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ALEXA, TELL ME I'M GROOVY!

LEARN HOW TO BUILD ALEXA SKILLS WITH GROOVY AND GRAILS

Created by [Ryan Vanderwerf](#) / [@RyanVanderwerf](#) - OCI ...and Lee Fox [@FoxInATX](#)



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ABOUT RYAN

- Software Engineer on Grails team at OCI (New home to Grails)
- Father of 2 girls under 12
- Co-Chair Austin Groovy and Grails User Group
- Co-Author of Effective Gradle Implementation Video Series on Packt
- I like to modify all the things (cars, home automation, phones, gadgets)
- Into lots of Devops/Linux stuff and AWS



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ABOUT LEE

- Cloud Architect/Operations Manager at Starmount
- Father of 2 boys under 13
- Past Technology Chair of Agile Austin
- Co-Author of Effective Gradle Implementation Video Series on Packt
- Amateur Chef (His Chicken Cordon Bleu is like crazy good.)
- Master of all things AWS and DevOps



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WHAT WE WILL COVER

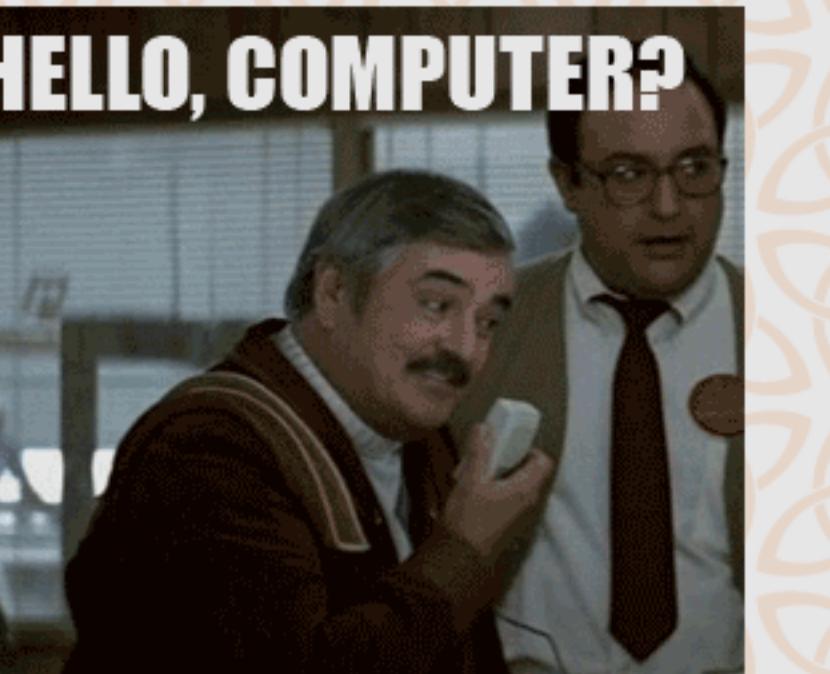
- What is Alexa and what devices it covers
- How does Alexa work?
- Alexa software concepts and components
- Brief Lamba Overview
- Lamba Groovy App Setup
- Superhero quiz for Groovy and Lamba
- Let's do more.. like account linking!
- Twitter app for Grails using OAuth, Spring Security
- Alexa Skills Plugin



