Building Spoken Language Apps for Amazon Echo and Alexa

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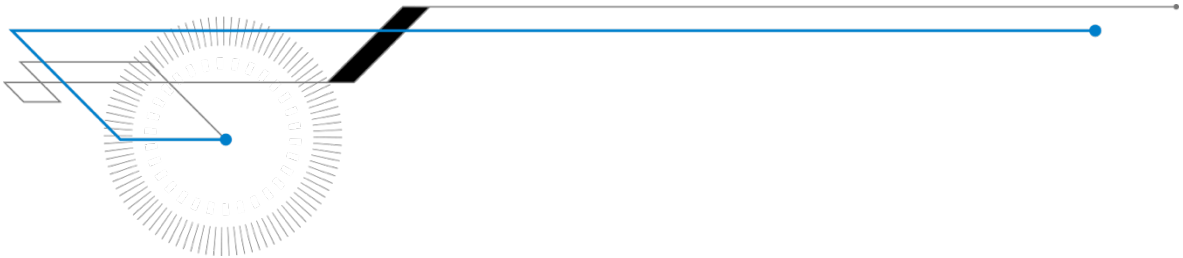
http://developer.amazon.com/ask

http://developer.amazon.com/blog

What is Alexa?



Alexa, Hello.

Skills are how you, as a developer, make Alexa smarte

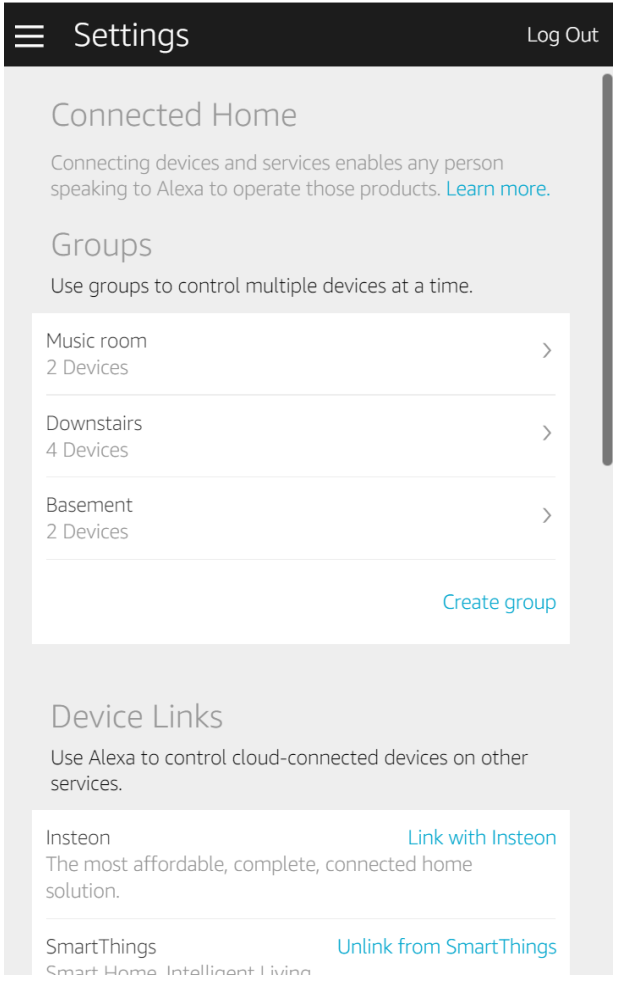
They give customers new experiences.

They’re the voice-first apps for Alexa.

The Alexa Platform

Connected Home (CoHo) and Lighting API

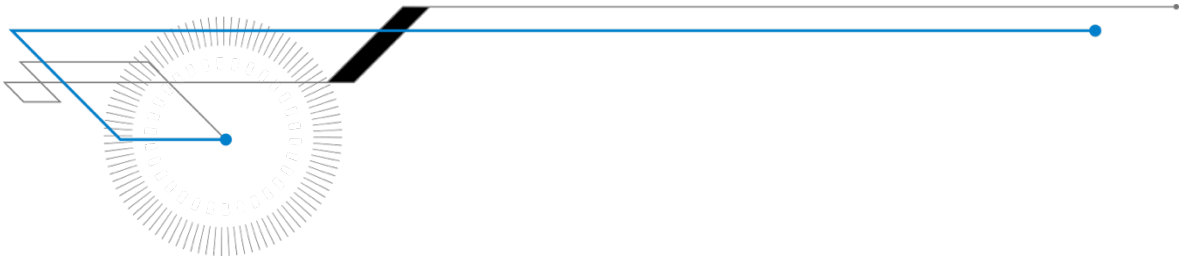
Alexa App



amazon alexa

http://alexa.amazon.com

Alexa Skills Kit (ASK) Overview



ALEXA SKILLS KIT (ASK)

https://developer.amazon.com/ask

Alexa Skills Kit (ASK) Developer Preview

A free SDK that lets you easily add new voice capabilities

Alexa, the voice service that powers Echo, provides a set of built-in abilities, or skills, that enable customers to interact with devices in a more intuitive way using voice. Examples of these skills include the ability to play music, answer general questions, set an alarm or timer and more. With the Alexa Skills Kit, you can easily build and add your own skills to Alexa. Customers can access these new skills simply by asking Alexa a question or making a command.

