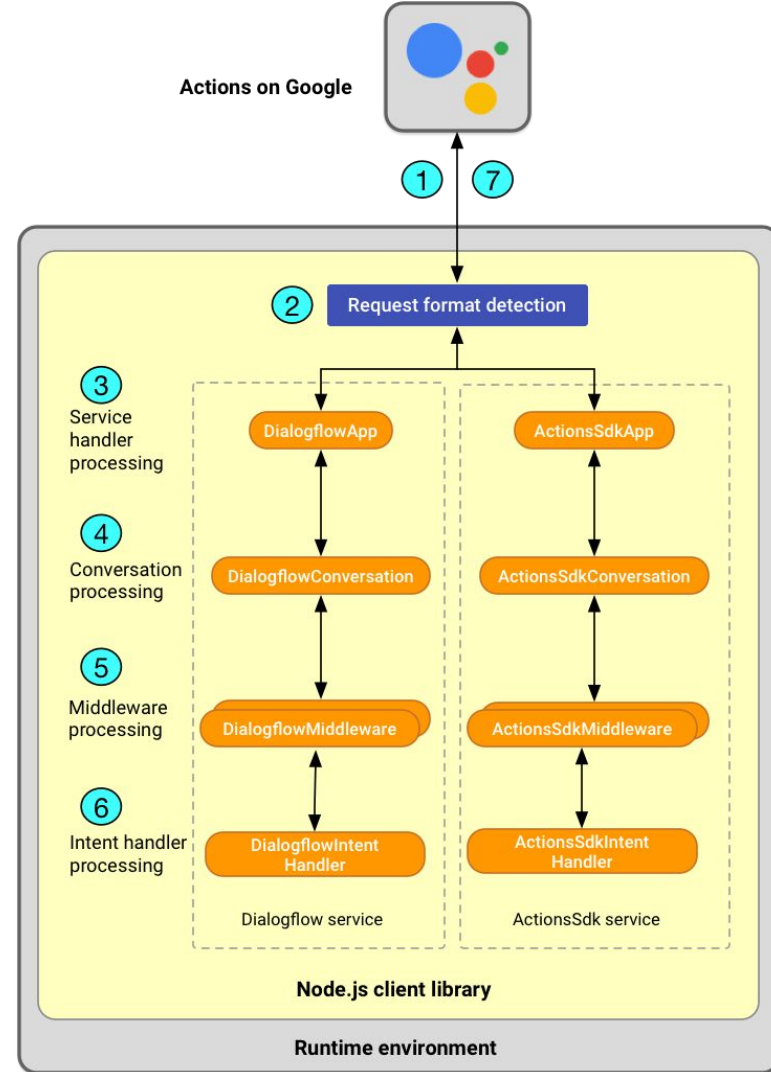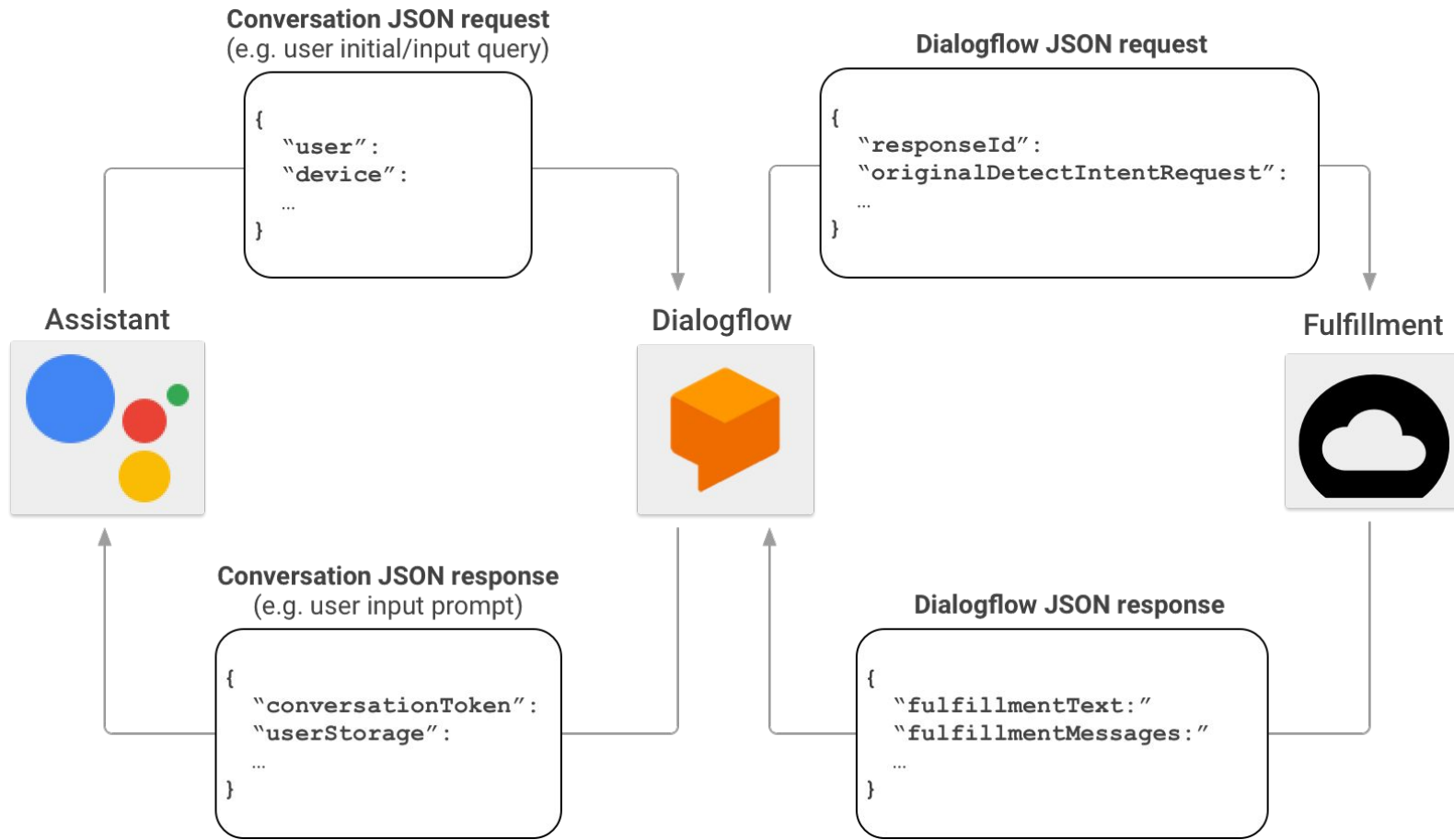**Actions on Google**

