

Computación Ubicua

Sesión 3 – Asistentes Virtuales

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Definición

- Un asistente virtual es un agente de software que ayuda a usuarios de sistemas computacionales, **automatizando y realizando tareas** con la mínima interacción hombre-máquina



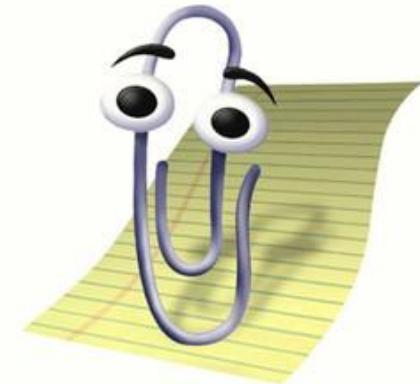
Historia

- 1961 – IBM Shoebox, primera herramienta con reconocimiento digital de voz. Reconoce 16 palabras y dígitos de 0 a 9
- 1970 – Harpy dominó 1 millón de palabras
- 1980 – Primer sistema capaz de reconocer cadenas de palabras
- 1990 – IBM, Microsoft, Philips y Lernout & Hauspie incorporan reconocimiento de voz a sus computadoras personales
- 1994 – IBM Simon, primer teléfono inteligente



Historia

- 1996 – Microsoft incorpora un asistente a Office llamado Clippy
- 2011 – Siri, primer asistente virtual instalado en un teléfono
- 2014 – Amazon lanza el altavoz Amazon echo
- 2016 – Google comercializa Google Home



Dispositivos con asistentes virtuales

- Altavoces inteligentes (Amazon Echo, Google Home)
- Aplicaciones de mensajería instantánea (Whatsapp)
- Como parte del sistema operativo (Siri, Cortana)
- En un modelo de teléfono concreto (Bixby)
- Aplicaciones móviles específicas (Cortana, Google Assistant)
- Relojes inteligentes
- Electrodomésticos

Método de interacción

- Los asistentes virtuales permiten interactuar por:



