

Create Smart and Interactive Applications with Intelligent Language Services on AWS

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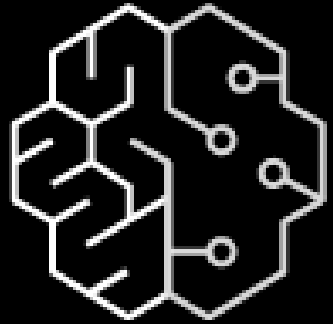
Agenda

- Amazon ML Stack
- AI Services
 - Features and Use Cases
- Demonstration
 - AI Powered Speech Analytics for Amazon Connect

Our mission at AWS

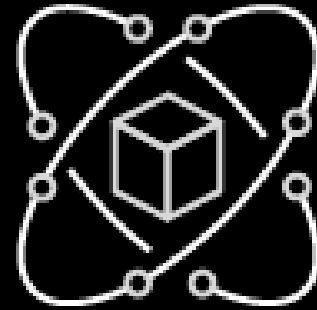
Put machine learning in the hands
of every developer

Why AWS for AI?



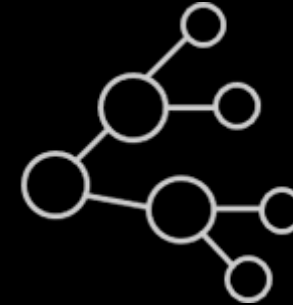
Broadest and deepest set of AI and ML services for your business

200+ new features and services since Jan 2018



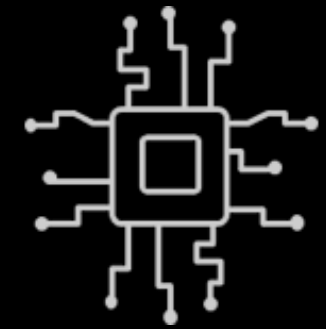
Solving the toughest problems holding back ML - cost, ease of use, and data

75% lower inference cost
70% cost reduction in data-labeling
“No ML experience required”



Unmatched support for the most popular frameworks

85% of TensorFlow projects in the cloud happen on AWS



Built on the most comprehensive cloud platform optimized for machine learning

AWS **holds the top spots** on Stanford's benchmark, for fastest training time, lowest cost, lowest inference latency

Deepest set of security and encryption features, with robust analytics capabilities