Key Statements:

- **Action On Google** can be used without Dialogflow
- **Dialogflow** can be used without Action On Google

- **Action On Google** is a way how to interact with Google Assistant devices (Google Home, Android smartphone...)
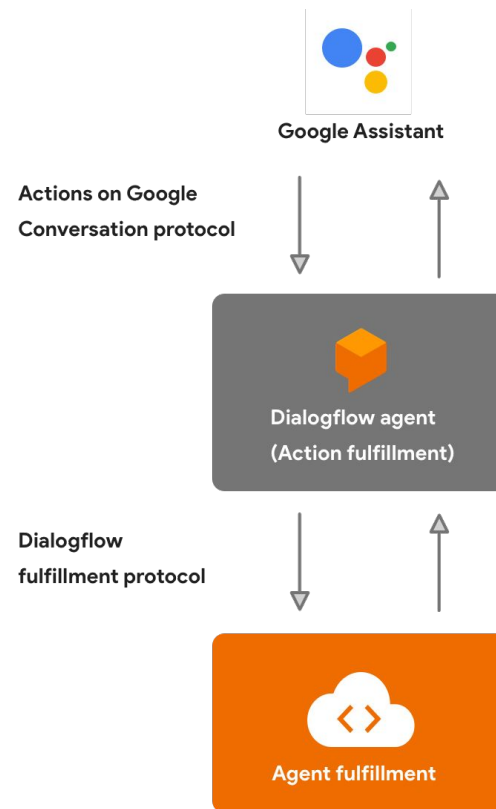
- **Dialogflow** is a ML platform for matching text to different intents and extract entities from a text (can be retrieve from multiple sources like Facebook Messenger, Google Assistant, Telegram …)