Texto

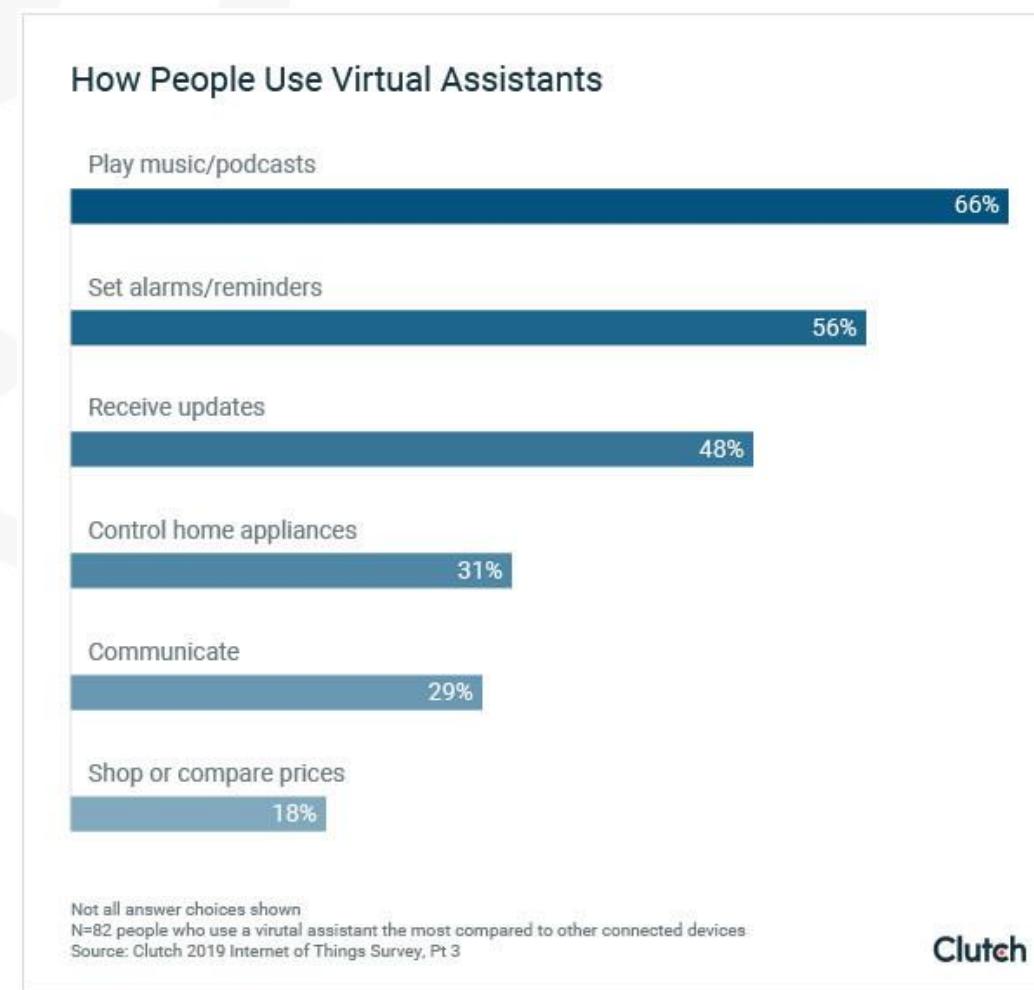


Voz

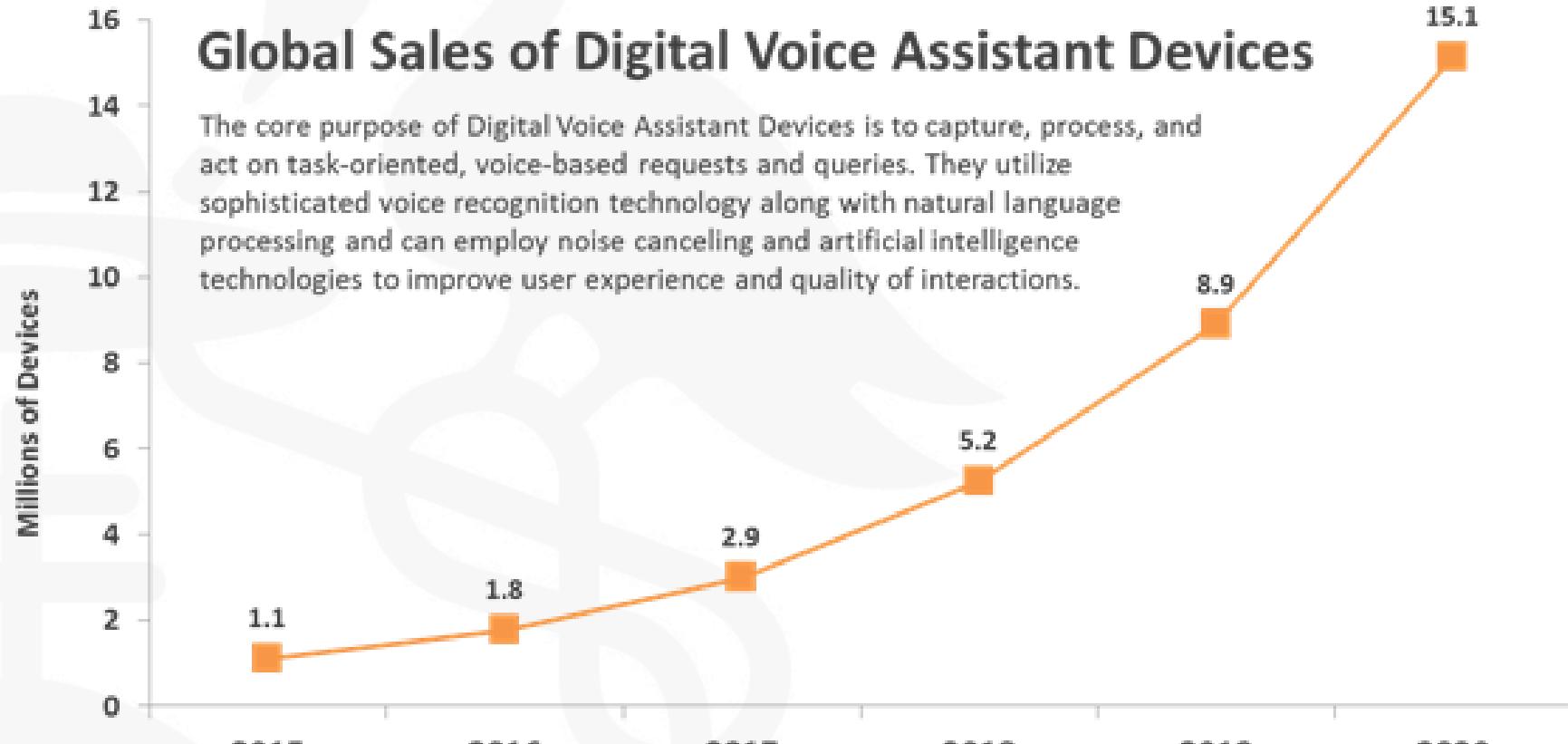


Imágenes

Principales Usos de los asistentes Virtuales

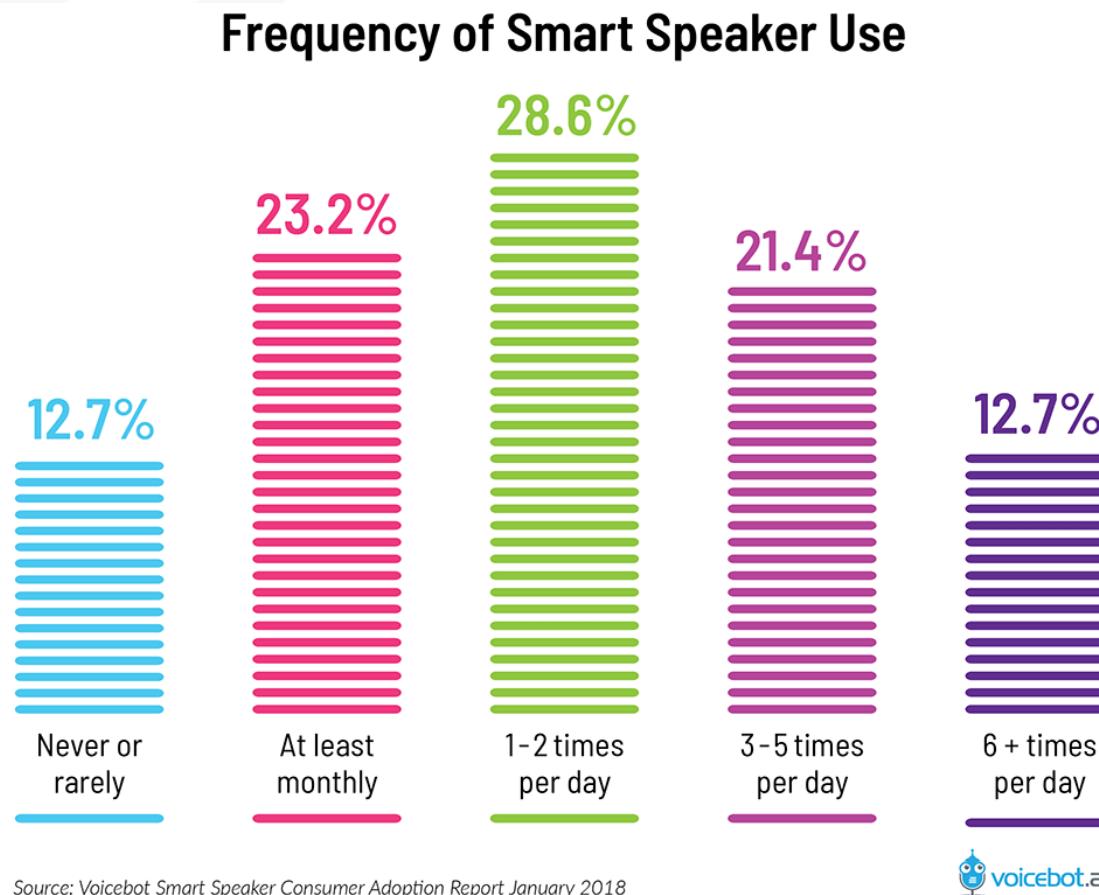


Evolución de ventas de asistentes virtuales



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Frecuencia de uso



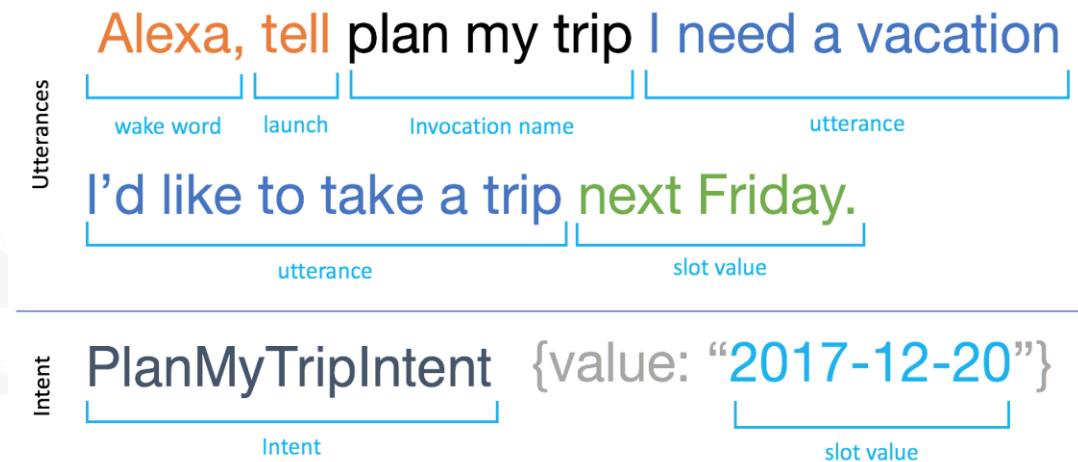
Reconocimiento de voz

Alexa, tell plan my trip I need a vacation

I'd like to take a trip next Friday

Reconocimiento de voz

- **Intents:** Solicitud o acción principal asociada con el comando del usuario
- **Slots:** Argumentos para un intent que proporcionan mas información. Pueden ser obligatorios u opcionales
- **Utterances:** Palabras que los usuarios dicen para transmitir lo que quieren que Alexa haga



Cortana

- Asistente virtual creado por Microsoft como pieza clave en su cambio de imagen
- Lleva el nombre de un personaje del videojuego Halo
- Comenzó su desarrollo en 2009 pero no fue presentado hasta 2013
- Cortana está disponible para Windows 10, Windows Phone, Android y Xbox One

