Report on:

What's Cooking

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Introduction

The story of every house is that they have a big problem in deciding the menu for the dinner. The variety and new dishes required by the people and the craze of good and delicious food makes it difficult for every cook in the apartment to satisfy their family wishes for new dish. So, when you are confused and run out of ideas, try our smart recipe finder app *“What's Cooking!”*

What's Cooking finds recipes that use as many of the given ingredients as possible and have as little as possible missing ingredients. It walks you through the instructions of the recipe step by step. You just need to specify the ingredients and our application will guarantee tasty dish. You can also add or remove ingredients according to its availability and our application will suggest you good dishes accordingly.

Here are some things you can ask Alexa for:

“Open Today’s Menu”

“Ask What’s Cooking give me recipes for Onions, Sweet Potatoes, Bell Pepper, etc”

“Add ingredient Tomatoes, Thai Chilly, etc”

“Remove ingredient Tomatoes, Thai Chilly, etc”

“Give me instructions for”

Overview

The What's cooking recipe application suggests recipe to the user based on the ingredient specified by the user. We have developed a user-friendly application with the help of Amazon Alexa which is an intelligent digital virtual assistant. We have used Amazon Echo Dot speaker with a built-in microphone for interactive speech user interface. When user speaks, Alexa quickly responds with recipes or necessary guidelines which matches your desired cuisine and the ingredients specified. This skill helps in providing access to thousands of recipes in just few voice commands.

Platform & Technologies

Alexa Skill Kit

The Alexa Skills Kit (ASK) is a collection of self-service APIs, tools, documentation, and code samples that makes it fast and easy for you to add skills to Alexa [1].

AWS Lambda

AWS Lambda is a compute service that lets you run code without provisioning or managing servers. AWS Lambda executes your code only when needed and scales automatically, from a few requests per day to thousands per second [6].

Echo Dot

Amazon Echo Dot is a 360-degree speaker that uses far-field voice recognition powered by the Amazon Alexa voice service/assistant [2].

Spoonacular API

The spoonacular Nutrition, Recipe, and Food API allows you to access over 365,000 recipes and 86,000 food products [3].

Flask – Ask

Flask-Ask is a Flask extension that makes building Alexa skills for the Amazon Echo easier and much more fun [4].

Ngrok

ngrok allows you to expose a web server running on your local machine to the internet [5].

Zappa

Zappa is a serverless framework which we have used to deploy our Alexa Skill to AWS Lambda using python [8].

Setup

Alexa Skill Setup

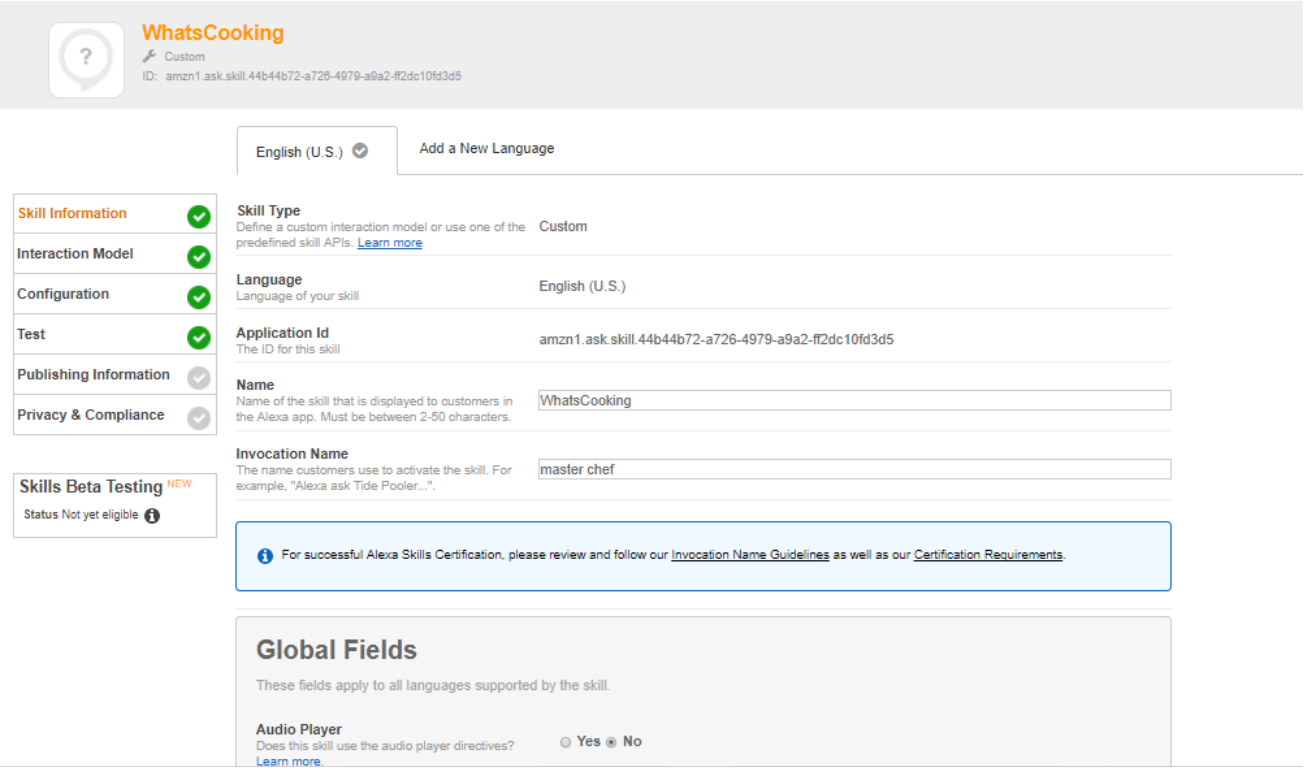
Alexa skill is comprised of two parts: -