Quickly Build Skills with the Alexa Skills Kit (ASK)

The Alexa Skills Kit is a collection of self-service APIs, tools, documentation and code samples that make it fast and easy for you to add skills to Alexa. Using ASK, you can teach new skills to Alexa in just a few hours. No prior experience with speech recognition or natural language understanding is required. All of the code runs in the cloud — nothing is installed on any user

Get Started

Alexa Voice Service

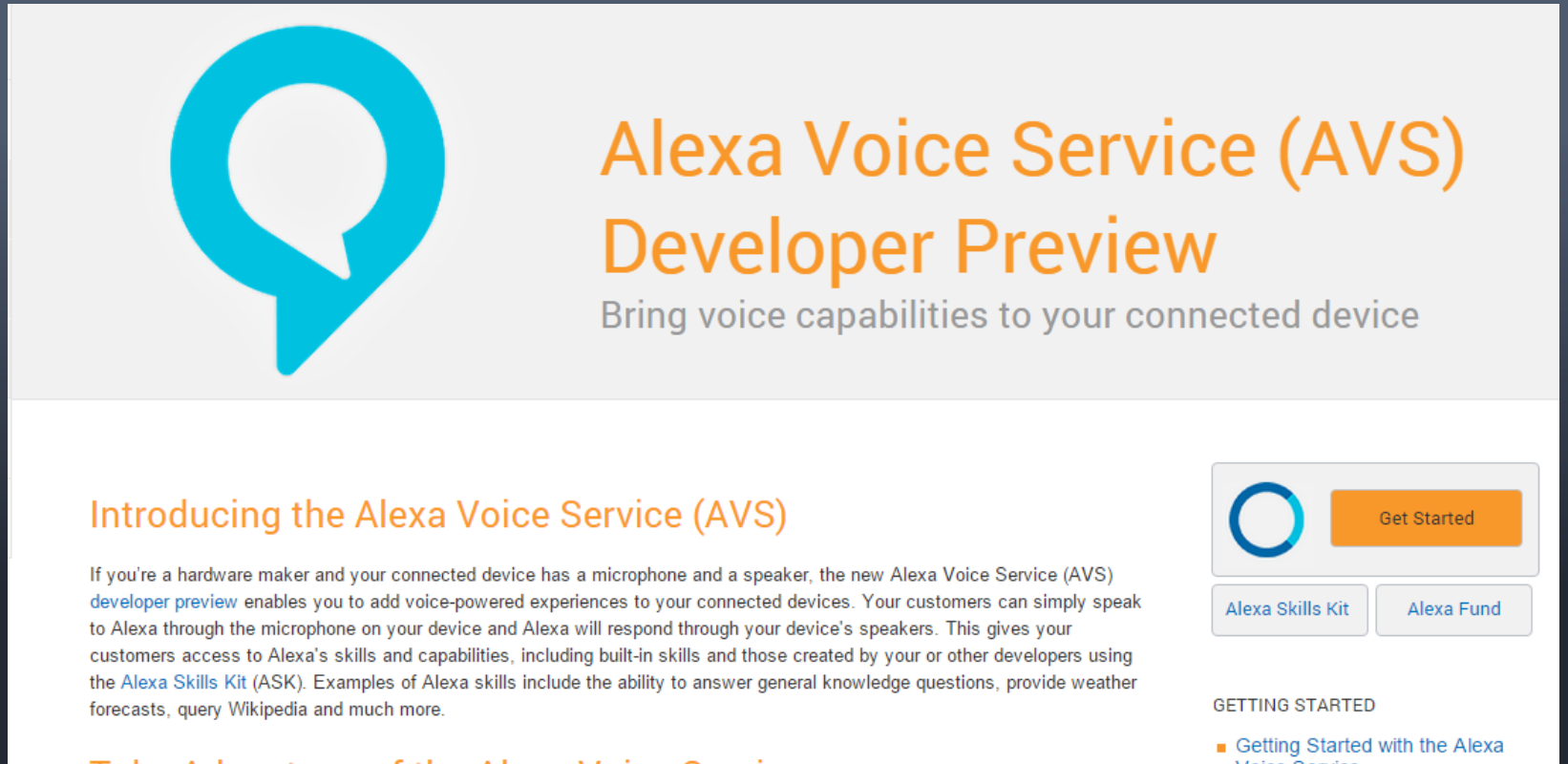
Alexa Fund

GETTING STARTED

- Getting Started with the Alexa Skills Kit

ALEXA VOICE SERVICE (AVS)

https://developer.amazon.com/avs



THE ALEXA FUND

https://developer.amazon.com/alexafund

The Alexa Fund

$100 million in investment to fuel voice technology innovation

What is the Alexa Fund?

Experiences designed around the human voice will fundamentally improve the way people use technology. Since introducing Amazon Echo, we've heard from developers, manufacturers, and start-ups of all sizes who want to innovate with voice. The Alexa Fund--named for Alexa, the cloud-based voice service that powers Amazon Echo--provides up to $100 million in investments to fuel voice technology innovation. Whether that's creating new Alexa capabilities with the Alexa Skills Kit (ASK), building devices that use Alexa for new and novel voice experiences using the Alexa Voice Service (AVS), or something else entirely, if you have a visionary idea, we'd love to talk to you.

Apply to the fund

Alexa Voice Service

Alexa Skills Kit

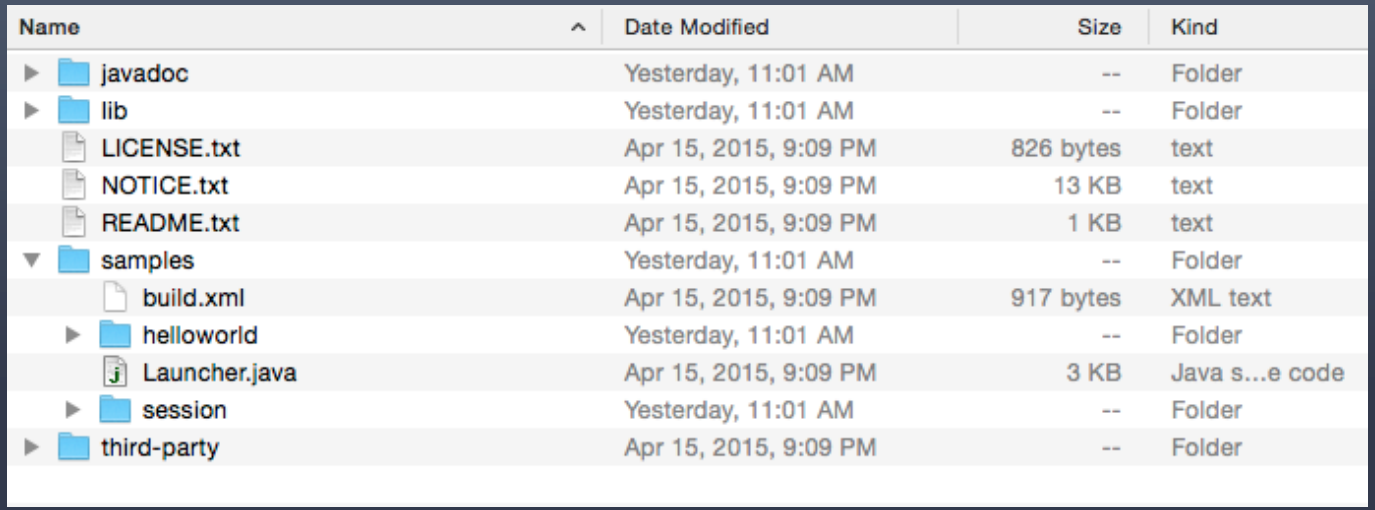
GETTING STARTED

- Tell us about your idea

ALEXA SKILLS KIT

Alexa is the cloud service used by Amazon Echo

The Alexa Skills Kit allows developers to build new Skills (new voice experiences) for Echo