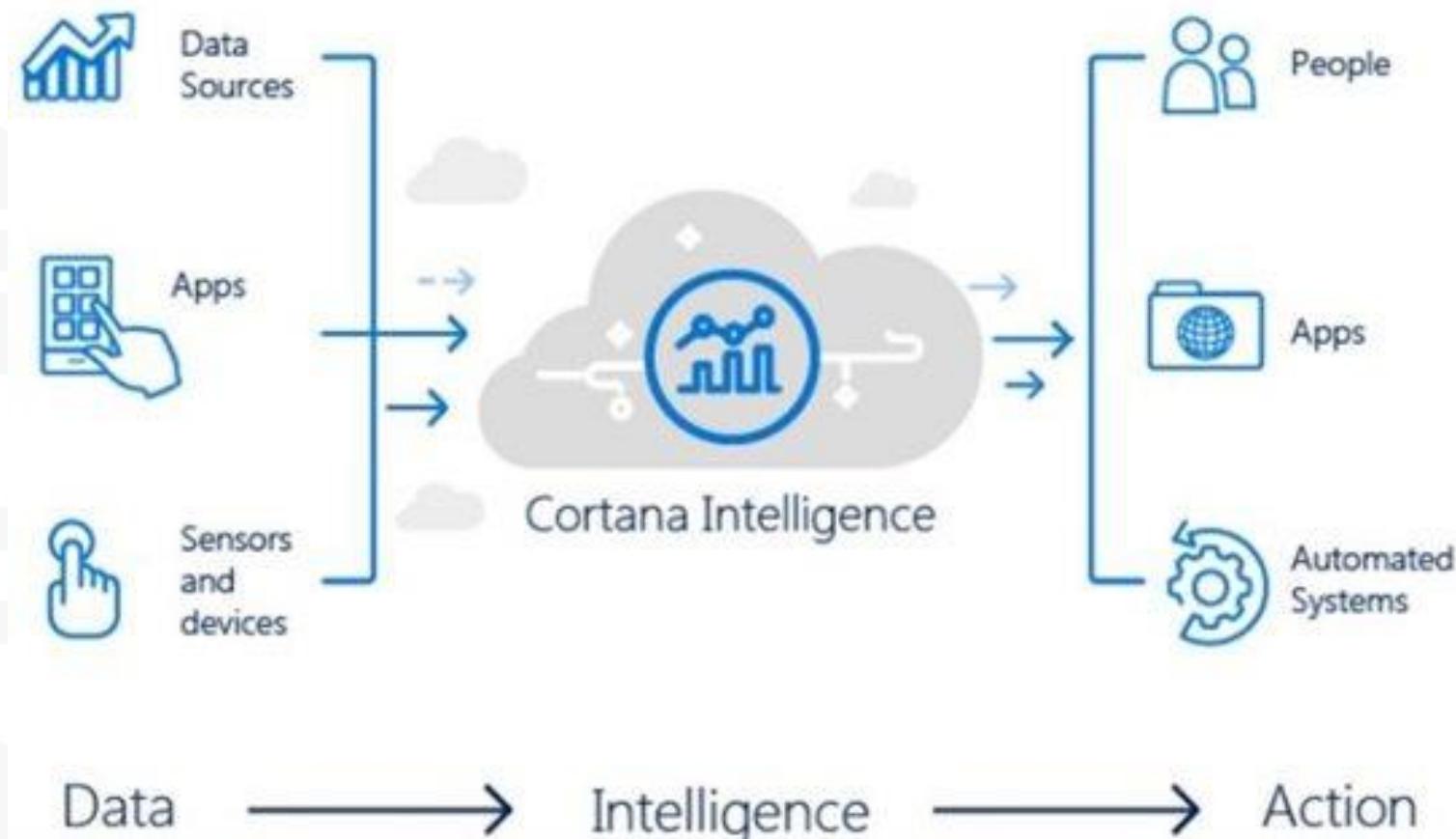


Cortana

- Acciones posibles con Cortana:
 - Comandos por voz
 - Abrir aplicaciones del sistema
 - Gestión del calendario
 - Buscar información a través de Internet
 - Contar la información destacada del día
 - Buscar archivos del sistema
 - Interactuar con las características del dispositivo



Cortana - Arquitectura



Cortana - Arquitectura

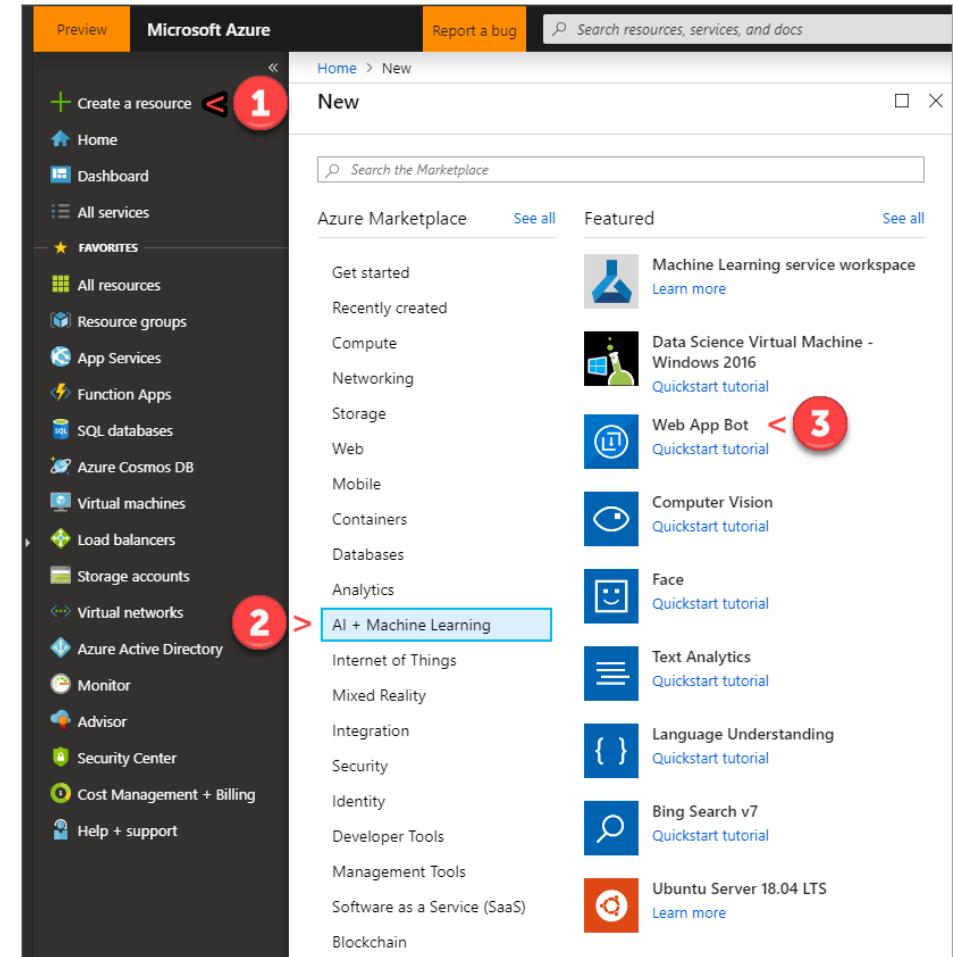
Cortana Intelligence Suite

Transform data into intelligent action



Cortana – Creación de una Skill básica

- La creación de Skills para Cortana se realizará por medio de Microsoft Azure
- Dentro de la cuenta debemos seguir los siguientes pasos:
 1. Crear recurso
 2. AI + Machine Learning
 3. Web App Bot



Cortana – Creación de una Skill básica

The image shows two side-by-side screenshots from the Azure portal during the creation of a new bot service.

Left Screenshot: Web App Bot Creation

- Path:** Home > New > Web App Bot
- Form Fields:**
 - Bot name:** Enter the bot name
 - Subscription:** Pay-As-You-Go
 - Resource group:** Select existing... or Create new
 - Location:** Central US
 - Pricing tier:** S1 (1K Premium Msgs/Unit)
 - App name:** App name .azurewebsites.net

Right Screenshot: Configuration Options

- Bot template:** Basic Bot (C#)
- LUIS App location:** West US
- App service plan/Location:** TestServicePlan/West US
- Application Insights:** On (selected)
- Application Insights Location:** West US 2
- Microsoft App ID and password:** Auto create App ID and password
- Buttons:** Create (highlighted in blue), Automation options

Cortana – Creación de una Skill básica

○ Una vez creado el bot podremos:

- Probarlo online
- Revisar el diseño
- Descargar/Cargar el código
- Publicarlo
- Conectarlo a canales

The screenshot shows the Azure Bot Service Overview page for a bot named 'dxtBasic'. The left sidebar lists various management options: Overview, Activity log, Access control (IAM), Tags, Bot management, Build, Test in Web Chat (highlighted with a red box), Analytics, Channels, Settings, Speech priming, Bot Service pricing, App Service Settings, Configuration, All App service settings, Support + troubleshooting, and New support request. The main content area displays resource details: Resource group (ConsumerSkillsKit), Subscription (Pay-As-You-Go), Subscription ID (c9402295-9808-4024-8c14-adb1c583e02d), Bot Service pricing tier (F0), and Messaging endpoint (<https://dxtbasic.azurewebsites.net/api/messages>). Below this, there are four cards: 'Plan:' (Review the bot design guidelines for best practices), 'Build:' (Download your bot's source code and develop it locally, using your preferred development environment. Add intelligence to your bot with services such as: Language Understanding, QnA Maker, and Dispatch.), 'Test:' (Test your bot online in Web Chat, highlighted with a red box), and 'Publish:' (Publish your bot from your local environment directly to Azure or automatically with Continuous Deployment).