1) Voice User Interface – Here we handle voice input of user
2) Actual Code Logic – It responds to the user input

There are two parts to an Alexa skill. The first part is the Voice User Interface (VUI). This is where we define how we will handle a user's voice input, and which code should be executed when specific commands are uttered.

Step 1: Sign in to Amazon developer console and select “Add a New Skill” under “Alexa Skills Kit”

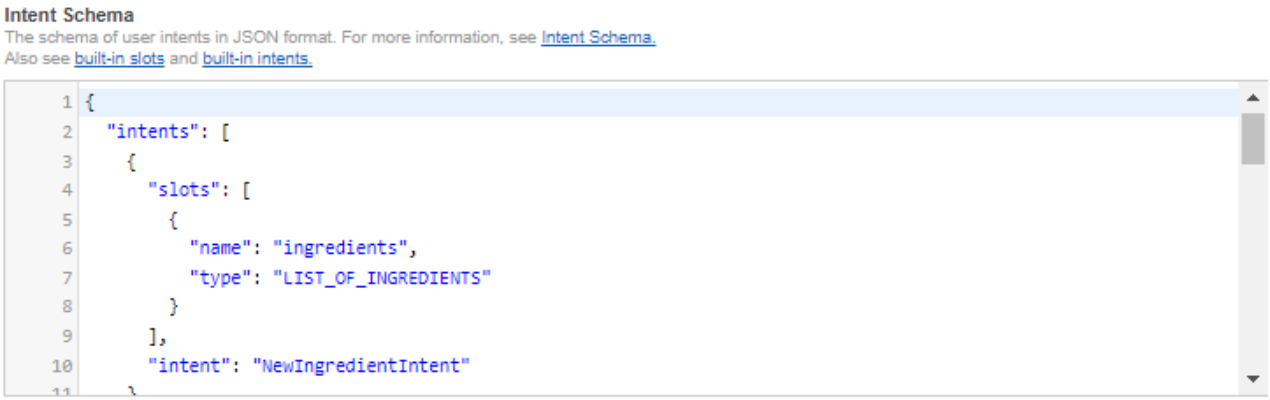
Step 2: Fill out all the skill information which includes name of the skill, Invocation name which triggers your Alexa skill.



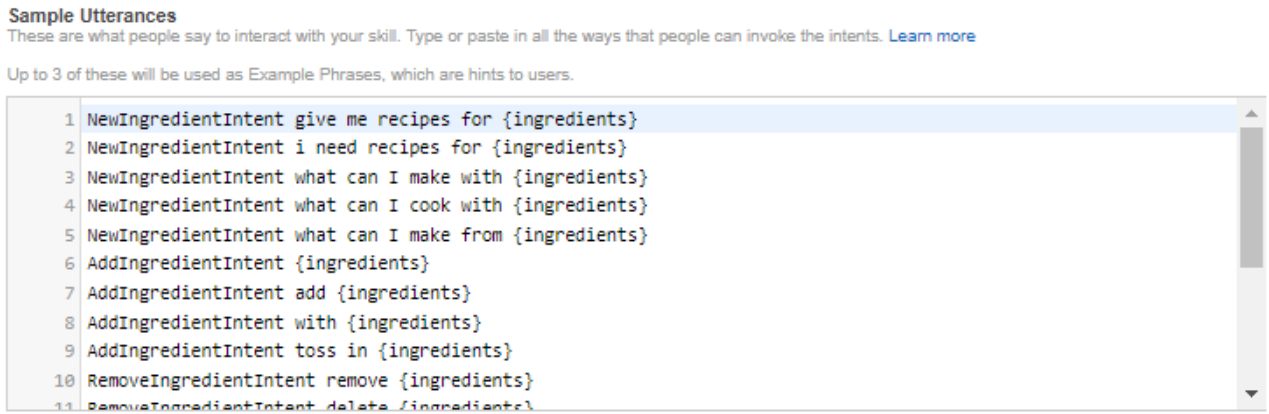
Step 3: To process user voice commands and invoke appropriate intent to generate an accurate respond to the user query are specified in the