More machine learning happens on AWS than anywhere else

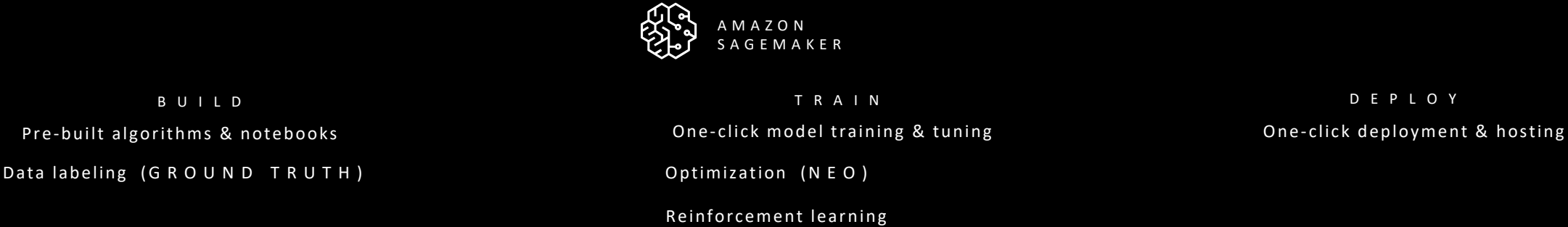


The Amazon ML stack: Broadest & deepest set of capabilities

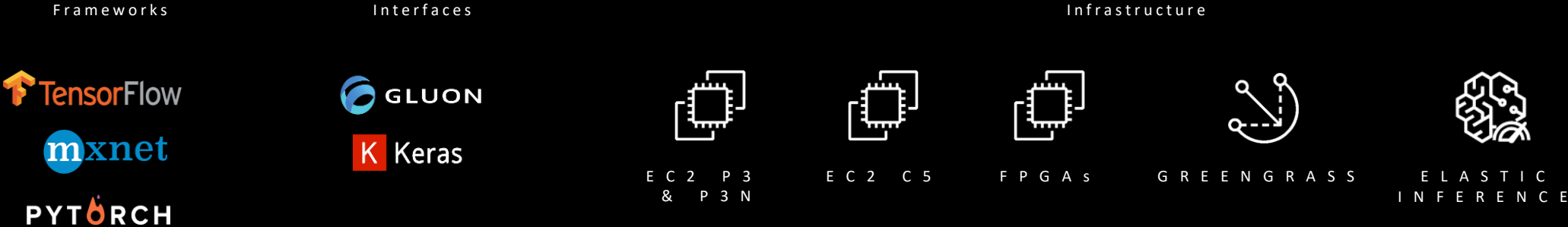
AI SERVICES



ML SERVICES



ML FRAMEWORKS & INFRASTRUCTURE



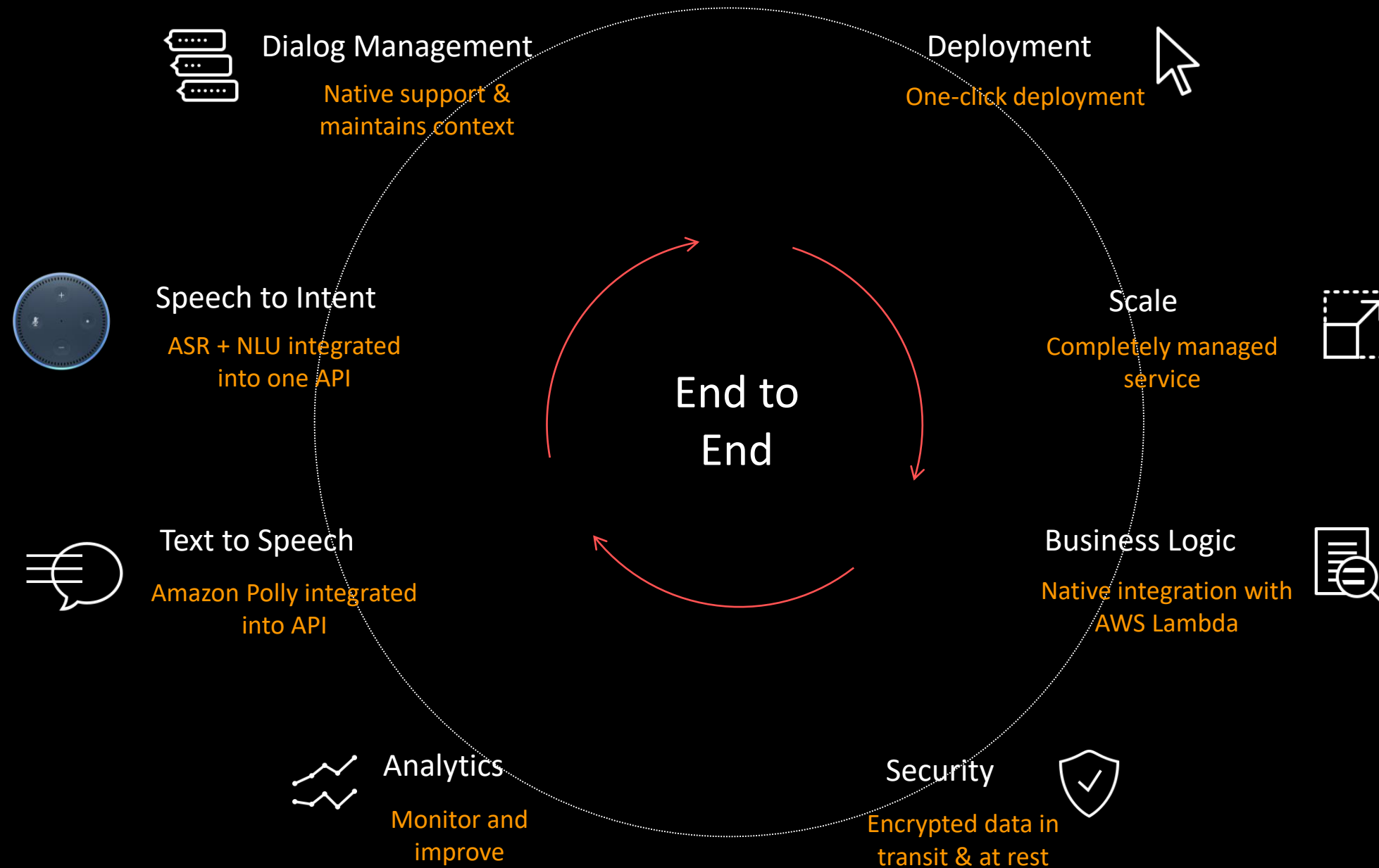
How do you power intelligent applications?

How do you make your applications conversational?

Amazon Lex

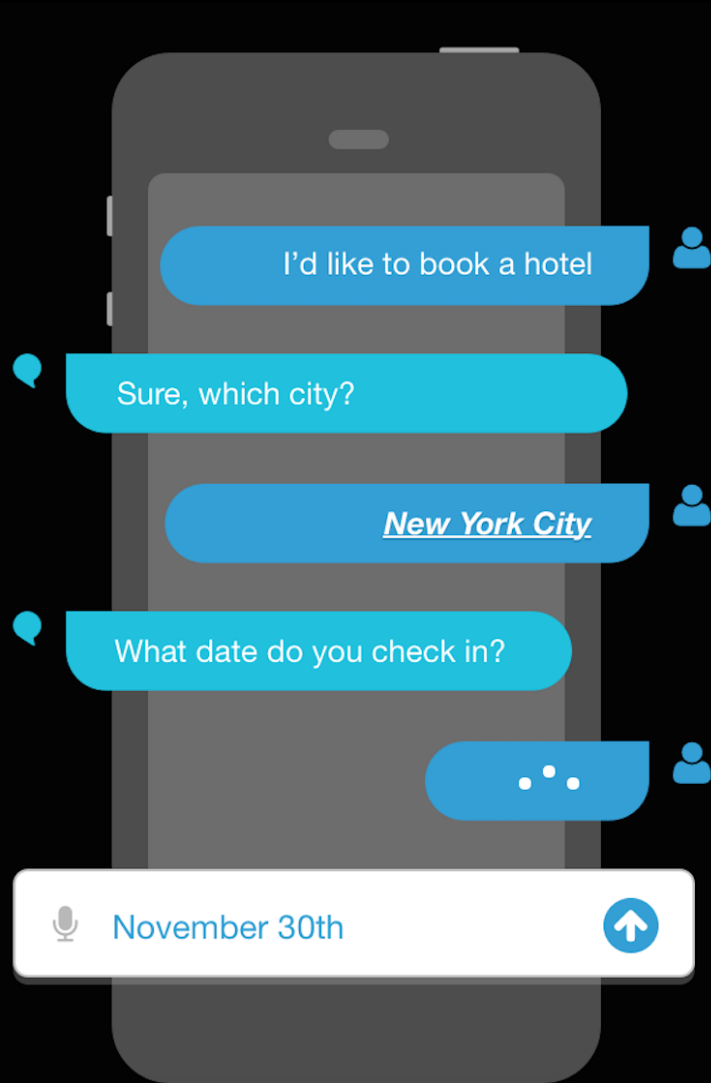
A service for building conversational interfaces into your applications using voice and text