Alexa

- Asistente virtual desarrollado por Amazon en 2014
- Se llama igual que el sistema de navegación de Star Trek.
- Su nombre se escogió porque la ‘X’ es una consonante complicada, lo cual facilitaría reconocer el nombre.
- Creado para ser incorporado a altavoces inteligentes “Echo”
- Para poder configurarlo es necesaria una aplicación móvil



Alexa

- Acciones posibles con Alexa:

- Reproducir música de servicios como Spotify o Amazon Music
- Crear listas de comprobación
- Establecer alarmas o temporizadores
- Reproducir podcasts y audiolibros
- Controlar dispositivos inteligentes
- Proveer información en tiempo real como noticias o el clima



Alexa - Architecture

Alexa Custom Skill - Reference Architecture



Alexa – Creación de una Skill básica

- La creación de Skills para Alexa se realizará por medio de Amazon Developer Console
- Dentro de la cuenta debemos seleccionar la opción “Alexa Skills Kit”

The screenshot shows the Amazon Developer Console interface. At the top, there is a navigation bar with links for DASHBOARD, APPS & SERVICES, ALEXA SKILLS KIT (which is highlighted with a red box), ALEXA VOICE SERVICE, SOFTWARE & GAMES, REPORTING, SUPPORT, and DOCS. Below the navigation bar, there are two main sections: 'Notifications' and 'Announcements'. The 'Notifications' section has tabs for 'All' and 'Critical', both of which are currently empty. The 'Announcements' section lists several recent updates:

Announcement	Date	Date
Build Alexa Skills for Customers in Italy and Spain	Jun 18, 2018	Alexa and Echo Devices Now Available to Customers in France
Announcing New Way to Improve #AlexaSkill Discoverability and Enhance Customer Experience	May 30, 2018	Developer Preview: Easily Use Amazon Polly Voices in Alexa Skills
Build Games for Echo Buttons with the New Trivia Template	May 14, 2018	Discover How Customers Engage With Your Alexa Skill Using Intent History In The Alexa Developer Console

Alexa – Creación de una Skill básica

The screenshot shows the Alexa Skills Kit creation interface. At the top, there's a dark header bar with the 'amazon alexa' logo on the left, 'Your Alexa Consoles' link, and three icons (M, ?, and a magnifying glass) on the right. Below the header, the main title 'Create a new skill' is centered above a horizontal line. Underneath the line, the skill name 'Hello World Greeter' is displayed. A blue 'Next' button is located to the right of the skill name. At the bottom of the screen, a small note says 'Skill created will default to English (US)' followed by a dropdown arrow.

Create a new skill

Hello World Greeter

Skill created will default to English (US) ▾

Alexa – Creación de una Skill básica

The screenshot shows the Alexa Skills Kit Developer Console interface. The top navigation bar includes links for 'Your Skills', 'Hello World Greeter', 'Build', 'Test', 'Distribution', 'Certification', 'Analytics', and 'Feedback forum'. A dropdown menu for language selection shows 'English (U.S.)'. The main content area has a sidebar on the left with sections for 'CUSTOM' (selected), 'Interaction Model', 'Invocation' (with a red box around 'Intents (4)' and a '+ Add' button), 'Slot Types (0)' (with a '+ Add' button), 'JSON Editor', 'Interfaces', 'Endpoint', and 'Intent History'. The main panel features a 'How to get started' section with a link to the 'Alexa Skills Kit Developer Console' and a 'Skill builder checklist' section. The checklist contains four required steps: 1. Invocation Name (checkmark), 2. Intents, Samples, and Slots (checkmark), 3. Build Model (checkmark), and 4. Endpoint (checkmark). Below the checklist are sections for 'Resources', 'Documentation' (link to technical documents), 'Sample Alexa Projects' (link to GitHub), 'Weekly Office Hours' (link to forums), and 'Alexa Developer Forums' (link to developer community).

Alexa – Creación de una Skill básica

The screenshot shows the Alexa Skills Kit developer console interface. On the left, there's a sidebar with navigation links: Your Skills, Hello World Greeter, Build, Test, Distribution, Certification, Analytics, Feedback forum, and a language dropdown set to English (U.S.). Below these are sections for CUSTOM, Interaction Model, Invocation (with a red box around Intents (4)), Slot Types (0), JSON Editor, Interfaces, Endpoint, and Intent History.

The main area has tabs for Your Skills, Hello World Greeter, Build, Test, Distribution, Certification, Analytics, and Feedback forum. It also includes Save Model and Build Model buttons.

The central part of the screen is titled "Add Intent". It explains what an intent is: "An intent represents an action that fulfills a user's spoken request. [Learn more](#) about intents." There are two options: "Create custom intent" (selected, with a red box around the "Create custom intent" button) and "Use an existing intent from Alexa's built-in library".

The "Create custom intent" section shows a text input field with "GreetHelloWorld" and a "Create custom intent" button.

The "Use an existing intent from Alexa's built-in library" section includes a search bar with "Search built-ins" and a results table with columns for Name and Description. It lists "Books" (16 built-ins) and "Calendar" (2 built-ins).

Alexa – Creación de una Skill básica

The screenshot shows the Amazon Alexa developer console interface. The top navigation bar includes links for 'Your Skills', 'Hello World Greeter', 'Build', 'Test', 'Distribution', 'Certification', 'Analytics', 'Feedback forum', and user account information.

The left sidebar contains several sections:

- Language:** English (U.S.)
- CUSTOM**
- Interaction Model**
- Invocation**
- Intents (4)** (highlighted with a red box)
- Built-In Intents (4)**
 - AMAZON.FallbackIntent
 - AMAZON.CancelIntent
 - AMAZON.HelpIntent
 - AMAZON.StopIntent
- Slot Types (0)** (with a '+ Add' button)
- JSON Editor**
- Interfaces**
- Endpoint**
- Intent History**

The main workspace displays the 'Hello World Greeter' skill. A modal window titled 'Add Intent' is open, showing the following steps:

- Create custom intent**: An intent represents an action that your skill can perform. The input field contains 'GreetHelloWorld'.
- Use an existing intent**: A link to learn more about using built-in intents.

The 'Intents (5)' section lists the following intents:

- GreetHelloWorld (highlighted with a red box)
- Built-In Intents (4)
 - AMAZON.FallbackIntent
 - AMAZON.CancelIntent
 - AMAZON.HelpIntent
 - AMAZON.StopIntent

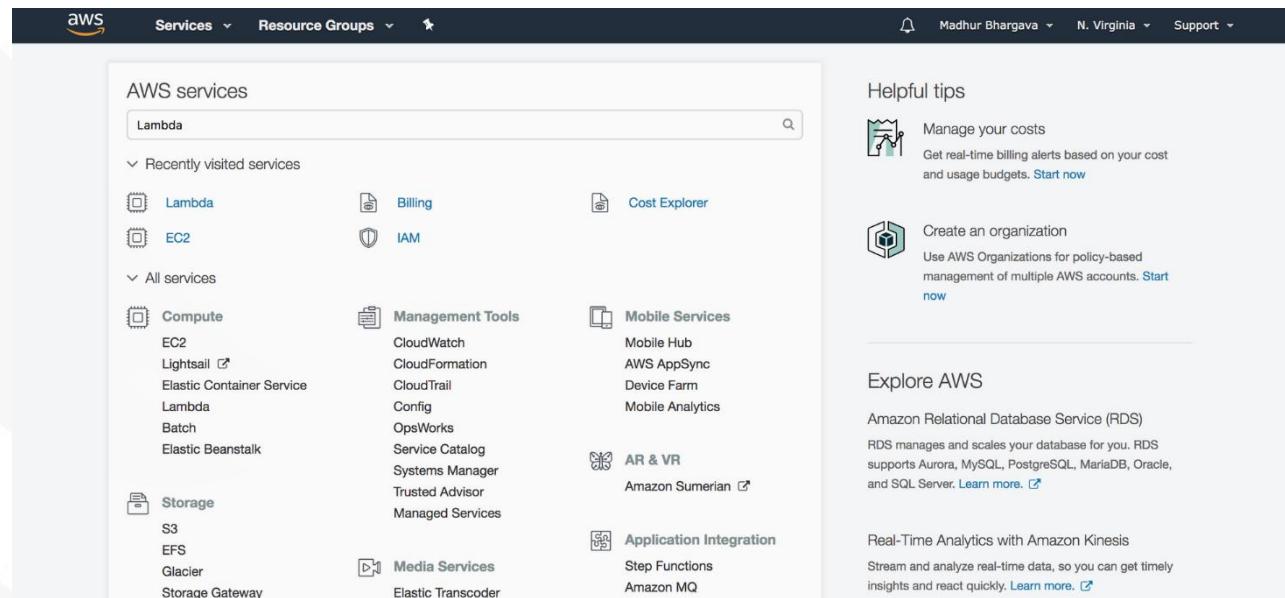
The right side of the screen shows the 'Sample Utterances (5)' section, which lists the following user inputs:

- Say Hi
- Say Hello
- Say Hello World
- Say Something
- Greet Us

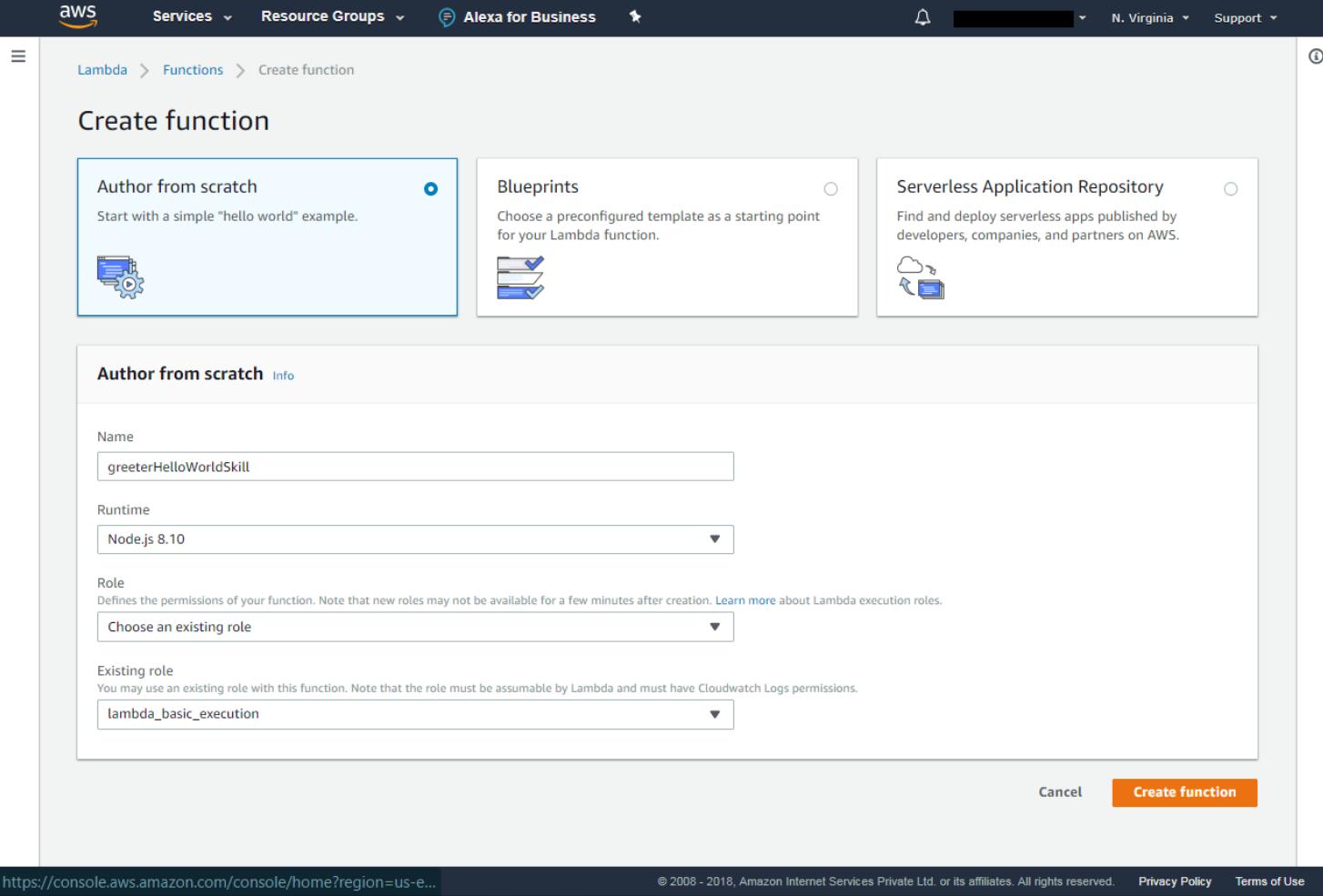
At the bottom, there are sections for 'Intent Slots (0)', 'ACCOUNT LINKING', and 'PERMISSIONS'.

Alexa – Creación de una Skill básica

- Para terminar de configurar la Skill para Alexa se realizará por medio de Amazon AWS
- Buscar el servicio “Lambda” y crear una función
 - Este servicio es el encargado de recibir las solicitudes de Alexa y responderlas



Alexa – Creación de una Skill básica

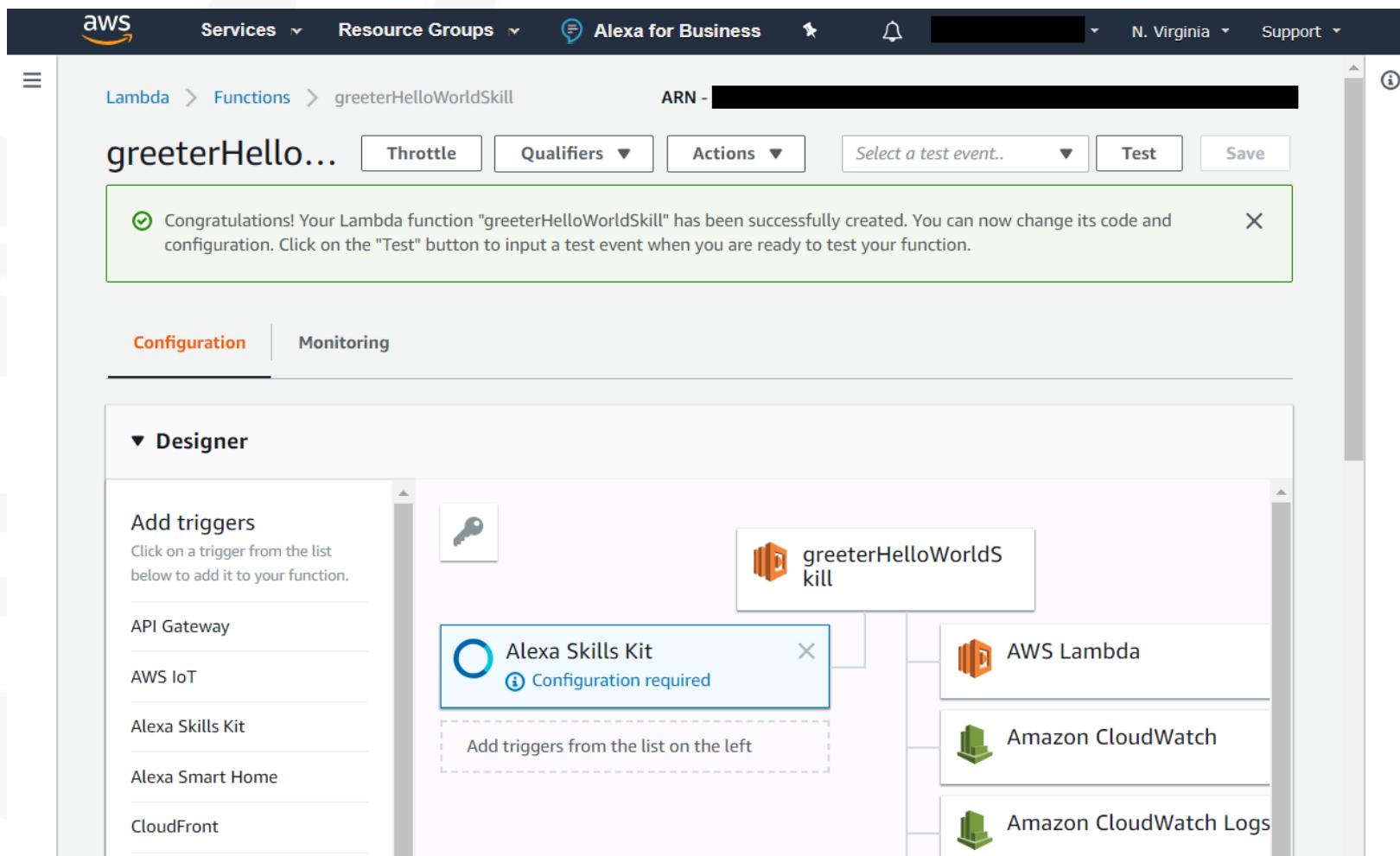


The screenshot shows the AWS Lambda 'Create function' wizard. At the top, there are three options: 'Author from scratch' (selected), 'Blueprints', and 'Serverless Application Repository'. The 'Author from scratch' section contains fields for 'Name' (greeterHelloWorldSkill), 'Runtime' (Node.js 8.10), 'Role' (Choose an existing role), and 'Existing role' (lambda_basic_execution). At the bottom right of this section are 'Cancel' and 'Create function' buttons.

