Developer Guide

Amazon Transcribe

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Amazon Transcribe: Developer Guide

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Table of Contents

What is Amazon Transcribe?

Amazon Transcribe is an automatic speech recognition service that uses machine learning models to convert audio to text. You can use Amazon Transcribe as a standalone transcription service or to add speech-to-text capabilities to any application.

With Amazon Transcribe, you can improve accuracy for your specific use case with language customization, filter content to ensure customer privacy or audience-appropriate language, analyze content in multi-channel audio, partition the speech of individual speakers, and more.

You can transcribe media in real time (streaming) or you can transcribe media files located in an Amazon S3 bucket (batch). To see which languages are supported for each type of transcription, refer to the Supported languages and language-specific features table.

Topics

See What is Amazon Transcribe? for a short video tour of this service.

To learn more, see How Amazon Transcribe works and Getting started with Amazon Transcribe.

Tip

Information on the **Amazon Transcribe API** is located in the API Reference.

Amazon Transcribe and HIPAA eligibility

Amazon Transcribe is covered under AWS's HIPAA eligibility and BAA which requires BAA customers to encrypt all PHI at rest and in transit when in use. Automatic PHI identification is available at no additional charge and in all regions where Amazon Transcribe operates. For more information, refer to HIPAA eligibility and BAA.

Pricing

Amazon Transcribe is a pay-as-you-go service; pricing is based on seconds of transcribed audio, billed on a monthly basis.

Usage is billed in one-second increments, with a minimum per request charge of 15 seconds. Note that additional charges apply for features such as PII content redaction and custom language models.

For cost information for each AWS Region, refer to Amazon Transcribe Pricing.

Region availability and quotas

Amazon Transcribe is supported in the following AWS Regions:

Region	Transcription type
af-south-1 (Cape Town)	batch, streaming
ap-east-1 (Hong Kong)	batch
ap-northeast-1 (Tokyo)	batch, streaming
ap-northeast-2 (Seoul)	batch, streaming
ap-south-1 (Mumbai)	batch, streaming
ap-southeast-1 (Singapore)	batch, streaming
ap-southeast-2 (Sydney)	batch, streaming
ca-central-1 (Canada, Central)	batch, streaming
eu-central-1 (Frankfurt)	batch, streaming
eu-north-1 (Stockholm)	batch
eu-west-1 (Ireland)	batch, streaming
eu-west-2 (London)	batch, streaming

Region	Transcription type
eu-west-3 (Paris)	batch
me-south-1 (Bahrain)	batch
sa-east-1 (São Paulo)	batch, streaming
us-east-1 (N. Virginia)	batch, streaming
us-east-2 (Ohio)	batch, streaming
us-gov-east-1 (GovCloud, US-East)	batch, streaming
us-gov-west-1 (GovCloud, US-West)	batch, streaming
us-west-1 (San Francisco)	batch
us-west-2 (Oregon)	batch, streaming

Important

Region support differs for Amazon Transcribe, Amazon Transcribe Medical, and Call Analytics.

To get the endpoints for each supported Region, see Service endpoints in the *AWS General Reference*.

For a list of quotas that pertain to your transcriptions, refer to the Service quotas in the *AWS General Reference*. Some quotas can be changed upon request. If the **Adjustable** column contains '**Yes**', you can request an increase. To do so, select the provided link.

Amazon Transcribe features

To help you decide which Amazon Transcribe solution best fits your use case, the following table offers a feature comparison.

Note that 'batch' and 'post-call' refer to transcribing a file that is located in an Amazon S3 bucket and 'streaming' and 'real-time' refer to transcribing media in real time.

Feature	Amazon Transcribe	Amazon Transcribe Medical[1]	Amazon Transcribe Call Analytics
Configuration options			
Alternative transcriptions	batch, streaming	batch, streaming	no
Channel identification	batch, streaming	batch, streaming	post-call, real-time
Job queueing	batch	no	post-call
Language identification	batch, streaming	no	post-call
Multi-language identification	batch, streaming	no	no
Speaker diarization	batch, streaming	batch, streaming	post-call
Transcribing digits[2]	batch, streaming	batch, streaming	post-call, real-time
Conversation analytics			
Call characteristics	no	no	post-call
Call summarization[2]	no	no	post-call
Custom categorization	no	no	post-call

Feature	Amazon Transcribe	Amazon Transcribe Medical[1]	Amazon Transcribe Call Analytics
Real-time category events	no	no	real-time
Real-time issue detection[2]	no	no	real-time
Real-time speaker sentiment	no	no	real-time
Speaker sentiment	no	no	post-call
Language customization			
Custom language models[2]	batch, streaming	no	post-call, real-time
Custom vocabularies	batch, streaming	batch, streaming	post-call, real-time
Resource organization			
Tagging	batch	batch	post-call
Sensitive data			
Identifying personal health information[2]	no	batch, streaming	no
Identifying personally identifiable informati on[2]	streaming	no	real-time
Redacting audio[2]	no	no	post-call, real-time
Redacting transcrip ts[2]	batch, streaming	no	post-call, real-time
Vocabulary filtering	batch, streaming	no	post-call, real-time

Feature	Amazon Transcribe	Amazon Transcribe Medical[1]	Amazon Transcribe Call Analytics
Video			
Subtitles	batch	no	no

[1] Amazon Transcribe Medical is only available in US English.
[2] This feature is not available for all languages; review the Supported languages and language-specific features table for more details.

Supported languages and language-specific features

The languages supported by Amazon Transcribe are listed in the following table; also listed are the features that are language-specific. Please verify that the feature you want to use is supported for the language in your media before proceeding with your transcription.

To view the complete list of Amazon Transcribe features, refer to the Feature summary.

In the following table, 'batch' refers to transcribing a media file located in an Amazon S3 bucket and 'streaming' refers to transcribing streamed media in real time. For Call Analytics transcriptions, 'post-call' refers to transcribing a media file located in an Amazon S3 bucket and 'real-time' refers to transcribing streamed media in real time.

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Abkhaz	ab-GE	batch	no	batch	no	no	no
Afrikaans	af-ZA	batch, streaming	no	batch, streaming	no	no	no
Arabic, Gulf	ar-AE	batch, streaming	no	no	no	no	post-call
Arabic, Modern Standard	ar-SA	batch, streaming	no	no	no	no	no
Armenian	hy-AM	batch	no	batch	no	no	no
Asturian	ast-ES	batch	no	batch	no	no	no
Azerbaijani	az-AZ	batch	no	batch	no	no	no
Bashkir	ba-RU	batch	no	batch	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Basque	eu-ES	batch, streaming	no	batch, streaming	no	no	no
Belarusian	be-BY	batch	no	batch	no	no	no
Bengali	bn-IN	batch	no	batch	no	no	no
Bosnian	bs-BA	batch	no	batch	no	no	no
Bulgarian	bg-BG	batch	no	batch	no	no	no
Catalan	ca-ES	batch, streaming	streaming	batch, streaming	no	no	no
Central Kurdish, Iran	ckb-IR	batch	no	batch	no	no	no
Central Kurdish, Iraq	ckb-IQ	batch	no	batch	no	no	no
Chinese, Cantonese	zh-HK (yue-HK)	batch, streaming	no	no	no	no	no
Chinese, Simplified	zh-CN	batch, streaming	no	no	no	no	post-call
Chinese, Traditional	zh-TW	batch, streaming	no	no	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Croatian	hr-HR	batch, streaming	no	batch, streaming	no	no	no
Czech	cs-CZ	batch, streaming	no	batch, streaming	no	no	no
Danish	da-DK	batch, streaming	no	batch, streaming	no	no	no
Dutch	nl-NL	batch, streaming	no	batch, streaming	no	no	no
English, Australian	en-AU	batch, streaming	batch, streaming	batch, streaming	batch, streaming	streaming	post-call, real-time
English, British	en-GB	batch, streaming	batch, streaming	batch, streaming	batch, streaming	streaming	post-call, real-time
English, Indian	en-IN	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
English, Irish	en-IE	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
English, New Zealand	en-NZ	batch, streaming	batch, streaming	batch, streaming	no	no	no
English, Scottish	en-AB	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
English, South African	en-ZA	batch, streaming	batch, streaming	batch, streaming	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
English, US	en-US	batch, streaming	batch, streaming	batch, streaming	batch, streaming	batch, streaming	post-call, real-time
English, Welsh	en-WL	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
Estonian	et-ET	batch	no	batch	no	no	no
Farsi	fa-IR	batch, streaming	no	no	no	no	no
Finnish	fi-FI	batch, streaming	no	batch, streaming	no	no	no
French	fr-FR	batch, streaming	batch, streaming	batch, streaming	no	no	post-call, real-time
French, Canadian	fr-CA	batch, streaming	batch, streaming	batch, streaming	no	no	post-call, real-time
Galician	gl-ES	batch, streaming	no	batch, streaming	no	no	no
Georgian	ka-GE	batch	no	batch	no	no	no
German	de-DE	batch, streaming	batch, streaming	batch, streaming	batch, streaming	no	post-call, real-time
German, Swiss	de-CH	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
Greek	el-GR	batch, streaming	no	batch, streaming	no	no	no
Gujarati	gu-IN	batch	no	batch	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Hausa	ha-NG	batch	no	batch	no	no	no
Hebrew	he-IL	batch, streaming	no	no	no	no	no
Hindi, Indian	hi-IN	batch, streaming	no	batch, streaming	batch	no	post-call
Hungarian	hu-HU	batch	no	batch	no	no	no
Icelandic	is-IS	batch	no	batch	no	no	no
Indonesian	id-ID	batch, streaming	no	batch, streaming	no	no	no
Italian	it-IT	batch, streaming	batch, streaming	batch, streaming	no	no	post-call, real-time
Japanese	ja-JP	batch, streaming	batch, streaming	no	batch, streaming	no	post-call
Kabyle	kab-DZ	batch	no	batch	no	no	no
Kannada	kn-IN	batch	no	batch	no	no	no
Kazakh	kk-KZ	batch	no	batch	no	no	no
Kinyarwanda	rw-RW	batch	no	batch	no	no	no
Korean	ko-KR	batch, streaming	no	no	no	no	post-call
Kyrgyz	ky-KG	batch	no	batch	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Latvian	lv-LV	batch, streaming	no	batch, streaming	no	no	no
Lithuanian	lt-LT	batch	no	batch	no	no	no
Luganda	lg-IN	batch	no	batch	no	no	no
Macedonian	mk-MK	batch	no	batch	no	no	no
Malay	ms-MY	batch, streaming	no	batch, streaming	no	no	no
Malayalam	ml-IN	batch	no	batch	no	no	no
Maltese	mt-MT	batch	no	batch	no	no	no
Marathi	mr-IN	batch	no	batch	no	no	no
Meadow Mari	mhr-RU	batch	no	batch	no	no	no
Mongolian	mn-MN	batch	no	batch	no	no	no
Norwegian Bokmål	no-NO	batch, streaming	no	batch, streaming	no	no	no
Odia/Oriya	or-IN	batch	no	batch	no	no	no
Pashto	ps-AF	batch	no	batch	no	no	no
Polish	pl-PL	batch, streaming	no	batch, streaming	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Portuguese	pt-PT	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
Portuguese, Brazilian	pt-BR	batch, streaming	batch, streaming	batch, streaming	no	no	post-call, real-time
Punjabi	pa-IN	batch	no	batch	no	no	no
Romanian	ro-RO	batch, streaming	no	batch, streaming	no	no	no
Russian	ru-RU	batch, streaming	no	no	no	no	no
Serbian	sr-RS	batch, streaming	no	batch, streaming	no	no	no
Sinhala	si-LK	batch	no	batch	no	no	no
Slovak	sk-SK	batch, streaming	no	batch, streaming	no	no	no
Slovenian	sl-SI	batch	no	batch	no	no	no
Somali	so-SO	batch, streaming	no	batch, streaming	no	no	no
Spanish	es-ES	batch, streaming	batch, streaming	batch, streaming	no	no	post-call
Spanish, US	es-US	batch, streaming	batch, streaming	batch, streaming	batch, streaming	batch, streaming	post-call, real-time
Sundanese	su-ID	batch	no	batch	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Swahili, Kenya	sw-KE	batch	no	batch	no	no	no
Swahili, Burundi	sw-BI	batch	no	batch	no	no	no
Swahili, Rwanda	sw-RW	batch	no	batch	no	no	no
Swahili, Tanzania	sw-TZ	batch	no	batch	no	no	no
Swahili, Uganda	sw-UG	batch	no	batch	no	no	no
Swedish	sv-SE	batch, streaming	no	batch, streaming	no	no	no
Tagalog/ Filipino	tl-PH	batch, streaming	no	batch, streaming	no	no	no
Tamil	ta-IN	batch	no	no	no	no	no
Tatar	tt-RU	batch	no	batch	no	no	no
Telugu	te-IN	batch	no	no	no	no	no
Thai	th-TH	batch, streaming	no	batch, streaming	no	no	no
Turkish	tr-TR	batch	no	batch	no	no	no
Ukrainian	uk-UA	batch, streaming	no	batch, streaming	no	no	no
Uyghur	ug-CN	batch	no	batch	no	no	no

Language	Language code#	Data input	Transcribing numbers	Acronyms	Custom language models	Redaction	Call Analytics *
Uzbek	uz-UZ	batch	no	batch	no	no	no
Vietnamese	vi-VN	batch, streaming	no	batch, streaming	no	no	no
Welsh	cy-WL	batch	no	batch	no	no	no
Wolof	wo-SN	batch	no	batch	no	no	no
Zulu	zu-ZA	batch, streaming	no	batch, streaming	no	no	no

*The following Call Analytics insights are only supported in select English dialects:

- Call summarization: `en-*` (all English dialects)
- Issue detection: `en-AU`, `en-GB`, `en-US`

#Language Code not supported in AWS GovCloud (US) (US-West, us-gov-west-1), AWS GovCloud (US) (US-East, us-gov-east-1), or Africa (Cape Town, af-south-1) regions:

- Language code: `ab-GE` ,`ast-ES` ,`az-AZ` ,`ba-RU` ,`be-BY` ,`bg-BG` ,`bn-IN` ,`bs-BA` ,`ca-ES` ,`ckb-IQ` ,`ckb-IR` ,`cs-CZ` ,`cy-WL` ,`el-GR` ,`et-ET` ,`eu-ES` ,`fi-FI` ,`gl-ES` ,`gu-IN` ,`ha-NG` ,`hr-HR` ,`hu-HU` ,`hy-AM` ,`is-IS` ,`ka-GE` ,`kab-DZ` ,`kk-KZ` ,`kn-IN` ,`ky-KG` ,`lg-IN` ,`lt-LT` ,`lv-LV` ,`mhr-RU` ,`mi-NZ` ,`mk-MK` ,`ml-IN` ,`mn-MN` ,`mr-IN` ,`mt-MT` ,`no-NO` ,`or-IN` ,`pa-IN` ,`pl-PL` ,`ps-AF` ,`ro-RO` ,`rw-RW` ,`si-LK` ,`sk-SK` ,`sl-SI` ,`so-SO` ,`sr-RS` ,`su-ID` ,`sw-BI` ,`sw-KE` ,`sw-RW` ,`sw-TZ` ,`sw-UG` ,`tl-PH` ,`tt-RU` ,`ug-CN` ,`uk-UA` ,`uz-UZ` ,`wo-SN` ,`zu-ZA`

Supported programming languages

Amazon Transcribe supports the following AWS SDKs:

Batch transcriptions	Streaming transcriptions
.NET	.NET is not supported for streaming.
AWS Command Line Interface (CLI)	The CLI is not supported for streaming.
C++	C++
Go	Go
Java V2	Java V2
JavaScript	JavaScript V3
PHP V3	PHP V3
Python Boto3	Python Streaming SDK for Amazon Transcribe
Ruby V3	Ruby V3
Rust	Rust

For information on using SDKs with Amazon Transcribe, refer to Transcribing with the AWS SDKs.

For more information on all available AWS SDKs and builder tools, refer to Tools to Build on AWS.

Tip

You can find SDK code samples in these GitHub repositories:

- AWS Code Examples
- Amazon Transcribe Examples

Character sets for custom vocabularies and vocabulary filters

For each language Amazon Transcribe supports, there is a specific set of characters Amazon Transcribe can recognize. When you create a custom vocabulary or vocabulary filter, use only the characters listed in your language's character set. If you use unsupported characters, your custom vocabulary or vocabulary filter fails.

Important

Be sure to check that your custom vocabulary file uses only the supported Unicode code points and code point sequences listed within the following character sets.

Many Unicode characters can appear identical in popular fonts, even if they use different code points. **Only the code points listed in this guide are supported**. For example, the French word **déjà** can be rendered using *precomposed* characters (where one Unicode value represents an accented character) or *decomposed* characters (where two Unicode values represent an accented character, one value for the base character and another for the accent).

- **Precomposed version**: 0064 **`00E9`** 006A **`00E0`** (renders as **déjà**)
- **Decomposed version**: 0064 **`0065 0301`** 006A **`0061 0300`** (renders as **déjà**)

Topics

- Chinese, Mandarin (Taiwan), Traditional character set
- Chinese, Cantonese (Hong Kong), Traditional character set
- Croatian character set
- Czech character set
- Danish character set
- Dutch character set
- English character set
- Estonian character set
- Farsi character set
- Finnish character set
- French character set
- Galician character set
- Georgian character set
- German character set
- Greek character set
- Gujarati character set
- Hausa character set
- Hebrew character set
- Hindi character set
- Hungarian character set
- Icelandic character set
- Indonesian character set
- Italian character set
- Japanese character set
- Kabyle character set
- Kannada character set
- Kazakh character set
- Kinyarwanda character set
- Korean character set
- Kyrgyz character set

- Latvian character set
- Lithuanian character set
- Luganda character set
- Macedonian character set
- Malay character set
- Malayalam character set
- Maltese character set
- Marathi character set
- Meadow Mari character set
- Mongolian character set
- Norwegian Bokmål character set
- Odia/Oriya character set
- Pashto character set
- Polish character set
- Portuguese character set
- Punjabi character set
- Romanian character set
- Russian character set
- Serbian character set
- Sinhala character set
- Slovak character set
- Slovenian character set
- Somali character set
- Spanish character set
- Sundanese character set
- Swahili character set
- Swedish character set
- Tagalog/Filipino character set
- Tamil character set
- Tatar character set

- Telugu character set
- Thai character set
- Turkish character set
- Ukrainian character set
- Uyghur character set
- Uzbek character set
- Vietnamese character set
- Welsh character set
- Wolof character set
- Zulu character set

Abkhaz character set

For Abkhaz custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F

Character	Code	Character	Code
з	0437	ґ	0491
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF

Character	Code	Character	Code
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9
#	0525		

Afrikaans character set

For Afrikaans custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the Phrase field:

Character	Code	Character	Code
á	00E1	ï	00EF
è	00E8	ó	00F3
é	00E9	ô	00F4
ê	00EA	ö	00F6
ë	00EB	ú	00FA
í	00ED	û	00FB
î	00EE	ü	00FC

Arabic character set

For Arabic custom vocabularies, you can use the following Unicode characters in the Phrase field. You can also use the hyphen (-) character to separate words.

Character	Code	Character	Code
ء	0621	س	0633
آ	0622	ش	0634
أ	0623	ص	0635
ؤ	0624	ض	0636
إ	0625	ط	0637
ئ	0626	ظ	0638
ا	0627	ع	0639
ب	0628	غ	063A

Character	Code	Character	Code
ة	0629	ف	0641
ت	062A	ق	0642
ث	062B	ك	0643
ج	062C	ل	0644
ح	062D	م	0645
خ	062E	ن	0646
د	062F	ه	0647
ذ	0630	و	0648
ر	0631	ى	0649
ز	0632	ي	064A

Asturian character set

For Asturian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ñ	00F1
é	00E9	ó	00F3
í	00ED	ú	00FA

Character	Code	Character	Code
ü	00FC		

Azerbaijani character set

For Azerbaijani custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ä	00E4	ğ	011F
ç	00E7	ı	0131
ö	00F6	ş	015F
ü	00FC	ə	0259
̇	0307		

Armenian character set

For Armenian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ա	0561	մ	0574
բ	0562	յ	0575
գ	0563	ն	0576
դ	0564	շ	0577
ե	0565	ո	0578
զ	0566	չ	0579
է	0567	պ	057A
ը	0568	ջ	057B
թ	0569	ռ	057C
ժ	056A	ս	057D
ի	056B	վ	057E
լ	056C	տ	057F
խ	056D	ր	0580
ծ	056E	ց	0581
կ	056F	ւ	0582
հ	0570	փ	0583
ձ	0571	ք	0584
ղ	0572	օ	0585
ճ	0573	ֆ	0586

Bashkir character set

For Bashkir custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1

Character	Code	Character	Code
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3

Character	Code	Character	Code
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Basque character set

For Basque custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ñ	00F1
é	00E9	ó	00F3
í	00ED	ú	00FA
ü	00FC		

Belarusian character set

For Belarusian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	с	0441
б	0431	т	0442
в	0432	у	0443
г	0433	ф	0444
д	0434	х	0445
е	0435	ц	0446
ж	0436	ч	0447
з	0437	ш	0448
й	0439	ы	044B
к	043A	ь	044C
л	043B	э	044D
м	043C	ю	044E
н	043D	я	044F
о	043E	ё	0451

Character	Code	Character	Code
п	043F	і	0456
р	0440	ў	045E

Bengali character set

For Bengali custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ঁ	0981	দ	09A6
ং	0982	ধ	09A7
ঃ	0983	ন	09A8
অ	0985	প	09AA
আ	0986	ফ	09AB
ই	0987	ব	09AC
ঈ	0988	ভ	09AD
উ	0989	ম	09AE
ঊ	098A	য	09AF
ঋ	098B	র	09B0
এ	098F	ল	09B2

Character	Code	Character	Code
ঐ	0990	শ	09B6
ও	0993	ষ	09B7
ঔ	0994	স	09B8
ক	0995	হ	09B9
খ	0996	়	09BC
গ	0997	#	09BD
ঘ	0998	া	09BE
ঙ	0999	ি	09BF
চ	099A	ী	09C0
ছ	099B	ু	09C1
জ	099C	ূ	09C2
ঝ	099D	ৃ	09C3
ঞ	099E	ৄ	09C4
ট	099F	ে	09C7
ঠ	09A0	ৈ	09C8
ড	09A1	ো	09CB
ঢ	09A2	ৌ	09CC
ণ	09A3	্	09CD
ত	09A4	#	09CE
থ	09A5	ৗ	09D7

Bosnian character set

For Bosnian custom vocabularies, you can use the following characters in the Phrase field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the Phrase field:

Character	Code	Character	Code
ć	0107	đ	0111
č	010D	š	0161
ž	017E		

Bulgarian character set

For Bulgarian custom vocabularies, you can use the following characters in the Phrase field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the Phrase field:

Character	Code	Character	Code
а	0430	п	043F
б	0431	р	0440
в	0432	с	0441
г	0433	т	0442

Character	Code	Character	Code
д	0434	у	0443
е	0435	ф	0444
ж	0436	х	0445
з	0437	ц	0446
и	0438	ч	0447
й	0439	ш	0448
к	043A	щ	0449
л	043B	ъ	044A
м	043C	ь	044C
н	043D	ю	044E
о	043E	я	044F

Catalan character set

For Catalan custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	ï	00EF
ç	00E7	ò	00F2

Character	Code	Character	Code
è	00E8	ó	00F3
é	00E9	ú	00FA
í	00ED	ü	00FC
ŀ	0140		

Central Kurdish character set

For Central Kurdish custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ئ	0626	م	0645
ا	0627	ن	0646
ب	0628	و	0648
ت	062A	پ	067E
ج	062C	چ	0686
ح	062D	ڕ	0695
خ	062E	ژ	0698
د	062F	ڤ	06A4
ر	0631	ک	06A9

Character	Code	Character	Code
ز	0632	گ	06AF
س	0633	ڵ	06B5
ش	0634	ھ	06BE
ع	0639	ۆ	06C6
غ	063A	ۇ	06C7
ف	0641	ی	06CC
ق	0642	ێ	06CE
ل	0644	ە	06D5

Chinese, Mandarin (Mainland China), Simplified character set

For Chinese (Simplified) custom vocabularies, the `Phrase` field can use any of the characters listed in the following file:

- zh-cn-character-set

The `SoundsLike` field can contain the pinyin syllables listed in the following file:

- pinyin-character-set

When you use pinyin syllables in the `SoundsLike` field, separate the syllables with a hyphen (-).

Amazon Transcribe represents the four tones in Chinese (Simplified) using numbers. The following table shows how tone marks are mapped for the word 'ma'.

Tone	Tone mark	Tone number
Tone 1	mā	ma1
Tone 2	má	ma2

Tone	Tone mark	Tone number
Tone 3	mǎ	ma3
Tone 4	mà	ma4

Note

For the 5th (neutral) tone, you can use Tone 1, with the exception of 'er', which must be mapped to Tone 2. For example, 打转儿 would be represented as 'da3-zhuan4-er2'.

Chinese (Simplified) custom vocabularies don't use the `IPA` field, but you must still include the `IPA` header in the custom vocabulary table.

The following example is an input file in text format. The example uses spaces to align the columns. Your input files should use TAB characters to separate the columns. Include spaces only in the `DisplayAs` column.

```
Phrase        SoundsLike                 IPA     DisplayAs
##           kang1-jian4
##           qian3-ze2
####         guo2-fang2-da4-chen2
#####      shi4-jie4-bo2-lan3-hui4          ###
```

Chinese, Mandarin (Taiwan), Traditional character set

For Chinese (Traditional) custom vocabularies, the `Phrase` field can use any of the characters listed in the following file:

- zh-tw-character-set

The `SoundsLike` field can contain the zhuyin syllables listed in the following file:

- zhuyin-character-set

When you use zhuyin syllables in the `SoundsLike` field, separate the syllables with a hyphen (-).

Amazon Transcribe represents the four tones in Chinese (Traditional) using numbers. The following table shows how tone marks are mapped for the word ㄇㄚ.

Tone	Tone mark	
Tone 1	ㄇㄚ	
Tone 2	ㄇㄚˊ	
Tone 3	ㄇㄚˇ	
Tone 4	ㄇㄚˋ	

Chinese (Traditional) custom vocabularies don't use the `IPA` field, but you must still include the `IPA` header in the custom vocabulary table.

The following example is an input file in text format. The example uses spaces to align the columns. Your input files should use TAB characters to separate the columns. Include spaces only in the `DisplayAs` column.

```
Phrase         SoundsLike                          IPA        DisplayAs
##           ###ˋ-##
##           ###ˇ-##ˊ
####        ###ˊ-##ˊ-##ˋ-##ˇ
#####     #ˋ-###ˋ-##ˊ-##ˇ-###ˋ               ###
```

Chinese, Cantonese (Hong Kong), Traditional character set

For Chinese (Cantonese) Hong Kong custom vocabularies, the `Phrase` field can use any of the characters listed in the following file:

- zh-hk-character-set

Croatian character set

For Croatian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)

- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ć	0107	đ	0111
č	010D	š	0161
ž	017E		

Czech character set

For Czech custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ď	010F
é	00E9	ě	011B
í	00ED	ň	0148
ó	00F3	ř	0159
ú	00FA	š	0161
ý	00FD	ť	0165
č	010D	ů	016F

Character	Code	Character	Code
ž	017E		

Danish character set

For Danish custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
Å	00C5	æ	00E6
Æ	00C6	é	00E9
Ø	00D8	ø	00F8
å	00E5		

Dutch character set

For Dutch custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	î	00EE
á	00E1	ï	00EF
â	00E2	ñ	00F1
ä	00E4	ò	00F2
ç	00E7	ó	00F3
è	00E8	ô	00F4
é	00E9	ö	00F6
ê	00EA	ù	00F9
ë	00EB	ú	00FA
ì	00EC	û	00FB
í	00ED	ü	00FC

English character set

For English custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

Estonian character set

For Estonian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ä	00E4	ü	00FC
õ	00F5	š	0161
ö	00F6	ž	017E

Farsi character set

For Farsi custom vocabularies, you can use the following characters in the `Phrase` field.

Character	Code	Character	Code
ء	0621	ظ	0638
آ	0622	ع	0639
أ	0623	غ	063A
ؤ	0624	ف	0641
ئ	0626	ق	0642
ا	0627	ل	0644
ب	0628	م	0645

Character	Code	Character	Code
ت	062A	ن	0646
ث	062B	ه	0647
ج	062C	و	0648
ح	062D	َ	064E
خ	062E	ُ	064F
د	062F	ِ	0650
ذ	0630	ّ	0651
ر	0631	پ	067E
ز	0632	چ	0686
س	0633	ژ	0698
ش	0634	ک	06A9
ص	0635	گ	06AF
ض	0636	ی	06CC
ط	0637		

Finnish character set

For Finnish custom vocabularies, you can use the following characters in the `Phrase` field:

- `a` - `z`
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ä	00E4	ö	00F6
å	00E5	š	0161
ž	017E		

French character set

For French custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
À	00C0	à	00E0
Â	00C2	â	00E2
Ç	00C7	ç	00E7
È	00C8	è	00E8
É	00C9	é	00E9
Ê	00CA	ê	00EA
Ë	00CB	ë	00EB
Î	00CE	î	00EE

Character	Code	Character	Code
Ï	00CF	ï	00EF
Ô	00D4	ô	00F4
Ö	00D6	ö	00F6
Ù	00D9	ù	00F9
Û	00DB	û	00FB
Ü	00DC	ü	00FC

Galician character set

For Galician custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ñ	00F1
é	00E9	ó	00F3
í	00ED	ú	00FA
ü	00FC		

Georgian character set

For Georgian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ა	10D0	რ	10E0
ბ	10D1	ს	10E1
გ	10D2	ტ	10E2
დ	10D3	უ	10E3
ე	10D4	ფ	10E4
ვ	10D5	ქ	10E5
ზ	10D6	ღ	10E6
თ	10D7	ყ	10E7
ი	10D8	შ	10E8
კ	10D9	ჩ	10E9
ლ	10DA	ც	10EA
მ	10DB	ძ	10EB
ნ	10DC	წ	10EC
ო	10DD	ჭ	10ED
პ	10DE	ხ	10EE
ჟ	10DF	ჯ	10EF

Character	Code	Character	Code
ჰ	10F0		

German character set

For German custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`
- `A - Z`
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ä	00E4	Ä	00C4
ö	00F6	Ö	00D6
ü	00FC	Ü	00DC
ß	00DF		

Greek character set

For Greek custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ά	03AC	ν	03BD
έ	03AD	ξ	03BE
ή	03AE	ο	03BF
ί	03AF	π	03C0
ΰ	03B0	ρ	03C1
α	03B1	ς	03C2
β	03B2	σ	03C3
γ	03B3	τ	03C4
δ	03B4	υ	03C5
ε	03B5	φ	03C6
ζ	03B6	χ	03C7
η	03B7	ψ	03C8
θ	03B8	ω	03C9
ι	03B9	ϊ	03CA
κ	03BA	ϋ	03CB
λ	03BB	ό	03CC
μ	03BC	ώ	03CE
ΐ	0390		

Gujarati character set

For Gujarati custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ઁ	0A81	દ	0AA6
ં	0A82	ધ	0AA7
ઃ	0A83	ન	0AA8
અ	0A85	પ	0AAA
આ	0A86	ફ	0AAB
ઇ	0A87	બ	0AAC
ઈ	0A88	ભ	0AAD
ઉ	0A89	મ	0AAE
ઊ	0A8A	ય	0AAF
ઋ	0A8B	ર	0AB0
ઍ	0A8D	લ	0AB2
એ	0A8F	ળ	0AB3
ઐ	0A90	વ	0AB5
ઑ	0A91	શ	0AB6
ઓ	0A93	ષ	0AB7
ઔ	0A94	સ	0AB8

Character	Code	Character	Code
ક	0A95	હ	0AB9
ખ	0A96	઼	0ABC
ગ	0A97	ા	0ABE
ઘ	0A98	િ	0ABF
ઙ	0A99	ી	0AC0
ચ	0A9A	ુ	0AC1
છ	0A9B	ૂ	0AC2
જ	0A9C	ૃ	0AC3
ઝ	0A9D	ૅ	0AC5
ઞ	0A9E	ે	0AC7
ટ	0A9F	ૈ	0AC8
ઠ	0AA0	ૉ	0AC9
ડ	0AA1	ો	0ACB
ઢ	0AA2	ૌ	0ACC
ણ	0AA3	્	0ACD
ત	0AA4	ૐ	0AD0
થ	0AA5	ૠ	0AE0

Hausa character set

For Hausa custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ƙ	0199	ɓ	0253
ƴ	01B4	ɗ	0257
̃	0303		

Hebrew character set

For Hebrew custom vocabularies, you can use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
-	002D	ם	05DD
א	05D0	מ	05DE
ב	05D1	ן	05DF
ג	05D2	נ	05E0
ד	05D3	ס	05E1
ה	05D4	ע	05E2
ו	05D5	ף	05E3
ז	05D6	פ	05E4
ח	05D7	ץ	05E5
ט	05D8	צ	05E6

Character	Code	Character	Code
י	05D9	ק	05E7
ך	05DA	ר	05E8
כ	05DB	ש	05E9
ל	05DC	ת	05EA

Hindi character set

For Hindi custom vocabularies, you can use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
-	002D	थ	0925
.	002E	द	0926
ँ	0901	ध	0927
ं	0902	न	0928
ः	0903	प	092A
अ	0905	फ	092B
आ	0906	ब	092C
इ	0907	भ	092D
ई	0908	म	092E
उ	0909	य	092F
ऊ	090A	र	0930
ऋ	090B	ल	0932

Character	Code	Character	Code
ए	090F	व	0935
ऐ	0910	श	0936
ऑ	0911	ष	0937
ओ	0913	स	0938
औ	0914	ह	0939
क	0915	ा	093E
ख	0916	ि	093F
ग	0917	ी	0940
घ	0918	ु	0941
ङ	0919	ू	0942
च	091A	ृ	0943
छ	091B	ॅ	0945
ज	091C	े	0947
झ	091D	ै	0948
ञ	091E	ॉ	0949
ट	091F	ो	094B
ठ	0920	ौ	094C
ड	0921	्	094D
ढ	0922	ज़	095B
ण	0923	ड़	095C

Character	Code	Character	Code
त	0924	ढ़	095D

Amazon Transcribe maps the following characters:

Character	Mapped to
ऩ (0929)	न (0928)
ऱ (0931)	र (0930)
क़ (0958)	क (0915)
ख़ (0959)	ख (0916)
ग़ (095A)	ग (0917)
फ़ (095E)	फ (092B)
य़ (095F)	य (092F)

Hungarian character set

For Hungarian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ö	00F6
é	00E9	ú	00FA

Character	Code	Character	Code
í	00ED	ü	00FC
ó	00F3	ő	0151
ű	0171		

Icelandic character set

For Icelandic custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ú	00FA
é	00E9	ý	00FD
ð	00F0	þ	00FE
í	00ED	æ	00E6
ó	00F3	ö	00F6

Indonesian character set

For Indonesian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)

- - (hyphen)
- . (period)

Italian character set

For Italian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
À	00C0	à	00E0
Ä	00C4	ä	00E4
Ç	00C7	ç	00E7
È	00C8	è	00E8
É	00C9	é	00E9
Ê	00CA	ê	00EA
Ë	00CB	ë	00EB
Ì	00CC	ì	00EC
Ò	00D2	ò	00F2
Ù	00D9	ù	00F9
Ü	00DC	ü	00FC

Japanese character set

For Japanese custom vocabularies, the `DisplayAs` field supports all hiragana, katakana, and kanji characters, and fullwidth romaji capital letters.

The `Phrase` field supports the characters listed in the following file:

- ja-jp-character-set

Kabyle character set

For Kabyle custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ï	00EF	ḍ	1E0D
č	010D	ḥ	1E25
ř	0159	ṛ	1E5B
ǧ	01E7	ṣ	1E63
ɛ	025B	ṭ	1E6D
ɣ	0263	ẓ	1E93

Kannada character set

For Kannada custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ಂ	0C82	ಧ	0CA7
ಃ	0C83	ನ	0CA8
ಅ	0C85	ಪ	0CAA
ಆ	0C86	ಫ	0CAB
ಇ	0C87	ಬ	0CAC
ಈ	0C88	ಭ	0CAD
ಉ	0C89	ಮ	0CAE
ಊ	0C8A	ಯ	0CAF
ಋ	0C8B	ರ	0CB0
ಎ	0C8E	ಲ	0CB2
ಏ	0C8F	ಳ	0CB3
ಐ	0C90	ವ	0CB5
ಒ	0C92	ಶ	0CB6
ಓ	0C93	ಷ	0CB7
ಔ	0C94	ಸ	0CB8
ಕ	0C95	ಹ	0CB9
ಖ	0C96	#	0CBC

Character	Code	Character	Code
ಗ	0C97	#	0CBD
ಘ	0C98	ಾ	0CBE
ಙ	0C99	ಿ	0CBF
ಚ	0C9A	ೀ	0CC0
ಛ	0C9B	ು	0CC1
ಜ	0C9C	ೂ	0CC2
ಝ	0C9D	ೃ	0CC3
ಞ	0C9E	ೆ	0CC6
ಟ	0C9F	ೇ	0CC7
ಠ	0CA0	ೈ	0CC8
ಡ	0CA1	ೊ	0CCA
ಢ	0CA2	ೋ	0CCB
ಣ	0CA3	ೌ	0CCC
ತ	0CA4	್	0CCD
ಥ	0CA5	ೕ	0CD5
ದ	0CA6	ೖ	0CD6
ೠ	0CE0		

Kazakh character set

For Kazakh custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
т	0442	ы	044B
б	0431	я	044F
о	043E	с	0441
п	043F	һ	04BB
ш	0448	д	0434
и	0438	р	0440
ч	0447	г	0433
н	043D	ё	0451
қ	049B	й	0439
і	0456	ө	04E9
щ	0449	в	0432
е	0435	э	044D
ә	04D9	ң	04A3
ю	044E	л	043B
з	0437	ф	0444
х	0445	к	043A
ц	0446	у	0443

Character	Code	Character	Code
ү	04AF	ж	0436
м	043C	ғ	0493
ь	044C	а	0430
ъ	044A	ұ	04B1

Kinyarwanda character set

For Kinyarwanda custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ó	00F3
â	00E2	ô	00F4
ã	00E3	ú	00FA
ç	00E7	ü	00FC
è	00E8	ā	0101
é	00E9	ē	0113
ê	00EA	ī	012B
ë	00EB	ō	014D
í	00ED	ū	016B

Character	Code	Character	Code
ï	00EF	́	0301

Korean character set

For Korean custom vocabularies, you can use any of the Hangul syllables in the `Phrase` field. For more information, see Hangul Syllables on Wikipedia.

Kyrgyz character set

For Kyrgyz custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491
и	0438	ғ	0493

Character	Code	Character	Code
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1

Character	Code	Character	Code
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Latvian character set

For Latvian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ā	0101	ķ	0137

Character	Code	Character	Code
č	010D	ļ	013C
ē	0113	ņ	0146
ģ	0123	š	0161
ī	012B	ū	016B
ž	017E		

Lithuanian character set

For Lithuanian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ą	0105	į	012F
č	010D	š	0161
ę	0119	ų	0173
ė	0117	ū	016B
ž	017E		

Luganda character set

For Luganda custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ÿ	00FF	ŋ	014B

Macedonian character set

For Macedonian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491

Character	Code	Character	Code
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA

Character	Code	Character	Code
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Malay character set

For Malay custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

Malayalam character set

For Malayalam custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ം	0D02	ന	0D28
ഃ	0D03	പ	0D2A
അ	0D05	ഫ	0D2B
ആ	0D06	ബ	0D2C
ഇ	0D07	ഭ	0D2D
ഈ	0D08	മ	0D2E
ഉ	0D09	യ	0D2F
ഊ	0D0A	ര	0D30
ഋ	0D0B	റ	0D31
എ	0D0E	ല	0D32
ഏ	0D0F	ള	0D33
ഐ	0D10	ഴ	0D34
ഒ	0D12	വ	0D35
ഓ	0D13	ശ	0D36

Character	Code	Character	Code
ഔ	0D14	ഷ	0D37
ക	0D15	സ	0D38
ഖ	0D16	ഹ	0D39
ഗ	0D17	ാ	0D3E
ഘ	0D18	ി	0D3F
ങ	0D19	ീ	0D40
ച	0D1A	ു	0D41
ഛ	0D1B	ൂ	0D42
ജ	0D1C	ൃ	0D43
ഝ	0D1D	െ	0D46
ഞ	0D1E	േ	0D47
ട	0D1F	ൈ	0D48
ഠ	0D20	ൊ	0D4A
ഡ	0D21	ോ	0D4B
ഢ	0D22	ൌ	0D4C
ണ	0D23	്	0D4D
ത	0D24	#	0D7A
ഥ	0D25	#	0D7B
ദ	0D26	#	0D7C
ധ	0D27	#	0D7D

Maltese character set

For Maltese custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	ù	00F9
è	00E8	ċ	010B
ì	00EC	ġ	0121
ò	00F2	ħ	0127
ż	017C		

Marathi character set

For Marathi custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ँ	0901	थ	0925
ं	0902	द	0926

Character	Code	Character	Code
ः	0903	ध	0927
अ	0905	न	0928
आ	0906	प	092A
इ	0907	फ	092B
ई	0908	ब	092C
उ	0909	भ	092D
ऊ	090A	म	092E
ऋ	090B	य	092F
ऍ	090D	र	0930
ए	090F	ल	0932
ऐ	0910	ळ	0933
ऑ	0911	व	0935
ओ	0913	श	0936
औ	0914	ष	0937
क	0915	स	0938
ख	0916	ह	0939
ग	0917	़	093C
घ	0918	ा	093E
ङ	0919	ि	093F
च	091A	ी	0940

Character	Code	Character	Code
छ	091B	ु	0941
ज	091C	ू	0942
झ	091D	ृ	0943
ञ	091E	ॅ	0945
ट	091F	े	0947
ठ	0920	ै	0948
ड	0921	ॉ	0949
ढ	0922	ो	094B
ण	0923	ौ	094C
त	0924	्	094D
ॐ	0950		

Meadow Mari character set

For Meadow Mari custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A

Character	Code	Character	Code
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3

Character	Code	Character	Code
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Mongolian character set

For Mongolian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1

Character	Code	Character	Code
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3

Character	Code	Character	Code
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Norwegian Bokmål character set

For Norwegian Bokmål custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
å	00E5	æ	00E6
ø	00F8		

Odia/Oriya character set

For Odia/Oriya custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ଁ	0B01	ଦ	0B26
ଂ	0B02	ଧ	0B27
ଃ	0B03	ନ	0B28
ଅ	0B05	ପ	0B2A
ଆ	0B06	ଫ	0B2B
ଇ	0B07	ବ	0B2C
ଈ	0B08	ଭ	0B2D
ଉ	0B09	ମ	0B2E
ଊ	0B0A	ଯ	0B2F
ଋ	0B0B	ର	0B30
ଏ	0B0F	ଲ	0B32
ଐ	0B10	ଳ	0B33
ଓ	0B13	ଶ	0B36
ଔ	0B14	ଷ	0B37
କ	0B15	ସ	0B38
ଖ	0B16	ହ	0B39
ଗ	0B17	଼	0B3C

Character	Code	Character	Code
ଘ	0B18	ା	0B3E
ଙ	0B19	ି	0B3F
ଚ	0B1A	ୀ	0B40
ଛ	0B1B	ୁ	0B41
ଜ	0B1C	ୂ	0B42
ଝ	0B1D	ୃ	0B43
ଞ	0B1E	େ	0B47
ଟ	0B1F	ୈ	0B48
ଠ	0B20	େ#	0B4B
ଡ	0B21	ୌ	0B4C
ଢ	0B22	୍	0B4D
ଣ	0B23	ୖ	0B56
ତ	0B24	ୟ	0B5F
ଥ	0B25	ୠ	0B60
#	0B71		

Pashto character set

For Pashto custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
آ	0622	و	0648
أ	0623	ي	064A
ؤ	0624	ً	064B
ئ	0626	ٌ	064C
ا	0627	ٍ	064D
ب	0628	َ	064E
ت	062A	ُ	064F
ث	062B	ِ	0650
ج	062C	ّ	0651
ح	062D	ْ	0652
خ	062E	#	0654
د	062F	ٰ	0670
ذ	0630	ټ	067C
ر	0631	پ	067E
ز	0632	ځ	0681
س	0633	څ	0685
ش	0634	چ	0686
ص	0635	ډ	0689
ض	0636	ړ	0693

Character	Code	Character	Code
ط	0637	ږ	0696
ظ	0638	ژ	0698
ع	0639	ښ	069A
غ	063A	ک	06A9
ف	0641	ګ	06AB
ق	0642	گ	06AF
ل	0644	ڼ	06BC
م	0645	ی	06CC
ن	0646	ۍ	06CD
ه	0647	ې	06D0

Polish character set

For Polish custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ó	00F3	ł	0142
ą	0105	ń	0144
ć	0107	ś	015B

Character	Code	Character	Code
ę	0119	ź	017A
ż	017C		

Portuguese character set

For Portuguese custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
À	00C0	à	00E0
Á	00C1	á	00E1
Â	00C2	â	00E2
Ã	00C3	ã	00E3
Ä	00C4	ä	00E4
Ç	00C7	ç	00E7
È	00C8	è	00E8
É	00C9	é	00E9
Ê	00CA	ê	00EA

Character	Code	Character	Code
Ë	00CB	ë	00EB
Í	00CD	í	00ED
Ñ	00D1	ñ	00F1
Ó	00D3	ó	00F3
Ô	00D4	ô	00F4
Õ	00D5	õ	00F5
Ö	00D6	ö	00F6
Ú	00DA	ú	00FA
Ü	00DC	ü	00FC

Punjabi character set

For Punjabi custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ਅ	0A05	ਧ	0A27
ਆ	0A06	ਨ	0A28
ਇ	0A07	ਪ	0A2A
ਈ	0A08	ਫ	0A2B

Character	Code	Character	Code
ਉ	0A09	ਬ	0A2C
ਊ	0A0A	ਭ	0A2D
ਏ	0A0F	ਮ	0A2E
ਐ	0A10	ਯ	0A2F
ਓ	0A13	ਰ	0A30
ਔ	0A14	ਲ	0A32
ਕ	0A15	ਵ	0A35
ਖ	0A16	ਸ	0A38
ਗ	0A17	ਹ	0A39
ਘ	0A18	਼	0A3C
ਙ	0A19	ਾ	0A3E
ਚ	0A1A	ਿ	0A3F
ਛ	0A1B	ੀ	0A40
ਜ	0A1C	ੁ	0A41
ਝ	0A1D	ੂ	0A42
ਞ	0A1E	ੇ	0A47
ਟ	0A1F	ੈ	0A48
ਠ	0A20	ੋ	0A4B
ਡ	0A21	ੌ	0A4C
ਢ	0A22	੍	0A4D

Character	Code	Character	Code
ਣ	0A23	ੜ	0A5C
ਤ	0A24	ੰ	0A70
ਥ	0A25	ੱ	0A71
ਦ	0A26	ੲ	0A72
ੳ	0A73		

Romanian character set

For Romanian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ă	0103	ș	0219
â	00E2	ț	021B
î	00EE	ş	015F
ţ	0163		

Russian character set

For Russian custom vocabularies, you can use the following characters in the `Phrase` field:

Character	Code	Character	Code
'	0027	п	043F
-	002D	р	0440
.	002E	с	0441
а	0430	т	0442
б	0431	у	0443
в	0432	ф	0444
г	0433	х	0445
д	0434	ц	0446
е	0435	ч	0447
ж	0436	ш	0448
з	0437	щ	0449
и	0438	ъ	044A
й	0439	ы	044B
к	043A	ь	044C
л	043B	э	044D
м	043C	ю	044E
н	043D	я	044F
о	043E	ё	0451

Serbian character set

For Serbian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ć	0107	і	0456
č	010D	ї	0457
đ	0111	ј	0458
š	0161	љ	0459
ž	017E	њ	045A
а	0430	ћ	045B
б	0431	ќ	045C
в	0432	ѝ	045D
г	0433	ў	045E
д	0434	џ	045F
е	0435	ґ	0491
ж	0436	ғ	0493
з	0437	җ	0497
и	0438	ҙ	0499
й	0439	қ	049B
к	043A	ҟ	049F

Character	Code	Character	Code
л	043B	ҡ	04A1
м	043C	ң	04A3
н	043D	ҥ	04A5
о	043E	ҩ	04A9
п	043F	ҫ	04AB
р	0440	ҭ	04AD
с	0441	ү	04AF
т	0442	ұ	04B1
у	0443	ҳ	04B3
ф	0444	ҵ	04B5
х	0445	ҷ	04B7
ц	0446	һ	04BB
ч	0447	ҽ	04BD
ш	0448	ҿ	04BF
щ	0449	ӊ	04CA
ъ	044A	ӑ	04D1
ы	044B	ӓ	04D3
ь	044C	ӗ	04D7
э	044D	ә	04D9
ю	044E	ӡ	04E1

Character	Code	Character	Code
я	044F	ӣ	04E3
ѐ	0450	ӧ	04E7
ё	0451	ө	04E9
ђ	0452	ӯ	04EF
ѓ	0453	ӱ	04F1
є	0454	ӳ	04F3
ѕ	0455	ӷ	04F7
ӹ	04F9		

Sinhala character set

For Sinhala custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
#	0D82	#	0DAF
#	0D83	#	0DB0
#	0D85	#	0DB1
#	0D86	#	0DB3
#	0D87	#	0DB4

Character	Code	Character	Code
#	0D88	#	0DB5
#	0D89	#	0DB6
#	0D8A	#	0DB7
#	0D8B	#	0DB8
#	0D8C	#	0DB9
#	0D8D	#	0DBA
#	0D91	#	0DBB
#	0D92	#	0DBD
#	0D93	#	0DC0
#	0D94	#	0DC1
#	0D95	#	0DC2
#	0D96	#	0DC3
#	0D9A	#	0DC4
#	0D9B	#	0DC5
#	0D9C	#	0DC6
#	0D9D	#	0DCA
#	0D9E	#	0DCF
#	0D9F	#	0DD0
#	0DA0	#	0DD1
#	0DA1	#	0DD2

Character	Code	Character	Code
#	0DA2	#	0DD3
#	0DA3	#	0DD4
#	0DA4	#	0DD6
#	0DA5	#	0DD8
#	0DA7	#	0DD9
#	0DA8	##	0DDA
#	0DA9	#	0DDB
#	0DAA	##	0DDC
#	0DAB	###	0DDD
#	0DAC	##	0DDE
#	0DAD	#	0DDF
#	0DAE	#	0DF2

Slovak character set

For Slovak custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
á	00E1	ň	0148

Character	Code	Character	Code
ä	00E4	ó	00F3
č	010D	ô	00F4
ď	010F	ŕ	0155
é	00E9	š	0161
í	00ED	ť	0165
ĺ	013A	ú	00FA
ľ	013E	ý	00FD
ž	017E		

Slovenian character set

For Slovenian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
č	010D	š	0161
ž	017E		

Somali character set

For Somali custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
s	0073	d	0064
t	0074	a	0061
a	0061	r	0072
n	006E	d	0064

Spanish character set

For Spanish custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
Á	00C1	á	00E1
É	00C9	é	00E9
Í	00CD	í	00ED

Character	Code	Character	Code
Ó	00D3	ó	0XF3
Ú	00DA	ú	00FA
Ñ	00D1	ñ	0XF1
ü	00FC		

Sundanese character set

For Sundanese custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
s	0073	d	0064
t	0074	a	0061
a	0061	r	0072
n	006E	d	0064

Swahili character set

For Swahili custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
s	0073	d	0064
t	0074	a	0061
a	0061	r	0072
n	006E	d	0064

Swedish character set

For Swedish custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`
- `A - Z`
- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
Ä	00C4	ä	00E4
Å	00C5	å	00E5
Ö	00D6	ö	00F6

Tagalog/Filipino character set

For Tagalog/Filipino custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code		
ñ	00F1		

Tamil character set

For Tamil custom vocabularies, you can use the following characters in the `Phrase` field:

Character	Code	Character	Code
அ	0B85	ர	0BB0
ஆ	0B86	ல	0BB2
இ	0B87	வ	0BB5
ஈ	0B88	ழ	0BB4
உ	0B89	ள	0BB3
ஊ	0B8A	ற	0BB1
எ	0B8E	ன	0BA9
ஏ	0B8F	ஜ	0B9C
ஐ	0B90	#	0BB6
ஒ	0B92	ஷ	0BB7
ஓ	0B93	ஸ	0BB8
ஔ	0B94	ஹ	0BB9

Character	Code	Character	Code
ஃ	0B83	்	0BCD
க	0B95	ா	0BBE
ங	0B99	ி	0BBF
ச	0B9A	ீ	0BC0
ஞ	0B9E	ு	0BC1
ட	0B9F	ூ	0BC2
ண	0BA3	ெ	0BC6
த	0BA4	ே	0BC7
ந	0BA8	ை	0BC8
ப	0BAA	ொ	0BCA
ம	0BAE	ோ	0BCB
ய	0BAF	ௌ	0BCC

Tatar character set

For Tatar custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	љ	0459

Character	Code	Character	Code
б	0431	њ	045A
в	0432	ћ	045B
г	0433	ќ	045C
д	0434	ѝ	045D
е	0435	ў	045E
ж	0436	џ	045F
з	0437	ґ	0491
и	0438	ғ	0493
й	0439	җ	0497
к	043A	ҙ	0499
л	043B	қ	049B
м	043C	ҟ	049F
н	043D	ҡ	04A1
о	043E	ң	04A3
п	043F	ҥ	04A5
р	0440	ҩ	04A9
с	0441	ҫ	04AB
т	0442	ҭ	04AD
у	0443	ү	04AF
ф	0444	ұ	04B1

Character	Code	Character	Code
х	0445	ҳ	04B3
ц	0446	ҵ	04B5
ч	0447	ҷ	04B7
ш	0448	һ	04BB
щ	0449	ҽ	04BD
ъ	044A	ҿ	04BF
ы	044B	ӊ	04CA
ь	044C	ӑ	04D1
э	044D	ӓ	04D3
ю	044E	ӗ	04D7
я	044F	ә	04D9
ѐ	0450	ӡ	04E1
ё	0451	ӣ	04E3
ђ	0452	ӧ	04E7
ѓ	0453	ө	04E9
є	0454	ӯ	04EF
ѕ	0455	ӱ	04F1
і	0456	ӳ	04F3
ї	0457	ӷ	04F7
ј	0458	ӹ	04F9

Telugu character set

For Telugu custom vocabularies, you can use the following characters in the `Phrase` field:

Character	Code	Character	Code
-	002D	త	0C24
ఁ	0C01	థ	0C25
ం	0C02	ద	0C26
ః	0C03	ధ	0C27
అ	0C05	న	0C28
ఆ	0C06	ప	0C2A
ఇ	0C07	ఫ	0C2B
ఈ	0C08	బ	0C2C
ఉ	0C09	భ	0C2D
ఊ	0C0A	మ	0C2E
ఋ	0C0B	య	0C2F
ర	0C30	ఎ	0C0E
ఱ	0C31	ఏ	0C0F
ల	0C32	ఐ	0C10
ళ	0C33	ఒ	0C12
వ	0C35	ఓ	0C13
శ	0C36	ఔ	0C14
ష	0C37	క	0C15

Character	Code	Character	Code
స	0C38	ఖ	0C16
హ	0C39	గ	0C17
ా	0C3E	ఘ	0C18
ి	0C3F	ఙ	0C19
ీ	0C40	చ	0C1A
ు	0C41	ఛ	0C1B
ూ	0C42	జ	0C1C
ృ	0C43	ఝ	0C1D
ౄ	0C44	ఞ	0C1E
ే	0C47	ట	0C1F
ై	0C48	ఠ	0C20
ొ	0C4A	డ	0C21
ో	0C4B	ఢ	0C22
ౌ	0C4C	ణ	0C23
్	0C4D		

Thai character set

For Thai custom vocabularies, you can use the following characters in the `Phrase` field:

- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
ก	0E01	ล	0E25
ข	0E02	ฦ	0E26
ฃ	0E03	ว	0E27
ค	0E04	ศ	0E28
ฅ	0E05	ษ	0E29
ฆ	0E06	ส	0E2A
ง	0E07	ห	0E2B
จ	0E08	ฬ	0E2C
ฉ	0E09	อ	0E2D
ช	0E0A	ฮ	0E2E
ซ	0E0B	ฯ	0E2F
ฌ	0E0C	ะ	0E30
ญ	0E0D	ั	0E31
ฎ	0E0E	า	0E32
ฏ	0E0F	ิ	0E34
ฐ	0E10	ี	0E35
ฑ	0E11	ึ	0E36
ฒ	0E12	ื	0E37
ณ	0E13	ุ	0E38
ด	0E14	ู	0E39

Character	Code	Character	Code
ต	0E15	ฺ	0E3A
ถ	0E16	เ	0E40
ท	0E17	แ	0E41
ธ	0E18	โ	0E42
น	0E19	ใ	0E43
บ	0E1A	ไ	0E44
ป	0E1B	ๅ	0E45
ผ	0E1C	ๆ	0E46
ฝ	0E1D	็	0E47
พ	0E1E	่	0E48
ฟ	0E1F	้	0E49
ภ	0E20	๊	0E4A
ม	0E21	๋	0E4B
ย	0E22	์	0E4C
ร	0E23	ํ	0E4D
ฤ	0E24		

Turkish character set

For Turkish custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z

- ' (apostrophe)
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
Ç	00C7	ö	00F6
Ö	00D6	û	00FB
Ü	00DC	ü	00FC
â	00E2	Ğ	011E
ä	00E4	ğ	011F
ç	00E7	İ	0130
è	00E8	ı	0131
é	00E9	Ş	015E
ê	00EA	ş	015F
í	00ED	š	0161
î	00EE	ž	017E
ó	00F3		

Ukrainian character set

For Ukrainian custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
а	0430	р	0440
б	0431	с	0441
в	0432	т	0442
г	0433	у	0443
д	0434	ф	0444
е	0435	х	0445
ж	0436	ц	0446
з	0437	ч	0447
и	0438	ш	0448
й	0439	щ	0449
к	043A	ь	044C
л	043B	ю	044E
м	043C	я	044F
н	043D	є	0454
о	043E	і	0456
п	043F	ї	0457
ґ	0491		

Uyghur character set

For Uyghur custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
#	0611	و	0648
#	0613	ى	0649
#	0614	ي	064A
ء	0621	ً	064B
آ	0622	ٌ	064C
أ	0623	ٍ	064D
ؤ	0624	َ	064E
إ	0625	ُ	064F
ئ	0626	ِ	0650
ا	0627	ّ	0651
ب	0628	ْ	0652
ة	0629	#	0653
ت	062A	#	0654
ث	062B	#	0657
ج	062C	ٰ	0670
ح	062D	ٹ	0679

Character	Code	Character	Code
خ	062E	ٺ	067A
د	062F	ٻ	067B
ذ	0630	ټ	067C
ر	0631	ٽ	067D
ز	0632	پ	067E
س	0633	ٿ	067F
ش	0634	ڀ	0680
ص	0635	ځ	0681
ض	0636	ڃ	0683
ط	0637	ڄ	0684
ظ	0638	څ	0685
ع	0639	چ	0686
غ	063A	ڇ	0687
ـ	0640	ڈ	0688
ف	0641	ډ	0689
ق	0642	ڊ	068A
ك	0643	ڌ	068C
ل	0644	ڍ	068D
م	0645	ڏ	068F
ن	0646	ڑ	0691

Character	Code	Character	Code
ه	0647	ړ	0693
ڕ	0695		

Uzbek character set

For Uzbek custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
т	0442	я	044F
б	0431	с	0441
о	043E	ҳ	04B3
п	043F	д	0434
ш	0448	р	0440
и	0438	ў	045E
ч	0447	г	0433
н	043D	ё	0451
қ	049B	й	0439
е	0435	в	0432
ю	044E	э	044D

Character	Code	Character	Code
з	0437	л	043B
х	0445	ф	0444
ц	0446	к	043A
м	043C	у	0443
ь	044C	ж	0436
ъ	044A	ғ	0493
а	0430		

Vietnamese character set

Amazon Transcribe represents the six tones in Vietnamese using numbers. The following table shows how tone marks are mapped for the word 'ma'.

Tone name	Tone mark	Tone number
ngang	ma	ma1
sắc	má	ma2
huyền	mà	ma3
hỏi	mả	ma4
ngã	mã	ma5
nặng	mạ	ma6

For Vietnamese custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- A - Z

- ' (apostrophe)
- - (hyphen)
- . (period)
- & (ampersand)
- ; (semicolon)
- _ (low line)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	À	00C0
á	00E1	Á	00C1
â	00E2	Â	00C2
ã	00E3	Ã	00C3
è	00E8	È	00C8
é	00E9	É	00C9
ê	00EA	Ê	00CA
ì	00EC	Ì	00CC
í	00ED	Í	00CD
ò	00F2	Ò	00D2
ó	00F3	Ó	00D3
ô	00F4	Ô	00D4
õ	00F5	Õ	00D5
ù	00F9	Ù	00D9

Character	Code	Character	Code
ú	00FA	Ú	00DA
ý	00FD	Ý	00DD
ă	0103	Ă	0102
đ	0111	Đ	0110
ĩ	0129	Ĩ	0128
ũ	0169	Ũ	0168
ơ	01A1	Ơ	01A0
ư	01B0	Ư	01AF
ạ	1EA1	Ạ	1EA0
ả	1EA3	Ả	1EA2
ấ	1EA5	Ấ	1EA4
ầ	1EA7	Ầ	1EA6
ẩ	1EA9	Ẩ	1EA8
ẫ	1EAB	Ẫ	1EAA
ậ	1EAD	Ậ	1EAC
ắ	1EAF	Ắ	1EAE
ằ	1EB1	Ằ	1EB0
ẳ	1EB3	Ẳ	1EB2
ẵ	1EB5	Ẵ	1EB4
ặ	1EB7	Ặ	1EB6

Character	Code	Character	Code
ẹ	1EB9	Ẹ	1EB8
ẻ	1EBB	Ẻ	1EBA
ẽ	1EBD	Ẽ	1EBC
ế	1EBF	Ế	1EBE
ề	1EC1	Ề	1EC0
ể	1EC3	Ể	1EC2
ễ	1EC5	Ễ	1EC4
ệ	1EC7	Ệ	1EC6
ỉ	1EC9	Ỉ	1EC8
ị	1ECB	Ị	1ECA
ọ	1ECD	Ọ	1ECC
ỏ	1ECF	Ỏ	1ECE
ố	1ED1	Ố	1ED0
ồ	1ED3	Ồ	1ED2
ổ	1ED5	Ổ	1ED4
ỗ	1ED7	Ỗ	1ED6
ộ	1ED9	Ộ	1ED8
ớ	1EDB	Ớ	1EDA
ờ	1EDD	Ờ	1EDC
ở	1EDF	Ở	1EDE

Character	Code	Character	Code
ỡ	1EE1	Ỡ	1EE0
ợ	1EE3	Ợ	1EE2
ụ	1EE5	Ụ	1EE4
ủ	1EE7	Ủ	1EE6
ứ	1EE9	Ứ	1EE8
ừ	1EEB	Ừ	1EEA
ử	1EED	Ử	1EEC
ữ	1EEF	Ữ	1EEE
ự	1EF1	Ự	1EF0
ỳ	1EF3	Ỳ	1EF2
ỵ	1EF5	Ỵ	1EF4
ỷ	1EF7	Ỷ	1EF6
ỹ	1EF9	Ỹ	1EF8

Welsh character set

For Welsh custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	ò	00F2
á	00E1	ó	00F3
â	00E2	ô	00F4
ä	00E4	ö	00F6
è	00E8	ù	00F9
é	00E9	ú	00FA
ê	00EA	û	00FB
ë	00EB	ü	00FC
ì	00EC	ý	00FD
í	00ED	ÿ	00FF
î	00EE	ŵ	0175
ï	00EF	ŷ	0177
ỳ	1EF3		

Wolof character set

For Wolof custom vocabularies, you can use the following characters in the `Phrase` field:

- `a - z`
- `-` (hyphen)
- `.` (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
à	00E0	ê	00EA
ã	00E3	ë	00EB
ç	00E7	ñ	00F1
è	00E8	ó	00F3
é	00E9	ô	00F4
ŋ	014B		

Zulu character set

For Zulu custom vocabularies, you can use the following characters in the `Phrase` field:

- a - z
- - (hyphen)
- . (period)

You can also use the following Unicode characters in the `Phrase` field:

Character	Code	Character	Code
s	0073	d	0064
t	0074	a	0061
a	0061	r	0072
n	006E	d	0064

How Amazon Transcribe works

Amazon Transcribe uses machine learning models to convert speech to text.

In addition to the transcribed text, transcripts contains data about the transcribed content, including confidence scores and timestamps for each word or punctuation mark. To see an output example, refer to the Data input and output section. For a complete list of features that you can apply to your transcription, refer to the feature summary.

Transcription methods can be separated into two main categories:

- **Batch transcriptions**: Transcribe media files that have been uploaded into an Amazon S3 bucket. You can use the AWS CLI, AWS Management Console, and various AWS SDKs for batch transcriptions.
- **Streaming transcriptions**: Transcribe media streams in real time. You can use the AWS Management Console, HTTP/2, WebSockets, and various AWS SDKs for streaming transcriptions.

Note that feature and language support differs for batch and streaming transcriptions. For more information, refer to Amazon Transcribe features and Supported languages.

Topics

API operations to get you started

Batch: `StartTranscriptionJob`
Streaming: `StartStreamTranscription`, StartStreamTranscriptionWebSocket

Data input and output

Amazon Transcribe takes audio data, as a media file in an Amazon S3 bucket or a media stream, and converts it to text data.

If you're transcribing media files stored in an Amazon S3 bucket, you're performing **batch transcriptions**. If you're transcribing media streams, you're performing **streaming transcriptions**. These two processes have different rules and requirements.

With batch transcriptions, you can use Job queueing if you don't need to process all of your transcription jobs concurrently. This allows Amazon Transcribe to keep track of your transcription jobs and process them when slots are available.

Note

Amazon Transcribe may temporarily store your content to continuously improve the quality of its analysis models. See the Amazon Transcribe FAQ to learn more. To request the deletion of content that may have been stored by Amazon Transcribe, open a case with Support.

Topics

Media formats

Supported media types differ between batch transcriptions and streaming transcriptions, though lossless formats are recommended for both. See the following table for details:

	Batch	Streaming
Supported formats	• AMR • FLAC • M4A • MP3 • MP4 • Ogg	• FLAC • Ogg Opus • PCM encoding

	Batch	Streaming
	• WebM • WAV	
Recommended formats	• FLAC • WAV with PCM 16-bit encoding	• FLAC • PCM signed 16-bit little-en dian audio (note that this does **not** include WAV)

For best results, use a lossless format, such as FLAC or WAV with PCM 16-bit encoding.

Note

Streaming transcriptions are not supported with all languages. Refer to the 'Data input' column in the supported languages table for details.

Audio channels

Amazon Transcribe supports single-channel and dual-channel media. Media with more than two channels is not currently supported.

If your audio contains multiple speakers on one channel and you want to partition and label each speaker in your transcription output, you can use Speaker partitioning (diarization).

If your audio contains speech on two separate channels, you can use Channel identification to transcribe each channel separately within your transcript.

Both of these options produce one transcript file.

Note

If you don't enable Speaker partitioning or Channel identification, your transcript text is provided as one continuous section.

Sample rates

With batch transcription jobs, you can choose to provide a sample rate, though this parameter is optional. If you include it in your request, make sure the value you provide matches the actual sample rate in your audio. If you provide a sample rate that doesn't match your audio, your job may fail.

With streaming transcriptions, you must include a sample rate in your request. As with batch transcription jobs, make sure the value you provide matches the actual sample rate in your audio.

Sample rates for low fidelity audio, such as telephone recordings, typically use 8,000 Hz. For high fidelity audio, Amazon Transcribe supports values between 16,000 Hz and 48,000 Hz.

Output

Transcription output is in JSON format. The first part of your transcript contains the transcript itself in paragraph form, followed by additional data for every word and punctuation mark. The data provided depends on the features you include in your request. At a minimum, your transcript contains the start time, end time, and confidence score for every word. The following section shows example output from a basic transcription request that didn't include any additional options or features.

All **batch transcripts** are stored in Amazon S3 buckets. You can choose to save your transcript in your own Amazon S3 bucket, or have Amazon Transcribe use a secure default bucket. To learn more about creating and using Amazon S3 buckets, see Working with buckets.

If you want your transcript stored in an Amazon S3 bucket that you own, specify the bucket's URI in your transcription request. Make sure you give Amazon Transcribe write permissions for this bucket before starting your batch transcription job. If you specify your own bucket, your transcript remains in that bucket until you remove it.

If you don't specify an Amazon S3 bucket, Amazon Transcribe uses a secure service-managed bucket and provides you with a temporary URI you can use to download your transcript. Note that temporary URIs are valid for 15 minutes. If you get an `AccessDenied` error when using the provided URI, make a `GetTranscriptionJob` request to get a new temporary URI for your transcript.

If you opt for a default bucket, your transcript is deleted when your job expires (90 days). If you want to keep your transcript past this expiration date, you must download it.

Streaming transcripts are returned via the same method you're using for your stream.

Tip

If you want to convert your JSON output into a turn-by-turn transcript in Word format, see this GitHub example (for Python3). This script works with post-call analytics transcripts and standard batch transcripts with diarization enabled.

Example output

Transcripts provide a complete transcription in paragraph form, followed by a word-for-word breakdown, which provides data for every word and punctuation mark. This includes start time, end time, a confidence score, and a type (`pronunciation` or `punctuation`).

The following example is from a simple batch transcription job that didn't include any additional features. With each additional feature that you apply to your transcription request, you get additional data in your transcript output file.

Basic batch transcripts contain two main sections:

1. `transcripts`: Contains the entire transcript in one text block.
2. `items`: Contains information on each word and punctuation mark from the `transcripts` section.
3. `audio_segments`: An audio segment is a specific portion of an audio recording that contains uninterrupted spoken language, with minimal pauses or breaks. This segment captures a natural flow of speech and is captured in `audio_segments` with a start time and end time. The `items` element within an audio segment is a sequence of identifiers that correspond to each item within the segment.

Each additional feature you include in your transcription request produces additional information in your transcript.

```
{
    "jobName": "my-first-transcription-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "Welcome to Amazon Transcribe."
            }
        ],
        "items": [
            {
                "id": 0,
                "start_time": "0.64",
                "end_time": "1.09",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "Welcome"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 1,
                "start_time": "1.09",
                "end_time": "1.21",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "to"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 2,
                "start_time": "1.21",
                "end_time": "1.74",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "Amazon"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 3,
                "start_time": "1.74",
                "end_time": "2.56",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "Transcribe"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 4,
                "alternatives": [
                    {
                        "confidence": "0.0",
                        "content": "."
                    }
                ],
                "type": "punctuation"
            }
        ],
        "audio_segments": [
            {
                "id": 0,
                "transcript": "Welcome to Amazon Transcribe.",
                "start_time": "0.64",
                "end_time": "2.56",
                "items": [
                    0,
                    1,
                    2,
                    3,
                    4
                ]
            }
        ]
    },
    "status": "COMPLETED"
}
```

Transcribing numbers and punctuation

Amazon Transcribe automatically adds punctuation to all supported languages, and capitalizes words appropriately for languages that use case distinction in their writing systems.

For most languages, numbers are transcribed into their word forms. However, for languages with support for transcribing numbers, Amazon Transcribe treats numbers differently depending on the context in which they're used.

For example, if a speaker says "*Meet me at eight-thirty AM on June first at one-hundred Main Street with three-dollars-and-fifty-cents and one-point-five chocolate bars*," this is transcribed as:

- Languages with number transcription support: Meet me at 8:30 a.m. on June 1st at 100 Main Street with $3.50 and 1.5 chocolate bars
- All other languages: Meet me at eight thirty a m on June first at one hundred Main Street with three dollars and fifty cents and one point five chocolate bars

To view the languages with support for transcribing numbers, refer to Supported languages and language-specific features.

Getting started with Amazon Transcribe

Before you can create transcriptions, you have a few prerequisites:

- Sign up for an AWS account
- Install the AWS CLI and SDKs (if you're using the AWS Management Console for your transcriptions, you can skip this step)
- Configure IAM credentials
- Set up an Amazon S3 bucket
- Create an IAM policy

Once you complete these prerequisites, you're ready to transcribe. Select your preferred transcription method from the following list to get started.

- AWS CLI
- AWS Management Console
- AWS SDK
- HTTP
- WebSockets

Tip

If you're new to Amazon Transcribe or would like to explore our features, we recommend using the AWS Management Console. This is also the easiest option if you'd like to start a stream using your computer microphone.

Because streaming using HTTP/2 and WebSockets is more complicated than the other transcription methods, we recommend reviewing the Setting up a streaming transcription section before getting started with these methods. **Note that we strongly recommend using an SDK for streaming transcriptions.**

Signing up for an AWS account

You can sign up for a free tier account or a paid account. Both options give you access to all AWS services. The free tier has a trial period during which you can explore AWS services and estimate your usage. Once your trial period expires, you can migrate to a paid account. Fees are accrued on a pay-as-you-use basis; see Amazon Transcribe Pricing for details.

Tip

When setting up your account, make note of your AWS account ID because you need it to create IAM entities.

Installing the AWS CLI and SDKs

To use the Amazon Transcribe API, you must first install the AWS CLI. The current AWS CLI is version 2. You can find installation instructions for Linux, Mac, Windows, and Docker in the *AWS Command Line Interface User Guide*.

Once you have the AWS CLI installed, you must configure it for your security credentials and AWS Region.

If you want to use Amazon Transcribe with an SDK, select your preferred language for installation instructions:

- .NET
- C++
- Go
- Java V2
- JavaScript
- PHP V3
- AWS SDK for Python (Boto3) (batch transcriptions)
- Python (streaming transcriptions)
- Ruby V3
- Rust (batch transcriptions)
- Rust (streaming transcriptions)

Configure IAM credentials

When you create an AWS account, you begin with one sign-in identity that has complete access to all AWS services and resources in your account. This identity is called the AWS account root user and is accessed by signing in with the email address and password that you used to create the account.

We strongly recommend that you do not use the root user for your everyday tasks. Safeguard your root user credentials and use them to perform the tasks that only the root user can perform.

As a best practice, require users—including those that require administrator access—to use federation with an identity provider to access AWS services by using temporary credentials.

A federated identity is any user who accesses AWS services by using credentials provided through an identity source. When federated identities access AWS accounts, they assume roles, and the roles provide temporary credentials.

For centralized access management, we recommend that you use AWS IAM Identity Center. You can create users and groups in IAM Identity Center. Or you can connect and synchronize to a set of users and groups in your own identity source for use across all your AWS accounts and applications. For more information, see Identity and Access Management for Amazon Transcribe.

To learn more about IAM best practices, refer to Security best practices in IAM.

Creating an Amazon S3 bucket

Amazon S3 is a secure object storage service. Amazon S3 stores your files (called *objects*) in containers (called *buckets*).

To run a batch transcription, you must first upload your media files into an Amazon S3 bucket. If you don't specify an Amazon S3 bucket for your transcription output, Amazon Transcribe puts your transcript in a temporary AWS-managed Amazon S3 bucket. Transcription output in AWS-managed buckets is automatically deleted after 90 days.

Learn how to Create your first S3 bucket and Upload an object to your bucket.

Creating an IAM policy

To manage access in AWS, you must create policies and attach them to IAM identities (users, groups, or roles) or AWS resources. A policy defines the permissions of the entity it is attached to. For example, a role can only access a media file located in your Amazon S3 bucket if you've attached a policy to that role which grants it access. If you want to further restrict that role, you can instead limit its access to a specific file within an Amazon S3 bucket.

To learn more about using AWS policies see:

- Policies and permissions in IAM
- Creating IAM policies
- How Amazon Transcribe works with IAM

For example policies you can use with Amazon Transcribe, see Amazon Transcribe identity-based policy examples. If you want to generate custom policies, consider using the AWS Policy Generator.

You can add a policy using the AWS Management Console, AWS CLI, or AWS SDK. For instructions, see Adding and removing IAM identity permissions.