① ⑦

② Request format detection

③ Service handler processing

DialogflowApp | ActionsSdkApp

④ Conversation processing

DialogflowConversation | ActionsSdkConversation

⑤ Middleware processing

DialogflowMiddleware | ActionsSdkMiddleware

⑥ Intent handler processing

DialogflowIntent Handler | ActionsSdkIntent Handler

Dialogflow service | ActionsSdk service

Node.js client library

Runtime environment

Action On Google + Dialogflow

Conversation JSON request
(e.g. user initial/input query)

```
{
    "user":
    "device":
    ...
}
```

Dialogflow JSON request

```
{
    "responseId":
    "originalDetectIntentRequest":
    ...
}
```

Assistant

Dialogflow

Fulfillment

Conversation JSON response
(e.g. user input prompt)

```
{
    "conversationToken":
    "userStorage":
    ...
}
```

Dialogflow JSON response

```
{
    "fulfillmentText:"
    "fulfillmentMessages:"
    ...
}
```

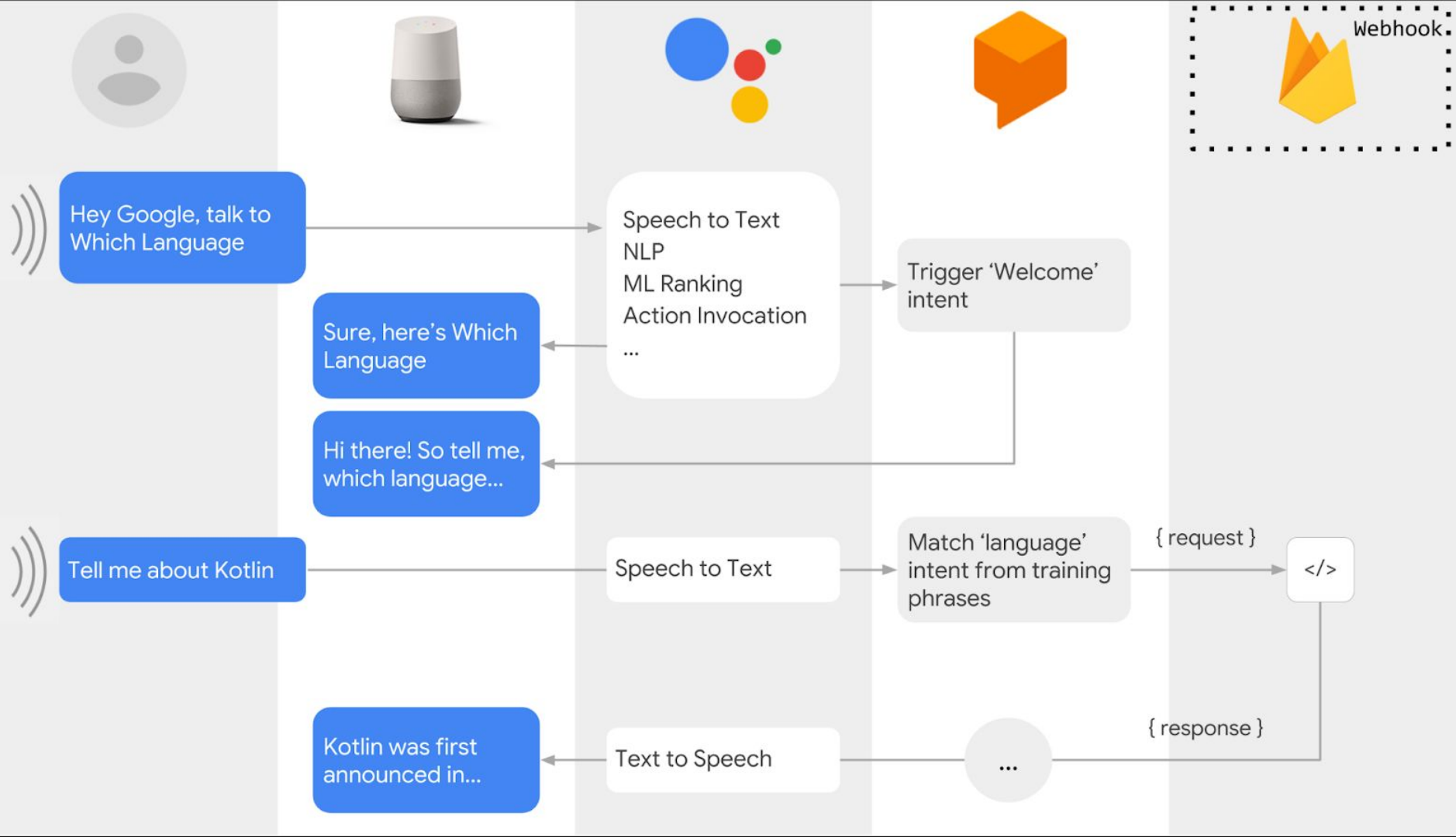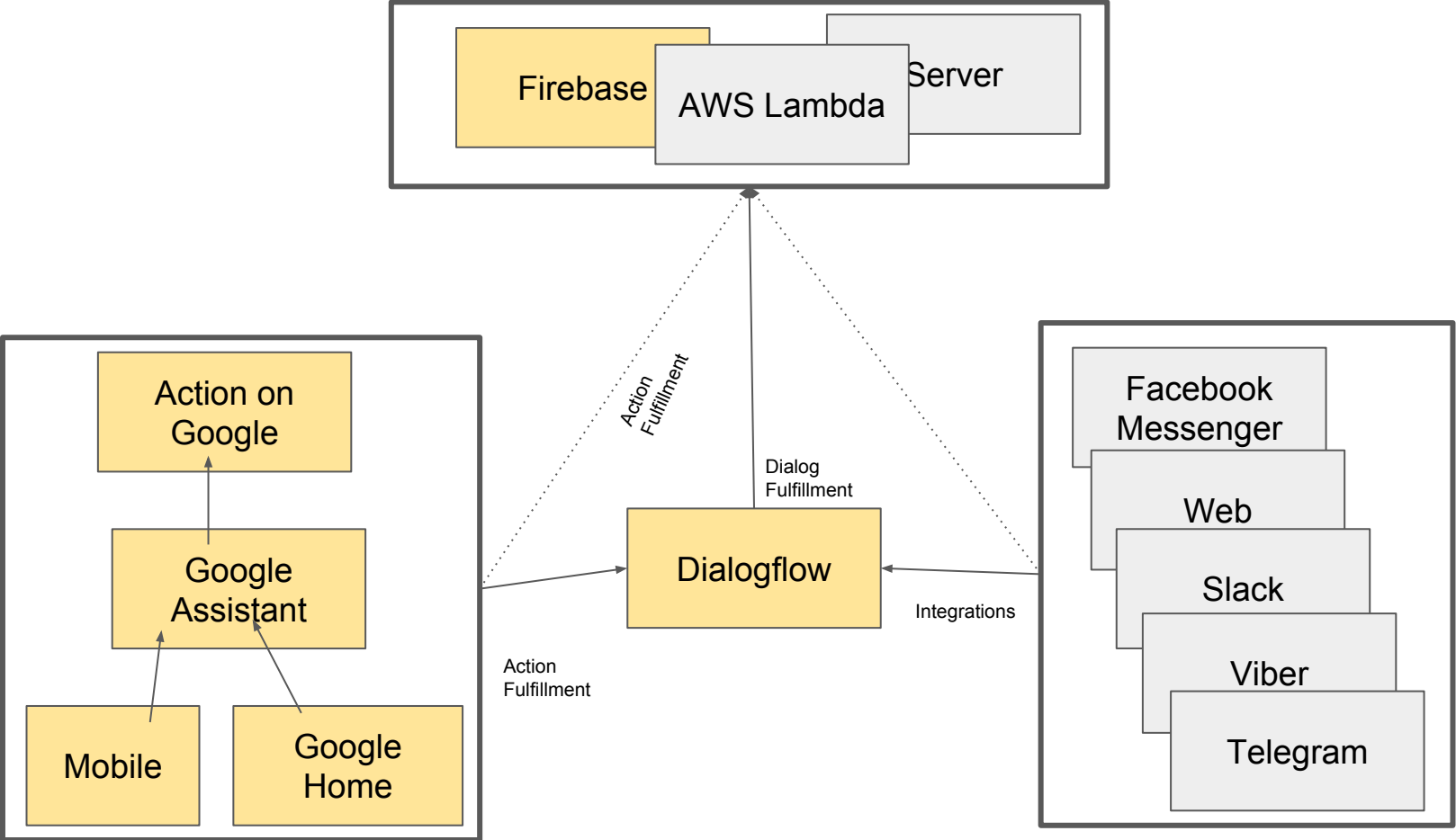**Google Assistant**

