices.traits.OnOff</code> <code>action.devices.traits.Modes</code> <code>action.devices.traits.Toggles</code>

Life Cycle



Communication



Live Demo

Thank you for your
attention!