Policies have the format:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "my-policy-name",
            "Effect": "Allow",
            "Action": [
                "service:action"
            ],
            "Resource": [
                "amazon-resource-name"
            ]
        }
    ]
}
```

Amazon Resource Names (ARNs) uniquely identify all AWS resources, such as an Amazon S3 bucket. You can use ARNs in your policy to grant permissions for specific actions to use specific resources. For example, if you want to grant read access to an Amazon S3 bucket and its sub-folders, you can add the following code to your trust policy's `Statement` section:

```
{
        "Effect": "Allow",
        "Action": [
            "s3:GetObject",
            "s3:ListBucket"
        ],
        "Resource": [
            "arn:aws:s3:::amzn-s3-demo-bucket",
            "arn:aws:s3:::amzn-s3-demo-bucket/*"
        ]
}
```

Here's an example policy that grants Amazon Transcribe read (`GetObject`, `ListBucket`) and write (`PutObject`) permissions to an Amazon S3 bucket, `amzn-s3-demo-bucket`, and its sub-folders:

```
{
  "Version": "2012-10-17",
  "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:GetObject",
                "s3:ListBucket"
            ],
            "Resource": [
                "arn:aws:s3:::amzn-s3-demo-bucket",
                "arn:aws:s3:::amzn-s3-demo-bucket/*"
            ]
        },
        {
             "Effect": "Allow",
             "Action": [
                 "s3:PutObject"
             ],
             "Resource": [
                 "arn:aws:s3:::amzn-s3-demo-bucket",
                 "arn:aws:s3:::amzn-s3-demo-bucket/*"
             ]
        }
  ]
}
```

Transcribing with the AWS Management Console

You can use the AWS console for batch and streaming transcriptions. If you're transcribing a media file located in an Amazon S3 bucket, you're performing a batch transcription. If you're transcribing a real-time stream of audio data, you're performing a streaming transcription.

Before starting a batch transcription, you must first upload your media file to an Amazon S3 bucket. For streaming transcriptions using the AWS Management Console, you must use your computer microphone.

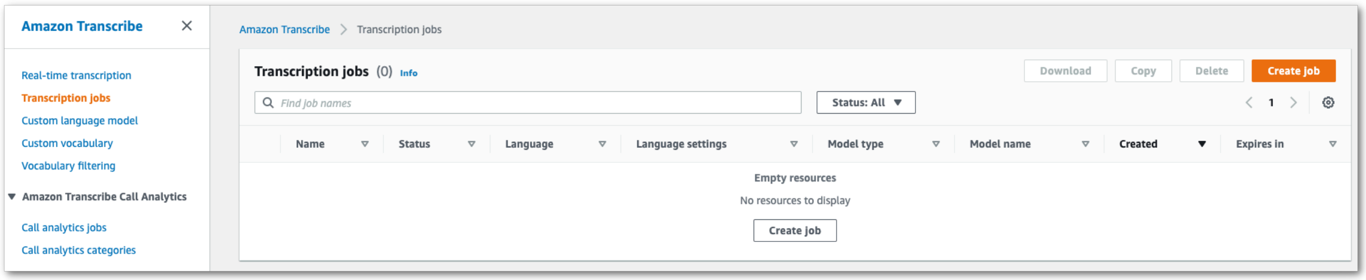
To view supported media formats and other media requirements and constraints, see Data input and output.

Expand the following sections for short walkthroughs of each transcription method.

Batch transcriptions

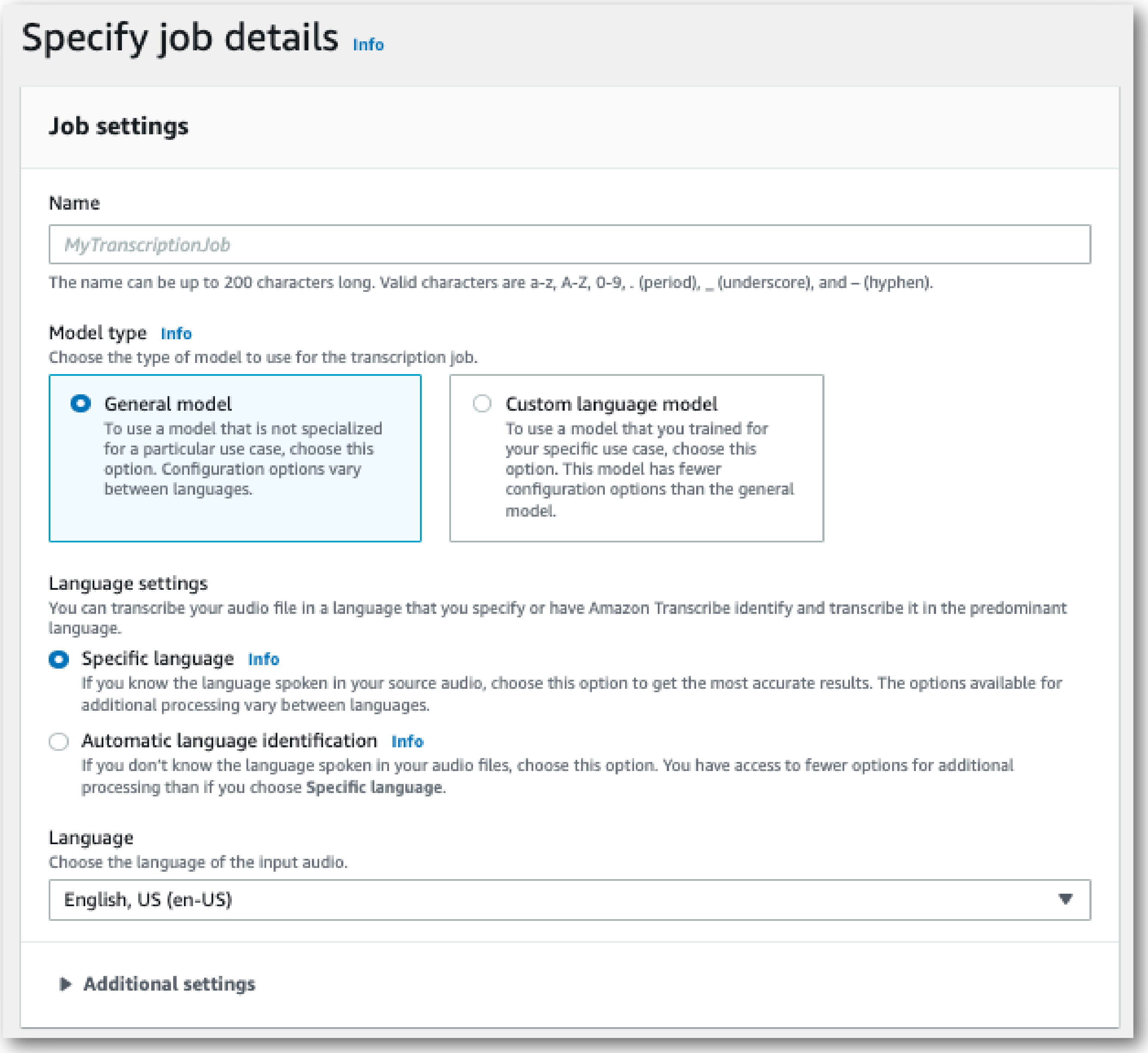
First make sure that you've uploaded the media file you want to transcribe into an Amazon S3 bucket. If you're unsure how to do this, refer to the *Amazon S3 User Guide*: Upload an object to your bucket.

1. From the AWS Management Console, select **Transcription jobs** in the left navigation pane. This takes you to a list of your transcription jobs.



   Select **Create job**.

2. Complete the fields on the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info
If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

Choose the language of the input audio.

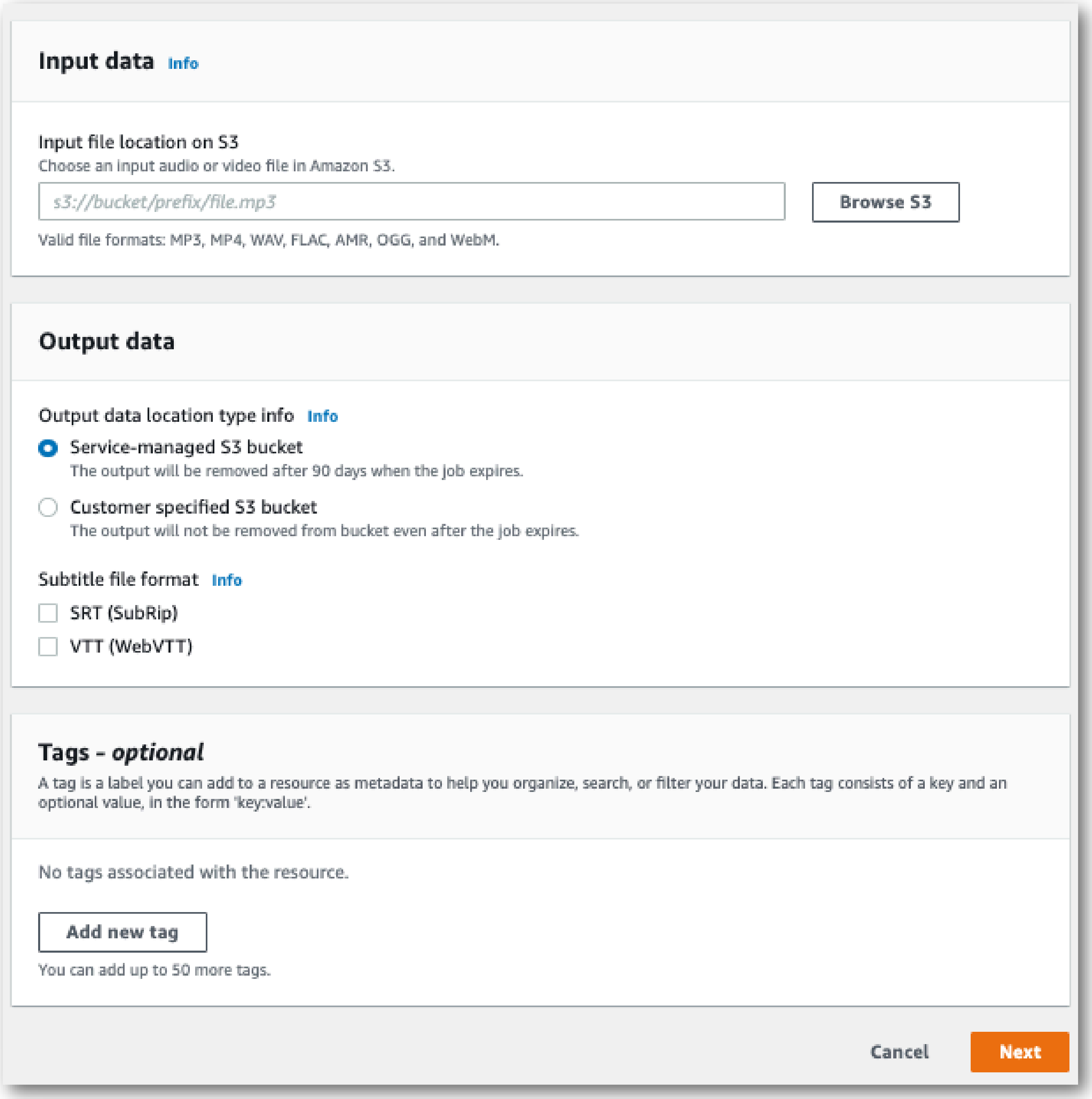
English, US (en-US)

▶ Additional settings

The input location *must* be an object within an Amazon S3 bucket. For output location, you can choose a secure Amazon S3 service-managed bucket or you can specify your own Amazon S3 bucket.

If you choose a service-managed bucket, you can view a transcript preview in the AWS Management Console and you can download your transcript from the job details page (see below).

If you choose your own Amazon S3 bucket, you cannot see a preview in the AWS Management Console and must go to the Amazon S3 bucket to download your transcript.



Input data Info

Input file location on S3

Choose an input audio or video file in Amazon S3.

s3://bucket/prefix/file.mp3

Browse S3

Valid file formats: MP3, MP4, WAV, FLAC, AMR, OGG, and WebM.

Output data

Output data location type info Info

● Service-managed S3 bucket

The output will be removed after 90 days when the job expires.

○ Customer specified S3 bucket

The output will not be removed from bucket even after the job expires.

Subtitle file format Info

☐ SRT (SubRip)

☐ VTT (WebVTT)

Tags - *optional*

A tag is a label you can add to a resource as metadata to help you organize, search, or filter your data. Each tag consists of a key and an optional value, in the form 'key:value'.

No tags associated with the resource.

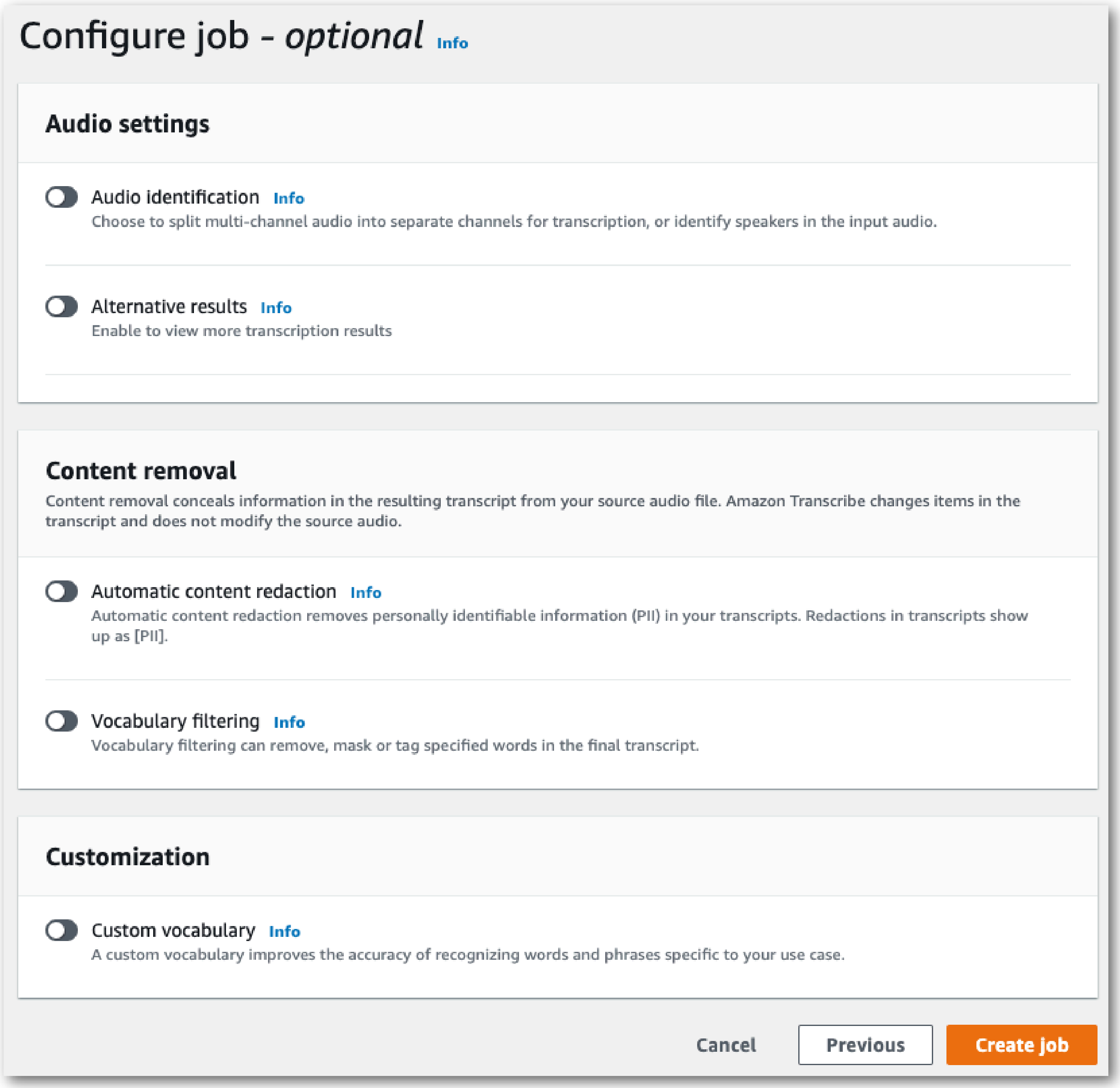
Add new tag

You can add up to 50 more tags.

Cancel Next

Select **Next**.

3. Select any desired options on the **Configure job** page. If you want to use Custom vocabularies or Custom language models with your transcription, you must create these before starting your transcription job.


Configure job - *optional* Info

Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Content removal
Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

Automatic content redaction Info
Automatic content redaction removes personally identifiable information (PII) in your transcripts. Redactions in transcripts show up as [PII].

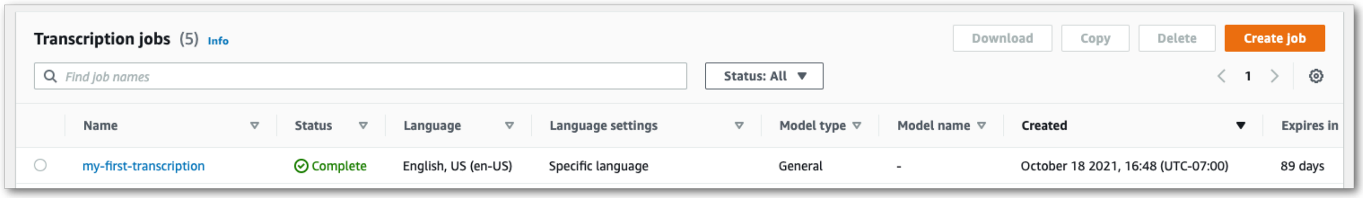
Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Select **Create job**.

4. You're now on the **Transcription jobs** page. Here you can see the status of the transcription job. Once complete, select your transcription.



Transcription jobs (5) Info

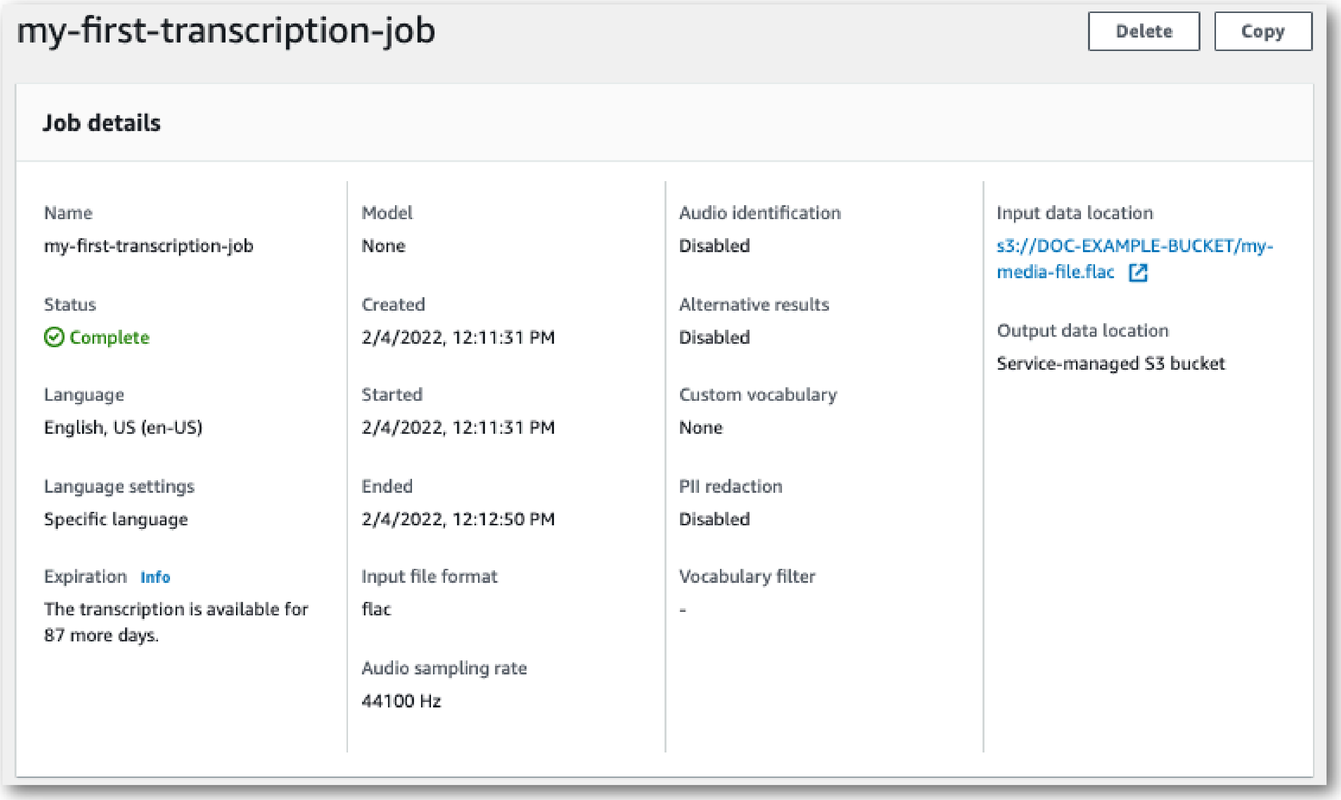
Download | Copy | Delete | Create job

Find job names | Status: All

Name	Status	Language	Language settings	Model type	Model name	Created	Expires in
my-first-transcription	Complete	English, US (en-US)	Specific language	General	-	October 18 2021, 16:48 (UTC-07:00)	89 days

5. You're now viewing the **Job details** page for your transcription. Here you can view all of the options you specified when setting up your transcription job.

   To view your transcript, select the linked filepath in the right column under **Output data location**. This takes you to the Amazon S3 output folder you specified. Select your output file, which now has a .json extension.



my-first-transcription-job

Delete | Copy

Job details

Name
my-first-transcription-job

Status
Complete

Language
English, US (en-US)

Language settings
Specific language

Expiration Info
The transcription is available for 87 more days.

Model
None

Created
2/4/2022, 12:11:31 PM

Started
2/4/2022, 12:11:31 PM

Ended
2/4/2022, 12:12:50 PM

Input file format
flac

Audio sampling rate
44100 Hz

Audio identification
Disabled

Alternative results
Disabled

Custom vocabulary
None

PII redaction
Disabled

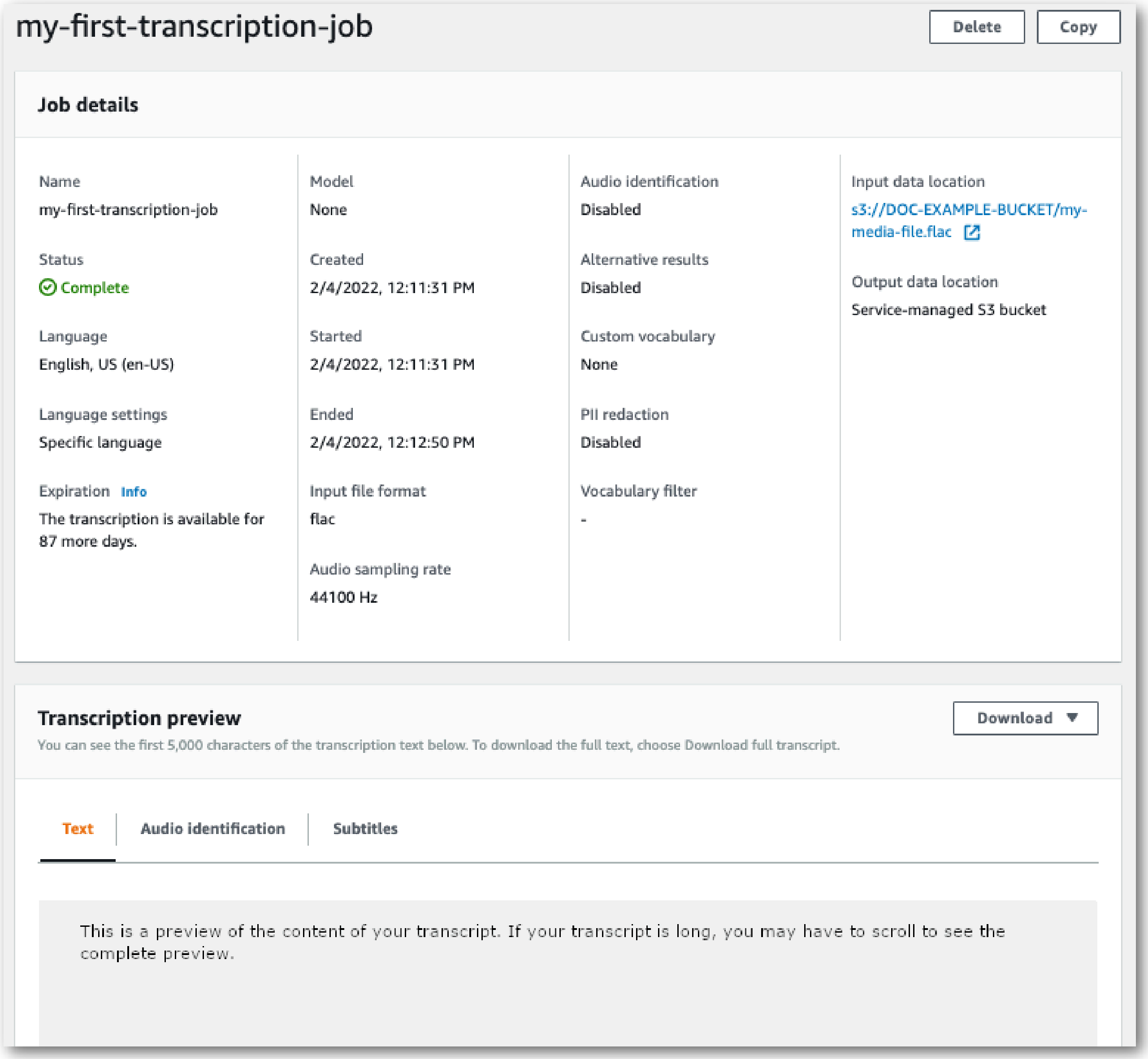
Vocabulary filter
-

Input data location
s3://DOC-EXAMPLE-BUCKET/my-media-file.flac

Output data location
Service-managed S3 bucket

6. How you download your transcript depends on whether you chose a service-managed Amazon S3 bucket or your own Amazon S3 bucket.

   a. If you chose a service-managed bucket, you can see a **Transcription preview** pane on your transcription job's information page, along with a **Download** button.



my-first-transcription-job

Job details

Name my-first-transcription-job	Model None	Audio identification Disabled	Input data location s3://DOC-EXAMPLE-BUCKET/my-media-file.flac
Status Complete	Created 2/4/2022, 12:11:31 PM	Alternative results Disabled	Output data location Service-managed S3 bucket
Language English, US (en-US)	Started 2/4/2022, 12:11:31 PM	Custom vocabulary None	
Language settings Specific language	Ended 2/4/2022, 12:12:50 PM	PII redaction Disabled	
Expiration Info The transcription is available for 87 more days.	Input file format flac	Vocabulary filter -	
	Audio sampling rate 44100 Hz		

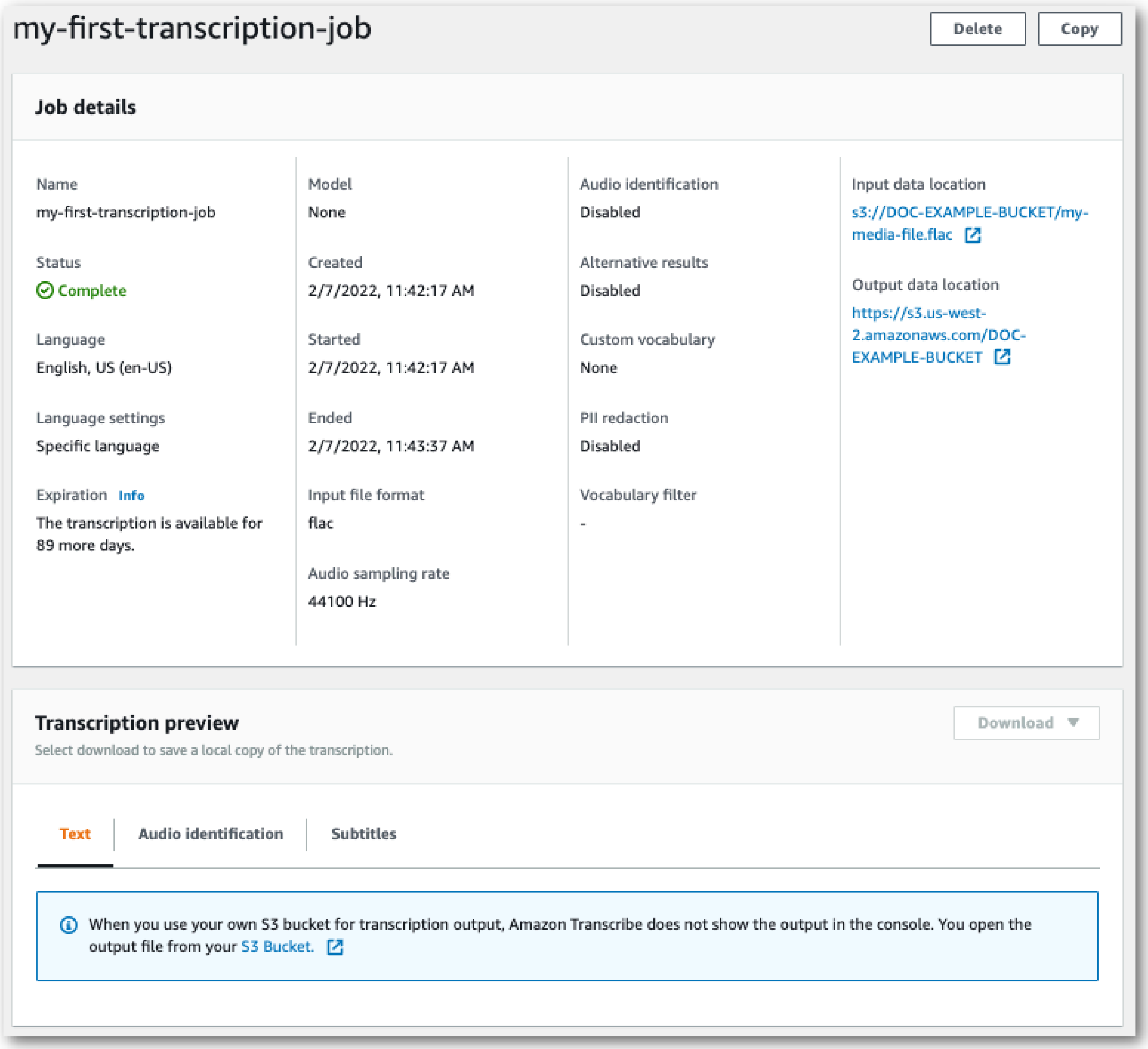
Transcription preview

You can see the first 5,000 characters of the transcription text below. To download the full text, choose Download full transcript.

This is a preview of the content of your transcript. If your transcript is long, you may have to scroll to see the complete preview.

Select **Download** and choose **Download transcript**.

b. If you chose your own Amazon S3 bucket, you don't see any text in the **Transcription preview** pane on your transcription job's information page. Instead, you see a blue information box with a link to the Amazon S3 bucket you chose.


my-first-transcription-job

Job details

Name
my-first-transcription-job

Status
Complete

Language
English, US (en-US)

Language settings
Specific language

Expiration Info
The transcription is available for 89 more days.

Model
None

Created
2/7/2022, 11:42:17 AM

Started
2/7/2022, 11:42:17 AM

Ended
2/7/2022, 11:43:37 AM

Input file format
flac

Audio sampling rate
44100 Hz

Audio identification
Disabled

Alternative results
Disabled

Custom vocabulary
None

PII redaction
Disabled

Vocabulary filter
-

Input data location
s3://DOC-EXAMPLE-BUCKET/my-media-file.flac

Output data location
https://s3.us-west-2.amazonaws.com/DOC-EXAMPLE-BUCKET

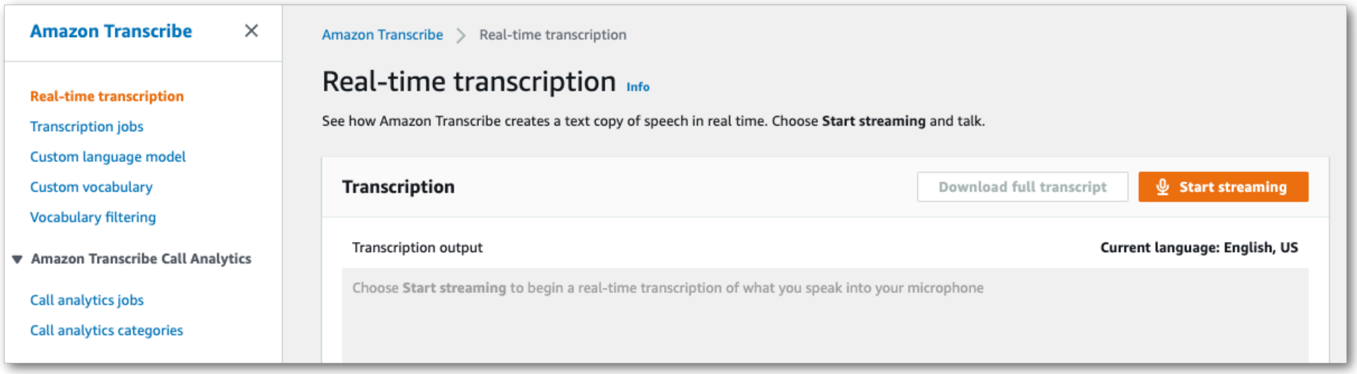
Transcription preview
Select download to save a local copy of the transcription.

When you use your own S3 bucket for transcription output, Amazon Transcribe does not show the output in the console. You open the output file from your S3 Bucket.

To access your transcript, go to the specified Amazon S3 bucket using the link under **Output data location** in the **Job details** pane or the **S3 Bucket** link within the blue information box in the **Transcription preview** pane.

Streaming transcriptions

1. From the AWS Management Console, select **Real-time transcription** in the left navigation pane. This takes you to the main streaming page where you can select options before starting your stream.



Real-time transcription

See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

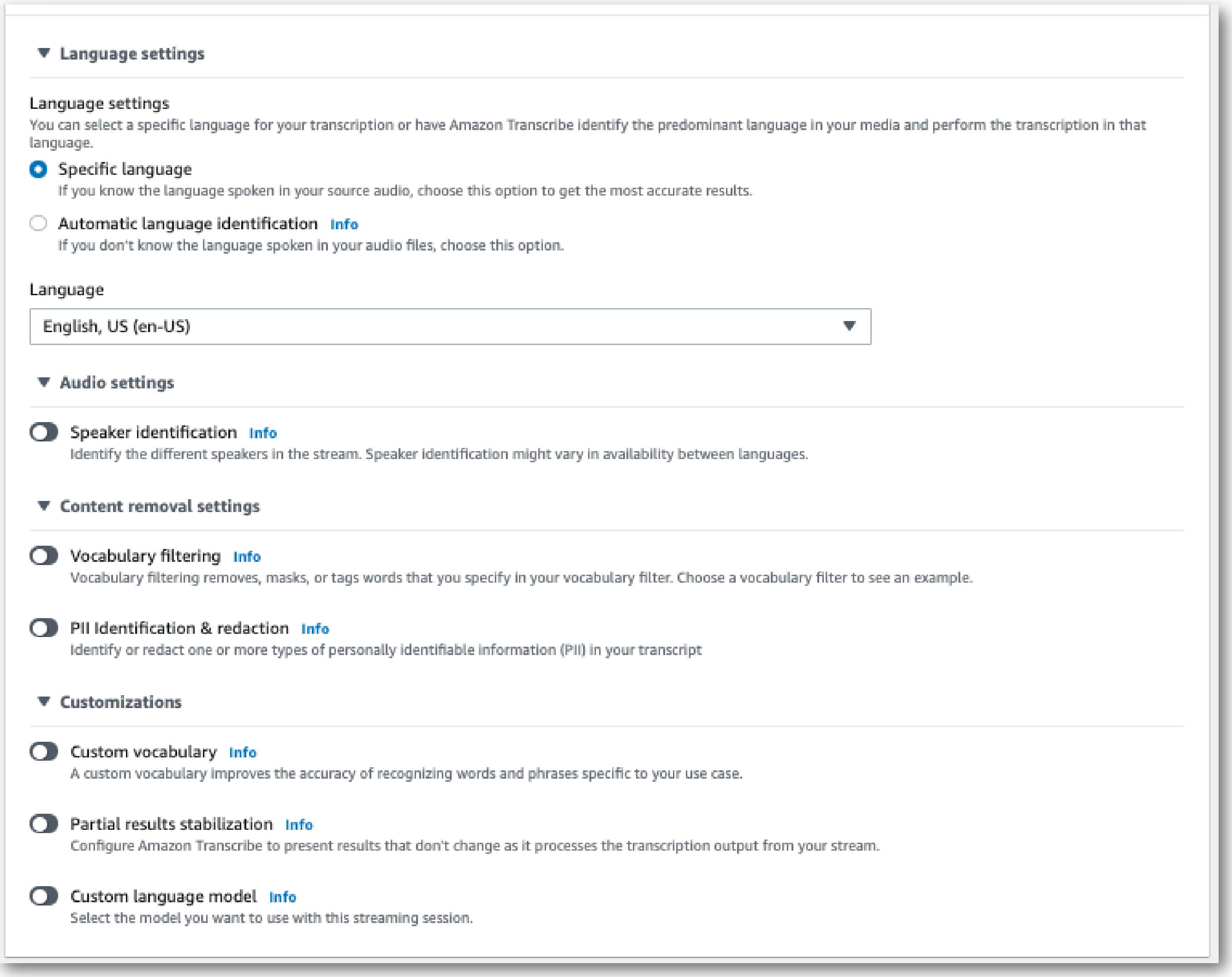
Transcription

Transcription output

Current language: English, US

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

2. Below the **Transcription output** box, you have the option to select various language and audio settings.



Language settings

Language settings

You can select a specific language for your transcription or have Amazon Transcribe identify the predominant language in your media and perform the transcription in that language.

- Specific language
  If you know the language spoken in your source audio, choose this option to get the most accurate results.
- Automatic language identification Info
  If you don't know the language spoken in your audio files, choose this option.

Language: English, US (en-US)

Audio settings

Speaker identification Info
Identify the different speakers in the stream. Speaker identification might vary in availability between languages.

Content removal settings

Vocabulary filtering Info
Vocabulary filtering removes, masks, or tags words that you specify in your vocabulary filter. Choose a vocabulary filter to see an example.

PII Identification & redaction Info
Identify or redact one or more types of personally identifiable information (PII) in your transcript

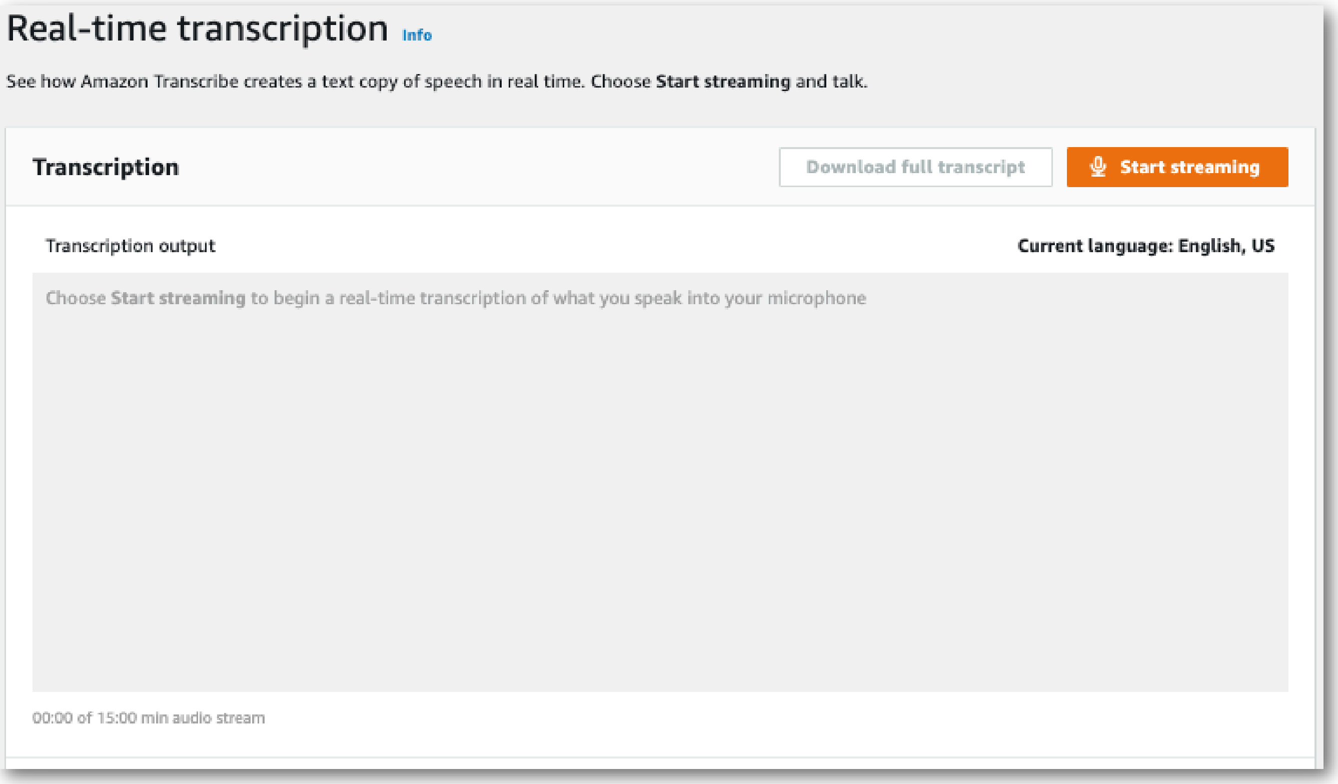
Customizations

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Partial results stabilization Info
Configure Amazon Transcribe to present results that don't change as it processes the transcription output from your stream.

Custom language model Info
Select the model you want to use with this streaming session.

3. After you've selected the appropriate settings, scroll to the top of the page and choose **Start streaming**, then begin speaking into your computer microphone. You can see your speech transcribed in real time.

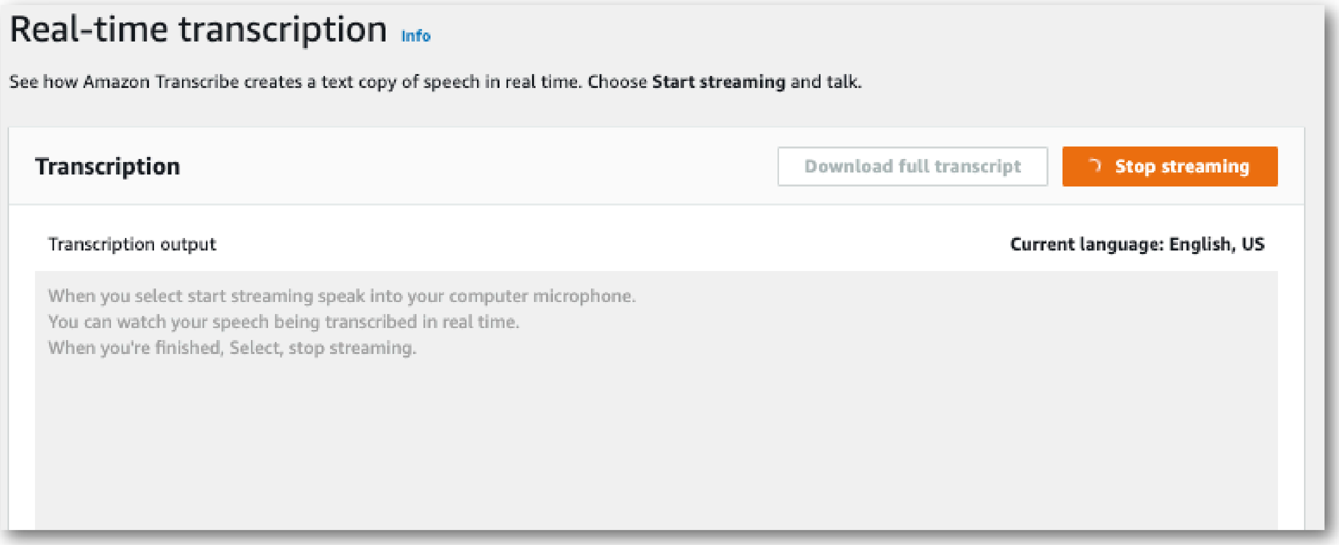

Real-time transcription

See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

00:00 of 15:00 min audio stream

4. When you're finished, select **Stop streaming**.


Real-time transcription

See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

When you select start streaming speak into your computer microphone.
You can watch your speech being transcribed in real time.
When you're finished, Select, stop streaming.

You can now download your transcript by selecting **Download full transcript**.

Transcribing with the AWS CLI

When using the AWS CLI to start a transcription, you can run all commands at the CLI level. Or you can run the command you want to use, followed by the AWS Region and the location of a JSON file that contains a request body. Examples throughout this guide show both methods; however, this section focuses on the former method.

The AWS CLI does not support streaming transcriptions.

Before you continue, make sure you've:

- Uploaded your media file into an Amazon S3 bucket. If you're unsure how to create an Amazon S3 bucket or upload your file, refer to Create your first Amazon S3 bucket and Upload an object to your bucket.
- Installed the AWS CLI.

You can find all AWS CLI commands for Amazon Transcribe in the AWS CLI Command Reference.

Starting a new transcription job

To start a new transcription, use the `start-transcription-job` command.

1. In a terminal window, type the following:

   ```
   aws transcribe start-transcription-job \
   ```

   A '>' appears on the next line, and you can now continue adding required parameters, as described in the next step.

   You can also omit the '\' and append all parameters, separating each with a space.

2. With the `start-transcription-job` command, you must include `region`, `transcription-job-name`, `media`, and either `language-code` or `identify-language`.

   If you want to specify an output location, include `output-bucket-name` in your request; if you want to specify a sub-folder of the specified output bucket, also include `output-key`.

   ```
   aws transcribe start-transcription-job \
    --region us-west-2 \
   ```

```
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--language-code en-US
```

If appending all parameters, this request looks like:

```
aws transcribe start-transcription-job --region us-west-2 --transcription-job-
name my-first-transcription-job --media MediaFileUri=s3://amzn-s3-demo-bucket/my-
input-files/my-media-file.flac --language-code en-US
```

If you choose not to specify an output bucket using `output-bucket-name`, Amazon Transcribe places your transcription output in a service-managed bucket. Transcripts stored in a service-managed bucket expire after 90 days.

Amazon Transcribe responds with:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "my-first-transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "en-US",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-
file.flac"
        },
        "StartTime": "2022-03-07T15:03:44.246000-08:00",
        "CreationTime": "2022-03-07T15:03:44.229000-08:00"
    }
}
```

Your transcription job is successful if `TranscriptionJobStatus` changes from `IN_PROGRESS` to `COMPLETED`. To see the updated `TranscriptionJobStatus`, use the `get-transcription-job` or `list-transcription-job` command, as shown in the following section.

Getting the status of a transcription job

To get information about your transcription job, use the `get-transcription-job` command.

The only required parameters for this command are the AWS Region where the job is located and the name of the job.

```
aws transcribe get-transcription-job \
 --region us-west-2 \
 --transcription-job-name my-first-transcription-job
```

Amazon Transcribe responds with:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "my-first-transcription-job",
        "TranscriptionJobStatus": "COMPLETED",
        "LanguageCode": "en-US",
        "MediaSampleRateHertz": 48000,
        "MediaFormat": "flac",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-
file.flac"
        },
        "Transcript": {
            "TranscriptFileUri": "https://s3.the-URI-where-your-job-is-located.json"
        },
        "StartTime": "2022-03-07T15:03:44.246000-08:00",
        "CreationTime": "2022-03-07T15:03:44.229000-08:00",
        "CompletionTime": "2022-03-07T15:04:01.158000-08:00",
        "Settings": {
            "ChannelIdentification": false,
            "ShowAlternatives": false
        }
    }
}
```

If you've selected your own Amazon S3 bucket for your transcription output, this bucket is listed with `TranscriptFileUri`. If you've selected a service-managed bucket, a temporary URI is provided; use this URI to download your transcript.

Note

Temporary URIs for service-managed Amazon S3 buckets are only valid for 15 minutes. If you get an `AccesDenied` error when using the URI, run the `get-transcription-job` request again to get a new temporary URI.

Listing your transcription jobs

To list all your transcription jobs in a given AWS Region, use the `list-transcription-jobs` command.

The only required parameter for this command is the AWS Region in which your transcription jobs are located.

```
aws transcribe list-transcription-jobs \
 --region us-west-2
```

Amazon Transcribe responds with:

```
{
    "NextToken": "A-very-long-string",
    "TranscriptionJobSummaries": [
        {
            "TranscriptionJobName": "my-first-transcription-job",
            "CreationTime": "2022-03-07T15:03:44.229000-08:00",
            "StartTime": "2022-03-07T15:03:44.246000-08:00",
            "CompletionTime": "2022-03-07T15:04:01.158000-08:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        }
    ]
}
```

Deleting your transcription job

To delete your transcription job, use the `delete-transcription-job` command.

The only required parameters for this command are the AWS Region where the job is located and the name of the job.

```
aws transcribe delete-transcription-job \
 --region us-west-2 \
 --transcription-job-name my-first-transcription-job
```

To confirm your delete request is successful, you can run the `list-transcription-jobs` command. Your job should no longer appear in the list.

Transcribing with the AWS SDKs

You can use SDKs for both batch and streaming transcriptions. If you're transcribing a media file located in an Amazon S3 bucket, you're performing a batch transcription. If you're transcribing a real-time stream of audio data, you're performing a streaming transcription.

For a list of the programming languages you can use with Amazon Transcribe, see Supported programming languages. Note that streaming transcriptions are not supported with all AWS SDKs. To view supported media formats and other media requirements and constraints, see Data input and output.

For more information on all available AWS SDKs and builder tools, refer to Tools to Build on AWS.

Tip

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.
You can also find SDK code samples in these GitHub repositories:

- AWS Code Examples
- Amazon Transcribe Examples

Batch transcriptions

You can create batch transcriptions using the URI of a media file located in an Amazon S3 bucket. If you're unsure how to create an Amazon S3 bucket or upload your file, refer to Create your first S3 bucket and Upload an object to your bucket.

Java

```
import software.amazon.awssdk.auth.credentials.AwsCredentialsProvider;
import software.amazon.awssdk.auth.credentials.DefaultCredentialsProvider;
import software.amazon.awssdk.regions.Region;
import software.amazon.awssdk.services.transcribe.TranscribeClient;
import software.amazon.awssdk.services.transcribe.model.*;
import software.amazon.awssdk.services.transcribestreaming.model.LanguageCode;

public class TranscribeDemoApp {
    private static final Region REGION = Region.US_WEST_2;
    private static TranscribeClient client;

    public static void main(String args[]) {

        client = TranscribeClient.builder()
                .credentialsProvider(getCredentials())
                .region(REGION)
                .build();

        String transcriptionJobName = "my-first-transcription-job";
        String mediaType = "flac"; // can be other types
        Media myMedia = Media.builder()
                .mediaFileUri("s3://amzn-s3-demo-bucket/my-input-files/my-media-
file.flac")
                .build();

        String outputS3BucketName = "s3://amzn-s3-demo-bucket";
        // Create the transcription job request
        StartTranscriptionJobRequest request =
 StartTranscriptionJobRequest.builder()
                .transcriptionJobName(transcriptionJobName)
                .languageCode(LanguageCode.EN_US.toString())
                .mediaSampleRateHertz(16000)
                .mediaFormat(mediaType)
                .media(myMedia)
                .outputBucketName(outputS3BucketName)
                .build();

        // send the request to start the transcription job
        StartTranscriptionJobResponse startJobResponse =
 client.startTranscriptionJob(request);

        System.out.println("Created the transcription job");
        System.out.println(startJobResponse.transcriptionJob());

        // Create the get job request
        GetTranscriptionJobRequest getJobRequest =
 GetTranscriptionJobRequest.builder()
                .transcriptionJobName(transcriptionJobName)
                .build();

        // send the request to get the transcription job including the job status
        GetTranscriptionJobResponse getJobResponse =
 client.getTranscriptionJob(getJobRequest);

        System.out.println("Get the transcription job request");
        System.out.println(getJobResponse.transcriptionJob());
    }

    private static AwsCredentialsProvider getCredentials() {
        return DefaultCredentialsProvider.create();
    }

}
```

JavaScript

```
const { TranscribeClient, StartTranscriptionJobCommand } = require("@aws-sdk/client-
transcribe"); // CommonJS import

const region = "us-west-2";
const credentials = {
  "accessKeyId": "",
  "secretAccessKey": "",
};

const input = {
  TranscriptionJobName: "my-first-transcription-job",
  LanguageCode: "en-US",
  Media: {
    MediaFileUri: "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  OutputBucketName: "amzn-s3-demo-bucket",
};

async function startTranscriptionRequest() {
  const transcribeConfig = {
    region,
    credentials
  };
  const transcribeClient = new TranscribeClient(transcribeConfig);
  const transcribeCommand = new StartTranscriptionJobCommand(input);
  try {
    const transcribeResponse = await transcribeClient.send(transcribeCommand);
    console.log("Transcription job created, the details:");
    console.log(transcribeResponse.TranscriptionJob);
  } catch(err) {
    console.log(err);
  }
}

startTranscriptionRequest();
```

Python

```
import time
import boto3

def transcribe_file(job_name, file_uri, transcribe_client):
    transcribe_client.start_transcription_job(
        TranscriptionJobName = job_name,
        Media = {
            'MediaFileUri': file_uri
        },
        MediaFormat = 'flac',
        LanguageCode = 'en-US'
    )

    max_tries = 60
    while max_tries > 0:
        max_tries -= 1
        job = transcribe_client.get_transcription_job(TranscriptionJobName =
 job_name)
        job_status = job['TranscriptionJob']['TranscriptionJobStatus']
        if job_status in ['COMPLETED', 'FAILED']:
            print(f"Job {job_name} is {job_status}.")
            if job_status == 'COMPLETED':
                print(
                    f"Download the transcript from\n"
                    f"\t{job['TranscriptionJob']['Transcript']
['TranscriptFileUri']}.")
            break
        else:
            print(f"Waiting for {job_name}. Current status is {job_status}.")
        time.sleep(10)


def main():
    transcribe_client = boto3.client('transcribe', region_name = 'us-west-2')
    file_uri = 's3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac'
    transcribe_file('Example-job', file_uri, transcribe_client)


if __name__ == '__main__':
    main()
```

Streaming transcriptions

You can create streaming transcriptions using a streamed media file or a live media stream.

Note that the standard AWS SDK for Python (Boto3) is not supported for Amazon Transcribe streaming. To start a streaming transcription using Python, use this async Python SDK for Amazon Transcribe.

Java

The following example is a Java program that transcribes streaming audio.

To run this example, note the following:

- You must use the AWS SDK for Java 2.x.
- Clients must use Java 1.8 to be compatible with the AWS SDK for Java 2.x.
- The sample rate you specify must match the actual sample rate of your audio stream.

See also: Retry client for Amazon Transcribe streaming (Java SDK). This code manages the connection to Amazon Transcribe and retries sending data when there are errors on the connection. For example, if there is a transient error on the network, this client resends the request that failed.

```
public class TranscribeStreamingDemoApp {
    private static final Region REGION = Region.US_WEST_2;
    private static TranscribeStreamingAsyncClient client;

    public static void main(String args[]) throws URISyntaxException,
 ExecutionException, InterruptedException, LineUnavailableException {

        client = TranscribeStreamingAsyncClient.builder()
                .credentialsProvider(getCredentials())
                .region(REGION)
                .build();

        CompletableFuture<Void> result =
client.startStreamTranscription(getRequest(16_000),
                new AudioStreamPublisher(getStreamFromMic()),
                getResponseHandler());

        result.get();
        client.close();
    }

    private static InputStream getStreamFromMic() throws LineUnavailableException {

        // Signed PCM AudioFormat with 16,000 Hz, 16 bit sample size, mono
        int sampleRate = 16000;
        AudioFormat format = new AudioFormat(sampleRate, 16, 1, true, false);
        DataLine.Info info = new DataLine.Info(TargetDataLine.class, format);

        if (!AudioSystem.isLineSupported(info)) {
            System.out.println("Line not supported");
            System.exit(0);
        }

        TargetDataLine line = (TargetDataLine) AudioSystem.getLine(info);
        line.open(format);
        line.start();

        InputStream audioStream = new AudioInputStream(line);
        return audioStream;
    }

    private static AwsCredentialsProvider getCredentials() {
        return DefaultCredentialsProvider.create();
    }

    private static StartStreamTranscriptionRequest getRequest(Integer
mediaSampleRateHertz) {
        return StartStreamTranscriptionRequest.builder()
                .languageCode(LanguageCode.EN_US.toString())
                .mediaEncoding(MediaEncoding.PCM)
                .mediaSampleRateHertz(mediaSampleRateHertz)
                .build();
    }
    private static StartStreamTranscriptionResponseHandler getResponseHandler() {
        return StartStreamTranscriptionResponseHandler.builder()
                .onResponse(r -> {
                    System.out.println("Received Initial response");
                })
                .onError(e -> {
                    System.out.println(e.getMessage());
                    StringWriter sw = new StringWriter();
                    e.printStackTrace(new PrintWriter(sw));
                    System.out.println("Error Occurred: " + sw.toString());
                })
                .onComplete(() -> {
                    System.out.println("=== All records stream successfully ===");
                })
                .subscriber(event -> {
                    List<Result> results = ((TranscriptEvent)
 event).transcript().results();
                    if (results.size() > 0) {
                        if (!
results.get(0).alternatives().get(0).transcript().isEmpty()) {

 System.out.println(results.get(0).alternatives().get(0).transcript());
                        }
                    }
                })
                .build();
    }

    private InputStream getStreamFromFile(String myMediaFileName) {
        try {
            File inputFile = new
 File(getClass().getClassLoader().getResource(myMediaFileName).getFile());
            InputStream audioStream = new FileInputStream(inputFile);
            return audioStream;
        } catch (FileNotFoundException e) {
            throw new RuntimeException(e);
        }
    }

    private static class AudioStreamPublisher implements Publisher<AudioStream> {
        private final InputStream inputStream;
        private static Subscription currentSubscription;
        private AudioStreamPublisher(InputStream inputStream) {
            this.inputStream = inputStream;
        }

        @Override
        public void subscribe(Subscriber<? super AudioStream> s) {

            if (this.currentSubscription == null) {
                this.currentSubscription = new SubscriptionImpl(s, inputStream);
            } else {
                this.currentSubscription.cancel();
                this.currentSubscription = new SubscriptionImpl(s, inputStream);
            }
            s.onSubscribe(currentSubscription);
        }
    }

    public static class SubscriptionImpl implements Subscription {
        private static final int CHUNK_SIZE_IN_BYTES = 1024 * 1;
        private final Subscriber<? super AudioStream> subscriber;
        private final InputStream inputStream;
        private ExecutorService executor = Executors.newFixedThreadPool(1);
        private AtomicLong demand = new AtomicLong(0);

        SubscriptionImpl(Subscriber<? super AudioStream> s, InputStream inputStream)
 {
            this.subscriber = s;
            this.inputStream = inputStream;
        }

        @Override
        public void request(long n) {
            if (n <= 0) {
                subscriber.onError(new IllegalArgumentException("Demand must be
 positive"));
            }

            demand.getAndAdd(n);

            executor.submit(() -> {
                try {
                    do {
                        ByteBuffer audioBuffer = getNextEvent();
                        if (audioBuffer.remaining() > 0) {
                            AudioEvent audioEvent =
audioEventFromBuffer(audioBuffer);
                            subscriber.onNext(audioEvent);
                        } else {
                            subscriber.onComplete();
                            break;
                        }
                    } while (demand.decrementAndGet() > 0);
                } catch (Exception e) {
                    subscriber.onError(e);
                }
            });
        }

        @Override
        public void cancel() {
            executor.shutdown();
        }

        private ByteBuffer getNextEvent() {
            ByteBuffer audioBuffer = null;
            byte[] audioBytes = new byte[CHUNK_SIZE_IN_BYTES];

            int len = 0;
            try {
                len = inputStream.read(audioBytes);

                if (len <= 0) {
                    audioBuffer = ByteBuffer.allocate(0);
                } else {
                    audioBuffer = ByteBuffer.wrap(audioBytes, 0, len);
                }
            } catch (IOException e) {
                throw new UncheckedIOException(e);
            }

            return audioBuffer;
        }

        private AudioEvent audioEventFromBuffer(ByteBuffer bb) {
            return AudioEvent.builder()
                    .audioChunk(SdkBytes.fromByteBuffer(bb))
                    .build();
        }
    }
}
```

JavaScript

```
const {
  TranscribeStreamingClient,
  StartStreamTranscriptionCommand,
} = require("@aws-sdk/client-transcribe-streaming");
const { createReadStream } = require("fs");
const { join } = require("path");

const audio = createReadStream(join(__dirname, "my-media-file.flac"),
 { highWaterMark: 1024 * 16});

const LanguageCode = "en-US";
const MediaEncoding = "pcm";
const MediaSampleRateHertz = "16000";
const credentials = {
  "accessKeyId": "",
  "secretAccessKey": "",
};
async function startRequest() {
  const client = new TranscribeStreamingClient({
    region: "us-west-2",
    credentials
  });

  const params = {
    LanguageCode,
    MediaEncoding,
    MediaSampleRateHertz,
    AudioStream: (async function* () {
      for await (const chunk of audio) {
        yield {AudioEvent: {AudioChunk: chunk}};
      }
    })(),
  };
  const command = new StartStreamTranscriptionCommand(params);
  // Send transcription request
  const response = await client.send(command);
  // Start to print response
```

```
    try {
      for await (const event of response.TranscriptResultStream) {
        console.log(JSON.stringify(event));
      }
    } catch(err) {
      console.log("error")
      console.log(err)
    }
  }
  startRequest();
```

Python

The following example is a Python program that transcribes streaming audio.

To run this example, note the following:

- You must use this SDK for Python .
- The sample rate you specify must match the actual sample rate of your audio stream.

```
import asyncio
# This example uses aiofile for asynchronous file reads.
# It's not a dependency of the project but can be installed
# with `pip install aiofile`.
import aiofile

from amazon_transcribe.client import TranscribeStreamingClient
from amazon_transcribe.handlers import TranscriptResultStreamHandler
from amazon_transcribe.model import TranscriptEvent

"""
Here's an example of a custom event handler you can extend to
process the returned transcription results as needed. This
handler will simply print the text out to your interpreter.
"""
class MyEventHandler(TranscriptResultStreamHandler):
    async def handle_transcript_event(self, transcript_event: TranscriptEvent):
        # This handler can be implemented to handle transcriptions as needed.
        # Here's an example to get started.
        results = transcript_event.transcript.results
        for result in results:
            for alt in result.alternatives:
                print(alt.transcript)


async def basic_transcribe():
    # Set up our client with your chosen Region
    client = TranscribeStreamingClient(region = "us-west-2")

    # Start transcription to generate async stream
    stream = await client.start_stream_transcription(
        language_code = "en-US",
        media_sample_rate_hz = 16000,
        media_encoding = "pcm",
    )

    async def write_chunks():
        # NOTE: For pre-recorded files longer than 5 minutes, the sent audio
        # chunks should be rate limited to match the real-time bitrate of the
        # audio stream to avoid signing issues.
        async with aiofile.AIOFile('filepath/my-media-file.flac', 'rb') as afp:
            reader = aiofile.Reader(afp, chunk_size = 1024 * 16)
            async for chunk in reader:
                await stream.input_stream.send_audio_event(audio_chunk = chunk)
        await stream.input_stream.end_stream()

    # Instantiate our handler and start processing events
    handler = MyEventHandler(stream.output_stream)
    await asyncio.gather(write_chunks(), handler.handle_events())

loop = asyncio.get_event_loop()
loop.run_until_complete(basic_transcribe())
loop.close()
```

C++

Refer to the Code examples chapter for the streaming C++ SDK example .

Using this service with an AWS SDK

AWS software development kits (SDKs) are available for many popular programming languages. Each SDK provides an API, code examples, and documentation that make it easier for developers to build applications in their preferred language.

SDK documentation	Code examples
AWS SDK for C++	AWS SDK for C++ code examples
AWS CLI	AWS CLI code examples
AWS SDK for Go	AWS SDK for Go code examples
AWS SDK for Java	AWS SDK for Java code examples
AWS SDK for JavaScript	AWS SDK for JavaScript code examples
AWS SDK for Kotlin	AWS SDK for Kotlin code examples
AWS SDK for .NET	AWS SDK for .NET code examples
AWS SDK for PHP	AWS SDK for PHP code examples
AWS Tools for PowerShell	Tools for PowerShell code examples
AWS SDK for Python (Boto3)	AWS SDK for Python (Boto3) code examples
AWS SDK for Ruby	AWS SDK for Ruby code examples
AWS SDK for Rust	AWS SDK for Rust code examples
AWS SDK for SAP ABAP	AWS SDK for SAP ABAP code examples
AWS SDK for Swift	AWS SDK for Swift code examples

For examples specific to this service, see Code examples for Amazon Transcribe using AWS SDKs.

Example availability

Can't find what you need? Request a code example by using the **Provide feedback** link at the bottom of this page.

Transcribing with HTTP or WebSockets

Amazon Transcribe supports HTTP for both batch (HTTP/1.1) and streaming (HTTP/2) transcriptions. WebSockets are supported for streaming transcriptions.

If you're transcribing a media file located in an Amazon S3 bucket, you're performing a batch transcription. If you're transcribing a real-time stream of audio data, you're performing a streaming transcription.

Both HTTP and WebSockets require you to authenticate your request using AWS Signature Version 4 headers. Refer to Signing AWS API requests for more information.

Batch transcriptions

You can make a batch HTTP request using the following headers:

- host
- x-amz-target
- content-type
- x-amz-content-sha256
- x-amz-date
- authorization

Here's an example of a `StartTranscriptionJob` request:

```
POST /transcribe HTTP/1.1
host: transcribe.us-west-2.amazonaws.com
x-amz-target: com.amazonaws.transcribe.Transcribe.StartTranscriptionJob
content-type: application/x-amz-json-1.1
x-amz-content-sha256: string
x-amz-date: YYYYMMDDTHHMMSSZ
authorization: AWS4-HMAC-SHA256 Credential=access-key/YYYYMMSS/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string

{
    "TranscriptionJobName": "my-first-transcription-job",
    "LanguageCode": "en-US",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
    },
    "OutputBucketName": "amzn-s3-demo-bucket",
    "OutputKey": "my-output-files/"
}
```

Additional operations and parameters are listed in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section. Other signature elements are detailed in Elements of an AWS Signature Version 4 request.

Streaming transcriptions

Streaming transcriptions using HTTP/2 and WebSockets are more involved than using SDKs. We recommend reviewing the Setting up a streaming transcription section before setting up your first stream.

For more information on these methods, refer to Setting up an HTTP/2 stream or Setting up a WebSocket stream.

Note

We strongly recommend using an SDK for streaming transcriptions. For a list of supported SDKs, refer to Supported programming languages.

Transcribing streaming audio

Using Amazon Transcribe streaming, you can produce real-time transcriptions for your media content. Unlike batch transcriptions, which involve uploading media files, streaming media is delivered to Amazon Transcribe in real time. Amazon Transcribe then returns a transcript, also in real time.

Streaming can include pre-recorded media (movies, music, and podcasts) and real-time media (live news broadcasts). Common streaming use cases for Amazon Transcribe include live closed captioning for sporting events and real-time monitoring of call center audio.

Streaming content is delivered as a series of sequential data packets, or 'chunks,' that Amazon Transcribe transcribes instantaneously. The advantages of using streaming over batch include real-time speech-to-text capabilities in your applications and faster transcription times. However, this increased speed may have accuracy limitations in some cases.

Amazon Transcribe offers the following options for streaming:

- SDKs (preferred)
- HTTP/2
- WebSockets
- AWS Management Console

To transcribe streaming audio in the AWS Management Console, speak into your computer microphone.

Tip

For SDK code examples, refer to the AWS Samples repository on GitHub.

Audio formats supported for streaming transcriptions are:

- FLAC
- OPUS-encoded audio in an Ogg container
- PCM (only signed 16-bit little-endian audio formats, which does **not** include WAV)

Lossless formats (FLAC or PCM) are recommended.

Note

Streaming transcriptions are not supported with all languages. Refer to the 'Data input' column in the supported languages table for details.

To view the Amazon Transcribe Region availability for streaming transcriptions, see: Amazon Transcribe Endpoints and Quotas.

Best practices

The following recommendations improve streaming transcription efficiency:

- If possible, use PCM-encoded audio.
- Ensure that your stream is as close to real-time as possible.
- Latency depends on the size of your audio chunks. If you're able to specify chunk size with your audio type (such as with PCM), set each chunk to between 50 ms and 200 ms. You can calculate the audio chunk size by the following formula:

```
chunk_size_in_bytes = chunk_duration_in_millisecond / 1000 * audio_sample_rate * 2
```

- Use a uniform chunk size.
- Make sure you correctly specify the number of audio channels.
- With single-channel PCM audio, each sample consists of two bytes, so each chunk should consist of an even number of bytes.
- With dual-channel PCM audio, each sample consists of four bytes, so each chunk should be a multiple of 4 bytes.
- When your audio stream contains no speech, encode and send the same amount of silence. For example, silence for PCM is a stream of zero bytes.
- Make sure you specify the correct sampling rate for your audio. If possible, record at a sampling rate of 16,000 Hz; this provides the best compromise between quality and data volume sent over the network. Note that most high-end microphones record at 44,100 Hz or 48,000 Hz.

Streaming and partial results

Because streaming works in real time, transcripts are produced in *partial results*. Amazon Transcribe breaks up the incoming audio stream based on natural speech segments, such as a change in speaker or a pause in the audio. The transcription is returned to your application in a stream of transcription events, with each response containing more transcribed speech until an entire segment is transcribed.

An approximation of this is shown in the following code block. You can view this process in action by signing into the AWS Management Console, selecting **Real-time transcription**, and speaking into your microphone. Watch the **Transcription output** pane as you speak.

In this example, each line is the partial result of an audio segment.

```
The
The Amazon.
The Amazon is
The Amazon is the law.
The Amazon is the largest
The Amazon is the largest ray
The Amazon is the largest rain for
The Amazon is the largest rainforest.
The Amazon is the largest rainforest on the
The Amazon is the largest rainforest on the planet.
```

These partial results are present in your transcription output within the `Results` objects. Also in this object block is an **IsPartial** field. If this field is true, your transcription segment is not yet complete. You can view the difference between an incomplete and a complete segment below:

```
"IsPartial": true (incomplete segment)

"Transcript": "The Amazon is the largest rainforest."

"EndTime": 4.545,
"IsPartial": true,
"ResultId": "12345a67-8bc9-0de1-2f34-a5b678c90d12",
"StartTime": 0.025


"IsPartial": false (complete segment)

```

```
"Transcript": "The Amazon is the largest rainforest on the planet."

"EndTime": 6.025,
"IsPartial": false,
"ResultId": "34567e89-0fa1-2bc3-4d56-78e90123456f",
"StartTime": 0.025
```

Each word within a *complete* segment has an associated confidence score, which is a value between `0` and 1. A larger value indicates a greater likelihood that the word is correctly transcribed.

Tip

The `StartTime` and `EndTime` of an audio segment can be used to synchronize transcription output with video dialogue.

If you're running an application that requires low latency, you may want to use partial-result stabilization.

Partial-result stabilization

Amazon Transcribe starts returning transcription results as soon as you start streaming your audio. It returns these partial results incrementally until it generates a finished result at the level of a natural speech segment. A natural speech segment is continuous speech that contains a pause or a change in speaker.

Amazon Transcribe continues outputting partial results until it generates the final transcription result for a speech segment. Because speech recognition may revise words as it gains more context, streaming transcriptions can change slightly with each new partial result output.

This process gives you two options for each speech segment:

- Wait for the finished segment
- Use the segment's partial results

Partial result stabilization changes how Amazon Transcribe produces the final transcription result for each complete segment. When activated, only the last few words from the partial results can change. Because of this, transcription accuracy may be affected. However, your transcript is returned faster than without partial-results stabilization. This reduction in latency may be beneficial when subtitling videos or generating captions for live streams.

The following examples show how the same audio stream is handled when partial-results stabilization is not activated and when it is. Note that you can set the stability level to low, medium, or high. Low stability provides the highest accuracy. High stability transcribes faster, but with slightly lower accuracy.

"Transcript":	**"EndTime":**	**"IsPartial":**
Partial-result stabilization not enabled		

`The`
`The`
`The Amazon.`
`The Amazon is`
`The Amazon is the law.`
`The Amazon is the largest`
`The Amazon is the largest ray`
`The Amazon is the largest rain for`
`The Amazon is the largest rainforest.`
`The Amazon is the largest rainforest on the`
`The Amazon is the largest rainforest on the planet.`
`The Amazon is the largest rainforest on the planet.`
`The Amazon is the largest rainforest on the planet.`
	`0.545`
	`1.045`
	`1.545`
	`2.045`
	`2.545`
	`3.045`
	`3.545`
	`4.045`
	`4.545`
	`5.045`
	`5.545`
	`6.025`
	`6.025`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`false`

Partial-result stabilization enabled (high stability)		
`The`	`0.515`	`true`

"Transcript":	"EndTime":	"IsPartial":

`The`
`The Amazon.`
`The Amazon is`
`The Amazon is the large`
`The Amazon is the largest`
`The Amazon is the largest rainfall.`
`The Amazon is the largest rain forest.`
`The Amazon is the largest rain forest on`
`The Amazon is the largest rain forest on the planet.`
`The Amazon is the largest rain forest on the planet.`
`The Amazon is the largest rain forest on the planet.`
`The Amazon is the largest rain forest on the planet.`
	`1.015`
	`1.515`
	`2.015`
	`2.515`
	`3.015`
	`3.515`
	`4.015`
	`4.515`
	`5.015`
	`5.515`
	`6.015`
	`6.335`
	`6.335`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`true`
		`false`

When you activate partial-result stabilization, Amazon Transcribe uses a `Stable` field to indicate whether an item is stable, where 'item' refers to a transcribed word or punctuation mark. Values for `Stable` are `true` or `false`. Items flagged as `false` (not stable) are more likely to change as your segment is transcribed. Conversely, items flagged as `true` (stable) won't change.

You can choose to render non-stable words so your captions align with speech. Even if captions change slightly as context is added, this is a better user experience than periodic text bursts, which may or may not align with speech.

You can also choose to display non-stable words in a different format, such as italics, to indicate to viewers that these words may change. Displaying partial results limits the amount of text displayed at a given time. This can be important when you're dealing with space constraints, as with video captions.

Dive deeper with the AWS Machine Learning Blog

To learn more about improving accuracy with real-time transcriptions, see:

- Improve the streaming transcription experience with Amazon Transcribe partial results stabilization
- “What was that?” Increasing subtitle accuracy for live broadcasts using Amazon Transcribe

Partial-result stabilization example output

The following example output shows `Stable` flags for an incomplete segment (`"IsPartial": true`). You can see that the words "*to*" and "*Amazon*" are not stable and therefore could change before the segment is finalized.

```
"Transcript": {
    "Results": [
        {
            "Alternatives": [
                {
                    "Items": [
                        {
                            "Content": "Welcome",
                            "EndTime": 2.4225,
                            "Stable": true,
                            "StartTime": 1.65,
                            "Type": "pronunciation",
                            "VocabularyFilterMatch": false
                        },
                        {
                            "Content": "to",
                            "EndTime": 2.8325,
                            "Stable": false,
                            "StartTime": 2.4225,
                            "Type": "pronunciation",
                            "VocabularyFilterMatch": false
                        },
                        {
                            "Content": "Amazon",
                            "EndTime": 3.635,
                            "Stable": false,
                            "StartTime": 2.8325,
                            "Type": "pronunciation",
                            "VocabularyFilterMatch": false
                        },
                        {
                            "Content": ".",
                            "EndTime": 3.635,
                            "Stable": false,
                            "StartTime": 3.635,
                            "Type": "punctuation",
                            "VocabularyFilterMatch": false
                        }
                    ],
                    "Transcript": "Welcome to Amazon."
                }
            ],
            "EndTime": 4.165,
            "IsPartial": true,
            "ResultId": "12345a67-8bc9-0de1-2f34-a5b678c90d12",
            "StartTime": 1.65
        }
    ]
}
```

Setting up a streaming transcription

This section expands on the main streaming section. It's intended to provide information for users who want to set up their stream with HTTP/2 or WebSockets directly, rather than with an AWS SDK. The information in this section can also be used to build your own SDK.

Important

We strongly recommend using SDKs rather than using HTTP/2 and WebSockets directly. SDKs are the simplest and most reliable method for transcribing data streams. To start streaming using an AWS SDK, see Transcribing with the AWS SDKs.

Setting up an HTTP/2 stream

The key components for an HTTP/2 protocol for streaming transcription requests with Amazon Transcribe are:

- A header frame. This contains the HTTP/2 headers for your request, and a signature in the authorization header that Amazon Transcribe uses as a seed signature to sign the data frames.
- One or more message frames in event stream encoding that contain metadata and raw audio bytes.
- An end frame. This is a signed message in event stream encoding with an empty body.

Note

Amazon Transcribe only supports one stream per HTTP/2 session. If you attempt to use multiple streams, your transcription request fails.

1. Attach the following policy to the IAM role that makes the request. See Adding IAM policies for more information.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "my-transcribe-http2-policy",
            "Effect": "Allow",
            "Action": "transcribe:StartStreamTranscription",
            "Resource": "*"
        }
    ]
}
```

2. To start the session, send an HTTP/2 request to Amazon Transcribe.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: YYYYMMDDTHHMMSSZ
```

```
Authorization: AWS4-HMAC-SHA256 Credential=access-key/YYYYMMDD/us-west-2/
transcribe/aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-
amz-date;x-amz-target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
transfer-encoding: chunked
```

Additional operations and parameters are listed in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Amazon Transcribe sends the following response:

```
HTTP/2.0 200
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-request-id: 8a08df7d-5998-48bf-a303-484355b4ab4e
x-amzn-transcribe-session-id: b4526fcf-5eee-4361-8192-d1cb9e9d6887
content-type: application/json
```

3. Create an audio event that contains your audio data. Combine the headers—described in the following table—with a chunk of audio bytes in an event-encoded message. To create the payload for the event message, use a buffer in raw-byte format.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	24	application/octet-stream
11	:event-type	7	10	AudioEvent
13	:message-type	7	5	event

Binary data in this example request are base64-encoded. In an actual request, data are raw bytes.

```
:content-type: "application/vnd.amazon.eventstream"
```

```
:event-type: "AudioEvent"
:message-type: "event"
UklGRjzxPQBXQVZFZm10IBAAAAABAAEAgD4AAAB9AAACABAAZGF0YVTwPQAAAAAAAAAAAAAAAAD//wIA/
f8EAA==
```

4. Create an audio message that contains your audio data.

   a. Your audio message data frame contains event-encoding headers that include the current date and a signature for the audio chunk and the audio event.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value
16	:chunk-si gnature	6	varies	generated signature
5	:date	8	8	timestamp

   Binary data in this request are base64-encoded. In an actual request, data are raw bytes.

```
:date: 2019-01-29T01:56:17.291Z
:chunk-signature: signature

AAAA0gAAAIKVoRFcTTcjb250ZW50LXR5cGUHABhhcHBsaWNhdGlvbi9vY3RldC1zdHJlYW0LOmV2ZW50LXR5
cGUHAApBdWRpb0V2ZW50DTptZXNzYWdlLXR5cGUHAAVldmVudAxDb256ZW50LVR5cGUHABphcHBsaWNhdGlv
bi94LWFtei1qc29uLTEuMVJJRkY88T0AV0FWRWZtdCAQAAAAAQABAIA
+AAAAfQAAAgAQAGRhdGFU8D0AAAAA
AAAAAAAAAAAA//8CAP3/BAC7QLFf
```

   b. Construct a string to sign, as outlined in Create a string to sign for Signature Version 4. Your string follows this format:

```
String stringToSign =
"AWS4-HMAC-SHA256" +
"\n" +
DateTime +
"\n" +
Keypath +
"\n" +
Hex(priorSignature) +
"\n" +
HexHash(nonSignatureHeaders) +
"\n" +
HexHash(payload);
```

- **DateTime**: The date and time the signature is created. The format is YYYYMMDDTHHMMSSZ, where YYYY=year, MM=month, DD=day, HH=hour, MM=minute, SS=seconds, and 'T' and 'Z' are fixed characters. For more information, refer to Handling Dates in Signature Version 4.
- **Keypath**: The signature scope in the format `date/region/service/aws4_request`. For example, `20220127/us-west-2/transcribe/aws4_request`.
- **Hex**: A function that encodes input into a hexadecimal representation.
- **priorSignature**: The signature for the previous frame. For the first data frame, use the signature of the header frame.
- **HexHash**: A function that first creates a SHA-256 hash of its input and then uses the Hex function to encode the hash.
- **nonSignatureHeaders**: The DateTime header encoded as a string.
- **payload**: The byte buffer containing the audio event data.

c. Derive a signing key from your AWS secret access key and use it to sign the `stringToSign`. For a greater degree of protection, the derived key is specific to the date, service, and AWS Region. For more information, see Calculate the signature for AWSSignature Version 4.

Make sure you implement the `GetSignatureKey` function to derive your signing key. If you have not yet derived a signing key, refer to Examples of how to derive a signing key for Signature Version 4.

```
String signature = HMACSHA256(derivedSigningKey, stringToSign);
```

- **HMACSHA256**: A function that creates a signature using the SHA-256 hash function.
- **derivedSigningKey**: The Signature Version 4 signing key.
- **stringToSign**: The string you calculated for the data frame.

After you've calculated the signature for the data frame, construct a byte buffer containing the date, signature, and audio event payload. Send the byte array to Amazon Transcribe for transcription.

5. To indicate the audio stream is complete, send an end frame (an empty data frame) that contains only the date and signature. You construct this end frame the same way that you construct a data frame.

   Amazon Transcribe responds with a stream of transcription events, sent to your application. This response is event stream encoded. It contains the standard prelude and the following headers.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	16	application/json
11	:event-type	7	15	TranscriptEvent
13	:message-type	7	5	event

   The events are sent in raw-byte format. In this example, the bytes are base64-encoded.

```
AAAAUwAAAEP1RHpYBTpkYXRlCAAAAWiXUkMLEDpjaHVuay1zaWduYXR1cmUGACCt6Zy+uymwEK2SrLp/
zVBI
5eGn83jdBwCaRUBJA+eaDafqjqI=
```

   To see the transcription results, decode the raw bytes using event stream encoding.

```
:content-type: "application/vnd.amazon.eventstream"
:event-type: "TranscriptEvent"
:message-type: "event"

{
    "Transcript":
        {
            "Results":
                [
                    results
                ]
        }
}
```

6. To end your stream, send an empty audio event to Amazon Transcribe. Create the audio event exactly like any other, except with an empty payload. Sign the event and include the signature in the `:chunk-signature` header, as follows:

```
:date: 2019-01-29T01:56:17.291Z
:chunk-signature: signature
```

Handling HTTP/2 streaming errors

If an error occurs when processing your media stream, Amazon Transcribe sends an exception response. The response is event stream encoded.

The response contains the standard prelude and the following headers:

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	16	application/json
11	:event-type	7	19	BadRequestException
13	:message-type	7	9	exception

When the exception response is decoded, it contains the following information:

```
:content-type: "application/vnd.amazon.eventstream"
:event-type: "BadRequestException"
:message-type: "exception"

Exception message
```

Setting up a WebSocket stream

The key components for a WebSocket protocol for streaming transcription requests with Amazon Transcribe are:

- The upgrade request. This contains the query parameters for your request, and a signature that Amazon Transcribe uses as a seed signature to sign the data frames.
- One or more message frames in event stream encoding that contain metadata and raw audio bytes.
- An end frame. This is a signed message in event stream encoding with an empty body.

Note

Amazon Transcribe only supports one stream per WebSocket session. If you attempt to use multiple streams, your transcription request fails.

1. Attach the following policy to the IAM role that makes the request. See Adding IAM policies for more information.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "my-transcribe-websocket-policy",
            "Effect": "Allow",
            "Action": "transcribe:StartStreamTranscriptionWebSocket",
            "Resource": "*"
        }
    ]
}
```

2. To start the session, create a presigned URL in the following format. Line breaks have been added for readability.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=access-key%2FYYYYMMDD%2Fus-west-2%2Ftranscribe%2Faws4_request
```

```
&X-Amz-Date=YYYYMMDDTHHMMSSZ
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
```

Note

The maximum value for `X-Amz-Expires` is 300 (5 minutes).

Additional operations and parameters are listed in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

To construct the URL for your request and create the Signature Version 4 signature, refer to the following steps. Examples are in pseudocode.

a. Create a canonical request. A canonical request is a string that includes information from your request in a standardized format. This ensures that when AWS receives the request, it can calculate the same signature you created for your URL. For more information, see Create a Canonical Request for Signature Version 4.

```
# HTTP verb
method = "GET"
# Service name
service = "transcribe"
# Region
region = "us-west-2"
# Amazon Transcribe streaming endpoint
endpoint = "wss://transcribestreaming.us-west-2.amazonaws.com:8443"
# Host
host = "transcribestreaming.us-west-2.amazonaws.com:8443"
# Date and time of request
amz-date = YYYYMMDDTHHMMSSZ
# Date without time for credential scope
datestamp = YYYYMMDD
```

b. Create a canonical URI, which is the part of the URI between the domain and the query string.

```
canonical_uri = "/stream-transcription-websocket"
```

c. Create the canonical headers and signed headers. Note the trailing \n in the canonical headers.

- Append the lowercase header name followed by a colon (:).
- Append a comma-separated list of values for that header. Do not sort values in headers that have multiple values.
- Append a new line (\n).

```
canonical_headers = "host:" + host + "\n"
signed_headers = "host"
```

d. Match the algorithm to the hashing algorithm. Use `SHA-256`.

```
algorithm = "AWS4-HMAC-SHA256"
```

e. Create the credential scope, which scopes the derived key to the date, AWS Region, and service. For example, `*20220127*/*us-west-2*/transcribe/aws4_request`.

```
credential_scope = datestamp + "/" + region + "/" + service + "/" + 
 "aws4_request"
```

f. Create the canonical query string. Query string values must be URI-encoded and sorted by name.

- Sort the parameter names by character code point in ascending order. Parameters with duplicate names should be sorted by value. For example, a parameter name that begins with the uppercase letter F precedes a parameter name that begins with the lowercase letter b.
- Do not URI-encode any of the unreserved characters that RFC 3986 defines: A-Z, a-z, 0-9, hyphen (-), underscore (_), period (.), and tilde (~).
- Percent-encode all other characters with %XY, where X and Y are hexadecimal characters (0-9 and uppercase A-F). For example, the space character must be encoded

as %20 (don't include '+', as some encoding schemes do); extended UTF-8 characters must be in the form %XY%ZA%BC.

- Double-encode any equals (=) characters in parameter values.

```
canonical_querystring  = "X-Amz-Algorithm=" + algorithm
canonical_querystring += "&X-Amz-Credential="+ URI-encode(access key + "/" +
 credential_scope)
canonical_querystring += "&X-Amz-Date=" + amz_date
canonical_querystring += "&X-Amz-Expires=300"
canonical_querystring += "&X-Amz-Security-Token=" + token
canonical_querystring += "&X-Amz-SignedHeaders=" + signed_headers
canonical_querystring += "&language-code=en-US&media-encoding=flac&sample-
rate=16000"
```

g. Create a hash of the payload. For a GET request, the payload is an empty string.

```
payload_hash = HashSHA256(("").Encode("utf-8")).HexDigest()
```

h. Combine the following elements to create the canonical request.

```
canonical_request = method + '\n'
   + canonical_uri + '\n'
   + canonical_querystring + '\n'
   + canonical_headers + '\n'
   + signed_headers + '\n'
   + payload_hash
```

3. Create the string to sign, which contains meta information about your request. You use the string to sign in the next step when you calculate the request signature. For more information, see Create a String to Sign for Signature Version 4.