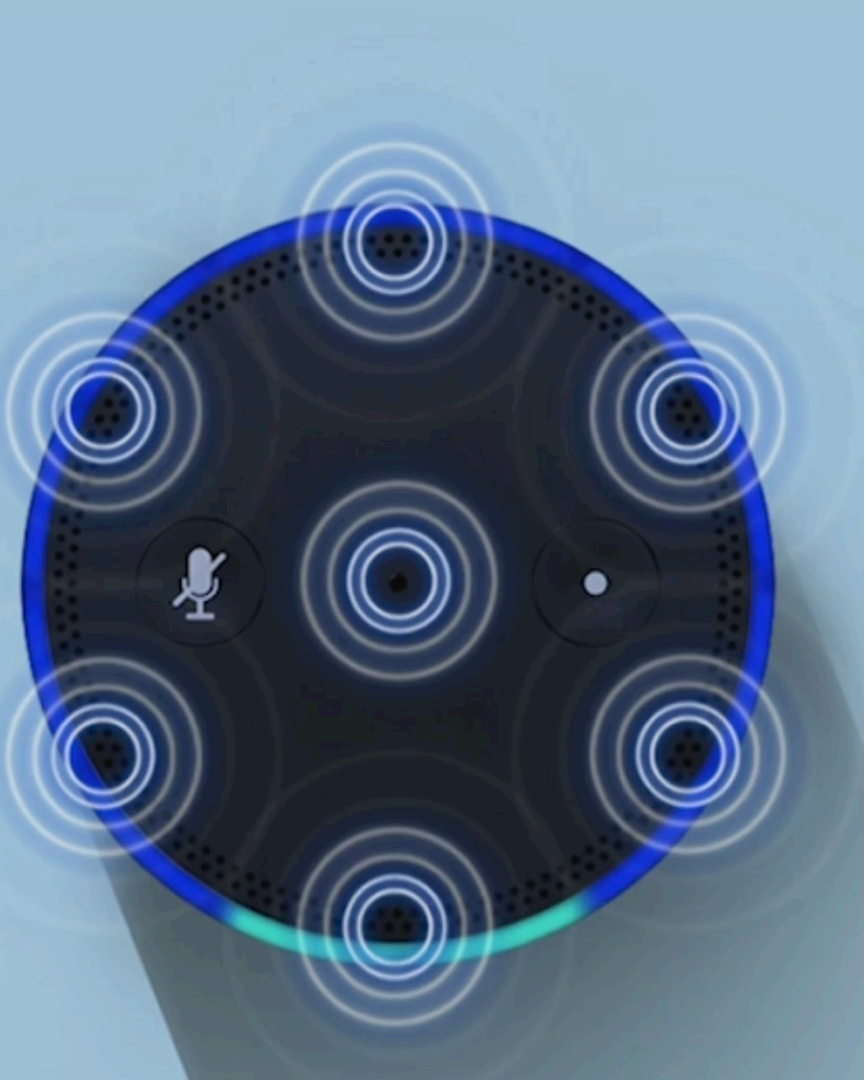
Alexa Architecture

Audio responses are rendered on-device

GUI cards are rendered in the Amazon Alexa app

amazon alexa