https://console.aws.amazon.com/console/home?region=us-east-1

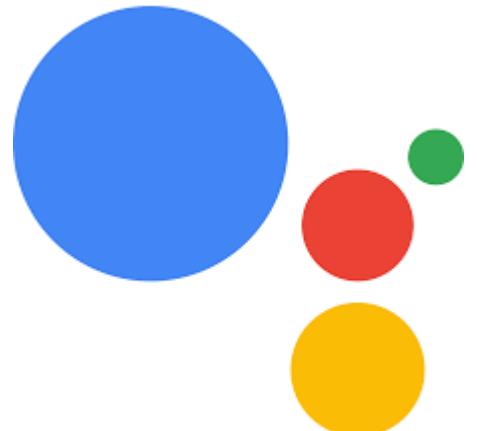
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Alexa – Creación de una Skill básica



Google Assistant

- Asistente virtual (Google Allo) desarrollado por Google y presentado en 2016 para dispositivos Pixel y Pixel XL
- Actualmente está disponible para dispositivos Android y altavoces inteligentes
- Google ha anunciado que el asistente podrá interactuar con la cámara para reconocer objetos



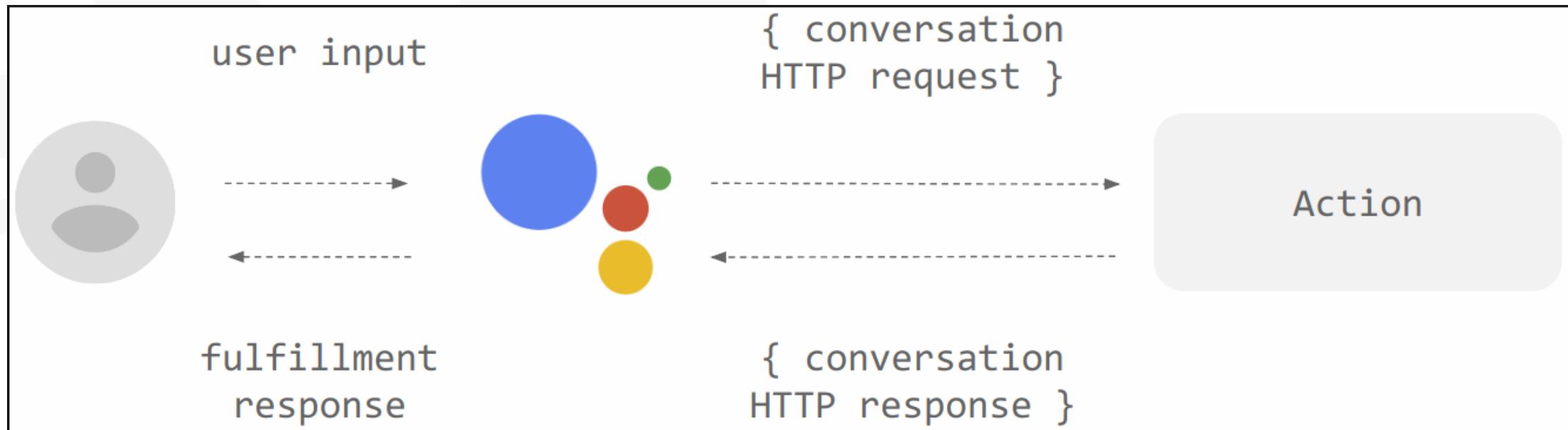
Google Assistant

- Acciones posibles con Google Assistant:

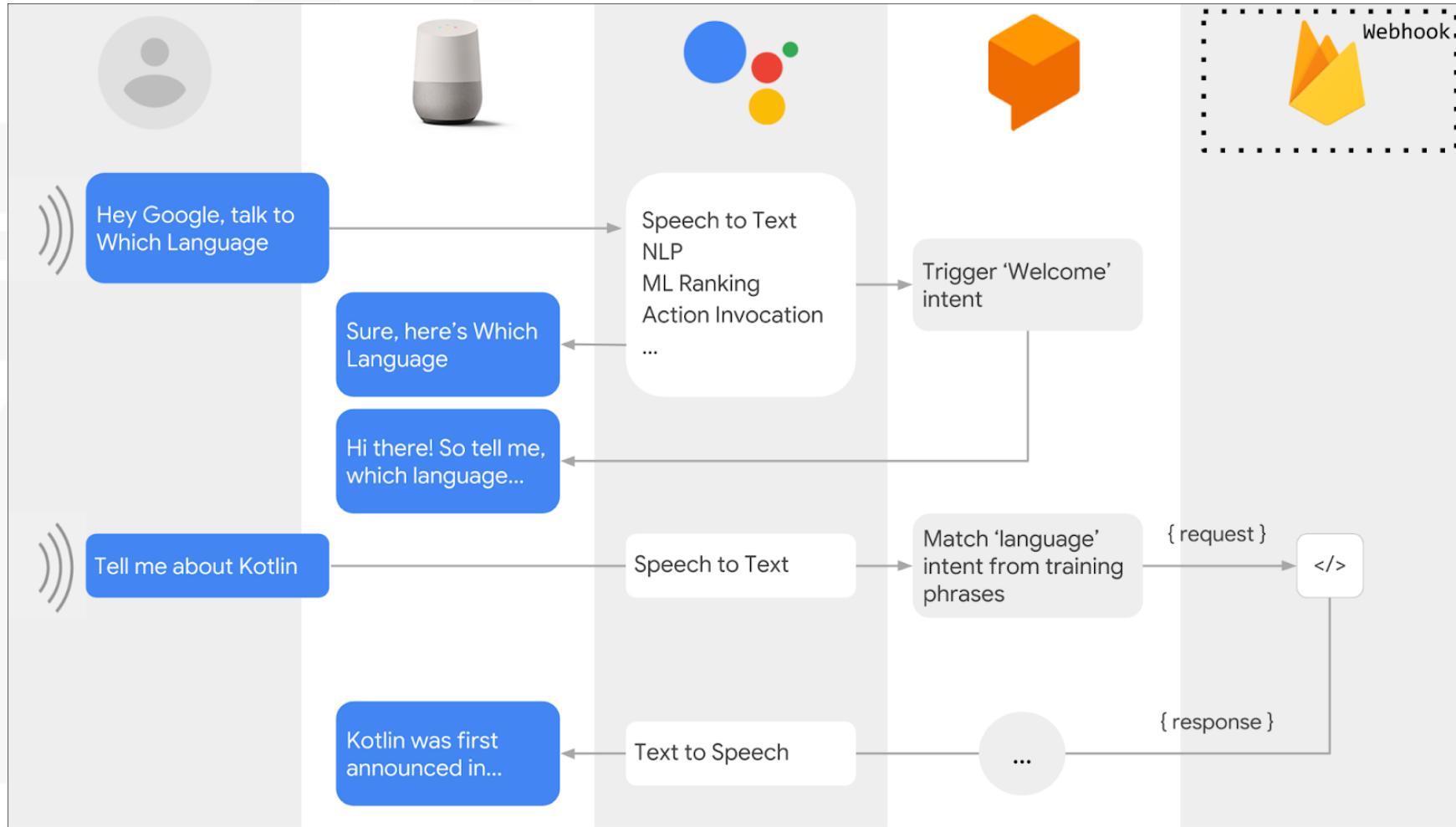
- Comandos por voz
- Controlar la reproducción de música
- Programar eventos
- Contestar mensajes
- Traducir textos en tiempo real
- Multicuenta