```
string_to_sign=algorithm + "\n"
   + amz_date + "\n"
   + credential_scope + "\n"
   + HashSHA256(canonical_request.Encode("utf-8")).HexDigest()
```

4. Calculate the signature. To do this, derive a signing key from your AWS secret access key. For a greater degree of protection, the derived key is specific to the date, service, and AWS Region. Use this derived key to sign the request. For more information, see Calculate the Signature for AWS Signature Version 4.

Make sure you implement the `GetSignatureKey` function to derive your signing key. If you have not yet derived a signing key, refer to Examples of how to derive a signing key for Signature Version 4.

```
#Create the signing key
signing_key = GetSignatureKey(secret_key, datestamp, region, service)

# Sign the string_to_sign using the signing key
signature = HMAC.new(signing_key, (string_to_sign).Encode("utf-8"),
 Sha256()).HexDigest
```

The function `HMAC(key, data)` represents an HMAC-SHA256 function that returns results in binary format.

5. Add signing information to the request and create the request URL.

   After you calculate the signature, add it to the query string. For more information, see Add the Signature to the Request.

   First, add the authentication information to the query string.

   ```
   canonical_querystring += "&X-Amz-Signature=" + signature
   ```

   Second, create the URL for the request.

   ```
   request_url = endpoint + canonical_uri + "?" + canonical_querystring
   ```

   Use the request URL with your WebSocket library to make the request to Amazon Transcribe.

6. The request to Amazon Transcribe must include the following headers. Typically these headers are managed by your WebSocket client library.

   ```
   Host: transcribestreaming.us-west-2.amazonaws.com:8443
   Connection: Upgrade
   Upgrade: websocket
   Origin: URI-of-WebSocket-client
   Sec-WebSocket-Version: 13
   Sec-WebSocket-Key: randomly-generated-string
   ```

7. When Amazon Transcribe receives your WebSocket request, it responds with a WebSocket upgrade response. Typically your WebSocket library manages this response and sets up a socket for communications with Amazon Transcribe.

   The following is the response from Amazon Transcribe. Line breaks have been added for readability.

```
HTTP/1.1 101 WebSocket Protocol Handshake

Connection: upgrade
Upgrade: websocket
websocket-origin: wss://transcribestreaming.us-west-2.amazonaws.com:8443
websocket-location: transcribestreaming.us-west-2.amazonaws.com:8443/stream-
transcription-websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-west-2%2Ftranscribe
%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&language-code=en-US
&session-id=String
&media-encoding=flac
&sample-rate=16000
x-amzn-RequestId: RequestId
Strict-Transport-Security: max-age=31536000
sec-websocket-accept: hash-of-the-Sec-WebSocket-Key-header
```

8. Make your WebSocket streaming request.

   After the WebSocket connection is established, the client can start sending a sequence of audio frames, each encoded using event stream encoding.

   Each data frame contains three headers combined with a chunk of raw audio bytes; the following table describes these headers.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	24	application/ octet-stream
11	:event-type	7	10	AudioEvent
13	:message-type	7	5	event

9. To end the data stream, send an empty audio chunk in an event stream encoded message.

   The response contains event stream encoded raw bytes in the payload. It contains the standard prelude and the following headers.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	16	application/ json
11	:event-type	7	15	TranscriptEvent
13	:message-type	7	5	event

   When you decode the binary response, you end up with a JSON structure containing the transcription results.

Handling WebSocket streaming errors

If an exception occurs while processing your request, Amazon Transcribe responds with a terminal WebSocket frame containing an event stream encoded response. This response contains the headers described in the following table; the body of the response contains a descriptive error message. After sending the exception response, Amazon Transcribe sends a close frame.

Header name byte length	Header name (string)	Header value type	Value string byte length	Value string (UTF-8)
13	:content-type	7	16	application/json
15	:exception-type	7	varies	varies, see below
13	:message-type	7	9	exception

The `exception-type` header contains one of the following values:

- **`BadRequestException`**: There was a client error when the stream was created, or an error occurred while streaming data. Make sure that your client is ready to accept data and try your request again.
- **`InternalFailureException`**: Amazon Transcribe had a problem during the handshake with the client. Try your request again.
- **`LimitExceededException`**: The client exceeded the concurrent stream limit. For more information, see Amazon Transcribe Limits. Reduce the number of streams that you're transcribing.
- **`UnrecognizedClientException`**: The WebSocket upgrade request was signed with an incorrect access key or secret key. Make sure you're correctly creating the access key and try your request again.

Amazon Transcribe can also return any of the common service errors. For a list, see Common Errors.

Event stream encoding

Amazon Transcribe uses a format called event stream encoding for streaming transcriptions.

Event stream encoding provides bidirectional communication between a client and a server. Data frames sent to the Amazon Transcribe streaming service are encoded in this format. The response from Amazon Transcribe also uses this encoding.

Each message consists of two sections: the prelude and the data. The prelude consists of:

1. The total byte length of the message
2. The combined byte length of all headers

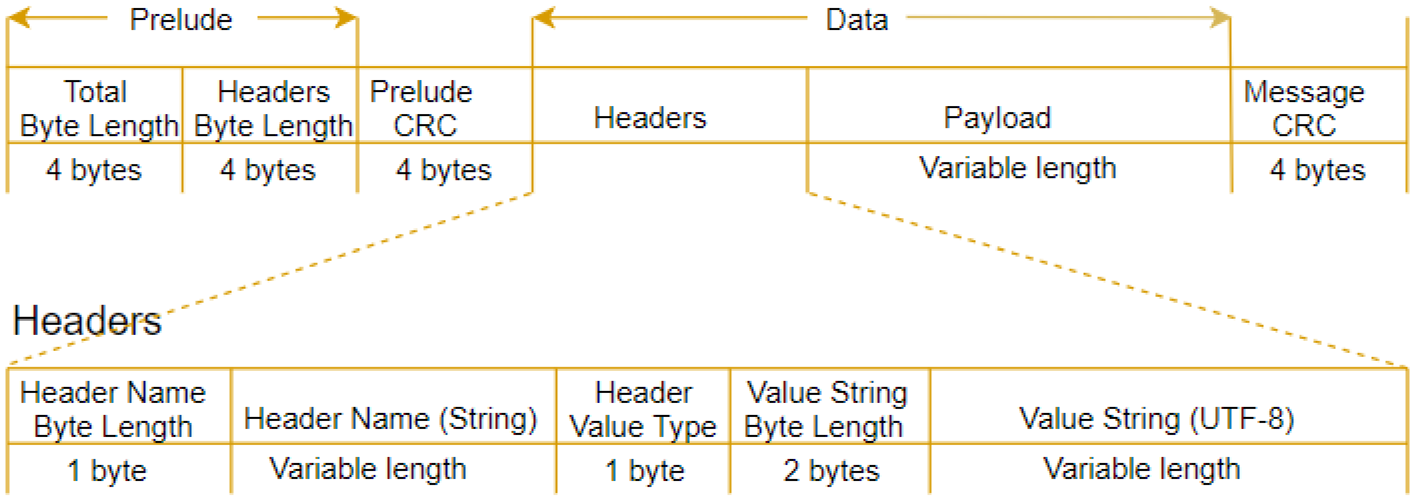
The data section consists of:

1. Headers
2. Payload

Each section ends with a 4-byte big-endian integer cyclic redundancy check (CRC) checksum. The message CRC checksum is for both the prelude section and the data section. Amazon Transcribe uses CRC32 (often referred to as GZIP CRC32) to calculate both CRCs. For more information about CRC32, see *GZIP file format specification version 4.3*.

Total message overhead, including the prelude and both checksums, is 16 bytes.

The following diagram shows the components that make up a message and a header. There are multiple headers per message.



Each message contains the following components:

- **Prelude**: Consists of two, 4-byte fields, for a fixed total of 8 bytes.
    - *First 4 bytes*: The big-endian integer byte-length of the entire message, inclusive of this 4-byte length field.
    - *Second 4 bytes*: The big-endian integer byte-length of the 'headers' portion of the message, excluding the 'headers' length field itself.
- **Prelude CRC**: The 4-byte CRC checksum for the prelude portion of the message, excluding the CRC itself. The prelude has a separate CRC from the message CRC. That ensures that Amazon Transcribe can detect corrupted byte-length information immediately without causing errors, such as buffer overruns.

- **Headers**: Metadata annotating the message; for example, message type and content type. Messages have multiple headers, which are key:value pairs, where the key is a UTF-8 string. Headers can appear in any order in the 'headers' portion of the message, and each header can appear only once.
- **Payload**: The audio content to be transcribed.
- **Message CRC**: The 4-byte CRC checksum from the start of the message to the start of the checksum. That is, everything in the message except the CRC itself.

The header frame is the authorization frame for the streaming transcription. Amazon Transcribe uses the authorization header's value as the seed for generating a chain of authorization headers for the data frames in the request.

Each header contains the following components; there are multiple headers per frame.

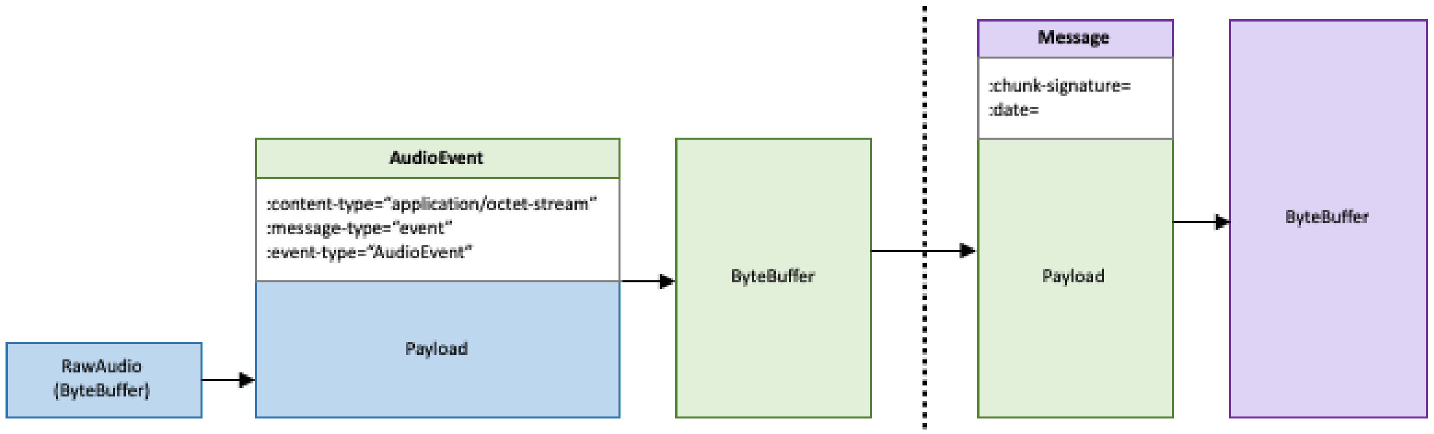
- **Header name byte-length**: The byte-length of the header name.
- **Header name**: The name of the header that indicates the header type. For valid values, see the following frame descriptions.
- **Header value type**: A number indicating the header value. The following list shows the possible values for the header and what they indicate.
  - `0` – TRUE
  - 1 – FALSE
  - 2 – BYTE
  - 3 – SHORT
  - 4 – INTEGER
  - 5 – LONG
  - 6 – BYTE ARRAY
  - 7 – STRING
  - 8 – TIMESTAMP
  - 9 – UUID
- **Value string byte length**: The byte length of the header value string.
- **Header value**: The value of the header string. Valid values for this field depend on the type of header. See Setting up an HTTP/2 stream or Setting up a WebSocket stream for more information.

Data frames

Each streaming request contains one or more data frames. There are two steps to creating a data frame:

1. Combine raw audio data with metadata to create the payload of your request.
2. Combine the payload with a signature to form the event message that is sent to Amazon Transcribe.

The following diagram shows how this works.



Job queueing

Using job queueing, you can submit more transcription job requests than can be concurrently processed. Without job queueing, once you reach the quota of allowed concurrent requests, you must wait until one or more requests are completed before submitting a new request.

Job queueing is optional for both transcription job and post-call analytics job requests.

If you enable job queueing, Amazon Transcribe creates a queue that contains all requests that exceed your limit. As soon as a request is completed, a new request is pulled from your queue and processed. Queued requests are processed in a FIFO (first in, first out) order.

You can add up to 10,000 jobs to your queue. If you exceed this limit, you get a `LimitExceededConcurrentJobException` error. To maintain optimal performance, Amazon Transcribe only uses up to 90 percent of your quota (a bandwidth ratio of 0.9) to process queued jobs. Note that these are default values that can be increased upon request.

Tip

You can find a list of default limits and quotas for Amazon Transcribe resources in the AWS General Reference. Some of these defaults can be increased upon request.

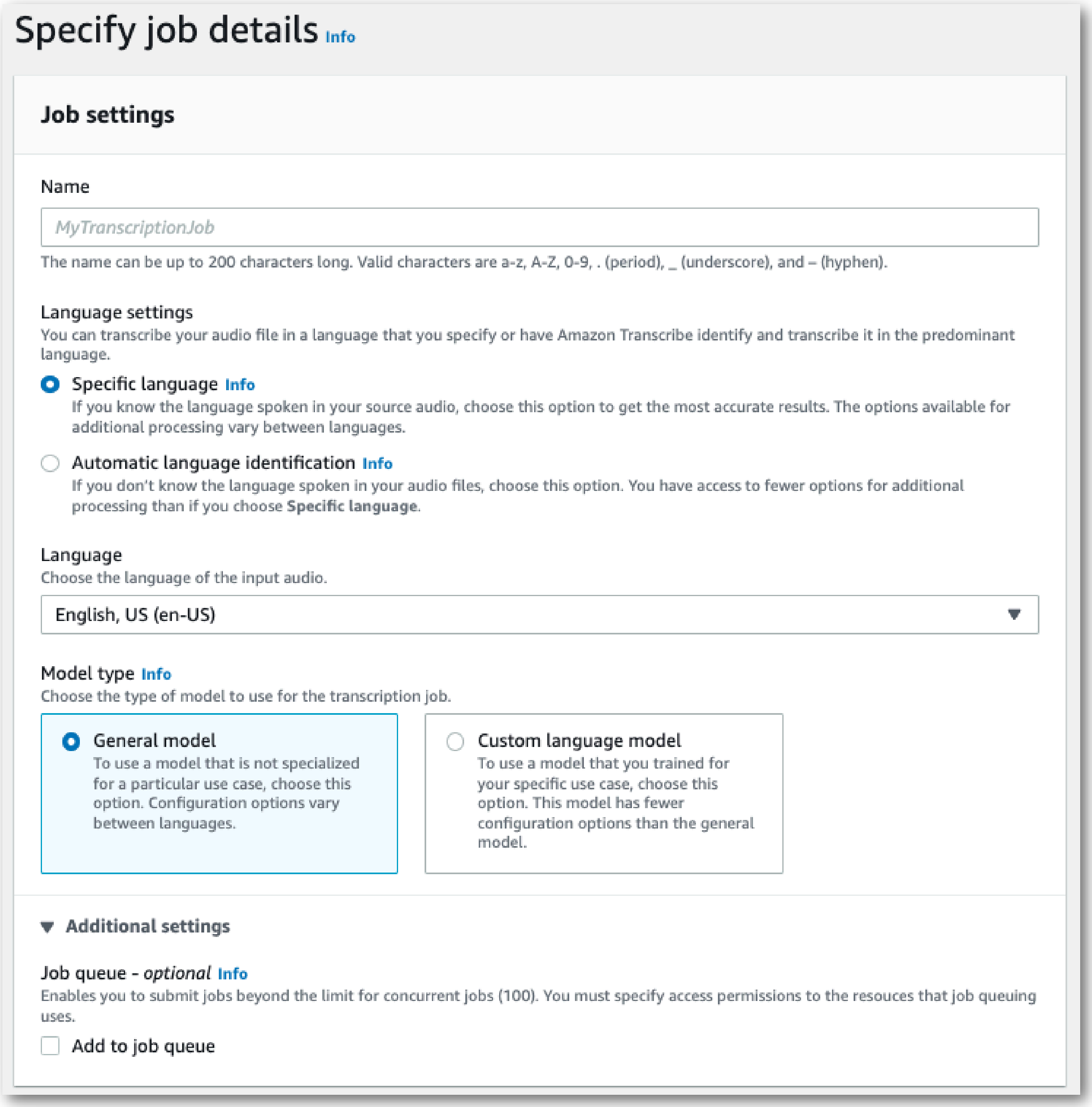
If you enable job queueing but don't exceed the quota for concurrent requests, all requests are processed concurrently.

Enabling job queueing

You can enable job queueing using the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples; see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.
3. In the **Job Settings** box, there is an **Additional settings** panel. If you expand this panel, you can select the **Add to job queue** box to enable job queueing.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info
If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

Choose the language of the input audio.

English, US (en-US)

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model]
To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model
To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Additional settings

Job queue - *optional* Info

Enables you to submit jobs beyond the limit for concurrent jobs (100). You must specify access permissions to the resouces that job queuing uses.

☐ Add to job queue

4. Fill in any other fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional* page**.

5. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `job-execution-settings` parameter with the `AllowDeferredExecution` sub-parameter. Note that when you include `AllowDeferredExecution` in your request, you must also include `DataAccessRoleArn`.

For more information, see `StartTranscriptionJob` and `JobExecutionSettings`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--job-execution-settings
 AllowDeferredExecution=true,DataAccessRoleArn=arn:aws:iam::111122223333:role/
ExampleRole
```

Here's another example using the start-transcription-job command, and a request body that enables queueing.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-queueing-request.json
```

The file *my-first-queueing-request.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "JobExecutionSettings": {
        "AllowDeferredExecution": true,
        "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole"
  }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to enable job queueing using the `AllowDeferredExecution` argument for the start_transcription_job method. Note that when you include `AllowDeferredExecution` in your request, you must also include `DataAccessRoleArn`. For more information, see `StartTranscriptionJob` and `JobExecutionSettings`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-queueing-request"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    JobExecutionSettings = {
        'AllowDeferredExecution': True,
        'DataAccessRoleArn': 'arn:aws:iam::111122223333:role/ExampleRole'
   }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

You can view the progress of a queued job via the AWS Management Console or by submitting a `GetTranscriptionJob` request. When a job is queued, the `Status` is QUEUED. The status changes to `IN_PROGRESS` once your job starts processing, then changes to `COMPLETED` or `FAILED` when processing is finished.

Tagging resources

A tag is a custom metadata label that you can add to a resource to make it easier to identify, organize, and find in a search. Tags are comprised of two individual parts: A tag key and a tag value. This is referred to as a key:value pair.

A tag key typically represents a larger category, while a tag value represents a subset of that category. For example you could have *tag key=Color* and *tag value=Blue*, which would produce the key:value pair `Color:Blue`. Note that you can set the value of a tag to an empty string, but you can't set the value of a tag to null. Omitting the tag value is the same as using an empty string.

Tip

AWS Billing and Cost Management can use tags to separate your bills into dynamic categories. For example, if you add tags to represent different departments within your company, such as `Department:Sales` or `Department:Legal`, AWS can provide you with your cost distribution per department.

In Amazon Transcribe, you can tag the following resources:

- Transcription jobs
- Medical transcription jobs
- Call analytics post call transcription jobs
- Custom vocabularies
- Custom medical vocabularies
- Custom vocabulary filters
- Call analytics categories
- Custom language models

Tag keys can be up to 128 characters in length and tag values can be up to 256 characters in length; both are case sensitive. Amazon Transcribe supports up to 50 tags per resource. For a given resource, each tag key must be unique with only one value. Note that your tags cannot begin with `aws:` because AWS reserves this prefix for system-generated tags. You cannot add, modify, or delete `aws:*` tags, and they don't count against your tags-per-resource limit.

API operations specific to resource tagging

`ListTagsForResource`, `TagResource`, `UntagResource`
To use the tagging APIs, you must include an Amazon Resource Name (ARN) with your request. ARNs have the format `arn:partition:service:region:account-id:resource-type/resource-id`. For example, the ARN associated with a transcription job may look like: `arn:aws:transcribe:us-west-2:111122223333:transcription-job/my-transcription-job-name`.

To learn more about tagging, including best practices, see Tagging AWS resources.

Tag-based access control

You can use tags to control access within your AWS accounts. For tag-based access control, you provide tag information in the condition element of an IAM policy. You can then use tags and their associated tag condition key to control access to:

- **Resources:** Control access to your Amazon Transcribe resources based on the tags you've assigned to those resources.
  - Use the `aws:ResourceTag/key-name` condition key to specify which tag key:value pair must be attached to the resource.
- **Requests:** Control which tags can be passed in a request.
  - Use the `aws:RequestTag/key-name` condition key to specify which tags can be added, modified, or removed from an IAM user or role.
- **Authorization processes:** Control tag-based access for any part of your authorization process.
  - Use the `aws:TagKeys/` condition key to control whether specific tag keys can be used on a resource, in a request, or by a principal. In this case, the key value doesn't matter.

For an example tag-based access control policy, see Viewing transcription jobs based on tags.

For more detailed information on tag-based access control, see Controlling access to AWS resources using tags.

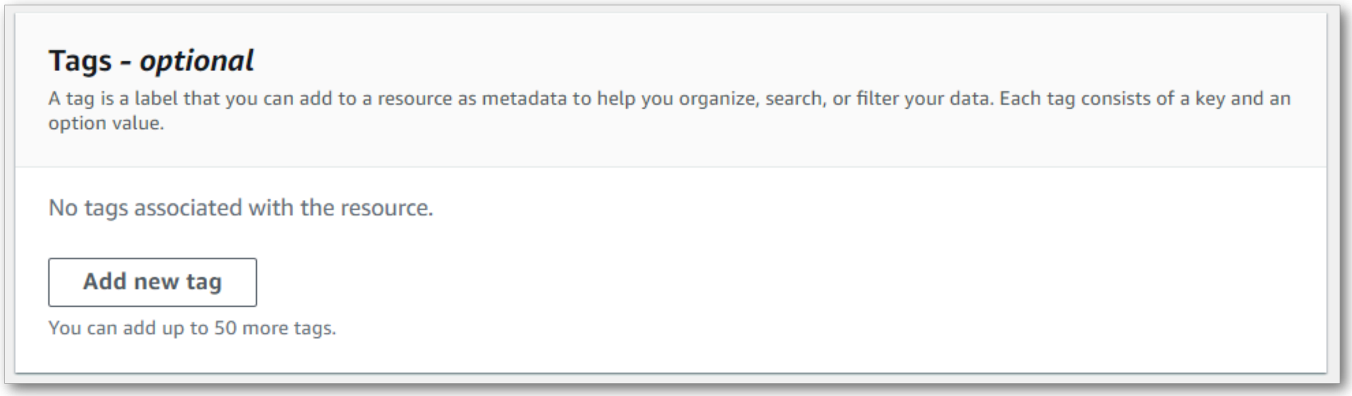
Adding tags to your Amazon Transcribe resources

You can add tags before or after you run your Amazon Transcribe job. Using the existing **Create*** and **Start*** APIs, you can add add tags with your transcription request.

You can add, modify or delete tags using the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.
3. Scroll to the bottom of the **Specify job details** page to find the **Tags - *optional*** box and select **Add new tag**.



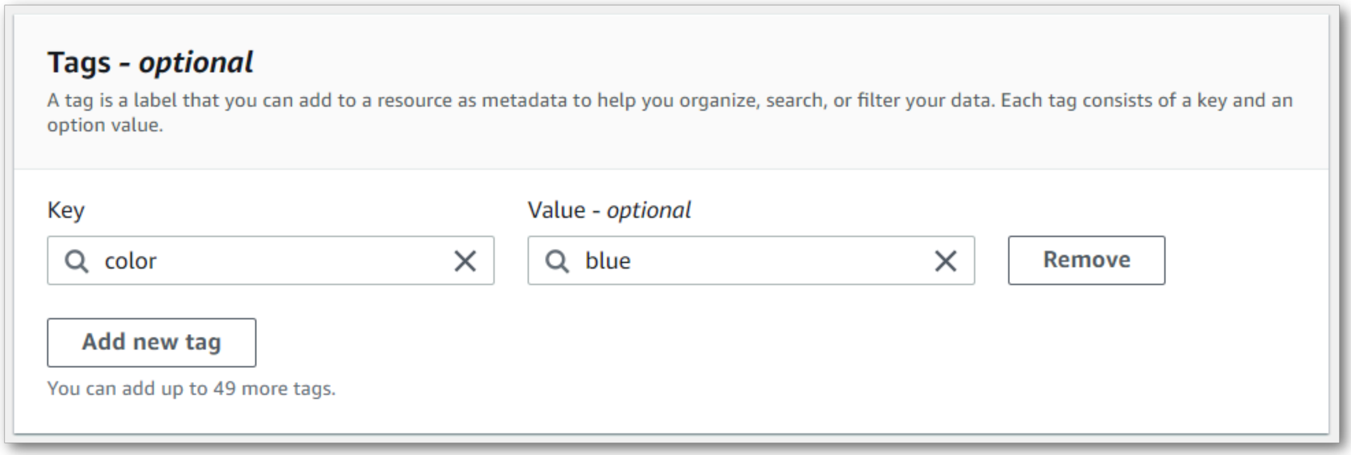
Tags - *optional*

A tag is a label that you can add to a resource as metadata to help you organize, search, or filter your data. Each tag consists of a key and an option value.

No tags associated with the resource.

You can add up to 50 more tags.

4. Enter information for the **Key** field and, optionally, the **Value** field.



Tags - *optional*

A tag is a label that you can add to a resource as metadata to help you organize, search, or filter your data. Each tag consists of a key and an option value.

Key: color

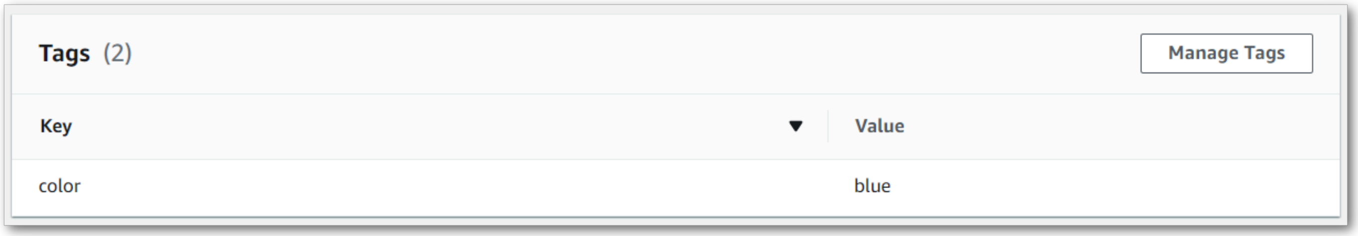
Value - *optional*: blue

You can add up to 49 more tags.

5. Fill in any other fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional* page.**

   Select **Create job** to run your transcription job.

6. You can view the tags associated with a transcription job by navigating to the **Transcription jobs** page, selecting a transcription job, and scrolling to the bottom of that job's information page. If you want to edit your tags, you can do so by selecting **Manage tags**.



Key	Value
color	blue

AWS CLI

This example uses the start-transcription-job command and Tags parameter. For more information, see StartTranscriptionJob and Tag.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--tags Key=color,Value=blue Key=shape,Value=square
```

Here's another example using the start-transcription-job command, and a request body that adds tags to that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-tagging-job.json
```

The file *my-first-tagging-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "Tags": [
        {
           "Key": "color",
           "Value": "blue"
        },
        {
           "Key": "shape",
           "Value": "square"
        }
  ]
}
```

AWS SDK for Python (Boto3)

The following example uses the AWS SDK for Python (Boto3) to add a tag by using the `Tags` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `Tag`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Tags = [
        {
            'Key':'color',
            'Value':'blue'
        }
    ]
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Partitioning speakers (diarization)

With speaker diarization, you can distinguish between different speakers in your transcription output. Amazon Transcribe can differentiate between a maximum of 30 unique speakers and labels the text from each unique speaker with a unique value (`spk_0` through `spk_9`).

In addition to the standard transcript sections (`transcripts` and `items`), requests with speaker partitioning enabled include a `speaker_labels` section. This section is grouped by speaker and contains information on each utterance, including speaker label and timestamps.

```
"speaker_labels": {
    "channel_label": "ch_0",
    "speakers": 2,
    "segments": [
         {
            "start_time": "4.87",
            "speaker_label": "spk_0",
            "end_time": "6.88",
            "items": [
                {
                    "start_time": "4.87",
                    "speaker_label": "spk_0",
                    "end_time": "5.02"
                },
        ...
        {
            "start_time": "8.49",
            "speaker_label": "spk_1",
            "end_time": "9.24",
            "items": [
                {
                    "start_time": "8.49",
                    "speaker_label": "spk_1",
                    "end_time": "8.88"
                },
```

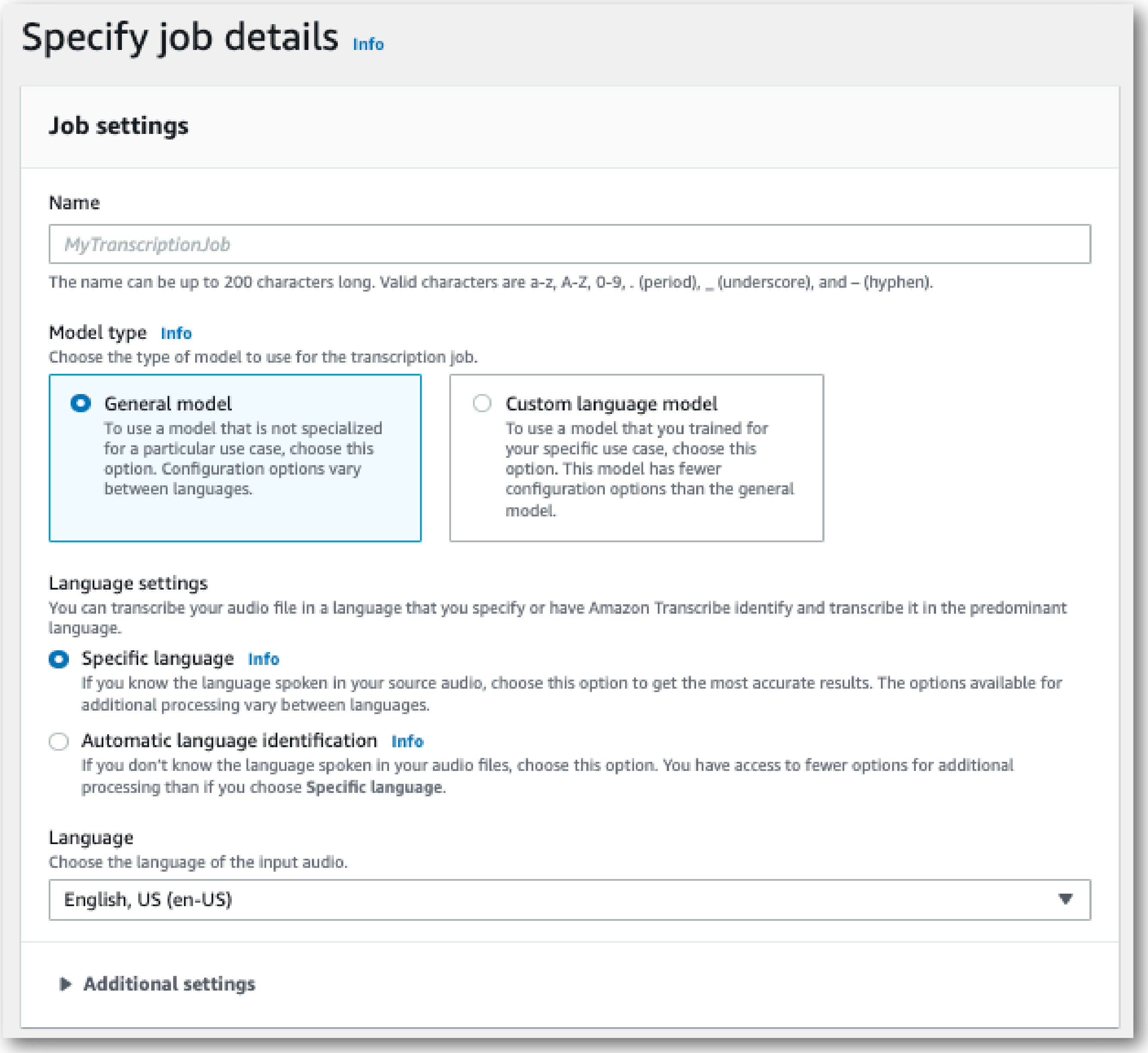
To view a complete example transcript with speaker partitioning (for two speakers), see Example diarization output (batch).

Partitioning speakers in a batch transcription

To partition speakers in a batch transcription, see the following examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

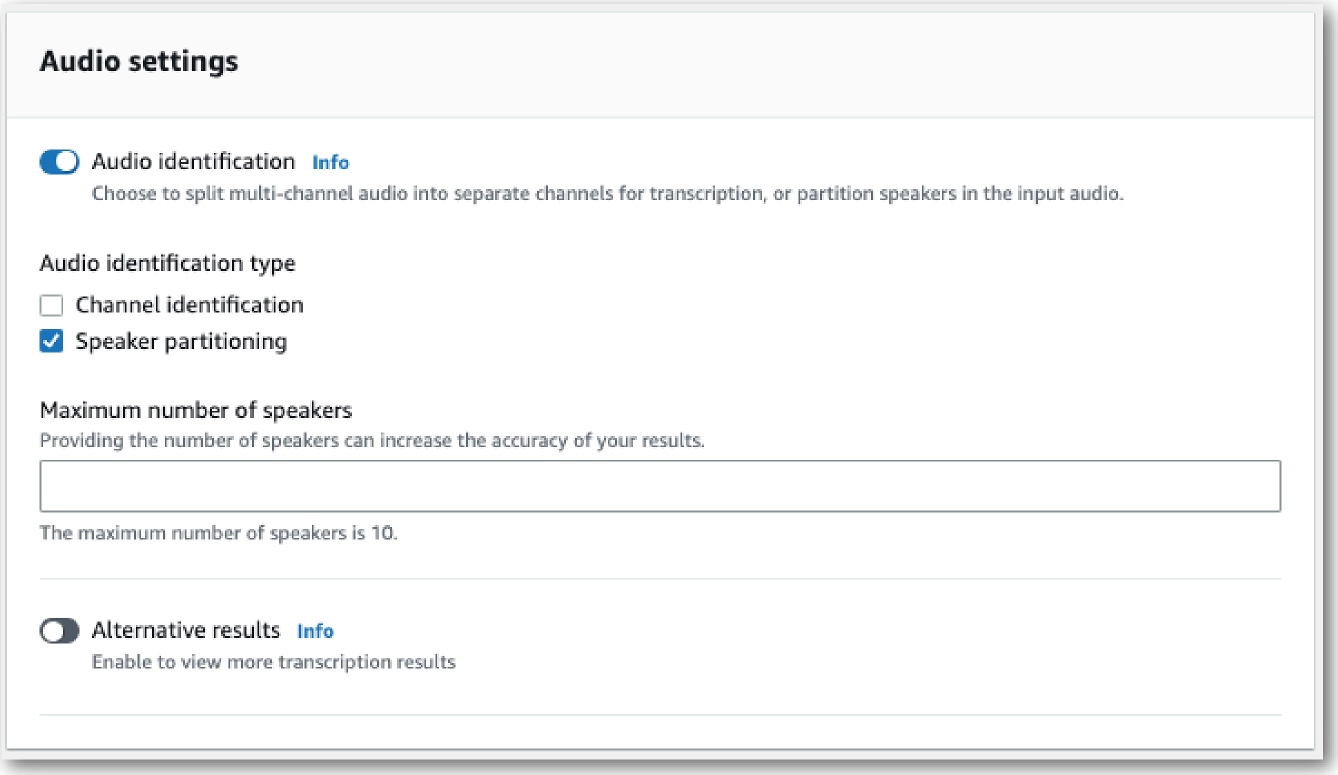
Language

Choose the language of the input audio.

English, US (en-US)

3. Fill in any fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional*** page.

   To enable speaker partitioning, in **Audio settings**, choose **Audio identification**. Then choose **Speaker partitioning** and specify the number of speakers.



Audio settings

Audio identification
Choose to split multi-channel audio into separate channels for transcription, or partition speakers in the input audio.

Audio identification type
☐ Channel identification
☑ Speaker partitioning

Maximum number of speakers
Providing the number of speakers can increase the accuracy of your results.

The maximum number of speakers is 10.

Alternative results
Enable to view more transcription results

4. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job. For more information, see `StartTranscriptionJob`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--settings ShowSpeakerLabels=true,MaxSpeakerLabels=3
```

Here's another example using the start-transcription-job command, and a request body that enables speaker partitioning with that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-transcription-job.json
```

The file *my-first-transcription-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "ShowSpeakerLabels": 'TRUE',
  "MaxSpeakerLabels": 3
 }
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to identify channels using the start_transcription_job method. For more information, see StartTranscriptionJob.

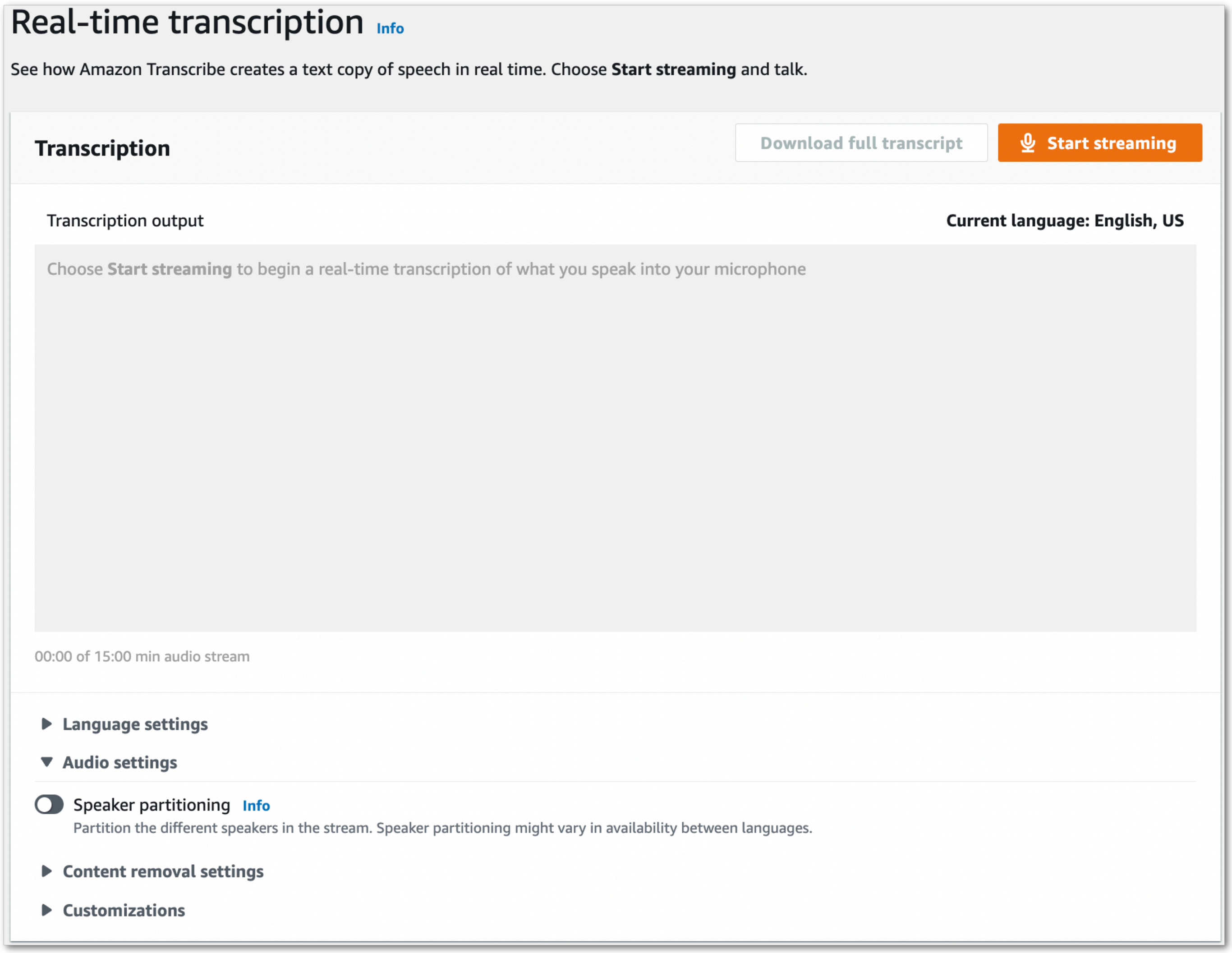
```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Settings = {
        'ShowSpeakerLabels': True,
        'MaxSpeakerLabels': 3
    }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Partitioning speakers in a streaming transcription

To partition speakers in a streaming transcription, see the following examples:

Streaming transcriptions

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Audio settings** and expand this field if it is minimized.



Real-time transcription

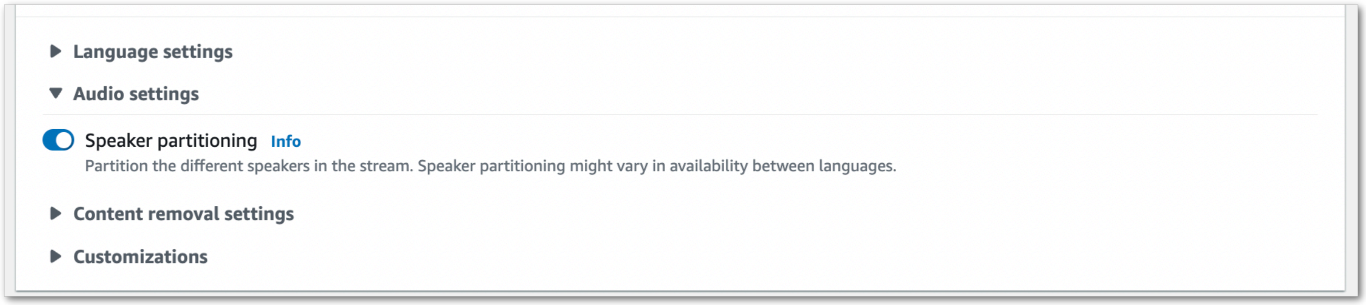
See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

Transcription
Download full transcript
Start streaming
Transcription output
Current language: English, US
Choose Start streaming to begin a real-time transcription of what you speak into your microphone
00:00 of 15:00 min audio stream
Language settings
Audio settings
Speaker partitioning Info

Partition the different speakers in the stream. Speaker partitioning might vary in availability between languages.

Content removal settings
Customizations

3. Toggle on **Speaker partitioning**.



Partition the different speakers in the stream. Speaker partitioning might vary in availability between languages.

4. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

HTTP/2 stream

This example creates an HTTP/2 request that partitions speakers in your transcription output. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see StartStreamTranscription.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-show-speaker-label: true
transfer-encoding: chunked
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that separates speakers in your transcription output. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
```

```
&language-code=en-US
&specialty=PRIMARYCARE
&type=DICTATION
&media-encoding=flac
&sample-rate=16000
&show-speaker-label=true
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Example diarization output (batch)

Here's an output example for a batch transcription with diarization enabled.

```
{
    "jobName": "my-first-transcription-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "I've been on hold for an hour. Sorry about that."
            }
        ],
        "speaker_labels": {
            "channel_label": "ch_0",
            "speakers": 2,
            "segments": [
                {
                    "start_time": "4.87",
                    "speaker_label": "spk_0",
                    "end_time": "6.88",
                    "items": [
                        {
                            "start_time": "4.87",
                            "speaker_label": "spk_0",
                            "end_time": "5.02"
                        },
                        {
                            "start_time": "5.02",
                            "speaker_label": "spk_0",
                            "end_time": "5.17"
                        },
                        {
```

```
                        "start_time": "5.17",
                        "speaker_label": "spk_0",
                        "end_time": "5.29"
                    },
                    {
                        "start_time": "5.29",
                        "speaker_label": "spk_0",
                        "end_time": "5.64"
                    },
                    {
                        "start_time": "5.64",
                        "speaker_label": "spk_0",
                        "end_time": "5.84"
                    },
                    {
                        "start_time": "6.11",
                        "speaker_label": "spk_0",
                        "end_time": "6.26"
                    },
                    {
                        "start_time": "6.26",
                        "speaker_label": "spk_0",
                        "end_time": "6.88"
                    }
                ]
            },
            {
                "start_time": "8.49",
                "speaker_label": "spk_1",
                "end_time": "9.24",
                "items": [
                    {
                        "start_time": "8.49",
                        "speaker_label": "spk_1",
                        "end_time": "8.88"
                    },
                    {
                        "start_time": "8.88",
                        "speaker_label": "spk_1",
                        "end_time": "9.05"
                    },
                    {
                        "start_time": "9.05",
                        "speaker_label": "spk_1",
                        "end_time": "9.24"
                    }
                ]
            }
        ]
    },
    "items": [
        {
            "id": 0,
            "start_time": "4.87",
            "speaker_label": "spk_0",
            "end_time": "5.02",
            "alternatives": [
                {
                    "confidence": "1.0",
                    "content": "I've"
                }
            ],
            "type": "pronunciation"
        },
        {
            "id": 1,
            "start_time": "5.02",
            "speaker_label": "spk_0",
            "end_time": "5.17",
            "alternatives": [
                {
                    "confidence": "1.0",
                    "content": "been"
                }
            ],
            "type": "pronunciation"
        },
        {
            "id": 2,
            "start_time": "5.17",
            "speaker_label": "spk_0",
            "end_time": "5.29",
            "alternatives": [
                {
                    "confidence": "1.0",
                    "content": "on"
                }
            ],
                "type": "pronunciation"
            },
            {
                "id": 3,
                "start_time": "5.29",
                "speaker_label": "spk_0",
                "end_time": "5.64",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "hold"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 4,
                "start_time": "5.64",
                "speaker_label": "spk_0",
                "end_time": "5.84",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "for"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 5,
                "start_time": "6.11",
                "speaker_label": "spk_0",
                "end_time": "6.26",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "an"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 6,
                "start_time": "6.26",
                    "speaker_label": "spk_0",
                    "end_time": "6.88",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "hour"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 7,
                    "speaker_label": "spk_0",
                    "alternatives": [
                        {
                            "confidence": "0.0",
                            "content": "."
                        }
                    ],
                    "type": "punctuation"
                },
                {
                    "id": 8,
                    "start_time": "8.49",
                    "speaker_label": "spk_1",
                    "end_time": "8.88",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "Sorry"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 9,
                    "start_time": "8.88",
                    "speaker_label": "spk_1",
                    "end_time": "9.05",
                    "alternatives": [
                        {
                            "confidence": "0.902",
                            "content": "about"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 10,
                    "start_time": "9.05",
                    "speaker_label": "spk_1",
                    "end_time": "9.24",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "that"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 11,
                    "speaker_label": "spk_1",
                    "alternatives": [
                        {
                            "confidence": "0.0",
                            "content": "."
                        }
                    ],
                    "type": "punctuation"
                }
            ],
            "audio_segments": [
                {
                    "id": 0,
                    "transcript": "I've been on hold for an hour.",
                    "start_time": "4.87",
                    "end_time": "6.88",
                    "speaker_label": "spk_0",
                    "items": [
                        0,
                        1,
                        2,
                        3,
                        4,
                        5,
                        6,
                        7
                    ]
                },
                {
                    "id": 1,
                    "transcript": "Sorry about that.",
                    "start_time": "8.49",
                    "end_time": "9.24",
                    "speaker_label": "spk_1",
                    "items": [
                        8,
                        9,
                        10,
                        11
                    ]
                }
            ]
        },
        "status": "COMPLETED"
    }
```

Transcribing multi-channel audio

If your audio has two channels, you can use channel identification to transcribe the speech from each channel separately. Amazon Transcribe doesn't currently support audio with more than two channels.

In your transcript, channels are assigned the labels `ch_0` and `ch_1`.

In addition to the standard transcript sections (`transcripts` and `items`), requests with channel identification enabled include a `channel_labels` section. This section contains each utterance or punctuation mark, grouped by channel, and its associated channel label, timestamps, and confidence score.

```
"channel_labels": {
    "channels": [
        {
            "channel_label": "ch_0",
            "items": [
                {
                    "channel_label": "ch_0",
                    "start_time": "4.86",
                    "end_time": "5.01",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "I've"
                        }
                    ],
                    "type": "pronunciation"
                },
                ...
            "channel_label": "ch_1",
            "items": [
                {
                    "channel_label": "ch_1",
                    "start_time": "8.5",
                    "end_time": "8.89",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "Sorry"
                        }
                    ],
                    "type": "pronunciation"
                },
                ...
            "number_of_channels": 2
        },
```

Note that if a person on one channel speaks at the same time as a person on a separate channel, timestamps for each channel overlap while the individuals are speaking over each other.

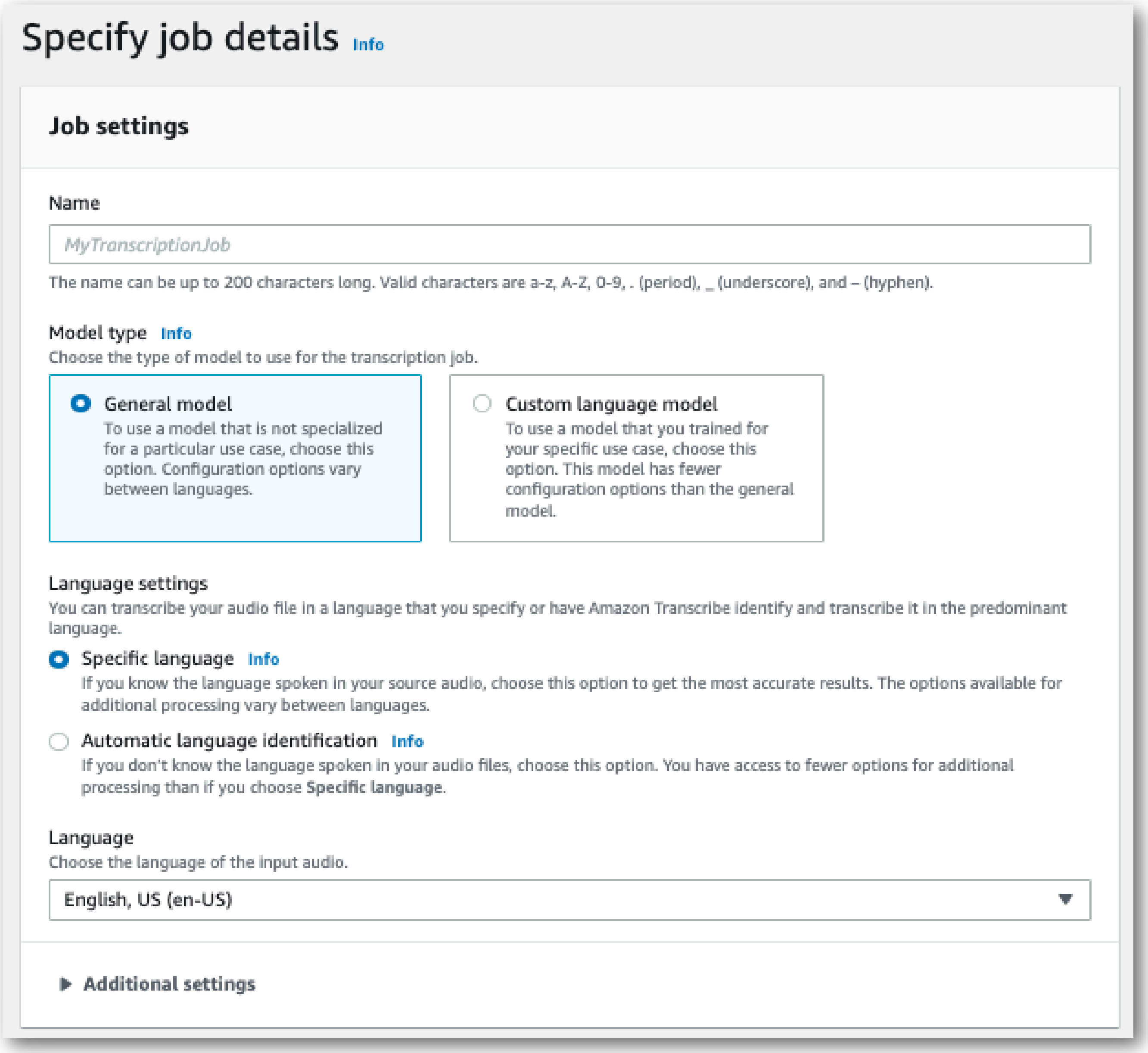
To view a complete example transcript with channel identification, see Example channel identification output (batch).

Using channel identification in a batch transcription

To identify channels in a batch transcription, you can use the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.


Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

- ● General model
  To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.
- ○ Custom language model
  To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

- ● Specific language Info
  If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.
- ○ Automatic language identification Info
  If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

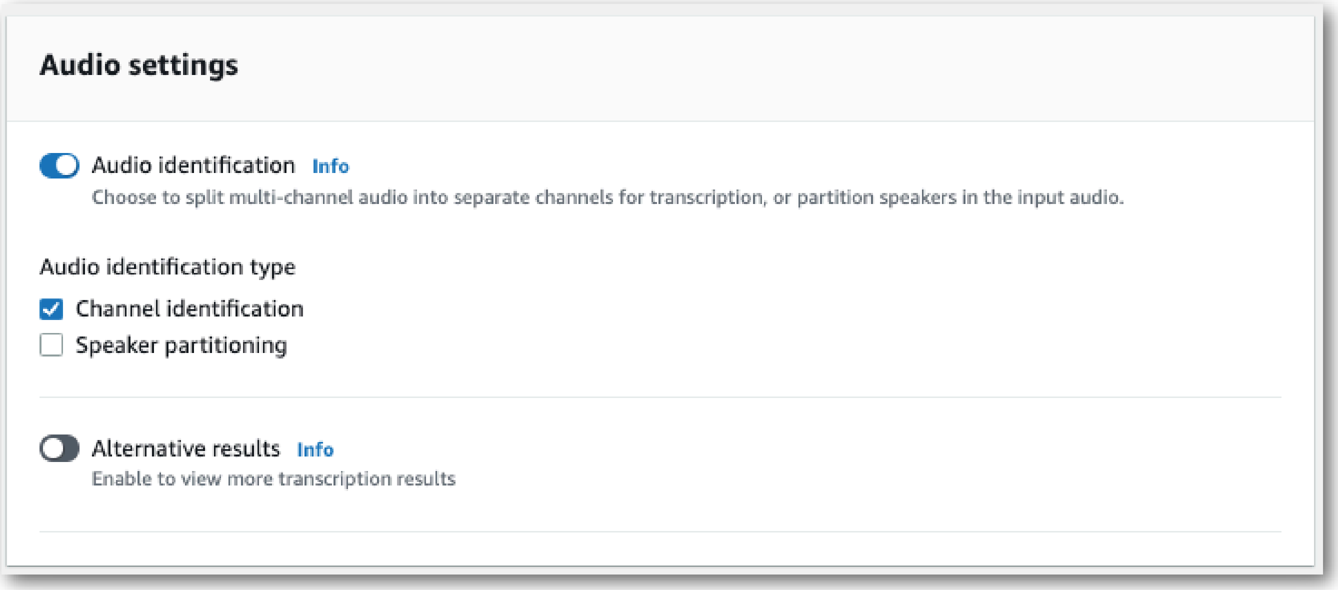
Choose the language of the input audio.

English, US (en-US)

▶ Additional settings

3. Fill in any fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional*** page.

   In the **Audio settings** panel, select **Channel identification** (under the 'Audio identification type' heading).


Audio settings

Audio identification

Choose to split multi-channel audio into separate channels for transcription, or partition speakers in the input audio.

Audio identification type

☑ Channel identification

☐ Speaker partitioning

Alternative results

Enable to view more transcription results

4. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job. For more information, see `StartTranscriptionJob`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--settings ChannelIdentification=true
```

Here's another example using the start-transcription-job command, and a request body that enables channel identification with that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-transcription-job.json
```

The file *my-first-transcription-job.json* contains the following request body.

```
{
    "TranscriptionJobName": "my-first-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
    "OutputBucketName": "amzn-s3-demo-bucket",
    "OutputKey": "my-output-files/",
    "LanguageCode": "en-US",
    "Settings": {
        "ChannelIdentification": true
    }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to identify channels using the start_transcription_job method. For more information, see StartTranscriptionJob.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Settings = {
        'ChannelIdentification':True
    }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
```

```
print(status)
```

Using channel identification in a streaming transcription

To identify channels in a streaming transcription, you can use **HTTP/2** or **WebSockets**; see the following for examples:

HTTP/2 stream

This example creates an HTTP/2 request that separates channels in your transcription output. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see StartStreamTranscription.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-channel-identification: TRUE
transfer-encoding: chunked
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that separates channels in your transcription output. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
```

```
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&language-code=en-US
&specialty=PRIMARYCARE
&type=DICTATION
&media-encoding=flac
&sample-rate=16000
&channel-identification=TRUE
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Example channel identification output (batch)

Here's an output example for a batch transcription with channel identification enabled.

```
{
    "jobName": "my-first-transcription-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "I've been on hold for an hour. Sorry about that."
            }
        ],
        "channel_labels": {
            "channels": [
                {
                    "channel_label": "ch_0",
                    "items": [
                        {
                            "channel_label": "ch_0",
                            "start_time": "4.86",
                            "end_time": "5.01",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "I've"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "5.01",
                            "end_time": "5.16",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "been"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "5.16",
                            "end_time": "5.28",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "on"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "5.28",
                            "end_time": "5.62",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "hold"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "5.62",
                            "end_time": "5.83",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "for"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "6.1",
                            "end_time": "6.25",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "an"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "start_time": "6.25",
                            "end_time": "6.87",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "hour"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_0",
                            "language_code": "en-US",
                            "alternatives": [
                                {
                                    "confidence": "0.0",
                                    "content": "."
                                }
                            ],
                            "type": "punctuation"
                        }
```

```
                    ]
                },
                {
                "channel_label": "ch_1",
                    "items": [
                        {
                            "channel_label": "ch_1",
                            "start_time": "8.5",
                            "end_time": "8.89",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "Sorry"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_1",
                            "start_time": "8.89",
                            "end_time": "9.06",
                            "alternatives": [
                                {
                                    "confidence": "0.9176",
                                    "content": "about"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_1",
                            "start_time": "9.06",
                            "end_time": "9.25",
                            "alternatives": [
                                {
                                    "confidence": "1.0",
                                    "content": "that"
                                }
                            ],
                            "type": "pronunciation"
                        },
                        {
                            "channel_label": "ch_1",
                            "alternatives": [
                                {
                                    "confidence": "0.0",
                                    "content": "."
                                }
                            ],
                            "type": "punctuation"
                        }
                    ]
                }
            ],
            "number_of_channels": 2
        },
        "items": [
            {
                "id": 0,
                "channel_label": "ch_0",
                "start_time": "4.86",
                "end_time": "5.01",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "I've"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 1,
                "channel_label": "ch_0",
                "start_time": "5.01",
                "end_time": "5.16",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "been"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 2,
                "channel_label": "ch_0",
                "start_time": "5.16",
                "end_time": "5.28",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "on"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 3,
                "channel_label": "ch_0",
                "start_time": "5.28",
                "end_time": "5.62",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "hold"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 4,
                "channel_label": "ch_0",
                "start_time": "5.62",
                "end_time": "5.83",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "for"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "id": 5,
                "channel_label": "ch_0",
                "start_time": "6.1",
                "end_time": "6.25",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "an"
                    }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 6,
                    "channel_label": "ch_0",
                    "start_time": "6.25",
                    "end_time": "6.87",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "hour"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 7,
                    "channel_label": "ch_0",
                    "alternatives": [
                        {
                            "confidence": "0.0",
                            "content": "."
                        }
                    ],
                    "type": "punctuation"
                },
                {
                    "id": 8,
                    "channel_label": "ch_1",
                    "start_time": "8.5",
                    "end_time": "8.89",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "Sorry"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 9,
                    "channel_label": "ch_1",
                    "start_time": "8.89",
                    "end_time": "9.06",
                    "alternatives": [
                        {
                            "confidence": "0.9176",
                            "content": "about"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 10,
                    "channel_label": "ch_1",
                    "start_time": "9.06",
                    "end_time": "9.25",
                    "alternatives": [
                        {
                            "confidence": "1.0",
                            "content": "that"
                        }
                    ],
                    "type": "pronunciation"
                },
                {
                    "id": 11,
                    "channel_label": "ch_1",
                    "alternatives": [
                        {
                            "confidence": "0.0",
                            "content": "."
                        }
                    ],
                    "type": "punctuation"
                }
            ],
            "audio_segments": [
                {
                    "id": 0,
                    "transcript": "I've been on hold for an hour.",
                    "start_time": "4.86",
                    "end_time": "6.87",
                    "channel_label": "ch_0",
                    "items": [
                        0,
                        1,
                        2,
                        3,
                        4,
                        5,
                        6,
                        7
                    ]
                },
                {
                    "id": 1,
                    "transcript": "Sorry about that.",
                    "start_time": "8.5",
                    "end_time": "9.25",
                    "channel_label": "ch_1",
                    "items": [
                        8,
                        9,
                        10,
                        11
                    ]
                }
            ]
        },
        "status": "COMPLETED"
    }
```

Identifying the dominant languages in your media

Amazon Transcribe is able to automatically identify the languages spoken in your media without you having to specify a language code.

Batch language identification can identify the dominant language spoken in your media file or, if your media contains multiple languages, it can identify all languages spoken. To improve language identification accuracy, you can optionally provide a list of two or more languages you think may be present in your media.

Streaming language identification can identify one language per channel (a maximum of two channels are supported) or, if your stream contains multiple languages, it can identify all languages spoken. Streaming requests must have a minimum of two additional language options included in your request. Providing language options allows for faster language identification. The faster Amazon Transcribe is able to identify the language, the less change there is of data loss in the first few seconds of your stream.

Important

Batch and streaming transcriptions support different languages. Refer to the **Data input** column in the supported languages table for details. Note that Swedish and Vietnamese are not currently supported with language identification.

To learn about monitoring and events with language identification, refer to Language identification events.

Language identification with batch transcription jobs

Use batch language identification to automatically identify the language, or languages, in your media file.

If your media contains only one language, you can enable single-language identification, which identifies the dominant language spoken in your media file and creates your transcript using only this language.

If your media contains more than one language, you can enable multi-language identification, which identifies all languages spoken in your media file and creates your transcript using each identified language. Note that a multi-lingual transcript is produced. You can use other services, such as Amazon Translate, to translate your transcript.

Refer to the supported languages table for a complete list of supported languages and associated language codes.

For best results, ensure that your media file contains at least 30 seconds of speech.

For usage examples with the AWS Management Console, AWS CLI, and AWS Python SDK, see Using language identification with batch transcriptions.

Identifying languages in multi-language audio

Multi-language identification is intended for multi-lingual media files, and provides you with a transcript that reflects all supported languages spoken in your media. This means that if speakers change languages mid-conversation, or if each participant is speaking a different language, your transcription output detects and transcribes each language correctly. For example, if your media contains a bilingual speaker who is alternating between US English (`en-US`) and Hindi (`hi-IN`), multi-language identification can identify and transcribe spoken US English as `en-US` and spoken Hindi as `hi-IN`.

This differs from single-language identification, where only one dominant language is used to create a transcript. In this case, any spoken language that is not the dominant language is transcribed incorrectly.

Note

Redaction and custom language models are not currently supported with multi-language identification.

Note

The following languages are currently supported with multi-language identification: en-AB, en-AU, en-GB, en-IE, en-IN, en-NZ, en-US, en-WL, en-ZA, es-ES, es-US, fr-CA, fr-FR, zh-CN, zh-TW, pt-BR, pt-PT, de-CH, de-DE, af-ZA, ar-AE, da-DK, he-IL, hi-IN, id-ID, fa-IR, it-IT, ja-JP, ko-KR, ms-MY, nl-NL, ru-RU, ta-IN, te-IN, th-TH, tr-TR

Multi-language transcripts provide a summary of detected languages and the total time that each language is spoken in your media. Here's an example:

```
"results": {
        "transcripts": [
            {
                "transcript": "welcome to Amazon transcribe. ## ## ###### ### #### ####
 ## #### ### ##################"
            }
        ],

    ...

        "language_codes": [
            {
                "language_code": "en-US",
                "duration_in_seconds": 2.45
            },
            {
                "language_code": "hi-IN",
                "duration_in_seconds": 5.325
            },
            {
                "language_code": "ja-JP",
                "duration_in_seconds": 4.15
            }
        ]
}
```

Improving language identification accuracy

With language identification, you have the option to include a list of languages you think may be present in your media. Including language options (`LanguageOptions`) restricts Amazon Transcribe to using only the languages that you specify when matching your audio to the correct language, which can speed up language identification and improve the accuracy associated with assigning the correct language dialect.

If you choose to include language codes, you must include at least two. There's no limit on the number of language codes you can include, but we recommend using between two and five for optimal efficiency and accuracy.

Note

If you include language codes with your request and none of the language codes you provide match the language, or languages, identified in your audio, Amazon Transcribe selects the closest language match from your specified language codes. It then produces a transcript in that language. For example, if your media is in US English (`en-US`) and you provide Amazon Transcribe with the language codes `zh-CN`, `fr-FR`, and `de-DE`, Amazon Transcribe is likely to match your media to German (`de-DE`) and produce a German-language transcription. Mismatching language codes and spoken languages can result in an inaccurate transcript, so we recommend caution when including language codes.

Combining language identification with other Amazon Transcribe features

You can use batch language identification in combination with any other Amazon Transcribe feature. If combining language identification with other features, you are limited to the languages supported with those features. For example, if using language identification with content redaction, you are limited to US English (`en-US`) or US Spanish (`es-US`), as this is only language available for redaction. Refer to Supported languages and language-specific features for more information.

Important

If you're using automatic language identification with content redaction enabled and your audio contains languages other than US English (`en-US`) or US Spanish (`es-US`), only the US English or US Spanish content is redacted in your transcript. Other languages cannot be redacted and there are no warnings or job failures.

Custom language models, custom vocabularies, and custom vocabulary filters

If you want to add one or more custom language models, custom vocabularies, or custom vocabulary filters to your language identification request, you must include the `LanguageIdSettings` parameter. You can then specify a language code with a corresponding custom language model, custom vocabulary, and custom vocabulary filter. Note that multi-language identification doesn't support custom language models.

It's recommended that you include `LanguageOptions` when using `LanguageIdSettings` to ensure that the correct language dialect is identified. For example, if you specify an `en-US` custom vocabulary, but Amazon Transcribe determines that the language spoken in your media is `en-AU`, your custom vocabulary *is not* applied to your transcription. If you include `LanguageOptions` and specify `en-US` as the only English language dialect, your custom vocabulary *is* applied to your transcription.

For examples of `LanguageIdSettings` in a request, refer to Option 2 in the **AWS CLI** and **AWS SDKs** dropdown panels in the Using language identification with batch transcriptions section.

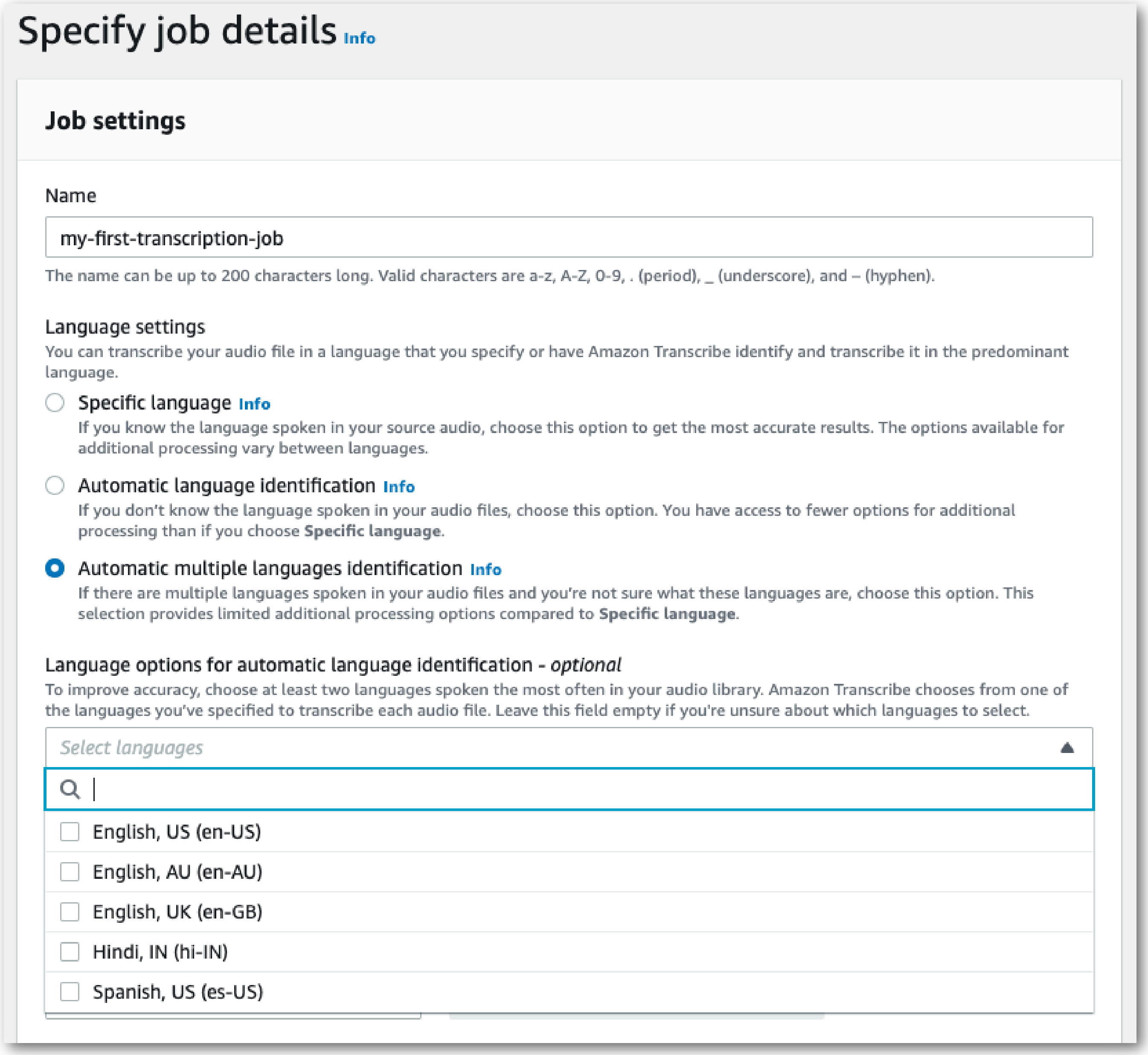
Using language identification with batch transcriptions

You can use automatic language identification in a batch transcription job using the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.
3. In the **Job settings** panel, find the **Language settings** section and select **Automatic language identification** or **Automatic multiple languages identification**.

   You have the option to select multiple language options (from the *Select languages* dropdown box) if you know which languages are present in your audio file. Providing language options can improve accuracy, but is not required.



Specify job details Info

Job settings

Name

my-first-transcription-job

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

Specific language Info

If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info

If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

[✓ Automatic multiple languages identification] Info

If there are multiple languages spoken in your audio files and you're not sure what these languages are, choose this option. This selection provides limited additional processing options compared to **Specific language**.

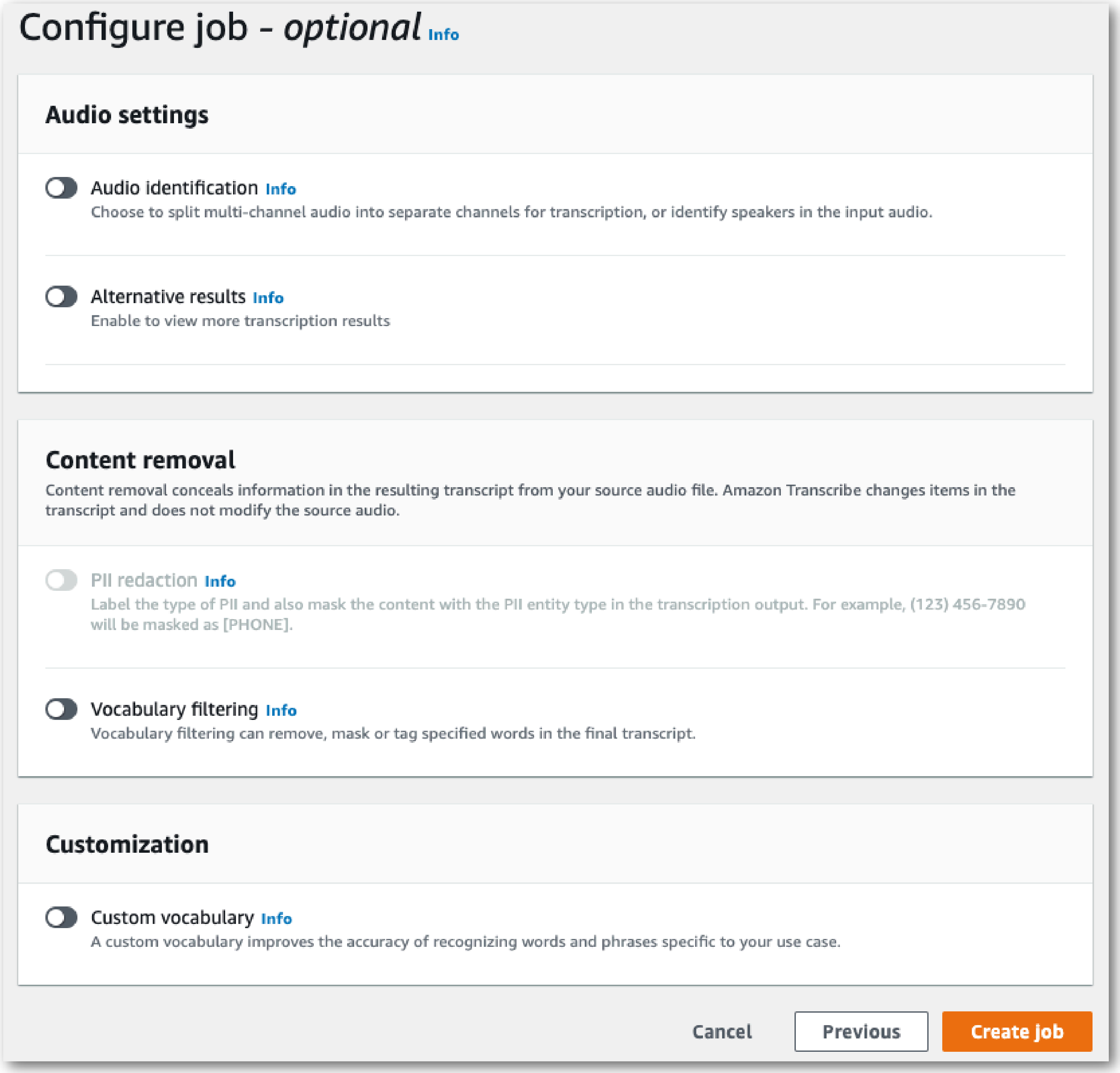
Language options for automatic language identification - *optional*

To improve accuracy, choose at least two languages spoken the most often in your audio library. Amazon Transcribe chooses from one of the languages you've specified to transcribe each audio file. Leave this field empty if you're unsure about which languages to select.

Select languages

- English, US (en-US)
- English, AU (en-AU)
- English, UK (en-GB)
- Hindi, IN (hi-IN)
- Spanish, US (es-US)

4. Fill in any other fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional*** page.



Configure job - *optional* Info

Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Content removal
Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

5. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `IdentifyLanguage` parameter. For more information, see `StartTranscriptionJob` and `LanguageIdSettings`.

Option 1: Without the `language-id-settings` parameter. Use this option if you are **not** including a custom language model, custom vocabulary, or custom vocabulary filter in your request. `language-options` is optional, but recommended.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--identify-language \  (or --identify-multiple-languages) \
--language-options "en-US" "hi-IN"
```

Option 2: With the `language-id-settings` parameter. Use this option if you **are** including a custom language model, custom vocabulary, or custom vocabulary filter in your request.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--identify-language \  (or --identify-multiple-languages)
--language-options "en-US" "hi-IN" \
--language-id-settings en-US=VocabularyName=my-en-US-vocabulary,en-
US=VocabularyFilterName=my-en-US-vocabulary-filter,en-US=LanguageModelName=my-en-US-
language-model,hi-IN=VocabularyName=my-hi-IN-vocabulary,hi-IN=VocabularyFilterName=my-
hi-IN-vocabulary-filter
```

Here's another example using the start-transcription-job command, and a request body that identifies the language.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-language-id-job.json
```

The file *my-first-language-id-job.json* contains the following request body.

Option 1: Without the `LanguageIdSettings` parameter. Use this option if you are **not** including a custom language model, custom vocabulary, or custom vocabulary filter in your request. `LanguageOptions` is optional, but recommended.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
   },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "IdentifyLanguage": true,  (or "IdentifyMultipleLanguages": true),
  "LanguageOptions": [
        "en-US", "hi-IN"
  ]
}
```

Option 2: With the `LanguageIdSettings` parameter. Use this option if you **are** including a custom language model, custom vocabulary, or custom vocabulary filter in your request.

```
{
   "TranscriptionJobName": "my-first-transcription-job",
   "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
   },
   "OutputBucketName": "amzn-s3-demo-bucket",
   "OutputKey": "my-output-files/",
   "IdentifyLanguage": true,  (or "IdentifyMultipleLanguages": true)
   "LanguageOptions": [
        "en-US", "hi-IN"
   ],
   "LanguageIdSettings": {
         "en-US" : {
            "LanguageModelName": "my-en-US-language-model",
            "VocabularyFilterName": "my-en-US-vocabulary-filter",
            "VocabularyName": "my-en-US-vocabulary"
         },
         "hi-IN": {
             "VocabularyName": "my-hi-IN-vocabulary",
             "VocabularyFilterName": "my-hi-IN-vocabulary-filter"
         }
    }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to identify your file's language using the `IdentifyLanguage` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `LanguageIdSettings`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

Option 1: Without the `LanguageIdSettings` parameter. Use this option if you are **not** including a custom language model, custom vocabulary, or custom vocabulary filter in your request. `LanguageOptions` is optional, but recommended.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    MediaFormat = 'flac',
    IdentifyLanguage = True,  (or IdentifyMultipleLanguages = True),
    LanguageOptions = [
        'en-US', 'hi-IN'
    ]
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Option 2: With the `LanguageIdSettings` parameter. Use this option if you **are** including a custom language model, custom vocabulary, or custom vocabulary filter in your request.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    MediaFormat='flac',
    IdentifyLanguage=True,  (or IdentifyMultipleLanguages=True)
    LanguageOptions = [
        'en-US', 'hi-IN'
    ],
    LanguageIdSettings={
        'en-US': {
            'VocabularyName': 'my-en-US-vocabulary',
            'VocabularyFilterName': 'my-en-US-vocabulary-filter',
            'LanguageModelName': 'my-en-US-language-model'
        },
        'hi-IN': {
            'VocabularyName': 'my-hi-IN-vocabulary',
            'VocabularyFilterName': 'my-hi-IN-vocabulary-filter'
        }
    }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Language identification with streaming transcriptions

Streaming language identification can identify the dominant language spoken in your media stream. Amazon Transcribe requires a minimum of one second of speech to identify the language.

If your stream contains only one language, you can enable single-language identification, which identifies the dominant language spoken in your media file and creates your transcript using only this language.

If your stream contains more than one language, you can enable multi-language identification, which identifies all languages spoken in your stream and creates your transcript using each identified language. Note that a multi-lingual transcript is produced. You can use other services, such as Amazon Transcribe, to translate your transcript.

To use streaming language identification, you must provide at least two language codes, and you can select only one language dialect per language per stream. This means that you cannot select `en-US` and `en-AU` as language options for the same transcription.

You also have the option to select a preferred language from the set of language codes you provide. Adding a preferred language can speed up the language identification process, which is helpful for short audio clips.

Important

If none of the language codes you provide match the language, or languages, identified in your audio, Amazon Transcribe selects the closest language match from your specified language codes. It then produces a transcript in that language. For example, if your media is in US English (`en-US`) and you provide Amazon Transcribe with the language codes `zh-CN`, `fr-FR`, and `de-DE`, Amazon Transcribe is likely to match your media to German (`de-DE`) and produce a German-language transcription. Mismatching language codes and spoken languages can result in an inaccurate transcript, so we recommend caution when including language codes.

If your media contains two channels, Amazon Transcribe can identify the dominant language spoken in each channel. In this case, set the `ChannelIdentification` parameter to `true` and each channel is transcribed separately. Note that the default for this parameter is `false`. If you don't change it, only the first channel is transcribed and only one language is identified.

Streaming language identification can't be combined with custom language models or redaction. If combining language identification with other features, you are limited to the languages supported with those features, and also with streaming transcriptions. Refer to [Supported languages](#).

> **Note**
>
> PCM and FLAC are the only supported audio formats for streaming language identification. For multi-language identification, only PCM is supported.

Identifying languages in multi-language audio

Multi-language identification is intended for multi-lingual streams, and provides you with a transcript that reflects all supported languages spoken in your stream. This means that if speakers change languages mid-conversation, or if each participant is speaking a different language, your transcription output detects and transcribes each language correctly.

For example, if your stream contains a bilingual speaker who is alternating between US English (`en-US`) and Hindi (`hi-IN`), multi-language identification can identify and transcribe spoken US English as `en-US` and spoken Hindi as `hi-IN`. This differs from single-language identification, where only one dominant language is used to create a transcript. In this case, any spoken language that is not the dominant language is transcribed incorrectly.