interaction model section of skill configuration. In short, the voice interface of your skill is defined under interaction model. They are as follows:

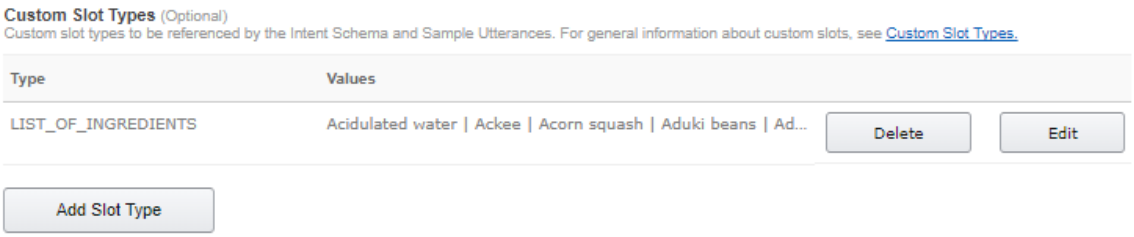
1) **Intents:** An intent represents an action that fulfills a user's spoken request. Intents can optionally have arguments called *slots*.



2) **Sample utterances:** A set of likely spoken phrases mapped to the intents. This should include as many representative phrases as possible.



3) **Custom slot types**: A representative list of possible values for a slot. Custom slot types are used for lists of items that are not covered by one of Amazon's built-in slot types.



4) **Dialog model** (optional): A structure that identifies the steps for a multi-turn conversation between your skill and the user to collect all the information needed to fulfill each intent. This simplifies the code you need to write to ask the user for information [7].

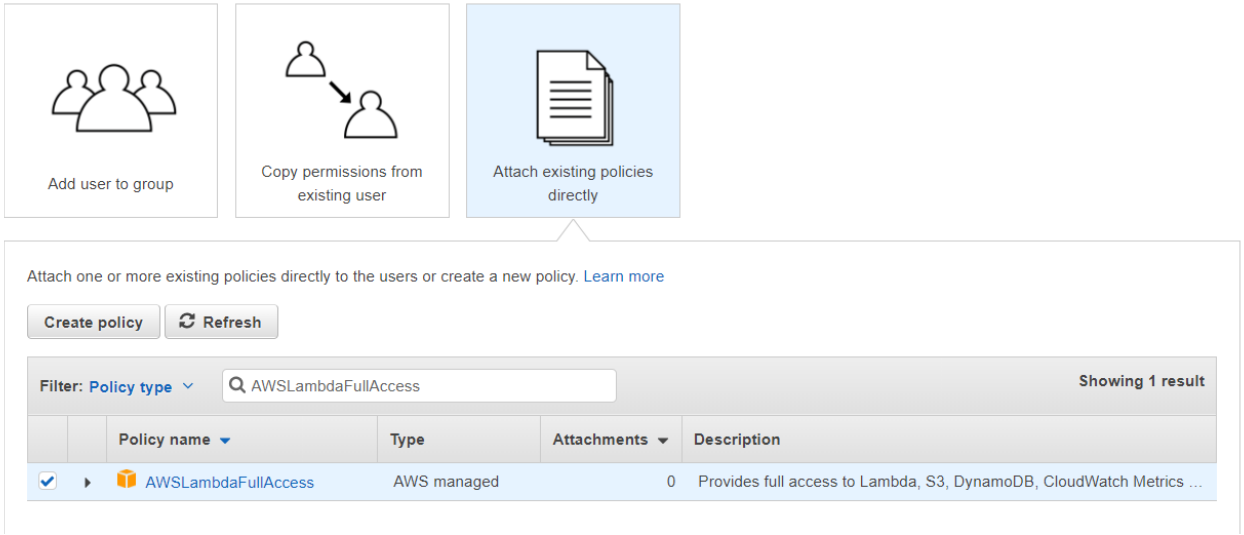
Step 4:

- **AWS Lambda Function**

  Here we will create the actual code logic for the Alexa skill using AWS lambda function. Create the Lambda function in one of the two regions: US East (N. Virginia) and EU (Ireland) as Alexa skill works only for these regions. Create the lambda function and upload your code logic

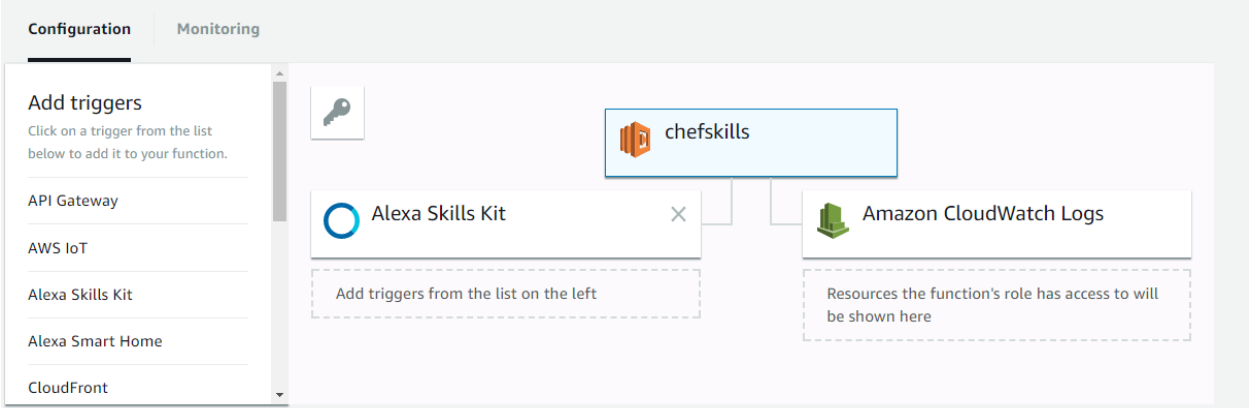
- **AWS IAM role**

  While creating Lambda function you will need to setup the IAM role to give the function access to other AWS resources.