Amazon Alexa Service



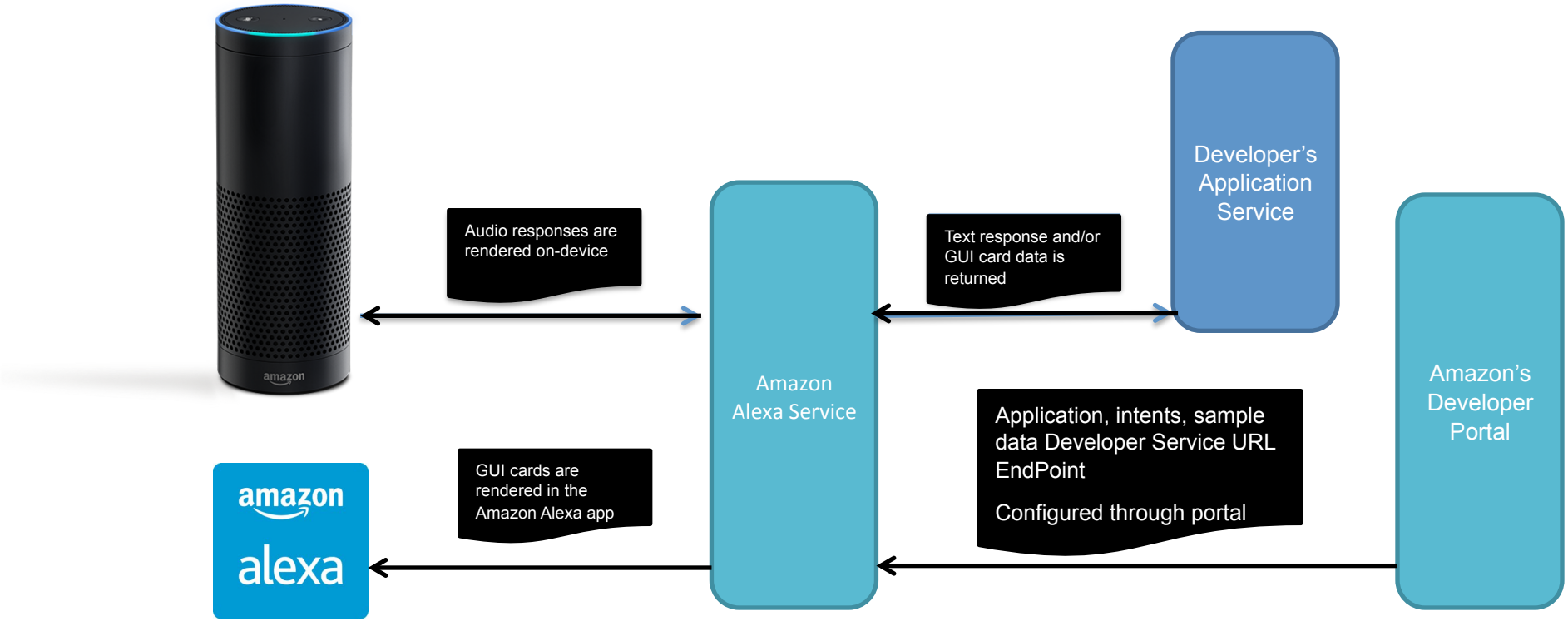
Creating your own
ALEXA SKILLS

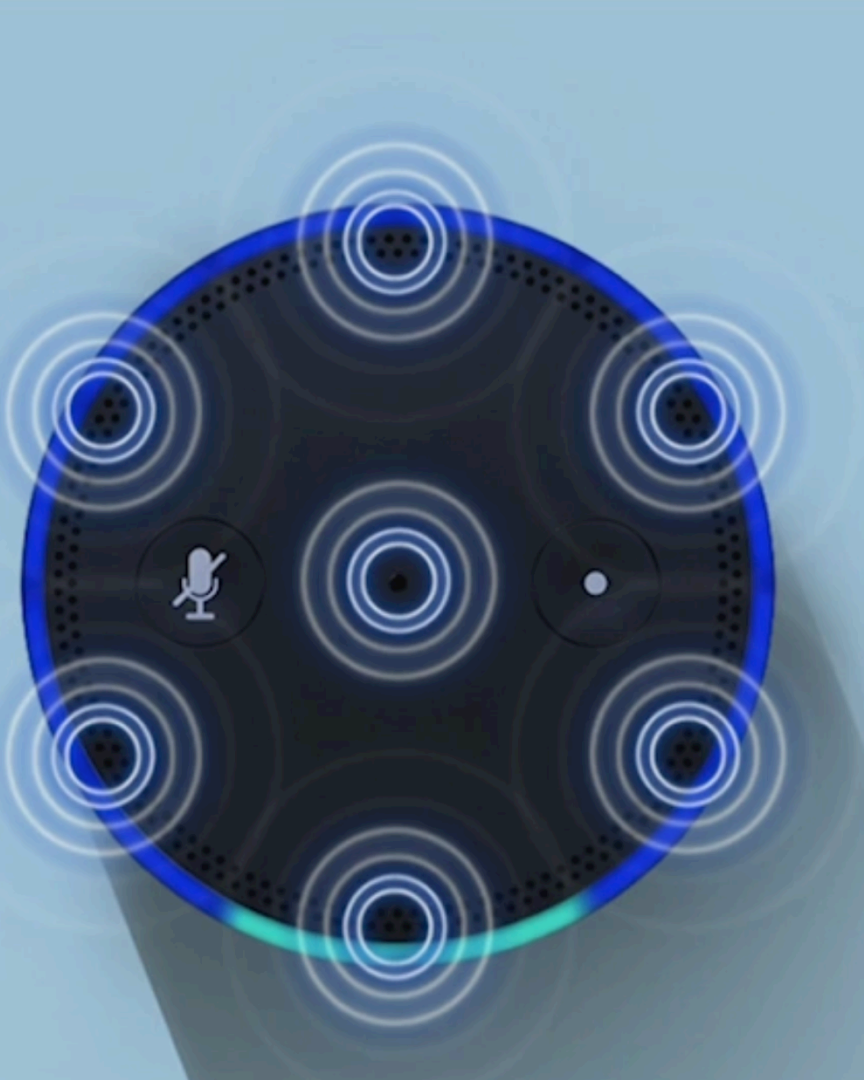
Alexa Skills have two parts:

Configuration data in Amazon Developer Portal

Hosted Service responding to user requests

Alexa Skills Kit Architecture





Sample Interactions of ALEXA SKILLS

One and done

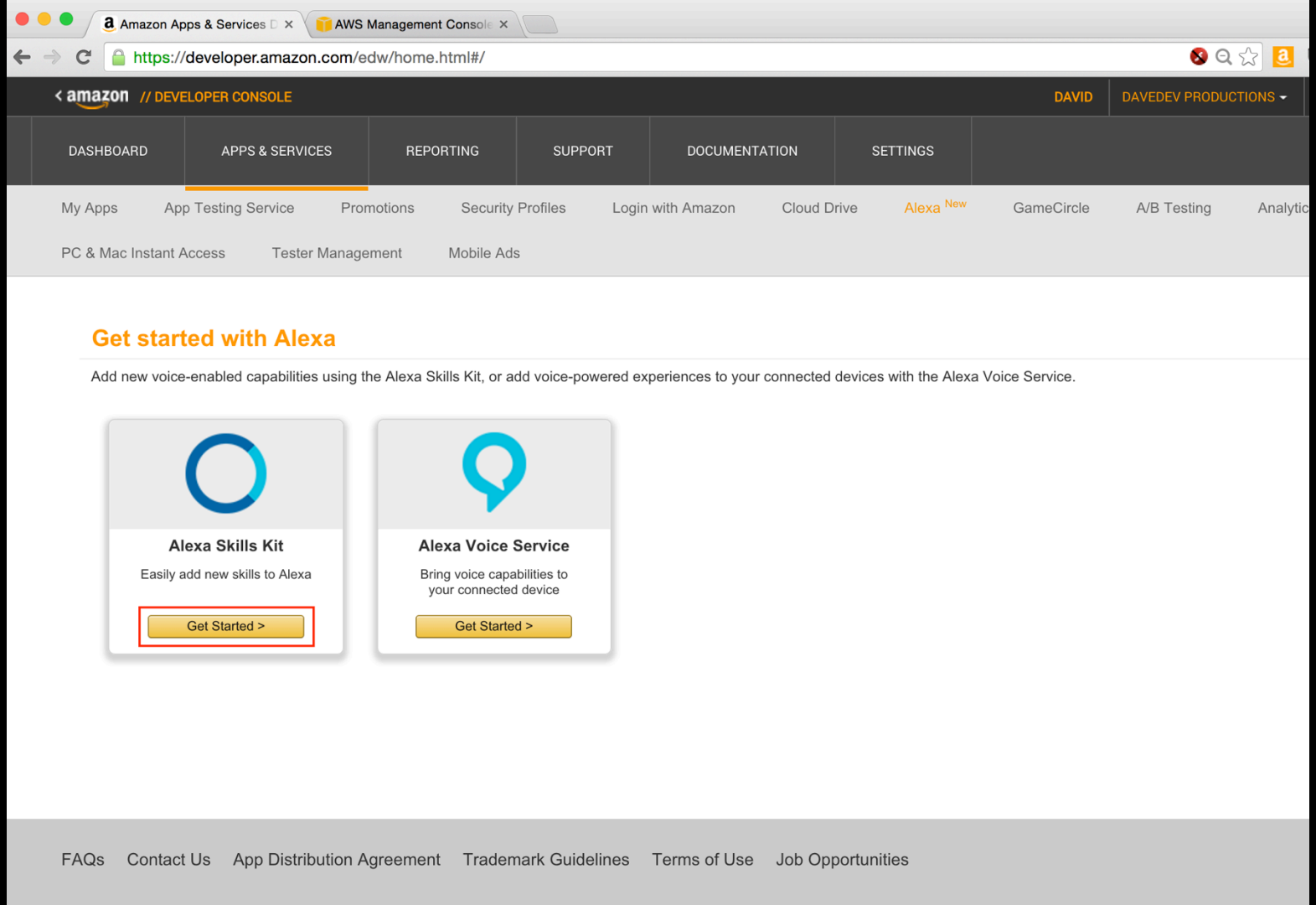
> “Alexa, start Astrology and get the Pisces horoscope.”
>
> [Horoscope Provided]

Conversation

> “Alexa, start Astrology”
>
> [“What’s your sign?”]
>
> “Pisces”
>
> [Horoscope Provided]

Configuring a new Alexa Skill

Demo


Amazon Apps & Services
AWS Management Console
https://developer.amazon.com/edw/home.html#/
amazon // DEVELOPER CONSOLE
DAVID
DAVEDEV PRODUCTIONS
DASHBOARD
APPS & SERVICES
REPORTING
SUPPORT
DOCUMENTATION
SETTINGS
My Apps
App Testing Service
Promotions
Security Profiles
Login with Amazon
Cloud Drive
Alexa New
GameCircle
A/B Testing
Analytic
PC & Mac Instant Access
Tester Management
Mobile Ads
Get started with Alexa
Add new voice-enabled capabilities using the Alexa Skills Kit, or add voice-powered experiences to your connected devices with the Alexa Voice Service.
Alexa Skills Kit
Easily add new skills to Alexa
Get Started >
Alexa Voice Service
Bring voice capabilities to your connected device
Get Started >
FAQs
Contact Us
App Distribution Agreement
Trademark Guidelines
Terms of Use
Job Opportunities

Building Alexa Skills with the Alexa Skills Kit

Add a New Skill

To learn more about building Alexa skills, see **Getting Started with the Alexa Skills Kit.** To start building an Alexa skill for free in Node.js or Java using AWS Lambda, see **Developing an Alexa Skill as a Lambda Function.**

We encourage you to visit the **Alexa Developer Forum** to collaborate with Alexa team members and fellow Alexa developers.

Your skills | Skill Metrics

Name	Invocation Name	Version	Modified	Status	Actions
Appstore Allhands	meeting	1.0	11/16/15	Development	Edit Delete
WhoIsPerson	anyone	1.0	11/15/15	Development	Edit Delete
BerlinColors	berlin colors	1.0	10/23/15	Development	Edit Delete
Daves Colors	daves color	1.00	10/20/15	Development	Edit Delete
myconference	my conference	1.0	10/8/15	Development	Edit Delete
myhackathon	my hackathon		10/8/15	Development	Edit Delete
beanstalkdemo	beanstalk demo	1.0	10/3/15	Development	Edit Delete

< Back to the list of skills

Create a New Alexa Skill

DEVELOPMENT

Getting started

*Fields required for certification

- Skill Information
- Interaction Model
- Test
- Description
- Publishing Information

Name *
The name of this skill. This is the name displayed in the Alexa App.

Webinar Colors

Invocation Name *
The name users will say to interact with this skill. This does not have to be the same as the skill name. The invocation name must comply with the Invocation Name Guidelines

webinar colors

Version
The serial number of the skill e.g. 1.0, 1.1

1.0

Endpoint *
The URL for the service endpoint, e.g. https://myskill.ishere.com/somepath, or the Lambda ARN,
More info about AWS Lambda
How to integrate AWS Lambda with Alexa

HTTPS | Lambda ARN (Amazon Resource Name)

Save

Next

Building an Alexa Skill

HOSTED SERVICE

- Adheres to ASK service interface
- Uses HTTP over **SSL/TLS** on **port 443**
- Must be **Internet-accessible**
- Presents a **trusted certificate** matching domain name
  - Can use self-signed certificate for development
  - Trusted certificate required for certification

```
{
  "intents": [
    {
      "intent": "GetComputer",
      "slots": [
        {
          "name": "Model",
          "type": "MODELS"
        },
        {
          "name": "Date",
          "type": "AMAZON.DATE"
        }
      ]
    }
  ]
}
```

Building an Alexa Skill

HOSTED SERVICE

- You **define** interactions for your skill through **Intent Schemas**
- Each intent consists of two fields. The **intent field** gives the name of the intent. The slots field lists the slots associated with that intent.
- Slots can be any internal types such as AMAZON.**LITERAL**, AMAZON.**NUMBER** or they can be ones you create.