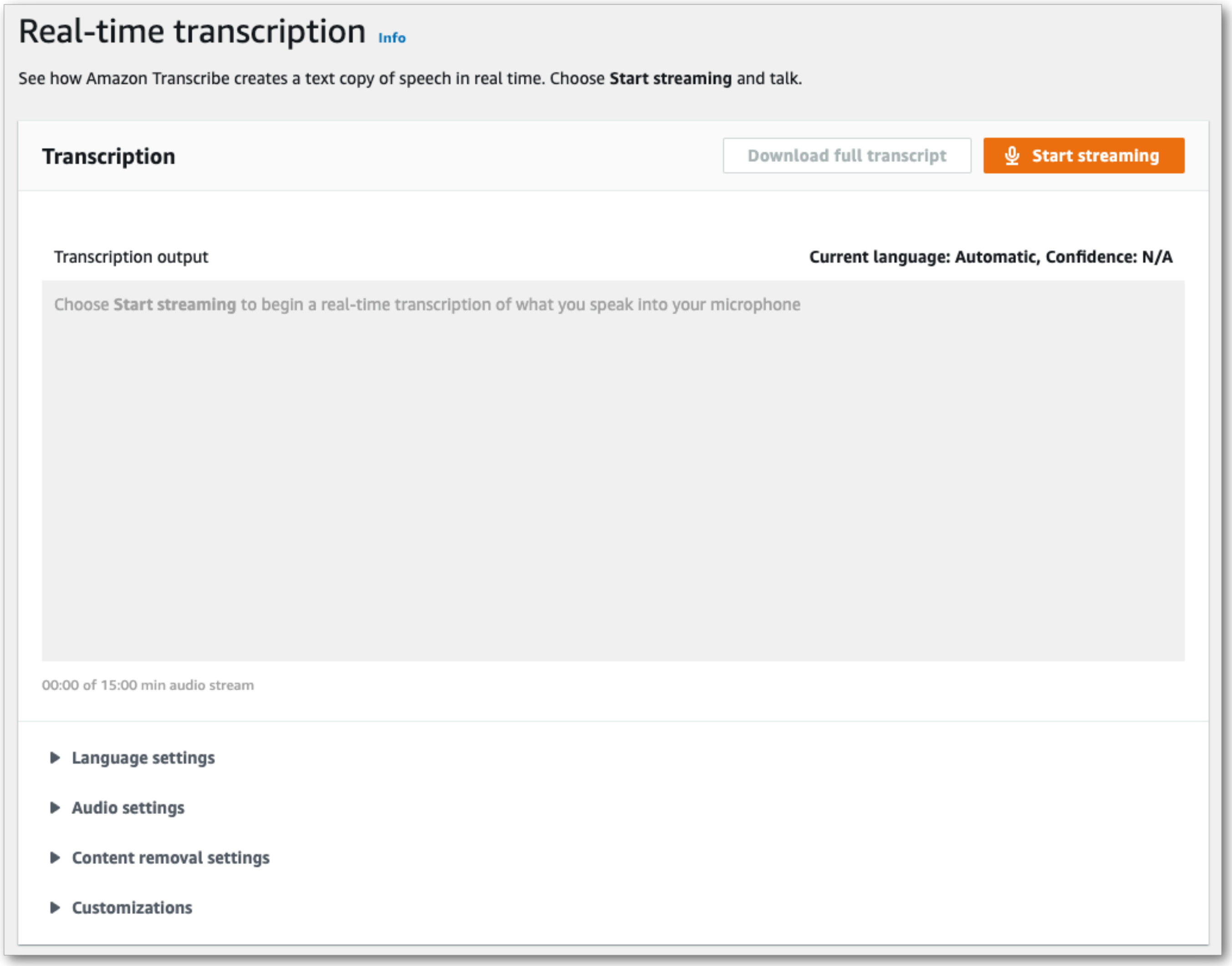
> **Note**
>
> Redaction and custom language models are not currently supported with multi-language identification.

Using language identification with streaming media

You can use automatic language identification in a streaming transcription using the **AWS Management Console**, **HTTP/2**, or **WebSockets**; see the following for examples:

AWS Management Console

1. Sign in to the [AWS Management Console](#).
2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Language settings** and expand this field if it is minimized.



See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

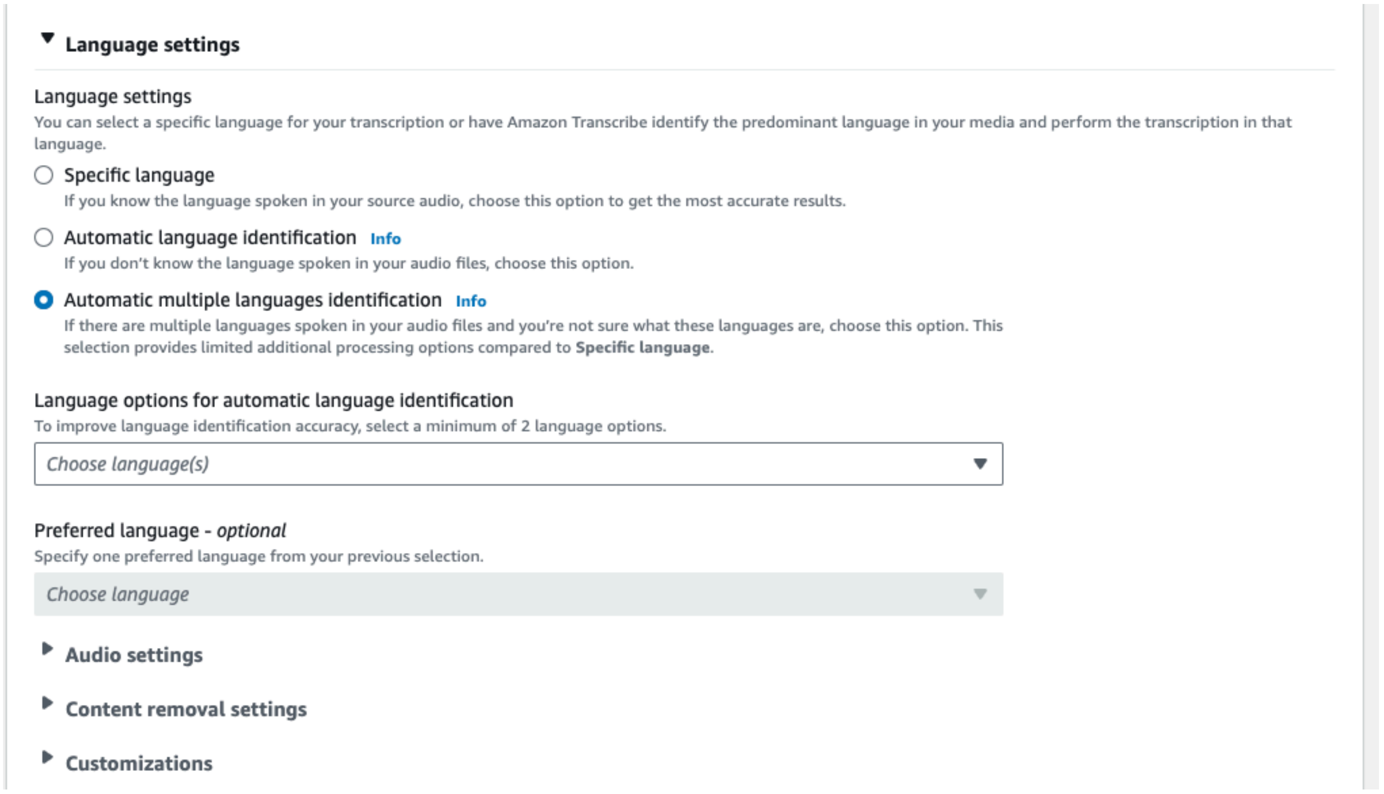
Transcription output

Current language: Automatic, Confidence: N/A

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

00:00 of 15:00 min audio stream

3. Select **Automatic language identification** or **Automatic multiple languages identification**.



▼ Language settings

Language settings

You can select a specific language for your transcription or have Amazon Transcribe identify the predominant language in your media and perform the transcription in that language.

○ Specific language
If you know the language spoken in your source audio, choose this option to get the most accurate results.

○ Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option.

● Automatic multiple languages identification Info
If there are multiple languages spoken in your audio files and you're not sure what these languages are, choose this option. This selection provides limited additional processing options compared to **Specific language**.

Language options for automatic language identification
To improve language identification accuracy, select a minimum of 2 language options.
Choose language(s)

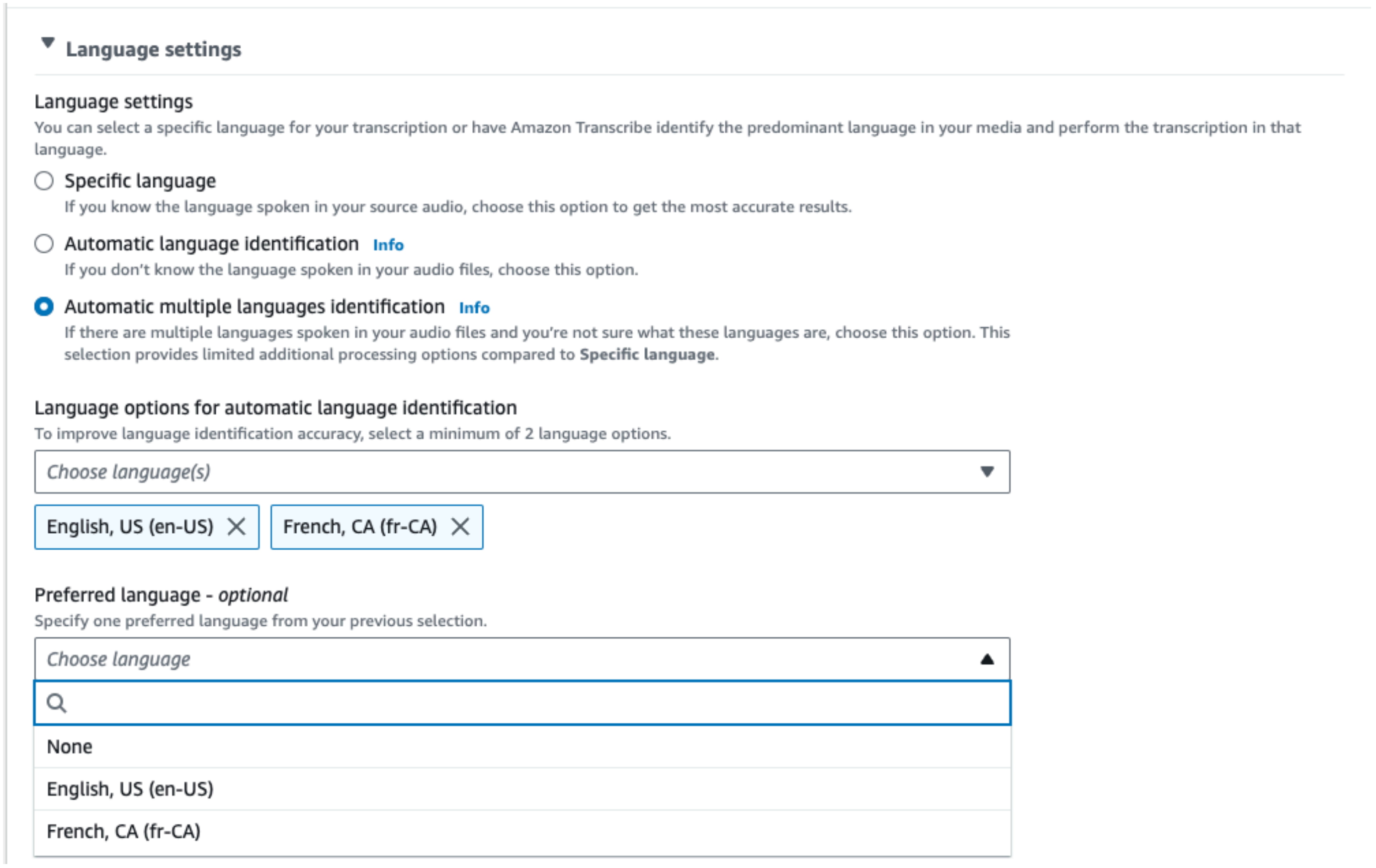
Preferred language - *optional*
Specify one preferred language from your previous selection.
Choose language

▶ Audio settings

▶ Content removal settings

▶ Customizations

4. Provide a minimum of two language codes for your transcription. Note that you can provide only one dialect per language. For example, you cannot select both `en-US` and `fr-CA` as language options for the same transcription.



▼ Language settings

Language settings

You can select a specific language for your transcription or have Amazon Transcribe identify the predominant language in your media and perform the transcription in that language.

○ Specific language
If you know the language spoken in your source audio, choose this option to get the most accurate results.

○ Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option.

● Automatic multiple languages identification Info
If there are multiple languages spoken in your audio files and you're not sure what these languages are, choose this option. This selection provides limited additional processing options compared to **Specific language**.

Language options for automatic language identification
To improve language identification accuracy, select a minimum of 2 language options.

Choose language(s)

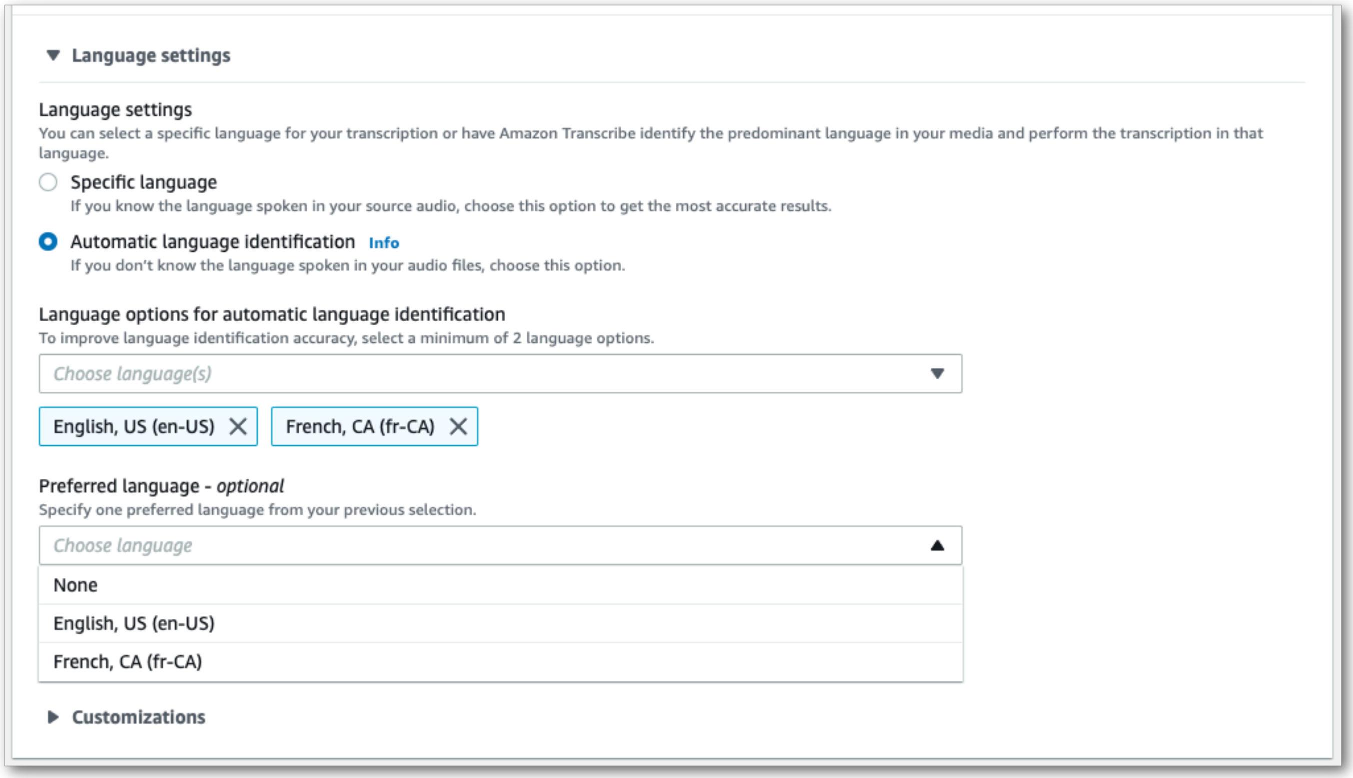
English, US (en-US) ✕ French, CA (fr-CA) ✕

Preferred language - *optional*
Specify one preferred language from your previous selection.

Choose language

None
English, US (en-US)
French, CA (fr-CA)

5. (Optional) From the subset of languages you selected in the previous step, you can choose a preferred language for your transcript.


▼ Language settings

Language settings
You can select a specific language for your transcription or have Amazon Transcribe identify the predominant language in your media and perform the transcription in that language.

○ Specific language
If you know the language spoken in your source audio, choose this option to get the most accurate results.

● Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option.

Language options for automatic language identification
To improve language identification accuracy, select a minimum of 2 language options.

Choose language(s)

English, US (en-US) ✕ French, CA (fr-CA) ✕

Preferred language - *optional*
Specify one preferred language from your previous selection.

Choose language
- None
- English, US (en-US)
- French, CA (fr-CA)

▶ Customizations

6. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

HTTP/2 stream

This example creates an HTTP/2 request with language identification enabled. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
```

```
x-amzn-transcribe-identify-language: true
x-amzn-transcribe-language-options: en-US,de-DE
x-amzn-transcribe-preferred-language: en-US
transfer-encoding: chunked
```

This example creates an HTTP/2 request with multiple languages identification enabled. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-identify-multiple-languages: true
x-amzn-transcribe-language-options: en-US,de-DE
x-amzn-transcribe-preferred-language: en-US
transfer-encoding: chunked
```

If you use `identify-language` or `identify-multiple-languages` in your request, you must also include `language-options`. You cannot use both `language-code` and `identify-language` in the same request.

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that uses language identification in a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
```

```
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&media-encoding=flac
&sample-rate=16000
&identify-language=true
&language-options=en-US,de-DE
&preferred-language=en-US
```

This example creates a presigned URL that uses multiple languages identification in a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&media-encoding=flac
&sample-rate=16000
&identify-multiple-languages=true
&language-options=en-US,de-DE
&preferred-language=en-US
```

If you use `identify-language` or `identify-multiple-languages` in your request, you must also include `language-options`. You cannot use both `language-code` and `identify-language` in the same request.

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Alternative transcriptions

When Amazon Transcribe transcribes audio, it creates different versions of the same transcript and assigns a confidence score to each version. In a typical transcription, you only get the version with the highest confidence score.

If you turn on alternative transcriptions, Amazon Transcribe returns other versions of your transcript that have lower confidence levels. You can choose to have up to 10 alternative transcriptions returned. If you specify a greater number of alternatives than what Amazon Transcribe identifies, only the actual number of alternatives is returned.

All alternatives are located in the same transcription output file and are presented at the segment level. Segments are natural pauses in speech, such as a change in speaker or a pause in the audio.

Alternative transcriptions are only available for batch transcriptions.

Your transcription output is structured as follows. The ellipses (`...`) in the code examples indicate where content has been removed for brevity.

1. A complete final transcription for a given segment.

```
"results": {
    "language_code": "en-US",
    "transcripts": [
        {
            "transcript": "The amazon is the largest rainforest on the planet."
        }
    ],
```

2. A confidence score for each word in the preceding `transcript` section.

```
"items": [
    {
        "start_time": "1.15",
        "end_time": "1.35",
        "alternatives": [
            {
                "confidence": "1.0",
                "content": "The"
            }
        ],
        "type": "pronunciation"
    },
    {
        "start_time": "1.35",
        "end_time": "2.05",
        "alternatives": [
            {
                "confidence": "1.0",
                "content": "amazon"
            }
        ],
        "type": "pronunciation"
    },
```

3. Your alternative transcriptions are located in the `segments` portion of your transcription output. The alternatives for each segment are ordered by descending confidence score.

```
"segments": [
            {
                "start_time": "1.04",
                "end_time": "5.065",
                "alternatives": [
                    {
                ...
                        "transcript": "The amazon is the largest rain forest on the
 planet.",
                        "items": [
                            {
                             "start_time": "1.15",
                                "confidence": "1.0",
                                "end_time": "1.35",
                                "type": "pronunciation",
                                "content": "The"
                            },
                            ...
                            {
                                "start_time": "3.06",
                                "confidence": "0.0037",
                                "end_time": "3.38",
                                "type": "pronunciation",
                                "content": "rain"
                            },
                            {
                                "start_time": "3.38",
                                "confidence": "0.0037",
                                "end_time": "3.96",
                                "type": "pronunciation",
                                "content": "forest"
                            },
```

4. A status at the end of your transcription output.

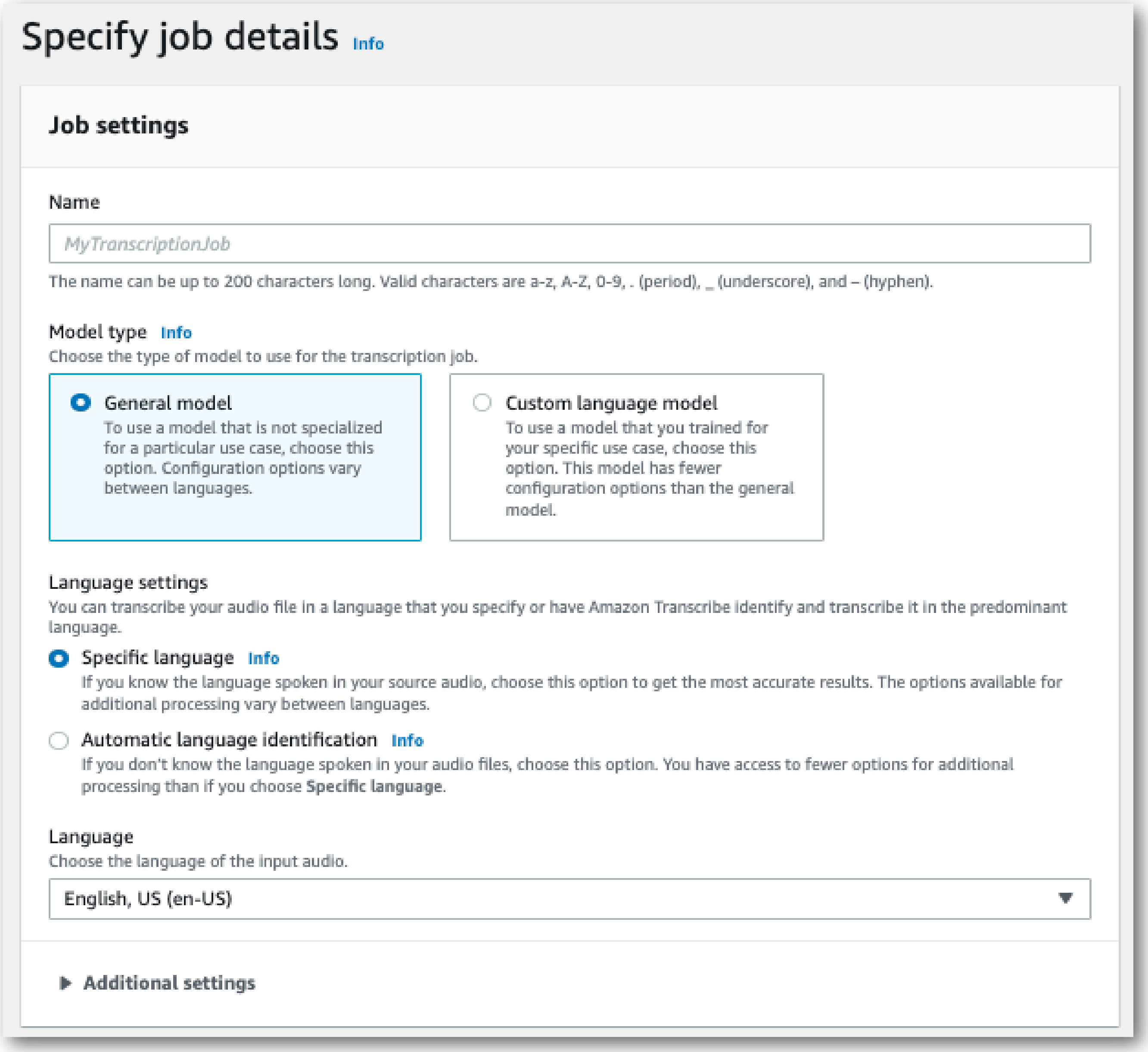
```
"status": "COMPLETED"
}
```

Requesting alternative transcriptions

You can request alternative transcriptions using the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

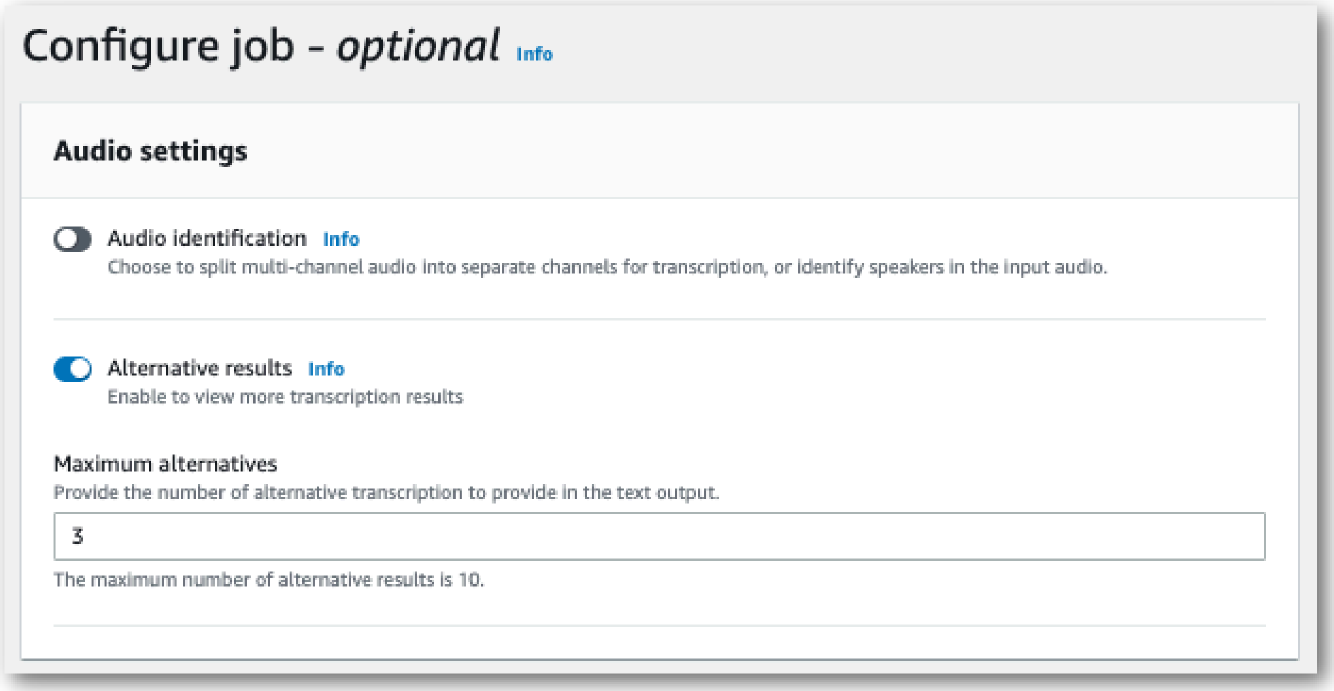
Choose the language of the input audio.

English, US (en-US)

▶ Additional settings

3. Fill in any fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional*** page.

   Select **Alternative results** and specify the maximum number of alternative transcription result you want in your transcript.


Configure job - *optional* Info

Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Maximum alternatives
Provide the number of alternative transcription to provide in the text output.

3

The maximum number of alternative results is 10.

4. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `ShowAlternatives` parameter. For more information, see `StartTranscriptionJob` and `ShowAlternatives`.

Note that if you include `ShowAlternatives=true` in your request, you must also include `MaxAlternatives`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--settings ShowAlternatives=true,MaxAlternatives=4
```

Here's another example using the start-transcription-job command, and a request body that includes alternative transcriptions.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-alt-transcription-job.json
```

The file *my-first-alt-transcription-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
   },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "Settings": {
        "ShowAlternatives": true,
        "MaxAlternatives": 4
   }
}
```

AWS SDK for Python (Boto3)

The following example uses the AWS SDK for Python (Boto3) to request alternative transcriptions by using the `ShowAlternatives` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `ShowAlternatives`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

Note that if you include `'ShowAlternatives':True` in your request, you must also include `MaxAlternatives`.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Settings = {
        'ShowAlternatives':True,
        'MaxAlternatives':4
    }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Improving transcription accuracy with custom vocabularies and custom language models

If your media contains domain-specific or non-standard terms, such as brand names, acronyms, technical words, and jargon, Amazon Transcribe might not correctly capture these terms in your transcription output.

To correct transcription inaccuracies and customize your output for your specific use case, you can create Custom vocabularies and Custom language models.

- Custom vocabularies are designed to tune and boost both the recognition and the formatting of specific words in all contexts. This involves supplying Amazon Transcribe with words and, optionally, pronunciation and display forms.

  If Amazon Transcribe is not correctly rendering specific terms in your transcripts, you can create a custom vocabulary file that tells Amazon Transcribe how you want these terms displayed. This word-specific approach is most appropriate for correcting terms like brand names and acronyms.
- Custom language models are designed to capture the context associated with terms. This involves supplying Amazon Transcribe with a large volume of domain-specific text data.

  If Amazon Transcribe is not correctly rendering technical terms or is using the incorrect homophone in your transcripts, you can create a custom language model that teaches Amazon Transcribe your domain-specific language. For example, a custom language model can learn when to use 'floe' (ice floe) versus 'flow' (linear flow).

  This context-aware approach is most appropriate for transcribing large volumes of domain-specific speech. Custom language models can produce significant accuracy improvements over custom vocabularies alone. When using batch transcriptions, you can include both a custom language model and a custom vocabulary in your request.

Tip

To achieve the highest transcription accuracy, use custom vocabularies in conjunction with your custom language models.

For a video demo on how to create a custom vocabulary using the AWS Management Console, see Using a custom vocabulary.

For a video demo on how to create and use custom language models, see Using Custom Language Models (CLM) to supercharge transcription accuracy.

Dive deeper with the AWS Machine Learning Blog

Custom vocabularies:

- Live transcriptions of F1 races using Amazon Transcribe

Custom language models:

- Building custom language models to supercharge speech-to-text performance Amazon Transcribe
- Boost transcription accuracy of class lectures with custom language models for Amazon Transcribe

Custom vocabularies

Use custom vocabularies to improve transcription accuracy for one or more specific words. These are generally domain-specific terms, such as brand names and acronyms, proper nouns, and words that Amazon Transcribe isn't rendering correctly.

Custom vocabularies can be used with all supported languages. Note that only the characters listed in your language's character set can be used in a custom vocabulary.

Important

You are responsible for the integrity of your own data when you use Amazon Transcribe. Do not enter confidential information, personal information (PII), or protected health information (PHI) into a custom vocabulary.

Considerations when creating a custom vocabulary:

- You can have up to 100 custom vocabulary files per AWS account

- The size limit for each custom vocabulary file is 50 Kb
- If using the API to create your custom vocabulary, your vocabulary file must be in text (*.txt) format. If using the AWS Management Console, your vocabulary file can be in text (*.txt) format or comma-separated value (*.csv) format.
- Each entry within a custom vocabulary cannot exceed 256 characters
- To use a custom vocabulary, it must have been created in the same AWS Region as your transcription.

Tip

You can test your custom vocabulary using the AWS Management Console. Once your custom vocabulary is ready to use, log in to the AWS Management Console, select **Real-time transcription**, scroll to **Customizations**, toggle on **Custom vocabulary**, and select your custom vocabulary from the dropdown list. Then select **start streaming**. Speak some of the words in your custom vocabulary into your microphone to see if they render correctly.

Custom vocabulary tables versus lists

Important

Custom vocabularies in list format are being deprecated. If you're creating a new custom vocabulary, use the table format.

Tables give you more options for—and more control over—the input and output of words within your custom vocabulary. With tables, you must specify multiple categories (Phrase and DisplayAs), allowing you to fine-tune your output.

Lists don't have additional options, so you can only type in entries as you want them to appear in your transcript, replacing all spaces with hyphens.

The AWS Management Console, AWS CLI, and AWS SDKs all use custom vocabulary tables in the same way; lists are used differently for each method and thus may require additional formatting for successful use between methods.

For more information, see Creating a custom vocabulary using a table and Creating a custom vocabulary using a list.

To dive a little deeper and learn how to use Amazon Augmented AI with custom vocabularies, see Start building a human review along with Amazon Transcribe

API operations specific to custom vocabularies

`CreateVocabulary`, `DeleteVocabulary`, `GetVocabulary`, `ListVocabularies`, `UpdateVocabulary`

Creating a custom vocabulary using a table

Using a table format is the preferred way to create your custom vocabulary. Vocabulary tables must consist of four columns (Phrase, SoundsLike, IPA, and DisplayAs), which can be included in any order:

Phrase	SoundsLike	IPA	DisplayAs
Required. Every row in your table must contain an entry in this column. Do not use spaces in this column. If your entry contains multiple words, separate each word with a hyphen (-). For example, **`Andorra-la-Vella`** or **`Los-Angeles`**. For acronyms, any pronounced letters must be separated by	`SoundsLike` is no longer supported for Custom Vocabulary. Please leave the column empty. Any values in this column will be ignored. We will remove the support for this column in the future.	`IPA` is no longer supported for Custom Vocabulary. Please leave the column empty. Any values in this column will be ignored. We will remove the support for this column in the future.	Optional. Rows in this column can be left empty. You can use spaces in this column. Defines the how you want your entry to look in your transcription output. For example, **`Andorra-la-Vella`** in the `Phrase` column is **`Andorra la Vella`** in the `DisplayAs` column.

Phrase	SoundsLike	IPA	DisplayAs
a period. The trailing period also needs to be pronounced. If your acronym is plural, you must use a hyphen between the acronym and the 's'. For example, 'CLI' is **`C.L.I.`** (not **`C.L.I`**) and 'ABCs' is **`A.B.C.-s`** (not **`A.B.C-s`**). If your phrase consists of both a word and an acronym, these two components must be separated by a hyphen. For example, 'DynamoDB' is **`Dynamo-D.B.`** . Do not include digits in this column; numbers must be spelled out. For example, 'VX02Q' is **`V.X.-zero-two-Q.`**.			If a row in this column is empty, Amazon Transcribe uses the contents of the `Phrase` column to determine output. You can include digits (`0-9`) in this column.

Things to note when creating your table:

- Your table must contain all four column headers (Phrase, SoundsLike, IPA, and DisplayAs). The `Phrase` column must contain an entry on each row. The ability to provide pronunciation inputs through `IPA` and `SoundsLike` is no longer supported and you may leave the column empty. Any values in these columns will be ignored.

- Each column must be TAB or comma (,) delineated; this applies to every row in your custom vocabulary file. If a row contains empty columns, you must still include a delineator (TAB or comma) for each column.
- Spaces are only allowed within the `IPA` and `DisplayAs` columns. Do not use spaces to separate columns.
- `IPA` and `SoundsLike` are no longer supported for Custom Vocabulary. Please leave the column empty. Any values in these column will be ignored. We will remove the support for this column in the future.
- The `DisplayAs` column supports symbols and special characters (for example, C++). All other columns support the characters that are listed on your language's character set page.
- If you want to include numbers in the `Phrase` column, you must spell them out. Digits (`0-9`) are only supported in the `DisplayAs` column.
- You must save your table as a plaintext (*.txt) file in `LF` format. If you use any other format, such as `CRLF`, your custom vocabulary can't be processed.
- You must upload your custom vocabulary file into an Amazon S3 bucket and process it using `CreateVocabulary` before you can include it in a transcription request. Refer to Creating custom vocabulary tables for instructions.

Note

Enter acronyms, or other words whose letters should be pronounced individually, as single letters separated by periods (**`A.B.C.`**). To enter the plural form of an acronym, such as 'ABCs', separate the 's' from the acronym with a hyphen (**`A.B.C.-s`**). You can use upper or lower case letters to define an acronym. Acronyms are not supported in all languages; refer to Supported languages and language-specific features.

Here is a sample custom vocabulary table (where **`[TAB]`** represents a tab character):

```
Phrase[TAB]SoundsLike[TAB]IPA[TAB]DisplayAs
Los-Angeles[TAB][TAB][TAB]Los Angeles
Eva-Maria[TAB][TAB][TAB]
A.B.C.-s[TAB][TAB][TAB]ABCs
```

```
Amazon-dot-com[TAB][TAB][TAB]Amazon.com
C.L.I.[TAB][TAB][TAB]CLI
Andorra-la-Vella[TAB][TAB][TAB]Andorra la Vella
Dynamo-D.B.[TAB][TAB][TAB]DynamoDB
V.X.-zero-two[TAB][TAB][TAB]VX02
V.X.-zero-two-Q.[TAB][TAB][TAB]VX02Q
```

For visual clarity, here is the same table with aligned columns. **Do not** add spaces between columns in your custom vocabulary table; your table should look misaligned like the preceding example.

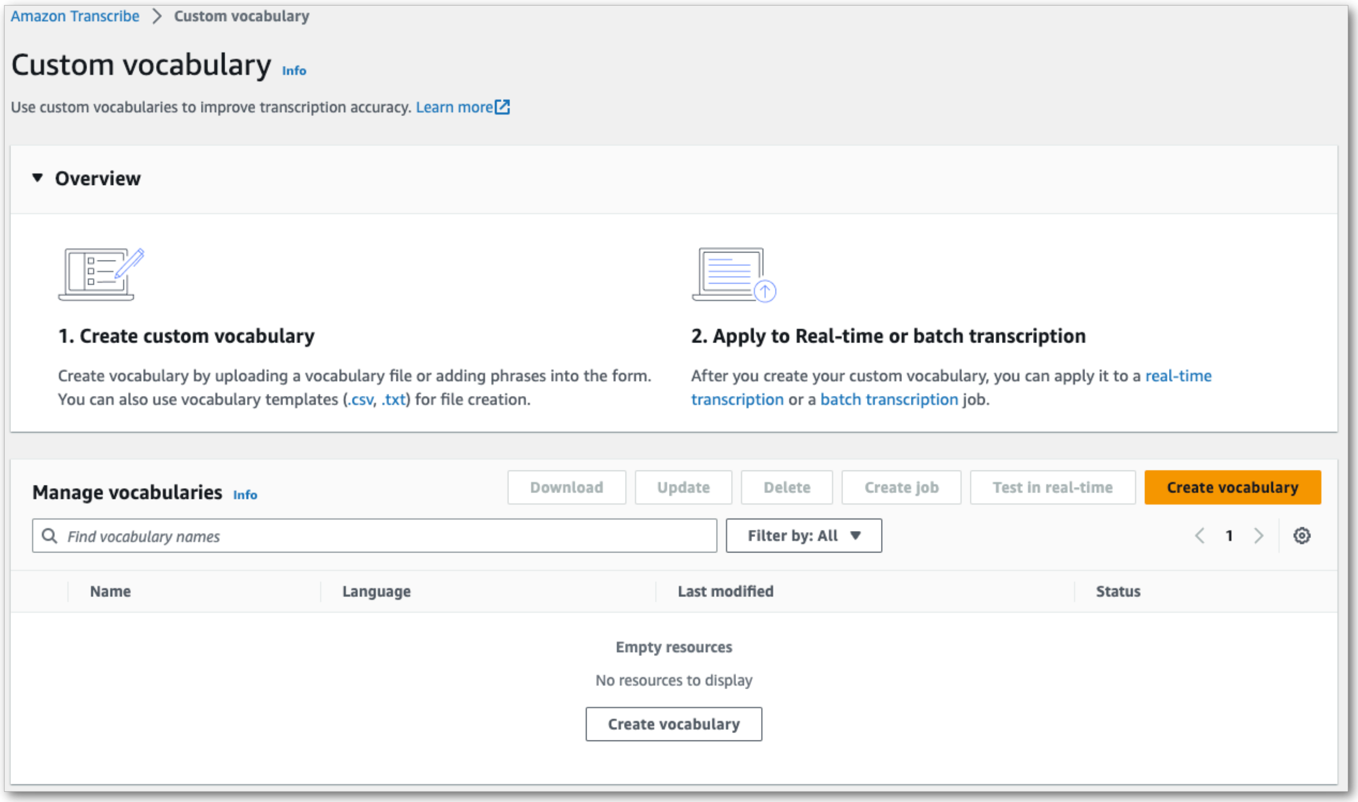
```
Phrase          [TAB]SoundsLike          [TAB]IPA                [TAB]DisplayAs
Los-Angeles     [TAB]                    [TAB]                   [TAB]Los Angeles
Eva-Maria       [TAB]                    [TAB]                   [TAB]
A.B.C.-s        [TAB]                    [TAB]                   [TAB]ABCs
amazon-dot-com  [TAB]                    [TAB]                   [TAB]amazon.com
C.L.I.          [TAB]                    [TAB]                   [TAB]CLI
Andorra-la-Vella[TAB]                    [TAB]                   [TAB]Andorra la Vella
Dynamo-D.B.     [TAB]                    [TAB]                   [TAB]DynamoDB
V.X.-zero-two   [TAB]                    [TAB]                   [TAB]VX02
V.X.-zero-two-Q.[TAB]                    [TAB]                   [TAB]VX02Q
```

Creating custom vocabulary tables

To process a custom vocabulary table for use with Amazon Transcribe, see the following examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Custom vocabulary**. This opens the **Custom vocabulary** page where you can view existing vocabularies or create a new one.
3. Select **Create vocabulary**.



Amazon Transcribe > Custom vocabulary

Custom vocabulary Info

Use custom vocabularies to improve transcription accuracy. Learn more

▼ Overview

1. Create custom vocabulary

Create vocabulary by uploading a vocabulary file or adding phrases into the form. You can also use vocabulary templates (.csv, .txt) for file creation.

2. Apply to Real-time or batch transcription

After you create your custom vocabulary, you can apply it to a real-time transcription or a batch transcription job.

Manage vocabularies Info

Name	Language	Last modified	Status

Empty resources

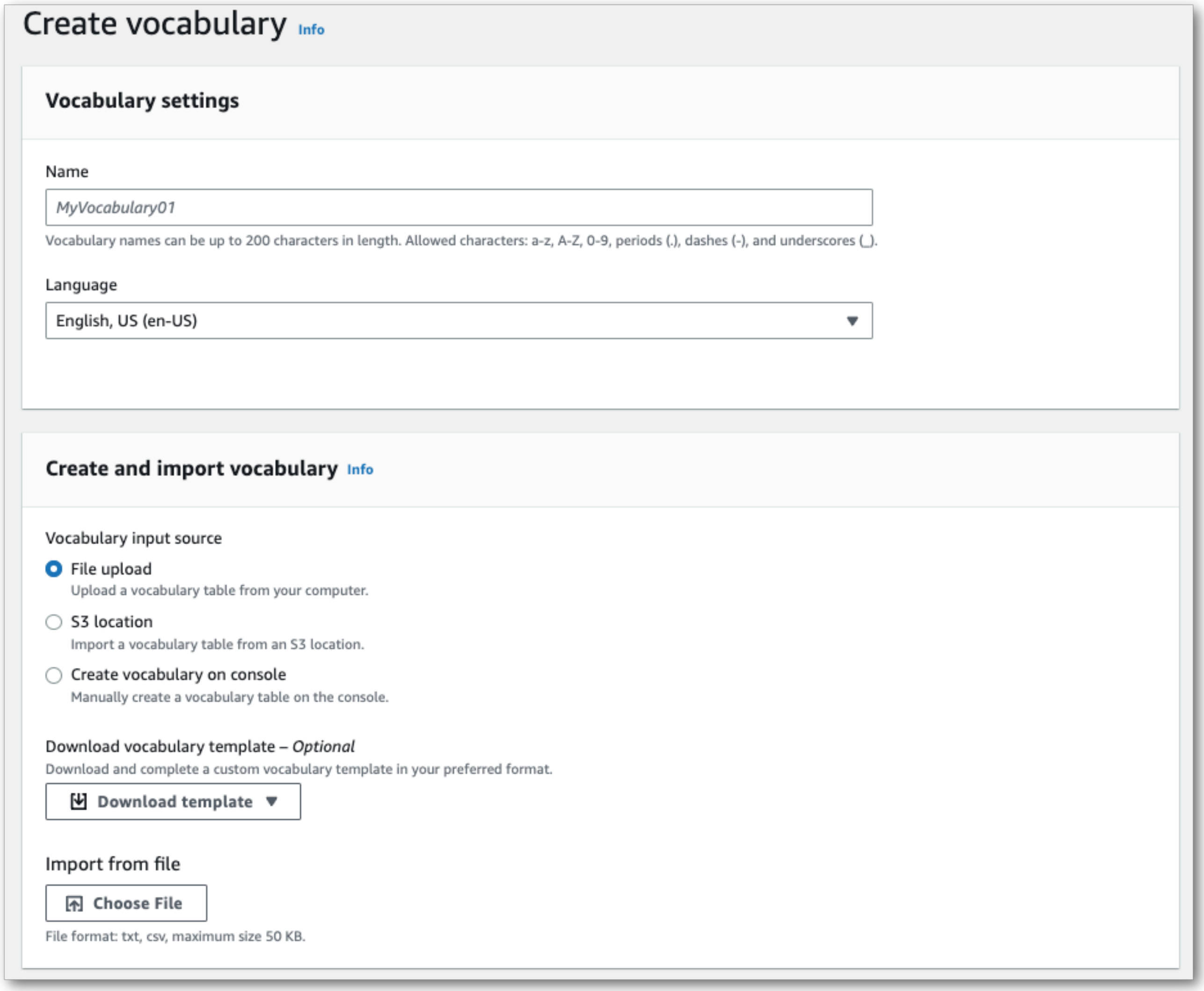
No resources to display

This takes you to the **Create vocabulary** page. Enter a name for your new custom vocabulary.

Here, you have three options:

a. Upload a txt or csv file from your computer.

   You can either create your custom vocabulary from scratch or download a template to help you get started. Your vocabulary is then auto-populated in the **View and edit vocabulary** pane.



Create vocabulary Info

Vocabulary settings

Name

MyVocabulary01

Vocabulary names can be up to 200 characters in length. Allowed characters: a-z, A-Z, 0-9, periods (.), dashes (-), and underscores (_).

Language

English, US (en-US)

Create and import vocabulary Info

Vocabulary input source

- [✓ File upload] Upload a vocabulary table from your computer.
- S3 location — Import a vocabulary table from an S3 location.
- Create vocabulary on console — Manually create a vocabulary table on the console.

Download vocabulary template – *Optional*

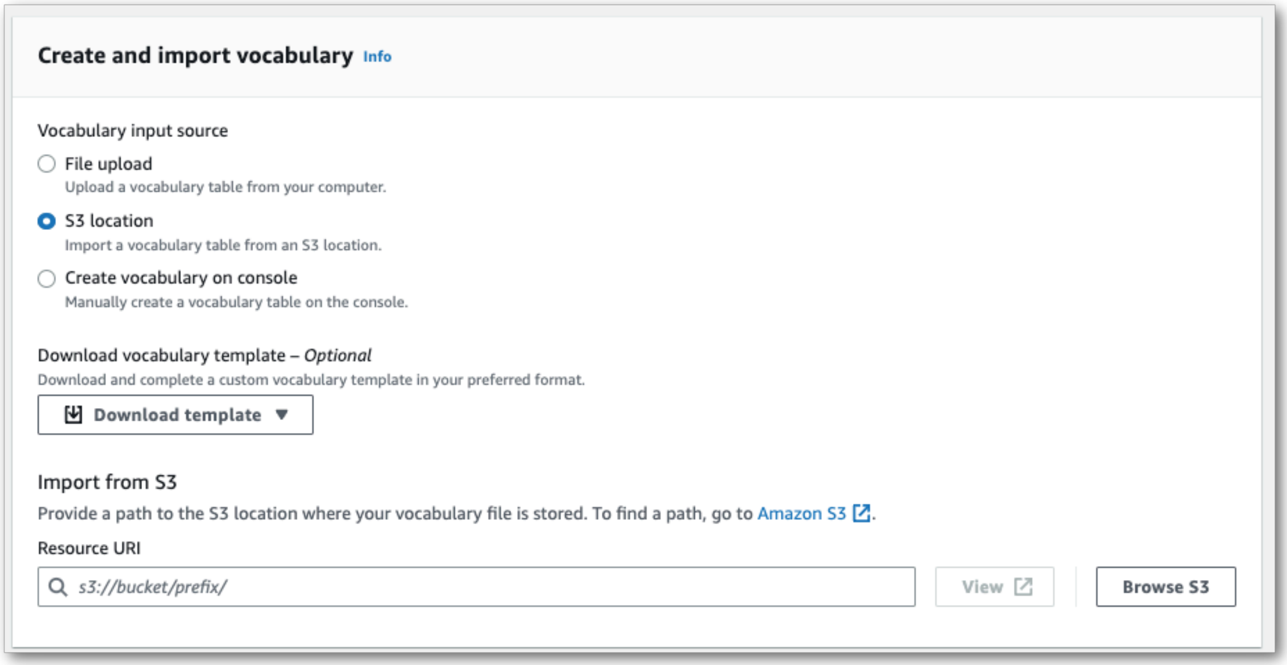
Download and complete a custom vocabulary template in your preferred format.

Import from file

File format: txt, csv, maximum size 50 KB.

b. Import a txt or csv file from an Amazon S3 location.

   You can either create your custom vocabulary from scratch or download a template to help you get started. Upload your finished vocabulary file to an Amazon S3 bucket and specify its URI in your request. Your vocabulary is then auto-populated in the **View and edit vocabulary** pane.


Create and import vocabulary Info

Vocabulary input source

File upload
Upload a vocabulary table from your computer.

[✓ S3 location]
Import a vocabulary table from an S3 location.

Create vocabulary on console
Manually create a vocabulary table on the console.

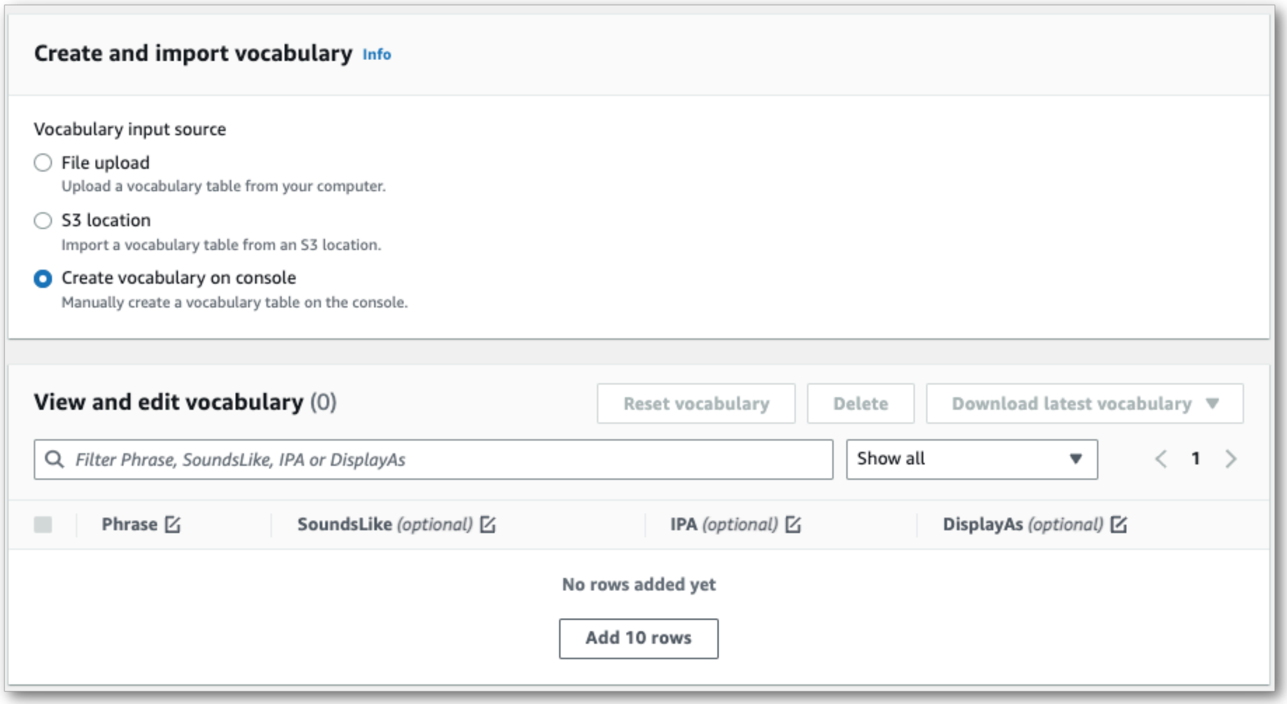
Download vocabulary template – *Optional*
Download and complete a custom vocabulary template in your preferred format.

Import from S3
Provide a path to the S3 location where your vocabulary file is stored. To find a path, go to Amazon S3.

Resource URI
s3://bucket/prefix/

c. Manually create your vocabulary in the console.

Scroll to the **View and edit vocabulary** pane and select **Add 10 rows**. You can now manually enter terms.


Create and import vocabulary Info

Vocabulary input source

File upload
Upload a vocabulary table from your computer.

S3 location
Import a vocabulary table from an S3 location.

[✓ Create vocabulary on console]
Manually create a vocabulary table on the console.

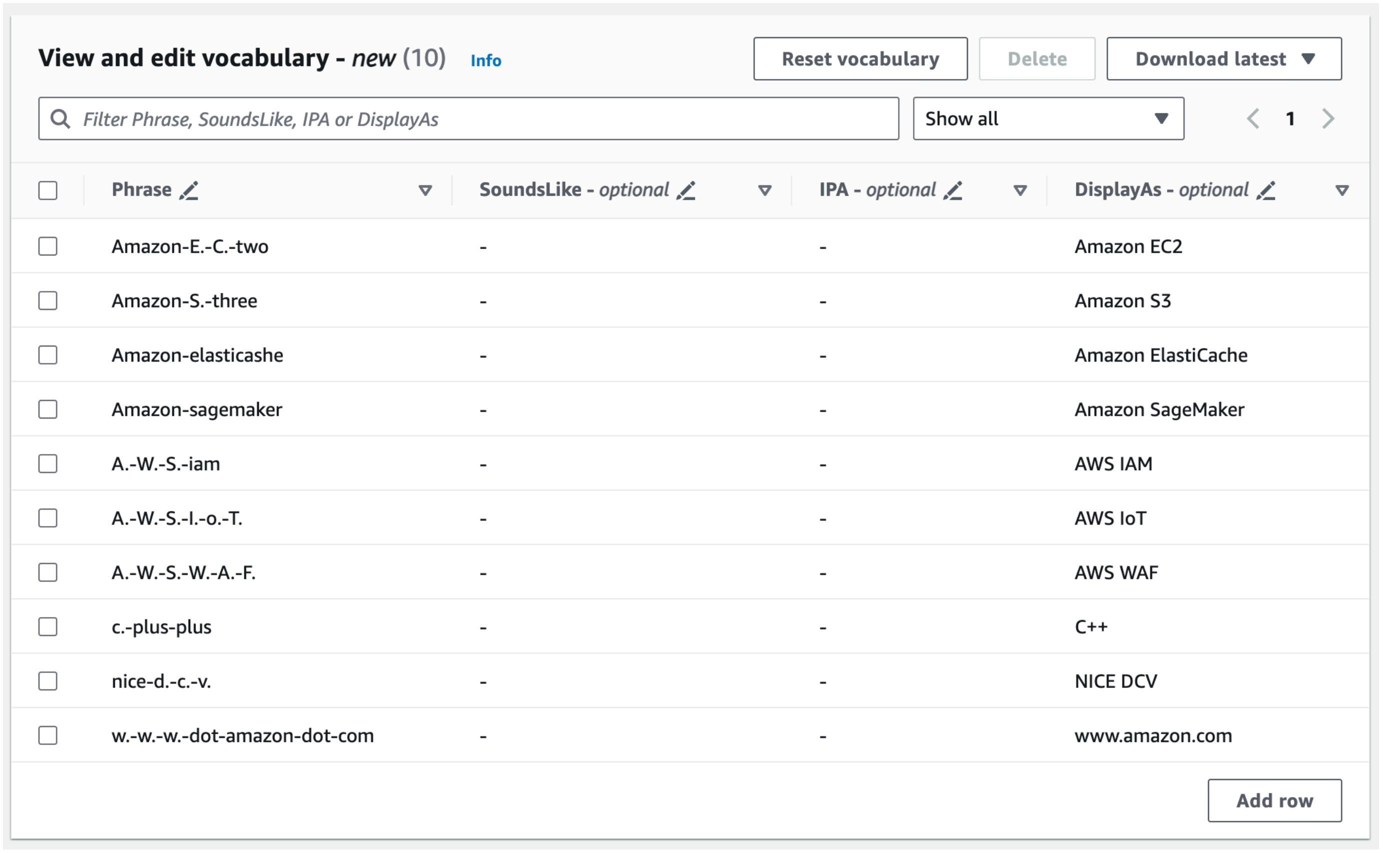
View and edit vocabulary (0)

Reset vocabulary
Delete
Download latest vocabulary
Filter Phrase, SoundsLike, IPA or DisplayAs
Show all
1

Phrase	SoundsLike *(optional)*	IPA *(optional)*	DisplayAs *(optional)*

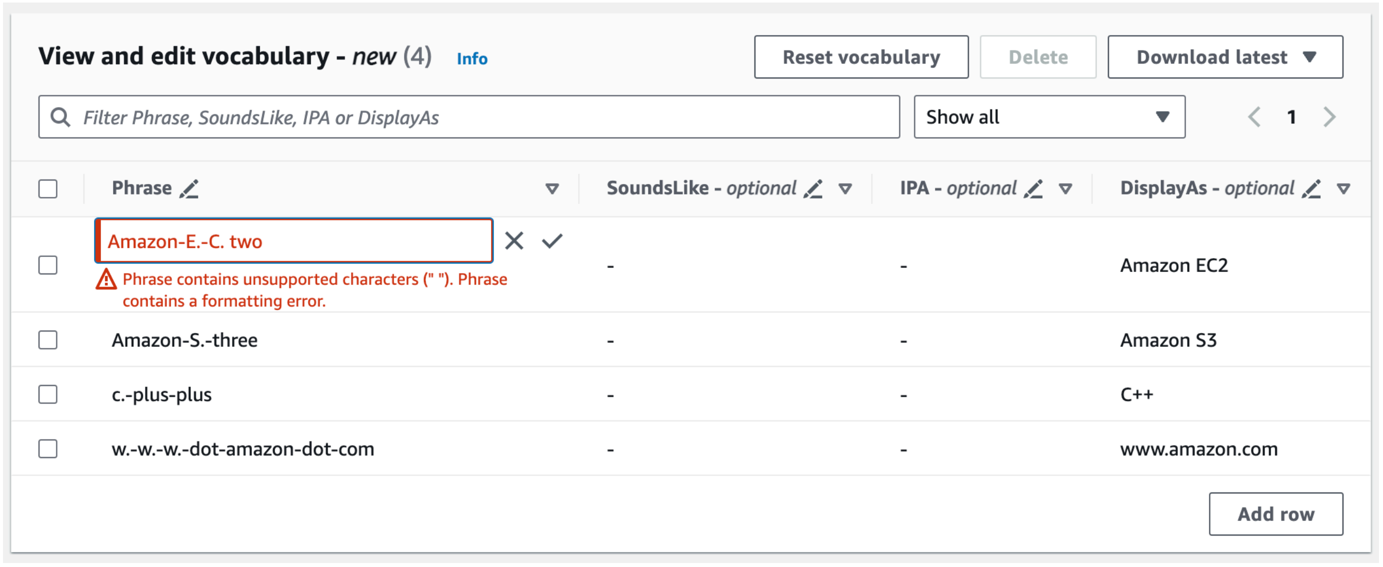
No rows added yet

4. You can edit your vocabulary the **View and edit vocabulary** pane. To make changes, click on the entry you want to modify.


View and edit vocabulary - *new* (10) Info

Phrase	SoundsLike - *optional*	IPA - *optional*	DisplayAs - *optional*
Amazon-E.-C.-two	-	-	Amazon EC2
Amazon-S.-three	-	-	Amazon S3
Amazon-elasticashe	-	-	Amazon ElastiCache
Amazon-sagemaker	-	-	Amazon SageMaker
A.-W.-S.-iam	-	-	AWS IAM
A.-W.-S.-I.-o.-T.	-	-	AWS IoT
A.-W.-S.-W.-A.-F.	-	-	AWS WAF
c.-plus-plus	-	-	C++
nice-d.-c.-v.	-	-	NICE DCV
w.-w.-w.-dot-amazon-dot-com	-	-	www.amazon.com

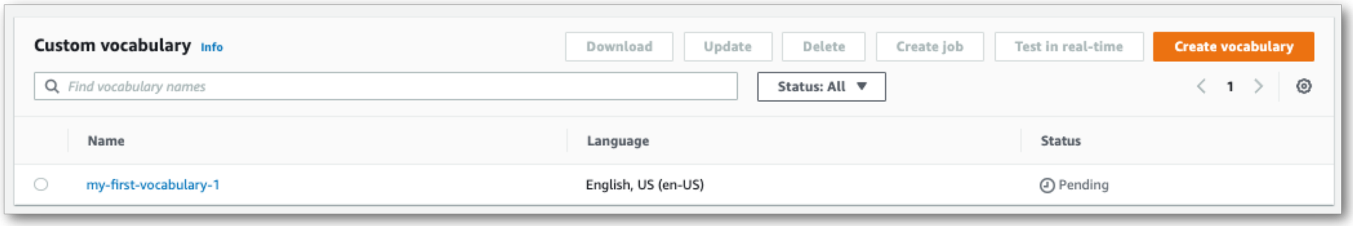
If you make an error, you get a detailed error message so you can correct any issues prior to processing your vocabulary. Note that if you don't correct all errors before selecting **Create vocabulary**, your vocabulary request fails.


View and edit vocabulary - *new* (4) Info

Phrase	SoundsLike - *optional*	IPA - *optional*	DisplayAs - *optional*
Amazon-E.-C. two Phrase contains unsupported characters (" "). Phrase contains a formatting error.	-	-	Amazon EC2
Amazon-S.-three	-	-	Amazon S3
c.-plus-plus	-	-	C++
w.-w.-w.-dot-amazon-dot-com	-	-	www.amazon.com

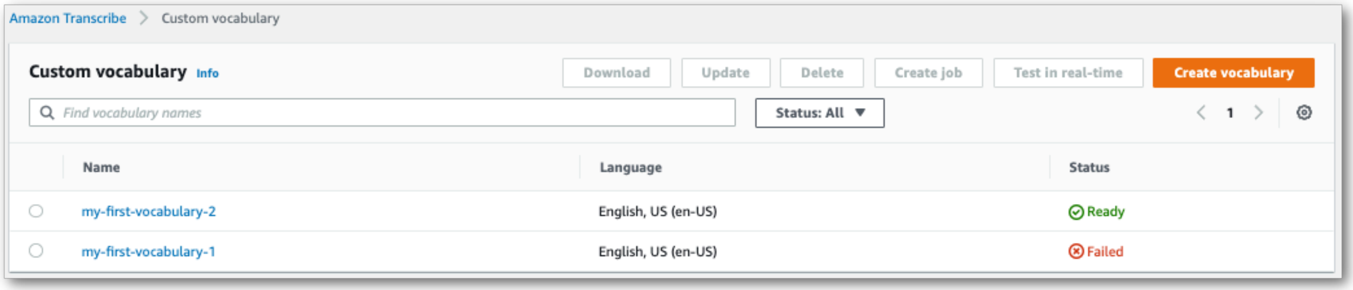
Select the check mark (✓) to save your changes or the 'X' to discard your changes.

5. Optionally, add tags to your custom vocabulary. Once you have all fields completed and are happy with your vocabulary, select **Create vocabulary** at the bottom of the page. This takes you back to the **Custom vocabulary** page where you can view the status of your custom vocabulary. When the status changes from 'Pending' to 'Ready' your custom vocabulary can be used with a transcription.



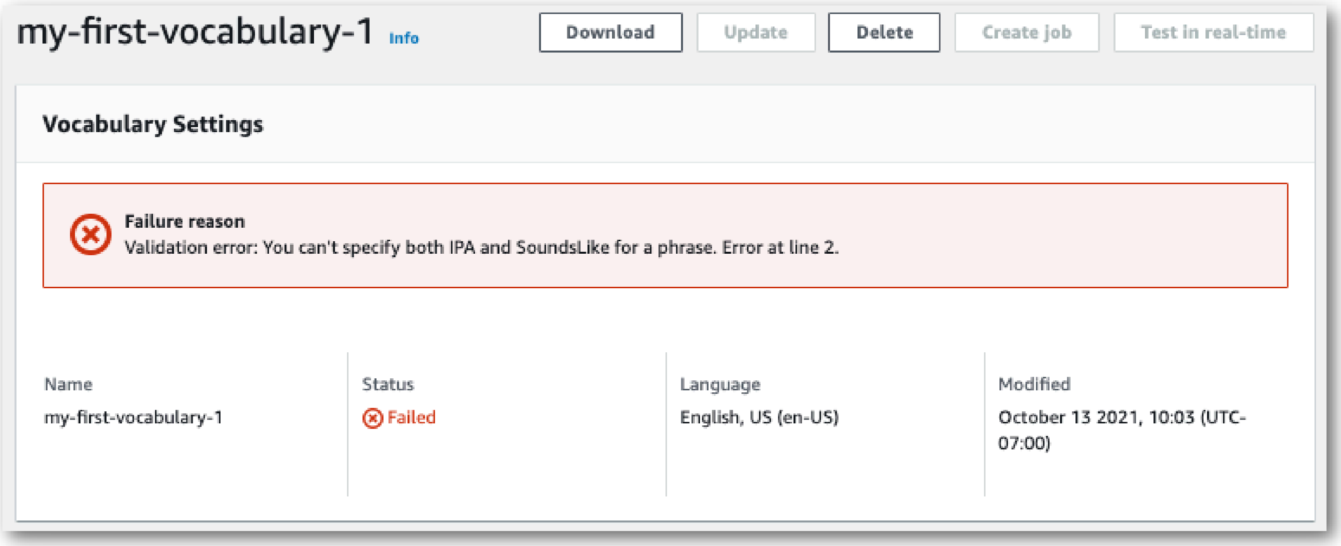
Name	Language	Status
my-first-vocabulary-1	English, US (en-US)	Pending

6. If the status changes to 'Failed', select the name of your custom vocabulary to go to its information page.



Name	Language	Status
my-first-vocabulary-2	English, US (en-US)	Ready
my-first-vocabulary-1	English, US (en-US)	Failed

There is a **Failure reason** banner at the top of this page that provides information on why your custom vocabulary failed. Correct the error in your text file and try again.



Failure reason
Validation error: You can't specify both IPA and SoundsLike for a phrase. Error at line 2.

Name	Status	Language	Modified
my-first-vocabulary-1	Failed	English, US (en-US)	October 13 2021, 10:03 (UTC-07:00)

AWS CLI

This example uses the create-vocabulary command with a table-formatted vocabulary file. For more information, see `CreateVocabulary`.

To use an existing custom vocabulary in a transcription job, set the `VocabularyName` in the `Settings` field when you call the `StartTranscriptionJob` operation or, from the AWS Management Console, choose the custom vocabulary from the dropdown list.

```
aws transcribe create-vocabulary \
--vocabulary-name my-first-vocabulary \
--vocabulary-file-uri s3://amzn-s3-demo-bucket/my-vocabularies/my-vocabulary-file.txt \
--language-code en-US
```

Here's another example using the create-vocabulary command, and a request body that creates your custom vocabulary.

```
aws transcribe create-vocabulary \
--cli-input-json file://filepath/my-first-vocab-table.json
```

The file *my-first-vocab-table.json* contains the following request body.

```
{
  "VocabularyName": "my-first-vocabulary",
  "VocabularyFileUri": "s3://amzn-s3-demo-bucket/my-vocabularies/my-vocabulary-
table.txt",
  "LanguageCode": "en-US"
}
```

Once `VocabularyState` changes from `PENDING` to `READY`, your custom vocabulary is ready to use with a transcription. To view the current status of your custom vocabulary, run:

```
aws transcribe get-vocabulary \
--vocabulary-name my-first-vocabulary
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a custom vocabulary from a table using the create_vocabulary method. For more information, see `CreateVocabulary`.

To use an existing custom vocabulary in a transcription job, set the `VocabularyName` in the `Settings` field when you call the `StartTranscriptionJob` operation or, from the AWS Management Console, choose the custom vocabulary from the dropdown list.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
vocab_name = "my-first-vocabulary"
response = transcribe.create_vocabulary(
    LanguageCode = 'en-US',
    VocabularyName = vocab_name,
    VocabularyFileUri = 's3://amzn-s3-demo-bucket/my-vocabularies/my-vocabulary-
table.txt'
)

while True:
    status = transcribe.get_vocabulary(VocabularyName = vocab_name)
    if status['VocabularyState'] in ['READY', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Note

If you create a new Amazon S3 bucket for your custom vocabulary files, make sure the IAM role making the `CreateVocabulary` request has permissions to access this bucket. If the role doesn't have the correct permissions, your request fails. You can optionally specify an IAM role within your request by including the `DataAccessRoleArn` parameter. For more information on IAM roles and policies in Amazon Transcribe, see Amazon Transcribe identity-based policy examples.

Creating a custom vocabulary using a list

Important

Custom vocabularies in list format are being deprecated, so if you're creating a new custom vocabulary, we strongly recommend using the table format.

You can create custom vocabularies from lists using the AWS Management Console, AWS CLI, or AWS SDKs.

- **AWS Management Console**: You must create and upload a text file containing your custom vocabulary. You can use line-separated or comma-separated entries. Note that your list must be saved as a text (*.txt) file in `LF` format. If you use any other format, such as `CRLF`, your custom vocabulary is not accepted by Amazon Transcribe.
- **AWS CLI** and **AWS SDKs**: You must include your custom vocabulary as comma-separated entries within your API call using the `Phrases` flag.

If an entry contains multiple words, you must hyphenate each word. For example, you include 'Los Angeles' as **`Los-Angeles`** and 'Andorra la Vella' as **`Andorra-la-Vella`**.

Here are examples of the two valid list formats. Refer to Creating custom vocabulary lists for method-specific examples.

- Comma-separated entries:

```
Los-Angeles,CLI,Eva-Maria,ABCs,Andorra-la-Vella
```

- Line-separated entries:

```
Los-Angeles
CLI
Eva-Maria
ABCs
Andorra-la-Vella
```

Important

You can only use characters that are supported for your language. Refer to your language's character set for details.

Custom vocabulary lists are not supported with the `CreateMedicalVocabulary` operation. If creating a custom medical vocabulary, you must use a table format; refer to Creating a custom vocabulary using a table for instructions.