Amazon Lex



Amazon Lex

BookHotel



Intents

An intent performs an action in response to natural language user input

Utterances

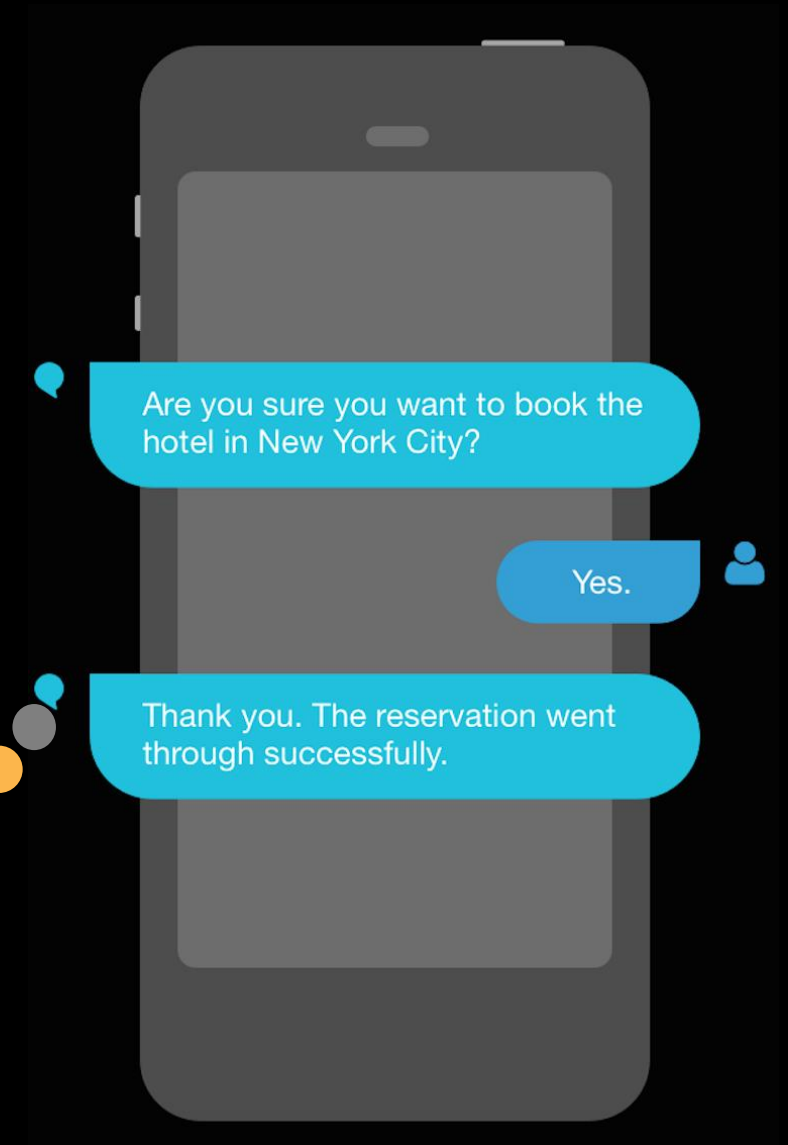
Spoken or typed phrases that invoke your intent

Slots

Slots are input data required to fulfill the intent

Fulfillment

Fulfillment mechanism for your intent



Designed for builders

BookTrip Latest

BuildPublish

EditorSettingsChannelsMonitoring

Intents

BookCar

BookHotel

Slot types

CarTypeValues

Directions

FlowerTypes

Halt

lexConsoleProxyDependencies

myServices

RoomTypeValues

statusCode

Units

Error Handling

BookHotel Latest

RemoveSave

Sample utterances

e.g. I would like to book a flight.

Book a hotel

I want a make hotel reservations

Book a (Nights) night stay in (Location)

Slots

Priority	Required	Name	Slot type	Prompt	
		e.g. Location	e.g. AMAZON.US_CITY	e.g. What city?	
1.	<input checked="" type="checkbox"/>	Location	AMAZON.US_CITY	Built-in	What city will you be staying in?
2.	<input checked="" type="checkbox"/>	CheckInDate	AMAZON.DATE	Built-in	What day do you want to check in?
3.	<input checked="" type="checkbox"/>	Nights	AMAZON.NUMBER	Built-in	How many nights will you be staying?
4.	<input checked="" type="checkbox"/>	RoomType	RoomTypeValues	1	What type of room would you like, queen, king or delu

Options

☐ Initialization and validation code hook

☒ Confirmation prompt

Confirm

Okay, I have you down for a (Nights) night stay in (Location) starting (CheckInDate). Shall I book the reservation?

Cancel (if the user says "no")

Okay, I have cancelled your reservation in progress.