- **Actions on Google** is a developer platform that lets you create software to extend the functionality of the Google Assistant

Actions on Google
Conversation protocol

- **Dialogflow's agent** (easy-to-use IDE and NLU) is used to build and deploy Actions **without having to parse requests and generate responses in the Conversation protocol**. In fact, you can build fulfillment for simple Actions completely in Dialogflow, **without any code**

Dialogflow
fulfillment protocol

**Dialogflow agent
(Action fulfillment)**

- **Your Dialogflow agent acts as conversational fulfillment for your Actions. In addition, your actual agent can also call it's own fulfillment to further customize logic for your Actions**
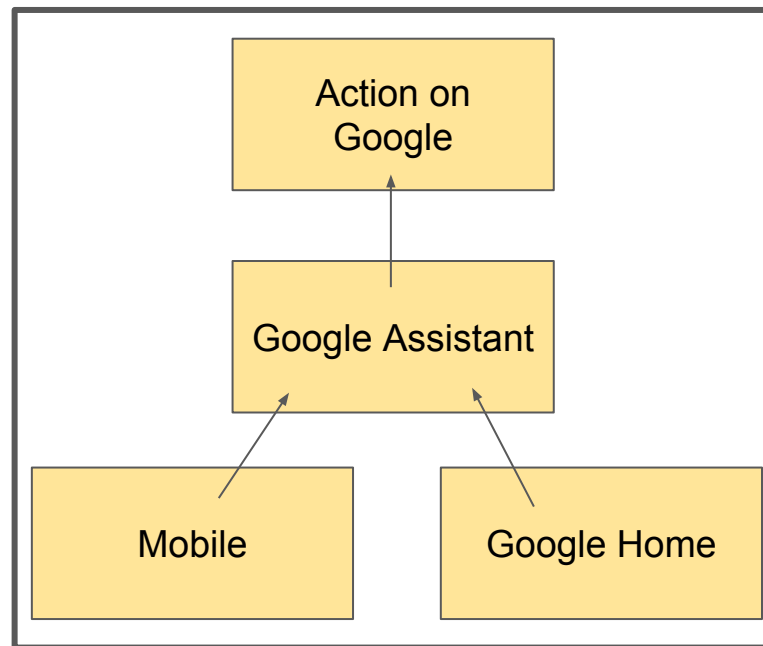
Agent fulfillment

Webhook

Hey Google, talk to Which Language

Speech to Text
NLP
ML Ranking
Action Invocation
...

Trigger 'Welcome' intent

Sure, here's Which Language

Hi there! So tell me, which language...

Tell me about Kotlin

Speech to Text

Match 'language' intent from training phrases

{ request }

</>

Kotlin was first announced in...

Text to Speech

...

{ response }

Usual dataflow
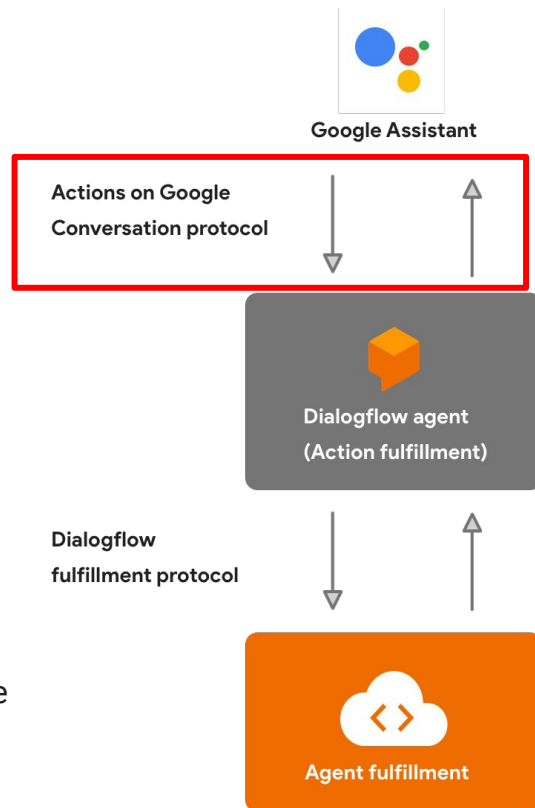
Actions for the Google Assistant

Key Terms:

- **Intent**: A goal or task that users want to do, such as ordering coffee or finding a piece of music. In Actions on Google, this is represented as a unique identifier and the corresponding user utterances that can trigger the intent.