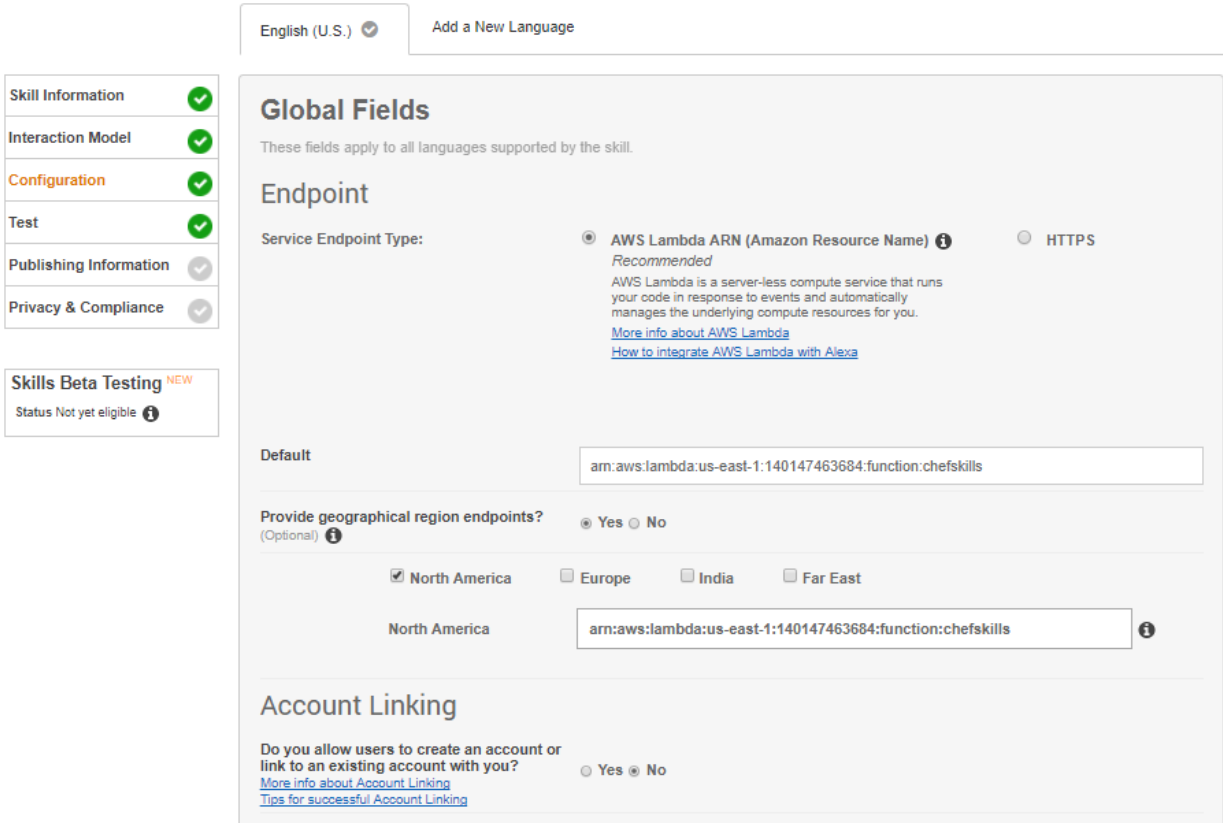


- **Configuring trigger**

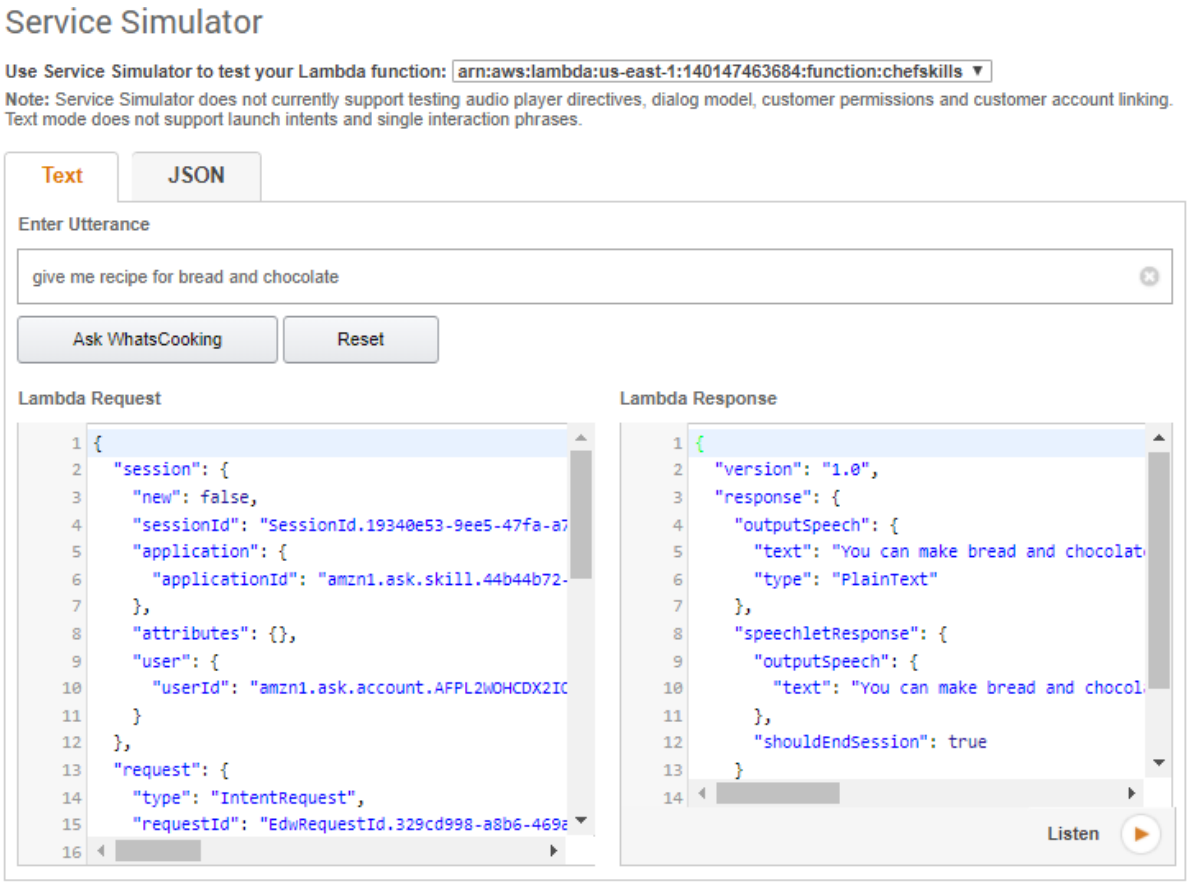
  After creating Lambda function select Alexa Skills Kit as a trigger for the Lambda function. After the creation of the function, a unique ARN will be generated which is to be used in further step.