Creating custom vocabulary lists

To process a custom vocabulary list for use with Amazon Transcribe, see the following examples:

AWS CLI

This example uses the create-vocabulary command with a list-formatted custom vocabulary file. For more information, see `CreateVocabulary`.

```
aws transcribe create-vocabulary \
--vocabulary-name my-first-vocabulary \
--language-code en-US \
--phrases {CLI,Eva-Maria,ABCs}
```

Here's another example using the create-vocabulary command, and a request body that creates your custom vocabulary.

```
aws transcribe create-vocabulary \
--cli-input-json file://filepath/my-first-vocab-list.json
```

The file *my-first-vocab-list.json* contains the following request body.

```
{
  "VocabularyName": "my-first-vocabulary",
  "LanguageCode": "en-US",
  "Phrases": [
        "CLI","Eva-Maria","ABCs"
  ]
}
```

Once `VocabularyState` changes from `PENDING` to `READY`, your custom vocabulary is ready to use with a transcription. To view the current status of your custom vocabulary, run:

```
aws transcribe get-vocabulary \
--vocabulary-name my-first-vocabulary
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a custom vocabulary from a list using the create_vocabulary method. For more information, see `CreateVocabulary`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
vocab_name = "my-first-vocabulary"
response = transcribe.create_vocabulary(
    LanguageCode = 'en-US',
    VocabularyName = vocab_name,
    Phrases = [
        'CLI','Eva-Maria','ABCs'
    ]
)

while True:
    status = transcribe.get_vocabulary(VocabularyName = vocab_name)
    if status['VocabularyState'] in ['READY', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Note

If you create a new Amazon S3 bucket for your custom vocabulary files, make sure the IAM role making the `CreateVocabulary` request has permissions to access this bucket. If the role doesn't have the correct permissions, your request fails. You can optionally specify an IAM role within your request by including the `DataAccessRoleArn` parameter. For more information on IAM roles and policies in Amazon Transcribe, see Amazon Transcribe identity-based policy examples.

Using a custom vocabulary

Once your custom vocabulary is created, you can include it in your transcription requests; refer to the following sections for examples.

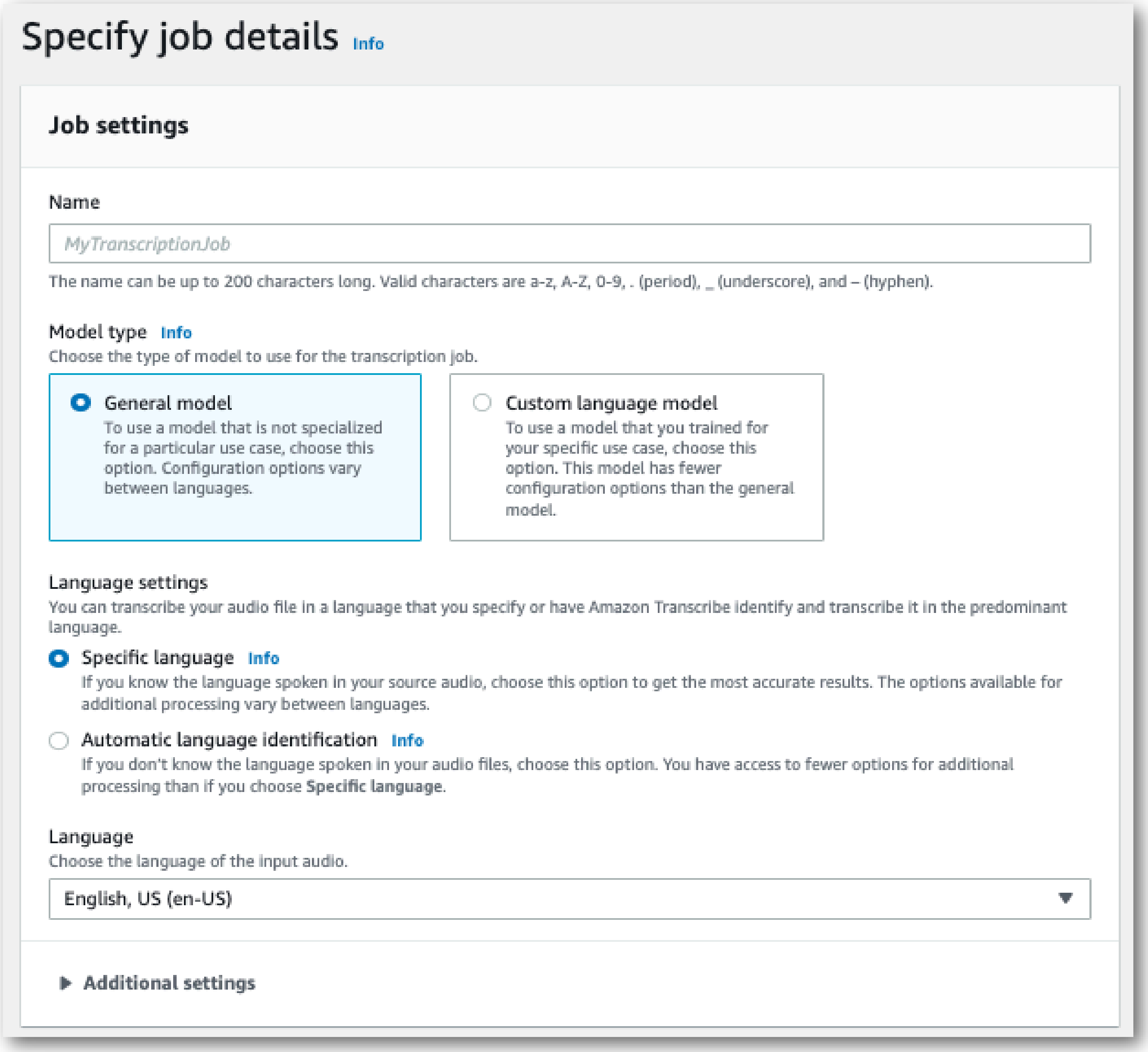
The language of the custom vocabulary you're including in your request must match the language code you specify for your media. If the languages don't match, your custom vocabulary is not applied to your transcription and there are no warnings or errors.

Using a custom vocabulary in a batch transcription

To use a custom vocabulary with a batch transcription, see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model: To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info
If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

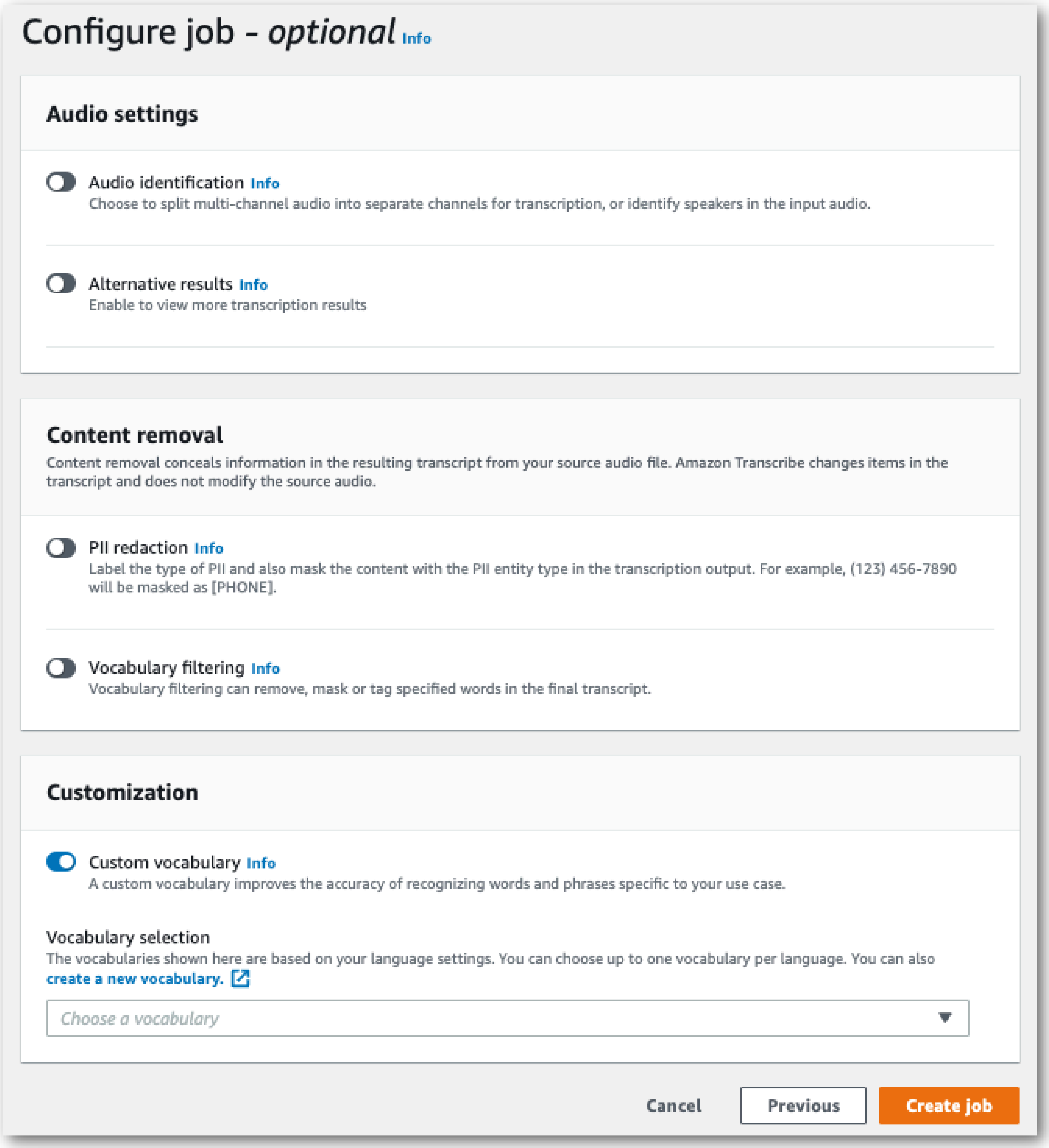
Choose the language of the input audio.

English, US (en-US)

▶ Additional settings

Name your job and specify your input media. Optionally include any other fields, then choose **Next**.

3. At the bottom of the **Configure job** page, in the **Customization** panel, toggle on **Custom vocabulary**.



Configure job - *optional* Info

Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Content removal
Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Vocabulary selection
The vocabularies shown here are based on your language settings. You can choose up to one vocabulary per language. You can also **create a new vocabulary.**

Choose a vocabulary

4. Select your custom vocabulary from the dropdown menu.

   Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `Settings` parameter with the `VocabularyName` sub-parameter. For more information, see `StartTranscriptionJob` and `Settings`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--settings VocabularyName=my-first-vocabulary
```

Here's another example using the start-transcription-job command, and a request body that includes your custom vocabulary with that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-vocabulary-job.json
```

The file *my-first-vocabulary-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "Settings": {
        "VocabularyName": "my-first-vocabulary"
   }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to include a custom vocabulary using the `Settings` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `Settings`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Settings = {
        'VocabularyName': 'my-first-vocabulary'
   }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

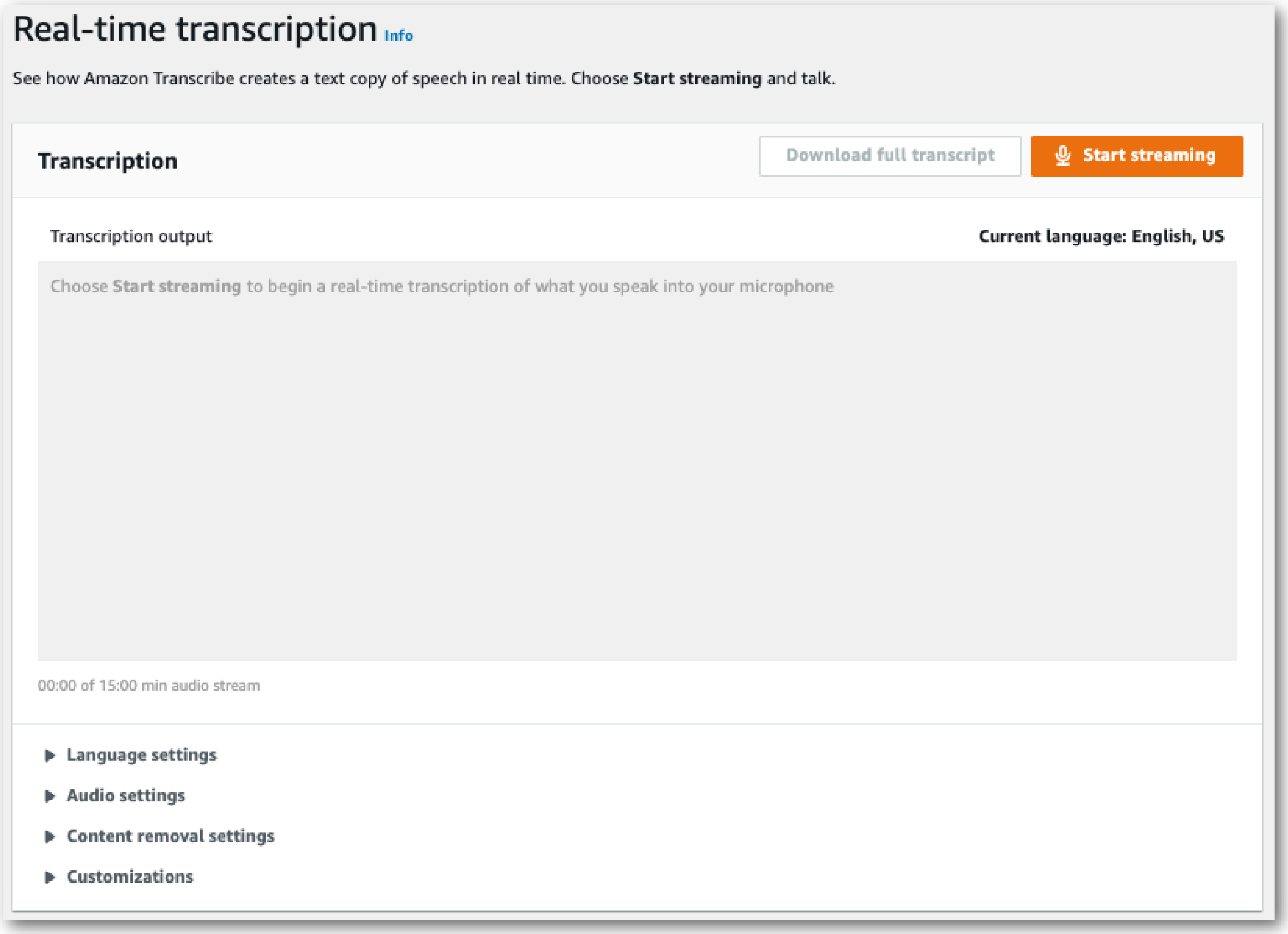
Using a custom vocabulary in a streaming transcription

To use a custom vocabulary with a streaming transcription, see the following for examples:

AWS Management Console

1. Sign into the AWS Management Console.

2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Customizations** and expand this field if it is minimized.



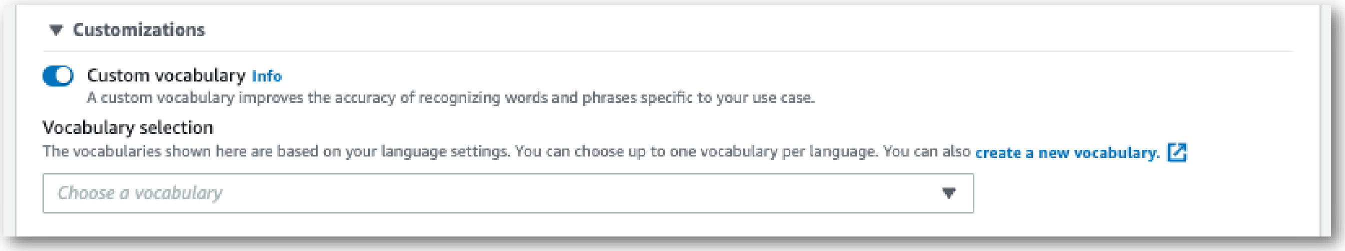
Real-time transcription Info

See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

00:00 of 15:00 min audio stream

3. Toggle on **Custom vocabulary** and select a custom vocabulary from the dropdown menu.



A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Vocabulary selection

The vocabularies shown here are based on your language settings. You can choose up to one vocabulary per language. You can also create a new vocabulary.

Include any other settings that you want to apply to your stream.

4. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

HTTP/2 stream

This example creates an HTTP/2 request that includes your custom vocabulary. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-vocabulary-name: my-first-vocabulary
transfer-encoding: chunked
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that applies your custom vocabulary to a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
```

```
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
&vocabulary-name=my-first-vocabulary
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Custom language models

Custom language models are designed to improve transcription accuracy for domain-specific speech. This includes any content outside of what you would hear in normal, everyday conversations. For example, if you're transcribing the proceedings from a scientific conference, a standard transcription is unlikely to recognize many of the scientific terms used by presenters. In this case, you can train a custom language model to recognize the specialized terms used in your discipline.

Unlike custom vocabularies, which increase recognition of a word by providing hints (such as pronunciations), custom language models learn the context associated with a given word. This includes how and when a word is used, and the relationship a word has to other words. For example, if you train your model using climate science research papers, your model may learn that 'ice floe' is a more likely word pair than 'ice flow'.

To view the supported languages for custom language models, refer to Supported languages and language-specific features. Note that if you include a custom language model in your request, you can't enable language identification (you must specify a language code).

API operations specific to custom language models

`CreateLanguageModel`, `DeleteLanguageModel`, `DescribeLanguageModel`, `ListLanguageModels`

Data sources

You can use any type of text data you want to train your model. However, the closer your text content is to your audio content, the more accurate your model. Therefore, it's important to choose text data that use the same terms in the same context as your audio.

The best data for training a model are accurate transcripts. This is considered in-domain data. In-domain text data have the exact same terms, usage, and context as the audio you want to transcribe.

If you don't have accurate transcripts, use journal articles, technical reports, whitepapers, conference proceedings, instruction manuals, news articles, website content, and any other text that contains the desired terms used in a similar context to that of your audio. This is considered domain-related data.

Creating a robust custom language model may require a significant amount of text data, which must contain the terms spoken in your audio. You can supply Amazon Transcribe with up to 2 GB of text data to train your model—this is referred to as **training data**. Optionally, when you have no (or few) in-domain transcripts, you can provide Amazon Transcribe with up to 200 MB of text data to tune your model—this is referred to as **tuning data**.

Training versus tuning data

The purpose of training data is to teach Amazon Transcribe to recognize new terms and learn the context in which these terms are used. In order to create a robust model, Amazon Transcribe may require a large volume of relevant text data. Providing as much training data as possible, up to the 2 GB limit, is strongly recommended.

The purpose of tuning data is to help refine and optimize the contextual relationships learned from your training data. Tuning data are not required to create a custom language model.

It's up to you to decide how best to select training and, optionally, tuning data. Each case is unique and depends on the type and amount of data you have. Tuning data are recommended when you lack in-domain training data.

If you choose to include both data types, do **not** overlap your training and tuning data; training and tuning data should be unique. Overlapping data can bias and skew your custom language model, impacting its accuracy.

As general guidance, we recommend using accurate, in-domain text as training data whenever possible. Here are some general scenarios, listed in order of preference:

- If you have more than 10,000 words of accurate, in-domain transcript text, use it as training data. In this case, there is no need to include tuning data. This is the ideal scenario for training a custom language model.

- If you have accurate, in-domain transcript text that contains less than 10,000 words and are not getting the desired results, consider augmenting your training data with domain-related written texts, such as technical reports. In this case, reserve a small portion (10-25%) of your in-domain transcript data to use as tuning data.
- If you have no in-domain transcript text, upload all your domain-related text as training data. In this case, transcript-style text is preferable to written text. This is the least effective scenario for training a custom language model.

When you're ready to create your model, see Creating a custom language model.

Creating a custom language model

Before you can create your custom language model, you must:

- Prepare your data. Data must be saved in plain text format and can't contain any special characters.
- Upload your data into an Amazon S3 bucket. Creating separate folders for training and tuning data is recommended.
- Make sure Amazon Transcribe has access to your Amazon S3 bucket. You must specify an IAM role that has access permissions to use your data.

Preparing your data

You can compile all your data in one file or save it as multiple files. Note that if you choose to include tuning data, it must be saved in a separate file from your training data.

It doesn't matter how many text files you use for your training or tuning data. Uploading one file with 100,000 words produces the same result as uploading 10 files with 10,000 words. Prepare your text data in a way that's most convenient for you.

Make sure all your data files meet the following criteria:

- They are all in the same language as the model you want to create. For example, if you want to create a custom language model that transcribes audio in US English (`en-US`), all your text data must be in US English.
- They are in plain text format with UTF-8 encoding.
- They don't contain any special characters or formatting, such as HTML tags.

- They amount to a maximum combined total of 2 GB in size for training data and 200 MB for tuning data.

If any of these criteria are not met, your model fails.

Uploading your data

Before uploading your data, create a new folder for your training data. If using tuning data, create another separate folder.

The URIs for your buckets might look like:

- `s3://amzn-s3-demo-bucket/my-model-training-data/`
- `s3://amzn-s3-demo-bucket/my-model-tuning-data/`

Upload your training and tuning data into the appropriate buckets.

You can add more data to these buckets at a later date. However, if you do, you need to recreate your model with the new data. Existing models can't be updated with new data.

Allowing access to your data

To create a custom language model, you must specify an IAM role that has permissions to access your Amazon S3 bucket. If you don't already have a role with access to the Amazon S3 bucket where you placed your training data, you must create one. After you create a role, you can attach a policy to grant that role permissions. Do not attach a policy to a user.

For example policies, see Amazon Transcribe identity-based policy examples.

To learn how to create a new IAM identity, see IAM Identities (users, user groups, and roles).

To learn more about policies, see:

- Policies and permissions in IAM
- Creating IAM policies
- Access management for AWS resources

Creating your custom language model

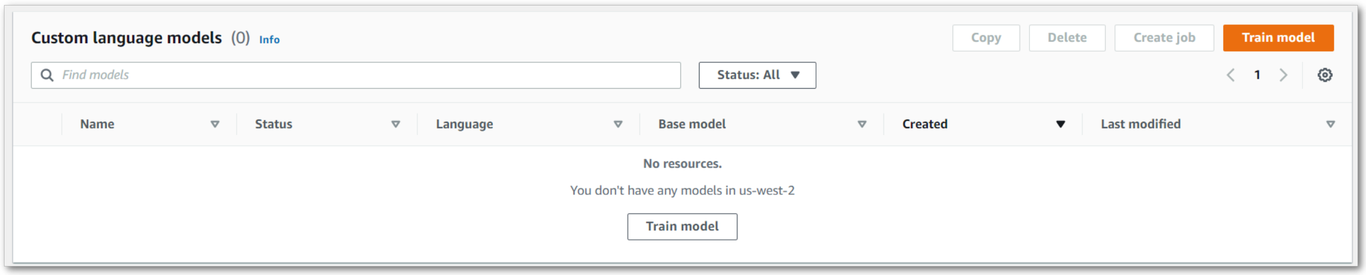
When creating your custom language model, you must choose a base model. There are two base model options:

- `NarrowBand`: Use this option for audio with a sample rate of less than 16,000 Hz. This model type is typically used for telephone conversations recorded at 8,000 Hz.
- `WideBand`: Use this option for audio with a sample rate greater than or equal to 16,000 Hz.

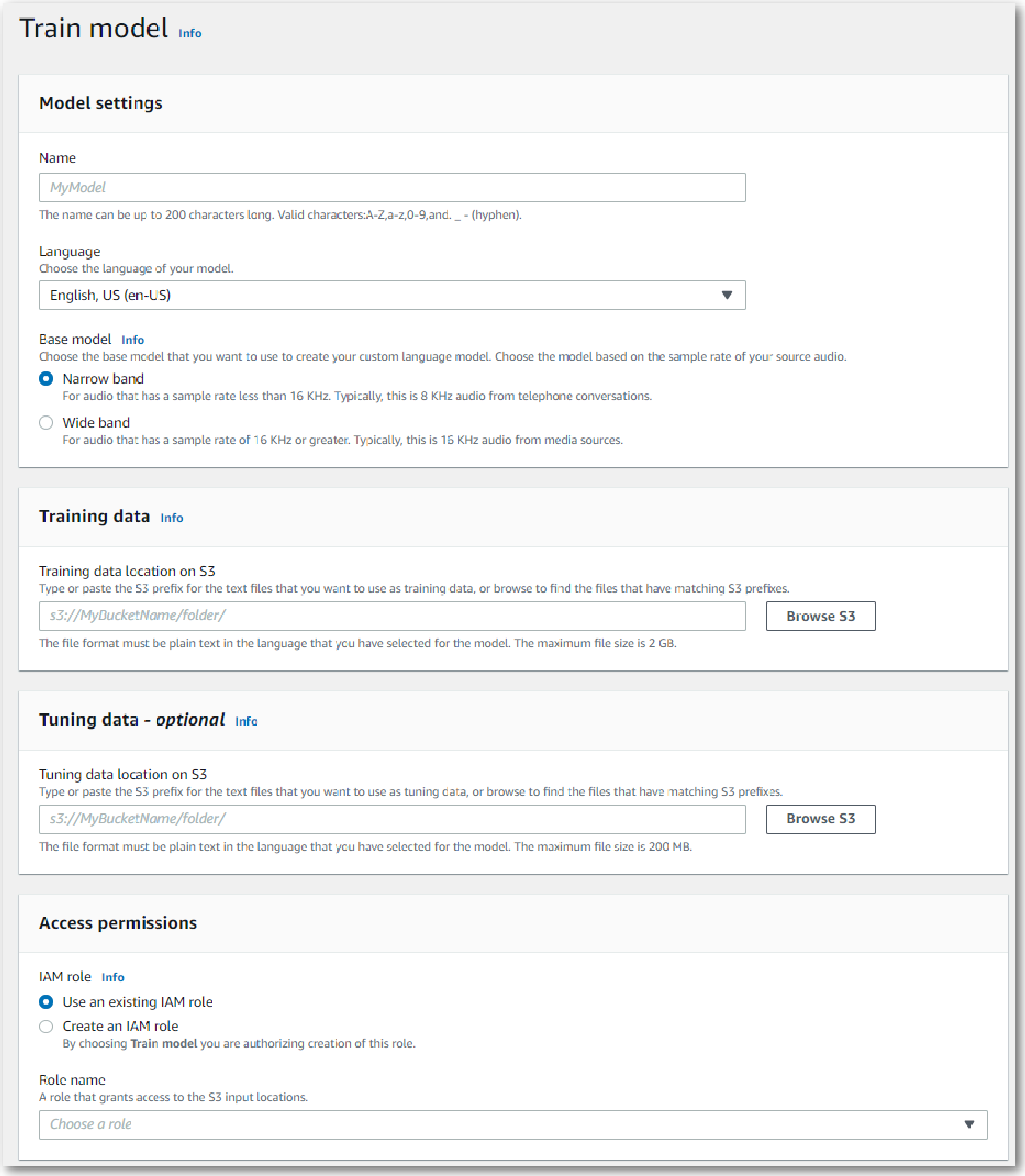
You can create custom language models using the AWS Management Console, AWS CLI, or AWS SDKs.; see the following examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Custom language model**. This opens the **Custom language models** page where you can view existing custom language models or train a new custom language model.
3. To train a new model, select **Train model**.



This takes you to the **Train model** page. Add a name, specify the language, and choose the base model you want for your model. Then, add the path to your training and, optionally, your tuning data. You must include an IAM role that has permissions to access your data.



Train model Info

Model settings

Name

MyModel

The name can be up to 200 characters long. Valid characters:A-Z,a-z,0-9,and. _ - (hyphen).

Language

Choose the language of your model.

English, US (en-US)

Base model Info

Choose the base model that you want to use to create your custom language model. Choose the model based on the sample rate of your source audio.

● Narrow band

For audio that has a sample rate less than 16 KHz. Typically, this is 8 KHz audio from telephone conversations.

○ Wide band

For audio that has a sample rate of 16 KHz or greater. Typically, this is 16 KHz audio from media sources.

Training data Info

Training data location on S3

Type or paste the S3 prefix for the text files that you want to use as training data, or browse to find the files that have matching S3 prefixes.

s3://MyBucketName/folder/

Browse S3

The file format must be plain text in the language that you have selected for the model. The maximum file size is 2 GB.

Tuning data - *optional* Info

Tuning data location on S3

Type or paste the S3 prefix for the text files that you want to use as tuning data, or browse to find the files that have matching S3 prefixes.

s3://MyBucketName/folder/

Browse S3

The file format must be plain text in the language that you have selected for the model. The maximum file size is 200 MB.

Access permissions

IAM role Info

● Use an existing IAM role

○ Create an IAM role

By choosing **Train model** you are authorizing creation of this role.

Role name

A role that grants access to the S3 input locations.

Choose a role

4. Once you have all fields completed, select **Train model** at the bottom of the page.

AWS CLI

This example uses the create-language-model command. For more information, see `CreateLanguageModel` and `LanguageModel`.

```
aws transcribe create-language-model \
--base-model-name NarrowBand \
--model-name my-first-language-model \
--input-data-config S3Uri=s3://amzn-s3-demo-bucket/my-clm-training-
data/,TuningDataS3Uri=s3://amzn-s3-demo-bucket/my-clm-tuning-
data/,DataAccessRoleArn=arn:aws:iam::111122223333:role/ExampleRole \
--language-code en-US
```

Here's another example using the create-language-model command, and a request body that creates your custom language model.

```
aws transcribe create-language-model \
--cli-input-json file://filepath/my-first-language-model.json
```

The file *my-first-language-model.json* contains the following request body.

```
{
  "BaseModelName": "NarrowBand",
  "ModelName": "my-first-language-model",
  "InputDataConfig": {
         "S3Uri": "s3://amzn-s3-demo-bucket/my-clm-training-data/",
         "TuningDataS3Uri"="s3://amzn-s3-demo-bucket/my-clm-tuning-data/",
         "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole"
    },
  "LanguageCode": "en-US"
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a CLM using the create_language_model method. For more information, see `CreateLanguageModel` and `LanguageModel`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
model_name = 'my-first-language-model',
transcribe.create_language_model(
    LanguageCode = 'en-US',
    BaseModelName = 'NarrowBand',
    ModelName = model_name,
    InputDataConfig = {
        'S3Uri':'s3://amzn-s3-demo-bucket/my-clm-training-data/',
        'TuningDataS3Uri':'s3://amzn-s3-demo-bucket/my-clm-tuning-data/',
        'DataAccessRoleArn':'arn:aws:iam::111122223333:role/ExampleRole'
    }
)

while True:
    status = transcribe.get_language_model(ModelName = model_name)
    if status['LanguageModel']['ModelStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Updating your custom language model

Amazon Transcribe continually updates the base models available for custom language models. To benefit from these updates, we recommend training new custom language models every 6 to 12 months.

To see if your custom language model is using the latest base model, run a `DescribeLanguageModel` request using the AWS CLI or an AWS SDK, then find the `UpgradeAvailability` field in your response.

If `UpgradeAvailability` is `true`, your model is not running the latest version of the base model. To use the latest base model in a custom language model, you must create a new custom language model. Custom language models cannot be upgraded.

Using a custom language model

Once you've created your custom language model, you can include it in your transcription requests; refer to the following sections for examples.

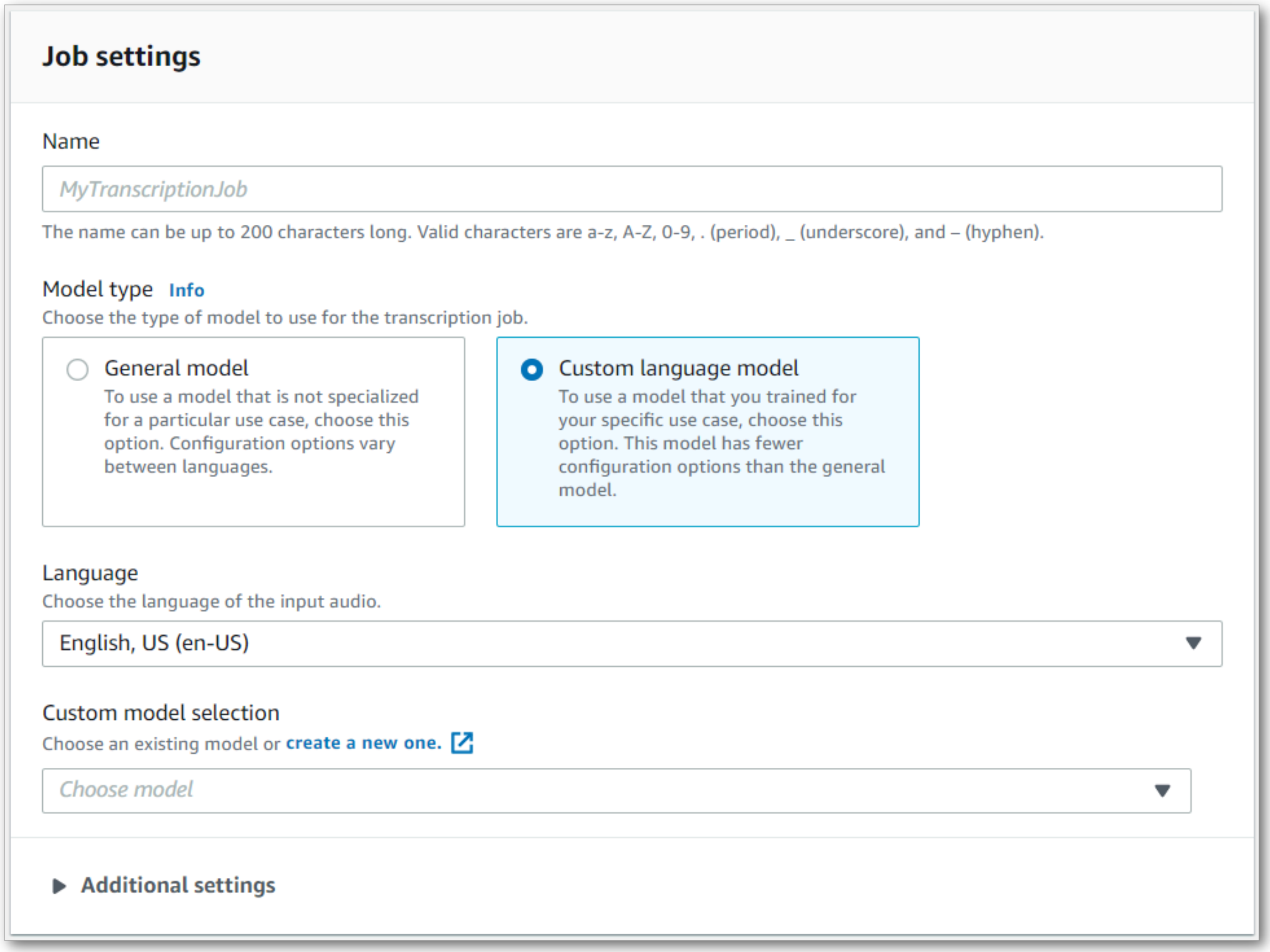
The language of the model you're including in your request must match the language code you specify for your media. If the languages don't match, your custom language model is not applied to your transcription and there are no warnings or errors.

Using a custom language model in a batch transcription

To use a custom language model with a batch transcription, see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.
3. In the **Job settings** panel under **Model type**, select the **Custom language model** box.



Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

General model: To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

[✓ Custom language model]: To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language

Choose the language of the input audio.

English, US (en-US)

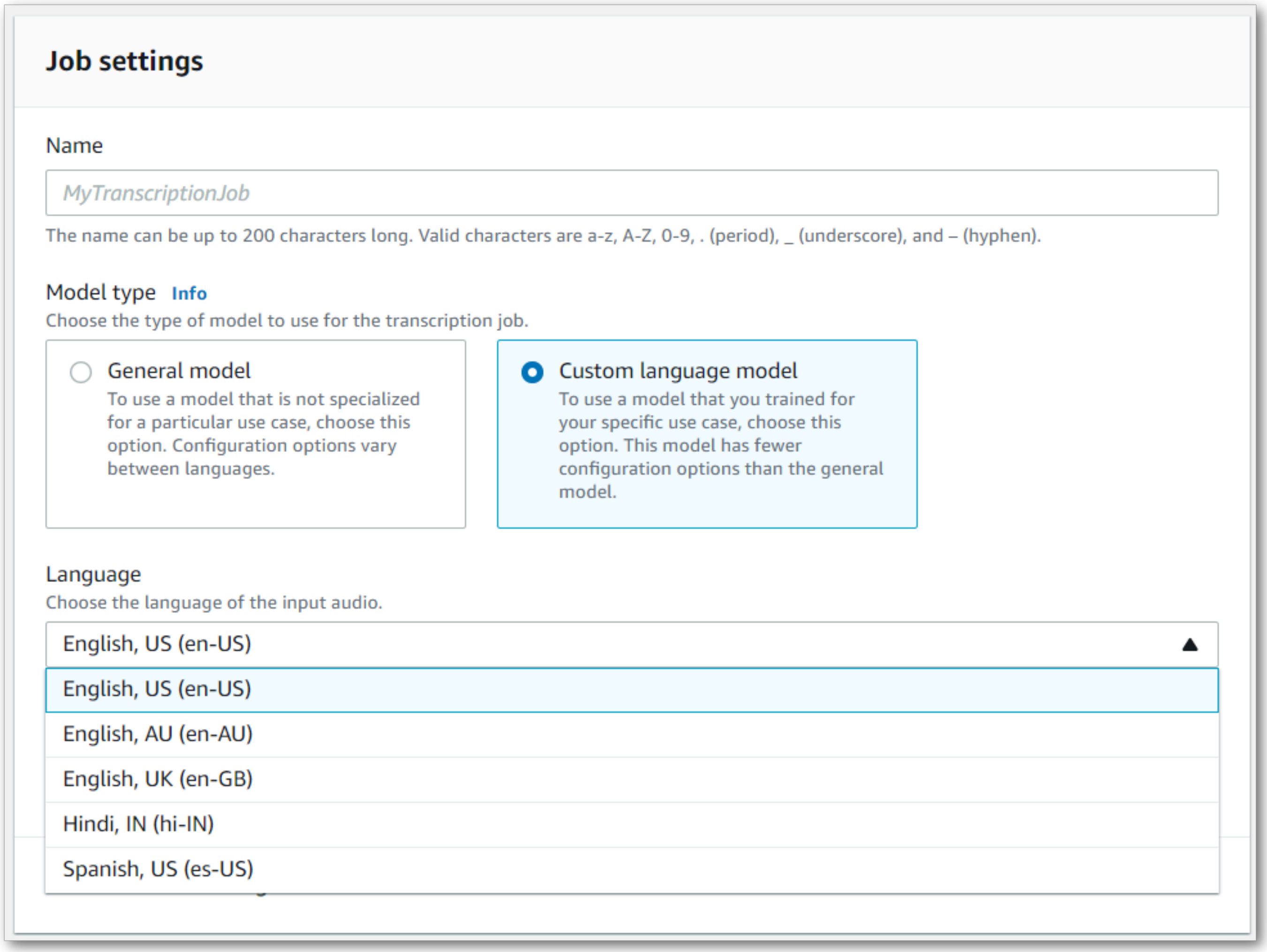
Custom model selection

Choose an existing model or create a new one.

Choose model

Additional settings

You must also select an input language from the dropdown menu.


Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

General model
To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

[✓ Custom language model]
To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language

Choose the language of the input audio.

English, US (en-US)

- English, US (en-US)
- English, AU (en-AU)
- English, UK (en-GB)
- Hindi, IN (hi-IN)
- Spanish, US (es-US)

4. Under **Custom model selection**, select an existing custom language model from the dropdown menu or **Create a new one**.

   Add the Amazon S3 location of your input file in the **Input data** panel.
5. Select **Next** for additional configuration options.

   Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `ModelSettings` parameter with the `VocabularyName` sub-parameter. For more information, see `StartTranscriptionJob` and `ModelSettings`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--model-settings LanguageModelName=my-first-language-model
```

Here's another example using the start-transcription-job command, and a request body that includes your custom language model with that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-model-job.json
```

The file *my-first-model-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "ModelSettings": {
        "LanguageModelName": "my-first-language-model"
   }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to include a custom language model using the `ModelSettings` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `ModelSettings`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

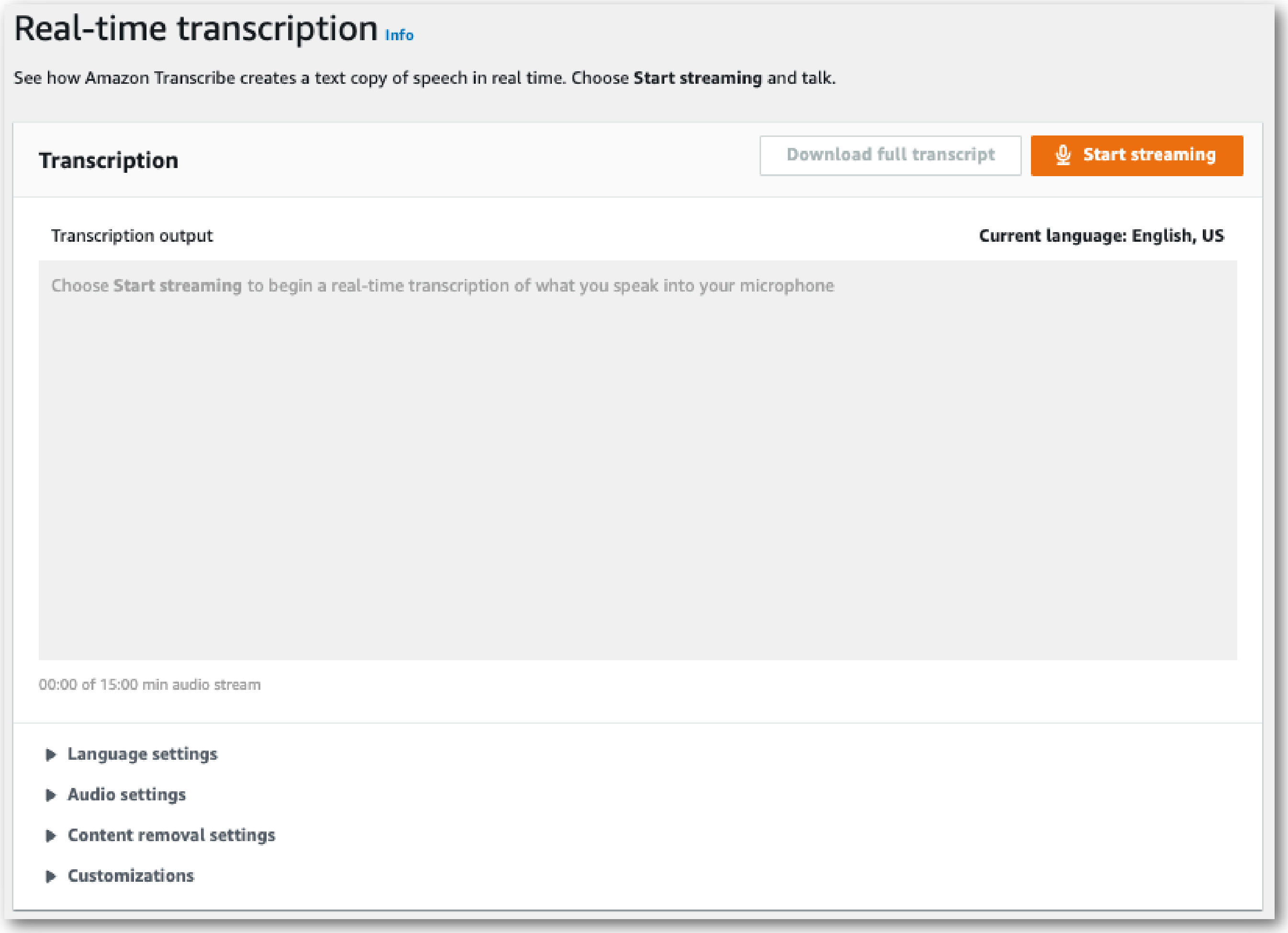
```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    ModelSettings = {
        'LanguageModelName': 'my-first-language-model'
   }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Using a custom language model in a streaming transcription

To use a custom language model with a streaming transcription, see the following for examples:

AWS Management Console

1. Sign into the AWS Management Console.
2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Customizations** and expand this field if it is minimized.



See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

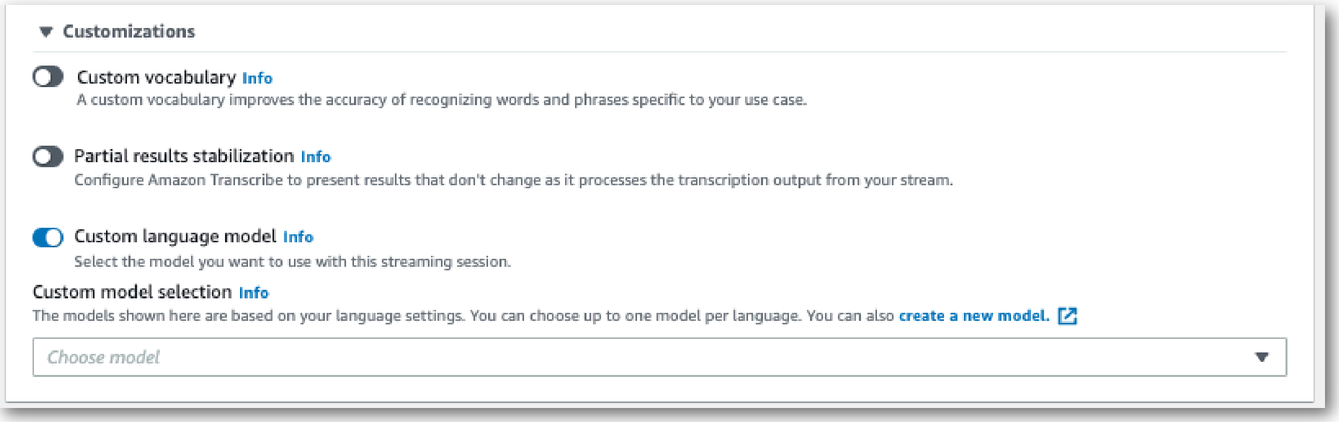
Transcription output

Current language: English, US

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

00:00 of 15:00 min audio stream

3. Toggle on **Custom language model** and select a model from the dropdown menu.



Custom vocabulary
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Partial results stabilization
Configure Amazon Transcribe to present results that don't change as it processes the transcription output from your stream.

Custom language model
Select the model you want to use with this streaming session.

Custom model selection
The models shown here are based on your language settings. You can choose up to one model per language. You can also **create a new model.**

Include any other settings you want to apply to your stream.

4. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

HTTP/2 stream

This example creates an HTTP/2 request that includes your custom language model. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-language-model-name: my-first-language-model
transfer-encoding: chunked
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that applies your custom language model to a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
```

```
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
&language-model-name=my-first-language-model
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Using custom vocabulary filters to delete, mask, or flag words

A custom vocabulary filter is a text file that contains a custom list of individual words that you want to modify in your transcription output.

A common use case is the removal of offensive or profane terms; however, custom vocabulary filters are completely custom, so you can select any words you want. For example, if you have a new product about to launch, you can mask the product name in meeting transcripts. In this case, you keep stakeholders up-to-date while keeping the product name secret until launch.

Vocabulary filtering has three display methods: `mask`, `remove`, and `tag`. Refer to the following examples to see how each works.

- **Mask**: Replaces specified words with three asterisks (***).

```
"transcript": "You can specify a list of *** or *** words, and *** *** removes them
 from transcripts automatically."
```

- **Remove**: Deletes specified words, leaving nothing in their place.

```
"transcript": "You can specify a list of or words, and removes them from transcripts
 automatically."
```

- **Tag**: Adds a tag (`"vocabularyFilterMatch": true`) to each specified word, but doesn't alter the word itself. Tagging allows for rapid transcript substitutions and edits.

```
"transcript": "You can specify a list of profane or offensive words, and amazon
 transcribe removes them from transcripts automatically."
...
    "alternatives": [
        {
            "confidence": "1.0",
            "content": "profane"
        }
    ],
    "type": "pronunciation",
    "vocabularyFilterMatch": true
```

When you submit a transcription request, you can specify a custom vocabulary filter and the filtration method you want to apply. Amazon Transcribe then modifies exact word matches when they appear in your transcript, according to the filtration method you specify.

Custom vocabulary filters can be applied to batch and streaming transcription requests. To learn how to create a custom vocabulary filter, see Creating a vocabulary filter. To learn how to apply your custom vocabulary filter, see Using a custom vocabulary filter.

Note

Amazon Transcribe automatically masks racially sensitive terms, though you can opt out of this default filter by contacting AWS Technical Support.

For a video walkthrough of vocabulary filtering, see Using vocabulary filters.

API operations specific to vocabulary filtering

`CreateVocabularyFilter`, `DeleteVocabularyFilter`, `GetVocabularyFilter`, `ListVocabularyFilters`, `UpdateVocabularyFilter`

Creating a vocabulary filter

There are two options for creating a custom vocabulary filter:

1. Save a list of line-separated words as a plain text file with UTF-8 encoding.
   - You can use this approach with the AWS Management Console, AWS CLI, or AWS SDKs.
   - If using the AWS Management Console, you can provide a local path or an Amazon S3 URI for your custom vocabulary file.
   - If using the AWS CLI or AWS SDKs, you must upload your custom vocabulary file to an Amazon S3 bucket and include the Amazon S3 URI in your request.
2. Include a list of comma-separated words directly in your API request.
   - You can use this approach with the AWS CLI or AWS SDKs using the `Words` parameter.

For examples of each method, refer to Creating custom vocabulary filters

Things to note when creating your custom vocabulary filter:

- Words aren't case sensitive. For example, "curse" and "CURSE" are treated the same.
- Only exact word matches are filtered. For example, if your filter includes "swear" but your media contains the word "swears" or "swearing", these are not filtered. Only instances of "swear" are filtered. You must therefore include all variations of the words you want filtered.
- Filters don't apply to words that are contained in other words. For example, if a custom vocabulary filter contains "marine" but not "submarine", "submarine" is not altered in the transcript.
- Each entry can only contain one word (no spaces).
- If you save your custom vocabulary filter as a text file, it must be in plain text format with UTF-8 encoding.
- You can have up to 100 custom vocabulary filters per AWS account and each can be up to 50 Kb in size.
- You can only use characters that are supported for your language. Refer to your language's character set for details.

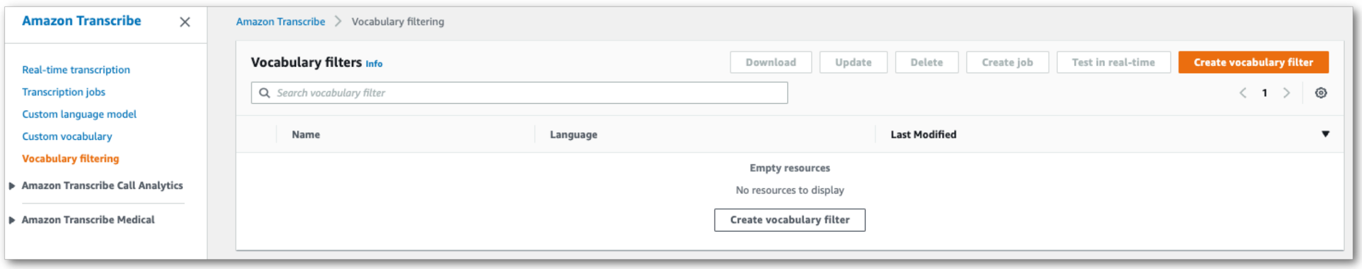
Creating custom vocabulary filters

To process a custom vocabulary filter for use with Amazon Transcribe, see the following examples:

AWS Management Console

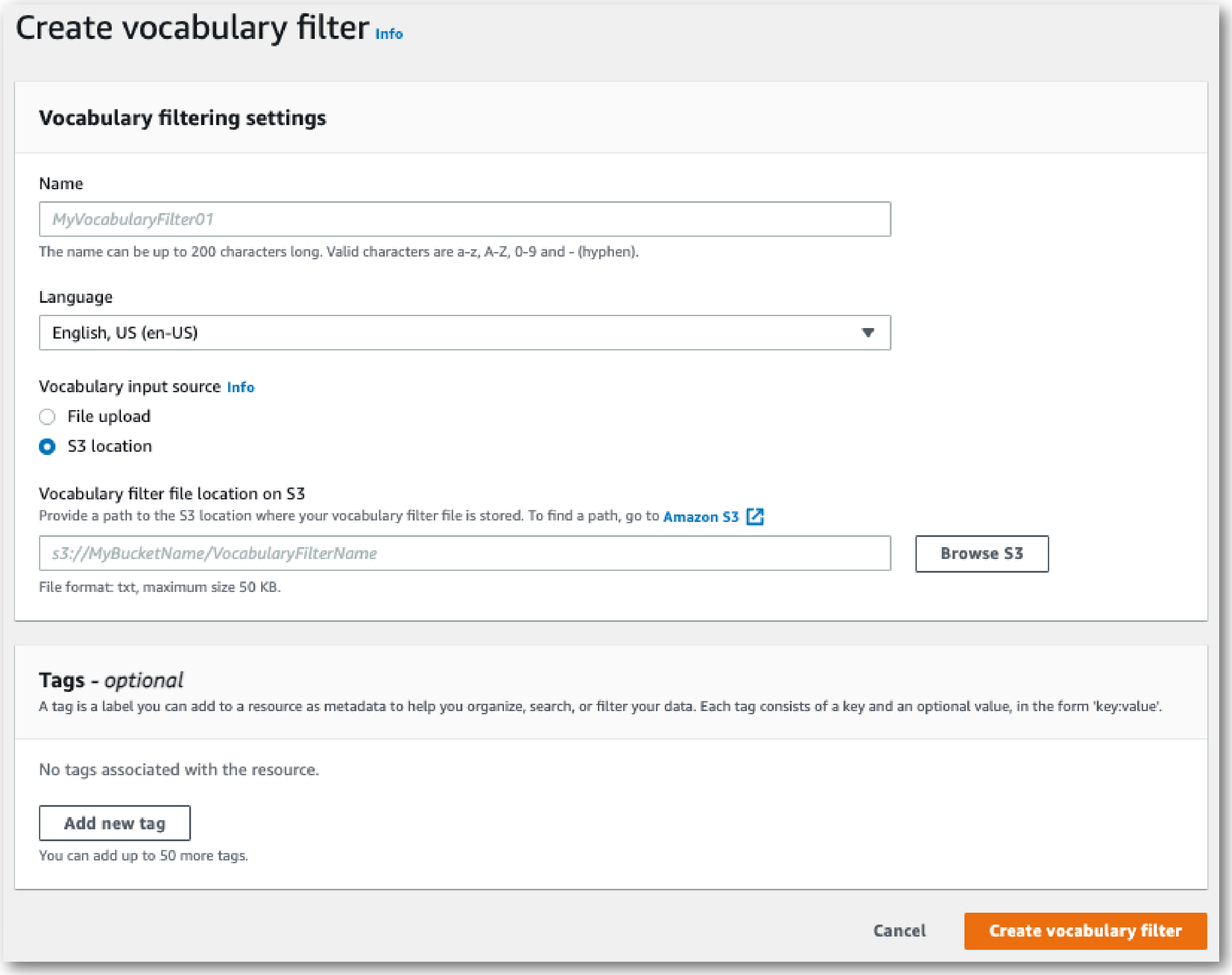
Before continuing, save your custom vocabulary filter as a text (*.txt) file. You can optionally upload your file to an Amazon S3 bucket.

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Vocabulary filtering**. This opens the **Vocabulary filters** page where you can view existing custom vocabulary filters or create a new one.
3. Select **Create vocabulary filter**.



This takes you to the **Create vocabulary filter** page. Enter a name for your new custom vocabulary filter.

Select the **File upload** or **S3 location** option under **Vocabulary input source**. Then specify the location of your custom vocabulary file.



Create vocabulary filter Info

Vocabulary filtering settings

Name

MyVocabularyFilter01

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9 and - (hyphen).

Language

English, US (en-US)

Vocabulary input source Info

File upload [✓ S3 location]

Vocabulary filter file location on S3

Provide a path to the S3 location where your vocabulary filter file is stored. To find a path, go to Amazon S3

s3://MyBucketName/VocabularyFilterName

File format: txt, maximum size 50 KB.

Tags - *optional*

A tag is a label you can add to a resource as metadata to help you organize, search, or filter your data. Each tag consists of a key and an optional value, in the form 'key:value'.

No tags associated with the resource.

You can add up to 50 more tags.

4. Optionally, add tags to your custom vocabulary filter. Once you have all fields completed, select **Create vocabulary filter** at the bottom of the page. If there are no errors processing your file, this takes you back to the **Vocabulary filters** page.

   Your custom vocabulary filter is now ready to use.

AWS CLI

This example uses the create-vocabulary-filter command to process a word list into a usable custom vocabulary filter. For more information, see `CreateVocabularyFilter`.

Option 1: You can include your list of words to your request using the `words` parameter.

```
aws transcribe create-vocabulary-filter \
--vocabulary-filter-name my-first-vocabulary-filter \
--language-code en-US \
--words profane,offensive,Amazon,Transcribe
```

Option 2: You can save your list of words as a text file and upload it to an Amazon S3 bucket, then include the file's URI in your request using the `vocabulary-filter-file-uri` parameter.

```
aws transcribe create-vocabulary-filter \
--vocabulary-filter-name my-first-vocabulary-filter \
--language-code en-US \
--vocabulary-filter-file-uri s3://amzn-s3-demo-bucket/my-vocabulary-filters/my-
vocabulary-filter.txt
```

Here's another example using the create-vocabulary-filter command, and a request body that creates your custom vocabulary filter.

```
aws transcribe create-vocabulary-filter \
--cli-input-json file://filepath/my-first-vocab-filter.json
```

The file *my-first-vocab-filter.json* contains the following request body.

Option 1: You can include your list of words to your request using the `Words` parameter.

```
{
  "VocabularyFilterName": "my-first-vocabulary-filter",
  "LanguageCode": "en-US",
  "Words": [
        "profane","offensive","Amazon","Transcribe"
  ]
}
```

Option 2: You can save your list of words as a text file and upload it to an Amazon S3 bucket, then include the file's URI in your request using the `VocabularyFilterFileUri` parameter.

```
{
  "VocabularyFilterName": "my-first-vocabulary-filter",
  "LanguageCode": "en-US",
  "VocabularyFilterFileUri": "s3://amzn-s3-demo-bucket/my-vocabulary-filters/my-
vocabulary-filter.txt"
}
```

Note

If you include `VocabularyFilterFileUri` in your request, you cannot use `Words`; you must choose one or the other.

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a custom vocabulary filter using the create_vocabulary_filter method. For more information, see `CreateVocabularyFilter`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

Option 1: You can include your list of words to your request using the `Words` parameter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
vocab_name = "my-first-vocabulary-filter"
response = transcribe.create_vocabulary_filter(
    LanguageCode = 'en-US',
    VocabularyFilterName = vocab_name,
    Words = [
        'profane','offensive','Amazon','Transcribe'
    ]
)
```

Option 2: You can save your list of words as a text file and upload it to an Amazon S3 bucket, then include the file's URI in your request using the `VocabularyFilterFileUri` parameter.

```
from __future__ import print_function
```

```
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
vocab_name = "my-first-vocabulary-filter"
response = transcribe.create_vocabulary_filter(
    LanguageCode = 'en-US',
    VocabularyFilterName = vocab_name,
    VocabularyFilterFileUri = 's3://amzn-s3-demo-bucket/my-vocabulary-filters/my-
vocabulary-filter.txt'
)
```

Note

If you include `VocabularyFilterFileUri` in your request, you cannot use `Words`; you must choose one or the other.

Note

If you create a new Amazon S3 bucket for your custom vocabulary filter files, make sure the IAM role making the `CreateVocabularyFilter` request has permissions to access this bucket. If the role doesn't have the correct permissions, your request fails. You can optionally specify an IAM role within your request by including the `DataAccessRoleArn` parameter. For more information on IAM roles and policies in Amazon Transcribe, see Amazon Transcribe identity-based policy examples.

Using a custom vocabulary filter

Once your custom vocabulary filter is created, you can include it in your transcription requests; refer to the following sections for examples.

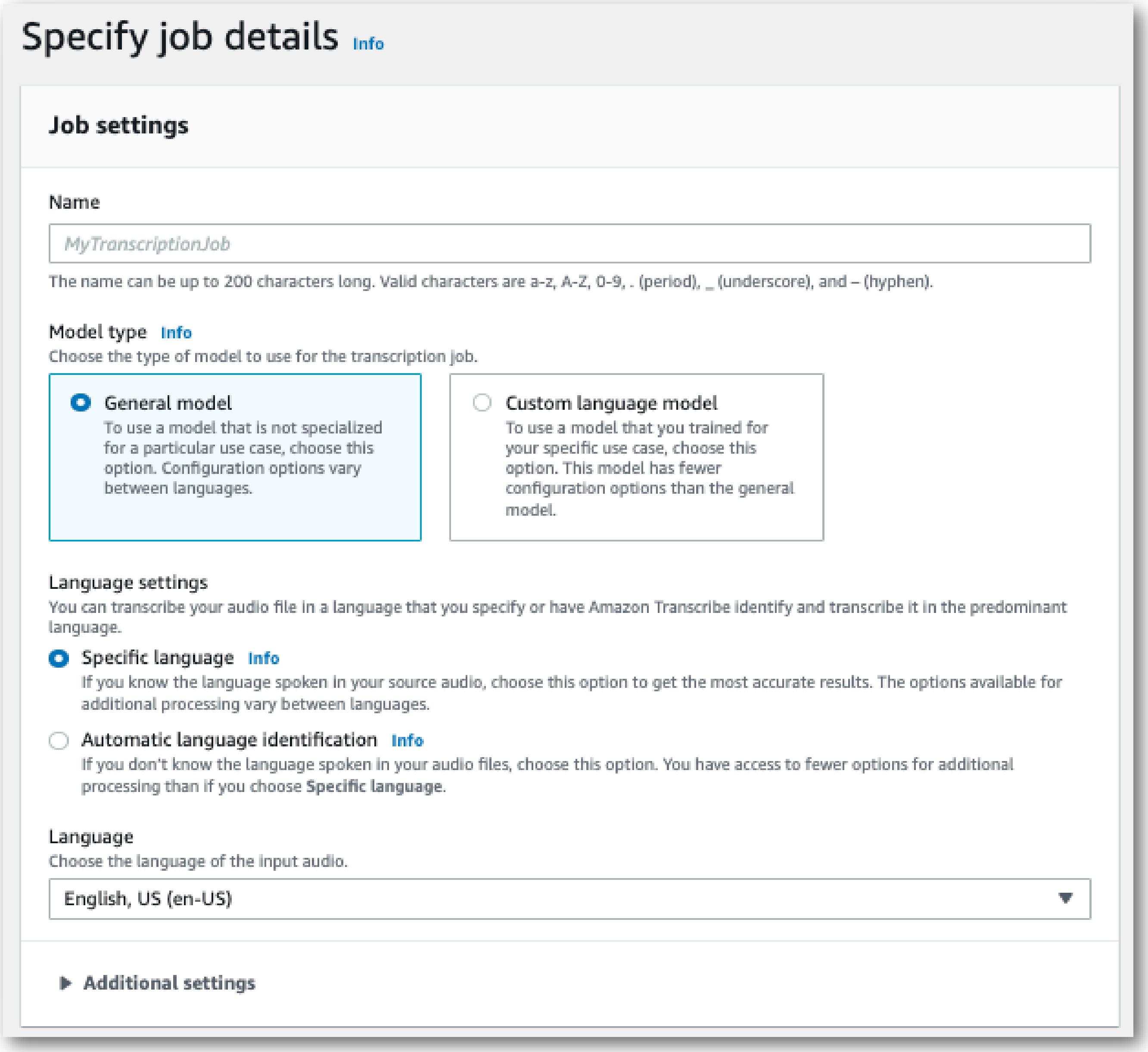
The language of the custom vocabulary filter you're including in your request must match the language code you specify for your media. If you use language identification and specify multiple language options, you can include one custom vocabulary filter per specified language. If the languages of your custom vocabulary filters don't match the language identified in your audio, your filters are not applied to your transcription and there are no warnings or errors.

Using a custom vocabulary filter in a batch transcription

To use a custom vocabulary filter with a batch transcription, see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info

If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info

If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

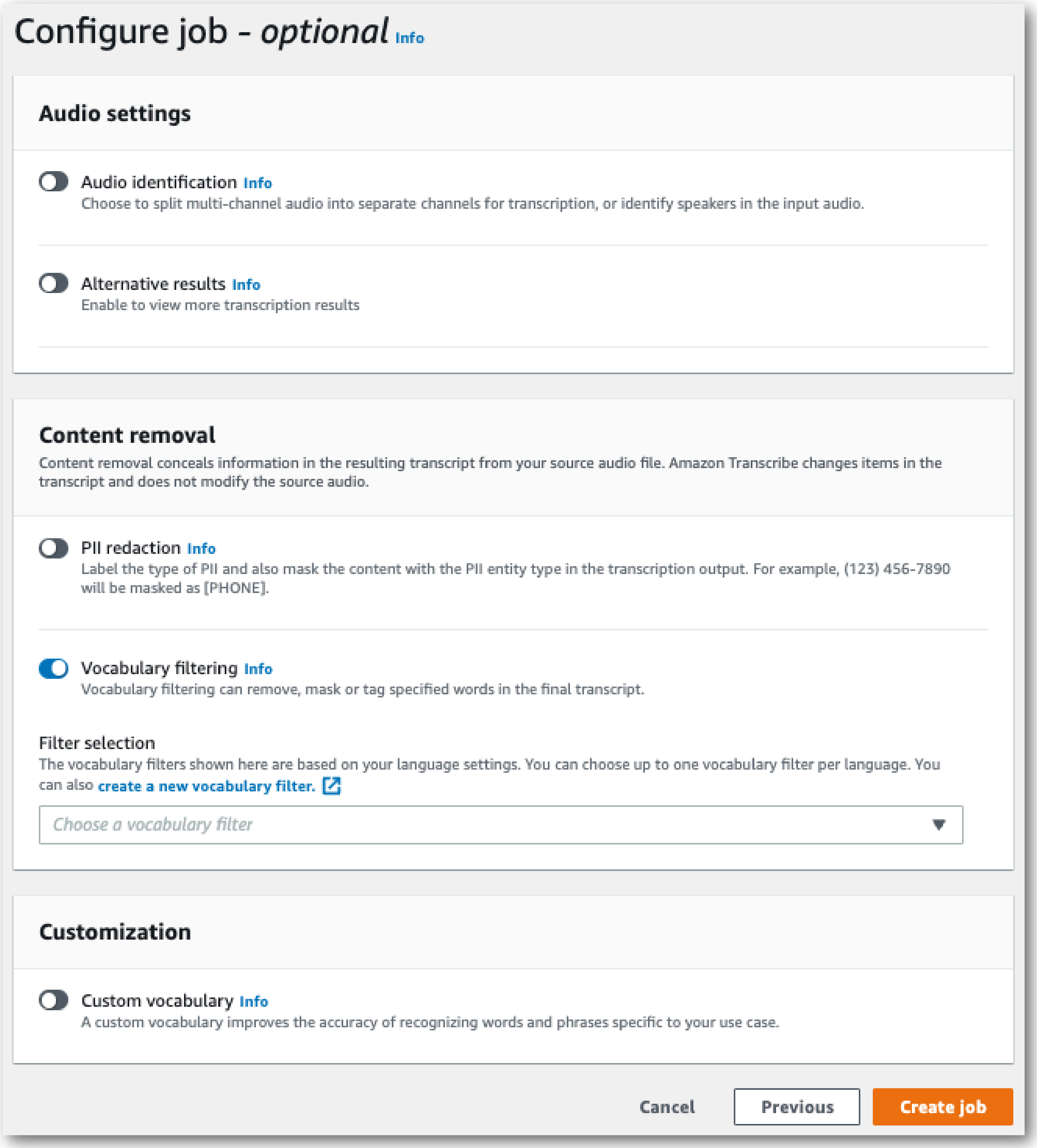
Choose the language of the input audio.

English, US (en-US)

Additional settings

Name your job and specify your input media. Optionally include any other fields, then choose **Next**.

3. On the **Configure job** page, in the **Content removal** panel, toggle on **Vocabulary filtering**.



Configure job - *optional* Info

Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Content removal
Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

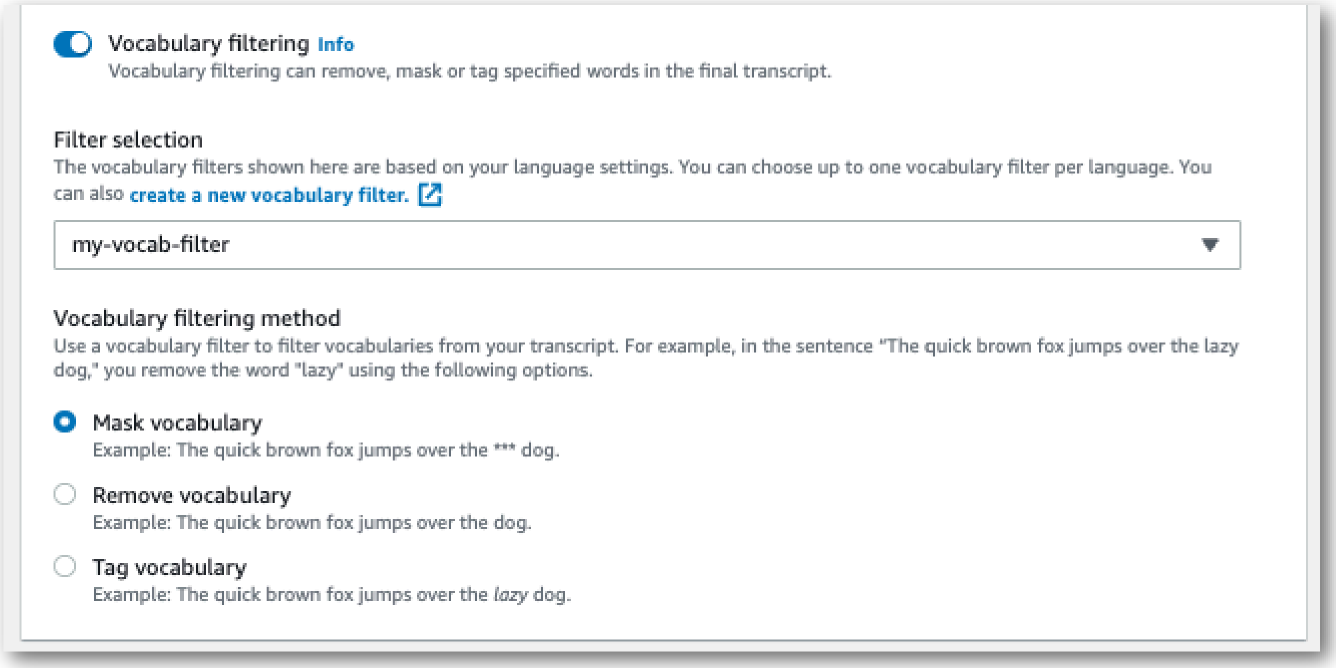
Filter selection
The vocabulary filters shown here are based on your language settings. You can choose up to one vocabulary filter per language. You can also create a new vocabulary filter.

Choose a vocabulary filter

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

4. Select your custom vocabulary filter from the dropdown menu and specify the filtration method.



Vocabulary filtering Info

Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Filter selection

The vocabulary filters shown here are based on your language settings. You can choose up to one vocabulary filter per language. You can also create a new vocabulary filter.

my-vocab-filter

Vocabulary filtering method

Use a vocabulary filter to filter vocabularies from your transcript. For example, in the sentence "The quick brown fox jumps over the lazy dog," you remove the word "lazy" using the following options.

[✓ Mask vocabulary]
Example: The quick brown fox jumps over the *** dog.

Remove vocabulary
Example: The quick brown fox jumps over the dog.

Tag vocabulary
Example: The quick brown fox jumps over the *lazy* dog.

5. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `Settings` parameter with the `VocabularyFilterName` and `VocabularyFilterMethod` sub-parameters. For more information, see `StartTranscriptionJob` and `Settings`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--settings VocabularyFilterName=my-first-vocabulary-filter,VocabularyFilterMethod=mask
```

Here's another example using the start-transcription-job command, and a request body that includes your custom vocabulary filter with that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-vocabulary-filter-job.json
```

The file *my-first-vocabulary-filter-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "Settings": {
        "VocabularyFilterName": "my-first-vocabulary-filter",
        "VocabularyFilterMethod": "mask"
   }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to include a custom vocabulary filter using the `Settings` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `Settings`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

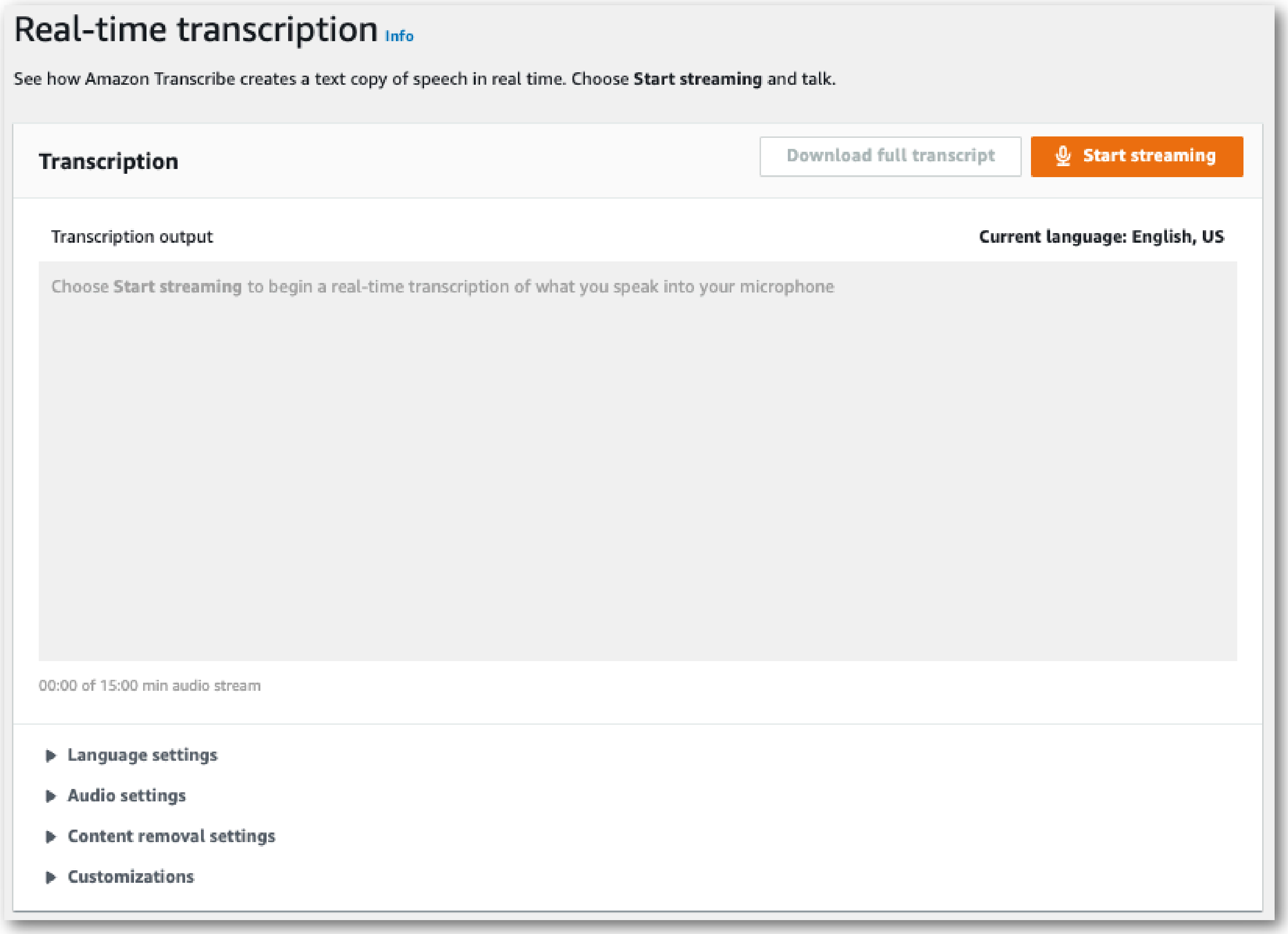
```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Settings = {
        'VocabularyFilterName': 'my-first-vocabulary-filter',
        'VocabularyFilterMethod': 'mask'
   }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Using a custom vocabulary filter in a streaming transcription

To use a custom vocabulary filter with a streaming transcription, see the following for examples:

AWS Management Console

1. Sign into the AWS Management Console.
2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Content removal settings** and expand this field if it is minimized.


Real-time transcription Info

See how Amazon Transcribe creates a text copy of speech in real time. Choose **Start streaming** and talk.

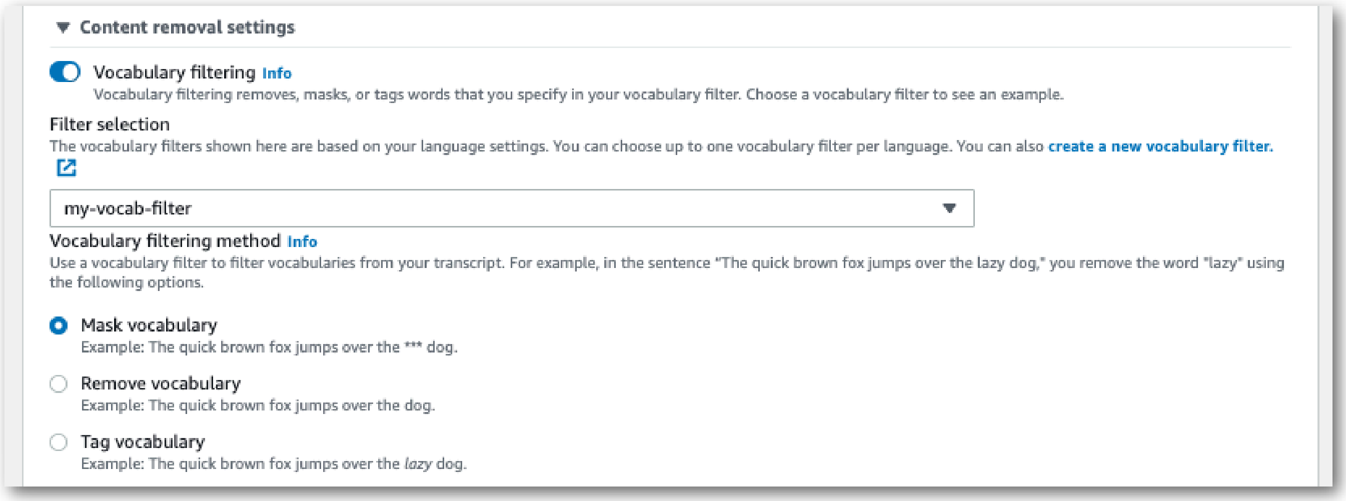
Transcription output

Current language: English, US

Choose **Start streaming** to begin a real-time transcription of what you speak into your microphone

00:00 of 15:00 min audio stream

3. Toggle on **Vocabulary filtering**. Select a custom vocabulary filter from the dropdown menu and specify the filtration method.


▼ Content removal settings

Vocabulary filtering Info

Vocabulary filtering removes, masks, or tags words that you specify in your vocabulary filter. Choose a vocabulary filter to see an example.

Filter selection

The vocabulary filters shown here are based on your language settings. You can choose up to one vocabulary filter per language. You can also create a new vocabulary filter.

my-vocab-filter

Vocabulary filtering method Info

Use a vocabulary filter to filter vocabularies from your transcript. For example, in the sentence "The quick brown fox jumps over the lazy dog," you remove the word "lazy" using the following options.

[✓ Mask vocabulary]
Example: The quick brown fox jumps over the *** dog.

Remove vocabulary
Example: The quick brown fox jumps over the dog.

Tag vocabulary
Example: The quick brown fox jumps over the *lazy* dog.

Include any other settings you want to apply to your stream.

4. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

HTTP/2 stream

This example creates an HTTP/2 request that includes your custom vocabulary filter and filter method. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-vocabulary-filter-name: my-first-vocabulary-filter
x-amzn-transcribe-vocabulary-filter-method: mask
transfer-encoding: chunked
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that applies your custom vocabulary filter to a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-
websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
```

```
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
&vocabulary-filter-name=my-first-vocabulary-filter
&vocabulary-filter-method=mask
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Detecting toxic speech

Toxic speech detection is designed to help moderate social media platforms that involve peer-to-peer dialogue, such as online gaming and social chat platforms. The use of toxic speech can be deeply detrimental to individuals, peer groups, and communities. Flagging harmful language helps organizations keep conversations civil and maintain a safe and inclusive online environment for users to create, share and participate freely.

Amazon Transcribe Toxicity Detection leverages both audio and text-based cues to identify and classify voice-based toxic content across seven categories including sexual harassment, hate speech, threat, abuse, profanity, insult, and graphic. In addition to text, Amazon Transcribe Toxicity Detection uses speech cues, such as tones and pitch to hone in on toxic intent in speech. This is an improvement from standard content moderation systems that are designed to focus only on specific terms, without accounting for intention.

Amazon Transcribe flags and categorizes toxic speech, which minimizes the volume of data that must be manually processed. This enables content moderators to quickly and efficiently manage the discourse on their platforms.

Toxic speech categories include:

- **Profanity**: Speech that contains words, phrases, or acronyms that are impolite, vulgar, or offensive.
- **Hate speech**: Speech that criticizes, insults, denounces, or dehumanizes a person or group on the basis of an identity (such as race, ethnicity, gender, religion, sexual orientation, ability, and national origin).
- **Sexual**: Speech that indicates sexual interest, activity, or arousal using direct or indirect references to body parts, physical traits, or sex.
- **Insults**: Speech that includes demeaning, humiliating, mocking, insulting, or belittling language. This type of language is also labeled as bullying.
- **Violence or threat**: Speech that includes threats seeking to inflict pain, injury, or hostility toward a person or group.
- **Graphic**: Speech that uses visually descriptive and unpleasantly vivid imagery. This type of language is often intentionally verbose to amplify a recipient's discomfort.
- **Harassment or abusive**: Speech intended to affect the psychological well-being of the recipient, including demeaning and objectifying terms. This type of language is also labeled as harassment.

Toxicity detection analyzes speech segments (the speech between natural pauses) and assigns confidence scores to these segments. Confidence scores are values between 0 and 1. A larger confidence score indicates a greater likelihood that the content is toxic speech in the associated category. You can use these confidence scores to set the appropriate threshold of toxicity detection for your use case.

Note

Toxicity detection is only available for batch transcriptions in US English (`en-US`).

View example output in JSON format.

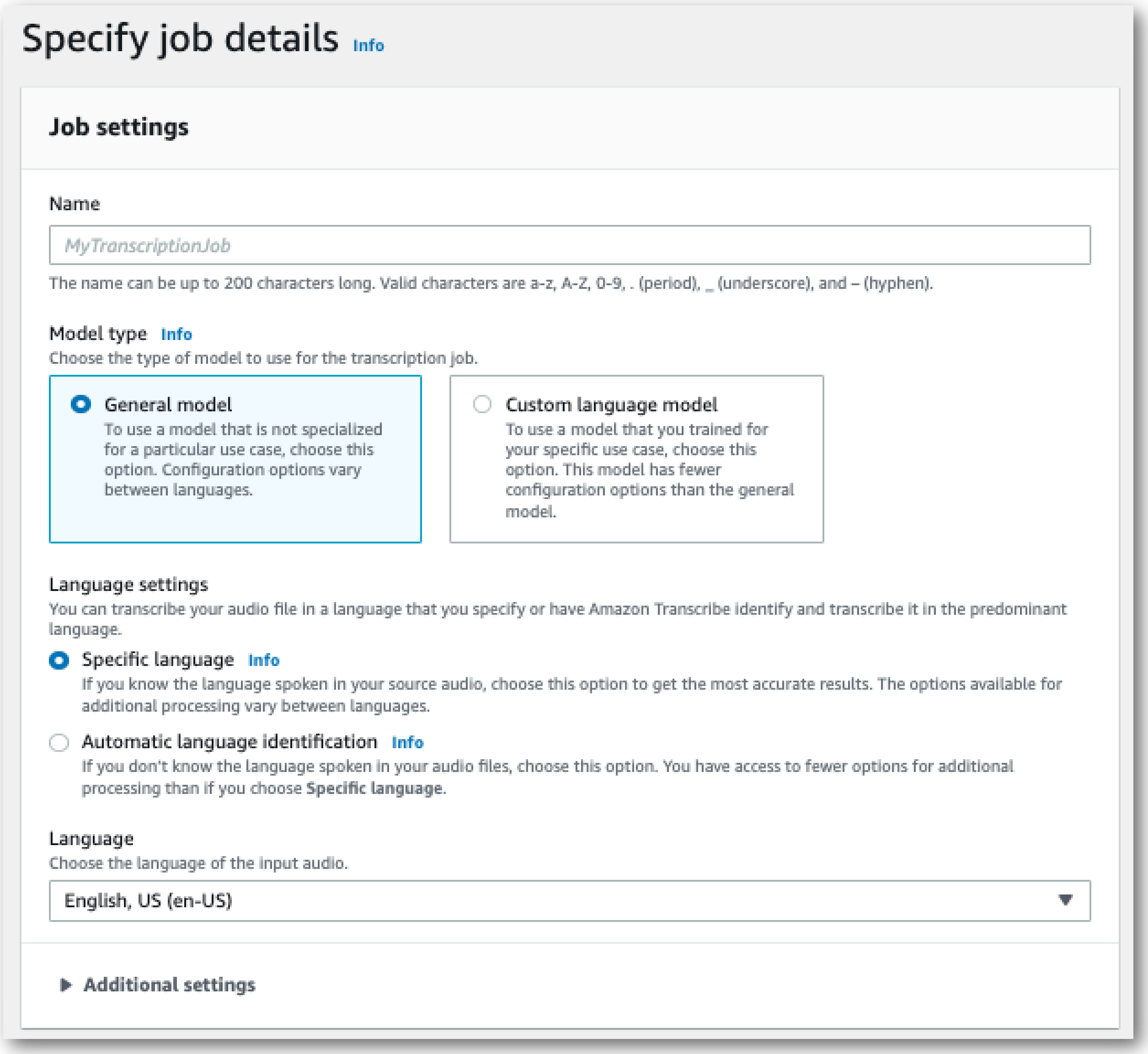
Using toxic speech detection

Using toxic speech detection in a batch transcription

To use toxic speech detection with a batch transcription, see the following for examples:

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page.



Specify job details Info

Job settings

Name

MyTranscriptionJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

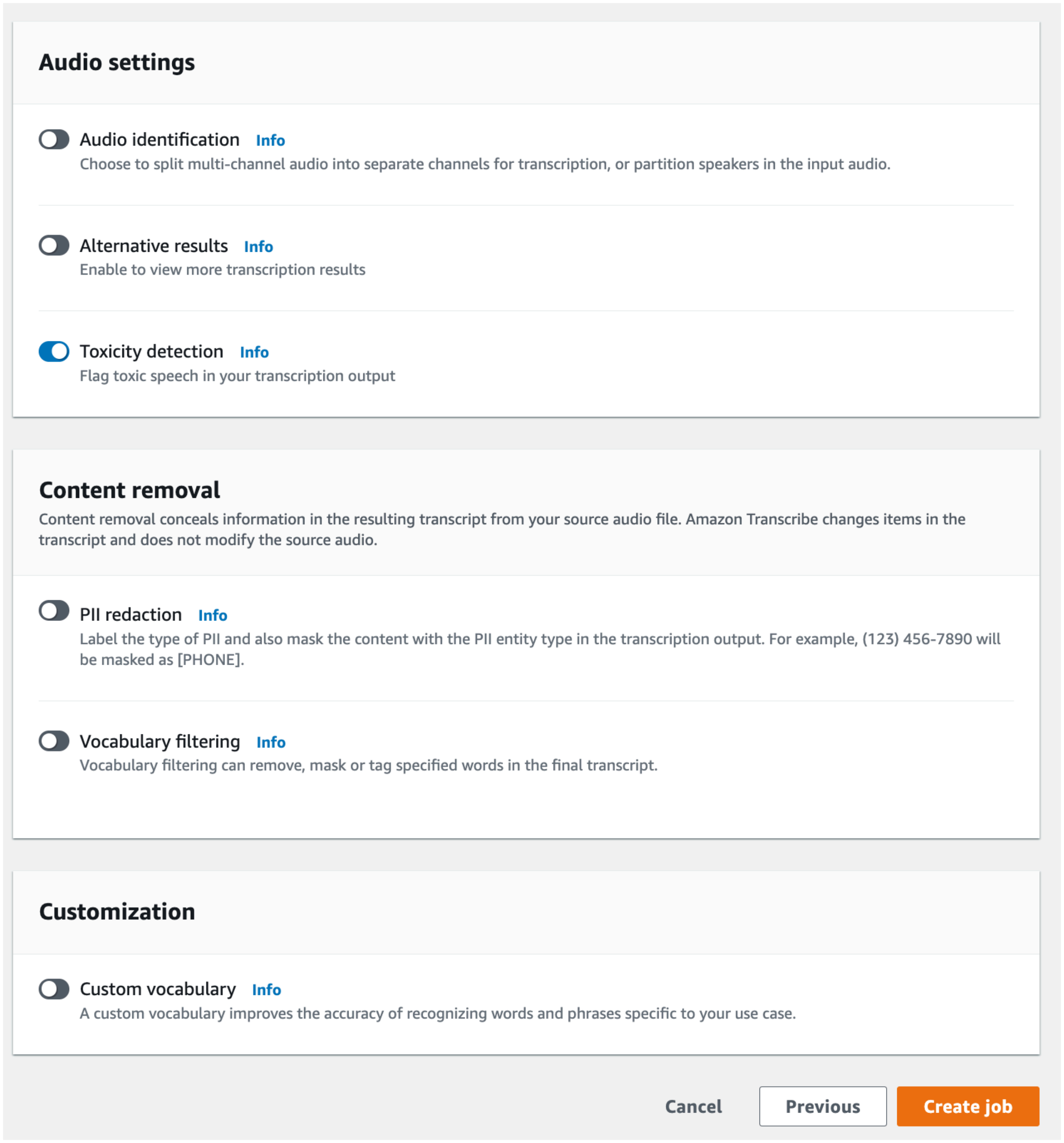
Automatic language identification Info If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

Choose the language of the input audio.

English, US (en-US)

3. On the **Specify job details** page, you can also enable PII redaction if you want. Note that the other listed options are not supported with Toxicity detection. Select **Next**. This takes you to the **Configure job - optional** page. In the **Audio settings** panel, select **Toxicity detection**.



Audio settings

Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or partition speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Toxicity detection Info
Flag toxic speech in your transcription output

Content removal

Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

4. Select **Create job** to run your transcription job.
5. Once your transcription job is complete, you can download your transcript from the **Download** drop-down menu in the transcription job's detail page.

AWS CLI

This example uses the start-transcription-job command and `ToxicityDetection` parameter. For more information, see `StartTranscriptionJob` and `ToxicityDetection`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--toxicity-detection ToxicityCategories=ALL
```

Here's another example using the start-transcription-job command, and a request body that includes toxicity detection.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-toxicity-job.json
```

The file *my-first-toxicity-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "ToxicityDetection": [
      {
         "ToxicityCategories": [ "ALL" ]
      }
   ]
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to enable `ToxicityDetection` for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `ToxicityDetection`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    ToxicityDetection = [
        {
            'ToxicityCategories': ['ALL']
        }
    ]
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Example output

Toxic speech is tagged and categorized in your transcription output. Each instance of toxic speech is categorized and assigned a confidence score (a value between 0 and 1). A larger confidence value indicates a greater likelihood that the content is toxic speech within the specified category.

Example output (JSON)

The following is an example output in JSON format showing categorized toxic speech with associated confidence scores.