Google Assistant - Arquitectura

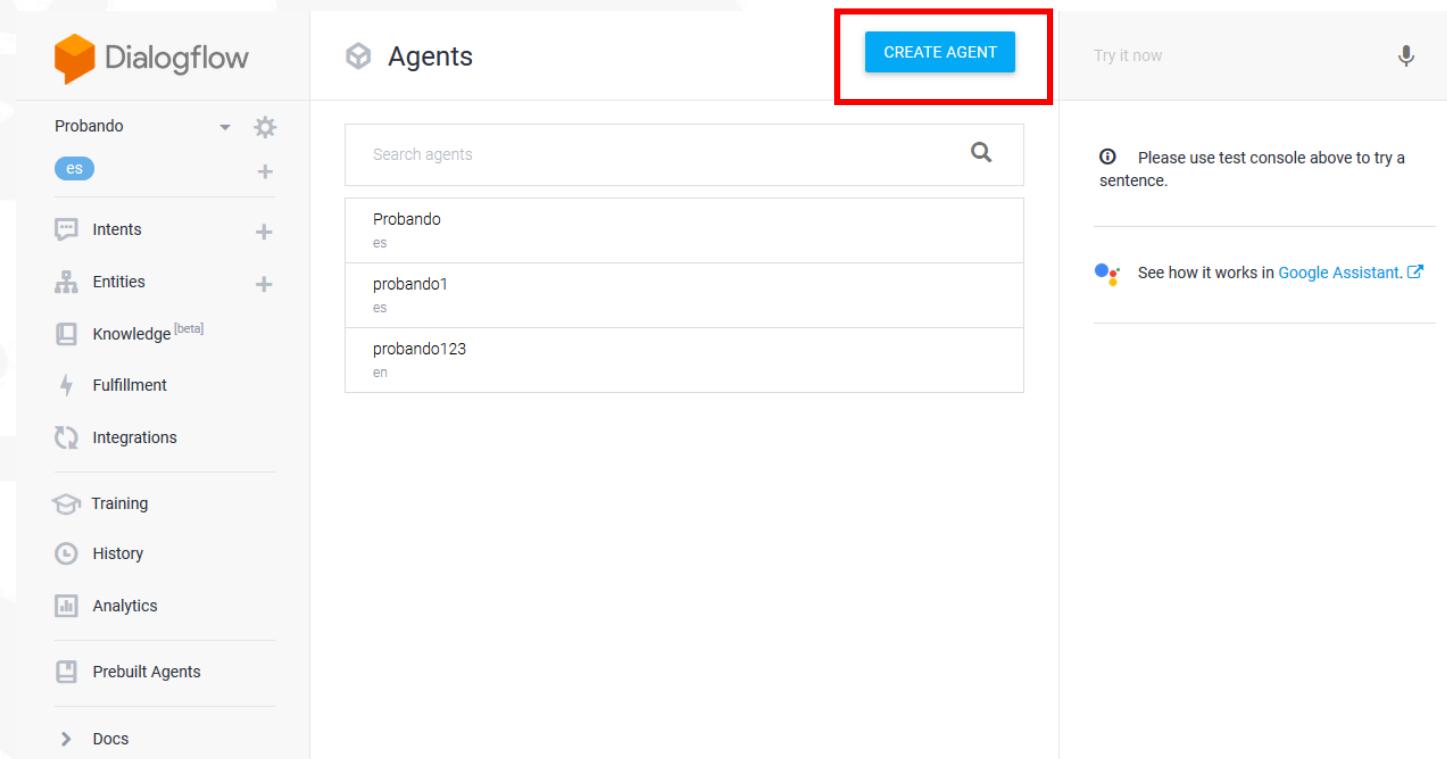


Google Assistant - Dialogflow



Google Assistant – Creación de una Skill básica

- Para crear una skill necesitamos una cuenta de Gmail y acceder a la herramienta *Dialogflow* y crear un nuevo agente



Google Assistant – Creación de una Skill básica

The screenshot shows the Dialogflow web interface. On the left, a sidebar lists project components: Probando (selected), en (language), Intents, Entities, Knowledge [beta], Fulfillment, Integrations, and Training. The main area is titled "Agent name" with a "CREATE" button. It includes sections for "DEFAULT LANGUAGE" (English – en) and "DEFAULT TIME ZONE" ((GMT+2:00) Europe/Kaliningrad). Below these are sections for "GOOGLE PROJECT" (Create a new Google project) and "Cloud functions, Actions on Google and permissions management". To the right, a "Try it now" section contains a note about using the test console and a link to "Set-up Google Assistant integration".

Google Assistant – Creación de una Skill básica

- El siguiente paso será crear los Intent con los que interactuar

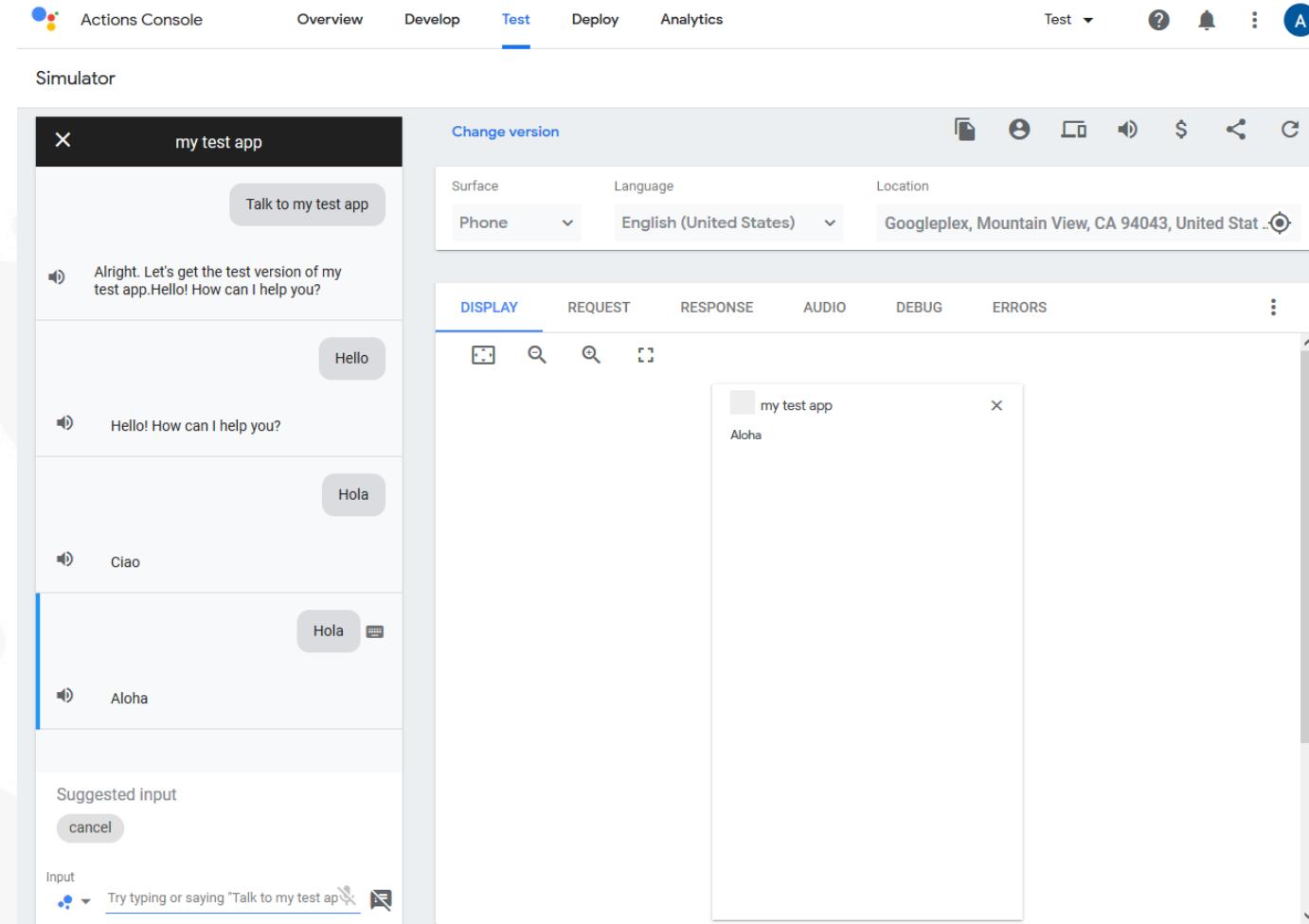
The screenshot shows the Dialogflow web interface. On the left, a sidebar menu includes options like Test, en, Intents (which is selected and highlighted in blue), Entities, Knowledge [beta], Fulfillment, Integrations, Training, History, and Analytics. The main content area is titled "Intents" and features a "CREATE INTENT" button. Below it is a search bar labeled "Search intents". A list of intents is shown, including "Default Fallback Intent" and "Default Welcome Intent". A message at the bottom says "No regular intents yet. [Create the first one.](#)". Further down, it explains that "Intents are mappings between a user's queries and actions fulfilled by your software." and provides a link to "Read more here". At the top right of the main area, there is a "Try it now" button with a microphone icon and a link to "See how it works in Google Assistant".