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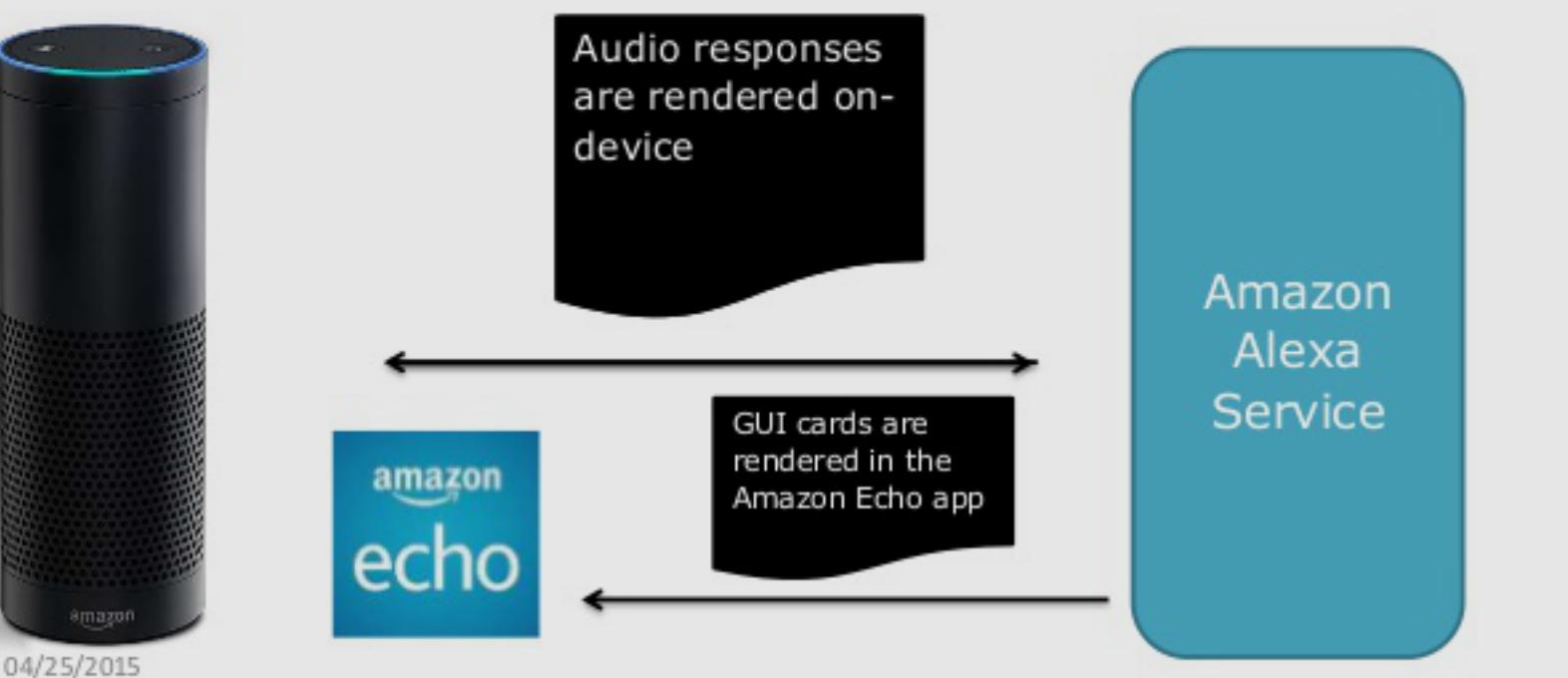


WHAT IS ALEXA?



Alexa is a cloud based voice recognition service

Alexa Architecture



There are 3 SDKs - Skills, AVS, and Home API



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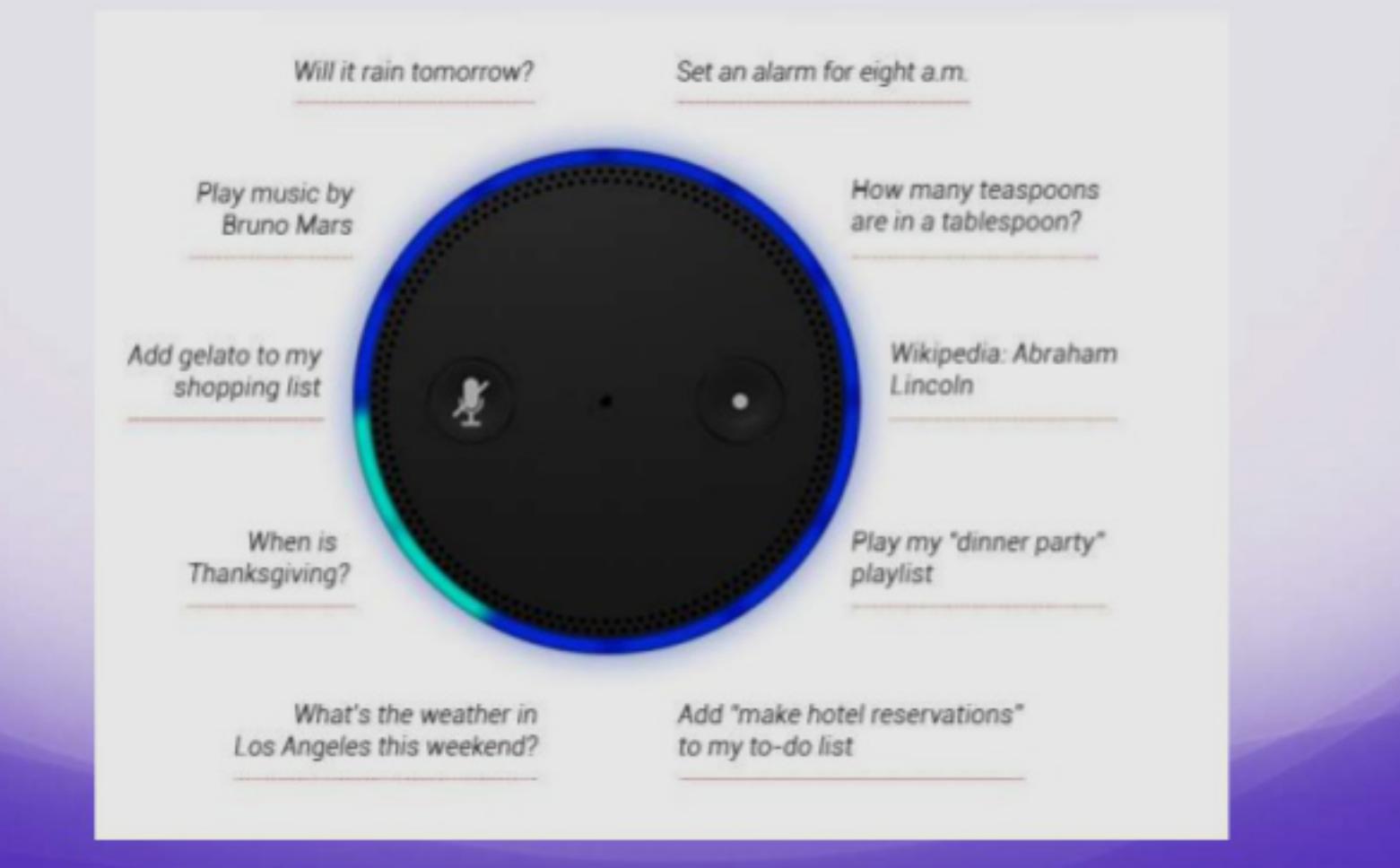
The Devices