- **Action**: An interaction you build for the Assistant that supports a specific intent and has a corresponding fulfillment that processes the intent.
  a. App action - "Take Machine Learning course on Coursera"
  b. Conversational action

- **Fulfillment**: A service, app, feed, conversation, or other logic that handles an intent and carries out the corresponding Action.

Intents are used differently in Actions on Google than in Dialogflow

Your Dialogflow agent maps one of its own intents to one of these **general types of Actions on Google** intents:
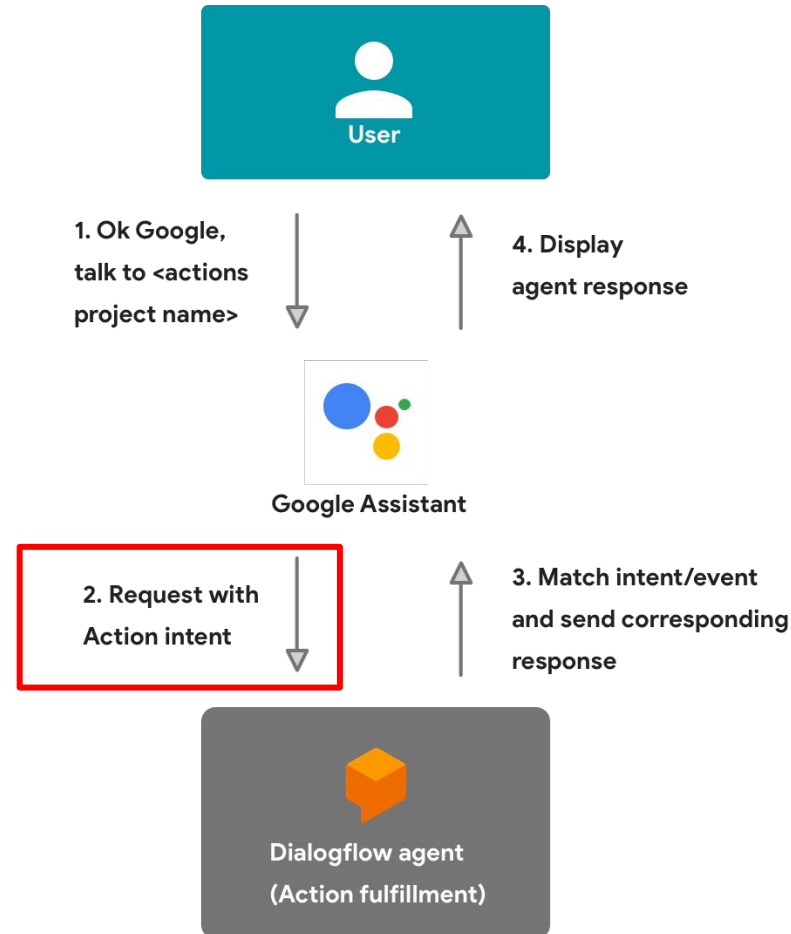
- **Actions** - The Assistant wants your agent to fulfill the user's request (`actions.intent.MAIN`)

- **Dialog** - Represents a back and forth turn between the Assistant and your fulfillment. The Assistant sends requests with the dialog intent (`actions.intent.TEXT`) to your agent when it receives a user utterance that it wants your agent to process.

- **Helper** - Represents a dialog that you want the Assistant to carry out on your behalf, such as obtaining the user's email or location. Your agent sends a response to the Assistant with a helper intent to carry out a dialog. The Assistant then returns the result of the helper back to your agent.

Google Assistant

Actions on Google
Conversation protocol

Dialogflow agent
(Action fulfillment)

Dialogflow
fulfillment protocol

Agent fulfillment

Types of **Actions intents**

- **HOW TO START YOUR ACTION**
  - **Main intent** - This intent is named `actions.intent.MAIN` and represents the default Action for every Actions project.
    - only one main intent
    - trigger when the user say the invocation name that is associated with your Actions project

  - **Built-in intents** - Google defines these intents and the user utterances that trigger them. A built-in intent is a unique identifier that you can specify to tell Google Assistant that your Action is suitable to fulfill a specific category of user requests
    - such as *"play a game"*.

