Build your first Amazon Alexa Skill

LOS ANGELES
AWS USERS GROUP

Kevin Epstein
CTO
CorpInfo | AWS Premier Partner
What we’ll cover

• What is the Echo? Who is Alexa?
• What are Alexa Skills
• Anatomy of an Alexa Skill
• Alexa conversation flow
• AWS Lambda
  • What is Lambda
  • Why Lambda
• Testing
  • Testing with echosim.io
  • Testing with the developer console
  • Testing with emulambda
• Example walk through
What is Echo, Who is Alexa?
Making Alexa Smart - What are Alexa Skills?

Customer favorites

- Capital One: “Alexa, Open Capital One”
- OneBusAway: “Alexa, open OneBusAway”
- Focus Word: “Alexa, open Focus Word.”
- Bloomberg: “Alexa, open Bloomberg”
- Tide- Sta: “Alexa, open Tide- Sta”

Skills trending this week

- “Alexa, open What to Expect”
- “Alexa, open The Voice”
- “Alexa, open CNN”
- “Alexa, ask the dog if we fed her?”
Anatomy of an Alexa Skill

- Invocation Name
- Set of Intents
- Sample Utterances
- Cloud Based Service
- Configuration
Anatomy of an Alexa Skill

• **Set of Intents**
  The core functionality of your skill. These are the things your users can do with your skill.

• **Sample Utterances**
  A mapping of sentences and phrases your users can say to invoke intents, forms the interaction model for your skill.

• **Invocation Name**
  The name you give your skill.
  "Alexa ask {invocation name} for …..”
  "Alexa tell {invocation name} to ….”

• **Cloud Based Service**
  This can be any web service that can accepts intents in the form of structured JSON requests. Could be any web service endpoint, today we’ll talk about using AWS Lambda.

• **Configuration**
  We define an Alexa skill in the Amazon Developers Portal.
Invocation Name

The name you give your skill.
"Alexa ask {invocation name} for ....."
"Alexa tell {invocation name} to ...."

Some Best Practices
• Your invocation name should not infringe intellectual property of an entity or a person
• One-word names are not allowed unless they are unique your own brand or intellectual property
• Names of people or places are not allowed unless there are other words in the name. e.g.
• Your invocation name should not cause confusion with existing Alexa features

Further reading on Invocation names
Set of Intents

The core functionality of your skill. These are the things your users can do with your skill. Thinks of an intent as a code function. Intents are defined with an Intent schema, which will also tie in slots (think of slots as variables)

```python
def GetWinner
    ...
    ...
    ...
    return WinnerInfo

def GetNextRace
    ...
    ...
    ...
    return NextRaceInfo
```
Sample Utterances

A mapping of sentences and phrases your users can say to invoke intents, forms the interaction model for your skill. Every one has a different way of speaking - come up with as many different utterances as you can for an intent.

GetWinner who won the last race
GetWinner who won
GetWinner who was the winner of the last race
GetWinner who won the last grand prix
GetDriverStandings what are the current driver standings
GetDriverStandings for the current driver championship standings
GetDriverStandings for the current driver standings
GetNextRace where is the next race
GetNextRace when will the next race be
GetNextRace when is the next grand prix
GetRemainingRaces what races are left this season
GetRemainingRaces what races are left on this years calendar
GetRemainingRaces what are the remaining races for this season
Alexa Voice Service (AVS) translates audio from the user into JSON for consumption by a backend web service. AWS Lambda is our example today. Lambda executes your code, and returns a JSON response. AVS converts that JSON back into audio which is streamed back to the Echo, which plays the audio to the user.
Alexa skills are configured in the Amazon Developers Console. The configuration ties skill information with interaction models (Intents, slots, and Sample Utterances), publishing information, privacy and compliances, and testing.
Alexa conversation flow

The winner of the race was Lewis Hamilton

Alexa, Ask Paddock reporter who won the last race
What is Lambda?

- Scalable, Highly Available, Stateless, event driven computing
- Fully managed runtime environment

Python  Node.js  Java
Why Lambda

- Focus on what’s important – your code
- Only pay for resources consumed
- Fault tolerant (code is replicated to multiple regions, automated execution retries)
- Highly available
- Monitoring (CloudWatch)
- Logging (CloudWatch Logs)
- Scales easily – no additional provisioning required
Testing your skill

• Testing your Lambda function
  • AWS Lambda Console

• Manually testing your Alexa Skill
  • Developer console
  • AWS Lambda Console
  • Echosim.io
  • Terminal

• Automated testing
  • Emulambda
  • Script testing with Python
Testing with the Developer Console

Voice Simulator

Hear how Alexa will speak a response entered in plain text or SSML. Learn more about supported SSML tags.