ECHO

Echo

Things Alexa Can Do



ECHO



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ECHO





DOT

- Baby brother - has the fancy mics but minimal speaker for voice
Has Wifi and bluetooth capabilities
The big deal: a 3.5mm audio output jack!
Always on listening for wake word (Alexa or Amazon)





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TAP





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TAP

- On the go - portable bluetooth speaker with battery and simple mic
- Has Wifi and bluetooth capabilities
- The big deal: a 3.5mm audio output jack!
- Not always listening - have to 'tap' button to wake



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FIRETV

- Available as a 'stick' or box with voice remote
- Mostly meant for TV apps - cheapest option for Alexa
- Recent OS updates support Alexa on both V1 and V2
- Must push voice remote button to start apps
- The same skills work here too!

YES, THERE ARE OTHERS - GOOGLE CHIRP



- Not yet released Google version of Echo

YES, THERE ARE OTHERS - MYCROFT



- Open source/hardware version
- Built on Raspberry Pi - all open
- Can buy on Kickstarter and Indiegogo

YES, THERE ARE OTHERS - MAKE YOUR OWN ECHO!

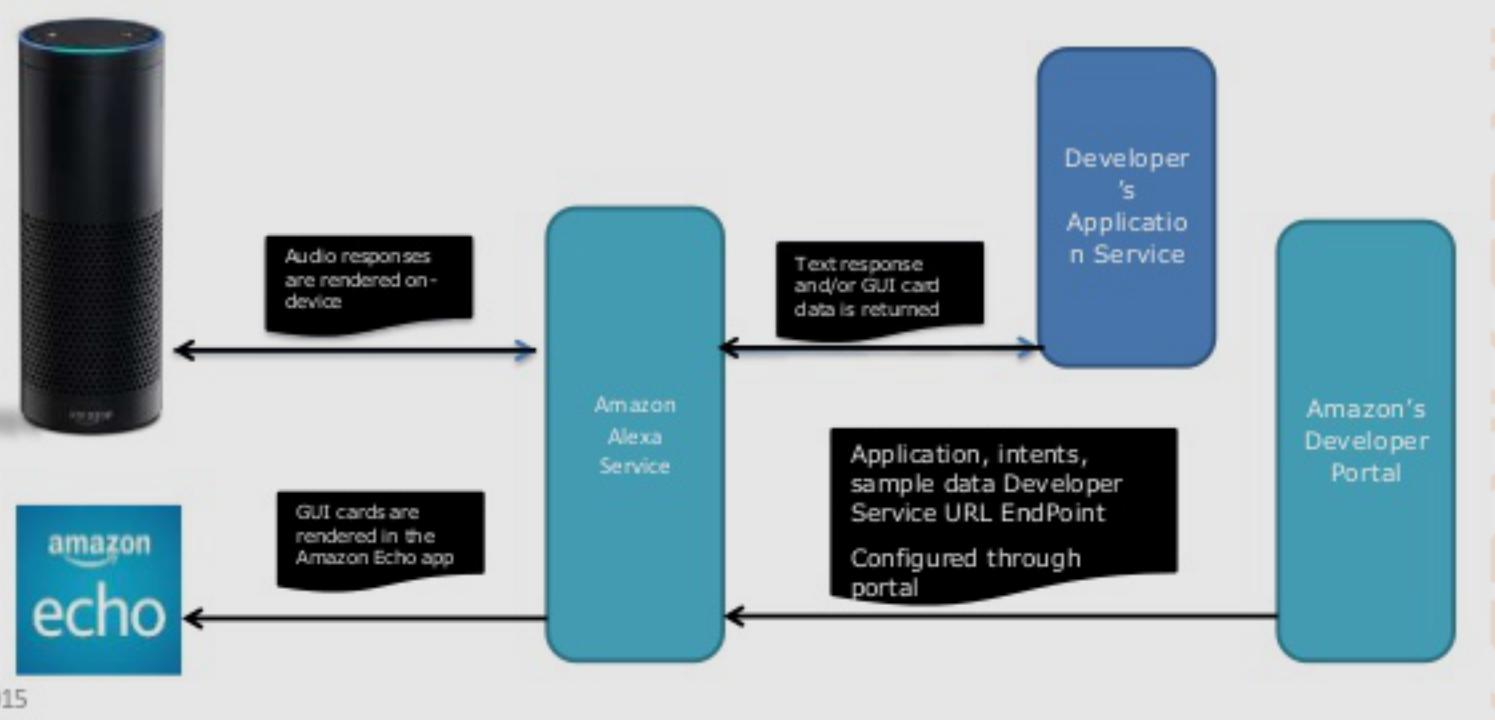
DIY Amazon
Echo with
Raspberry Pi!