Fulfillment

☐ AWS Lambda function

☒ Return parameters to client

Test Bot

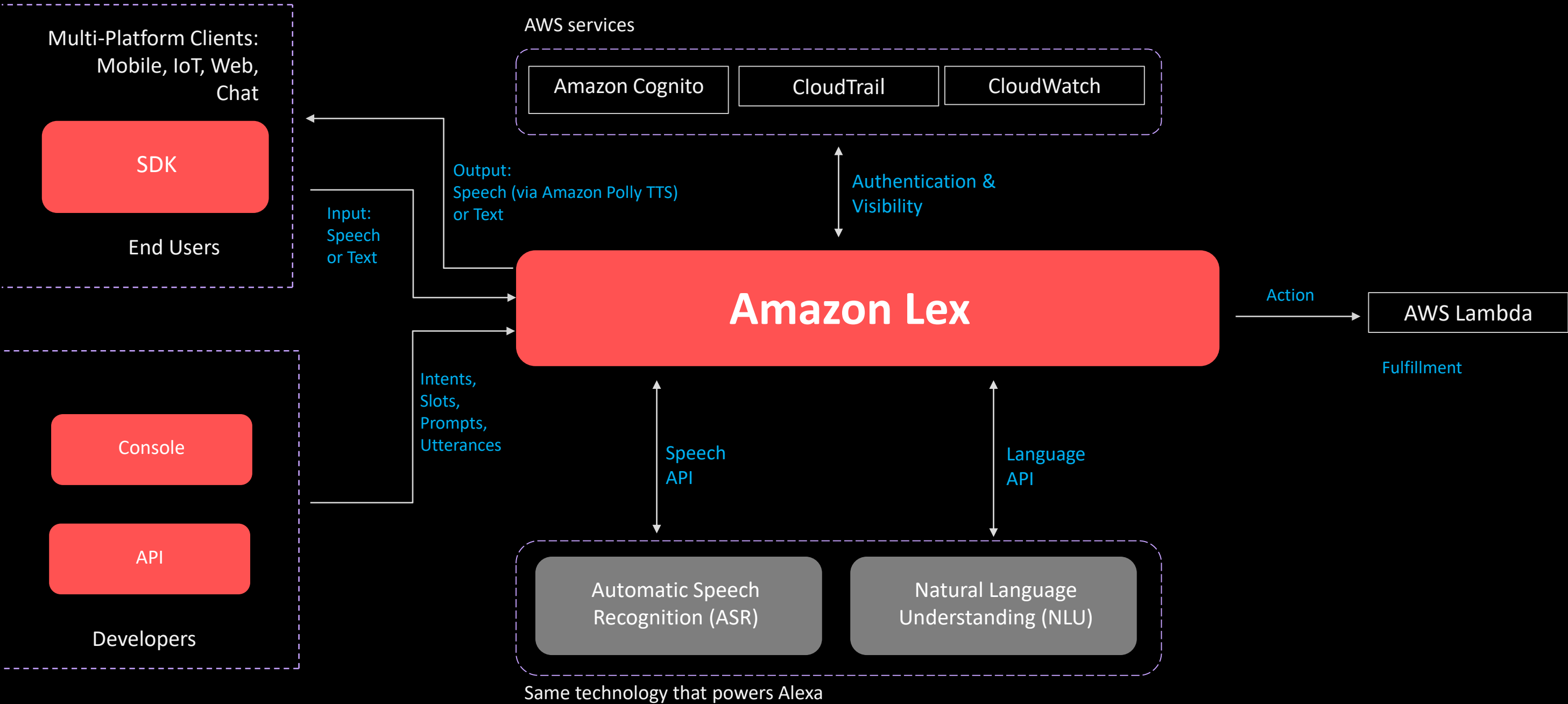
Build: Latest | Status: READY

Clear

Type to your bot...

Efficient and intuitive tools to build conversations

Amazon Lex—Technology



Amazon Lex

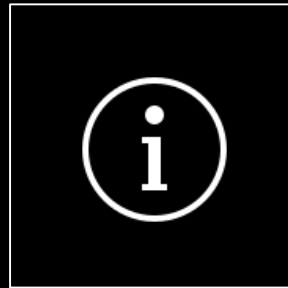
Use Cases



Contact Center Bots

Chatbots for customer service IVR

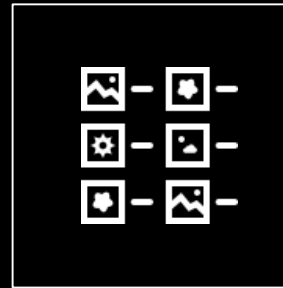
Account inquiries
Bill payment
Service update



Informational Bots

Chatbots for everyday consumer requests

News updates
Weather information
Game scores



Application Bots

Build powerful interfaces to mobile applications

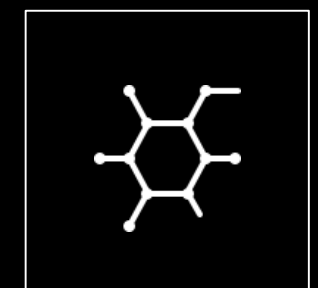
Book tickets
Order food
Manage bank accounts



Enterprise Productivity Bots

Streamline enterprise work activities and improve efficiencies

Check sales numbers
Marketing performance
Inventory status



Internet of Things (IoT) Bots

Enable conversational interfaces for device interactions

Wearables
Appliances
Auto



Meaningful customer interactions

Liberty Mutual uses **Amazon Lex** and AI Services to develop natural language-driven conversational apps to enable customer service agents to respond to customer requests with real-time and contextual intelligence, improving response time, and quality of service.

How do you give your applications a voice?

Amazon Polly

A text-to-speech (TTS) service that uses advanced deep learning technologies to synthesize speech that sounds like a human voice



Use Cases

Content Creation

Mobile & Desktop Applications

Internet of Things (IoT)

Education & E-Learning

Telephony

Game Development

Key Features

Dozens of voices across multiple languages

Lip-Syncing & Text Highlighting

Fine-grained Voice Control

Custom Vocabularies

Available in 14 AWS regions

Amazon Polly

Quality

- **Natural sounding speech**

A subjective measure of how close TTS output is to human speech.



- **Accurate text processing**

Ability of the system to interpret common text formats such as abbreviations, numerical sequences, homographs etc.



Today in Las Vegas, NV it's 90°F.



"We live for the music", live from the Madison Square Garden.

- **Highly intelligible**

A measure of how comprehensible speech is.



"Peter Piper picked a peck of pickled peppers."

Improving Contact Centers with Artificial Intelligence

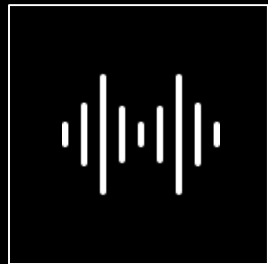
<https://github.com/aws-samples/amazon-lex-customerservice-workshop>

How do make your applications listen?

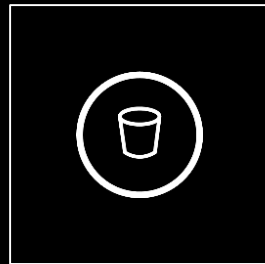
Amazon Transcribe

A fully managed deep learning based
Automatic Speech Recognition (ASR) service
that converts audio to text

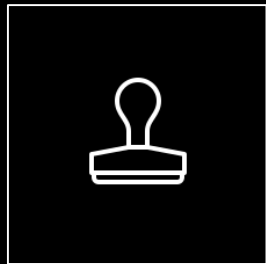
Amazon Transcribe



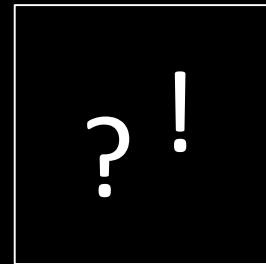
Support for
both regular &
telephony audio