For example: Here is a word spelled out: <say-as interpret-as="spell-out">hello</say-as>.

who won the last race

Service Simulator

Use Service Simulator to test your lambda function: arn:aws:lambda:us-east-1:385000587821:function:F1Reporter:PR

Text JSON

Enter Utterance

who won the last race

Lambda Request

```
{  
  "session": {  
    "sessionID": "SessionId.flcc91b2-7868-45c1-1e66-04be9f7b98ed",  
    "application": {  
      "applicationId": "amzn1.echo-sdk-ams.app.c4e130ba",  
      "attributes": {},  
      "user": {  
        "userId": "amzn1.ask.account.AFPJZWPOSZBG",  
        "attributes": {}  
      }  
    },  
    "new": true  
  },  
  "request": {  
    "type": "IntentRequest",  
    "requestId": "EdwRequestId.f54703a1-3dc3-4b67-b038-450590e9c64e",  
    "locale": "en-US"  
  }  
}
```

Lambda Response

```
1 {  
 2   "version": "1.0",  
 3   "response": {  
 4     "outputSpeech": {  
 5       "type": "PlainText",  
 6       "text": "The winner of the Mexican Grand Prix is...",  
 7     },  
 8     "card": {  
 9       "content": "The winner of the Mexican Grand Prix is...",  
10       "title": "Race Winner",  
11       "type": "Simple"  
12     },  
13     "shouldEndSession": true  
14   }  
}
```
Testing with the AWS Lambda Console

Input test event

Use the editor below to enter an event to test your function with. You can edit the event again by choosing Configure test event in the Actions list. Note that changes to the event will only be saved locally.

Sample event template

```json
{
  "session": {
    "sessionId": "F1cc9b2-786b-43c1-b5df-60385655a86",
    "application": {
      "applicationId": "amzn1.echo-sdk-ams.app.cd7e422d-9dfe4-4309-a7b9-7d1017f56e2b"
    },
    "attributes": {},
    "user": {
      "userId": "amzn1.ask.account.AFPRJWPOS28GJR70W1Z30HP0NK0WY4AY6YFUR7ILBWNIAHQN7",
      "new": true
    },
    "request": {
      "type": "IntentRequest",
      "requestId": "EdwRequestid.f54703a3-4b6a-bc33-1753b3e760a4",
      "locale": "en-US",
      "timestamp": "2016-11-12T22:05:29Z",
      "intent": {
        "name": "GetWinner",
        "slots": {}
      }
    }
  }
```

Summary

Code SHA-256: x2luZh0o+WihNjdzcNemPy82/T5dWRTFznmgYRdp=  
Request ID: c39075sec-a924-11e6-a923-3bb100195e9  
Duration: 620.92 ms

The area below shows the logging calls in your code. These correspond to a single row within the CloudWatch log group.
Testing with Echosim.io
Testing with Emulambda

```
1. kevin@kevin:~/Dropbox/Workspace/Python/F1 (zsh)

(f1) ➜ ~/Dropbox/Workspace/Python/F1 ➜ development
emulambda -v lambda_function.lambda_handler test-events/Launch.json
Executed lambda_function.lambda_handler
Estimated...
...execution clock time: 0ms (100ms billing bucket)
...execution peak RSS memory: 720K (737280 bytes)
---------------------------RESULT--------------------------
{'version': '1.0', 'response': {'outputSpeech': {'text': 'Hello! Welcome to Paddock Reporter for Formula 1. I can tell you who won the last race! Just say, who won the last race? I can also tell you when the next race will be! Just say, when is the next race? What would you like to do?', 'type': 'PlainText'}, 'shouldEndSession': False, 'reprompt': {'outputSpeech': {'text': 'You can say, Who won the last race?, or say, When is the next race?', 'type': 'PlainText'}}, 'sessionAttributes': {}}
(f1) ➜ ~/Dropbox/Workspace/Python/F1 ➜ development
```
Further Reading

• Alexa Skills Kit
  https://developer.amazon.com/alexa-skills-kit

• Amazon Developers – Alexa
  https://developer.amazon.com/alexa

• Big Nerd Ranch
  https://developer.amazon.com/alexa-skills-kit/big-nerd-ranch

• Speech Synthesized Markup Language Reference

• Amazon Node.js Skills Samples
  https://github.com/amzn/alexa-skills-kit-js

• ASK Alexa PyKit
  https://github.com/anjishnu/ask-alexa-pykit
Example Walk Through