Step 5: Connecting the voice user interface to the Lambda function in the configuration section. Select the AWS Lambda ARN option and paste the ARN of the lambda function in the appropriate geographical region



Step 6: Your skill is ready and in this section, you can test your skill using the service emulator provided. You can verify the request and response of the Lambda function.



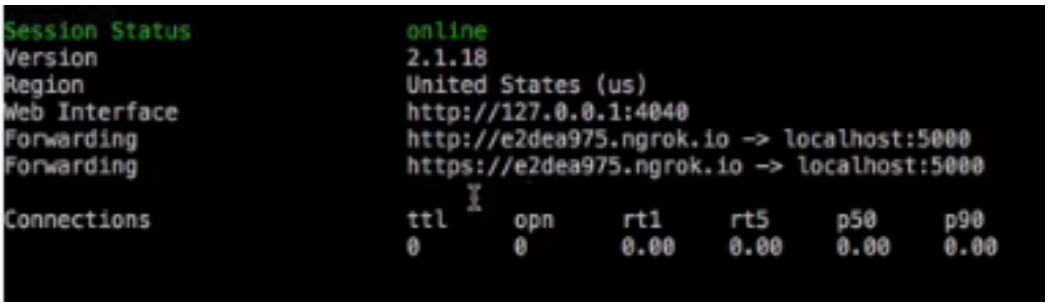
ngrok setup

Step 1: Download ngrok from https://ngrok.com/

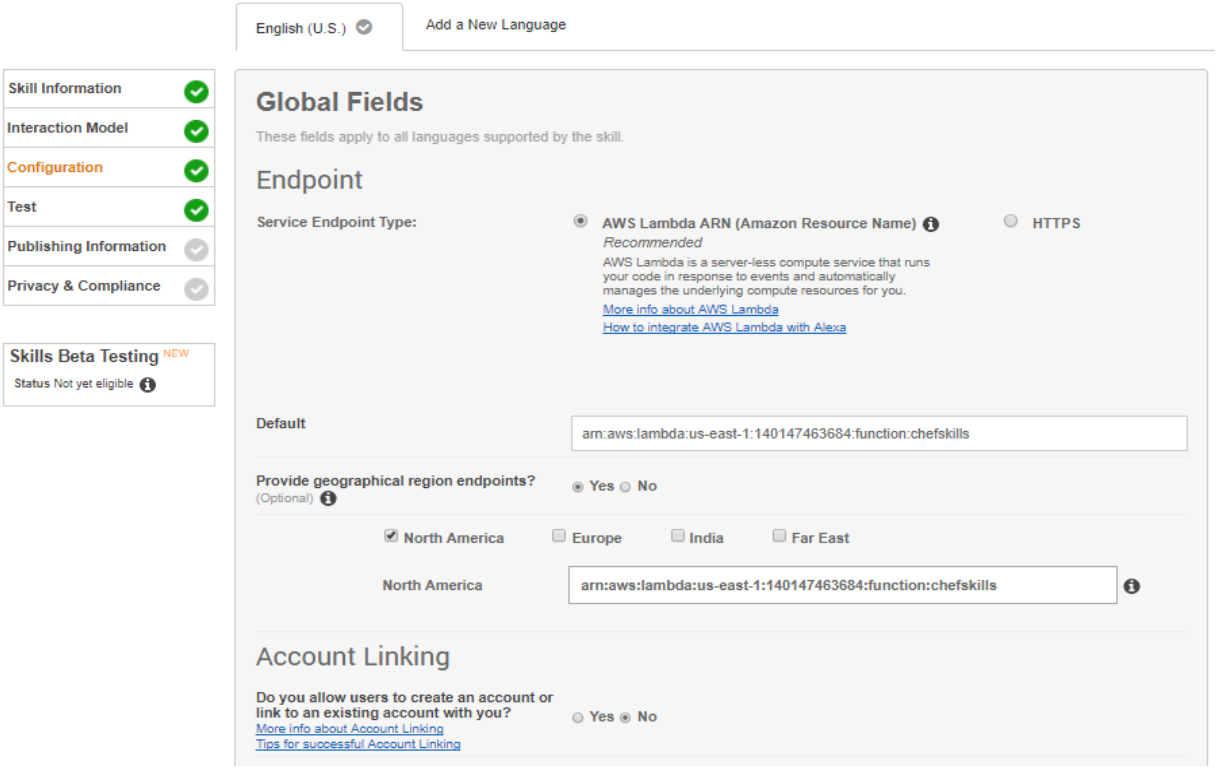
Step 2: Unzip the folder and copy the ngrok file and paste it in the project folder