- Some examples:
- Github repo: <http://bit.ly/1PrOq6A>
- Official DIY: <http://bit.ly/1OMpfwP>
- Video guide: <http://bit.ly/1WRZO5u>

BACK TO ALEXA SKILLS - HOW DOES IT WORK?

Alexa Appkit Architecture



- App developer never talks directly to device
- Device must initiate interaction
- Alexa server response with JSON body
- Currently text to speech or small sounds clips (90s low quality)
- Run as Lambda function or separate webapp

SDKS



- Skills SDK - custom skill or Home
- Voice SDK - build a device like an Echo
- We'll focus on the Skills API today



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SKILLS SDK - DON'T CALL US, WE'LL CALL YOU

- We host this as a web service that parses JSON requests
- Responds in kind with JSON
- Alexa Java speechlet SDK gets us mostly there



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SKILLS SDK - SPEECHLET SDK

- Does some things for us like validate the request and call events
- Gives us decent classes that use an API form SpeechResponses
- Also helps us build Card responses
- Let's dig in to the specifics!

SKILLS SDK - INTENT SCHEMA



- This tells Alexa what actions your app can do
- Describes intents and slots used
- When you upload this, Alexa calculates speech variations to launch them
- See sample IntentSchema.json

SKILLS SDK - SLOTS



- This is how Alexa parametrizes commands
- Very simple list of options
- Slots don't work well for multi-word responses it seems

SKILLS SDK - SAMPLE UTTERANCES



- Train Alexa on what the commands it will understand
- This is the phrases that activate the intents
- Use {} and | to use parameters
- When you upload this, Alexa calculates speech variations to launch Intents

THE ALEXA APP



- This is where you can do non-speech interactions
- See a log of what you've done
- Install Skills
- Can use mobile app or go to echo.amazon.com

SKILLS SDK - CARDS



- This is similar to Android cards
- You can launch different cards for different intents
- There are 3 main cards: Simple, Standard, and LinkAccount
- Amazon limits what kind of content can be on each type of card

SKILLS SDK - SPEECHLET - OPEN APP



- Uses special keywords: Open, Ask/About, Get/From, Give/From, Want/To/
- Full list of invocation commands at
<http://amzn.to/1NpPIZo>

SKILLS SDK - INTENTS



- Uses concept of Intents to trigger bits of your code
- Intents are: `onSessionStarted`, `onLaunch`, `onIntent`, `onSessionEnded`
- The only intent you -have- to override is '`onIntent`'



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LET'S MAKE A GROOVY LAMBDA SKILL!



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THAT'S COOL, BUT CAN IT ONLY TO TEXT TO SPEECH?