  - **Custom intents** - You define these intents and the user utterances that trigger them.
    - Query patterns
    - Parameters
    - A unique name
      - i. For example, `com.mybrand.MY_INTENT`.

User

1. Ok Google, talk to <actions project name>

4. Display agent response

Google Assistant

2. Request with Action intent

3. Match intent/event and send corresponding response

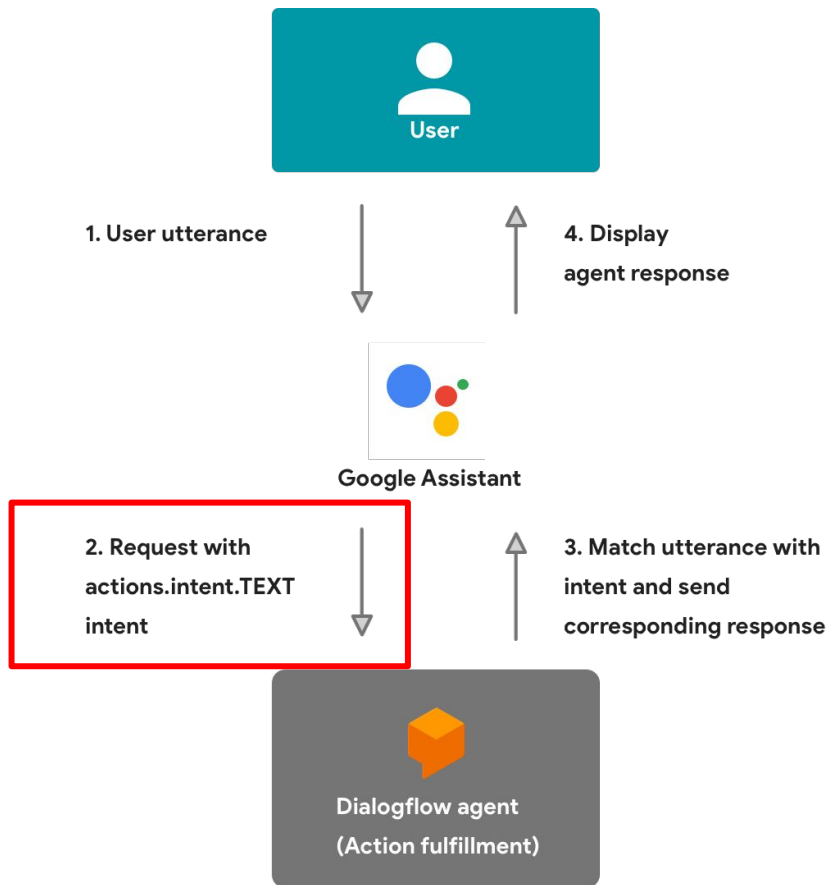**Dialogflow agent (Action fulfillment)**

Dialog intent

- **HOW TO INTERACT WITH YOUR ACTION**
  - Requests are represented by the `actions.intent.TEXT` intent, which represents a generic user utterance
  - The user utterances that are associated with these intents are matched to the corresponding Dialogflow intent in your agent.
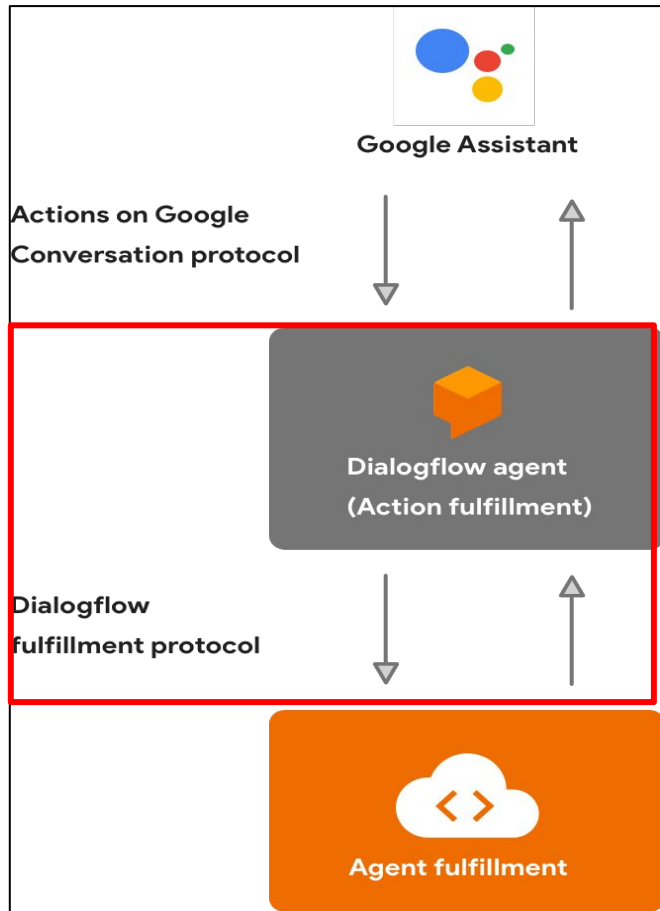
Helper intent