Step 3: Start ngrok by using the following command:

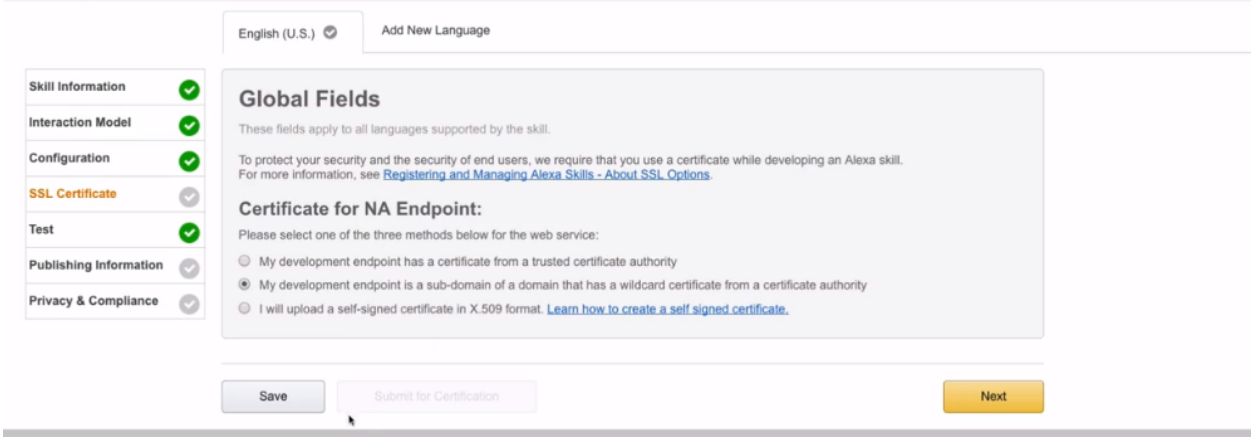
. /ngrok http port_number



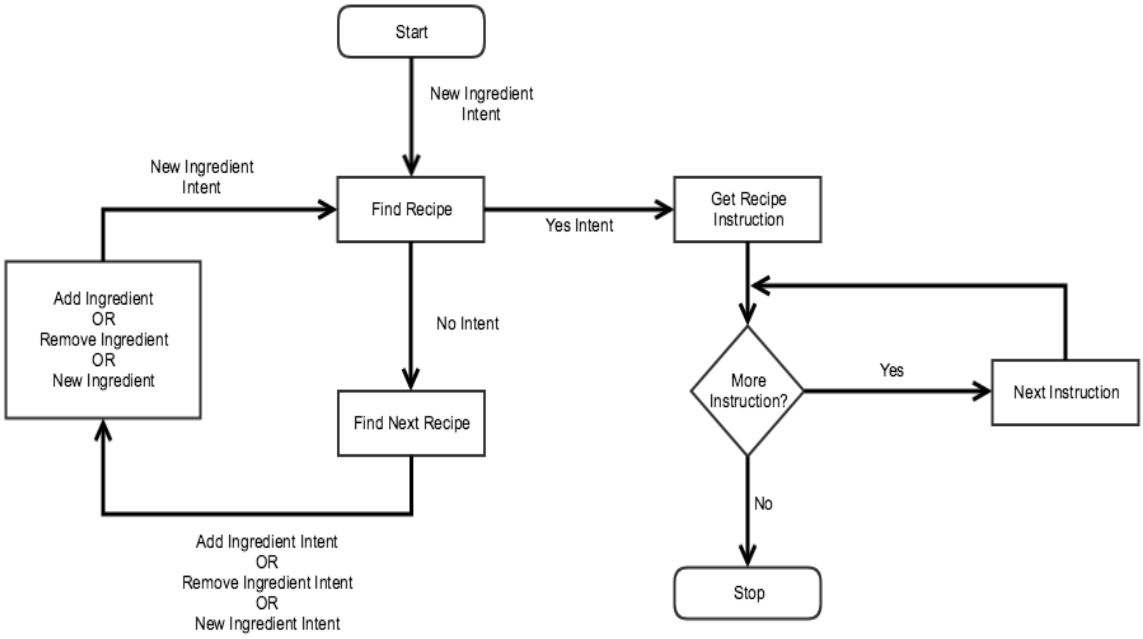
Step 4: Copy the http link to the Alexa End in the configuration section as shown in the figure