```
{
    "jobName": "my-toxicity-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [...],
        "items":[...],
        "toxicity_detection": [
            {
                "text": "What the * are you doing man? That's why I didn't want to play
 with your * .  man it was a no, no I'm not calming down * man. I well I spent I spent
 too much * money on this game.",
                "toxicity": 0.7638,
                "categories": {
                    "profanity": 0.9913,
                    "hate_speech": 0.0382,
                    "sexual": 0.0016,
                    "insult": 0.6572,
                    "violence_or_threat": 0.0024,
                    "graphic": 0.0013,
                    "harassment_or_abuse": 0.0249
                },
                "start_time": 8.92,
                "end_time": 21.45
            },
            Items removed for brevity
            {
                "text": "What? Who? What the * did you just say to me? What's your
 address? What is your * address? I will pull up right now on your * * man. Take your *
 back to , tired of this **.",
                "toxicity": 0.9816,
                "categories": {
                    "profanity": 0.9865,
                    "hate_speech": 0.9123,
                    "sexual": 0.0037,
                    "insult": 0.5447,
                    "violence_or_threat": 0.5078,
                    "graphic": 0.0037,
                    "harassment_or_abuse": 0.0613
                },
                "start_time": 43.459,
                "end_time": 54.639
            },
        ]
    },
    ...
    "status": "COMPLETED"
}
```

Redacting or identifying personally identifiable information

Redaction is used to mask or remove sensitive content, in the form of personally identifiable information (PII), from your transcripts. The types of PII Amazon Transcribe can redact varies between batch and streaming transcriptions. To view the PII list for each transcription method, refer to Redacting PII in your batch job and Redacting or identifying PII in a real-time stream. With streaming transcriptions, you also have the option to flag PII without redacting it; refer to Example PII identification output for an output example.

When redaction is enabled, you have the option to generate only a redacted transcript or both a redacted transcript and an unredacted transcript. If you choose to generate only a redacted transcript, note that your media is the only place where the complete conversation is stored. If you delete your original media, there is no record of the unredacted PII. Because of this, it may be prudent to generate an unredacted transcript in addition to a redacted one.

To learn more about PII redaction with batch transcriptions, refer to: Redacting PII in your batch job.

To learn more about PII redaction or identification with streaming transcriptions, refer to: Redacting or identifying PII in a real-time stream.

Important

The redaction feature is designed to identify and remove sensitive data. However, due to the predictive nature of machine learning, Amazon Transcribe may not identify and remove all instances of sensitive data in your transcript. We strongly recommend that you review any redacted output to ensure it meets your needs.
The redaction feature does not meet the requirements for de-identification under medical privacy laws, such as the U.S. Health Insurance Portability and Accountability Act of 1996 (HIPAA).

For a video walkthrough of the Amazon Transcribe's redaction feature, see Use content redaction to identify & redact PII.

Redacting PII in your batch job

When redacting personally identifiable information (PII) from a transcript during a batch transcription job, Amazon Transcribe replaces each identified instance of PII with `[PII]` in the main text body of your transcript. You can also view the type of PII that is redacted in the word-for-word portion of the transcription output. For an output sample, see Example redacted output (batch).

Redaction with batch transcriptions is available with US English (`en-US`) and US Spanish (`es-US`). Redaction is not compatible with language identification.

Both redacted and unredacted transcripts are stored in the same output Amazon S3 bucket. Amazon Transcribe stores them in a bucket you specify or in the default Amazon S3 bucket managed by the service.

Types of PII Amazon Transcribe can recognize for batch transcriptions

PII type	Description
`ADDRESS`	A physical address, such as *100 Main Street, Anytown, USA* or *Suite #12, Building 123*. An address can include a street, building, location, city, state, country, county, zip, precinct, neighborhood, and more.
`ALL`	Redact or identify all PII types listed in this table.
`BANK_ACCOUNT_NUMBER`	A US bank account number. These are typically between 10 - 12 digits long, but Amazon Transcribe also recognizes bank account numbers when only the last 4 digits are present.
`BANK_ROUTING`	A US bank account routing number. These are typically 9 digits long, but Amazon Transcrib e also recognizes routing numbers when only the last 4 digits are present.

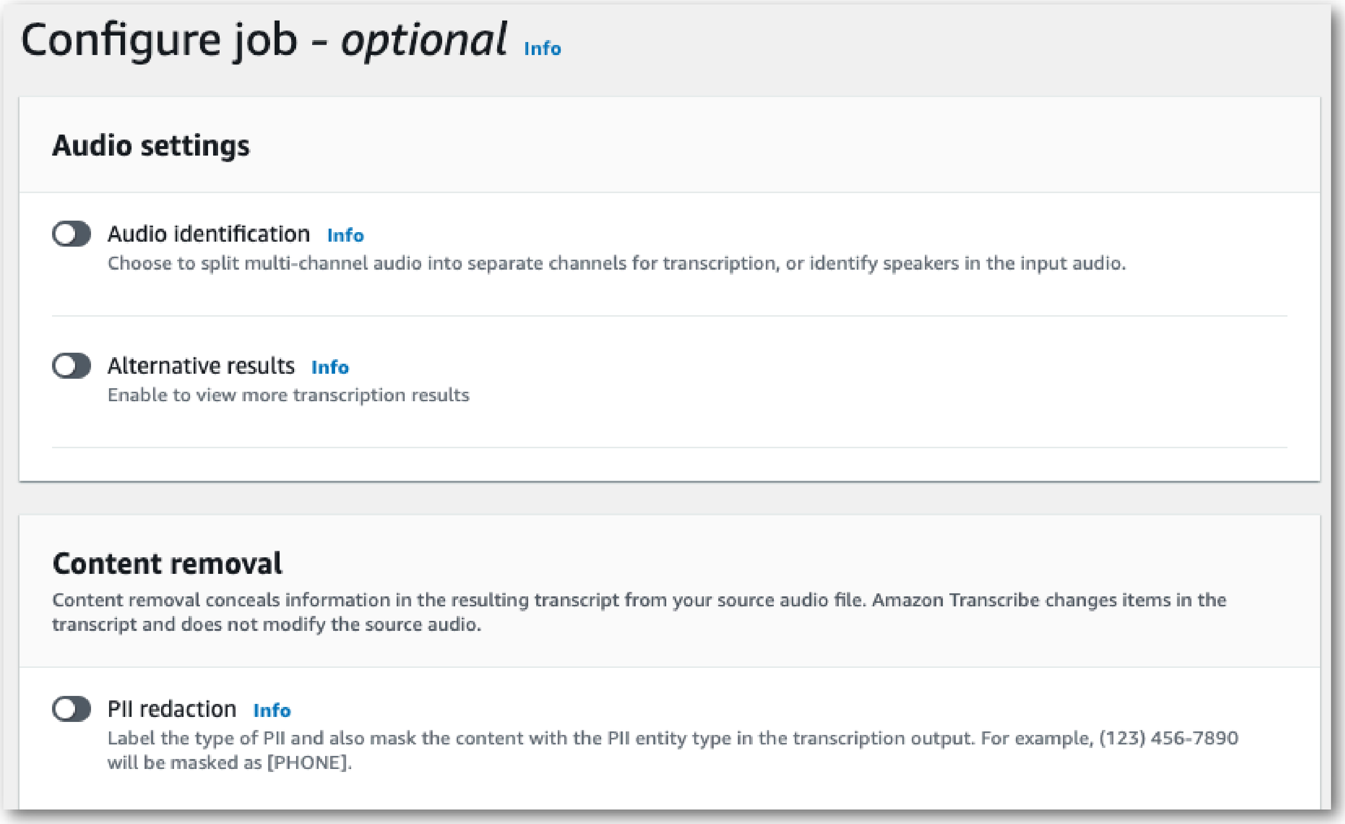
PII type	Description
`CREDIT_DEBIT_CVV`	A 3-digit card verification code (CVV) that is present on VISA, MasterCard, and Discover credit and debit cards. In American Express credit or debit cards, it is a 4-digit numeric code.
`CREDIT_DEBIT_EXPIRY`	The expiration date for a credit or debit card. This number is usually 4 digits long and formatted as month/year or MM/YY. For example, Amazon Transcribe can recognize expiration dates such as *01/21*, *01/2021*, and *Jan 2021*.
`CREDIT_DEBIT_NUMBER`	The number for a credit or debit card. These numbers can vary from 13 to 16 digits in length, but Amazon Transcribe also recognize s credit or debit card numbers when only the last 4 digits are present.
`EMAIL`	An email address, such as *efua.owusu@email.c om*.
`NAME`	An individual's name. This entity type does not include titles, such as Mr., Mrs., Miss, or Dr. Amazon Transcribe does not apply this entity type to names that are part of organizations or addresses. For example, Amazon Transcrib e recognizes the *John Doe Organization* as an organization, and *Jane Doe Street* as an address.
`PHONE`	A phone number. This entity type also includes fax and pager numbers.

PII type	Description
`PIN`	A 4-digit personal identification number (PIN) that allows someone to access their bank account information.
`SSN`	A Social Security Number (SSN) is a 9-digit number that is issued to US citizens, permanent residents, and temporary working residents. Amazon Transcribe also recognizes Social Security Numbers when only the last 4 digits are present.

You can start a batch transcription job using the AWS Management Console, AWS CLI, or AWS SDK.

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This will open the **Specify job details** page.
3. After filling in your desired fields on the **Specify job details** page, select **Next** to go to the **Configure job - *optional*** page. Here you'll find the **Content removal** panel with the **PII redaction** toggle.



Configure job - *optional* Info

Audio settings

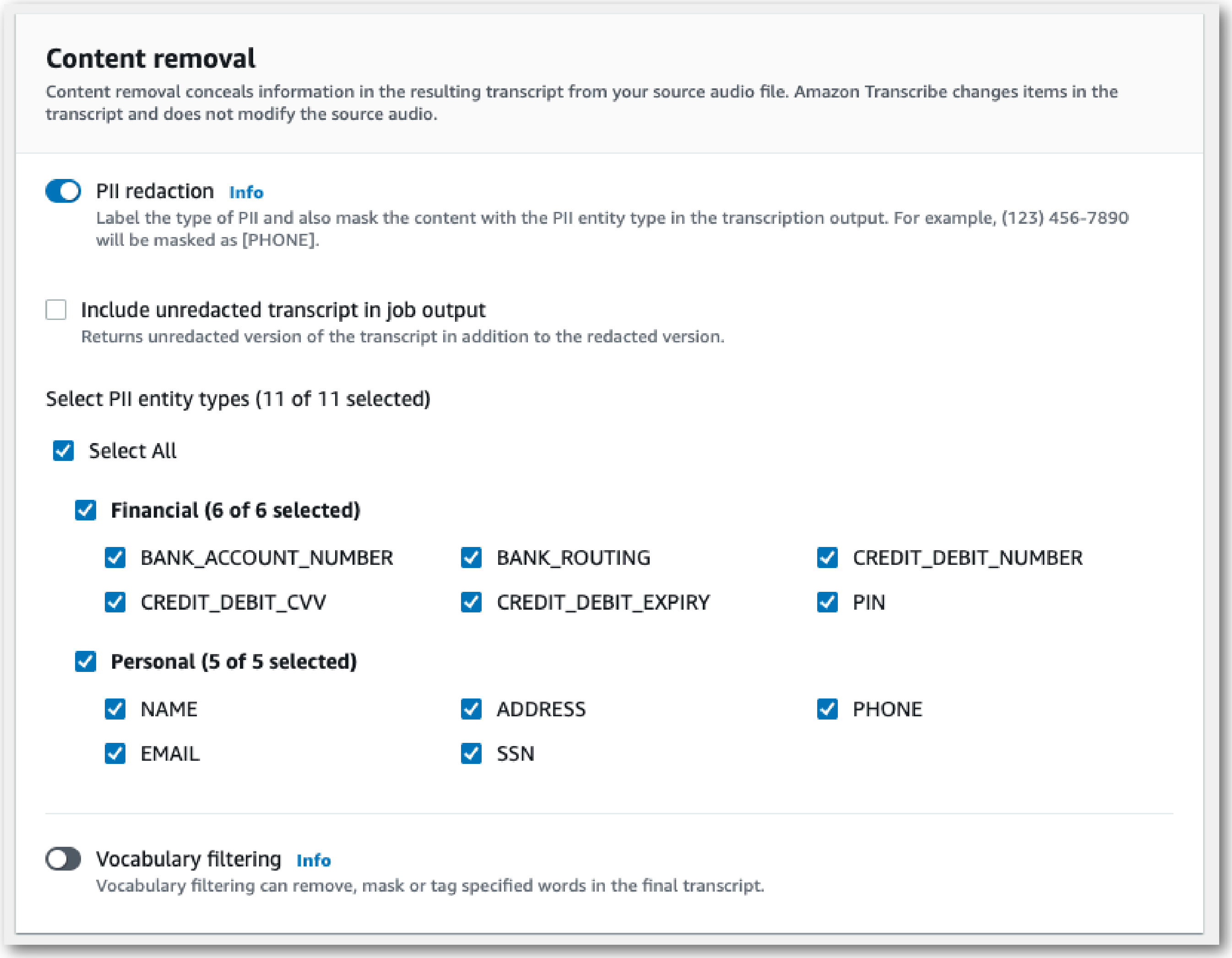
Audio identification Info
Choose to split multi-channel audio into separate channels for transcription, or identify speakers in the input audio.

Alternative results Info
Enable to view more transcription results

Content removal
Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

4. Once you select **PII redaction**, you have the option to select all PII types you want to redact. You can also choose to have an unredacted transcript if you select **Include unredacted transcript in job output** box.



Content removal

Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction (on) Info

Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

☐ Include unredacted transcript in job output

Returns unredacted version of the transcript in addition to the redacted version.

Select PII entity types (11 of 11 selected)

☑ Select All

☑ Financial (6 of 6 selected)

☑ BANK_ACCOUNT_NUMBER	☑ BANK_ROUTING	☑ CREDIT_DEBIT_NUMBER
☑ CREDIT_DEBIT_CVV	☑ CREDIT_DEBIT_EXPIRY	☑ PIN

☑ Personal (5 of 5 selected)

☑ NAME	☑ ADDRESS	☑ PHONE
☑ EMAIL	☑ SSN	

Vocabulary filtering (off) Info

Vocabulary filtering can remove, mask or tag specified words in the final transcript.

5. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `content-redaction` parameter. For more information, see `StartTranscriptionJob` and `ContentRedaction`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--content-redaction
 RedactionType=PII,RedactionOutput=redacted,PiiEntityTypes=NAME,ADDRESS,BANK_ACCOUNT_NUMBER
```

Here's another example using the start-transcription-job method, and the request body redacts PII for that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-redaction-job.json
```

The file *my-first-redaction-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
      "MediaFileUri":  "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "ContentRedaction": {
      "RedactionOutput":"redacted",
      "RedactionType":"PII",
      "PiiEntityTypes": [
           "NAME",
           "ADDRESS",
           "BANK_ACCOUNT_NUMBER"
      ]
  }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to redact content using the `ContentRedaction` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `ContentRedaction`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
```

```
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    ContentRedaction = {
        'RedactionOutput':'redacted',
        'RedactionType':'PII',
        'PiiEntityTypes': [
            'NAME','ADDRESS','BANK_ACCOUNT_NUMBER'
        ]
    }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Note

PII redaction for batch jobs is only supported in these AWS Regions: Asia Pacific (Hong Kong), Asia Pacific (Mumbai), Asia Pacific (Seoul), Asia Pacific (Singapore), Asia Pacific (Sydney), Asia Pacific (Tokyo), GovCloud (US-West), Canada (Central), EU (Frankfurt), EU (Ireland), EU (London), EU (Paris), Middle East (Bahrain), South America (Sao Paulo), US East (N. Virginia), US East (Ohio), US West (Oregon), and US West (N. California).

Redacting or identifying PII in a real-time stream

When redacting personally identifiable information (PII) from a streaming transcription, Amazon Transcribe replaces each identified instance of PII with `[PII]` in your transcript.

An additional option available for streaming transcriptions is *PII identification*. When you activate PII Identification, Amazon Transcribe labels the PII in your transcription results under an `Entities` object. For an output sample, see Example redacted streaming output and Example PII identification output.

Redaction and identification of PII with streaming transcriptions is available with these English dialects: Australian (`en-AU`), British (`en-GB`), US (`en-US`) and Spanish US dialect (`es-US`).

PII identification and redaction for streaming jobs is performed only upon complete transcription of the audio segments.

Types of PII Amazon Transcribe can recognize for streaming transcriptions

PII type	Description
`ADDRESS`	A physical address, such as *100 Main Street, Anytown, USA* or *Suite #12, Building 123*. An address can include a street, building, location, city, state, country, county, zip, precinct, neighborhood, and more.
`ALL`	Redact or identify all PII types listed in this table.
`BANK_ACCOUNT_NUMBER`	A US bank account number. These are typically between 10 - 12 digits long, but Amazon Transcribe also recognizes bank account numbers when only the last 4 digits are present.
`BANK_ROUTING`	A US bank account routing number. These are typically 9 digits long, but Amazon Transcrib e also recognizes routing numbers when only the last 4 digits are present.

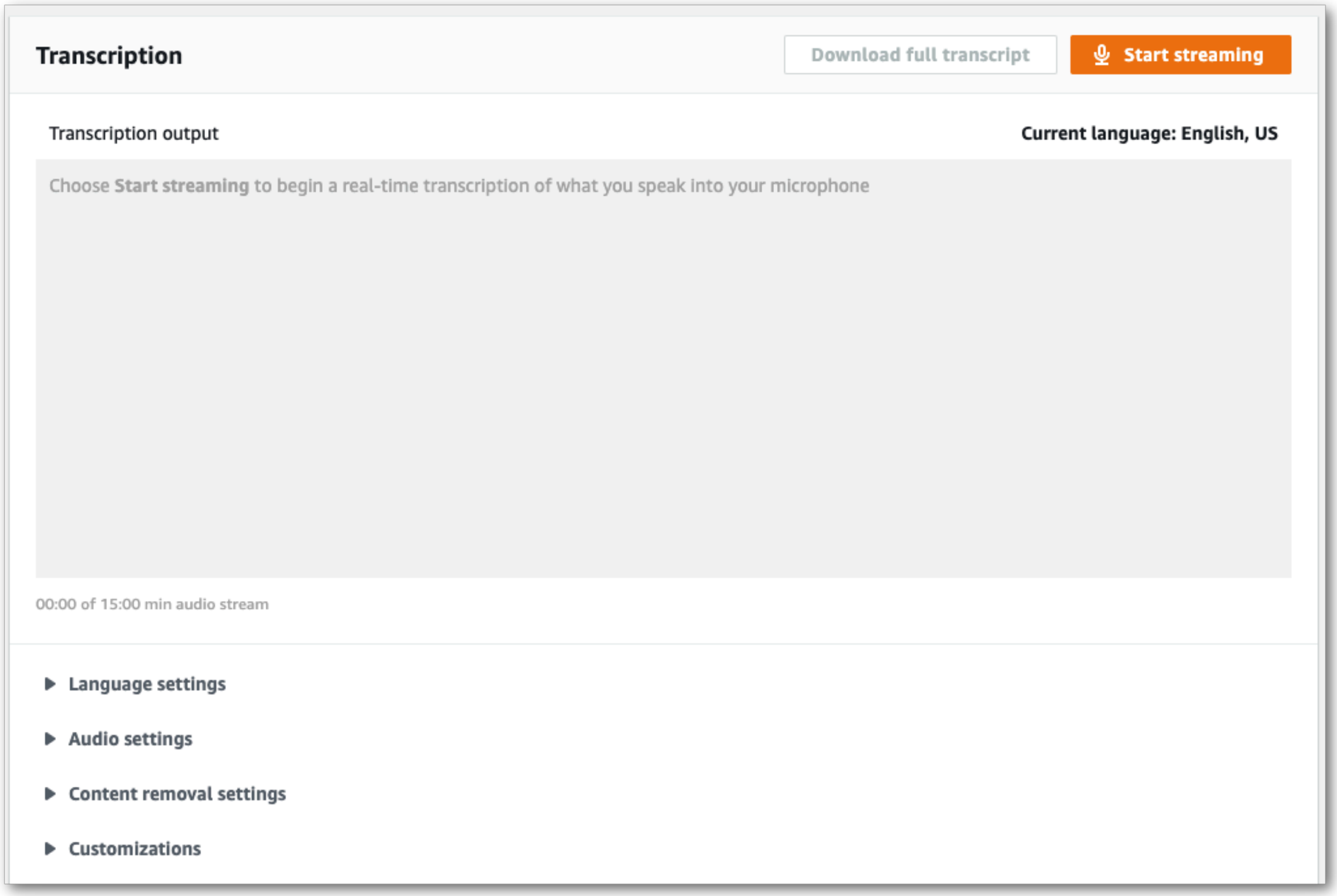
PII type	Description
`CREDIT_DEBIT_CVV`	A 3-digit card verification code (CVV) that is present on VISA, MasterCard, and Discover credit and debit cards. In American Express credit or debit cards, it is a 4-digit numeric code.
`CREDIT_DEBIT_EXPIRY`	The expiration date for a credit or debit card. This number is usually 4 digits long and formatted as month/year or MM/YY. For example, Amazon Transcribe can recognize expiration dates such as *01/21*, *01/2021*, and *Jan 2021*.
`CREDIT_DEBIT_NUMBER`	The number for a credit or debit card. These numbers can vary from 13 to 16 digits in length, but Amazon Transcribe also recognize s credit or debit card numbers when only the last 4 digits are present.
`EMAIL`	An email address, such as *efua.owusu@email.c om*.
`NAME`	An individual's name. This entity type does not include titles, such as Mr., Mrs., Miss, or Dr. Amazon Transcribe does not apply this entity type to names that are part of organizations or addresses. For example, Amazon Transcrib e recognizes the *John Doe Organization* as an organization, and *Jane Doe Street* as an address.
`PHONE`	A phone number. This entity type also includes fax and pager numbers.

PII type	Description
`PIN`	A 4-digit personal identification number (PIN) that allows someone to access their bank account information.
`SSN`	A Social Security Number (SSN) is a 9-digit number that is issued to US citizens, permanent residents, and temporary working residents. Amazon Transcribe also recognizes Social Security Numbers when only the last 4 digits are present.

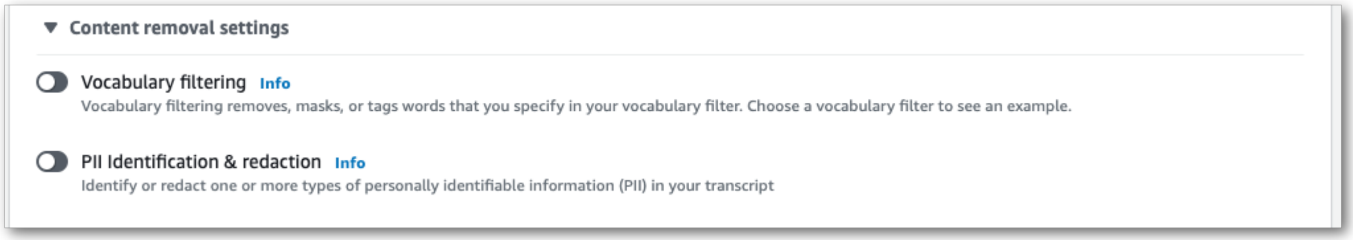
You can start a streaming transcription using the AWS Management Console, WebSocket, or HTTP/2.

AWS Management Console

1. Sign into the AWS Management Console.
2. In the navigation pane, choose **Real-time transcription**. Scroll down to **Content removal settings** and expand this field if it is minimized.


Transcription
Download full transcript
Start streaming
Transcription output
Current language: English, US
Choose Start streaming to begin a real-time transcription of what you speak into your microphone
00:00 of 15:00 min audio stream
Language settings
Audio settings
Content removal settings
Customizations

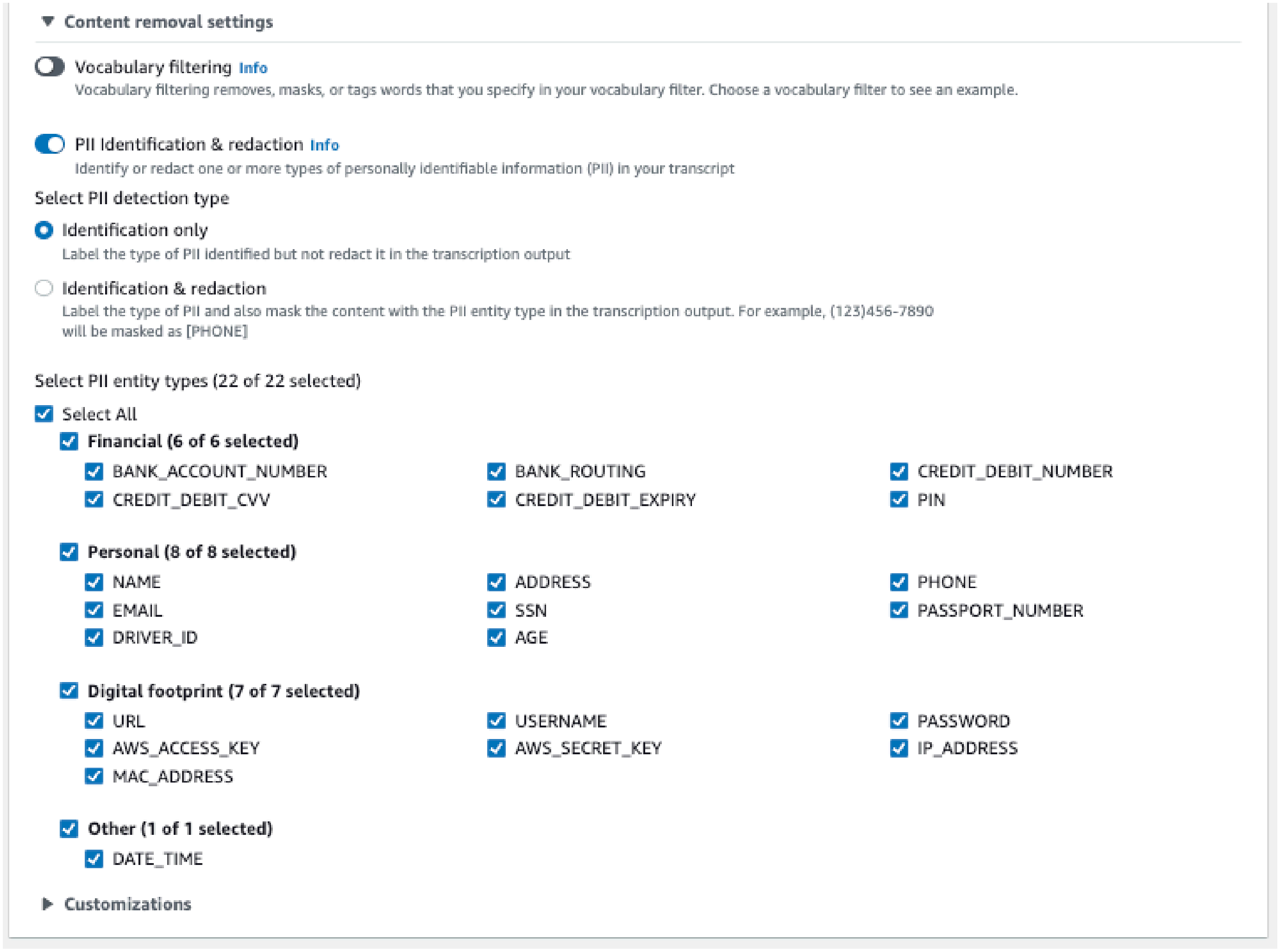
3. Toggle on **PII Identification & redaction**.


Content removal settings
Vocabulary filtering Info
PII Identification & redaction Info

Vocabulary filtering removes, masks, or tags words that you specify in your vocabulary filter. Choose a vocabulary filter to see an example.

Identify or redact one or more types of personally identifiable information (PII) in your transcript

4. Select **Identification only** or **Identification & redaction**, then select the PII entity types you want to identify or redact in your transcript.



▼ Content removal settings

Vocabulary filtering Info
Vocabulary filtering removes, masks, or tags words that you specify in your vocabulary filter. Choose a vocabulary filter to see an example.

PII Identification & redaction Info
Identify or redact one or more types of personally identifiable information (PII) in your transcript

Select PII detection type

[✓ Identification only]
Label the type of PII identified but not redact it in the transcription output

Identification & redaction
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123)456-7890 will be masked as [PHONE]

Select PII entity types (22 of 22 selected)

- ✓ Select All
  - ✓ **Financial (6 of 6 selected)**
    - ✓ BANK_ACCOUNT_NUMBER
    - ✓ BANK_ROUTING
    - ✓ CREDIT_DEBIT_NUMBER
    - ✓ CREDIT_DEBIT_CVV
    - ✓ CREDIT_DEBIT_EXPIRY
    - ✓ PIN
  - ✓ **Personal (8 of 8 selected)**
    - ✓ NAME
    - ✓ ADDRESS
    - ✓ PHONE
    - ✓ EMAIL
    - ✓ SSN
    - ✓ PASSPORT_NUMBER
    - ✓ DRIVER_ID
    - ✓ AGE
  - ✓ **Digital footprint (7 of 7 selected)**
    - ✓ URL
    - ✓ USERNAME
    - ✓ PASSWORD
    - ✓ AWS_ACCESS_KEY
    - ✓ AWS_SECRET_KEY
    - ✓ IP_ADDRESS
    - ✓ MAC_ADDRESS
  - ✓ **Other (1 of 1 selected)**
    - ✓ DATE_TIME

▶ Customizations

5. You're now ready to transcribe your stream. Select **Start streaming** and begin speaking. To end your dictation, select **Stop streaming**.

WebSocket stream

This example creates a presigned URL that uses PII redaction (or PII identification) in a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartStreamTranscription`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/stream-transcription-websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
```

```
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
&pii-entity-types=NAME,ADDRESS
&content-redaction-type=PII (or &content-identification-type=PII)
```

You cannot use both `content-identification-type` and `content-redaction-type` in the same request.

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

HTTP/2 stream

This example creates an HTTP/2 request with PII identification or PII redaction enabled. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartStreamTranscription`.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-content-identification-type: PII (or x-amzn-transcribe-content-
redaction-type: PII)
x-amzn-transcribe-pii-entity-types: NAME,ADDRESS
transfer-encoding: chunked
```

You cannot use both `content-identification-type` and `content-redaction-type` in the same request.

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Note

PII redaction for streaming is only supported in these AWS Regions: Asia Pacific (Seoul), Asia Pacific (Sydney), Asia Pacific (Tokyo), Canada (Central), EU (Frankfurt), EU (Ireland), EU (London), US East (N. Virginia), US East (Ohio), and US West (Oregon).

Example PII redaction and identification output

The following examples show redacted output from batch and streaming jobs, and PII identification from a streaming job.

Transcription jobs using content redaction generate two types of `confidence` values. The Automatic Speech Recognition (ASR) confidence indicates the items that have the `type` of `pronunciation` or `punctuation` is a specific utterance. In the following transcript output, the word Good has a `confidence` of `1.0`. This confidence value indicates that Amazon Transcribe is 100 percent confident that the word uttered in this transcript is 'Good'. The `confidence` value for a `[PII]` tag is the confidence that the speech it flagged for redaction is truly PII. In the following transcript output, the `confidence` of `0.9999` indicates that Amazon Transcribe is 99.99 percent confident that the entity it redacted in the transcript is PII.

Example redacted output (batch)

```
{
    "jobName": "my-first-transcription-job",
    "accountId": "111122223333",
    "isRedacted": true,
    "results": {
        "transcripts": [
            {
                "transcript": "Good morning, everybody. My name is [PII], and today I
 feel like
                sharing a whole lot of personal information with you. Let's start with
 my Social
                Security number [PII]. My credit card number is [PII] and my C V V code
 is [PII].
```

```
                I hope that Amazon Transcribe is doing a good job at redacting that
 personal
                information away. Let's check."
            }
        ],
        "items": [
            {
                "id": 0,
                "start_time": "2.86",
                "end_time": "3.35",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "Good"
                    }
                ],
                "type": "pronunciation"
            },
            Items removed for brevity
            {
                "id": 8,
                "start_time": "5.56",
                "end_time": "6.25",
                "alternatives": [
                    {
                        "content": "[PII]",
                        "redactions": [
                            {
                                "confidence": "0.9999",
                                "type": "NAME",
                                "category": "PII"
                            }
                        ]
                    }
                ],
                "type": "pronunciation"
            },
            Items removed for brevity
        ],
    },
    "status": "COMPLETED"
}
```

Here's the unredacted transcript for comparison:

```
{
    "jobName": "job id",
    "accountId": "111122223333",
    "isRedacted": false,
    "results": {
        "transcripts": [
            {
                "transcript": "Good morning, everybody. My name is Mike, and today I
 feel like
                sharing a whole lot of personal information with you. Let's start with
 my Social
                Security number 000000000. My credit card number is 5555555555555555
                and my C V V code is 000. I hope that Amazon Transcribe is doing a good
 job
                at redacting that personal information away. Let's check."
            }
        ],
        "items": [
            {
                "id": 0,
                "start_time": "2.86",
                "end_time": "3.35",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "Good"
                    }
                ],
                "type": "pronunciation"
            },
            Items removed for brevity
            {
                "id": 8,
                "start_time": "5.56",
                "end_time": "6.25",
                "alternatives": [
                    {
                        "confidence": "0.9999",
                        "content": "Mike",
                     {
                ],
                "type": "pronunciation"
            },
            Items removed for brevity
        ],
    },
    "status": "COMPLETED"
}
```

Example redacted streaming output

```
{
    "TranscriptResultStream": {
        "TranscriptEvent": {
            "Transcript": {
                "Results": [
                    {
                        "Alternatives": [
                            {
                                "Transcript": "my name is [NAME]",
                                "Items": [
                                    {
                                        "Content": "my",
                                        "EndTime": 0.3799375,
                                        "StartTime": 0.0299375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "name",
                                        "EndTime": 0.5899375,
                                        "StartTime": 0.3899375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "is",
                                        "EndTime": 0.7899375,
                                        "StartTime": 0.5999375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "[NAME]",
                                        "EndTime": 1.0199375,
                                        "StartTime": 0.7999375,
                                        "Type": "pronunciation"
                                    }
                                ],
                                "Entities": [
                                    {
                                        "Content": "[NAME]",
                                        "Category": "PII",
                                        "Type": "NAME",
                                        "StartTime" : 0.7999375,
                                        "EndTime" : 1.0199375,
                                        "Confidence": 0.9989
                                    }
                                ]
                            }
                        ],
                        "EndTime": 1.02,
                        "IsPartial": false,
                        "ResultId": "12345a67-8bc9-0de1-2f34-a5b678c90d12",
                        "StartTime": 0.0199375
                    }
                ]
            }
        }
    }
}
```

Example PII identification output

PII identification is an additional feature that you can use with your streaming transcription job. The identified PII is listed in each segment's `Entities` section.

```
{
    "TranscriptResultStream": {
        "TranscriptEvent": {
            "Transcript": {
                "Results": [
                    {
                        "Alternatives": [
                            {
                                "Transcript": "my name is mike",
                                "Items": [
                                    {
                                        "Content": "my",
                                        "EndTime": 0.3799375,
                                        "StartTime": 0.0299375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "name",
                                        "EndTime": 0.5899375,
                                        "StartTime": 0.3899375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "is",
                                        "EndTime": 0.7899375,
                                        "StartTime": 0.5999375,
                                        "Type": "pronunciation"
                                    },
                                    {
                                        "Content": "mike",
                                        "EndTime": 0.9199375,
                                        "StartTime": 0.7999375,
                                        "Type": "pronunciation"

                                    }
                                ],
                                "Entities": [
                                    {
                                        "Content": "mike",
                                        "Category": "PII",
                                        "Type": "NAME",
                                        "StartTime" : 0.7999375,
                                        "EndTime" : 1.0199375,
                                        "Confidence": 0.9989
                                    }
                                ]
                            }
                        ],
                        "EndTime": 1.02,
                        "IsPartial": false,
                        "ResultId": "12345a67-8bc9-0de1-2f34-a5b678c90d12",
                        "StartTime": 0.0199375
                    }
                ]
            }
        }
    }
```

```
}
```

Creating video subtitles

Amazon Transcribe supports WebVTT (*.vtt) and SubRip (*.srt) output for use as video subtitles. You can select one or both file types when setting up your batch video transcription job. When using the subtitle feature, your selected subtitle file(s) and a regular transcript file (containing additional information) are produced. Subtitle and transcription files are output to the same destination.

Subtitles are displayed at the same time text is spoken, and remain visible until there is a natural pause or the speaker finishes talking. Note that if you enable subtitles in your transcription request and your audio contains no speech, a subtitle file is not created.

Important

Amazon Transcribe uses a default start index of `0` for subtitle output, which differs from the more widely used value of 1. If you require a start index of 1, you can specify this in the AWS Management Console or in your API request using the `OutputStartIndex` parameter.

Using the incorrect start index can result in compatibility errors with other services, so be sure to verify which start index you require before creating your subtitles. If you're uncertain which value to use, we recommend choosing 1. Refer to `Subtitles` for more information.

Features supported with subtitles:

- **Content redaction** — Any redacted content is reflected as '`PII`' in both your subtitle and regular transcript output files. The audio is not altered.
- **Vocabulary filters** — Subtitle files are generated from the transcription file, so any words you filter in your standard transcription output are also filtered in your subtitles. Filtered content is displayed as whitespace or `***` in your transcript and subtitle files. The audio is not altered.
- **Speaker diarization** — If there are multiple speakers in a given subtitle segment, dashes are used to distinguish each speaker. This applies to both WebVTT and SubRip formats; for example:
  - -- Text spoken by Person 1
  - -- Text spoken by Person 2

Subtitle files are stored in the same Amazon S3 location as your transcription output.

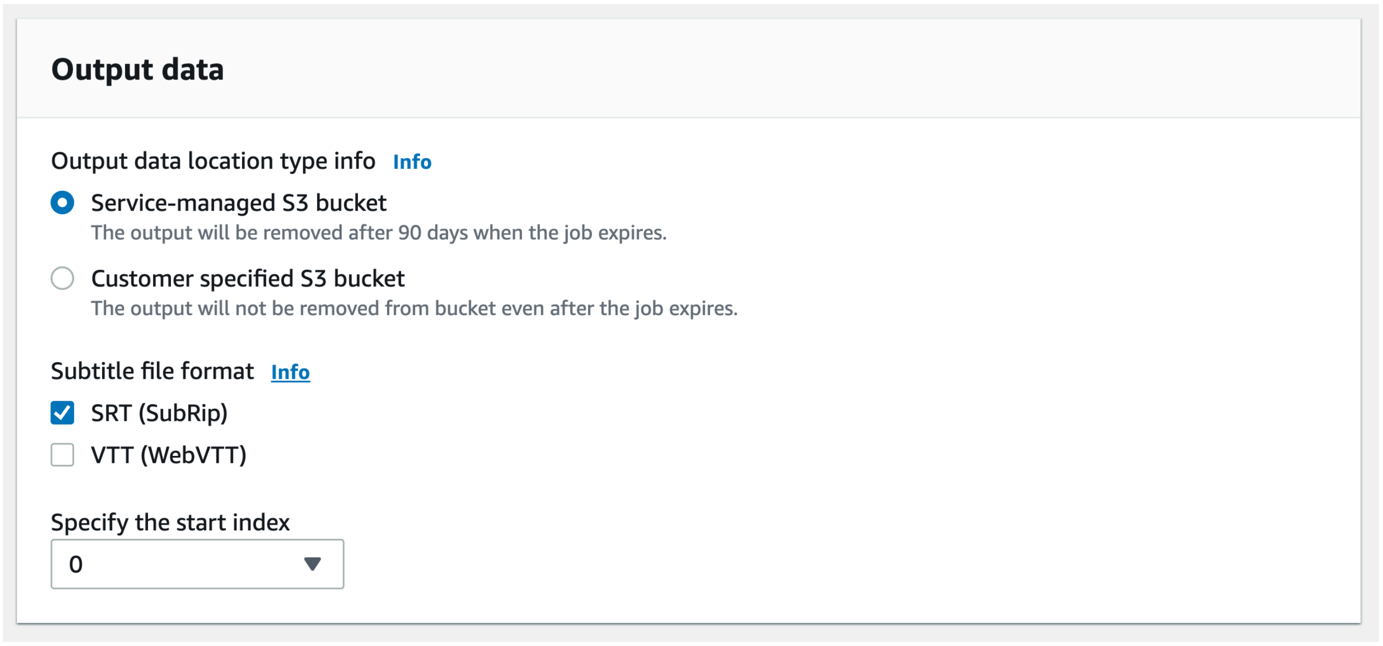
See [Amazon Transcribe Video Snacks: Creating Video Subtitles Without Writing Any Code]() for a video walkthrough of creating subtitles.

Generating subtitle files

You can create subtitle files using the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following examples:

AWS Management Console

1. Sign in to the [AWS Management Console]().
2. In the navigation pane, choose **Transcription jobs**, then select **Create job** (top right). This opens the **Specify job details** page. Subtitle options are located in the **Output data** panel.
3. Select the formats you want for your subtitles files, then choose a value for your start index. Note that the Amazon Transcribe default is `0`, but `1` is more widely used. If you're uncertain which value to use, we recommend choosing `1`, as this may improve compatibility with other services.



Output data

Output data location type info Info

● Service-managed S3 bucket
The output will be removed after 90 days when the job expires.

○ Customer specified S3 bucket
The output will not be removed from bucket even after the job expires.

Subtitle file format Info

✓ SRT (SubRip)

☐ VTT (WebVTT)

Specify the start index

0

4. Fill in any other fields you want to include on the **Specify job details** page, then select **Next**. This takes you to the **Configure job - *optional* page**.
5. Select **Create job** to run your transcription job.

AWS CLI

This example uses the start-transcription-job command and `Subtitles` parameter. For more information, see `StartTranscriptionJob` and `Subtitles`.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--transcription-job-name my-first-transcription-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--output-key my-output-files/ \
--language-code en-US \
--subtitles Formats=vtt,srt,OutputStartIndex=1
```

Here's another example using the start-transcription-job command, and a request body that adds subtitles to that job.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://my-first-subtitle-job.json
```

The file *my-first-subtitle-job.json* contains the following request body.

```
{
  "TranscriptionJobName": "my-first-transcription-job",
  "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "OutputKey": "my-output-files/",
  "LanguageCode": "en-US",
  "Subtitles": {
        "Formats": [
            "vtt","srt"
        ],
        "OutputStartIndex": 1
   }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to add subtitles using the `Subtitles` argument for the start_transcription_job method. For more information, see `StartTranscriptionJob` and `Subtitles`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_transcription_job(
    TranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Subtitles = {
        'Formats': [
            'vtt','srt'
        ],
        'OutputStartIndex': 1
   }
)

while True:
    status = transcribe.get_transcription_job(TranscriptionJobName = job_name)
    if status['TranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Analyzing call center audio with Call Analytics

Use Amazon Transcribe Call Analytics to gain insight into customer-agent interactions. Call Analytics is designed specifically for call center audio and automatically provides you with valuable data relating to each call and each participant. You can also hone in on data at specific points throughout call. For example, you can compare customer sentiment in a call's first few seconds to the last quarter of the call to see if your agent provided a positive experience. Other use case examples are listed in the following section.

Call Analytics is available for post-call and real-time transcriptions. If you're transcribing a file located in an Amazon S3 bucket, you're performing a post-call transcription. If you're transcribing an audio stream, you're performing a real-time transcription. These two transcription methods offer different Call Analytics insights and features. For more detail on each method, see Post-call analytics and Real-time Call Analytics.

With real-time Call Analytics transcriptions, you can also include post-call analytics in your request. Your post-call analytics transcript is stored in the Amazon S3 bucket that you specify in your request. Refer to Post-call analytics with real-time transcriptions for more information.

API operations specific to Call Analytics

Post-call: `CreateCallAnalyticsCategory`, `DeleteCallAnalyticsCategory`, `DeleteCallAnalyticsJob`, `GetCallAnalyticsCategory`, `GetCallAnalyticsJob`, `ListCallAnalyticsCategories`, `ListCallAnalyticsJobs`, `StartCallAnalyticsJob`, `UpdateCallAnalyticsCategory`
Real-time: `StartCallAnalyticsStreamTranscription`, StartCallAnalyticsStreamTranscriptionWebSocket

Common use cases

Post-call transcriptions:

- **Monitor issue frequency over time**: Use call categorization to identify recurring keywords within your transcripts.

- **Gain insight into your customer service experience**: Use call characteristics (non-talk time, talk time, interruptions, voice loudness, talk speed) and sentiment analysis to determine if customer issues are being appropriately resolved during the call.
- **Ensure regulatory compliance or adherence to company policy**: Set keywords and phrases for company-specific greetings or disclaimers to verify that your agents are meeting regulatory requirements.
- **Improve handling of customers' personal data**: Use PII redaction in your transcription output or audio file to help protect customer privacy.
- **Improve staff training**: Use criteria (sentiment, non-talk time, interruptions, talk speed) to flag transcripts that can be used as examples of positive or negative customer interactions.
- **Measure staff efficacy in creating a positive customer experience**: Use sentiment analysis to measure if your agents are able to turn a negative customer sentiment into a positive one as calls progress.
- **Improve data organization**: Label and sort calls based on custom categories (including keywords and phrases, sentiment, talk time, and interruptions).
- **Summarize the important aspects of a call using Generative AI**: Use generative call summarization to get a concise summary of the transcript, which includes key components such as issues, action items and outcomes discussed in the call.

Real-time transcriptions:

- **Mitigate escalations in real time**: Set up real-time alerts for key phrases—such as a customer saying "speak to a manager"—to flag calls as they begin to escalate. You can create real-time alerts using real-time category matches.
- **Improve handling of customer data**: Use PII identification or PII redaction in your transcription output to help protect customer privacy.
- **Identify custom keywords and phrases**: Use custom categories to flag specific keywords in a call.
- **Automatically identify issues**: Use automatic issue detection to get a succinct summary of all issues identified in a call.
- **Measure staff efficacy in creating a positive customer experience**: Use sentiment analysis to measure if your agents are able to turn a negative customer sentiment into a positive one as calls progress.

- **Set up agent-assist**: Use the insights of your choice to provide your agents with proactive assistance in resolving customer calls. See Live Call Analytics and agent assist for your contact center with Amazon language AI services for more information.

To compare the features available with Call Analytics to those for Amazon Transcribe and Amazon Transcribe Medical, refer to the feature table.

To get started, see Starting a post-call analytics transcription and Starting a real-time Call Analytics transcription. Call Analytics output is similar to that of a standard transcription job, but contains additional analytics data. To view sample output, see Post-call analytics output and Real-time Call Analytics output.

Considerations and additional information

Before using Call Analytics, note that:

- Call Analytics only supports two-channel audio, where an agent is present on one channel and a customer is present on a second channel.
- Job queueing is always enabled for post-call analytics jobs, so you're limited to 100 concurrent Call Analytics jobs. If you want to request a quota increase, see AWS service quotas.
- Input files for post-call analytics jobs cannot be greater than 500 MB and must be less than 4 hours. Note that the file size limit may be smaller for certain compressed, non-WAV audio file formats.
- If using categories, you must create all desired categories before starting a Call Analytics transcription. Any new categories cannot be applied to existing transcriptions. To learn how to create a new category, see Creating categories for post-call transcriptions and Creating categories for real-time transcriptions.
- Some Call Analytics quotas differ from Amazon Transcribe and Amazon Transcribe Medical; refer to the AWS General Reference for details.

Dive deeper with the AWS Machine Learning Blog

To learn more about Call Analytics options, see:

- Post Call Analytics for your contact center with Amazon language AI services

- Live Call Analytics and agent assist for your contact center with Amazon language AI services

To view sample Call Analytics output and features, see our GitHub demo. We also offer a JSON to Word document application to convert your transcript into an easy-to-read format.

Region availability and quotas

Call Analytics is supported in the following AWS Regions:

Region	Transcription type
ap-northeast-1 (Tokyo)	post-call, real-time
ap-northeast-2 (Seoul)	post-call, real-time
ap-south-1 (Mumbai)	post-call
ap-southeast-1 (Singapore)	post-call
ap-southeast-2 (Sydney)	post-call, real-time
ca-central-1 (Canada, Central)	post-call, real-time
eu-central-1 (Frankfurt)	post-call, real-time
eu-west-2 (London)	post-call, real-time
us-east-1 (N. Virginia)	post-call, real-time
us-west-2 (Oregon)	post-call, real-time

Note that Region support differs for Amazon Transcribe, Amazon Transcribe Medical, and Call Analytics.

To get the endpoints for each supported Region, see Service endpoints in the *AWS General Reference*.

For a list of quotas that pertain to your transcriptions, refer to the Service quotas in the *AWS General Reference*. Some quotas can be changed upon request. If the **Adjustable** column contains '**Yes**', you can request an increase. To do so, select the provided link.

Post-call analytics

Call Analytics provides post-call analyses, which are useful for monitoring customer service trends.

Post-call transcriptions offer the following insights:

- Call characteristics, including talk time, non-talk time, speaker loudness, interruptions, talk speed, issues, outcomes, and action items
- Generative call summarization, which creates a concise summary of the entire call
- Custom categorization with rules that you can use to hone in on specific keywords and criteria
- PII redaction of your text transcript and your audio file
- Speaker sentiment for each caller at various points in a call

Post-call insights

This section details the insights available for post-call analytics transcriptions.

Call characteristics

The call characteristics feature measures the quality of agent-customer interactions using these criteria:

- **Interruption**: Measures if and when one participant cuts off the other participant mid-sentence. Frequent interruptions may be associated with rudeness or anger, and could correlate to negative sentiment for one or both participants.
- **Loudness**: Measures the volume at which each participant is speaking. Use this metric to see if the caller or the agent is speaking loudly or yelling, which is often indicative of being upset. This metric is represented as a normalized value (speech level per second of speech in a given segment) on a scale from 0 to 100, where a higher value indicates a louder voice.
- **Non-talk time**: Measures periods of time that do not contain speech. Use this metric to see if there are long periods of silence, such as an agent keeping a customer on hold for an excessive amount of time.

- **Talk speed**: Measures the speed at which both participants are speaking. Comprehension can be affected if one participant speaks too quickly. This metric is measured in words per minute.
- **Talk time**: Measures the amount of time (in milliseconds) each participant spoke during the call. Use this metric to help identify if one participant is dominating the call or if the dialogue is balanced.
- **Issues, Outcomes, and Action Items**: Identifies issues, outcomes and action items from the call transcript.

Here's an output example.

Generative call summarization

Generative call summarization creates a concise summary of the entire call, capturing key components such as reason for the call, steps taken to resolve issue, and next steps.

Using generative call summarization, you can:

- Reduce the need for manual note-taking during and after calls.
- Improve agent efficiency as they can spend more time talking to callers waiting in queue rather than engaging in after-call work.
- Speed up supervisor reviews as call summaries are much quicker to review than entire transcripts.

To use generative call summarization with a post-call analytics job, see Enabling generative call summarization. For example output, see Generative call summarization output example. Generative call summarization is priced separately (please refer to pricing page).

Note

Generative call summarization is currently available in `us-east-1` and `us-west-2`. This capability is supported with these English language dialects: Australian (`en-AU`), British (`en-GB`), Indian (`en-IN`), Irish (`en-IE`), Scottish (`en-AB`), US (`en-US`), and Welsh (`en-WL`).

Custom categorization

Use call categorization to flag keywords, phrases, sentiment, or actions within a call. Our categorization options can help you triage escalations, such as negative-sentiment calls with many interruptions, or organize calls into specific categories, such as company departments.

The criteria you can add to a category include:

- **Non-talk time**: Periods of time when neither the customer nor the agent is talking.
- **Interruptions**: When the customer or the agent is interrupting the other person.
- **Customer or agent sentiment**: How the customer or the agent is feeling during a specified time period. If at least 50 percent of the conversation turns (the back-and-forth between two speakers) in a specified time period match the specified sentiment, Amazon Transcribe considers the sentiment a match.
- **Keywords or phrases**: Matches part of the transcription based on an exact phrase. For example, if you set a filter for the phrase "I want to speak to the manager", Amazon Transcribe filters for that *exact* phrase.

You can also flag the inverse of the previous criteria (talk time, lack of interruptions, a sentiment not being present, and the lack of a specific phrase).

Here's an output example.

For more information on categories or to learn how to create a new category, see Creating categories for post-call transcriptions.

Sensitive data redaction

Sensitive data redaction replaces personally identifiable information (PII) in the text transcript and the audio file. A redacted transcript replaces the original text with `[PII]`; a redacted audio file replaces spoken personal information with silence. This parameter is useful for protecting customer information.

Note

Post-call PII redaction is supported with US English (`en-US`) and US Spanish (`es-US`).

To view the list of PII that is redacted using this feature, or to learn more about redaction with Amazon Transcribe, see Redacting or identifying personally identifiable information.

Here is an output example.

Sentiment analysis

Sentiment analysis estimates how the customer and agent are feeling throughout the call. This metric is represented as both a quantitative value (with a range from 5 to `-5`) and a qualitative value (`positive`, `neutral`, `mixed`, or `negative`). Quantitative values are provided per quarter and per call; qualitative values are provided per turn.

This metric can help identify if your agent is able to delight an upset customer by the time the call ends.

Sentiment analysis works out-of-the-box and thus doesn't support customization, such as model training or custom categories.

Here's an output example.

Creating categories for post-call transcriptions

Post-call analytics supports the creation of custom categories, enabling you to tailor your transcript analyses to best suit your specific business needs.

You can create as many categories as you like to cover a range of different scenarios. For each category you create, you must create between 1 and 20 rules. Each rule is based on one of four criteria: interruptions, keywords, non-talk time, or sentiment. For more details on using these criteria with the `CreateCallAnalyticsCategory` operation, refer to the Rule criteria for post-call analytics categories section.

If the content in your media matches all the rules you've specified in a given category, Amazon Transcribe labels your output with that category. See call categorization output for an example of a category match in JSON output.

Here are a few examples of what you can do with custom categories:

- Isolate calls with specific characteristics, such as calls that end with a negative customer sentiment
- Identify trends in customer issues by flagging and tracking specific sets of keywords

- Monitor compliance, such as an agent speaking (or omitting) a specific phrase during the first few seconds of a call
- Gain insight into customer experience by flagging calls with many agent interruptions and negative customer sentiment
- Compare multiple categories to measure correlations, such as analyzing whether an agent using a welcome phrase correlates with positive customer sentiment

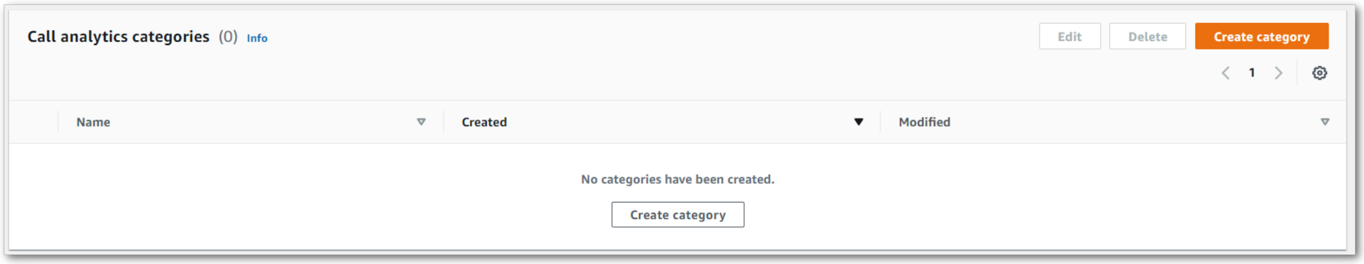
Post-call versus real-time categories

When creating a new category, you can specify whether you want it created as a post-call analytics category (`POST_CALL`) or as a real-time Call Analytics category (`REAL_TIME`). If you don't specify an option, your category is created as a post-call category by default. Post-call analytics category matches are available in your output upon completion of your post-call analytics transcription.

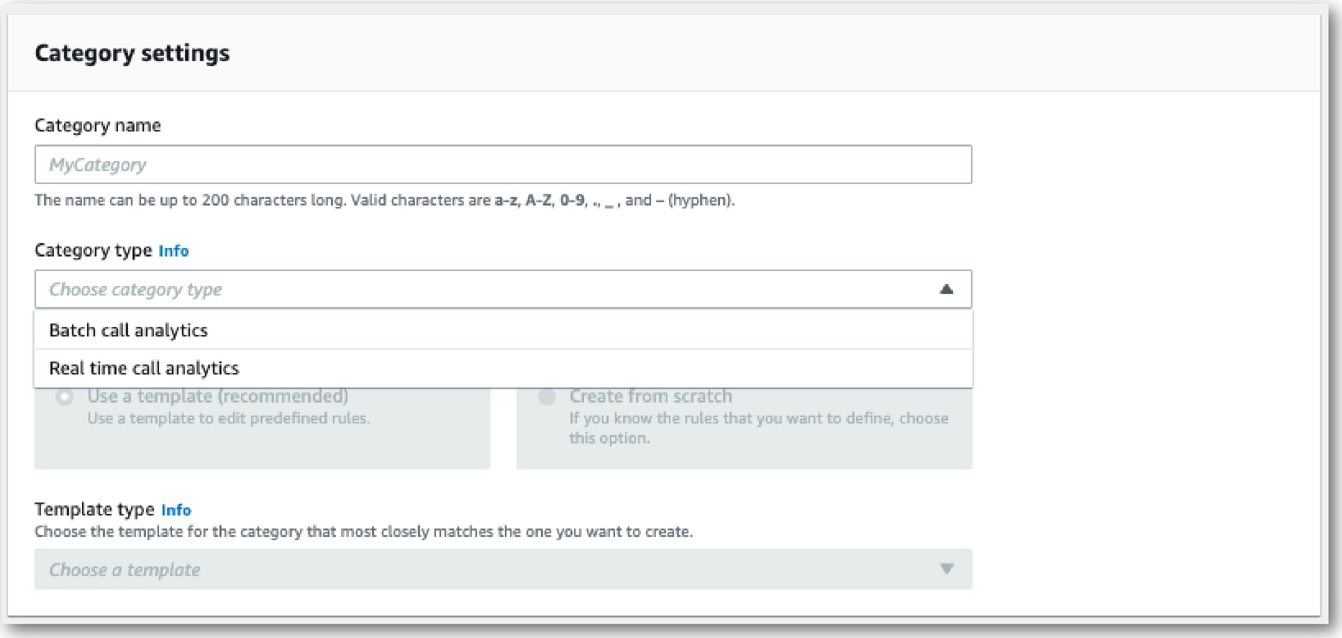
To create a new category for post-call analytics, you can use the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. In the navigation pane, under Amazon Transcribe, choose **Amazon Transcribe Call Analytics**.
2. Choose **Call analytics categories**, which takes you to the **Call analytics categories** page. Select **Create category**.

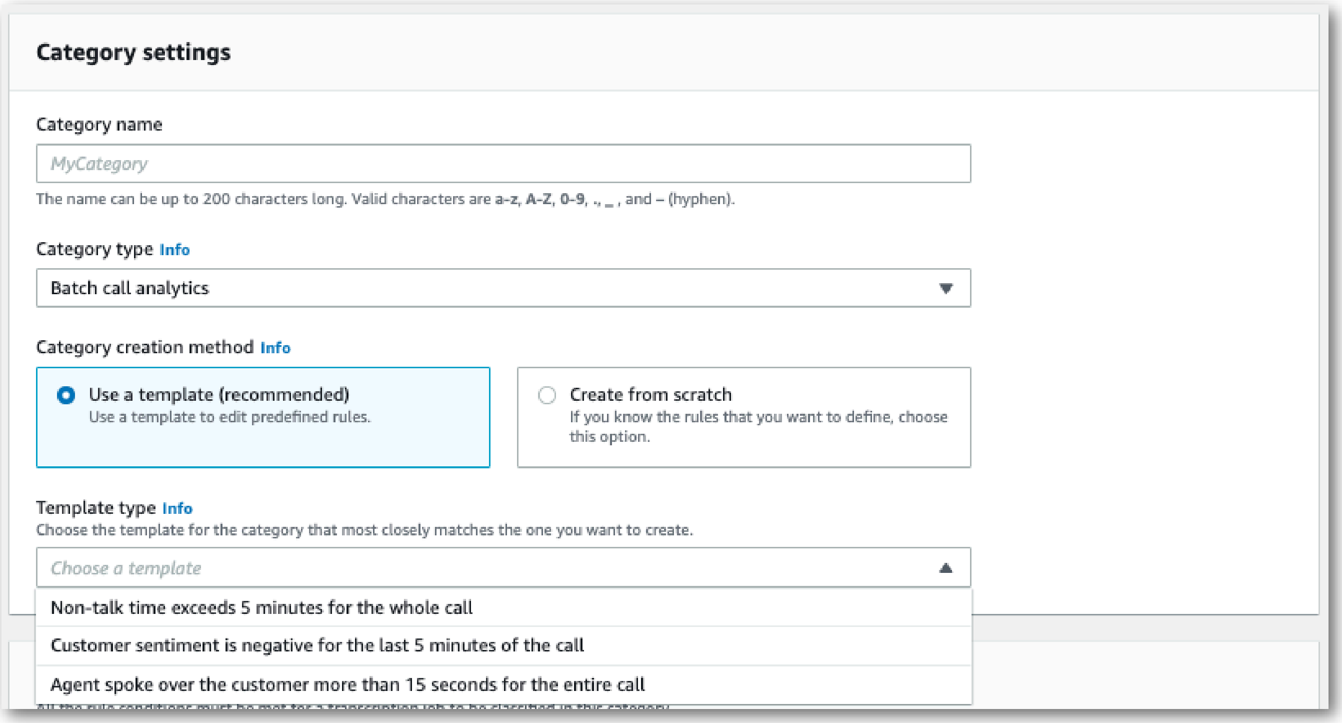

Call analytics categories (0) Info
Edit
Delete
Create category
1
Name
Created
Modified
No categories have been created.
Create category

3. You're now on the **Create category page**. Enter a name for your category, then choose 'Batch call analytics' in the **Category type** dropdown menu.

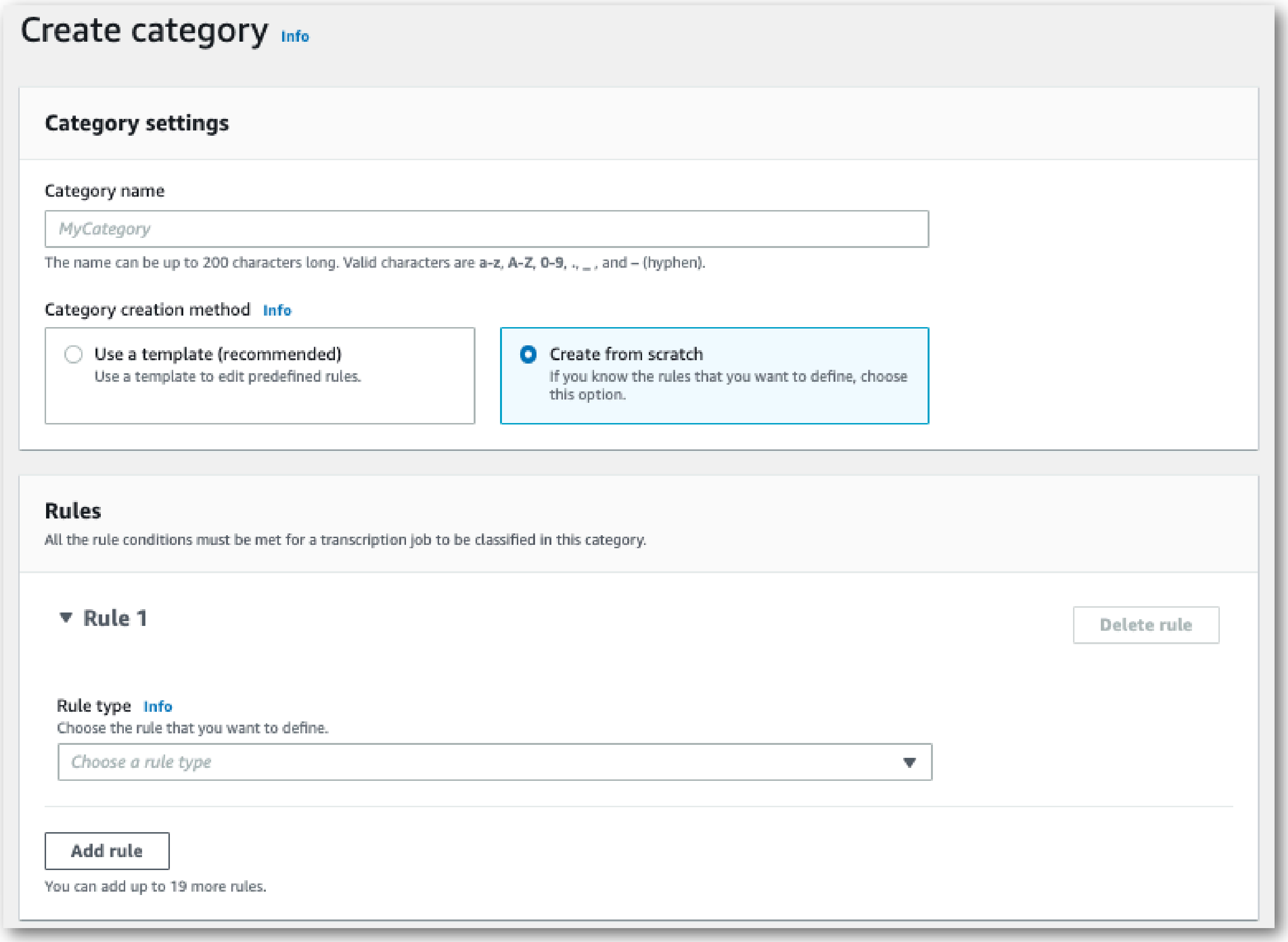

Category settings
Category name
MyCategory
The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).
Category type Info
Choose category type
Batch call analytics
Real time call analytics
Use a template (recommended)
Use a template to edit predefined rules.
Create from scratch
If you know the rules that you want to define, choose this option.
Template type Info
Choose the template for the category that most closely matches the one you want to create.
Choose a template

4. You can choose a template to create your category or you can make one from scratch.

   If using a template: select **Use a template (recommended)**, choose the template you want, then select **Create category**.


Category settings
Category name
MyCategory
The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).
Category type Info
Batch call analytics
Category creation method Info
Use a template (recommended)
Use a template to edit predefined rules.
Create from scratch
If you know the rules that you want to define, choose this option.
Template type Info
Choose the template for the category that most closely matches the one you want to create.
Choose a template
Non-talk time exceeds 5 minutes for the whole call
Customer sentiment is negative for the last 5 minutes of the call
Agent spoke over the customer more than 15 seconds for the entire call

5. If creating a custom category: select **Create from scratch**.



Create category Info

Category settings

Category name

MyCategory

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).

Category creation method Info

○ Use a template (recommended)
Use a template to edit predefined rules.

● Create from scratch
If you know the rules that you want to define, choose this option.

Rules

All the rule conditions must be met for a transcription job to be classified in this category.

▼ Rule 1

Delete rule

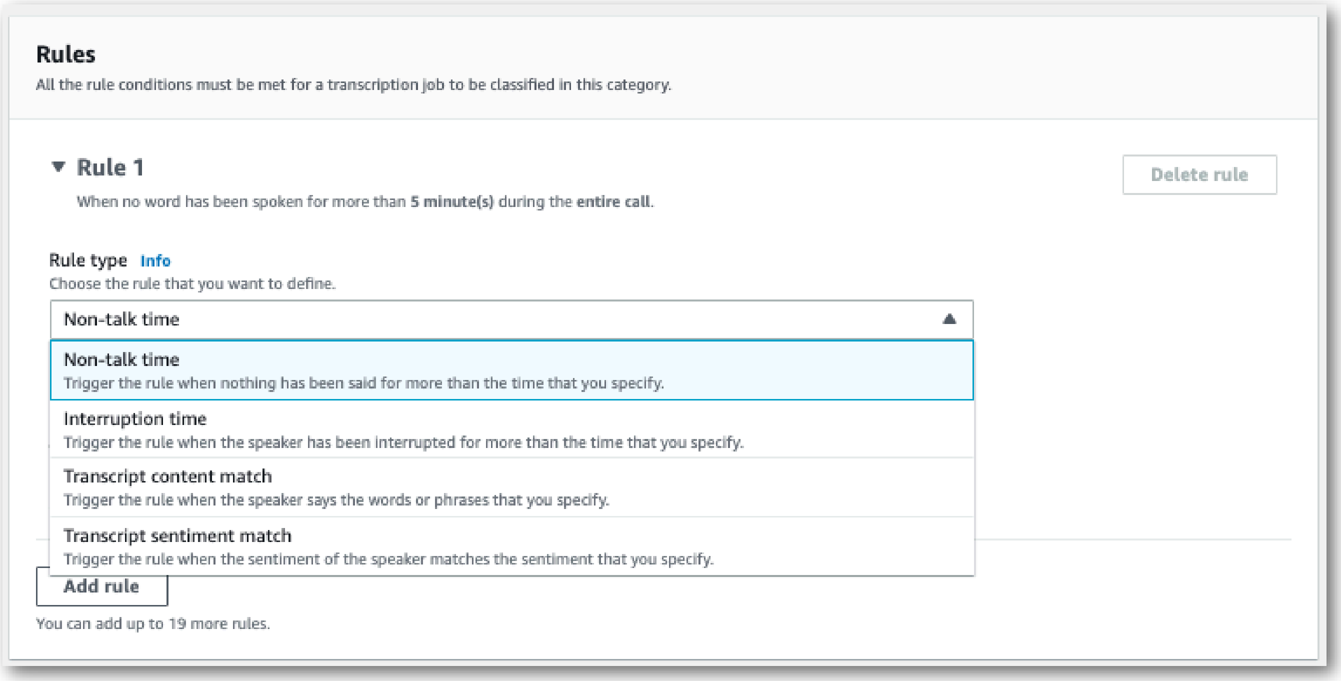
Rule type Info
Choose the rule that you want to define.

Choose a rule type

Add rule

You can add up to 19 more rules.

6. Add rules to your category using the dropdown menu. You can add up to 20 rules per category.



Rules

All the rule conditions must be met for a transcription job to be classified in this category.

Rule 1

When no word has been spoken for more than **5 minute(s)** during the **entire call**.

Rule type Info

Choose the rule that you want to define.

Non-talk time

Non-talk time
Trigger the rule when nothing has been said for more than the time that you specify.

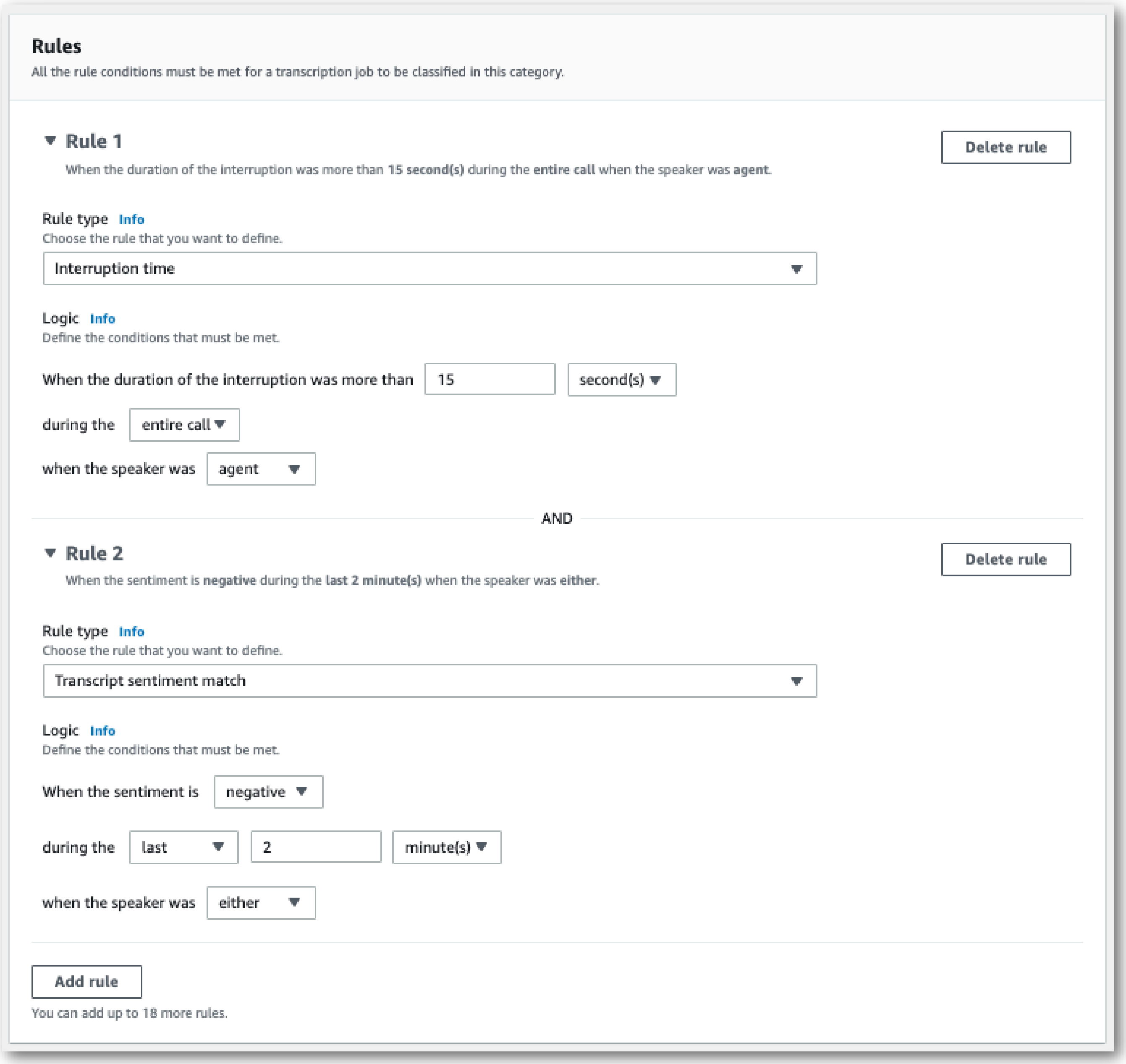
Interruption time
Trigger the rule when the speaker has been interrupted for more than the time that you specify.

Transcript content match
Trigger the rule when the speaker says the words or phrases that you specify.

Transcript sentiment match
Trigger the rule when the sentiment of the speaker matches the sentiment that you specify.

You can add up to 19 more rules.

7. Here's an example of a category with two rules: an agent who interrupts a customer for more than 15 seconds during the call and a negative sentiment felt by the customer or the agent in the last two minutes of the call.


Rules

All the rule conditions must be met for a transcription job to be classified in this category.

Rule 1

When the duration of the interruption was more than **15 second(s)** during the **entire call** when the speaker was **agent**.

Rule type: Interruption time

Logic: When the duration of the interruption was more than 15 second(s) during the entire call when the speaker was agent

AND

Rule 2

When the sentiment is **negative** during the **last 2 minute(s)** when the speaker was **either**.

Rule type: Transcript sentiment match

Logic: When the sentiment is negative during the last 2 minute(s) when the speaker was either

You can add up to 18 more rules.

Delete rule
Info
Choose the rule that you want to define.
Define the conditions that must be met.
Add rule

8. When you're finished adding rules to your category, choose **Create category**.

AWS CLI

This example uses the create-call-analytics-category command. For more information, see `CreateCallAnalyticsCategory`, `CategoryProperties`, and `Rule`.

The following example creates a category with the rules:

- The customer was interrupted in the first 60,000 milliseconds. The duration of these interruptions lasted at least 10,000 milliseconds.
- There was a period of silence that lasted at least 20,000 milliseconds between 10% into the call and 80% into the call.
- The agent had a negative sentiment at some point in the call.
- The words "welcome" or "hello" were not used in the first 10,000 milliseconds of the call.

This example uses the create-call-analytics-category command, and a request body that adds several rules to your category.

```
aws transcribe create-call-analytics-category \
--cli-input-json file://filepath/my-first-analytics-category.json
```

The file *my-first-analytics-category.json* contains the following request body.

```
{
  "CategoryName": "my-new-category",
  "InputType": "POST_CALL",
  "Rules": [
        {
            "InterruptionFilter": {
                "AbsoluteTimeRange": {
                    "First": 60000
                },
                "Negate": false,
                "ParticipantRole": "CUSTOMER",
                "Threshold": 10000
            }
        },
        {
            "NonTalkTimeFilter": {
                "Negate": false,
                "RelativeTimeRange": {
                    "EndPercentage": 80,
                    "StartPercentage": 10
                },
                "Threshold": 20000
            }
        },
        {
            "SentimentFilter": {
                "ParticipantRole": "AGENT",
                "Sentiments": [
                    "NEGATIVE"
                ]
            }
        },
        {
            "TranscriptFilter": {
                "Negate": true,
                "AbsoluteTimeRange": {
                    "First": 10000
                },
                "Targets": [
                    "welcome",
                    "hello"
                ],
                "TranscriptFilterType": "EXACT"
            }
        }
    ]
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a category using the `CategoryName` and `Rules` arguments for the create_call_analytics_category method. For more information, see `CreateCallAnalyticsCategory`, `CategoryProperties`, and `Rule`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

The following example creates a category with the rules:

- The customer was interrupted in the first 60,000 milliseconds. The duration of these interruptions lasted at least 10,000 milliseconds.
- There was a period of silence that lasted at least 20,000 milliseconds between 10% into the call and 80% into the call.
- The agent had a negative sentiment at some point in the call.
- The words "welcome" or "hello" were not used in the first 10,000 milliseconds of the call.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
category_name = "my-new-category"
transcribe.create_call_analytics_category(
    CategoryName = category_name,
    InputType = POST_CALL,
    Rules = [
        {
            'InterruptionFilter': {
                'AbsoluteTimeRange': {
                    'First': 60000
                },
                'Negate': False,
                'ParticipantRole': 'CUSTOMER',
                'Threshold': 10000
            }
        },
        {
            'NonTalkTimeFilter': {
                'Negate': False,
                'RelativeTimeRange': {
                    'EndPercentage': 80,
                    'StartPercentage': 10
                },
                'Threshold': 20000
            }
        },
        {
            'SentimentFilter': {
                'ParticipantRole': 'AGENT',
                'Sentiments': [
                    'NEGATIVE'
                ]
            }
        },
        {
            'TranscriptFilter': {
                'Negate': True,
                'AbsoluteTimeRange': {
                    'First': 10000
                },
                'Targets': [
                    'welcome',
                    'hello'
                ],
                'TranscriptFilterType': 'EXACT'
            }
        }
    ]

)

result = transcribe.get_call_analytics_category(CategoryName = category_name)
print(result)
```

Rule criteria for post-call analytics categories

This section outlines the types of custom `POST_CALL` rules that you can create using the `CreateCallAnalyticsCategory` API operation.

Interruption match

Rules using interruptions (`InterruptionFilter` data type) are designed to match:

- Instances where an agent interrupts a customer
- Instances where a customer interrupts an agent
- Any participant interrupting the other
- A lack of interruptions

Here's an example of the parameters available with `InterruptionFilter`:

```
"InterruptionFilter": {
    "AbsoluteTimeRange": {
       Specify the time frame, in milliseconds, when the match should occur
    },
    "RelativeTimeRange": {
       Specify the time frame, in percentage, when the match should occur
    },
    "Negate": Specify if you want to match the presence or absence of interruptions,
    "ParticipantRole": Specify if you want to match speech from the agent, the
 customer, or both,
    "Threshold": Specify a threshold for the amount of time, in seconds, interruptions
 occurred during the call
},
```

Refer to CreateCallAnalyticsCategory and InterruptionFilter for more information on these parameters and the valid values associated with each.

Keyword match

Rules using keywords (TranscriptFilter data type) are designed to match:

- Custom words or phrases spoken by the agent, the customer, or both
- Custom words or phrases **not** spoken by the agent, the customer, or both
- Custom words or phrases that occur in a specific time frame

Here's an example of the parameters available with TranscriptFilter:

```
"TranscriptFilter": {
    "AbsoluteTimeRange": {
       Specify the time frame, in milliseconds, when the match should occur
    },
    "RelativeTimeRange": {
       Specify the time frame, in percentage, when the match should occur
    },
    "Negate": Specify if you want to match the presence or absence of your custom
 keywords,
    "ParticipantRole": Specify if you want to match speech from the agent, the
 customer, or both,
    "Targets": [ The custom words and phrases you want to match ],
    "TranscriptFilterType": Use this parameter to specify an exact match for the
 specified targets
}
```

Refer to CreateCallAnalyticsCategory and TranscriptFilter for more information on these parameters and the valid values associated with each.

Non-talk time match

Rules using non-talk time (NonTalkTimeFilter data type) are designed to match:

- The presence of silence at specified periods throughout the call

- The presence of speech at specified periods throughout the call

Here's an example of the parameters available with `NonTalkTimeFilter`:

```
"NonTalkTimeFilter": {
    "AbsoluteTimeRange": {
 Specify the time frame, in milliseconds, when the match should occur
 },
    "RelativeTimeRange": {
 Specify the time frame, in percentage, when the match should occur
 },
    "Negate": Specify if you want to match the presence or absence of speech,
    "Threshold": Specify a threshold for the amount of time, in seconds, silence (or
 speech) occurred during the call
},
```

Refer to `CreateCallAnalyticsCategory` and `NonTalkTimeFilter` for more information on these parameters and the valid values associated with each.

Sentiment match

Rules using sentiment (`SentimentFilter` data type) are designed to match:

- The presence or absence of a positive sentiment expressed by the customer, agent, or both at specified points in the call
- The presence or absence of a negative sentiment expressed by the customer, agent, or both at specified points in the call
- The presence or absence of a neutral sentiment expressed by the customer, agent, or both at specified points in the call
- The presence or absence of a mixed sentiment expressed by the customer, agent, or both at specified points in the call

Here's an example of the parameters available with `SentimentFilter`:

```
"SentimentFilter": {
    "AbsoluteTimeRange": {
    Specify the time frame, in milliseconds, when the match should occur
    },
    "RelativeTimeRange": {
```

```
    Specify the time frame, in percentage, when the match should occur
    },
    "Negate": Specify if you want to match the presence or absence of your chosen
 sentiment,
    "ParticipantRole": Specify if you want to match speech from the agent, the
 customer, or both,
    "Sentiments": [ The sentiments you want to match ]
},
```

Refer to `CreateCallAnalyticsCategory` and `SentimentFilter` for more information on these parameters and the valid values associated with each.

Starting a post-call analytics transcription

Before starting a post-call analytics transcription, you must create all the categories you want Amazon Transcribe to match in your audio.

Note

Call Analytics transcripts can't be retroactively matched to new categories. Only the categories you create *before* starting a Call Analytics transcription can be applied to that transcription output.