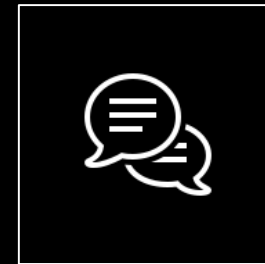
Amazon S3
integration



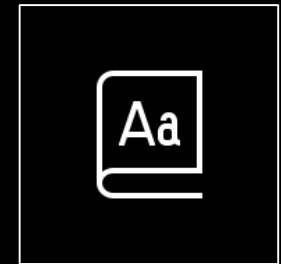
Timestamps



Punctuation
& formatting



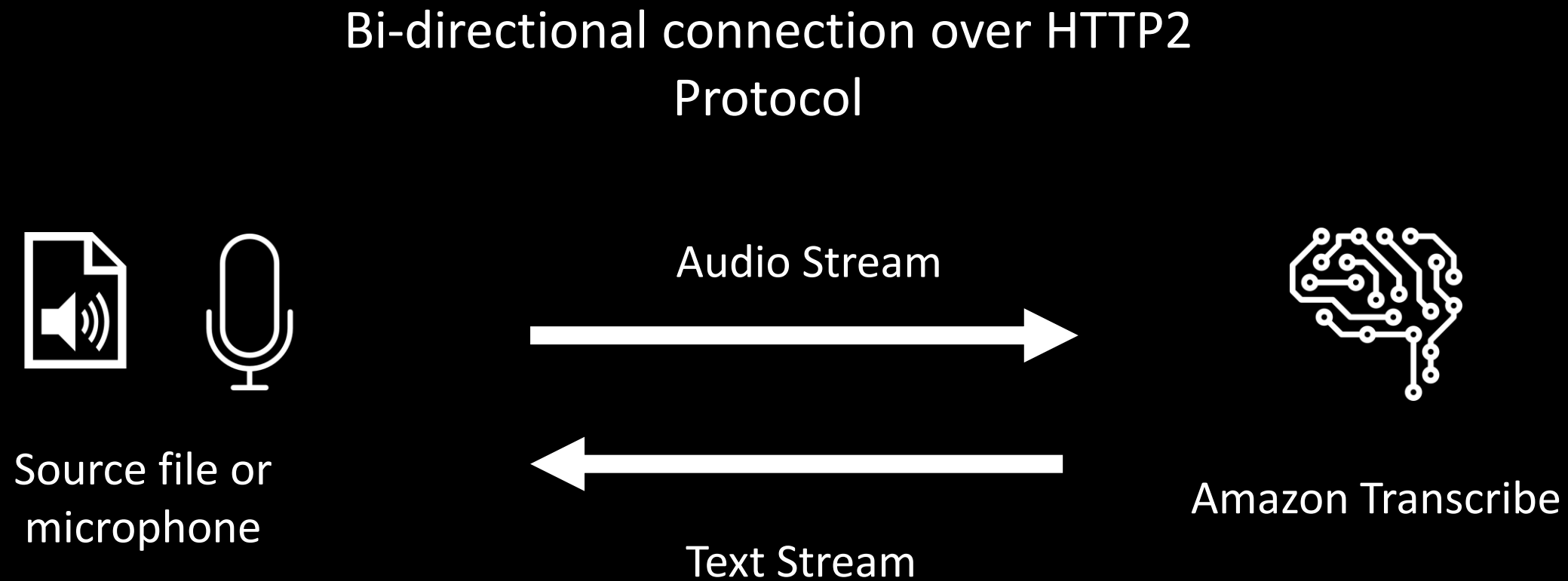
Recognize
multiple
speakers

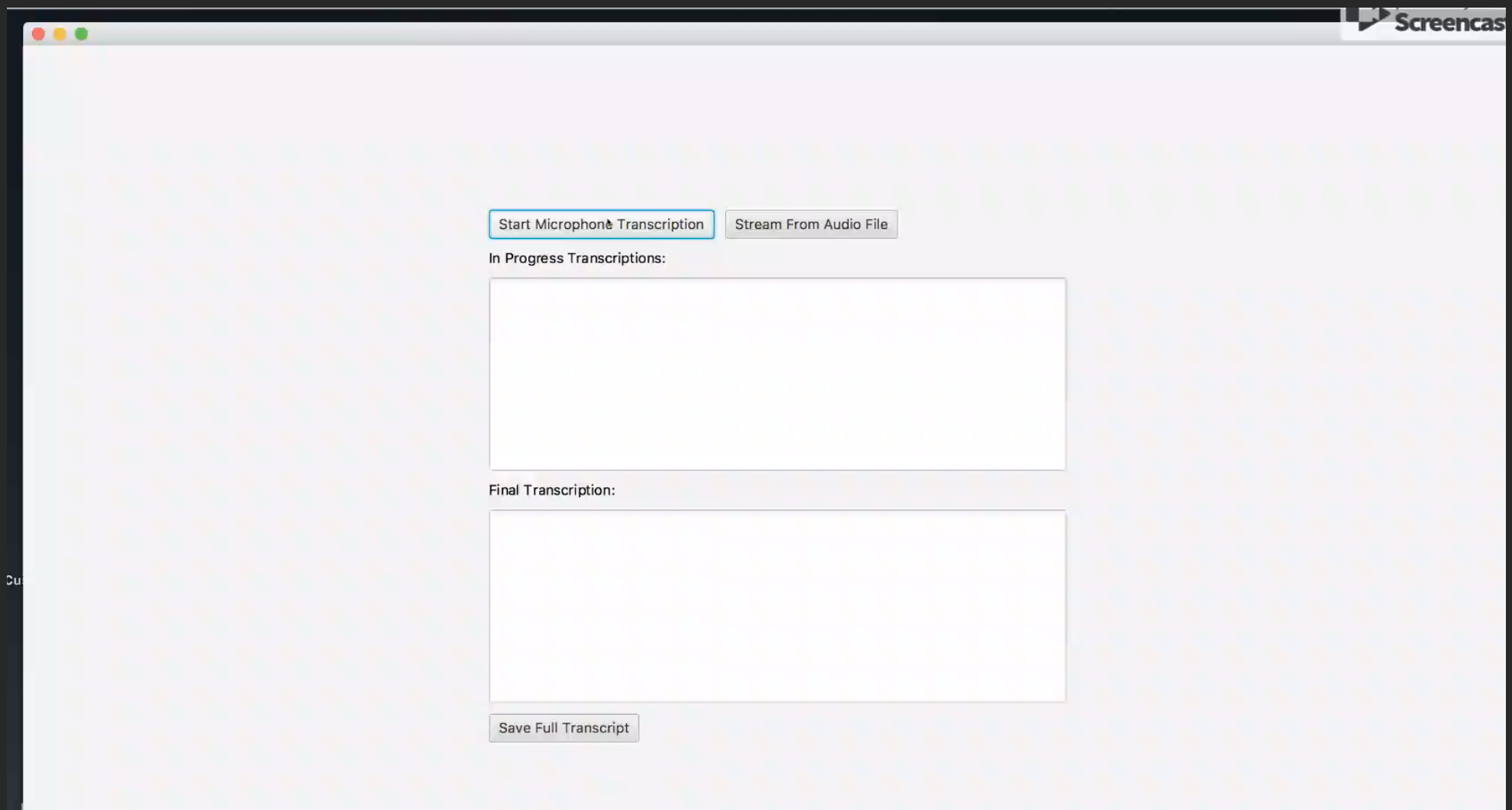


Custom
dictionaries

Amazon Transcribe

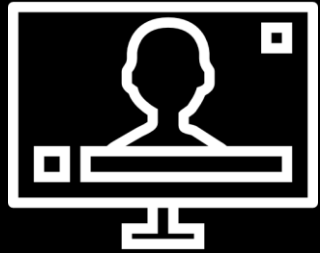
Streaming Transcription





Amazon Transcribe

Use Cases



Media Subtitles



Contact Center Analytics



Meeting Minutes

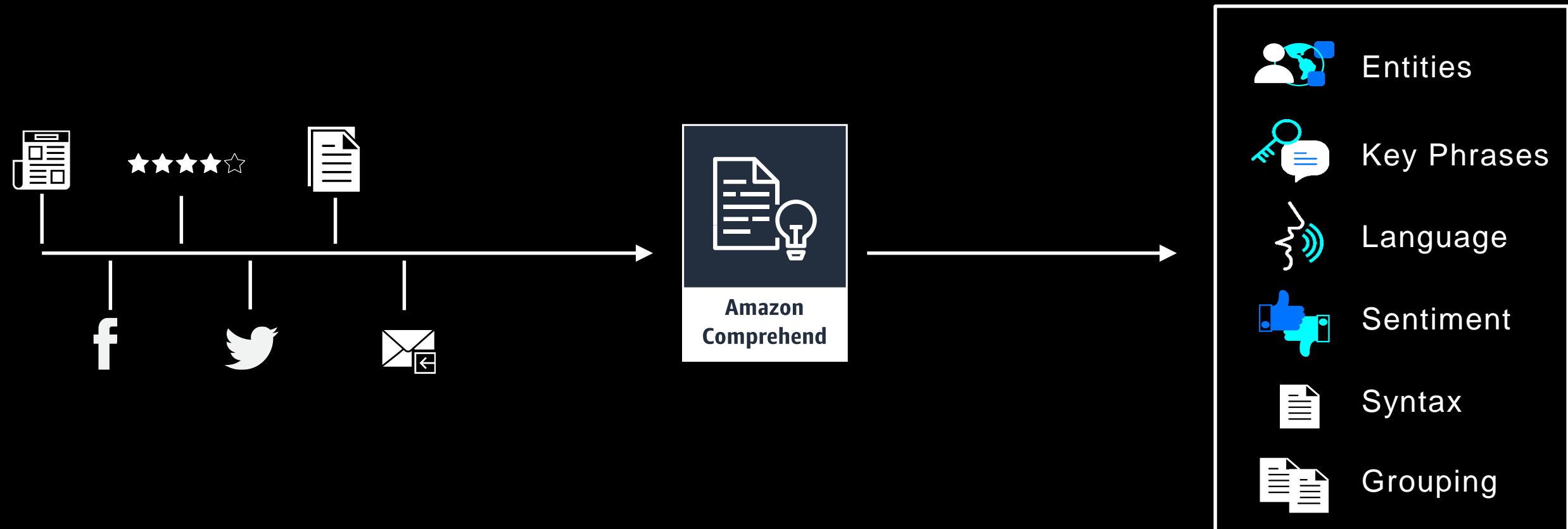


Court Depositions

HIPAA Eligible

How do you extract insights from unstructured text?

Amazon Comprehend



Amazon Comprehend

Extract Insights From Text

Amazon.com, Inc. is located in
Seattle, WA and was founded July
5th, 1994 by Jeff Bezos. Our
customers love buying everything
from books to blenders at great
prices

Named Entities