Implementing Custom Slot Types

- **AMAZON.DATE** – converts words that indicate dates (“today”, “tomorrow”, or “july”) into a date format (such as “2015-07-00T9”).
- **AMAZON.DURATION** – converts words that indicate durations (“five minutes”) into a numeric duration (“PT5M”).
- **AMAZON.FOUR_DIGIT_NUMBER** - Provides recognition for four-digit numbers, such as years.
- **AMAZON.NUMBER** – converts numeric words (“five”) into digits (such as “5”).
- **AMAZON.TIME** – converts words that indicate time (“four in the morning”, “two p m”) into a time value (“04:00”, “14:00”).

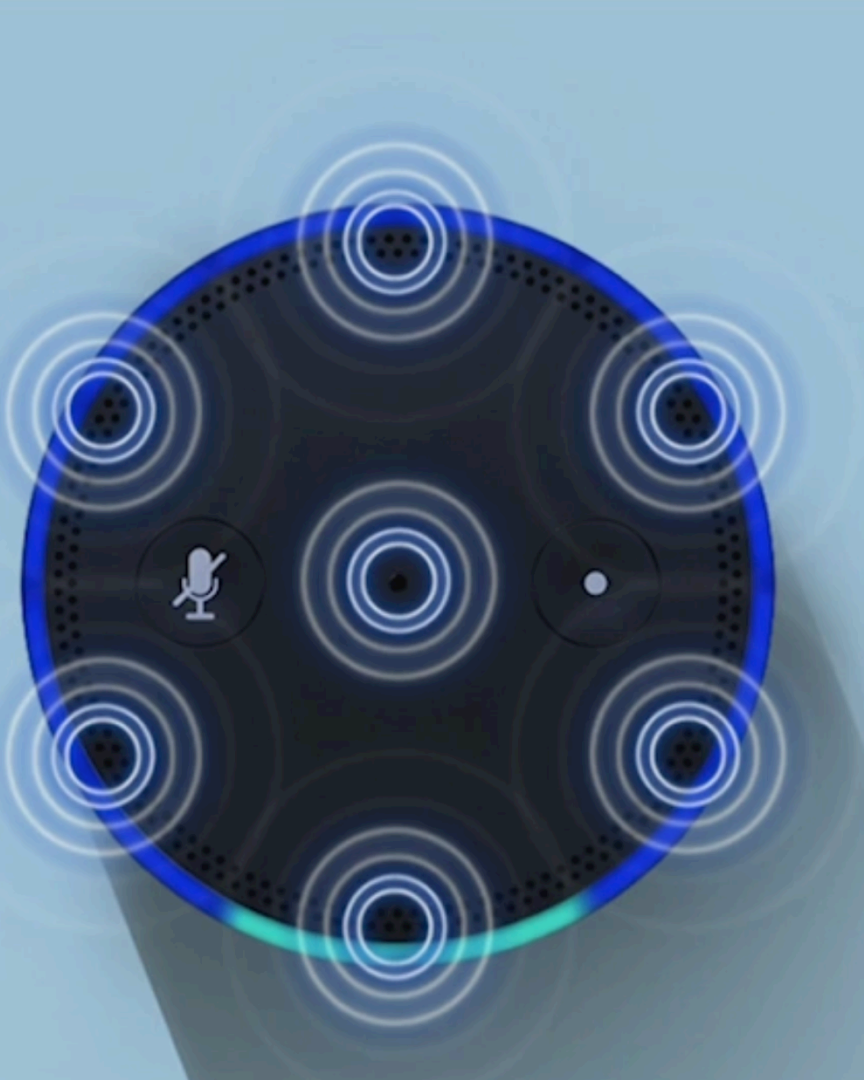
Implementing Custom Slot Types

- **AMAZON.US_CITY** - provides recognition for major cities in the United States.
- **AMAZON.US_STATE** - provides recognition for US states, territories, and the District of Columbia.
- **AMAZON.US_FIRST_NAME** - provides recognition for thousands of popular first names, based on census and social security data.
- **AMAZON.LITERAL** – always try to use a custom slot type first. Used for backwards compatibility.

- “what is…”
- “what’s…”
- “tell me…”
- “give…”
- “give me…”
- “get…”
- “get me…”
- “find…”
- “find me…”

Building an Alexa Skill
HOSTED SERVICE

- The mappings between intents and the typical utterances that invoke those intents are provided in a tab-separated text document of sample utterances.
- Each possible phrase is assigned to one of the defined intents.
- **GetModelsBy**Year what were the Amiga models in **{1997|Date}**
- **GetModel** what year was the **{model}** released



The Amazon Alexa Service
WILL POST EVENTS

LaunchRequest

Maps to **onLaunch()** and occurs when the user launches the app without specifying what they want

IntentRequest

Maps to **onIntent()** and occurs when when the user specifies an intent

SessionEndedRequest

Maps to **OnSessionEnded()** and when the user ends the session

Examining the JSON Requests from

Alexa Service

HTTP Header

```
POST / HTTP/1.1
Content-Type : application/json;charset=UTF-8
Host : your.application.endpoint
Content-Length :
Accept : application/json
Accept-Charset : utf-8
Signature:
SignatureCertChainUrl: https://s3.amazonaws.com/echo.api/echo-api-cert.pem
```

Request Body Syntax

The request body sent to an Alexa app is in JSON format.

```
{
  "version": "string",
  "session": {
    "new": boolean,
    "sessionId": "string",
    "application": {
      "applicationId": "string"
    },
    "attributes": {
      "string": object
    },
    "user": {
      "userId": "string"
    }
  },
  "request": object
}
```

```
{
  "type": "IntentRequest",
  "requestId": "string",
  "timestamp": "string",
  "intent": {
    "name": "string",
    "slots": {
      "string": {
        "name": "string",
        "value": "string"
      }
    }
  }
}
```