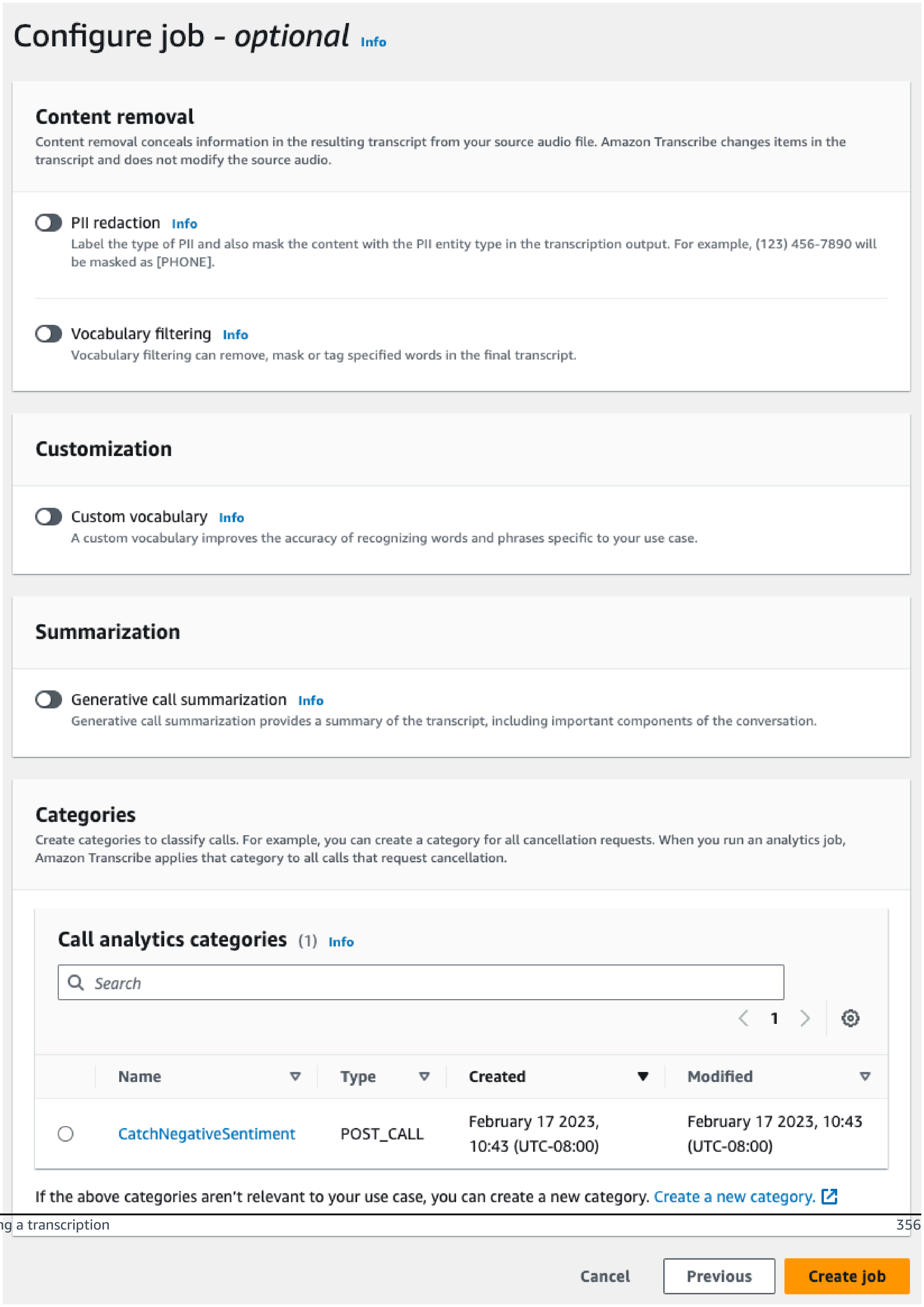
If you've created one or more categories, and your audio matches all the rules within at least one of your categories, Amazon Transcribe flags your output with the matching category. If you choose not to use categories, or if your audio doesn't match the rules specified in your categories, your transcript isn't flagged.

To start a post-call analytics transcription, you can use the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

Use the following procedure to start a post-call analytics job. The calls that match all characteristics defined by a category are labeled with that category.

1. In the navigation pane, under Amazon Transcribe Call Analytics, choose **Call analytics jobs**.
2. Choose **Create job**.



Configure job - *optional* Info

Content removal

Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Summarization

Generative call summarization Info
Generative call summarization provides a summary of the transcript, including important components of the conversation.

Categories

Create categories to classify calls. For example, you can create a category for all cancellation requests. When you run an analytics job, Amazon Transcribe applies that category to all calls that request cancellation.

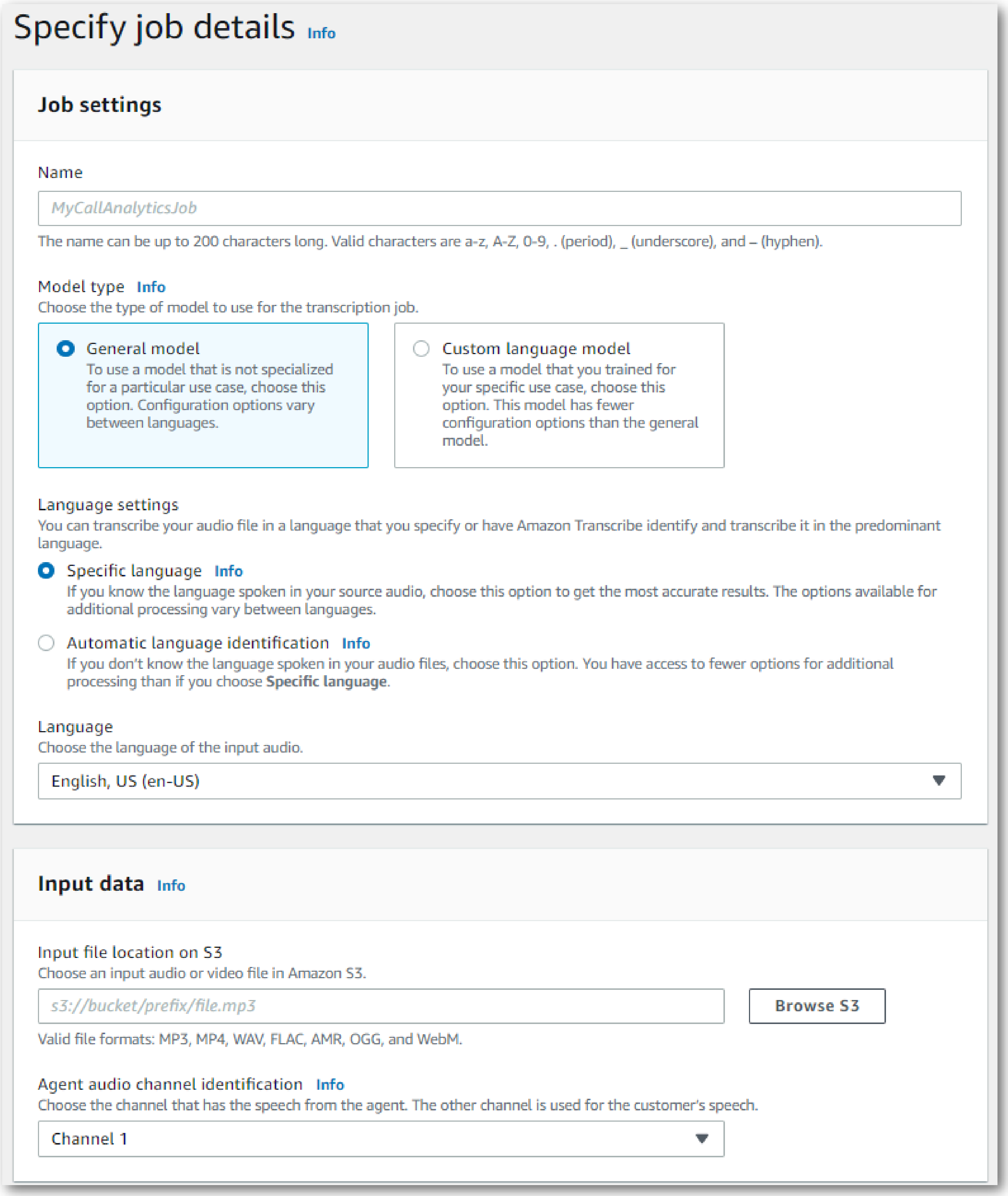
Call analytics categories (1) Info

Search

	Name	Type	Created	Modified
○	CatchNegativeSentiment	POST_CALL	February 17 2023, 10:43 (UTC-08:00)	February 17 2023, 10:43 (UTC-08:00)

If the above categories aren't relevant to your use case, you can create a new category. Create a new category.

3. On the **Specify job details** page, provide information about your Call Analytics job, including the location of your input data.



Specify job details Info

Job settings

Name

MyCallAnalyticsJob

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, . (period), _ (underscore), and – (hyphen).

Model type Info

Choose the type of model to use for the transcription job.

[✓ General model] To use a model that is not specialized for a particular use case, choose this option. Configuration options vary between languages.

Custom language model To use a model that you trained for your specific use case, choose this option. This model has fewer configuration options than the general model.

Language settings

You can transcribe your audio file in a language that you specify or have Amazon Transcribe identify and transcribe it in the predominant language.

[✓ Specific language] Info
If you know the language spoken in your source audio, choose this option to get the most accurate results. The options available for additional processing vary between languages.

Automatic language identification Info
If you don't know the language spoken in your audio files, choose this option. You have access to fewer options for additional processing than if you choose **Specific language**.

Language

Choose the language of the input audio.

English, US (en-US)

Input data Info

Input file location on S3

Choose an input audio or video file in Amazon S3.

s3://bucket/prefix/file.mp3

Browse S3

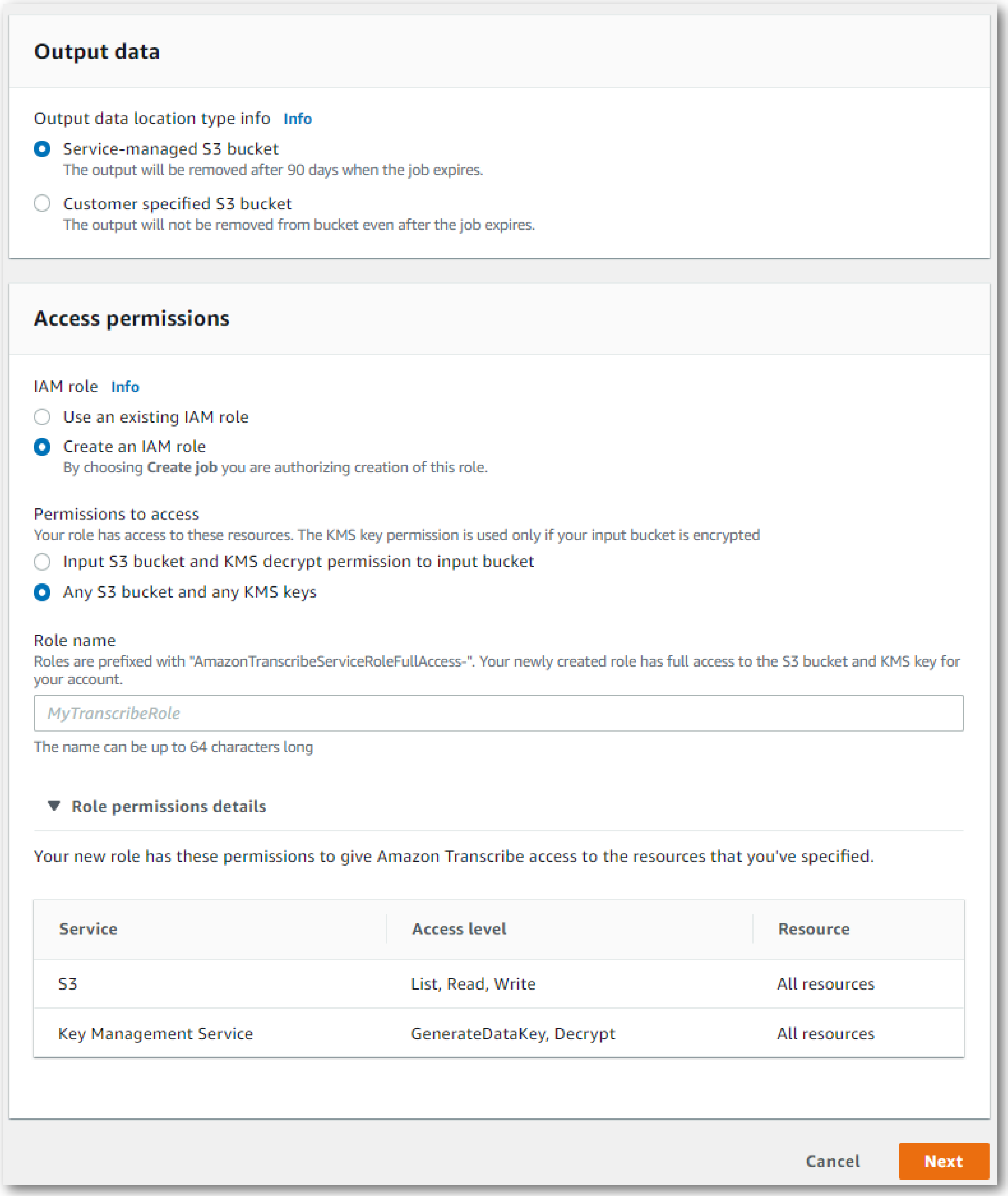
Valid file formats: MP3, MP4, WAV, FLAC, AMR, OGG, and WebM.

Agent audio channel identification Info

Choose the channel that has the speech from the agent. The other channel is used for the customer's speech.

Channel 1

Specify the desired Amazon S3 location of your output data and which IAM role to use.



Output data

Output data location type info Info

● Service-managed S3 bucket
The output will be removed after 90 days when the job expires.

○ Customer specified S3 bucket
The output will not be removed from bucket even after the job expires.

Access permissions

IAM role Info

○ Use an existing IAM role

● Create an IAM role
By choosing **Create job** you are authorizing creation of this role.

Permissions to access
Your role has access to these resources. The KMS key permission is used only if your input bucket is encrypted

○ Input S3 bucket and KMS decrypt permission to input bucket

● Any S3 bucket and any KMS keys

Role name
Roles are prefixed with "AmazonTranscribeServiceRoleFullAccess-". Your newly created role has full access to the S3 bucket and KMS key for your account.

MyTranscribeRole

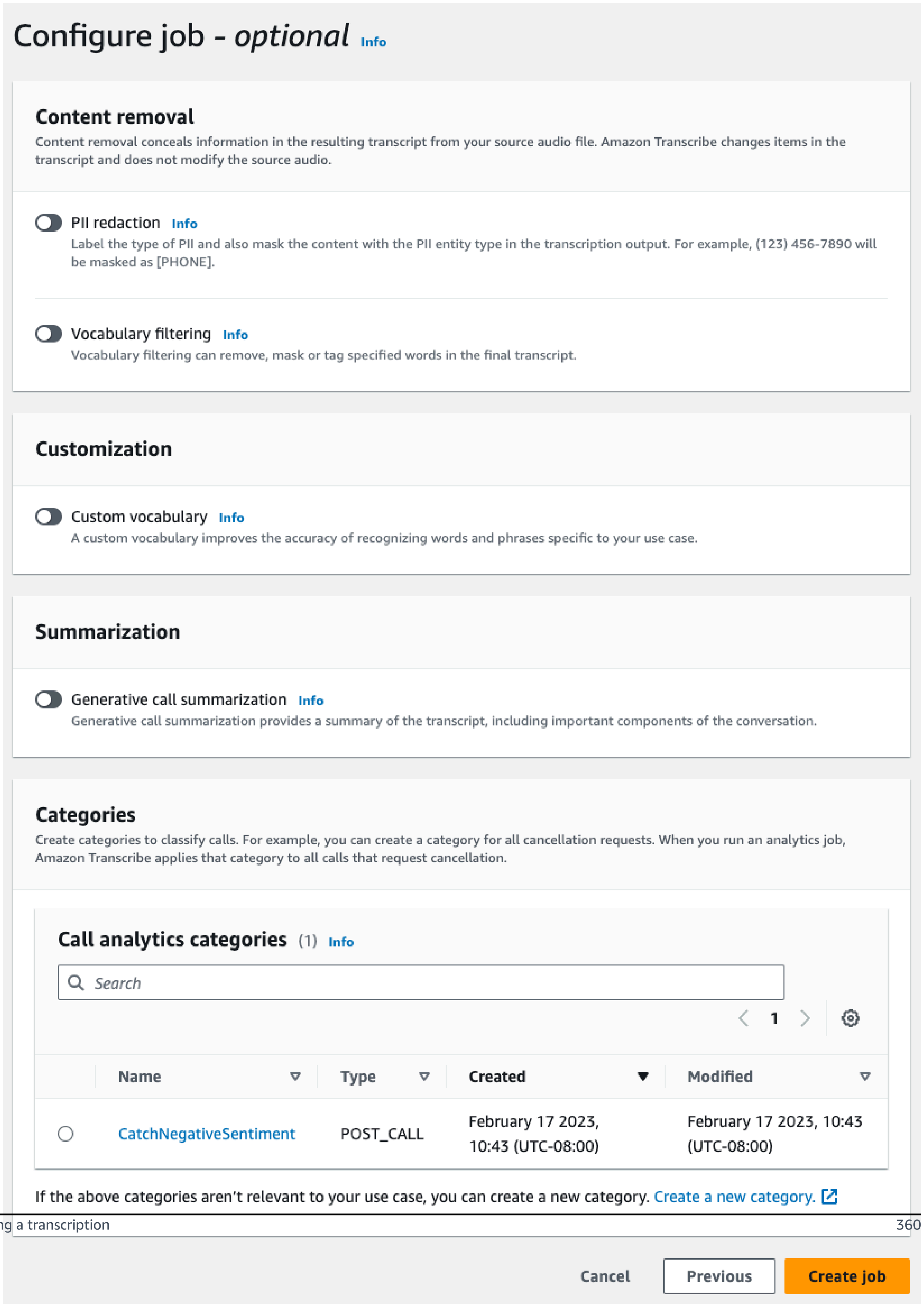
The name can be up to 64 characters long

▼ Role permissions details

Your new role has these permissions to give Amazon Transcribe access to the resources that you've specified.

Service	Access level	Resource
S3	List, Read, Write	All resources
Key Management Service	GenerateDataKey, Decrypt	All resources

4. Choose **Next**.
5. For **Configure job**, turn on any optional features you want to include with your Call Analytics job. If you previously created categories, they appear in the **Categories** panel and are automatically applied to your Call Analytics job.



Configure job - *optional* Info

Content removal

Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info

Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info

Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info

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Generative call summarization Info

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Call analytics categories (1) Info

Search

	Name	Type	Created	Modified
○	CatchNegativeSentiment	POST_CALL	February 17 2023, 10:43 (UTC-08:00)	February 17 2023, 10:43 (UTC-08:00)

If the above categories aren't relevant to your use case, you can create a new category. Create a new category.

6. Choose **Create job**.

AWS CLI

This example uses the start-call-analytics-job command and `channel-definitions` parameter. For more information, see `StartCallAnalyticsJob` and `ChannelDefinition`.

```
aws transcribe start-call-analytics-job \
--region us-west-2 \
--call-analytics-job-name my-first-call-analytics-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-location s3://amzn-s3-demo-bucket/my-output-files/ \
--data-access-role-arn arn:aws:iam::111122223333:role/ExampleRole \
--channel-definitions ChannelId=0,ParticipantRole=AGENT
 ChannelId=1,ParticipantRole=CUSTOMER
```

Here's another example using the start-call-analytics-job command, and a request body that enables Call Analytics for that job.

```
aws transcribe start-call-analytics-job \
--region us-west-2 \
--cli-input-json file://filepath/my-call-analytics-job.json
```

The file *my-call-analytics-job.json* contains the following request body.

```
{
      "CallAnalyticsJobName": "my-first-call-analytics-job",
      "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole",
      "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
      },
      "OutputLocation": "s3://amzn-s3-demo-bucket/my-output-files/",
      "ChannelDefinitions": [
          {
              "ChannelId": 0,
              "ParticipantRole": "AGENT"
          },
          {
              "ChannelId": 1,
              "ParticipantRole": "CUSTOMER"
          }
```

```
        ]
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to start a Call Analytics job using the start_call_analytics_job method. For more information, see `StartCallAnalyticsJob` and `ChannelDefinition`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-call-analytics-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
output_location = "s3://amzn-s3-demo-bucket/my-output-files/"
data_access_role = "arn:aws:iam::111122223333:role/ExampleRole"
transcribe.start_call_analytics_job(
     CallAnalyticsJobName = job_name,
     Media = {
        'MediaFileUri': job_uri
     },
     DataAccessRoleArn = data_access_role,
     OutputLocation = output_location,
     ChannelDefinitions = [
        {
            'ChannelId': 0,
            'ParticipantRole': 'AGENT'
        },
        {
            'ChannelId': 1,
            'ParticipantRole': 'CUSTOMER'
        }
     ]
)

 while True:
   status = transcribe.get_call_analytics_job(CallAnalyticsJobName = job_name)
   if status['CallAnalyticsJob']['CallAnalyticsJobStatus'] in ['COMPLETED', 'FAILED']:
     break
```

```
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Post-call analytics output

Post-call analytics transcripts are displayed in a turn-by-turn format by segment. They include call categorization, call characteristics (loudness scores, interruptions, non-talk time, talk speed), call summarization (issues, outcomes, and action items), redaction, and sentiment. Additionally, a summary of conversation characteristics is provided at the end of the transcript.

To increase accuracy and further customize your transcripts to your use case, such as including industry-specific terms, add custom vocabularies or custom language models to your Call Analytics request. To mask, remove, or tag words that you don't want in your transcription results, such as profanity, add vocabulary filtering. If you are unsure of the language code to be passed to the media file, you can enable batch language identification to automatically identify the language in your media file.

The following sections show examples of JSON output at an insight level. For compiled output, see Compiled post-call analytics output.

Call categorization

Here's what a category match looks like in your transcription output. This example shows that the audio from the 40040 millisecond timestamp to the 42460 millisecond timestamp is a match to the 'positive-resolution' category. In this case, the custom 'positive-resolution' category required a positive sentiment in last few seconds of speech.

```
"Categories": {
    "MatchedDetails": {
        "positive-resolution": {
            "PointsOfInterest": [
                {
                    "BeginOffsetMillis":  40040,
                    "EndOffsetMillis":  42460
                }
            ]
        }
    },
    "MatchedCategories": [
        " positive-resolution"
    ]
},
```

Call characteristics

Here's what call characteristics look like in your transcription output. Note that loudness scores are provided for each conversation turn, while all other characteristics are provided at the end of the transcript.

```
"LoudnessScores": [
    87.54,
    88.74,
    90.16,
    86.36,
    85.56,
    85.52,
    81.79,
    87.74,
    89.82
],

...

"ConversationCharacteristics": {
    "NonTalkTime": {
        "Instances": [],
        "TotalTimeMillis": 0
    },
    "Interruptions": {
        "TotalCount": 2,
        "TotalTimeMillis": 10700,
        "InterruptionsByInterrupter": {
            "AGENT": [
                {
                    "BeginOffsetMillis": 26040,
                    "DurationMillis": 5510,
                    "EndOffsetMillis": 31550
                }
            ],
            "CUSTOMER": [
                {
                    "BeginOffsetMillis": 770,
                    "DurationMillis": 5190,
                        "EndOffsetMillis": 5960
                    }
                ]
            }
    },
    "TotalConversationDurationMillis": 42460,

    ...

    "TalkSpeed": {
        "DetailsByParticipant": {
            "AGENT": {
                "AverageWordsPerMinute": 150
            },
            "CUSTOMER": {
                "AverageWordsPerMinute": 167
            }
        }
    },
    "TalkTime": {
        "DetailsByParticipant": {
            "AGENT": {
                "TotalTimeMillis": 32750
            },
            "CUSTOMER": {
                "TotalTimeMillis": 18010
            }
        },
        "TotalTimeMillis": 50760
    }
},
```

Issues, Action Items and Next Steps

- In the following example, **issues** are identified as starting at character 7 and ending at character 51, which refers to this section of the text: "*I would like to cancel my recipe subscription*".

```
"Content": "Well, I would like to cancel my recipe subscription.",

"IssuesDetected": [
    {
        "CharacterOffsets": {
            "Begin": 7,
            "End": 51
        }
    }
],
```

- In the following example, **outcomes** are identified as starting at character 12 and ending at character 78, which refers to this section of the text: "*I made all changes to your account and now this discount is applied*".

```
"Content": "Wonderful. I made all changes to your account and now this discount is
 applied, please check.",

"OutcomesDetected": [
    {
        "CharacterOffsets": {
            "Begin": 12,
            "End": 78
        }
    }
],
```

- In the following example, **action items** are identified as starting at character 0 and ending at character 103, which refers to this section of the text: "*I will send an email with all the details to you today, and I will call you back next week to follow up*".

```
"Content": "I will send an email with all the details to you today, and I will call
 you back next week to follow up. Have a wonderful evening.",

"ActionItemsDetected": [
    {
        "CharacterOffsets": {
            "Begin": 0,
            "End": 103
        }
    }
],
```

Generative call summarization

Here's what generative call summarization looks like in your transcription output:

```
"ContactSummary": {
    "AutoGenerated": {
        "OverallSummary": {
            "Content": "A customer wanted to check to see if we had a bag allowance. We
 told them that we didn't have it, but we could add the bag from Canada to Calgary and
 then do the one coming back as well."
        }
    }
}
```

The analytics job will complete without summary generation in the following cases:

- Insufficient conversation content: The conversation must include at least one turn from both the agent and the customer. When there is insufficient conversation content, the service will return the error code INSUFFICIENT_CONVERSATION_CONTENT.
- Safety guardrails: The conversation must meet safety guardrails in place to ensure appropriate summary is generated. When these guardrails are not met, the service will return the error code FAILED_SAFETY_GUIDELINES.

The error code can be found in `Skipped` section within `AnalyticsJobDetails` in the output. You may also find the error reason in `CallAnalyticsJobDetails` in the `GetCallAnalyticsJob` API Response.

Sample Error Output

```
{
    "JobStatus": "COMPLETED",
    "AnalyticsJobDetails": {
        "Skipped": [
            {
                "Feature": "GENERATIVE_SUMMARIZATION",
                "ReasonCode": "INSUFFICIENT_CONVERSATION_CONTENT",
                "Message": "The conversation needs to have at least one turn from both
 the participants to generate summary"
            }
        ]
    },
    "LanguageCode": "en-US",
    "AccountId": "***************",
    "JobName": "Test2-copy",
    ...
}
```

Sentiment analysis

Here is what sentiment analysis looks like in your transcription output.

- Qualitative turn-by-turn sentiment values:

```
"Content": "That's very sad to hear. Can I offer you a 50% discount to have you stay
 with us?",

...

"BeginOffsetMillis": 12180,
"EndOffsetMillis": 16960,
"Sentiment": "NEGATIVE",
"ParticipantRole": "AGENT"

...

"Content": "That is a very generous offer. And I accept.",

...

"BeginOffsetMillis": 17140,
"EndOffsetMillis": 19860,
"Sentiment": "POSITIVE",
"ParticipantRole": "CUSTOMER"
```

- Quantitative sentiment values for the entire call:

```
"Sentiment": {
    "OverallSentiment": {
        "AGENT": 2.5,
        "CUSTOMER": 2.1
    },
```

- Quantitative sentiment values per participant and per call quarter:

```
"SentimentByPeriod": {
    "QUARTER": {
        "AGENT": [
            {
                "Score": 0.0,
                "BeginOffsetMillis": 0,
                "EndOffsetMillis": 9862
            },
            {
                "Score": -5.0,
                "BeginOffsetMillis": 9862,
                "EndOffsetMillis": 19725
            },
            {
                "Score": 5.0,
                "BeginOffsetMillis": 19725,
                "EndOffsetMillis": 29587
            },
            {
                "Score": 5.0,
                "BeginOffsetMillis": 29587,
                "EndOffsetMillis": 39450
            }
        ],
        "CUSTOMER": [
            {
                "Score": -2.5,
                "BeginOffsetMillis": 0,
                "EndOffsetMillis": 10615
            },
            {
                "Score": 5.0,
                "BeginOffsetMillis": 10615,
                "EndOffsetMillis": 21230
            },
            {
                "Score": 2.5,
                "BeginOffsetMillis": 21230,
                "EndOffsetMillis": 31845
            },
            {
                "Score": 5.0,
                "BeginOffsetMillis": 31845,
                "EndOffsetMillis": 42460
            }
        ]
    }
```

```
}
```

PII redaction

Here is what PII redaction looks like in your transcription output.

```
"Content": "[PII], my name is [PII], how can I help?",
"Redaction": [{
    "Confidence": "0.9998",
    "Type": "NAME",
    "Category": "PII"
}]
```

For more information, refer to Redacting PII in your batch job.

Language identification

Here is what Language Identification looks like in your transcription output if the feature is enabled.

```
"LanguageIdentification": [{
  "Code": "en-US",
  "Score": "0.8299"
}, {
  "Code": "en-NZ",
  "Score": "0.0728"
}, {
  "Code": "zh-TW",
  "Score": "0.0695"
}, {
  "Code": "th-TH",
  "Score": "0.0156"
}, {
  "Code": "en-ZA",
  "Score": "0.0121"
}]
```

In the above output example, Language Identification will populate the language codes with confidence scores. The result with the highest score will be selected as the language code for transcription. For mode details refer to Identifying the dominant languages in your media.

Compiled post-call analytics output

For brevity, some content is replaced with ellipses in the following transcription output.

This sample includes optional feature - Generative call summarization.

```
{
    "JobStatus": "COMPLETED",
    "LanguageCode": "en-US",
    "Transcript": [
        {
            "LoudnessScores": [
                78.63,
                78.37,
                77.98,
                74.18
            ],
            "Content": "[PII], my name is [PII], how can I help?",

            ...

             "Content": "Well, I would like to cancel my recipe subscription.",
             "IssuesDetected": [
                 {
                     "CharacterOffsets": {
                         "Begin": 7,
                         "End": 51
                     }
                 }
             ],

            ...

            "Content": "That's very sad to hear. Can I offer you a 50% discount to have
 you stay with us?",
            "Items": [
            ...
             ],
            "Id": "649afe93-1e59-4ae9-a3ba-a0a613868f5d",
            "BeginOffsetMillis": 12180,
            "EndOffsetMillis": 16960,
            "Sentiment": "NEGATIVE",
            "ParticipantRole": "AGENT"
        },
        {
            "LoudnessScores": [
                    80.22,
                    79.48,
                    82.81
            ],
            "Content": "That is a very generous offer. And I accept.",
            "Items": [
            ...
            ],
            "Id": "f9266cba-34df-4ca8-9cea-4f62a52a7981",
            "BeginOffsetMillis": 17140,
            "EndOffsetMillis": 19860,
            "Sentiment": "POSITIVE",
            "ParticipantRole": "CUSTOMER"
        },
        {

    ...

            "Content": "Wonderful. I made all changes to your account and now this
 discount is applied, please check.",
            "OutcomesDetected": [
                {
                    "CharacterOffsets": {
                        "Begin": 12,
                        "End": 78
                    }
                }
            ],

            ...

            "Content": "I will send an email with all the details to you today, and I
 will call you back next week to follow up. Have a wonderful evening.",
            "Items": [
            ...
            ],
            "Id": "78cd0923-cafd-44a5-a66e-09515796572f",
            "BeginOffsetMillis": 31800,
            "EndOffsetMillis": 39450,
            "Sentiment": "POSITIVE",
            "ParticipantRole": "AGENT"
        },
        {
            "LoudnessScores": [
                78.54,
                68.76,
                67.76
            ],
            "Content": "Thank you very much, sir. Goodbye.",
            "Items": [
            ...
            ],
            "Id": "5c5e6be0-8349-4767-8447-986f995af7c3",
            "BeginOffsetMillis": 40040,
            "EndOffsetMillis": 42460,
            "Sentiment": "POSITIVE",
            "ParticipantRole": "CUSTOMER"
        }
    ],

    ...

    "Categories": {
         "MatchedDetails": {
             "positive-resolution": {
                 "PointsOfInterest": [
                     {
                         "BeginOffsetMillis": 40040,
                         "EndOffsetMillis": 42460
                     }
                 ]
             }
         },
         "MatchedCategories": [
             "positive-resolution"
         ]
     },

     ...

     "ConversationCharacteristics": {
         "NonTalkTime": {
             "Instances": [],
             "TotalTimeMillis": 0
         },
         "Interruptions": {
             "TotalCount": 2,
             "TotalTimeMillis": 10700,
             "InterruptionsByInterrupter": {
                 "AGENT": [
                     {
                         "BeginOffsetMillis": 26040,
                         "DurationMillis": 5510,
                         "EndOffsetMillis": 31550
                     }
                 ],
                 "CUSTOMER": [
                     {
                         "BeginOffsetMillis": 770,
                         "DurationMillis": 5190,
                         "EndOffsetMillis": 5960
                     }
                 ]
             }
         },
         "TotalConversationDurationMillis": 42460,
         "Sentiment": {
             "OverallSentiment": {
                 "AGENT": 2.5,
                 "CUSTOMER": 2.1
             },
             "SentimentByPeriod": {
                 "QUARTER": {
                     "AGENT": [
                         {
                             "Score": 0.0,
                             "BeginOffsetMillis": 0,
                             "EndOffsetMillis": 9862
                         },
                         {
                             "Score": -5.0,
                             "BeginOffsetMillis": 9862,
                             "EndOffsetMillis": 19725
                         },
                         {
                             "Score": 5.0,
                             "BeginOffsetMillis": 19725,
                             "EndOffsetMillis": 29587
                         },
                         {
                             "Score": 5.0,
                             "BeginOffsetMillis": 29587,
                             "EndOffsetMillis": 39450
                         }
                     ],
                     "CUSTOMER": [
                         {
                             "Score": -2.5,
                             "BeginOffsetMillis": 0,
                             "EndOffsetMillis": 10615
                         },
                         {
                             "Score": 5.0,
                             "BeginOffsetMillis": 10615,
                             "EndOffsetMillis": 21230
                         },
                         {
                             "Score": 2.5,
                             "BeginOffsetMillis": 21230,
                             "EndOffsetMillis": 31845
                         },
                         {
                             "Score": 5.0,
                             "BeginOffsetMillis": 31845,
                             "EndOffsetMillis": 42460
                         }
                     ]
                 }
             }
         },
         "TalkSpeed": {
             "DetailsByParticipant": {
                 "AGENT": {
                     "AverageWordsPerMinute": 150
                 },
                 "CUSTOMER": {
                     "AverageWordsPerMinute": 167
                 }
             }
         },
         "TalkTime": {
             "DetailsByParticipant": {
                 "AGENT": {
                     "TotalTimeMillis": 32750
```

```
                },
                "CUSTOMER": {
                    "TotalTimeMillis": 18010
                }
            },
            "TotalTimeMillis": 50760
        },
        "ContactSummary": { // Optional feature - Generative call summarization
            "AutoGenerated": {
                "OverallSummary": {
                    "Content": "The customer initially wanted to cancel but the agent
 convinced them to stay by offering a 50% discount, which the customer accepted after
 reconsidering cancelling given the significant savings. The agent ensured the discount
 was applied and said they would follow up to ensure the customer remained happy with
 the revised subscription."
                }
            }
        }
    },
    "AnalyticsJobDetails": {
        "Skipped": []
    },
    ...
}
```

Enabling generative call summarization

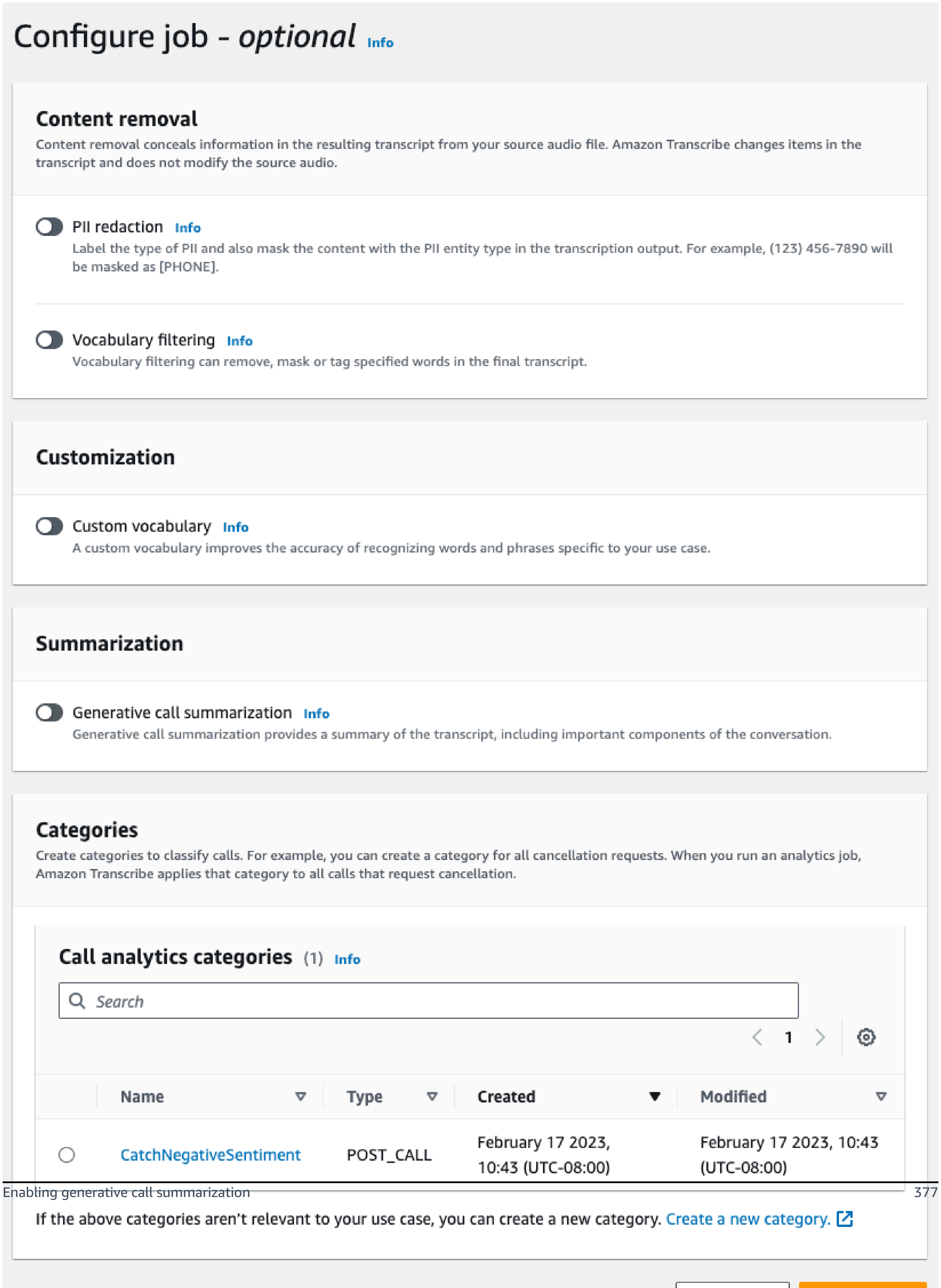
Note

Powered by Amazon Bedrock: AWS implements automated abuse detection. Because post-contact summarization powered by generative AI is built on Amazon Bedrock, users can take full advantage of the controls implemented in Amazon Bedrock to enforce safety, security, and the responsible use of artificial intelligence (AI).

To use generative call summarization with a post call analytics job, see the following for examples:

AWS Management Console

In the Summarization panel, enable Generative call summarization to receive summary in the output.



Configure job - *optional* Info

Content removal

Content removal conceals information in the resulting transcript from your source audio file. Amazon Transcribe changes items in the transcript and does not modify the source audio.

PII redaction Info
Label the type of PII and also mask the content with the PII entity type in the transcription output. For example, (123) 456-7890 will be masked as [PHONE].

Vocabulary filtering Info
Vocabulary filtering can remove, mask or tag specified words in the final transcript.

Customization

Custom vocabulary Info
A custom vocabulary improves the accuracy of recognizing words and phrases specific to your use case.

Summarization

Generative call summarization Info
Generative call summarization provides a summary of the transcript, including important components of the conversation.

Categories

Create categories to classify calls. For example, you can create a category for all cancellation requests. When you run an analytics job, Amazon Transcribe applies that category to all calls that request cancellation.

Call analytics categories (1) Info

Search

	Name	Type	Created	Modified
○	CatchNegativeSentiment	POST_CALL	February 17 2023, 10:43 (UTC-08:00)	February 17 2023, 10:43 (UTC-08:00)

If the above categories aren't relevant to your use case, you can create a new category. Create a new category.

AWS CLI

This example uses the start-call-analytics-job command and `Settings` parameter with the `Summarization` sub-parameters. For more information, see `StartCallAnalyticsJob`.

```
aws transcribe start-call-analytics-job \
--region us-west-2 \
--call-analytics-job-name my-first-call-analytics-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-location s3://amzn-s3-demo-bucket/my-output-files/ \
--data-access-role-arn arn:aws:iam::111122223333:role/ExampleRole \
--channel-definitions ChannelId=0,ParticipantRole=AGENT
 ChannelId=1,ParticipantRole=CUSTOMER
--settings '{"Summarization":{"GenerateAbstractiveSummary":true}}'
```

Here's another example using the start-call-analytics-job command, and a request body that enables summarization for that job.

```
aws transcribe start-call-analytics-job \
--region us-west-2 \
--cli-input-json file://filepath/my-call-analytics-job.json
```

The file *my-call-analytics-job.json* contains the following request body.

```
{
  "CallAnalyticsJobName": "my-first-call-analytics-job",
  "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole",
  "Media": {
    "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
  },
  "OutputLocation": "s3://amzn-s3-demo-bucket/my-output-files/",
  "ChannelDefinitions": [
    {
      "ChannelId": 0,
      "ParticipantRole": "AGENT"
    },
    {
      "ChannelId": 1,
      "ParticipantRole": "CUSTOMER"
    }
  ],
  "Settings": {
    "Summarization":{
      "GenerateAbstractiveSummary": true
    }
  }
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to start a Call Analytics with summarization enabled using the start_call_analytics_job method. For more information, see `StartCallAnalyticsJob`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

```
from __future__ import print_function
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-call-analytics-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
output_location = "s3://amzn-s3-demo-bucket/my-output-files/"
data_access_role = "arn:aws:iam::111122223333:role/ExampleRole"
transcribe.start_call_analytics_job(
  CallAnalyticsJobName = job_name,
  Media = {
    'MediaFileUri': job_uri
  },
  DataAccessRoleArn = data_access_role,
  OutputLocation = output_location,
  ChannelDefinitions = [
    {
      'ChannelId': 0,
      'ParticipantRole': 'AGENT'
    },
    {
      'ChannelId': 1,
      'ParticipantRole': 'CUSTOMER'
    }
  ],
  Settings = {
    "Summarization":
      {
        "GenerateAbstractiveSummary": true
      }
  }
)

while True:
  status = transcribe.get_call_analytics_job(CallAnalyticsJobName = job_name)
  if status['CallAnalyticsJob']['CallAnalyticsJobStatus'] in ['COMPLETED', 'FAILED']:
    break
  print("Not ready yet...")
  time.sleep(5)
print(status)
```

Real-time Call Analytics

Real-time Call Analytics provides real-time insights that can be used for addressing issues and mitigating escalations as they happen.

The following insights are available with real-time Call Analytics:

- Category events that use rules to flag specific keywords and phrases; category events can be used to create real-time alerts
- Issue detection identifies the issues spoken within each audio segment
- PII (sensitive data) identification in your text transcript
- PII (sensitive data) redaction of your text transcript
- Sentiment analysis for each speech segment

In addition to real-time Call Analytics, Amazon Transcribe can also perform post-call analytics on your media stream. You can include post-call analytics in your real-time Call Analytics request using the `PostCallAnalyticsSettings` parameter.

Real-time insights

This section details the insights available for real-time Call Analytics transcriptions.

Category events

Using category events, you can match your transcription based on an exact keyword or phrase. For example, if you set a filter for the phrase "I want to speak to the manager", Amazon Transcribe filters for that *exact* phrase.

Here's an output example.

For more information on creating real-time Call Analytics categories, see Creating categories for real-time transcriptions.

Tip

Category events allow you to set real-time alerts; see Creating real-time alerts for category matches for more information.

Issue detection

Issue detection provides succinct summaries of detected issues within each audio segment. Using the issue detection feature, you can:

- Reduce the need for manual note-taking during and after calls
- Improve agent efficiency, allowing them to respond faster to customers

Note

Issue detection is supported with these English language dialects: Australian (`en-AU`), British (`en-GB`), and US (`en-US`).

The issue detection feature works across all industries and business sectors, and is context-based. It works out-of-the-box and thus doesn't support customization, such as model training or custom categories.

Issue detection with real-time Call Analytics is performed on each complete audio segment.

Here's an output example.

PII (sensitive data) identification

Sensitive data identification labels personally identifiable information (PII) in the text transcript. This parameter is useful for protecting customer information.

Note

Real-time PII identification is supported with these English language dialects: Australian (`en-AU`), British (`en-GB`), US (`en-US`) and with Spanish language dialect (`es-US`).

PII identification with real-time Call Analytics is performed on each complete audio segment.

To view the list of PII that is identified using this feature, or to learn more about PII identification with Amazon Transcribe, see Redacting or identifying personally identifiable information.

Here is an output example.

PII (sensitive data) redaction

Sensitive data redaction replaces personally identifiable information (PII) in your text transcript with the type of PII (for example, `[NAME]`). This parameter is useful for protecting customer information.

Note

Real-time PII redaction is supported with these English language dialects: Australian (`en-AU`), British (`en-GB`), US (`en-US`) and with Spanish language dialect (`es-US`).

PII redaction with real-time Call Analytics is performed on each complete audio segment.

To view the list of PII that is redacted using this feature, or to learn more about redaction with Amazon Transcribe, see Redacting or identifying personally identifiable information.

Here is an output example.

Sentiment analysis

Sentiment analysis estimates how the customer and agent are feeling throughout the call. This metric is provided for every speech segment and is represented as a qualitative value (`positive`, `neutral`, `mixed`, or `negative`).

Using this parameter, you can qualitatively evaluate the overall sentiment for each call participant and the sentiment for each participant during each speech segment. This metric can help identify if your agent is able to delight an upset customer by the time the call ends.

Sentiment analysis with real-time Call Analytics is performed on each complete audio segment.

Sentiment analysis works out-of-the-box and thus doesn't support customization, such as model training or custom categories.

Here's an output example.

Creating categories for real-time transcriptions

Real-time Call Analytics supports the creation of custom categories, which you can use to tailor your transcript analyses to best suit your specific business needs.

You can create as many categories as you like to cover a range of different scenarios. For each category you create, you must create between 1 and 20 rules. Real-time Call Analytics transcriptions only support rules that use `TranscriptFilter` (keyword matches). For more detail on using rules with the `CreateCallAnalyticsCategory` operation, refer to the Rule criteria for real-time Call Analytics categories section.

If the content in your media matches all the rules you've specified in a given category, Amazon Transcribe labels your output with that category. See category event output for an example of a category match in JSON output format.

Here are a few examples of what you can do with custom categories:

- Identify issues that warrant immediate attention by flagging and tracking specific sets of keywords
- Monitor compliance, such as an agent speaking (or omitting) a specific phrase
- Flag specific words and phrases in real time; you can then set your category match to set an immediate alert. For example, if you create a real-time Call Analytics category for a customer saying "*speak to a manager*," you can set an event alert for this real-time category match that notifies the on-duty manager.

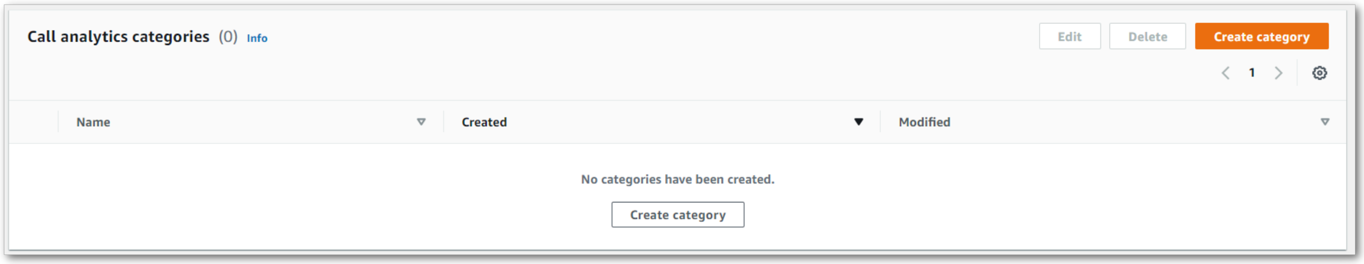
Post-call versus real-time categories

When creating a new category, you can specify whether you want it created as a post-call category (`POST_CALL`) or as a real-time category (`REAL_TIME`). If you don't specify an option, your category is created as a post-call category by default. Real-time category matches can be used to create real-time alerts. For more information, see Creating real-time alerts for category matches.

To create a new category for real-time Call Analytics, you can use the **AWS Management Console**, **AWS CLI**, or **AWS SDKs**; see the following for examples:

AWS Management Console

1. In the navigation pane, under Amazon Transcribe, choose **Amazon Transcribe Call Analytics**.
2. Choose **Call analytics categories**, which takes you to the **Call analytics categories** page. Select the **Create category** button.

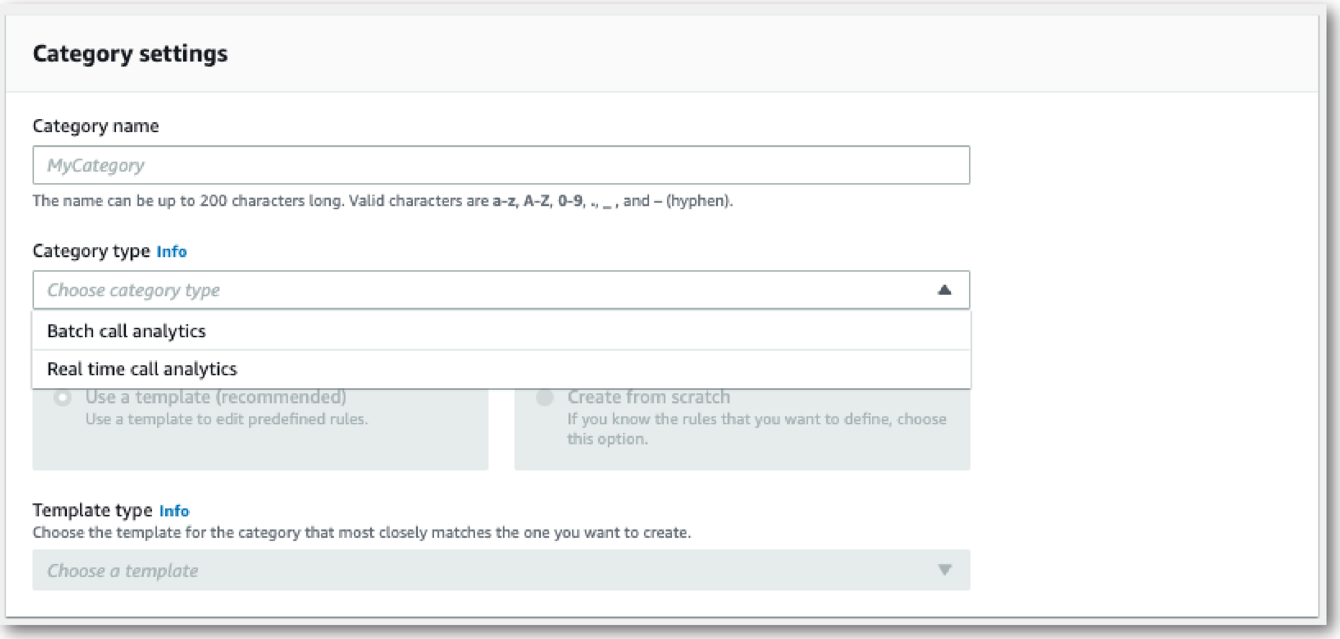


Call analytics categories (0) Info

Name	Created	Modified

No categories have been created.

3. You're now on the **Create category page**. Enter a name for your category, then choose 'Real time call analytics' in the **Category type** dropdown menu.



Category settings

Category name

MyCategory

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).

Category type Info

Choose category type

Batch call analytics

Real time call analytics

Use a template (recommended)
Use a template to edit predefined rules.

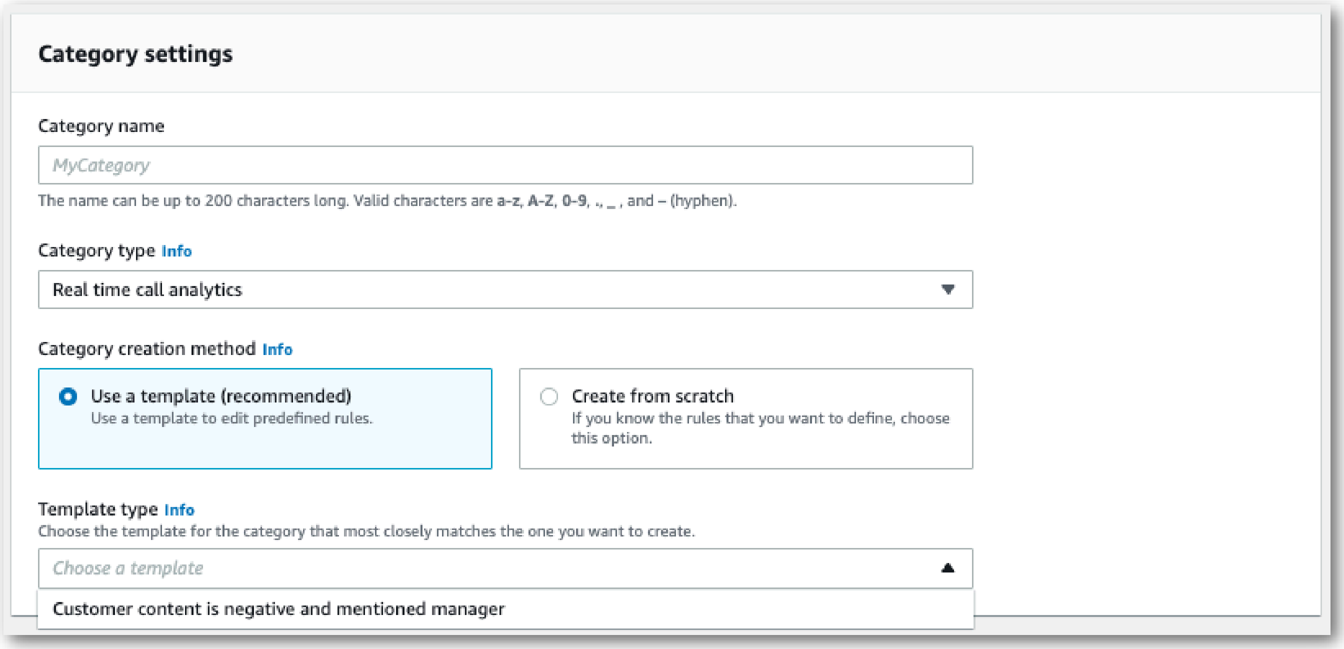
Create from scratch
If you know the rules that you want to define, choose this option.

Template type Info
Choose the template for the category that most closely matches the one you want to create.

Choose a template

4. You can choose a template to create your category or you can make one from scratch.

   If using a template: select **Use a template (recommended)**, choose the template you want, then select **Create category**.

   Category settings

   Category name

   MyCategory

   The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).

   Category type Info

   Real time call analytics

   Category creation method Info

   Use a template (recommended)
   Use a template to edit predefined rules.

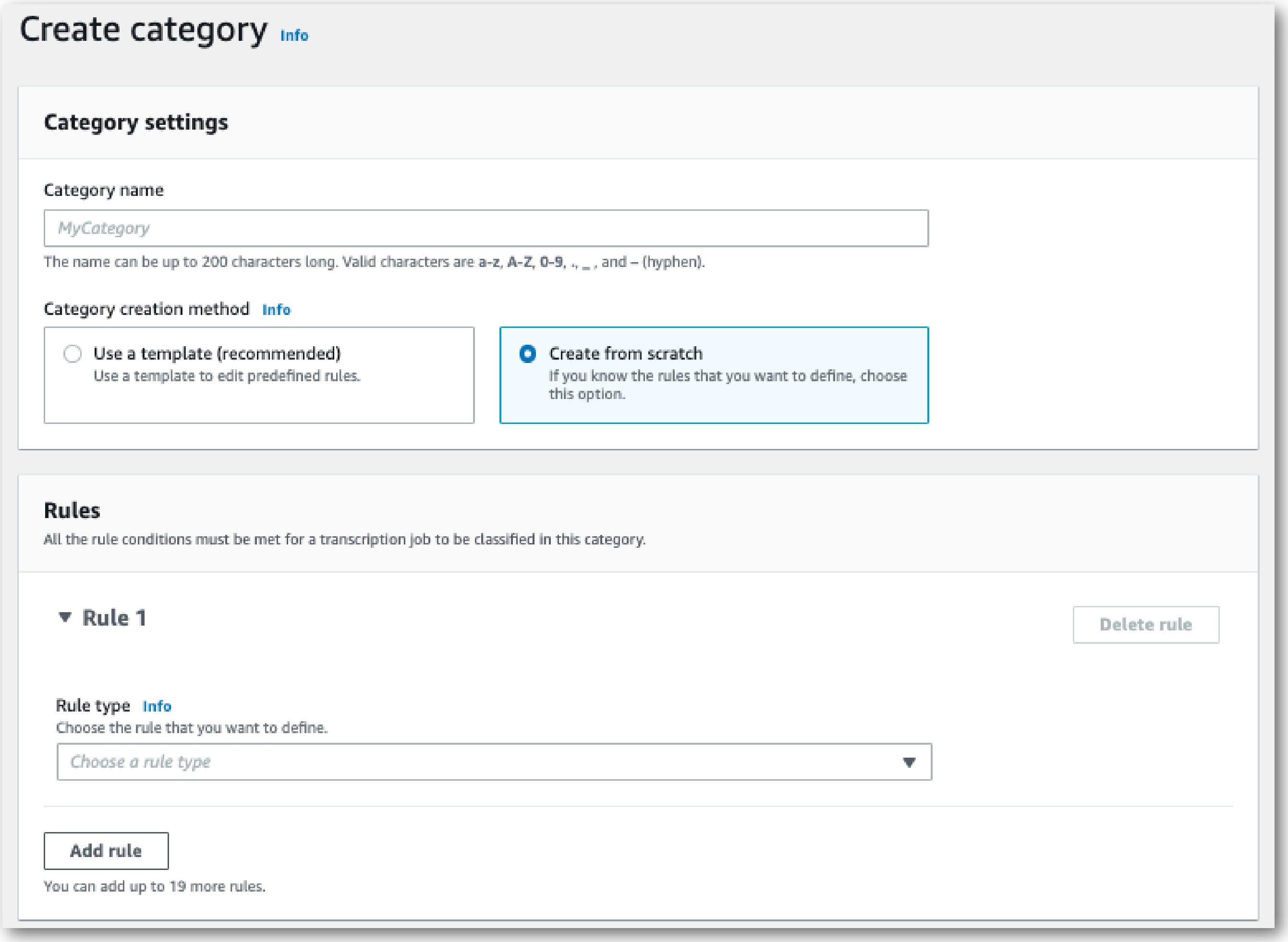
   Create from scratch
   If you know the rules that you want to define, choose this option.

   Template type Info
   Choose the template for the category that most closely matches the one you want to create.

   Choose a template

   Customer content is negative and mentioned manager

5. If creating a custom category: select **Create from scratch**.



Create category Info

Category settings

Category name

MyCategory

The name can be up to 200 characters long. Valid characters are a-z, A-Z, 0-9, ., _ , and – (hyphen).

Category creation method Info

( ) Use a template (recommended)
Use a template to edit predefined rules.

(●) Create from scratch
If you know the rules that you want to define, choose this option.

Rules

All the rule conditions must be met for a transcription job to be classified in this category.

▼ Rule 1 — Delete rule

Rule type Info

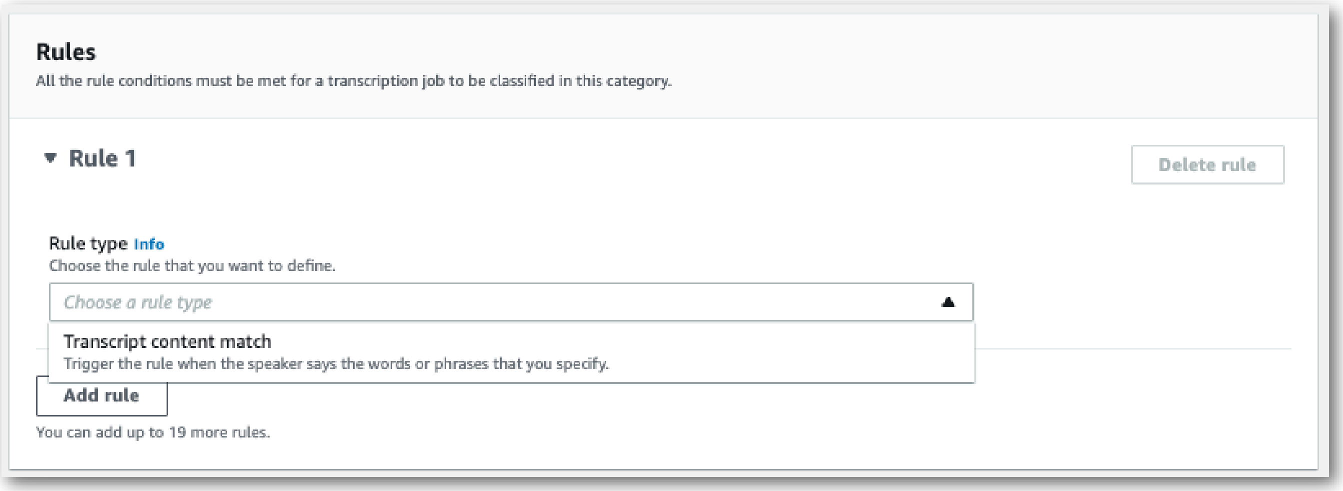
Choose the rule that you want to define.

Choose a rule type ▼

Add rule

You can add up to 19 more rules.

6. Add rules to your category using the dropdown menu. You can add up to 20 rules per category. With real-time Call Analytics transcriptions, you can only include rules that involve transcript content matches. Any matches are flagged in real time.



Rules

All the rule conditions must be met for a transcription job to be classified in this category.

▼ Rule 1 — Delete rule

Rule type Info

Choose the rule that you want to define.

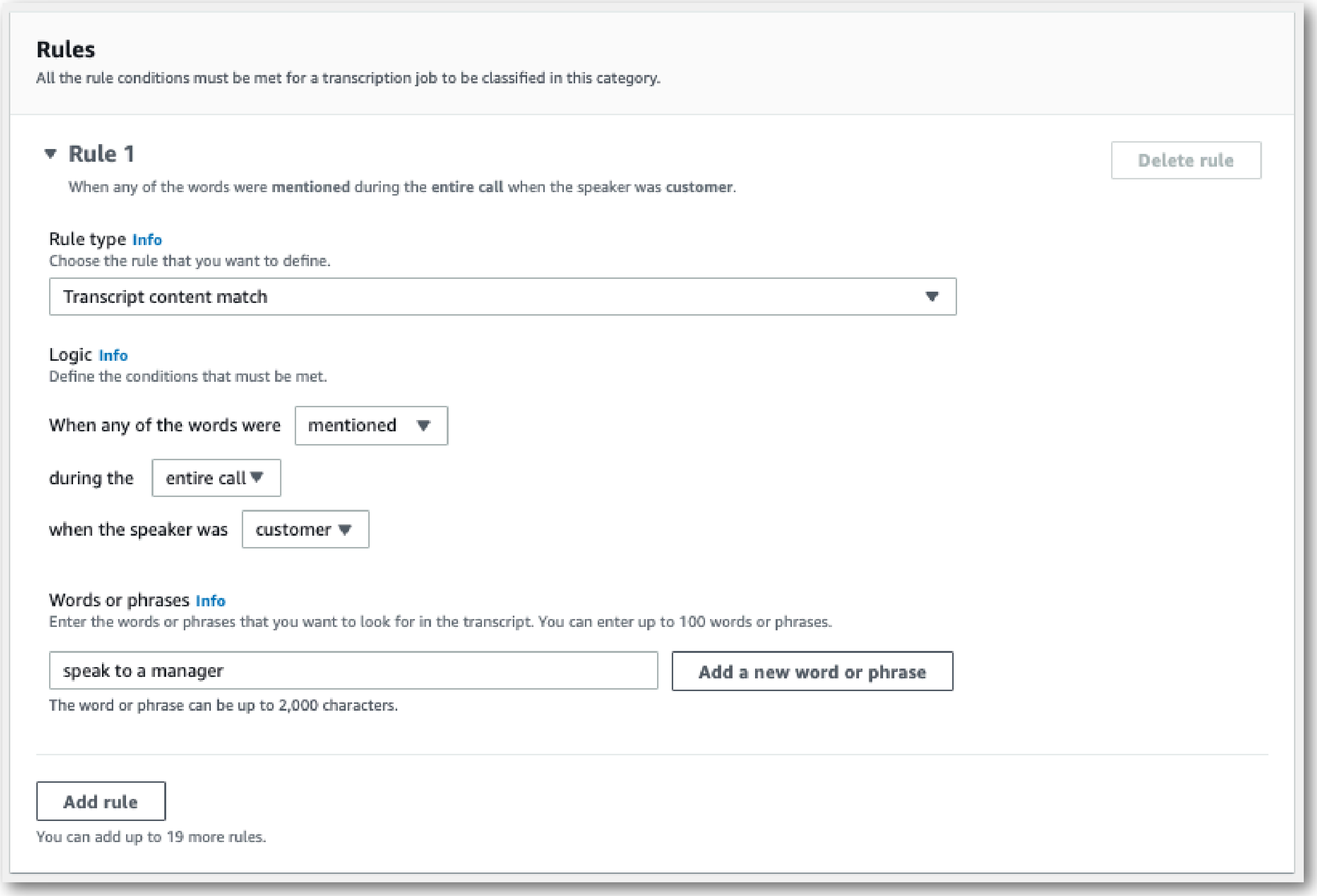
Choose a rule type ▲

Transcript content match
Trigger the rule when the speaker says the words or phrases that you specify.

Add rule

You can add up to 19 more rules.

7. Here's an example of a category with one rule: a customer who says "speak to a manager" at any point in the call.



Rules

All the rule conditions must be met for a transcription job to be classified in this category.

Rule 1

When any of the words were **mentioned** during the **entire call** when the speaker was **customer**.

Rule type Info

Choose the rule that you want to define.

Transcript content match

Logic Info

Define the conditions that must be met.

When any of the words were: mentioned

during the: entire call

when the speaker was: customer

Words or phrases Info

Enter the words or phrases that you want to look for in the transcript. You can enter up to 100 words or phrases.

speak to a manager

The word or phrase can be up to 2,000 characters.

You can add up to 19 more rules.

8. When you're finished adding rules to your category, choose **Create category**.

AWS CLI

This example uses the create-call-analytics-category command. For more information, see `CreateCallAnalyticsCategory`, `CategoryProperties`, and `Rule`.

The following example creates a category with the rule:

- The customer spoke the phrase "speak to the manager" at any point in the call.

This example uses the create-call-analytics-category command, and a request body that adds a rule to your category.

```
aws transcribe create-call-analytics-category \
--cli-input-json file://filepath/my-first-analytics-category.json
```

The file *my-first-analytics-category.json* contains the following request body.

```
{
  "CategoryName": "my-new-real-time-category",
  "InputType": "REAL_TIME",
  "Rules": [
        {
            "TranscriptFilter": {
                "Negate": false,
                "Targets": [
                    "speak to the manager"
                ],
                "TranscriptFilterType": "EXACT"
            }
        }
    ]
}
```

AWS SDK for Python (Boto3)

This example uses the AWS SDK for Python (Boto3) to create a category using the `CategoryName` and `Rules` arguments for the create_call_analytics_category method. For more information, see `CreateCallAnalyticsCategory`, `CategoryProperties`, and `Rule`.

For additional examples using the AWS SDKs, including feature-specific, scenario, and cross-service examples, refer to the Code examples for Amazon Transcribe using AWS SDKs chapter.

The following example creates a category with the rule:

- The customer spoke the phrase "speak to the manager" at any point in the call.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
category_name = "my-new-real-time-category"
transcribe.create_call_analytics_category(
    CategoryName = category_name,
    InputType = "REAL_TIME",
    Rules = [
        {
            'TranscriptFilter': {
                'Negate': False,
                'Targets': [
                    'speak to the manager'
                ],
                'TranscriptFilterType': 'EXACT'
            }
        }
    ]
)

result = transcribe.get_call_analytics_category(CategoryName = category_name)
print(result)
```

Rule criteria for real-time Call Analytics categories

This section outlines the types of custom `REAL_TIME` rules that you can create using the `CreateCallAnalyticsCategory` API operation.

Issue detection occurs automatically, so you don't need to create any rules or categories to flag issues.

Note that only keyword matches are supported for real-time Call Analytics transcriptions. If you want to create categories that include interruptions, silence, or sentiment, refer to Rule criteria for post-call analytics categories.

Keyword match

Rules using keywords (`TranscriptFilter` data type) are designed to match:

- Custom words or phrases spoken by the agent, the customer, or both
- Custom words or phrases **not** spoken by the agent, the customer, or both
- Custom words or phrases that occur in a specific time frame

Here's an example of the parameters available with `TranscriptFilter`:

```
"TranscriptFilter": {
    "AbsoluteTimeRange": {
       Specify the time frame, in milliseconds, when the match should occur
    },
    "RelativeTimeRange": {
        Specify the time frame, in percentage, when the match should occur
    },
    "Negate": Specify if you want to match the presence or absence of your custom
 keywords,
    "ParticipantRole": Specify if you want to match speech from the agent, the
 customer, or both,
    "Targets": [ The custom words and phrases you want to match ],
    "TranscriptFilterType": Use this parameter to specify an exact match for the
 specified targets
}
```

Refer to `CreateCallAnalyticsCategory` and `TranscriptFilter` for more information on these parameters and the valid values associated with each.

Post-call analytics with real-time transcriptions

Post-call analytics is an optional feature available with real-time Call Analytics transcriptions. In addition to the standard real-time analytics insights, post-call analytics provides you with the following:

- **Action items**: Lists any action items identified in the call
- **Interruptions**: Measures if and when one participant cuts off the other participant midsentence
- **Issues**: Provides the issues identified in the call
- **Loudness**: Measures the volume at which each participant is speaking
- **Non-talk time**: Measures periods of time that do not contain speech
- **Outcomes**: Provides the outcome, or resolution, identified in the call
- **Talk speed**: Measures the speed at which both participants are speaking
- **Talk time**: Measures the amount of time (in milliseconds) each participant spoke during the call

When enabled, post-call analytics from an audio stream produces a transcript similar to a post-call analytics from an audio file and stores it in the Amazon S3 bucket specified in `OutputLocation`. Additionally, post-call analytics records your audio stream and saves it as an audio file (`WAV` format) in the same Amazon S3 bucket. If you enable redaction, a redacted transcript and a redacted audio file are also stored in the specified Amazon S3 bucket. Enabling post-call analytics with your audio stream produces between two and four files, as described here:

- If redaction is **not** enabled, your output files are:
  1. An unredacted transcript
  2. An unredacted audio file
- If redaction is enabled **without** the unredacted option (`redacted`), your output files are:
  1. A redacted transcript
  2. A redacted audio file
- If redaction is enabled **with** the unredacted option (`redacted_and_unredacted`), your output files are:
  1. A redacted transcript
  2. A redacted audio file
  3. An unredacted transcript
  4. An unredacted audio file

Note that if you enable post-call analytics (`PostCallAnalyticsSettings`) with your request, and you're using `FLAC` or `OPUS-OGG` media, you **do not** get `loudnessScore` in your transcript and no audio recordings of your stream are created. Transcribe may also not be able to provide post-call analytics for long-running audio streams lasting longer than 90 minutes.

For more information on the insights available with post-call analytics for audio streams, refer to the post-call analytics insights section.

Tip

If you enable post-call analytics with your real-time Call Analytics request, all of your `POST_CALL` and `REAL-TIME` categories are applied to your post-call analytics transcription.

Enabling post-call analytics

To enable post-call analytics, you must include the `PostCallAnalyticsSettings` parameter in your real-time Call Analytics request. The following parameters must be included when `PostCallAnalyticsSettings` is enabled:

- `OutputLocation`: The Amazon S3 bucket where you want your post-call transcript stored.

- `DataAccessRoleArn`: The Amazon Resource Name (ARN) of the Amazon S3 role that has permissions to access the specified Amazon S3 bucket. Note that you must also use the Trust policy for real-time analytics.

If you want a redacted version of your transcript, you can include `ContentRedactionOutput` or `ContentRedactionType` in your request. For more information on these parameters, see `StartCallAnalyticsStreamTranscription` in the API Reference.

To start a real-time Call Analytics transcription with post-call analytics enabled, you can use the **AWS Management Console** (demo only), **HTTP/2**, or **WebSockets**. For examples, see Starting a real-time Call Analytics transcription.

Important

Currently, the AWS Management Console only offers a demo for real-time Call Analytics with pre-loaded audio examples. If you want to use your own audio, you must use the API (HTTP/2, WebSockets, or an SDK).

Example post-call analytics output

Post-call transcripts are displayed in a turn-by-turn format by segment. They include call characteristics, sentiment, call summarization, issue detection, and (optionally) PII redaction. If any of your post-call categories are a match to the audio content, these are also present in your output.

To increase accuracy and further customize your transcripts to your use case, such as including industry-specific terms, add custom vocabularies or custom language models to your Call Analytics request. To mask, remove, or tag words you don't want in your transcription results, such as profanity, add vocabulary filtering.

Here is a compiled post-call analytics output example:

```
{
    "JobStatus": "COMPLETED",
    "LanguageCode": "en-US",
    "AccountId": "1234567890",
    "Channel": "VOICE",
    "Participants": [{
        "ParticipantRole": "AGENT"
    },
    {
        "ParticipantRole": "CUSTOMER"
    }],
    "SessionId": "12a3b45c-de6f-78g9-0123-45h6ab78c901",
    "ContentMetadata": {
        "Output": "Raw"
    }
    "Transcript": [{
        "LoudnessScores": [
            78.63,
            78.37,
            77.98,
            74.18
        ],
        "Content": "[PII], my name is [PII], how can I help?",

            ...

        "Content": "Well, I would like to cancel my recipe subscription.",
            "IssuesDetected": [{
                "CharacterOffsets": {
                    "Begin": 7,
                    "End": 51
                }
            }],

            ...

        "Content": "That's very sad to hear. Can I offer you a 50% discount to have you
 stay with us?",
        "Id": "649afe93-1e59-4ae9-a3ba-a0a613868f5d",
        "BeginOffsetMillis": 12180,
        "EndOffsetMillis": 16960,
        "Sentiment": "NEGATIVE",
        "ParticipantRole": "AGENT"
    },
    {
        "LoudnessScores": [
            80.22,
            79.48,
            82.81
        ],
        "Content": "That is a very generous offer. And I accept.",
        "Id": "f9266cba-34df-4ca8-9cea-4f62a52a7981",
        "BeginOffsetMillis": 17140,
        "EndOffsetMillis": 19860,
        "Sentiment": "POSITIVE",
        "ParticipantRole": "CUSTOMER"
    },
            ...

        "Content": "Wonderful. I made all changes to your account and now this discount
 is applied, please check.",
        "OutcomesDetected": [{
        "CharacterOffsets": {
            "Begin": 12,
            "End": 78
        }
        }],

            ...

        "Content": "I will send an email with all the details to you today, and I will
 call you back next week to follow up. Have a wonderful evening.",
        "Id": "78cd0923-cafd-44a5-a66e-09515796572f",
        "BeginOffsetMillis": 31800,
        "EndOffsetMillis": 39450,
        "Sentiment": "POSITIVE",
        "ParticipantRole": "AGENT"
    },
    {
        "LoudnessScores": [
            78.54,
            68.76,
            67.76
        ],
        "Content": "Thank you very much, sir. Goodbye.",
        "Id": "5c5e6be0-8349-4767-8447-986f995af7c3",
        "BeginOffsetMillis": 40040,
        "EndOffsetMillis": 42460,
        "Sentiment": "POSITIVE",
        "ParticipantRole": "CUSTOMER"
    }
    ],

    ...

    "Categories": {
        "MatchedDetails": {
            "positive-resolution": {
                "PointsOfInterest": [{
                    "BeginOffsetMillis": 40040,
                    "EndOffsetMillis": 42460
                }]
            }
        },
        "MatchedCategories": [
            "positive-resolution"
        ]
    },

    ...