- Amazon.com: Organization
- Seattle, WA: Location
- July 5th, 1994: Date
- Jeff Bezos: Person

Keyphrases

- Our customers
- books
- blenders
- great prices

Sentiment

Positive

Language

English

Amazon Comprehend

Use Cases



Voice of Customer Analytics

Analyzing what customers are saying about your brand, products and services



Semantic Search

Making search smarter by searching on key phrase, sentiment and topic



Knowledge Management/Discovery

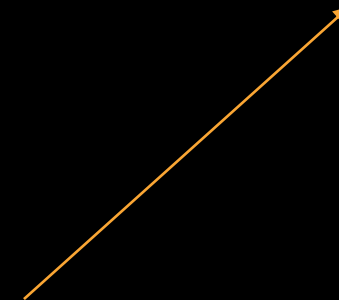
Organizing documents, categorizing by topic and personalizing experiences

Amazon Comprehend

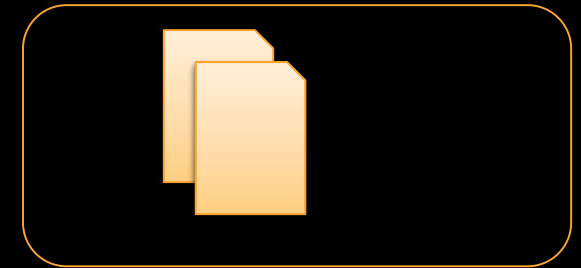
Custom Classification



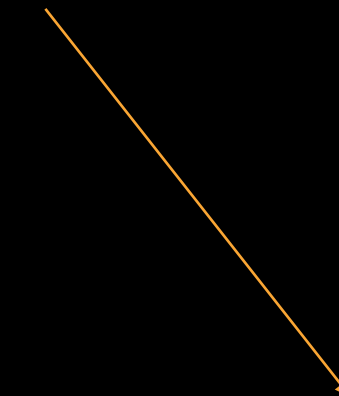
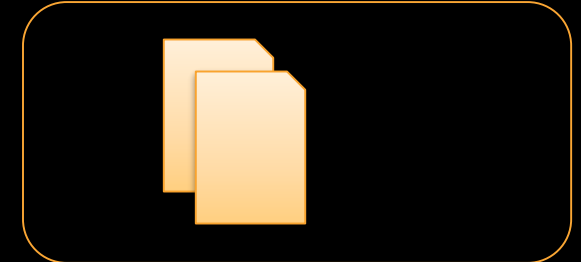
- Triage Support Tickets
- Moderate Forums
- Organize Customer Feedback
- Organize Support Calls