Handling Amazon Alexa Service

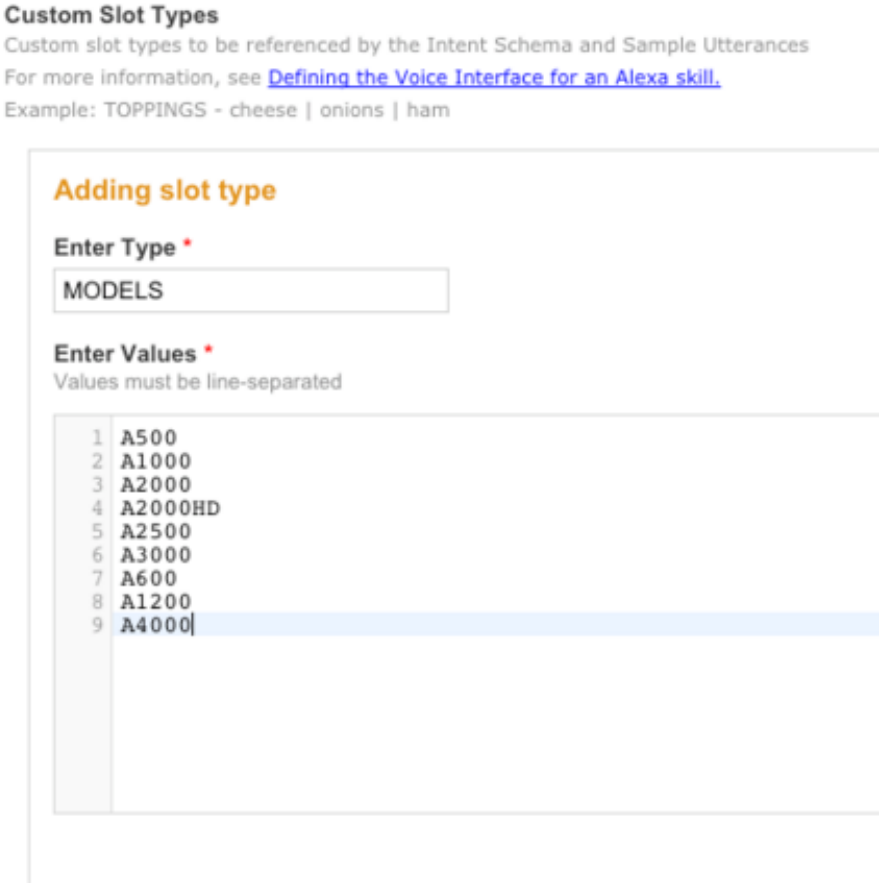
REQUESTS

- You will need to handle **POST** requests to your service over port 443 and parse the JSON
- You need to check the **session variable** to see if the user started a new session or if request is from existing one
- Requests always Include a **type**, **requestId** and **timestamp**
- requestId maps directly to **LaunchRequest**, **IntentRequest** and **SessionEndedRequest**

```
{
  "intents": [
    {
      "intent": "GetFirstEventIntent",
      "slots": [
        {
          "name": "day",
          "type": "AMAZON.DATE"
        }
      ]
    },
    {
      "intent": "GetNextEventIntent"
    },
    {
      "intent": "AMAZON.HelpIntent"
    },
    {
      "intent": "AMAZON.StopIntent"
    }
  ]
}
```

Increasing Accuracy with Built-In Intents

- Called in a natural, spontaneous by users across all skills and Alexa core functionality
- These intents provides a way for you to return help or response whenever these Intents are killed.
- CancelIntent, HelpIntent, YesIntent, NoIntent, RepeatIntent, StartOverIntent, StopIntent



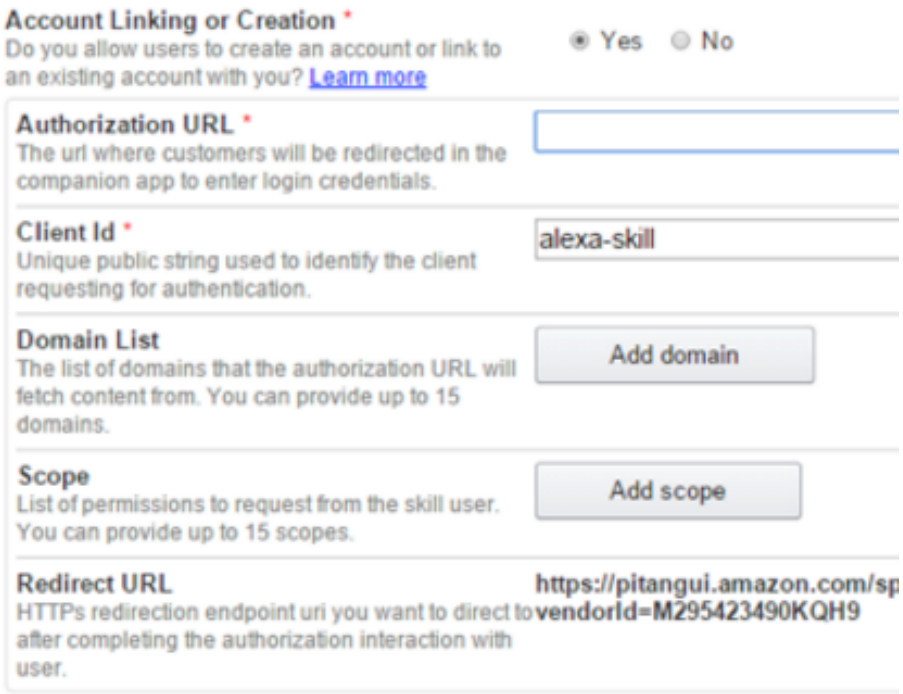
Increasing Accuracy with CUSTOM SLOTS

- Created inside Interaction Model page once in the Developer Portal
- Greatly reduces the number of sample utterances required
- Can define as many as you need with values line separated
- Can be combined with existing AMAZON internal types