- Nope! We can use SSML to play sounds clips!
- Limited to 90s, 48kbit SSL hosted mp3 only
- Very picky about formats and unhelpful error messages
- Can do other commands like pronounce words
- Let's check out the SSML Reference [here](#)



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AUDIO PROTIP

Use ffmpeg to resample your mp3 so amazon likes it (s3 is easiest).

```
ffmpeg -y -i -ar 16000 -ab 48k -codec:a libmp3lame -ac 1  
.mp3
```



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SSML MARKUP

Audio SSML Example

```
<speak>
  <audio src="\"https://s3.amazonaws.com/vanderfox-sounds/test.m
</audio></speak>
```



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SSML MARKUP

Pronounce SSML Example

```
<speak>
Here is a number spoken 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="digits">12345</say-as>.
Here is a word spelled out: <say-as interpret-as="spell-out">hello</
</speak>
```

Complete SSML reference <http://amzn.to/1OaLmAZ>



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TESTING - COUPLE OPTIONS

- Using the developer.amazon.com test tab
- *NEW* Use echosim.io browser tester!

YEAH IT'S NOT PERFECT



- Not multi-language yet
- May have troubles with strong accents
- Currently meant for NA



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SUPERHERO QUIZ APP



- Uses Groovy Lambdas and DynamoDB
- Asks you superhero trivia
- Let's try it out! <http://bit.ly/2aqLqAu>



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DEMO - GROOVY LAMBDA SUPERHERO QUIZ



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LET'S DO MORE ADVANCED STUFF!

- How can I make the app use MY twitter credentials?
- How does Grails fit into this?
- Let's talk about account linking then take a look



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ACCOUNT LINKING

- There are rules
- How do does Grails fit into this?
- Let's talk about account linking then take a look



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ACCOUNT LINKING

- Uses OAuth
- Supports Implicit or Authorization code
- Use an Intent to send an AccountLinkCard
- Docs at <http://amzn.to/1OQWqkq>



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SETTING UP YOUR OWN SERVER

- Must use SSL and be accessible to Alexa via internet
- You can use self-signed certs in dev only
- Self signed certs MUST have hostname match common name
- Trusted certs support most cert providers
- Docs at <http://amzn.to/1OQWqkq>



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GRAILS TWITTER SEARCH

- Uses OAuth, Groovy, Grails, and Spring Social
- Supports OAUTH to authenticate a user
- Uses Spring Security UI to register accounts
- Provides Admin UI to manage users and credentials
- Code at <https://github.com/rvanderwerf/twitterAuth>



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DEMO - GRAILS TWITTER SEARCH



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PUBLISHING

In order to publish your app you must...

- Supply an icon of 108x108px and large icon 512x512
- Valid Recognized Cert (For non Lamba)
- Must have a VALID privacy policy and terms of use
- Must supply proper HELP anytime during session
- Must supply ability to stop skill by saying "STOP" or "CANCEL"
- A real person will fire up the app and use it to test
- Process takes about 2 days for feedback



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UX TIPS

Here are some tips to help the user have a good experience

- Try to make sample utterances as specific as possible
- More sample utterances are better
- Use custom slots wherever possible
- Make sure Alexa always responds to a request when prompted
- Be Specific - Guide user during prompts tell the user what to say
- Use misspellings or phoentics in your code to help Alexa understand



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GOTCHA

Here are some gotchas

- Use number type for numbers- it will translated spoken word to numbers not words
- Sometimes you must have Amazon Literal Type to parse better
- Some invocation don't work - Hello, Amazon, Echo. Grails is often mis-interpreted
- SSL Self-signed certs - common name must match hostname of app
- SSML Audio - follow tips given, it's very picky and needs valid CA cert



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SOURCE LINKS

- Grails 3 Plugin: <http://bit.ly/2a9RQyz> or <http://bit.ly/2a9RQyz>
- Twitter AWS Groovy Lambda App: <http://bit.ly/2afiibl>
- Twitter Grails 3 App: <http://bit.ly/2aAg9d2>
- Hero Quiz Groovy Lambda App: <http://bit.ly/2aqLqAu>
- Run Skills in Browser: <http://echosim.io>
- Amazon Developer Portal to register Skills: <https://developer.amazon.com>



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SOURCE LINKS CONTINUED

- Lazybones template to generate Lambda Groovy Skills
<http://bit.ly/2afiKXE>
- Alexa Workshop Labs <http://bit.ly/2ajJR4Y>
- Lamba Groovy Example from Talk <http://bit.ly/2anfNTp>
- HelloWorld Grails Account Linking Sample from lab
<http://bit.ly/2ahQpE1>



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SPECIAL THANKS

- Bendoit Benoit Hédiard for his awesome Groovy Lamba code sample from GGX



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THE END



I HOPE YOU HAVE ENJOYED THE SESSION!

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