Google Assistant – Creación de una Skill básica

- El siguiente paso será crear los Intent con los que interactuar

The screenshot shows the Dialogflow web interface. On the left, a sidebar menu includes 'Test' (en), 'Intents' (selected), 'Entities', 'Knowledge [beta]', 'Fulfillment', 'Integrations', 'Training', 'History', and 'Analytics'. The main area is titled 'Intents' with a 'CREATE INTENT' button. It displays two default intents: 'Default Fallback Intent' and 'Default Welcome Intent'. A central message says 'No regular intents yet. [Create the first one.](#)' Below it, instructions state: 'Intents are mappings between a user's queries and actions fulfilled by your software.' and 'Before you start, check out [Prebuilt Agents](#), a collection of agents developed by the Dialogflow team.' On the right, a detailed view of the 'Default Welcome Intent' is shown, including sections for 'Contexts', 'Events' (with 'Welcome'), and 'Training phrases' (listing various greetings like 'just going to say hi', 'heya', 'hello hi', etc.).

Google Assistant – Creación de una Skill básica



Siri

- Es considerada la primera aplicación de asistente personal virtual
- Asistente virtual desarrollado por Sri venture group en 2008
- En 2010 se lanza una app para iPhone
- 2 meses después Apple compra Siri
- 2011 Siri es incorporada al iPhone 4S
- 2018 Apple lanza su altavoz inteligente Home pod



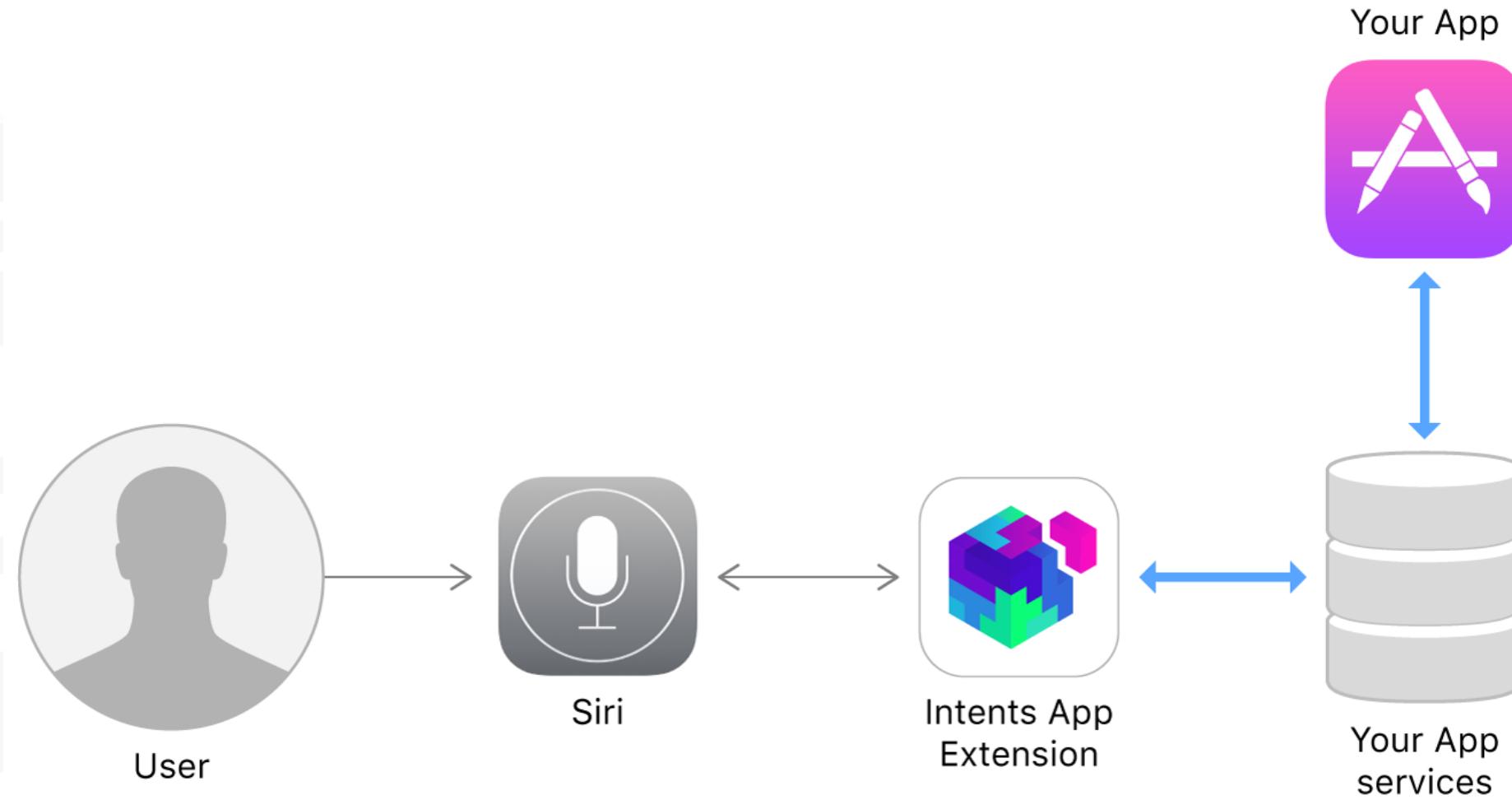
Siri

- Acciones posibles con Siri:

- Comandos por voz
- Creación de atajos personalizados para combinar acciones
- Reproducir música a través de aplicaciones
- Buscar ficheros dentro del dispositivo
- Buscar contraseñas almacenadas en el dispositivo
- Interactuar con las características del dispositivo
- Interactuar con personas
- Buscar información en Internet



Siri - Arquitectura



Otros asistentes

- **Bixby**

- Asistente creado en 2017 por Samsung
 - Disponible en algunos dispositivos Samsung



- **Braina**

- Asistente virtual para ordenador
 - Permite traducir a 100 idiomas



Otros asistentes

○ Voice Mate

- Asistente creado en 2017 por LG
- Disponible en algunos dispositivos LG
- Puede instalarse en otros dispositivos



○ J.A.R.V.I.S.

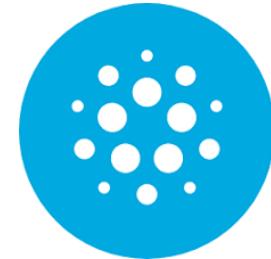
- Asistente virtual para el control de electrodomésticos inteligentes
- Disponible para descargar a dispositivos móviles



Otros asistentes

- Aura

- Asistente desarrollado por Telefónica en 2017
- Orientado a la aplicación Movistar +
- Programado sobre los servicios Azure Machine Learning



- Dueros

- Asistente virtual desarrollado por Baidu's
- Disponible para dispositivos Android
- Gran popularidad en China



Comparativa entre Asistentes Virtuales

Query Results

	Answered Correctly	Understood Query
Google Assistant	87.9%	100%
Siri	74.6%	99.6%
Alexa	72.5%	99.0%
Cortana	63.4%	99.4%



Comparativa entre Asistentes Virtuales

Queries Answered Correctly by Category