Changing Alexa's inflection with SSML

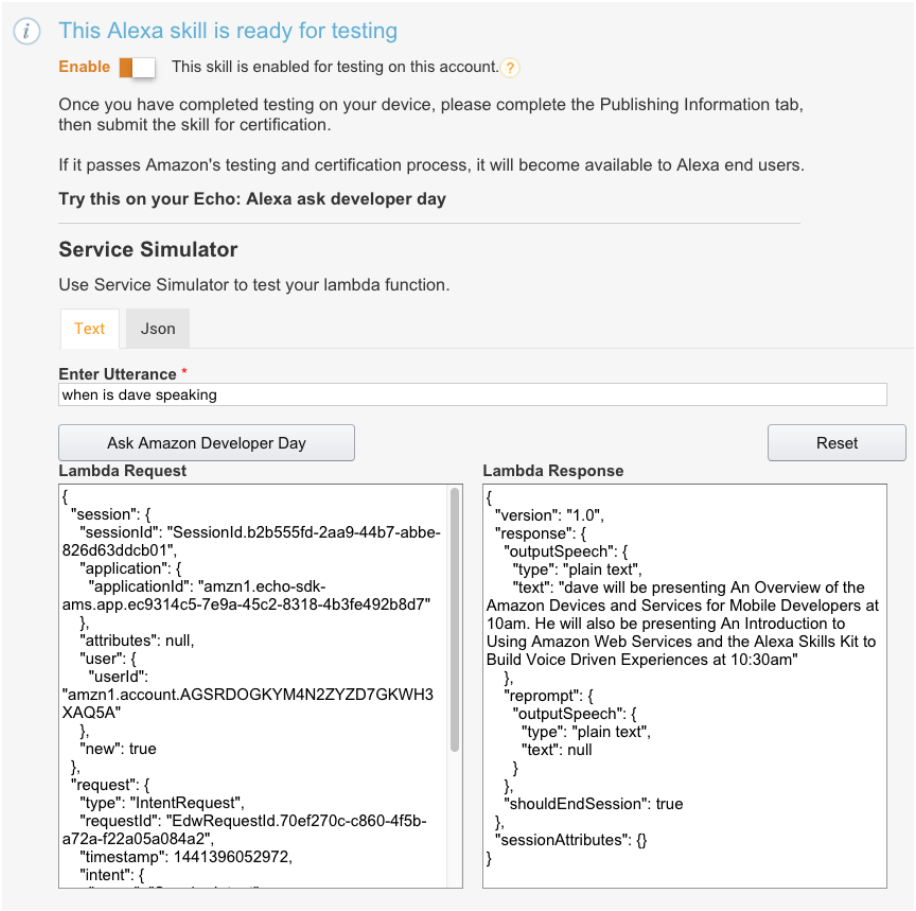
- Alexa automatically handles normal punctuation, such as pausing after a period, or speaking a sentence ending in a question mark as a question.
- Speech Synthesis Markup Language (SSML) is a markup language that provides a standard way to mark up text for the generation of synthetic speech.
- Tags supported include: speak, p, s, break, say-as, phoneme, w and **audio**.

```
<speak>
    Here is a number read as a cardinal number:
    <say-as interpret-as="cardinal">12345</say-as>.
    Here is the same number with each digit spoken separately:
    <say-as interpret-as="digit">12345</say-as>.
    Here is a word spelled out: <say-as type="spell-out">hello</say-as>
</speak>
```



Existing Customer with ACCOUNT LINKING

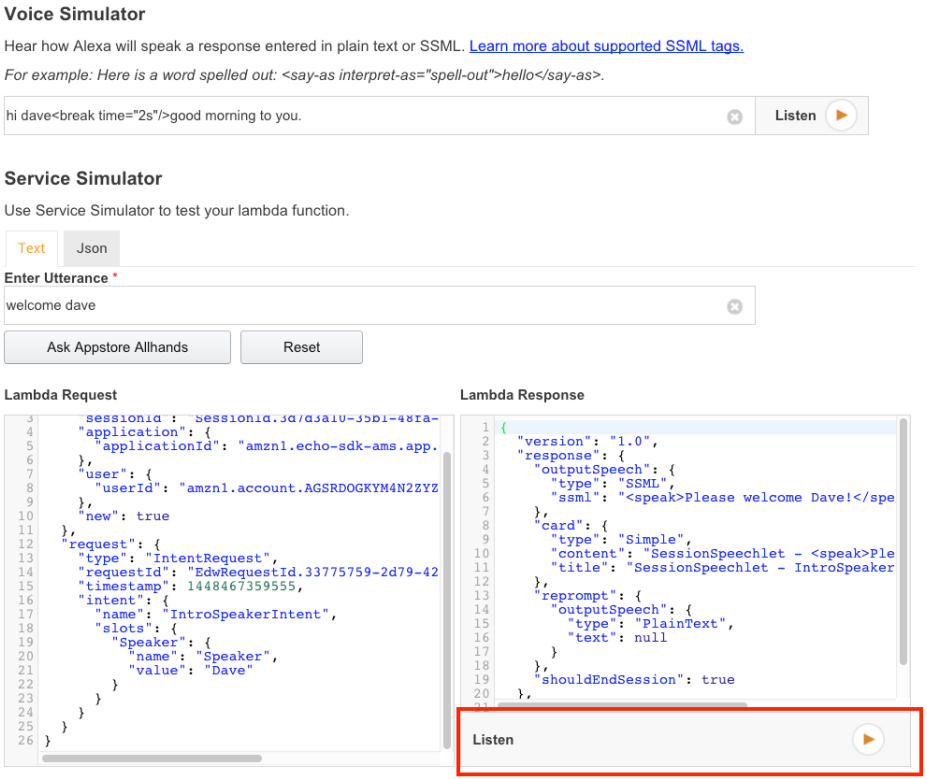
- Allow your customers to link their existing accounts with you, to Alexa.
- Customers are prompted to log in to your site using their normal credentials with webview url you provide.
- You authenticate the customer and generate an access token that uniquely identifies the customer and link the accounts.



Testing Your Skill

SERVICE SIMULATOR

- Enabled once a Skill has been configured in the Developer Portal
- Use spoken utterances to generate ad hoc results
- Use JSON to verify requests
- Combine with AWS Lambda Unit Tests to verify both client and service side Alexa end points



Testing Your Skill
VOICE SIMULATOR

- The new Voice Simulator tool will let you create SSML on the fly and then have Alexa respond.
- The Voice Simulator does not interact with the service for your skill, so you can use it to hear text-to-speech conversion before you have completed the minimum configuration for your skill.

AWS Lambda

Run code without thinking about servers.

Pay for only the compute time you consume.

Get started with AWS Lambda

Creating a new Alexa skill with AWS Lambda

Demo

http://developer.amazon.com/ask

http://developer.amazon.com/blog