- Helpers let you call on standard logic to carry out common tasks like **asking users for their email address or location.**
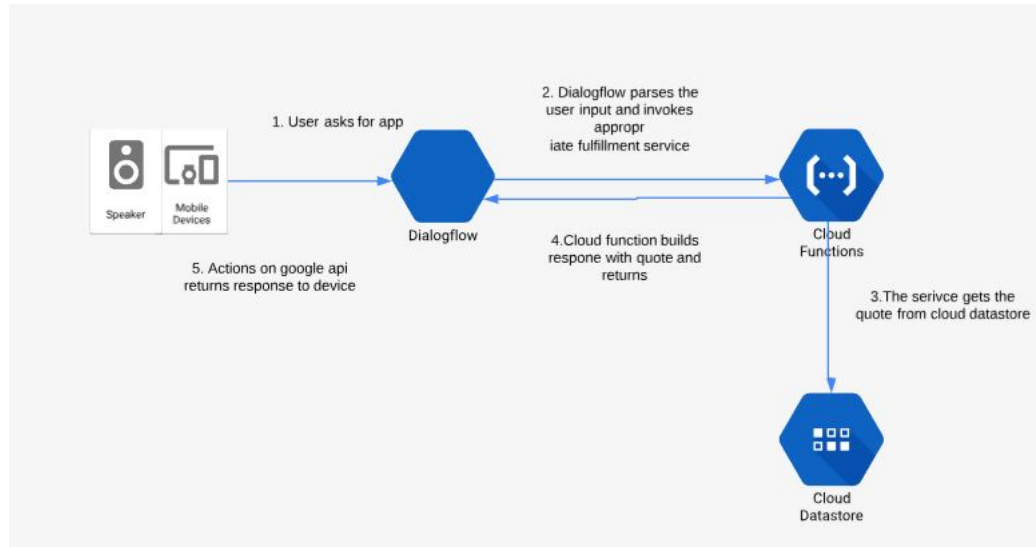
Dialogflow

- **For your own Actions, Google provides a service called Dialogflow to let you handle NLU easily.**
  - **Parameters (Dialogflow):**
    - Represents values that you want to extract from the user's phrases
    - Dialogflow will send the user additional prompts until the parameter is extracted.
  - **Dialogflow intent**
    - An object that maps user utterances to your agent's response.
  - **Dialogflow webhook (fulfillment)**
    - Code that responds to an HTTP request in a Dialogflow-specific messaging format
  - **Entities (Dialogflow)**
    - Represents a category of things. Dialogflow comes with a catalog of System Entities

Dialogflow webhook

- The code for the webhook is implemented in JavaScript by default. When you use Dialogflow's inline editor, it deploys your webhook code on a managed environment in the cloud using **Cloud Functions for Firebase.**
- You can use whatever endpoint you like

Links

- https://stackoverflow.com/questions/53524693/is-it-possible-to-invoke-an-action-based-on-the-date-and-time/53525453#53525453
- https://stackoverflow.com/questions/54216147/add-google-assistant-routines-from-my-app
- https://stackoverflow.com/questions/53009929/get-unique-google-home-user-id-device-id-in-dialogflow-fullfillment-hook
  - You can use UserID but the user has ability to reset it and there are the 30 day non-use revocation policy

- With the Google Assistant SDK, you can embed the Google Assistant into your **own device**, making it function similarly to a Google Home