Step 5: Configure the SSL Certificate by selecting the second option



Working: Flow Diagram with description



The diagram above illustrates the flow of the system and how various voice commands are controlled and executed to invoke the type of service requested by the user. The description of various Intent are as follows:

Each intent can be called with different phrases i.e. sample utterances

NewIngredientIntent give me recipes for {ingredients}
NewIngredientIntent I need recipes for {ingredients}
NewIngredientIntent what can I make with {ingredients}
NewIngredientIntent what can I cook with {ingredients}
NewIngredientIntent what can I make from {ingredients}
AddIngredientIntent {ingredients}
AddIngredientIntent add {ingredients}
AddIngredientIntent with {ingredients}
AddIngredientIntent toss in {ingredients}
RemoveIngredientIntent remove {ingredients}
RemoveIngredientIntent delete {ingredients}
RemoveIngredientIntent scratch {ingredients}
RemoveIngredientIntent never mind the {ingredients}
RemoveIngredientIntent forget the {ingredients}
RemoveIngredientIntent minus the {ingredients}
RemoveIngredientIntent without the {ingredients}
NextInstructionIntent say next
NextInstructionIntent Next Step
NextInstructionIntent afterwards
NextInstructionIntent after that

NextInstructionIntent ok next
NextInstructionIntent ok after that
InstructionSetIntent give me Instructions
InstructionSetIntent yes
NextRecipe say give me another recipe
NextRecipe no

Launch Intent

Whenever the Alexa Skill “What’s Cooking” is invoked, the first request that we receive is the launch request. This request greets the user and provide the necessary information or the commands that user can use to play with the skill around.

New Ingredient Intent

When the user specifies new list of ingredient or add or remove ingredient from the list an API call is made to retrieve the new recipes.

Add Ingredient Intent

When user wants to change the list of ingredients he provided add or remove ingredient is invoked depending on user request. In the add ingredient intent, a new list of ingredients is created and the call is passed to New Ingredient Intent to retrieve the new recipes based on the updated list. Also, if the users specify same ingredients multiple times then care is taken that the ingredient is added only once. i.e. the list doesn’t contain duplicate ingredients.

Remove Ingredient Intent

In this intent, if the item is present then its removed from the existing list of ingredients and same as add ingredient intent a new call is made to New Ingredient Intent to retrieve new recipe list.

Yes Intent

When the user finds the dish that he/she is looking for then upon saying “Yes”, another API call is made to retrieve the step by step instructions to prepare the dish.

No Intent

When the user says “No” after retrieving list of recipes from the New Ingredient Intent, then the user doesn’t need to make another API call to retrieve a new Dish. The new dish is retrieved from the list one by one until user finds something interesting.

Next Step Intent

Once the user has started to prepare the dish and after Alexa has provided the first step, upon request Alexa responds to the user with next step and waits for the user until he/she has completed the ongoing step.

Stop Intent

It is a built – in intent where Alexa greets the user “Good – Bye” and successfully exits the running skill. You can also modify the greeting message by overriding it.

Conclusion & Future Scope

Link to the project:
https://drive.google.com/open?id=1TrnZsdfn9gihqU0KN_Mkw5Xb3zVZKxZ9

For the future scope, you can ask Alexa to save your favorite recipes in the app. This will lead to faster retrieval of frequently used recipes and the dishes you like the most. As most of the time our schedule is so busy that we forget to bring things even when are near to that place or pass by that location. You can ask Alexa to send you the reminder of all the ingredients you need to your phone even you are miles away from your apartment. Even when you are running low on the ingredients, Alexa can keep a track and send you the reminder of what ingredients you might need in the future so that you never run out of stock.

References

1. https://developer.amazon.com/alexa-skills-kit
2. https://turbofuture.com/consumer-electronics/Why-Amazons-Echo-Dot-Is-Better-Than-Amazon-Echo
3. https://market.mashape.com/spoonacular/recipe-food-nutrition
4. https://github.com/johnwheeler/flask-ask
5. https://ngrok.com/docs
6. http://docs.aws.amazon.com/lambda/latest/dg/welcome.html
7. https://developer.amazon.com/docs/custom-skills/define-the-interaction-model-in-json-and-text.html
8. https://github.com/Miserlou/Zappa