Classification: "Pricing"



Classification: "Cancel_Account"



Classification: "Loyalty Program"



Amazon Comprehend Medical

A new HIPAA eligible service that uses machine learning to extract medical information with high accuracy, reducing the cost, time and effort of processing large amounts of unstructured medical text

Amazon Comprehend Medical

Medical Named Entity and Relationship
Extraction (NERe API)

Protected Health Information Identification
(PHId API)

Entities

- Medication
- Medical condition
- Test, Treatments and Procedures
- Anatomy
- Protected Health Information (PHI)

Relationship Extraction

- Medication and dosage
- Test and result
- Many more

Entity Traits

- Negation
 - Diagnosis, Sign or Symptom
-

Distill a complex process into a simple API call

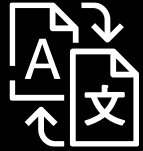
How do you make your applications multilingual?

Amazon Translate

A fully managed and continuously trained neural machine translation service that translates text from one language to another

Amazon Translate

Features



25 Languages

595 Combinations



\$15/1M characters

Or \$0.000075 per word;

Pay as you go, 2M characters monthly free tier



Real-time

< 500ms / sentence on average

< 150ms / conversational / short form



Tag Handling

XML tags placement maintains styling and formatting through translation



Data Security

Data ownership

Encryption

Access Management



Ease of Use

Simple API calls and partner solutions

HIPAA Eligible

Amazon Translate

Use Cases

MOST CONSUMERS ONLY SPEAK ONE LANGUAGE



eCommerce
company is
expanding
internationally



Travel website sees
lower conversion
rates from non-
English speaking
customers



Financial services
company offers its
customers
hundreds of
thousands of news
articles

Powerful language capabilities

Amazon Lex	Conversational interfaces for text-based and voice-based applications
Amazon Polly	Turn text into lifelike speech using deep learning
Amazon Transcribe	Automatic conversion of speech into accurate, grammatically correct text
Amazon Comprehend	Discover insights and relationships in text
Amazon Translate	Natural and fluent language translation

Put AI to work, no ML experience required

Modernize your contact center to improve customer service

conversational chat bots | call transcription | intelligent routing | sentiment analysis | VoC analytics | text-to-speech | multilingual omni-channel communication



AMAZON
POLLY



TRANSCRIBE



TRANSLATE



COMPREHEND



AMAZON
LEX


Vonage®




Live call analysis with next best action and translation

[Home](#)[Demo Sites ▾](#)[Data Mgmt ▾](#)[References ▾](#)[Agent Metrics](#)[Native CCP](#)[Log Out](#)[Change status ▾](#)

Available

 Dial number

 Quick connects

AI Powered Speech Analytics for Amazon Connect

Caller Name



Overall Customer Sentiment:

Real-time Customer Transcript:

Show Entities


Real-time Customer Translation:

Show Contact Attributes

Spanish



https://docs.aws.amazon.com/solutions/latest/ai-powered-speech-analytics-for-amazon-connect/welcome.html



English

Sign In to the Console

AI Powered Speech Analytics for Amazon Connect

AI Powered Speech Analytics for Amazon Connect

Documentation - This Guide

Search

Home

Overview

Components

Considerations

Template

Deployment

Security

Resources

Appendix A: Controlling the Solution Behavior

Appendix B: Limitations

Appendix C: Operational Metrics

Source Code

AWS Documentation » AWS Solutions » AI Powered Speech Analytics for Amazon Connect » AI Powered Speech Analytics for Amazon Connect

The AWS Documentation website is getting a new look! Try it now and let us know what you think. [Switch to the new look >>](#)

You can return to the original look by selecting English in the language selector above.

AI Powered Speech Analytics for Amazon Connect

AWS Implementation Guide

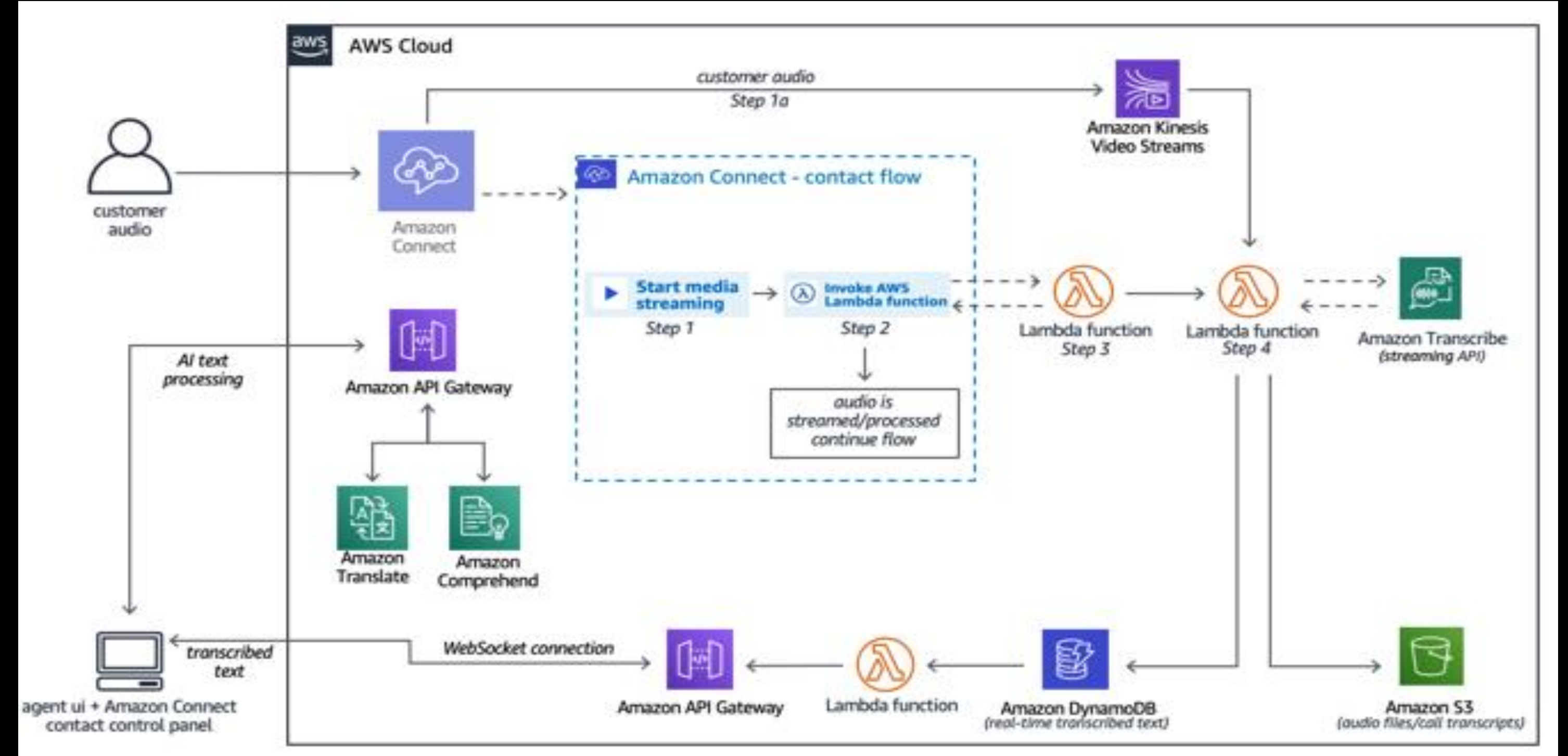
AWS Solutions Builder Team

June 2019

This implementation guide discusses architectural considerations and configuration steps for deploying the AI Powered Speech Analytics for Amazon Connect solution on the Amazon Web Services (AWS) Cloud. It includes a link to [AWS CloudFormation](#) template and instructions for manual steps to launch, configure, and run the AWS security, compute, storage, and other services required to deploy this solution on AWS, and using AWS best practices for security and availability.

The guide is intended for IT infrastructure architects, administrators, and DevOps professionals who have practical experience architecting on the AWS Cloud.

<https://docs.aws.amazon.com/solutions/latest/ai-powered-speech-analytics-for-amazon-connect/welcome.html>



<https://aws.amazon.com/solutions/>

AWS Solutions

Vetted, technical reference implementations designed to help you solve common problems and build faster

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AWS Solutions help you solve common problems and build faster using the AWS platform. All AWS Solutions are vetted by AWS architects and are designed to be operationally effective, reliable, secure, and cost effective. Every AWS Solution comes with detailed architecture, a deployment guide, and instructions for both automated and manual deployment.

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<div>MACHINE LEARNING ANALYTICS NEW</div> <div>Analyzing Text with Amazon Elasticsearch... Built by AWS</div> <div>Deploy a cost-effective, end-to-end solution for extracting meaningful insights from unstructured data, such as customer calls, support tickets, and online customer feedback.</div> <div><div>Last Update</div><div>September 2019</div><div> </div></div>	<div>MACHINE LEARNING ANALYTICS NEW</div> <div>AI-Powered Health Data Masking Built by AWS</div> <div>Deploy a solution that helps healthcare organizations identify and mask health data in images or text.</div> <div><div>Last Update August 2019</div><div></div><div> </div></div>	<div>ANALYTICS IBM MACHINE LEARNING & AI</div> <div></div> <div>IBM Cloud Pak for Data Built by IBM and AWS</div> <div>Deploys IBM Cloud Pak for Data, an end-to-end platform that enables access to data wherever it lives, with data management, governance, and</div> <div><div>Last Update July 2019</div><div></div><div> </div></div>
<div>MACHINE LEARNING ANALYTICS</div> <div>Predictive Maintenance Using Machine Learning Built by AWS</div> <div>Learn how to build an architecture that uses Amazon SageMaker to detect potential equipment failures and</div> <div><div>Last Update July 2019</div><div></div><div> </div></div>	<div>MACHINE LEARNING ANALYTICS STORAGE</div> <div>AI-Driven Social Media Dashboard Built by AWS</div> <div>Deploy a solution that captures multi-language tweets in near real-time, translates them, and stores</div> <div><div>Last Update July 2019</div><div></div><div> </div></div>	<div>MACHINE LEARNING ANALYTICS CUSTOMER...</div> <div>AI Powered Speech Analytics for Amazon... Built by AWS</div> <div>Deploy a solution that uses AWS artificial intelligence services to transcribe, translate, and analyze your</div> <div><div>Last Update June 2019</div><div></div><div> </div></div>

Ready to dive deeper into machine learning?

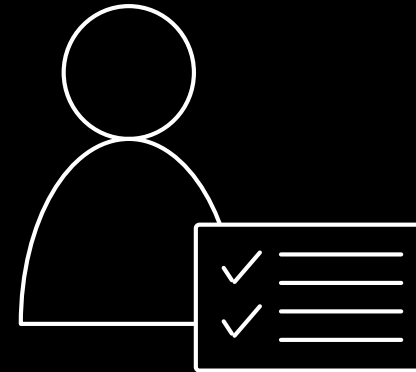
AWS Machine Learning Training & Certification



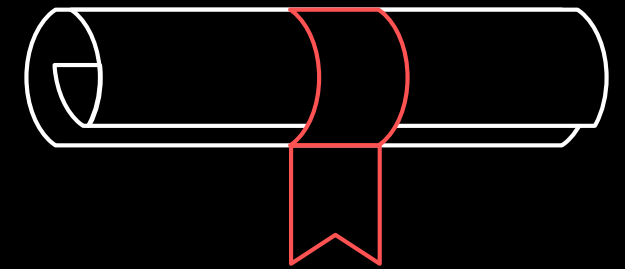
Uses the same materials
used to train Amazon
developers



Foundational
knowledge with
real-world application



Structured
courses



Specialist
certification



ai.aws

Questions?