    "ConversationCharacteristics": {
        "NonTalkTime": {
            "Instances": [],
            "TotalTimeMillis": 0
        },
        "Interruptions": {
            "TotalCount": 2,
            "TotalTimeMillis": 10700,
            "InterruptionsByInterrupter": {
                "AGENT": [{
                    "BeginOffsetMillis": 26040,
                    "DurationMillis": 5510,
                    "EndOffsetMillis": 31550
                }],
                "CUSTOMER": [{
                    "BeginOffsetMillis": 770,
                    "DurationMillis": 5190,
                    "EndOffsetMillis": 5960
                }]
            }
        },
        "TotalConversationDurationMillis": 42460,
        "Sentiment": {
            "OverallSentiment": {
                "AGENT": 2.5,
                "CUSTOMER": 2.1
            },
            "SentimentByPeriod": {
                "QUARTER": {
                    "AGENT": [{
                        "Score": 0.0,
                        "BeginOffsetMillis": 0,
                        "EndOffsetMillis": 9862
                    },
                    {
                        "Score": -5.0,
                        "BeginOffsetMillis": 9862,
                        "EndOffsetMillis": 19725
                    },
                    {
                        "Score": 5.0,
                        "BeginOffsetMillis": 19725,
                        "EndOffsetMillis": 29587
                    },
                    {
                       "Score": 5.0,
                        "BeginOffsetMillis": 29587,
                        "EndOffsetMillis": 39450
                    }
                    ],
                    "CUSTOMER": [{
                        "Score": -2.5,
                        "BeginOffsetMillis": 0,
                        "EndOffsetMillis": 10615
                    },
                    {
                        "Score": 5.0,
                        "BeginOffsetMillis": 10615,
                        "EndOffsetMillis": 21230
                    },
                    {
                        "Score": 2.5,
                        "BeginOffsetMillis": 21230,
                        "EndOffsetMillis": 31845
                    },
                    {
                        "Score": 5.0,
                        "BeginOffsetMillis": 31845,
                        "EndOffsetMillis": 42460
                    }
                    ]
                }
            }
```

```
        },
        "TalkSpeed": {
            "DetailsByParticipant": {
                "AGENT": {
                    "AverageWordsPerMinute": 150
                },
                "CUSTOMER": {
                    "AverageWordsPerMinute": 167
                }
            }
        },
        "TalkTime": {
            "DetailsByParticipant": {
                "AGENT": {
                    "TotalTimeMillis": 32750
                },
                "CUSTOMER": {
                    "TotalTimeMillis": 18010
                }
            },
            "TotalTimeMillis": 50760
        }
    },
    ...
}
```

Starting a real-time Call Analytics transcription

Before starting a real-time Call Analytics transcription, you must create all the categories you want Amazon Transcribe to match in your call.

Note

Call Analytics transcripts can't be retroactively matched to new categories. Only the categories you create *before* starting a Call Analytics transcription can be applied to that transcription output.

If you've created one or more categories, and your audio matches all the rules within at least one of your categories, Amazon Transcribe flags your output with the matching categories. If you choose not to use categories, or if your audio doesn't match the rules specified in your categories, your transcript isn't flagged.

To include post-call analytics with your real-time Call Analytics transcription, you must provide an Amazon S3 bucket in your request using the `OutputLocation` parameter. You must also include a `DataAccessRoleArn` that has write permissions to the specified bucket. A separate transcript is produced and stored in the specified bucket upon completion of your real-time Call Analytics streaming session.

With real-time Call Analytics, you also have the option to create real-time category alerts; refer to Creating real-time alerts for category matches for instructions.

To start a real-time Call Analytics transcription, you can use the **AWS Management Console**, **HTTP/2**, or **WebSockets**; see the following for examples:

Important

Currently, the AWS Management Console only offers a demo for real-time Call Analytics with pre-loaded audio examples. If you want to use your own audio, you must use the API (HTTP/2, WebSockets, or an SDK).

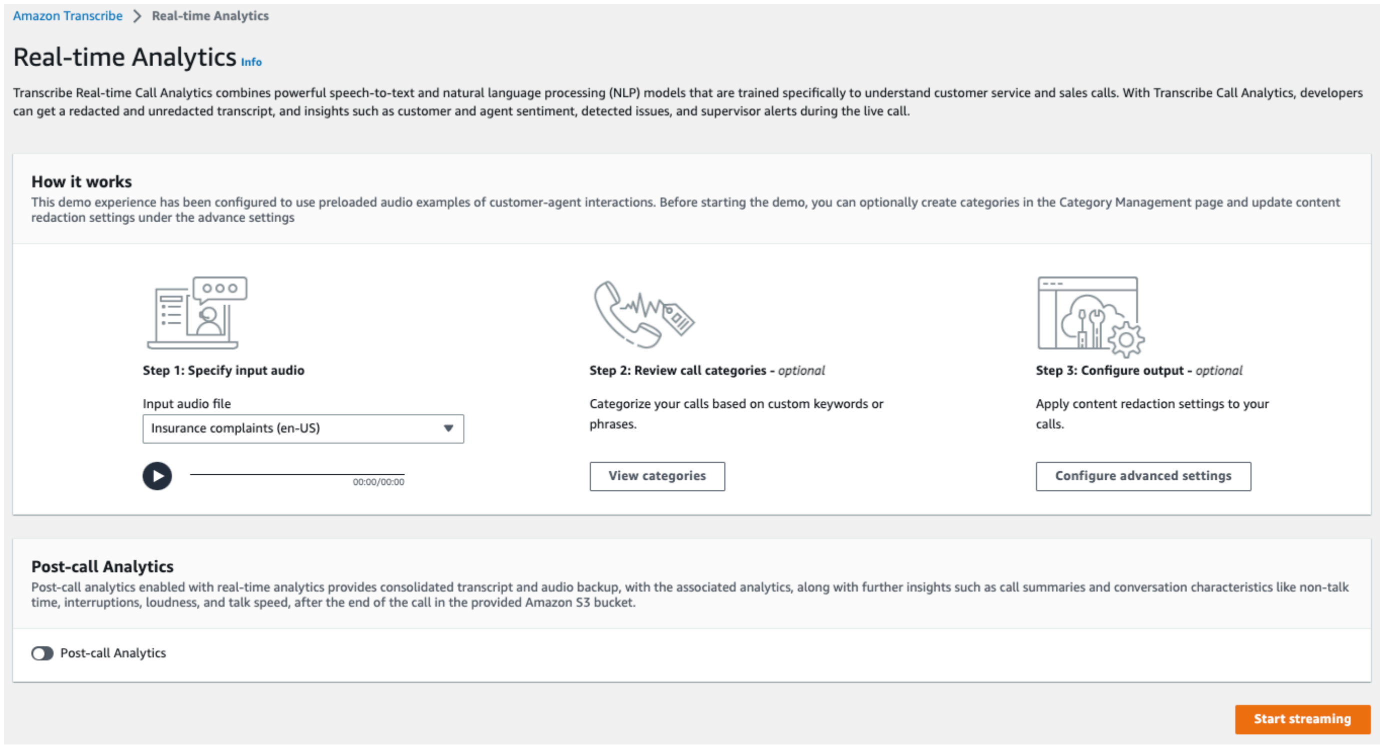
AWS Management Console

Use the following procedure to start a Call Analytics request. The calls that match all characteristics defined by a category are labeled with that category.

Note

Only a demo is available in the AWS Management Console. To start a custom real-time analytics transcription, you must use the API.

1. In the navigation pane, under Amazon Transcribe Call Analytics, choose **Analyze a real-time call**.



Amazon Transcribe > Real-time Analytics

Real-time Analytics Info

Transcribe Real-time Call Analytics combines powerful speech-to-text and natural language processing (NLP) models that are trained specifically to understand customer service and sales calls. With Transcribe Call Analytics, developers can get a redacted and unredacted transcript, and insights such as customer and agent sentiment, detected issues, and supervisor alerts during the live call.

How it works

This demo experience has been configured to use preloaded audio examples of customer-agent interactions. Before starting the demo, you can optionally create categories in the Category Management page and update content redaction settings under the advance settings

Step 1: Specify input audio

Input audio file: Insurance complaints (en-US)

00:00/00:00

Step 2: Review call categories - *optional*

Categorize your calls based on custom keywords or phrases.

View categories

Step 3: Configure output - *optional*

Apply content redaction settings to your calls.

Configure advanced settings

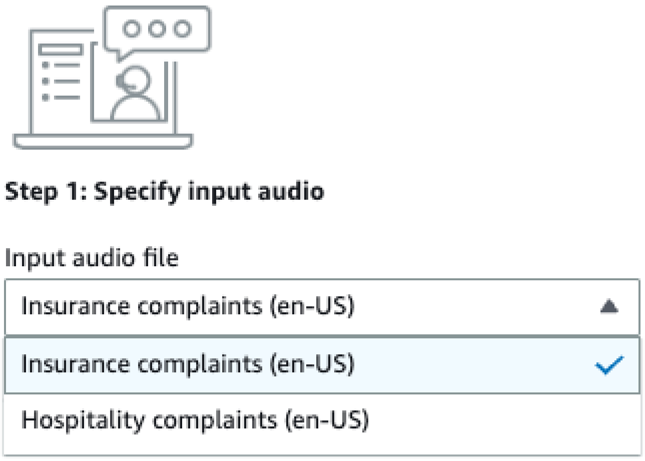
Post-call Analytics

Post-call analytics enabled with real-time analytics provides consolidated transcript and audio backup, with the associated analytics, along with further insights such as call summaries and conversation characteristics like non-talk time, interruptions, loudness, and talk speed, after the end of the call in the provided Amazon S3 bucket.

Post-call Analytics

Start streaming

2. For **Step 1: Specify input audio**, choose a demo test file from the dropdown menu.



Step 1: Specify input audio

Input audio file

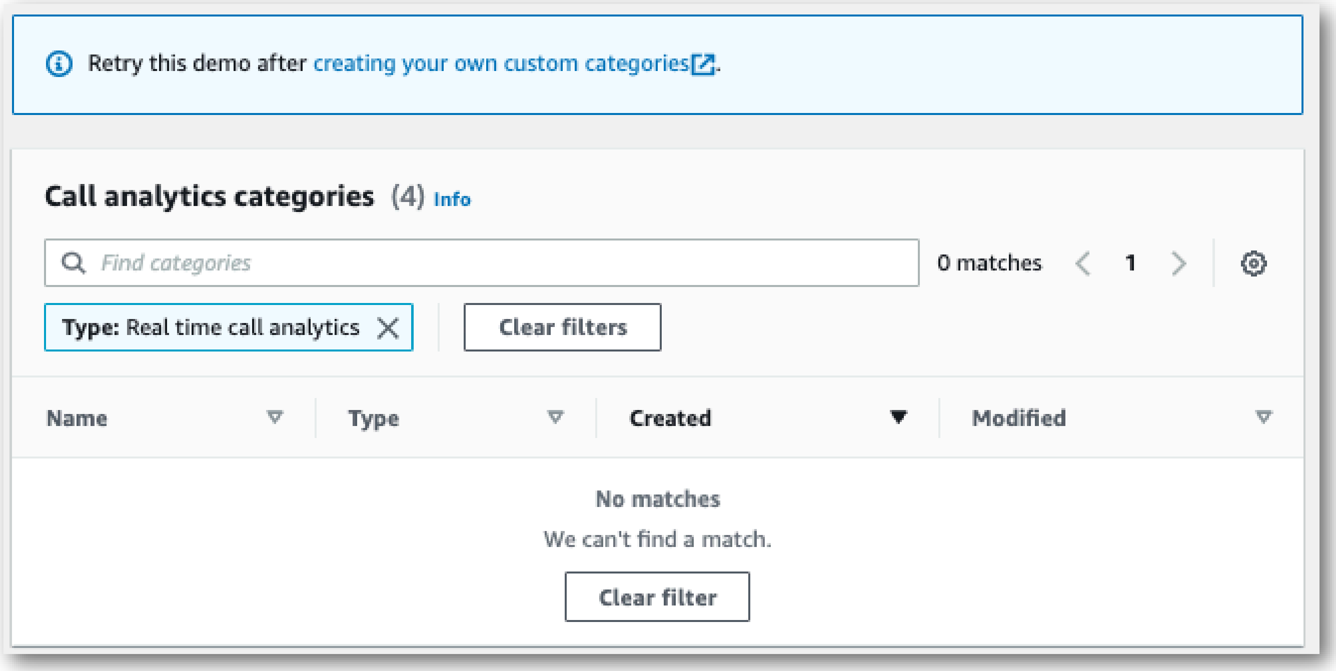
Insurance complaints (en-US)

Insurance complaints (en-US) ✓

Hospitality complaints (en-US)

3. For **Step 2: Review call categories**, you have the option to review the real-time Call Analytics categories you previously created. All real-time Call Analytics categories are applied to your transcription.

   Choosing **View categories** opens a new pane that shows your existing real-time Call Analytics categories and provides a link to create new ones.


Retry this demo after creating your own custom categories.

Call analytics categories (4) Info

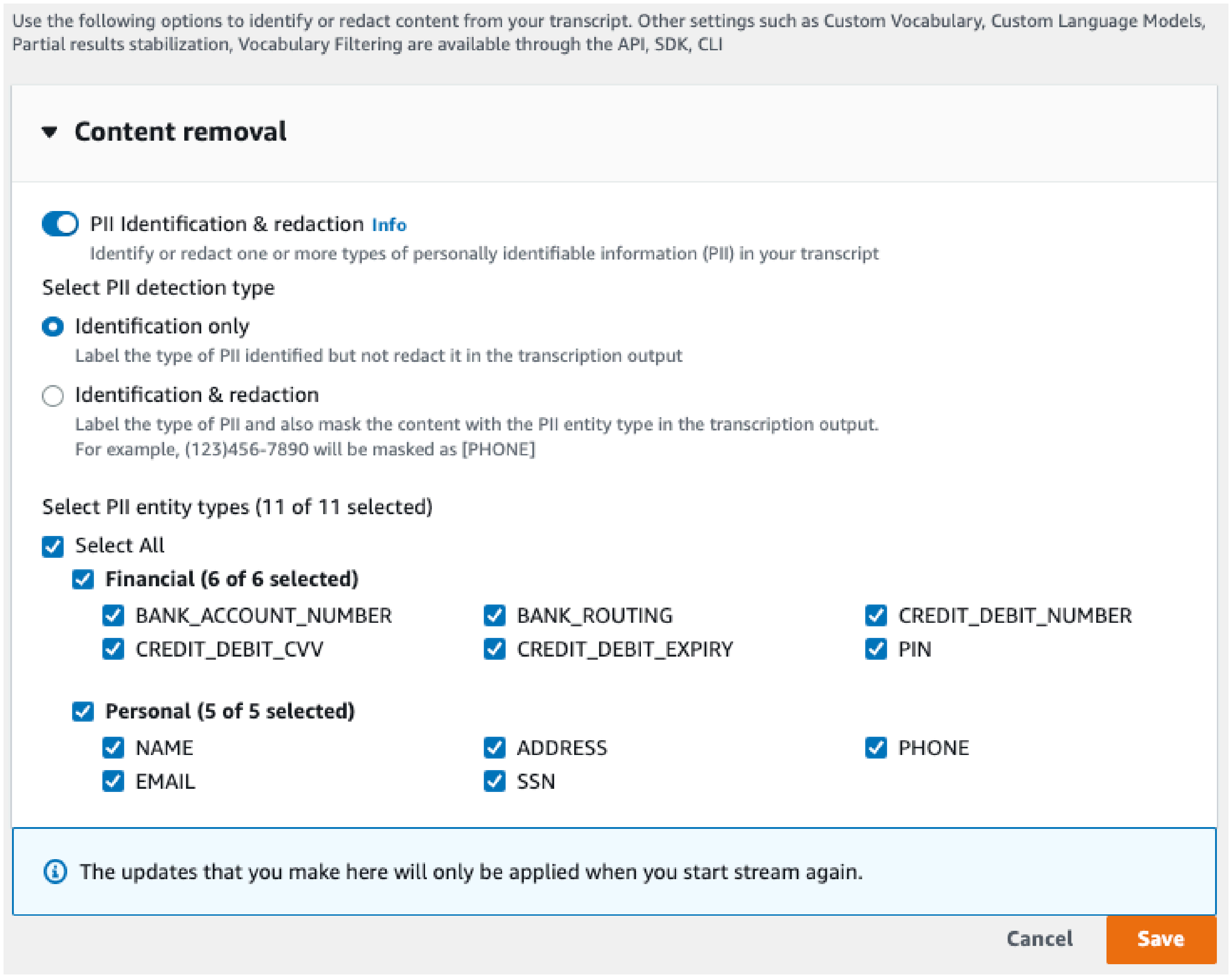
Name	Type	Created	Modified

No matches

We can't find a match.

4. For **Step 3: Configure input and output**, you have the option to apply additional settings.

   Choosing **Configure advanced settings** opens a new pane where you can specify content redaction settings.



Use the following options to identify or redact content from your transcript. Other settings such as Custom Vocabulary, Custom Language Models, Partial results stabilization, Vocabulary Filtering are available through the API, SDK, CLI

▼ **Content removal**

[✓] PII Identification & redaction Info
Identify or redact one or more types of personally identifiable information (PII) in your transcript

Select PII detection type

● Identification only
Label the type of PII identified but not redact it in the transcription output

○ Identification & redaction
Label the type of PII and also mask the content with the PII entity type in the transcription output.
For example, (123)456-7890 will be masked as [PHONE]

Select PII entity types (11 of 11 selected)

✓ Select All

✓ **Financial (6 of 6 selected)**

✓ BANK_ACCOUNT_NUMBER	✓ BANK_ROUTING	✓ CREDIT_DEBIT_NUMBER
✓ CREDIT_DEBIT_CVV	✓ CREDIT_DEBIT_EXPIRY	✓ PIN

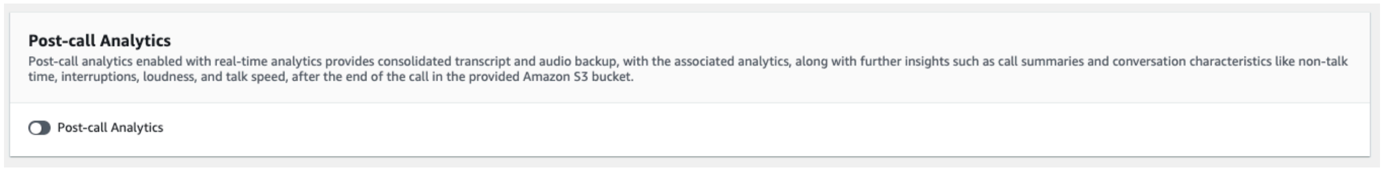
✓ **Personal (5 of 5 selected)**

✓ NAME	✓ ADDRESS	✓ PHONE
✓ EMAIL	✓ SSN	

The updates that you make here will only be applied when you start stream again.

Once you've made all your selections, choose **Save** to return to the main page.

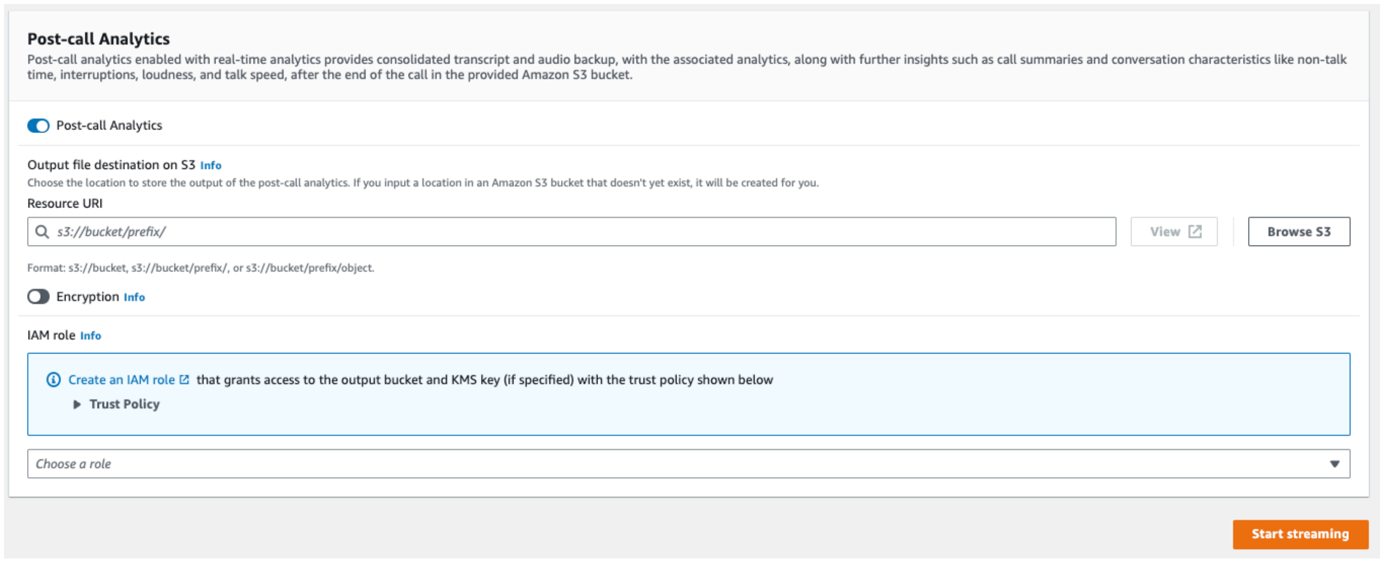
5. To apply additional analytics, you can toggle on **Post-call Analytics**. This provides you with the same analytics as a post-call analytics transcription, including interruptions, loudness, non-talk time, talk speed, talk time, issues, action items, and outcomes. Post-call analytics output is stored in a separate file from your real-time Call Analytics transcript.



Post-call Analytics
Post-call analytics enabled with real-time analytics provides consolidated transcript and audio backup, with the associated analytics, along with further insights such as call summaries and conversation characteristics like non-talk time, interruptions, loudness, and talk speed, after the end of the call in the provided Amazon S3 bucket.

Post-call Analytics

If you apply post-call analytics, you must specify an Amazon S3 output file destination and an IAM role. You can optionally choose to encrypt your output.



Post-call Analytics

Post-call analytics enabled with real-time analytics provides consolidated transcript and audio backup, with the associated analytics, along with further insights such as call summaries and conversation characteristics like non-talk time, interruptions, loudness, and talk speed, after the end of the call in the provided Amazon S3 bucket.

Post-call Analytics

Output file destination on S3 Info

Choose the location to store the output of the post-call analytics. If you input a location in an Amazon S3 bucket that doesn't yet exist, it will be created for you.

Resource URI

s3://bucket/prefix/

Format: s3://bucket, s3://bucket/prefix/, or s3://bucket/prefix/object.

Encryption Info

IAM role Info

Create an IAM role that grants access to the output bucket and KMS key (if specified) with the trust policy shown below

Trust Policy

Choose a role

6. Choose **Start streaming**.

HTTP/2 stream

This example creates an HTTP/2 request with Call Analytics enabled. For more information on using HTTP/2 streaming with Amazon Transcribe, see Setting up an HTTP/2 stream. For more detail on parameters and headers specific to Amazon Transcribe, see `StartCallAnalyticsStreamTranscription`.

This example includes post-call analytics. If you don't want post-call analytics, remove the `PostCallAnalyticsSettings` section from the request.

Note that the configuration event shown in the following example needs to be passed as the first event in the stream.

```
POST /stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
X-Amz-Target: com.amazonaws.transcribe.Transcribe.StartCallAnalyticsStreamTranscription
Content-Type: application/vnd.amazon.eventstream
X-Amz-Content-Sha256: string
X-Amz-Date: 20220208T235959Z
Authorization: AWS4-HMAC-SHA256 Credential=access-key/20220208/us-west-2/transcribe/
aws4_request, SignedHeaders=content-type;host;x-amz-content-sha256;x-amz-date;x-amz-
target;x-amz-security-token, Signature=string
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
transfer-encoding: chunked
```

```
{
    "AudioStream": {
        "AudioEvent": {
            "AudioChunk": blob
        },
        "ConfigurationEvent": {
            "ChannelDefinitions": [
                {
                    "ChannelId": 0,
                    "ParticipantRole": "AGENT"
                },
                {
                     "ChannelId": 1,
                    "ParticipantRole": "CUSTOMER"
                }
            ],
            "PostCallAnalyticsSettings": {
                "OutputLocation": "s3://amzn-s3-demo-bucket/my-output-files/",
                "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole"
            }
        }
    }
}
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

WebSocket stream

This example creates a presigned URL that uses Call Analytics in a WebSocket stream. Line breaks have been added for readability. For more information on using WebSocket streams with Amazon Transcribe, see Setting up a WebSocket stream. For more detail on parameters, see `StartCallAnalyticsStreamTranscription`.

This example includes post-call analytics. If you don't want post-call analytics, remove the `PostCallAnalyticsSettings` section from the request.

Note that the configuration event shown in the following example needs to be passed as the first event in the stream.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/call-analytics-stream-
transcription-websocket?
```

```
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=string
&X-Amz-SignedHeaders=content-type%3Bhost%3Bx-amz-date
&language-code=en-US
&media-encoding=flac
&sample-rate=16000

{
    "AudioStream": {
        "AudioEvent": {
            "AudioChunk": blob
        },
        "ConfigurationEvent": {
            "ChannelDefinitions": [
                {
                    "ChannelId": 0,
                    "ParticipantRole": "AGENT"
                },
                {
                     "ChannelId": 1,
                    "ParticipantRole": "CUSTOMER"
                }
            ],
            "PostCallAnalyticsSettings": {
                "OutputLocation": "s3://amzn-s3-demo-bucket/my-output-files/",
                "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole"
            }
        }
    }
}
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Tip

The above HTTP/2 and WebSocket examples include post-call analytics. If you don't want post-call analytics, remove the `PostCallAnalyticsSettings` section from the request.

If you enable `PostCallAnalyticsSettings`, you must send a configuration event as the first event. Your configuration event includes settings for `ChannelDenifitions` and `PostStreamAnalyticsSettings`, as shown in the preceding examples.
Binary data are passed as a binary message with `content-type application/octet-stream` and the configuration event is passed as a text message with `content-type application/json`.
For more information, see Setting up a streaming transcription.

Creating real-time alerts for category matches

To set up real-time alerts, you must first create a `TranscriptFilterType` category with the `REAL_TIME` flag. This flag allows your category to be applied to real-time Call Analytics transcriptions.

For instructions on creating a new category, see Creating categories for real-time transcriptions.

When you start your real-time Call Analytics transcription, all categories that have the `REAL_TIME` flag are automatically applied to your transcription output at a segment level. If a `TranscriptFilterType` match occurs, it appears under the `CategoryEvent` section of your transcript. You can then use this parameter and its sub-parameters, `MatchedCategories` and `MatchedDetails`, to set up custom real-time alerts.

Here's an example of real-time Call Analytics transcription output for a `CategoryEvent` match:

```
"CategoryEvent": {
    "MatchedCategories": [ "shipping-complaint" ],
    "MatchedDetails": {
        "my package never arrived" : {
            "TimestampRanges": [
                {
                    "BeginOffsetMillis": 19010,
                    "EndOffsetMillis": 22690
                }
            ]
        }
    }
},
```

The previous example represents an exact text match to the speech "*my package never arrived*," which represents a rule within the 'shipping-complaint' category.

You can set up your real-time alert to include any combination of the listed parameters. For example, you could set your alert to include only the phrase that was matched (`MatchedDetails`) or only the category name (`MatchedCategories`). Or you could set your alert to include all parameters.

How you set up your real-time alerts depends on your organization's interfaces and your desired alert type. For example, you could set a `CategoryEvent` match to send a pop-up notification, an email, a text, or any other alert your system can accept.

Real-time Call Analytics output

Real-time Call Analytics transcripts are displayed in a turn-by-turn format by segment. They include category events, issue detection, sentiment, and PII identification and redaction. Category events allow you to set real-time alerts; see Creating real-time alerts for category matches for more information.

To increase accuracy and further customize your transcripts to your use case, such as including industry-specific terms, add custom vocabularies or custom language models to your Call Analytics request. To mask, remove, or tag words you don't want in your transcription results, such as profanity, add vocabulary filtering.

The following sections show examples of JSON output for real-time Call Analytics transcriptions.

Category events

Here's what a category match looks like in your transcription output. This example shows that the audio from the 19010 millisecond timestamp to the 22690 millisecond timestamp is a match to the 'network-complaint' category. In this case, the custom 'network-complaint' category required that the customer said "*network issues*" (exact word match).

```
"CategoryEvent": {
    "MatchedCategories": [
        "network-complaint"
    ],
    "MatchedDetails": {
        "network issues" : {
            "TimestampRanges": [
                {
                    "BeginOffsetMillis": 9299375,
                    "EndOffsetMillis": 7899375
                }
            ]
        }
    }
},
```

Issue detection

Here's what an issue detection match looks like in your transcription output. This example shows that the text from character 26 to character 62 describes an issue.

```
"UtteranceEvent": {
    ...
    "Transcript": "Wang Xiulan I'm tired of the network issues my phone is having.",
    ...
    "IssuesDetected": [
        {
            "CharacterOffsets": {
                "BeginOffsetChar": 26,
                "EndOffsetChar": 62
            }
        }
    ]
},
```

Sentiment

Here's what sentiment analysis looks like in your transcription output.

```
"UtteranceEvent": {
    ...
    "Sentiment": "NEGATIVE",
    "Items": [{
        ...
```

PII identification

Here's what PII identification looks like in your transcription output.

```
"Entities": [
    {
        "Content": "Wang Xiulan",
        "Category": "PII",
        "Type": "NAME",
        "BeginOffsetMillis": 7999375,
        "EndOffsetMillis": 199375,
        "Confidence": 0.9989
    }
],
```

PII redaction

Here's what PII redaction looks like in your transcription output.

```
"Content": "[NAME]. Hi, [NAME]. I'm [NAME] Happy to be helping you today.",
"Redaction": {
    "RedactedTimestamps": [
        {
            "BeginOffsetMillis": 32670,
            "EndOffsetMillis": 33343
        },
        {
            "BeginOffsetMillis": 33518,
            "EndOffsetMillis": 33858
        },
        {
            "BeginOffsetMillis": 34068,
            "EndOffsetMillis": 34488
        }
    ]
},
```

Compiled real-time Call Analytics output

For brevity, some content is replaced with ellipses in the following transcription output.

```
{
    "CallAnalyticsTranscriptResultStream": {
        "BadRequestException": {},
        "ConflictException": {},
        "InternalFailureException": {},
        "LimitExceededException": {},
        "ServiceUnavailableException": {},
        "UtteranceEvent": {
            "UtteranceId": "58c27f92-7277-11ec-90d6-0242ac120003",
            "ParticipantRole": "CUSTOMER",
            "IsPartial": false,
            "Transcript": "Wang Xiulan I'm tired of the network issues my phone is 
 having.",
            "BeginOffsetMillis": 19010,
            "EndOffsetMillis": 22690,
            "Sentiment": "NEGATIVE",
            "Items": [{
                    "Content": "Wang",
                    "BeginOffsetMillis": 379937,
                    "EndOffsetMillis": 299375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                {
                    "Content": "Xiulan",
                    "EndOffsetMillis": 5899375,
                    "BeginOffsetMillis": 3899375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                ...
                {
                    "Content": "network",
                    "EndOffsetMillis": 199375,
                    "BeginOffsetMillis": 9299375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                {
                    "Content": "issues",
                    "EndOffsetMillis": 7899375,
                    "BeginOffsetMillis": 5999375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                {
                    "Content": "my",
                    "EndOffsetMillis": 9199375,
                    "BeginOffsetMillis": 7999375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                {
                    "Content": "phone",
                    "EndOffsetMillis": 199375,
                    "BeginOffsetMillis": 9299375,
                    "Type": "pronunciation",
                    "Confidence": 0.9961,
                    "VocabularyFilterMatch": false
                },
                ...
            ],
            "Entities": [{
                "Content": "Wang Xiulan",
                "Category": "PII",
                "Type": "NAME",
                "BeginOffsetMillis": 7999375,
                "EndOffsetMillis": 199375,
                "Confidence": 0.9989
            }],
            "IssuesDetected": [{
                "CharacterOffsets": {
                    "BeginOffsetChar": 26,
                    "EndOffsetChar": 62
                }
            }]
        },
        "CategoryEvent": {
            "MatchedCategories": [
                "network-complaint"
            ],
            "MatchedDetails": {
                "network issues" : {
                    "TimestampRanges": [
                        {
                            "BeginOffsetMillis": 9299375,
                            "EndOffsetMillis": 7899375
                        }
                    ]
                }
                }
            }
        }
}
```

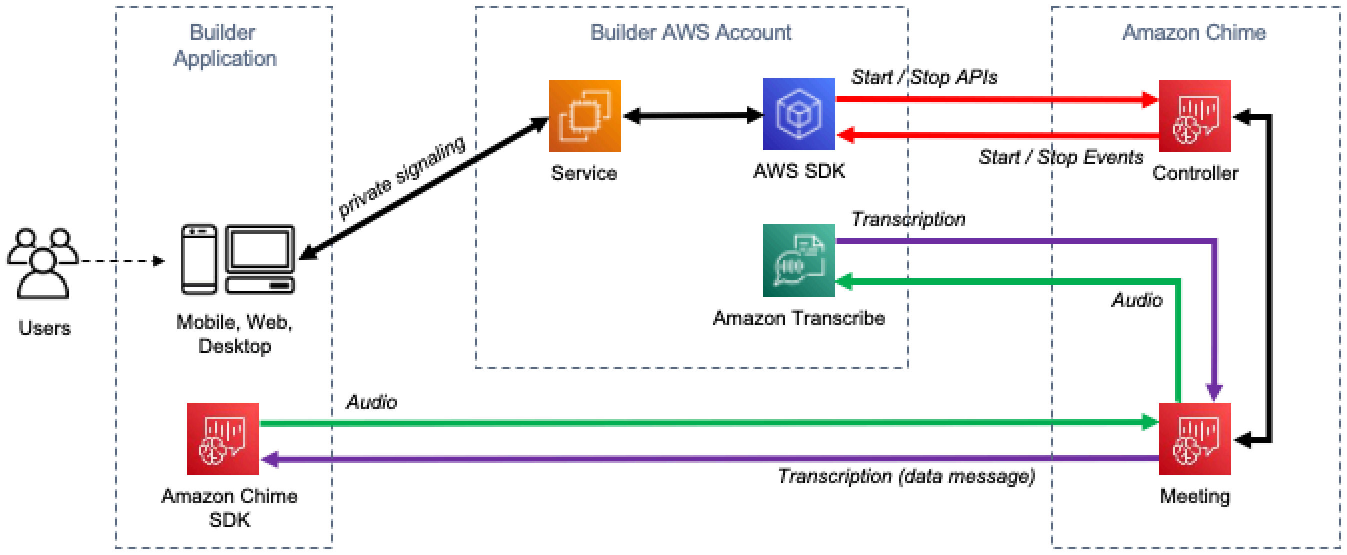
Transcribing your Amazon Chime calls in real time

Amazon Transcribe is integrated with the Amazon Chime SDK, facilitating real-time transcriptions of your Amazon Chime calls.

When you request a transcription using the Amazon Chime SDK API, Amazon Chime begins streaming audio to Amazon Transcribe and continues to do so for the duration of the call.

The Amazon Chime SDK uses its 'active talker' algorithm to select the top two active talkers, and then sends their audio to Amazon Transcribe as two separate channels via a single stream. Meeting participants receive user-attributed transcriptions via Amazon Chime SDK data messages. You can view delivery examples in the *Amazon Chime SDK Developer Guide*.

The data flow of an Amazon Chime transcription is depicted in the following diagram:



For additional information and detailed instructions on how to set up real-time Amazon Chime transcriptions, refer to Using Amazon Chime SDK live transcription in the *Amazon Chime SDK Developer Guide*. For API operations, refer to the *Amazon Chime SDK API Reference*.

Dive deeper with the AWS Machine Learning Blog

To learn more about improving accuracy with real-time transcriptions, see:

- Amazon Chime SDK meetings now support live transcription with Amazon Transcribe and Amazon Transcribe Medical

- Amazon Chime SDK for Telemedicine Solution

Code examples for Amazon Transcribe using AWS SDKs

The following code examples show how to use Amazon Transcribe with an AWS software development kit (SDK).

Actions are code excerpts from larger programs and must be run in context. While actions show you how to call individual service functions, you can see actions in context in their related scenarios.

Scenarios are code examples that show you how to accomplish specific tasks by calling multiple functions within a service or combined with other AWS services.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Code examples

- Transcribe audio and get job data with Amazon Transcribe using an AWS SDK

Basic examples for Amazon Transcribe using AWS SDKs

The following code examples show how to use the basics of Amazon Transcribe with AWS SDKs.

Examples

Actions for Amazon Transcribe using AWS SDKs

The following code examples demonstrate how to perform individual Amazon Transcribe actions with AWS SDKs. Each example includes a link to GitHub, where you can find instructions for setting up and running the code.

These excerpts call the Amazon Transcribe API and are code excerpts from larger programs that must be run in context. You can see actions in context in Scenarios for Amazon Transcribe using AWS SDKs .

The following examples include only the most commonly used actions. For a complete list, see the Amazon Transcribe API Reference.

Examples

- Use CreateVocabulary with an AWS SDK or CLI
- Use DeleteMedicalTranscriptionJob with an AWS SDK or CLI
- Use DeleteTranscriptionJob with an AWS SDK or CLI
- Use DeleteVocabulary with an AWS SDK or CLI
- Use GetTranscriptionJob with an AWS SDK or CLI
- Use GetVocabulary with an AWS SDK or CLI
- Use ListMedicalTranscriptionJobs with an AWS SDK or CLI
- Use ListTranscriptionJobs with an AWS SDK or CLI
- Use ListVocabularies with an AWS SDK or CLI
- Use StartMedicalTranscriptionJob with an AWS SDK or CLI
- Use StartTranscriptionJob with an AWS SDK or CLI
- Use UpdateVocabulary with an AWS SDK or CLI

Use `CreateVocabulary` with an AWS SDK or CLI

The following code examples show how to use `CreateVocabulary`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Create a custom vocabulary using a list of phrases. Custom vocabularies
    /// improve transcription accuracy for one or more specific words.
    /// </summary>
    /// <param name="languageCode">The language code of the vocabulary.</param>
    /// <param name="phrases">Phrases to use in the vocabulary.</param>
    /// <param name="vocabularyName">Name for the vocabulary.</param>
    /// <returns>The state of the custom vocabulary.</returns>
    public async Task<VocabularyState> CreateCustomVocabulary(LanguageCode
 languageCode,
        List<string> phrases, string vocabularyName)
    {
        var response = await _amazonTranscribeService.CreateVocabularyAsync(
            new CreateVocabularyRequest
            {
                LanguageCode = languageCode,
                Phrases = phrases,
                VocabularyName = vocabularyName
            });
        return response.VocabularyState;
    }
```

- For API details, see CreateVocabulary in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To create a custom vocabulary

The following `create-vocabulary` example creates a custom vocabulary. To create a custom vocabulary, you must have created a text file with all the terms that you want to transcribe more accurately. For vocabulary-file-uri, specify the Amazon Simple Storage Service (Amazon S3) URI of that text file. For language-code, specify a language code corresponding to the language of your custom vocabulary. For vocabulary-name, specify what you want to call your custom vocabulary.

```
aws transcribe create-vocabulary \
    --language-code language-code \
    --vocabulary-name cli-vocab-example \
    --vocabulary-file-uri s3://amzn-s3-demo-bucket/Amazon-S3-prefix/the-text-
file-for-the-custom-vocabulary.txt
```

Output:

```
{
    "VocabularyName": "cli-vocab-example",
    "LanguageCode": "language-code",
    "VocabularyState": "PENDING"
}
```

For more information, see Custom Vocabularies in the *Amazon Transcribe Developer Guide*.

- For API details, see CreateVocabulary in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def create_vocabulary(
    vocabulary_name, language_code, transcribe_client, phrases=None,
 table_uri=None
):
    """
    Creates a custom vocabulary that can be used to improve the accuracy of
    transcription jobs. This function returns as soon as the vocabulary
 processing
    is started. Call get_vocabulary to get the current status of the vocabulary.
    The vocabulary is ready to use when its status is 'READY'.

    :param vocabulary_name: The name of the custom vocabulary.
    :param language_code: The language code of the vocabulary.
                          For example, en-US or nl-NL.
    :param transcribe_client: The Boto3 Transcribe client.
    :param phrases: A list of comma-separated phrases to include in the
 vocabulary.
    :param table_uri: A table of phrases and pronunciation hints to include in
 the
```

```
                      vocabulary.
    :return: Information about the newly created vocabulary.
    """
    try:
        vocab_args = {"VocabularyName": vocabulary_name, "LanguageCode":
 language_code}
        if phrases is not None:
            vocab_args["Phrases"] = phrases
        elif table_uri is not None:
            vocab_args["VocabularyFileUri"] = table_uri
        response = transcribe_client.create_vocabulary(**vocab_args)
        logger.info("Created custom vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't create custom vocabulary %s.",
 vocabulary_name)
        raise
    else:
        return response
```

- For API details, see CreateVocabulary in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `DeleteMedicalTranscriptionJob` with an AWS SDK or CLI

The following code examples show how to use `DeleteMedicalTranscriptionJob`.

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Delete a medical transcription job. Also deletes the transcript
 associated with the job.
    /// </summary>
    /// <param name="jobName">Name of the medical transcription job to delete.</
param>
    /// <returns>True if successful.</returns>
    public async Task<bool> DeleteMedicalTranscriptionJob(string jobName)
    {
        var response = await
 _amazonTranscribeService.DeleteMedicalTranscriptionJobAsync(
            new DeleteMedicalTranscriptionJobRequest()
            {
                MedicalTranscriptionJobName = jobName
            });
        return response.HttpStatusCode == HttpStatusCode.OK;
    }
```

- For API details, see DeleteMedicalTranscriptionJob in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To delete a medical transcription job

The following `delete-medical-transcription-job` example deletes a medical transcription job.

```
aws transcribe delete-medical-transcription-job \
    --medical-transcription-job-name medical-transcription-job-name
```

This command produces no output.

For more information, see DeleteMedicalTranscriptionJob in the *Amazon Transcribe Developer Guide*.

- For API details, see DeleteMedicalTranscriptionJob in *AWS CLI Command Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

Delete a medical transcription job.

```
// Import the required AWS SDK clients and commands for Node.js
import { DeleteMedicalTranscriptionJobCommand } from "@aws-sdk/client-
transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  MedicalTranscriptionJobName: "MEDICAL_JOB_NAME", // For example,
 'medical_transciption_demo'
};

export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new DeleteMedicalTranscriptionJobCommand(params),
    );
    console.log("Success - deleted");
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see DeleteMedicalTranscriptionJob in *AWS SDK for JavaScript API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `DeleteTranscriptionJob` with an AWS SDK or CLI

The following code examples show how to use `DeleteTranscriptionJob`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Delete a transcription job. Also deletes the transcript associated with
 the job.
    /// </summary>
    /// <param name="jobName">Name of the transcription job to delete.</param>
    /// <returns>True if successful.</returns>
    public async Task<bool> DeleteTranscriptionJob(string jobName)
    {
        var response = await
 _amazonTranscribeService.DeleteTranscriptionJobAsync(
            new DeleteTranscriptionJobRequest()
            {
                TranscriptionJobName = jobName
            });
        return response.HttpStatusCode == HttpStatusCode.OK;
    }
```

- For API details, see DeleteTranscriptionJob in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To delete one of your transcription jobs

The following `delete-transcription-job` example deletes one of your transcription jobs.

```
aws transcribe delete-transcription-job \
    --transcription-job-name your-transcription-job
```

This command produces no output.

For more information, see DeleteTranscriptionJob in the *Amazon Transcribe Developer Guide*.

- For API details, see DeleteTranscriptionJob in *AWS CLI Command Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Delete a transcription job.

```
// Import the required AWS SDK clients and commands for Node.js
import { DeleteTranscriptionJobCommand } from "@aws-sdk/client-transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  TranscriptionJobName: "JOB_NAME", // Required. For example, 'transciption_demo'
};

export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new DeleteTranscriptionJobCommand(params),
    );
    console.log("Success - deleted");
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see DeleteTranscriptionJob in *AWS SDK for JavaScript API Reference*.

Python

SDK for Python (Boto3)

> **Note**
>
> There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def delete_job(job_name, transcribe_client):
    """
    Deletes a transcription job. This also deletes the transcript associated with
    the job.

    :param job_name: The name of the job to delete.
    :param transcribe_client: The Boto3 Transcribe client.
    """
    try:
        transcribe_client.delete_transcription_job(TranscriptionJobName=job_name)
        logger.info("Deleted job %s.", job_name)
    except ClientError:
        logger.exception("Couldn't delete job %s.", job_name)
        raise
```

- For API details, see DeleteTranscriptionJob in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `DeleteVocabulary` with an AWS SDK or CLI

The following code examples show how to use `DeleteVocabulary`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Delete an existing custom vocabulary.
    /// </summary>
    /// <param name="vocabularyName">Name of the vocabulary to delete.</param>
    /// <returns>True if successful.</returns>
    public async Task<bool> DeleteCustomVocabulary(string vocabularyName)
    {
        var response = await _amazonTranscribeService.DeleteVocabularyAsync(
            new DeleteVocabularyRequest
            {
                VocabularyName = vocabularyName
            });
        return response.HttpStatusCode == HttpStatusCode.OK;
    }
```

- For API details, see DeleteVocabulary in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To delete a custom vocabulary

The following `delete-vocabulary` example deletes a custom vocabulary.

```
aws transcribe delete-vocabulary \
    --vocabulary-name vocabulary-name
```

This command produces no output.

For more information, see Custom Vocabularies in the *Amazon Transcribe Developer Guide*.

- For API details, see DeleteVocabulary in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def delete_vocabulary(vocabulary_name, transcribe_client):
    """
    Deletes a custom vocabulary.

    :param vocabulary_name: The name of the vocabulary to delete.
    :param transcribe_client: The Boto3 Transcribe client.
    """
    try:
        transcribe_client.delete_vocabulary(VocabularyName=vocabulary_name)
        logger.info("Deleted vocabulary %s.", vocabulary_name)
    except ClientError:
        logger.exception("Couldn't delete vocabulary %s.", vocabulary_name)
        raise
```

- For API details, see DeleteVocabulary in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use GetTranscriptionJob with an AWS SDK or CLI

The following code examples show how to use GetTranscriptionJob.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code examples:

- Create and refine a custom vocabulary
- Transcribe audio and get job data

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Get details about a transcription job.
    /// </summary>
    /// <param name="jobName">A unique name for the transcription job.</param>
    /// <returns>A TranscriptionJob instance with information on the requested
job.</returns>
    public async Task<TranscriptionJob> GetTranscriptionJob(string jobName)
    {
        var response = await _amazonTranscribeService.GetTranscriptionJobAsync(
            new GetTranscriptionJobRequest()
            {
                TranscriptionJobName = jobName
            });
        return response.TranscriptionJob;
    }
```

- For API details, see GetTranscriptionJob in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To get information about a specific transcription job

The following `get-transcription-job` example gets information about a specific transcription job. To access the transcription results, use the TranscriptFileUri parameter. Use the MediaFileUri parameter to see which audio file you transcribed with this job. You can use the Settings object to see the optional features you've enabled in the transcription job.

```
aws transcribe get-transcription-job \
    --transcription-job-name your-transcription-job
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "your-transcription-job",
        "TranscriptionJobStatus": "COMPLETED",
        "LanguageCode": "language-code",
        "MediaSampleRateHertz": 48000,
        "MediaFormat": "mp4",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.file-
extension"
        },
        "Transcript": {
            "TranscriptFileUri": "https://Amazon-S3-file-location-of-
transcription-output"
        },
        "StartTime": "2020-09-18T22:27:23.970000+00:00",
        "CreationTime": "2020-09-18T22:27:23.948000+00:00",
        "CompletionTime": "2020-09-18T22:28:21.197000+00:00",
        "Settings": {
            "ChannelIdentification": false,
            "ShowAlternatives": false
        },
        "IdentifyLanguage": true,
        "IdentifiedLanguageScore": 0.8672199249267578
    }
}
```

For more information, see Getting Started (AWS Command Line Interface) in the *Amazon Transcribe Developer Guide*.

- For API details, see GetTranscriptionJob in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def get_job(job_name, transcribe_client):
    """
    Gets details about a transcription job.

    :param job_name: The name of the job to retrieve.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: The retrieved transcription job.
    """
    try:
        response = transcribe_client.get_transcription_job(
            TranscriptionJobName=job_name
        )
        job = response["TranscriptionJob"]
        logger.info("Got job %s.", job["TranscriptionJobName"])
    except ClientError:
        logger.exception("Couldn't get job %s.", job_name)
        raise
    else:
        return job
```

- For API details, see GetTranscriptionJob in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `GetVocabulary` with an AWS SDK or CLI

The following code examples show how to use `GetVocabulary`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
/// <summary>
/// Get information about a custom vocabulary.
/// </summary>
/// <param name="vocabularyName">Name of the vocabulary.</param>
/// <returns>The state of the custom vocabulary.</returns>
public async Task<VocabularyState> GetCustomVocabulary(string vocabularyName)
{
    var response = await _amazonTranscribeService.GetVocabularyAsync(
        new GetVocabularyRequest()
        {
            VocabularyName = vocabularyName
        });
    return response.VocabularyState;
}
```

- For API details, see GetVocabulary in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To get information about a custom vocabulary

The following `get-vocabulary` example gets information on a previously created custom vocabulary.

```
aws transcribe get-vocabulary \
    --vocabulary-name cli-vocab-1
```

Output:

```
{
    "VocabularyName": "cli-vocab-1",
    "LanguageCode": "language-code",
    "VocabularyState": "READY",
    "LastModifiedTime": "2020-09-19T23:22:32.836000+00:00",
    "DownloadUri": "https://link-to-download-the-text-file-used-to-create-your-
custom-vocabulary"
}
```

For more information, see Custom Vocabularies in the *Amazon Transcribe Developer Guide*.

- For API details, see GetVocabulary in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def get_vocabulary(vocabulary_name, transcribe_client):
    """
    Gets information about a custom vocabulary.

    :param vocabulary_name: The name of the vocabulary to retrieve.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: Information about the vocabulary.
    """
    try:
        response =
 transcribe_client.get_vocabulary(VocabularyName=vocabulary_name)
        logger.info("Got vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't get vocabulary %s.", vocabulary_name)
        raise
    else:
        return response
```

- For API details, see GetVocabulary in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `ListMedicalTranscriptionJobs` with an AWS SDK or CLI

The following code examples show how to use `ListMedicalTranscriptionJobs`.

.NET

SDK for .NET

> **Note**
>
> There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// List medical transcription jobs, optionally with a name filter.
    /// </summary>
    /// <param name="jobNameContains">Optional name filter for the medical
 transcription jobs.</param>
    /// <returns>A list of summaries about medical transcription jobs.</returns>
    public async Task<List<MedicalTranscriptionJobSummary>>
 ListMedicalTranscriptionJobs(
        string? jobNameContains = null)
    {
        var response = await
 _amazonTranscribeService.ListMedicalTranscriptionJobsAsync(
            new ListMedicalTranscriptionJobsRequest()
            {
                JobNameContains = jobNameContains
            });
        return response.MedicalTranscriptionJobSummaries;
    }
```

- For API details, see ListMedicalTranscriptionJobs in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To list your medical transcription jobs

The following `list-medical-transcription-jobs` example lists the medical transcription jobs associated with your AWS account and Region. To get more information about a particular transcription job, copy the value of a MedicalTranscriptionJobName parameter in the transcription output, and specify that value for the `MedicalTranscriptionJobName` option of the `get-medical-transcription-job` command. To see more of your transcription jobs, copy the value of the NextToken parameter, run the `list-medical-transcription-jobs` command again, and specify that value in the `--next-token` option.

```
aws transcribe list-medical-transcription-jobs
```

Output:

```
{
    "NextToken": "3/PblzkiGhzjER3KHuQt2fmbPLF7cDYafjFMEoGn44ON/
gsuUSTIkGyanvRE6WMXFd/ZTEc2EZj+P9eii/
z1O2FDYli6RLI0WoRX4RwMisVrh9G0Kie0Y8ikBCdtqlZB10Wa9McC+ebOl
+LaDtZPC4u6ttoHLRlEfzqstHXSgapXg3tEBtm9piIaPB6MOM5BB6t86+qtmocTR/
qrteHZBBudhTfbCwhsxaqujHiiUvFdm3BQbKKWIW06yV9b+4f38oD2lVIan
+vfUs3gBYAl5VTDmXXzQPBQOHPjtwmFI+IWX15nSUjWuN3TUylHgPWzDaYT8qBtu0Z+3UG4V6b
+K2CC0XszXg5rBq9hYgNzy4XoFh/6s5DoSnzq49Q9xHgHdT2yBADFmvFK7myZBsj75+2vQZOSVpWUPy3WT/32zFAc
+mFYfUjtTZ8n/jq7aQEjQ42A
+X/7K6JgOcdVPtEg8PlDr5kgYYG3q3OmYXX37U3FZuJmnTI63VtIXsNnOU5eGoYObtpk00Nq9UkzgSJxqj84ZD5n
+S0EGy9ZUYBJRRcGeYUM3Q4DbSJfUwSAqcFdLIWZdp8qIREMQIBWy7BLwSdyqsQo2vRrd53hm5aWM7SVf6pPq6X/
IXR5+1eUOOD8/coaTT4ES2DerbV6RkV4o0VT1d0SdVX/
MmtkNG8nYj8PqU07w7988quh1ZP6D80veJS1q73tUUR9MjnGernW2tAnvnLNhdefBcD
+sZVfYq3iBMFY7wTy1P1G6NqW9GrYDYoX3tTPWlD7phpbVSyKrh/
PdYrps5UxnsGoA1b7L/FfAXDfUoGrGUB4N3JsPYXX9D++g+6gV1qBBs/
WfF934aKqfD6UTggm/zV3GAOWiBpfvAZRvEb924i6yGHyMC7y54O1ZAwSBupmI
+FFd13CaPO4kN1vJlth6aM5vUPXg4BpyUhtbRhwD/KxCvf9K0tLJGyL1A==",
    "MedicalTranscriptionJobSummaries": [
        {
            "MedicalTranscriptionJobName": "vocabulary-dictation-medical-
transcription-job",
            "CreationTime": "2020-09-21T21:17:27.016000+00:00",
            "StartTime": "2020-09-21T21:17:27.045000+00:00",
            "CompletionTime": "2020-09-21T21:17:59.561000+00:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "CUSTOMER_BUCKET",
            "Specialty": "PRIMARYCARE",
            "Type": "DICTATION"
        },
        {
            "MedicalTranscriptionJobName": "alternatives-dictation-medical-
transcription-job",
            "CreationTime": "2020-09-21T21:01:14.569000+00:00",
            "StartTime": "2020-09-21T21:01:14.592000+00:00",
            "CompletionTime": "2020-09-21T21:01:43.606000+00:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "CUSTOMER_BUCKET",
            "Specialty": "PRIMARYCARE",
            "Type": "DICTATION"
        },
        {
            "MedicalTranscriptionJobName": "alternatives-conversation-medical-
transcription-job",
            "CreationTime": "2020-09-21T19:09:18.171000+00:00",
            "StartTime": "2020-09-21T19:09:18.199000+00:00",
            "CompletionTime": "2020-09-21T19:10:22.516000+00:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "CUSTOMER_BUCKET",
            "Specialty": "PRIMARYCARE",
            "Type": "CONVERSATION"
        },
        {
            "MedicalTranscriptionJobName": "speaker-id-conversation-medical-
transcription-job",
            "CreationTime": "2020-09-21T18:43:37.157000+00:00",
            "StartTime": "2020-09-21T18:43:37.265000+00:00",
            "CompletionTime": "2020-09-21T18:44:21.192000+00:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "CUSTOMER_BUCKET",
            "Specialty": "PRIMARYCARE",
            "Type": "CONVERSATION"
        },
        {
            "MedicalTranscriptionJobName": "multichannel-conversation-medical-
transcription-job",
            "CreationTime": "2020-09-20T23:46:44.053000+00:00",
            "StartTime": "2020-09-20T23:46:44.081000+00:00",
            "CompletionTime": "2020-09-20T23:47:35.851000+00:00",
            "LanguageCode": "en-US",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "CUSTOMER_BUCKET",
            "Specialty": "PRIMARYCARE",
            "Type": "CONVERSATION"
        }
    ]
}
```

For more information, see https://docs.aws.amazon.com/transcribe/latest/dg/batch-med-transcription.html> in the *Amazon Transcribe Developer Guide*.

- For API details, see ListMedicalTranscriptionJobs in *AWS CLI Command Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

List medical transcription jobs.

```
// Import the required AWS SDK clients and commands for Node.js
import { StartMedicalTranscriptionJobCommand } from "@aws-sdk/client-transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  MedicalTranscriptionJobName: "MEDICAL_JOB_NAME", // Required
  OutputBucketName: "OUTPUT_BUCKET_NAME", // Required
  Specialty: "PRIMARYCARE", // Required. Possible values are 'PRIMARYCARE'
  Type: "JOB_TYPE", // Required. Possible values are 'CONVERSATION' and
 'DICTATION'
  LanguageCode: "LANGUAGE_CODE", // For example, 'en-US'
  MediaFormat: "SOURCE_FILE_FORMAT", // For example, 'wav'
  Media: {
    MediaFileUri: "SOURCE_FILE_LOCATION",
    // The S3 object location of the input media file. The URI must be in the
 same region
    // as the API endpoint that you are calling.For example,
    // "https://transcribe-demo.s3-REGION.amazonaws.com/hello_world.wav"
  },
};

export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new StartMedicalTranscriptionJobCommand(params),
    );
    console.log("Success - put", data);
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see ListMedicalTranscriptionJobs in *AWS SDK for JavaScript API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `ListTranscriptionJobs` with an AWS SDK or CLI

The following code examples show how to use `ListTranscriptionJobs`.

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// List transcription jobs, optionally with a name filter.
    /// </summary>
    /// <param name="jobNameContains">Optional name filter for the transcription
 jobs.</param>
    /// <returns>A list of transcription job summaries.</returns>
    public async Task<List<TranscriptionJobSummary>>
 ListTranscriptionJobs(string? jobNameContains = null)
    {
        var response = await _amazonTranscribeService.ListTranscriptionJobsAsync(
            new ListTranscriptionJobsRequest()
            {
                JobNameContains = jobNameContains
            });
        return response.TranscriptionJobSummaries;
    }
```

- For API details, see ListTranscriptionJobs in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To list your transcription jobs

The following `list-transcription-jobs` example lists the transcription jobs associated with your AWS account and Region.

```
aws transcribe list-transcription-jobs
```

Output:

```
{
    "NextToken": "NextToken",
    "TranscriptionJobSummaries": [
        {
            "TranscriptionJobName": "speak-id-job-1",
            "CreationTime": "2020-08-17T21:06:15.391000+00:00",
            "StartTime": "2020-08-17T21:06:15.416000+00:00",
            "CompletionTime": "2020-08-17T21:07:05.098000+00:00",
            "LanguageCode": "language-code",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        },
        {
            "TranscriptionJobName": "job-1",
            "CreationTime": "2020-08-17T20:50:24.207000+00:00",
            "StartTime": "2020-08-17T20:50:24.230000+00:00",
            "CompletionTime": "2020-08-17T20:52:18.737000+00:00",
            "LanguageCode": "language-code",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        },
        {
            "TranscriptionJobName": "sdk-test-job-4",
            "CreationTime": "2020-08-17T20:32:27.917000+00:00",
            "StartTime": "2020-08-17T20:32:27.956000+00:00",
            "CompletionTime": "2020-08-17T20:33:15.126000+00:00",
            "LanguageCode": "language-code",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        },
        {
            "TranscriptionJobName": "Diarization-speak-id",
            "CreationTime": "2020-08-10T22:10:09.066000+00:00",
            "StartTime": "2020-08-10T22:10:09.116000+00:00",
            "CompletionTime": "2020-08-10T22:26:48.172000+00:00",
            "LanguageCode": "language-code",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        },
        {
            "TranscriptionJobName": "your-transcription-job-name",
            "CreationTime": "2020-07-29T17:45:09.791000+00:00",
            "StartTime": "2020-07-29T17:45:09.826000+00:00",
            "CompletionTime": "2020-07-29T17:46:20.831000+00:00",
            "LanguageCode": "language-code",
            "TranscriptionJobStatus": "COMPLETED",
            "OutputLocationType": "SERVICE_BUCKET"
        }
    ]
}
```

For more information, see Getting Started (AWS Command Line Interface) in the *Amazon Transcribe Developer Guide*.

- For API details, see ListTranscriptionJobs in *AWS CLI Command Reference*.

Java

SDK for Java 2.x

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the [AWS Code Examples Repository](https://github.com/awsdocs/aws-doc-sdk-examples/tree/main/javav2/example_code/transcribe#code-examples).

```
public class ListTranscriptionJobs {
    public static void main(String[] args) {
        TranscribeClient transcribeClient = TranscribeClient.builder()
            .region(Region.US_EAST_1)
            .build();

            listTranscriptionJobs(transcribeClient);
        }

        public static void listTranscriptionJobs(TranscribeClient
 transcribeClient) {
            ListTranscriptionJobsRequest listJobsRequest =
 ListTranscriptionJobsRequest.builder()
                .build();


 transcribeClient.listTranscriptionJobsPaginator(listJobsRequest).stream()
                .flatMap(response ->
 response.transcriptionJobSummaries().stream())
                .forEach(jobSummary -> {
                    System.out.println("Job Name: " +
 jobSummary.transcriptionJobName());
                    System.out.println("Job Status: " +
 jobSummary.transcriptionJobStatus());
                    System.out.println("Output Location: " +
 jobSummary.outputLocationType());
                    // Add more information as needed

                    // Retrieve additional details for the job if necessary
                    GetTranscriptionJobResponse jobDetails =
 transcribeClient.getTranscriptionJob(
                        GetTranscriptionJobRequest.builder()
.transcriptionJobName(jobSummary.transcriptionJobName())
                            .build());

                    // Display additional details
                    System.out.println("Language Code: " +
jobDetails.transcriptionJob().languageCode());
                    System.out.println("Media Format: " +
jobDetails.transcriptionJob().mediaFormat());
                    // Add more details as needed

                    System.out.println("--------------");
                });
        }
    }
```

- For API details, see ListTranscriptionJobs in *AWS SDK for Java 2.x API Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

List transcription jobs.

```
// Import the required AWS SDK clients and commands for Node.js

import { ListTranscriptionJobsCommand } from "@aws-sdk/client-transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  JobNameContains: "KEYWORD", // Not required. Returns only transcription
  // job names containing this string
};
```

```
export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new ListTranscriptionJobsCommand(params),
    );
    console.log("Success", data.TranscriptionJobSummaries);
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see ListTranscriptionJobs in *AWS SDK for JavaScript API Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def list_jobs(job_filter, transcribe_client):
    """
    Lists summaries of the transcription jobs for the current AWS account.
    :param job_filter: The list of returned jobs must contain this string in 
their
                       names.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: The list of retrieved transcription job summaries.
    """
    try:
        response = 
transcribe_client.list_transcription_jobs(JobNameContains=job_filter)
        jobs = response["TranscriptionJobSummaries"]
        next_token = response.get("NextToken")
        while next_token is not None:
            response = transcribe_client.list_transcription_jobs(
                JobNameContains=job_filter, NextToken=next_token
            )
            jobs += response["TranscriptionJobSummaries"]
            next_token = response.get("NextToken")
        logger.info("Got %s jobs with filter %s.", len(jobs), job_filter)
    except ClientError:
        logger.exception("Couldn't get jobs with filter %s.", job_filter)
        raise
    else:
        return jobs
```

- For API details, see ListTranscriptionJobs in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `ListVocabularies` with an AWS SDK or CLI

The following code examples show how to use `ListVocabularies`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// List custom vocabularies for the current account. Optionally specify a
 name
    /// filter and a specific state to filter the vocabularies list.
    /// </summary>
    /// <param name="nameContains">Optional string the vocabulary name must
 contain.</param>
    /// <param name="stateEquals">Optional state of the vocabulary.</param>
    /// <returns>List of information about the vocabularies.</returns>
    public async Task<List<VocabularyInfo>> ListCustomVocabularies(string?
 nameContains = null,
        VocabularyState? stateEquals = null)
    {
        var response = await _amazonTranscribeService.ListVocabulariesAsync(
            new ListVocabulariesRequest()
            {
                NameContains = nameContains,
                StateEquals = stateEquals
            });
        return response.Vocabularies;
    }
```

- For API details, see ListVocabularies in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To list your custom vocabularies

The following `list-vocabularies` example lists the custom vocabularies associated with your AWS account and Region.

```
aws transcribe list-vocabularies
```

Output:

```
{
    "NextToken": "NextToken",
    "Vocabularies": [
        {
            "VocabularyName": "ards-test-1",
            "LanguageCode": "language-code",
            "LastModifiedTime": "2020-04-27T22:00:27.330000+00:00",
            "VocabularyState": "READY"
        },
        {
            "VocabularyName": "sample-test",
            "LanguageCode": "language-code",
            "LastModifiedTime": "2020-04-24T23:04:11.044000+00:00",
            "VocabularyState": "READY"
        },
        {
            "VocabularyName": "CRLF-to-LF-test-3-1",
            "LanguageCode": "language-code",
            "LastModifiedTime": "2020-04-24T22:12:22.277000+00:00",
            "VocabularyState": "READY"
        },
        {
            "VocabularyName": "CRLF-to-LF-test-2",
            "LanguageCode": "language-code",
            "LastModifiedTime": "2020-04-24T21:53:50.455000+00:00",
            "VocabularyState": "READY"
        },
        {
            "VocabularyName": "CRLF-to-LF-1-1",
            "LanguageCode": "language-code",
            "LastModifiedTime": "2020-04-24T21:39:33.356000+00:00",
            "VocabularyState": "READY"
        }
    ]
}
```

For more information, see Custom Vocabularies in the *Amazon Transcribe Developer Guide*.

- For API details, see ListVocabularies in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def list_vocabularies(vocabulary_filter, transcribe_client):
    """
    Lists the custom vocabularies created for this AWS account.

    :param vocabulary_filter: The returned vocabularies must contain this string
 in
                              their names.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: The list of retrieved vocabularies.
    """
    try:
        response = 
 transcribe_client.list_vocabularies(NameContains=vocabulary_filter)
        vocabs = response["Vocabularies"]
        next_token = response.get("NextToken")
        while next_token is not None:
            response = transcribe_client.list_vocabularies(
                NameContains=vocabulary_filter, NextToken=next_token
            )
            vocabs += response["Vocabularies"]
            next_token = response.get("NextToken")
        logger.info(
            "Got %s vocabularies with filter %s.", len(vocabs), vocabulary_filter
        )
    except ClientError:
        logger.exception(
            "Couldn't list vocabularies with filter %s.", vocabulary_filter
        )
```

```
            raise
        else:
            return vocabs
```

- For API details, see ListVocabularies in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `StartMedicalTranscriptionJob` with an AWS SDK or CLI

The following code examples show how to use `StartMedicalTranscriptionJob`.

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Start a medical transcription job for a media file. This method returns
    /// as soon as the job is started.
    /// </summary>
    /// <param name="jobName">A unique name for the medical transcription job.</
param>
    /// <param name="mediaFileUri">The URI of the media file, typically an Amazon
 S3 location.</param>
    /// <param name="mediaFormat">The format of the media file.</param>
    /// <param name="outputBucketName">Location for the output, typically an
 Amazon S3 location.</param>
    /// <param name="transcriptionType">Conversation or dictation transcription
 type.</param>
```

```
   /// <returns>A MedicalTransactionJob instance with information on the new
job.</returns>
   public async Task<MedicalTranscriptionJob> StartMedicalTranscriptionJob(
       string jobName, string mediaFileUri,
       MediaFormat mediaFormat, string outputBucketName,
Amazon.TranscribeService.Type transcriptionType)
   {
       var response = await
_amazonTranscribeService.StartMedicalTranscriptionJobAsync(
           new StartMedicalTranscriptionJobRequest()
           {
               MedicalTranscriptionJobName = jobName,
               Media = new Media()
               {
                   MediaFileUri = mediaFileUri
               },
               MediaFormat = mediaFormat,
               LanguageCode =
                   LanguageCode
                       .EnUS, // The value must be en-US for medical
transcriptions.
               OutputBucketName = outputBucketName,
               OutputKey =
                   jobName, // The value is a key used to fetch the output of
the transcription.
               Specialty = Specialty.PRIMARYCARE, // The value PRIMARYCARE must
be set.
               Type = transcriptionType
           });
       return response.MedicalTranscriptionJob;
   }
```

- For API details, see StartMedicalTranscriptionJob in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

Example 1: To transcribe a medical dictation stored as an audio file

The following `start-medical-transcription-job` example transcribes an audio file. You specify the location of the transcription output in the `OutputBucketName` parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://myfile.json
```

Contents of `myfile.json`:

```
{
    "MedicalTranscriptionJobName": "simple-dictation-medical-transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "DICTATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
    }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "simple-dictation-medical-transcription-
job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-20T00:35:22.256000+00:00",
        "CreationTime": "2020-09-20T00:35:22.218000+00:00",
        "Specialty": "PRIMARYCARE",
        "Type": "DICTATION"
    }
}
```

For more information, see Batch Transcription Overview in the *Amazon Transcribe Developer Guide*.

Example 2: To transcribe a clinician-patient dialogue stored as an audio file

The following `start-medical-transcription-job` example transcribes an audio file containing a clinician-patient dialogue. You specify the location of the transcription output in the OutputBucketName parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://mysecondfile.json
```

Contents of `mysecondfile.json`:

```
{
    "MedicalTranscriptionJobName": "simple-dictation-medical-transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "CONVERSATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
    }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "simple-conversation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-20T23:19:49.965000+00:00",
        "CreationTime": "2020-09-20T23:19:49.941000+00:00",
        "Specialty": "PRIMARYCARE",
        "Type": "CONVERSATION"
    }
}
```

For more information, see Batch Transcription Overview in the *Amazon Transcribe Developer Guide*.

Example 3: To transcribe a multichannel audio file of a clinician-patient dialogue

The following `start-medical-transcription-job` example transcribes the audio from each channel in the audio file and merges the separate transcriptions from each channel into a single transcription output. You specify the location of the transcription output in the `OutputBucketName` parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://mythirdfile.json
```

Contents of `mythirdfile.json`:

```
{
    "MedicalTranscriptionJobName": "multichannel-conversation-medical-
transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "CONVERSATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
        "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "Settings":{
          "ChannelIdentification": true
        }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "multichannel-conversation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-20T23:46:44.081000+00:00",
        "CreationTime": "2020-09-20T23:46:44.053000+00:00",
        "Settings": {
            "ChannelIdentification": true
        },
        "Specialty": "PRIMARYCARE",
        "Type": "CONVERSATION"
    }
}
```

For more information, see Channel Identification in the *Amazon Transcribe Developer Guide*.

Example 4: To transcribe an audio file of a clinician-patient dialogue and identify the speakers in the transcription output

The following `start-medical-transcription-job` example transcribes an audio file and labels the speech of each speaker in the transcription output. You specify the location of the transcription output in the `OutputBucketName` parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://myfourthfile.json
```

Contents of `myfourthfile.json`:

```
{
    "MedicalTranscriptionJobName": "speaker-id-conversation-medical-
transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "CONVERSATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
    "Settings":{
        "ShowSpeakerLabels": true,
        "MaxSpeakerLabels": 2
        }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "speaker-id-conversation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-21T18:43:37.265000+00:00",
        "CreationTime": "2020-09-21T18:43:37.157000+00:00",
        "Settings": {
            "ShowSpeakerLabels": true,
            "MaxSpeakerLabels": 2
        },
        "Specialty": "PRIMARYCARE",
        "Type": "CONVERSATION"
    }
}
```

For more information, see Identifying Speakers in the *Amazon Transcribe Developer Guide*.

Example 5: To transcribe a medical conversation stored as an audio file with up to two transcription alternatives

The following `start-medical-transcription-job` example creates up to two alternative transcriptions from a single audio file. Every transcriptions has a level of confidence associated with it. By default, Amazon Transcribe returns the transcription with the highest confidence level. You can specify that Amazon Transcribe return additional transcriptions with lower confidence levels. You specify the location of the transcription output in the `OutputBucketName` parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://myfifthfile.json
```

Contents of `myfifthfile.json`:

```
{
    "MedicalTranscriptionJobName": "alternatives-conversation-medical-
transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "CONVERSATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
    },
    "Settings":{
        "ShowAlternatives": true,
        "MaxAlternatives": 2
    }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "alternatives-conversation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-21T19:09:18.199000+00:00",
        "CreationTime": "2020-09-21T19:09:18.171000+00:00",
        "Settings": {
            "ShowAlternatives": true,
            "MaxAlternatives": 2
        },
        "Specialty": "PRIMARYCARE",
        "Type": "CONVERSATION"
    }
}
```

For more information, see Alternative Transcriptions in the *Amazon Transcribe Developer Guide*.

Example 6: To transcribe an audio file of a medical dictation with up to two alternative transcriptions

The following `start-medical-transcription-job` example transcribes an audio file and uses a vocabulary filter to mask any unwanted words. You specify the location of the transcription output in the OutputBucketName parameter.

```
aws transcribe start-medical-transcription-job \
    --cli-input-json file://mysixthfile.json
```

Contents of `mysixthfile.json`:

```
{
    "MedicalTranscriptionJobName": "alternatives-conversation-medical-
transcription-job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "DICTATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
    },
    "Settings":{
          "ShowAlternatives": true,
          "MaxAlternatives": 2
    }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "alternatives-dictation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-21T21:01:14.592000+00:00",
        "CreationTime": "2020-09-21T21:01:14.569000+00:00",
        "Settings": {
            "ShowAlternatives": true,
            "MaxAlternatives": 2
        },
        "Specialty": "PRIMARYCARE",
        "Type": "DICTATION"
    }
}
```

For more information, see Alternative Transcriptions in the *Amazon Transcribe Developer Guide*.

Example 7: To transcribe an audio file of a medical dictation with increased accuracy by using a custom vocabulary

The following `start-medical-transcription-job` example transcribes an audio file and uses a medical custom vocabulary you've previously created to increase the transcription accuracy. You specify the location of the transcription output in the `OutputBucketName` parameter.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myseventhfile.json
```

Contents of `mysixthfile.json`:

```
{
    "MedicalTranscriptionJobName": "vocabulary-dictation-medical-transcription-
job",
    "LanguageCode": "language-code",
    "Specialty": "PRIMARYCARE",
    "Type": "DICTATION",
    "OutputBucketName":"amzn-s3-demo-bucket",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
    },
    "Settings":{
        "VocabularyName": "cli-medical-vocab-1"
    }
}
```

Output:

```
{
    "MedicalTranscriptionJob": {
        "MedicalTranscriptionJobName": "vocabulary-dictation-medical-
transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.extension"
        },
        "StartTime": "2020-09-21T21:17:27.045000+00:00",
        "CreationTime": "2020-09-21T21:17:27.016000+00:00",
        "Settings": {
            "VocabularyName": "cli-medical-vocab-1"
        },
        "Specialty": "PRIMARYCARE",
        "Type": "DICTATION"
    }
}
```

For more information, see [Medical Custom Vocabularies](#) in the *Amazon Transcribe Developer Guide*.

- For API details, see [StartMedicalTranscriptionJob](#) in *AWS CLI Command Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the [AWS Code Examples Repository](#).

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

Start a medical transcription job.

```
// Import the required AWS SDK clients and commands for Node.js
import { StartMedicalTranscriptionJobCommand } from "@aws-sdk/client-transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  MedicalTranscriptionJobName: "MEDICAL_JOB_NAME", // Required
  OutputBucketName: "OUTPUT_BUCKET_NAME", // Required
  Specialty: "PRIMARYCARE", // Required. Possible values are 'PRIMARYCARE'
  Type: "JOB_TYPE", // Required. Possible values are 'CONVERSATION' and
 'DICTATION'
  LanguageCode: "LANGUAGE_CODE", // For example, 'en-US'
  MediaFormat: "SOURCE_FILE_FORMAT", // For example, 'wav'
  Media: {
    MediaFileUri: "SOURCE_FILE_LOCATION",
    // The S3 object location of the input media file. The URI must be in the
 same region
    // as the API endpoint that you are calling.For example,
    // "https://transcribe-demo.s3-REGION.amazonaws.com/hello_world.wav"
  },
};

export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new StartMedicalTranscriptionJobCommand(params),
    );
    console.log("Success - put", data);
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see StartMedicalTranscriptionJob in *AWS SDK for JavaScript API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `StartTranscriptionJob` with an AWS SDK or CLI

The following code examples show how to use `StartTranscriptionJob`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code examples:

- Create and refine a custom vocabulary
- Transcribe audio and get job data

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Start a transcription job for a media file. This method returns
    /// as soon as the job is started.
    /// </summary>
    /// <param name="jobName">A unique name for the transcription job.</param>
    /// <param name="mediaFileUri">The URI of the media file, typically an Amazon
 S3 location.</param>
    /// <param name="mediaFormat">The format of the media file.</param>
    /// <param name="languageCode">The language code of the media file, such as
 en-US.</param>
    /// <param name="vocabularyName">Optional name of a custom vocabulary.</
param>
    /// <returns>A TranscriptionJob instance with information on the new job.</
returns>
    public async Task<TranscriptionJob> StartTranscriptionJob(string jobName,
 string mediaFileUri,
        MediaFormat mediaFormat, LanguageCode languageCode, string?
 vocabularyName)
    {
        var response = await _amazonTranscribeService.StartTranscriptionJobAsync(
            new StartTranscriptionJobRequest()
            {
                TranscriptionJobName = jobName,
                Media = new Media()
                {
                    MediaFileUri = mediaFileUri
                },
                MediaFormat = mediaFormat,
                LanguageCode = languageCode,
                Settings = vocabularyName != null ? new Settings()
                {
                    VocabularyName = vocabularyName
                } : null
            });
        return response.TranscriptionJob;
    }
```

- For API details, see StartTranscriptionJob in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

Example 1: To transcribe an audio file

The following `start-transcription-job` example transcribes your audio file.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myfile.json
```

Contents of `myfile.json`:

```
{
    "TranscriptionJobName": "cli-simple-transcription-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    }
}
```

For more information, see Getting Started (AWS Command Line Interface) in the *Amazon Transcribe Developer Guide*.

Example 2: To transcribe a multi-channel audio file

The following `start-transcription-job` example transcribes your multi-channel audio file.

```
aws transcribe start-transcription-job \
    --cli-input-json file://mysecondfile.json
```

Contents of `mysecondfile.json`:

```
{
    "TranscriptionJobName": "cli-channelid-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    },
    "Settings":{
        "ChannelIdentification":true
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-channelid-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "the-language-of-your-transcription-job",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-
media-file-name.file-extension"
        },
        "StartTime": "2020-09-17T16:07:56.817000+00:00",
        "CreationTime": "2020-09-17T16:07:56.784000+00:00",
        "Settings": {
            "ChannelIdentification": true
        }
    }
}
```

For more information, see Transcribing Multi-Channel Audio in the *Amazon Transcribe Developer Guide*.

Example 3: To transcribe an audio file and identify the different speakers

The following `start-transcription-job` example transcribes your audio file and identifies the speakers in the transcription output.

```
aws transcribe start-transcription-job \
    --cli-input-json file://mythirdfile.json
```

Contents of `mythirdfile.json`:

```
{
    "TranscriptionJobName": "cli-speakerid-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    },
    "Settings":{
    "ShowSpeakerLabels": true,
    "MaxSpeakerLabels": 2
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-speakerid-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "the-language-of-your-transcription-job",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-
media-file-name.file-extension"
        },
        "StartTime": "2020-09-17T16:22:59.696000+00:00",
        "CreationTime": "2020-09-17T16:22:59.676000+00:00",
        "Settings": {
            "ShowSpeakerLabels": true,
            "MaxSpeakerLabels": 2
        }
    }
}
```

For more information, see Identifying Speakers in the *Amazon Transcribe Developer Guide*.

Example 4: To transcribe an audio file and mask any unwanted words in the transcription output

The following `start-transcription-job` example transcribes your audio file and uses a vocabulary filter you've previously created to mask any unwanted words.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myfourthfile.json
```

Contents of `myfourthfile.json`:

```
{
    "TranscriptionJobName": "cli-filter-mask-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    },
    "Settings":{
        "VocabularyFilterName": "your-vocabulary-filter",
        "VocabularyFilterMethod": "mask"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-filter-mask-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "the-language-of-your-transcription-job",
        "Media": {
            "MediaFileUri": "s3://Amazon-S3-Prefix/your-media-file.file-
extension"
        },
        "StartTime": "2020-09-18T16:36:18.568000+00:00",
        "CreationTime": "2020-09-18T16:36:18.547000+00:00",
        "Settings": {
            "VocabularyFilterName": "your-vocabulary-filter",
            "VocabularyFilterMethod": "mask"
        }
    }
}
```

For more information, see Filtering Transcriptions in the *Amazon Transcribe Developer Guide*.

Example 5: To transcribe an audio file and remove any unwanted words in the transcription output

The following `start-transcription-job` example transcribes your audio file and uses a vocabulary filter you've previously created to mask any unwanted words.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myfifthfile.json
```

Contents of `myfifthfile.json`:

```
{
    "TranscriptionJobName": "cli-filter-remove-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    },
    "Settings":{
        "VocabularyFilterName": "your-vocabulary-filter",
        "VocabularyFilterMethod": "remove"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-filter-remove-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "the-language-of-your-transcription-job",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-
media-file-name.file-extension"
        },
        "StartTime": "2020-09-18T16:36:18.568000+00:00",
        "CreationTime": "2020-09-18T16:36:18.547000+00:00",
        "Settings": {
            "VocabularyFilterName": "your-vocabulary-filter",
            "VocabularyFilterMethod": "remove"
        }
    }
}
```

For more information, see Filtering Transcriptions in the *Amazon Transcribe Developer Guide*.

Example 6: To transcribe an audio file with increased accuracy using a custom vocabulary

The following `start-transcription-job` example transcribes your audio file and uses a vocabulary filter you've previously created to mask any unwanted words.

```
aws transcribe start-transcription-job \
    --cli-input-json file://mysixthfile.json
```

Contents of `mysixthfile.json`:

```
{
    "TranscriptionJobName": "cli-vocab-job",
    "LanguageCode": "the-language-of-your-transcription-job",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    },
    "Settings":{
        "VocabularyName": "your-vocabulary"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-vocab-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "the-language-of-your-transcription-job",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-
media-file-name.file-extension"
        },
        "StartTime": "2020-09-18T16:36:18.568000+00:00",
        "CreationTime": "2020-09-18T16:36:18.547000+00:00",
        "Settings": {
            "VocabularyName": "your-vocabulary"
        }
    }
}
```

For more information, see Filtering Transcriptions in the *Amazon Transcribe Developer Guide*.

Example 7: To identify the language of an audio file and transcribe it

The following `start-transcription-job` example transcribes your audio file and uses a vocabulary filter you've previously created to mask any unwanted words.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myseventhfile.json
```

Contents of `myseventhfile.json`:

```
{
    "TranscriptionJobName": "cli-identify-language-transcription-job",
    "IdentifyLanguage": true,
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-media-
file-name.file-extension"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-identify-language-transcription-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/Amazon-S3-prefix/your-
media-file-name.file-extension"
        },
        "StartTime": "2020-09-18T22:27:23.970000+00:00",
        "CreationTime": "2020-09-18T22:27:23.948000+00:00",
        "IdentifyLanguage": true
    }
}
```

For more information, see Identifying the Language in the *Amazon Transcribe Developer Guide*.

Example 8: To transcribe an audio file with personally identifiable information redacted

The following `start-transcription-job` example transcribes your audio file and redacts any personally identifiable information in the transcription output.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myeighthfile.json
```

Contents of `myeigthfile.json`:

```
{
    "TranscriptionJobName": "cli-redaction-job",
    "LanguageCode": "language-code",
    "Media": {
        "MediaFileUri": "s3://Amazon-S3-Prefix/your-media-file.file-extension"
    },
    "ContentRedaction": {
        "RedactionOutput":"redacted",
        "RedactionType":"PII"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-redaction-job",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://Amazon-S3-Prefix/your-media-file.file-
extension"
        },
        "StartTime": "2020-09-25T23:49:13.195000+00:00",
        "CreationTime": "2020-09-25T23:49:13.176000+00:00",
        "ContentRedaction": {
            "RedactionType": "PII",
            "RedactionOutput": "redacted"
        }
    }
}
```

For more information, see Automatic Content Redaction in the *Amazon Transcribe Developer Guide*.

Example 9: To generate a transcript with personally identifiable information (PII) redacted and an unredacted transcript

The following `start-transcription-job` example generates two transcrptions of your audio file, one with the personally identifiable information redacted, and the other without any redactions.

```
aws transcribe start-transcription-job \
    --cli-input-json file://myninthfile.json
```

Contents of `myninthfile.json`:

```
{
    "TranscriptionJobName": "cli-redaction-job-with-unredacted-transcript",
    "LanguageCode": "language-code",
    "Media": {
          "MediaFileUri": "s3://Amazon-S3-Prefix/your-media-file.file-extension"
        },
    "ContentRedaction": {
        "RedactionOutput":"redacted_and_unredacted",
        "RedactionType":"PII"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-redaction-job-with-unredacted-transcript",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://Amazon-S3-Prefix/your-media-file.file-
extension"
```

```
        },
        "StartTime": "2020-09-25T23:59:47.677000+00:00",
        "CreationTime": "2020-09-25T23:59:47.653000+00:00",
        "ContentRedaction": {
            "RedactionType": "PII",
            "RedactionOutput": "redacted_and_unredacted"
        }
    }
}
```

For more information, see Automatic Content Redaction in the *Amazon Transcribe Developer Guide*.

Example 10: To use a custom language model you've previously created to transcribe an audio file.

The following `start-transcription-job` example transcribes your audio file with a custom language model you've previously created.

```
aws transcribe start-transcription-job \
    --cli-input-json file://mytenthfile.json
```

Contents of `mytenthfile.json`:

```
{
    "TranscriptionJobName": "cli-clm-2-job-1",
    "LanguageCode": "language-code",
    "Media": {
        "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.file-extension"
    },
    "ModelSettings": {
        "LanguageModelName":"cli-clm-2"
    }
}
```

Output:

```
{
    "TranscriptionJob": {
        "TranscriptionJobName": "cli-clm-2-job-1",
        "TranscriptionJobStatus": "IN_PROGRESS",
        "LanguageCode": "language-code",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/your-audio-file.file-
extension"
        },
        "StartTime": "2020-09-28T17:56:01.835000+00:00",
        "CreationTime": "2020-09-28T17:56:01.801000+00:00",
        "ModelSettings": {
            "LanguageModelName": "cli-clm-2"
        }
    }
}
```

For more information, see Improving Domain-Specific Transcription Accuracy with Custom Language Models in the *Amazon Transcribe Developer Guide*.

- For API details, see StartTranscriptionJob in *AWS CLI Command Reference*.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Start a transcription job.

```
// Import the required AWS SDK clients and commands for Node.js
import { StartTranscriptionJobCommand } from "@aws-sdk/client-transcribe";
import { transcribeClient } from "./libs/transcribeClient.js";

// Set the parameters
export const params = {
  TranscriptionJobName: "JOB_NAME",
  LanguageCode: "LANGUAGE_CODE", // For example, 'en-US'
  MediaFormat: "SOURCE_FILE_FORMAT", // For example, 'wav'
  Media: {
    MediaFileUri: "SOURCE_LOCATION",
    // For example, "https://transcribe-demo.s3-REGION.amazonaws.com/
hello_world.wav"
```

```
  },
  OutputBucketName: "OUTPUT_BUCKET_NAME",
};

export const run = async () => {
  try {
    const data = await transcribeClient.send(
      new StartTranscriptionJobCommand(params),
    );
    console.log("Success - put", data);
    return data; // For unit tests.
  } catch (err) {
    console.log("Error", err);
  }
};
run();
```

Create the client.

```
import { TranscribeClient } from "@aws-sdk/client-transcribe";
// Set the AWS Region.
const REGION = "REGION"; //e.g. "us-east-1"
// Create an Amazon Transcribe service client object.
const transcribeClient = new TranscribeClient({ region: REGION });
export { transcribeClient };
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see StartTranscriptionJob in *AWS SDK for JavaScript API Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def start_job(
    job_name,
    media_uri,
    media_format,
    language_code,
    transcribe_client,
    vocabulary_name=None,
):
    """
    Starts a transcription job. This function returns as soon as the job is
 started.
    To get the current status of the job, call get_transcription_job. The job is
    successfully completed when the job status is 'COMPLETED'.

    :param job_name: The name of the transcription job. This must be unique for
                     your AWS account.
    :param media_uri: The URI where the audio file is stored. This is typically
                      in an Amazon S3 bucket.
    :param media_format: The format of the audio file. For example, mp3 or wav.
    :param language_code: The language code of the audio file.
                          For example, en-US or ja-JP
    :param transcribe_client: The Boto3 Transcribe client.
    :param vocabulary_name: The name of a custom vocabulary to use when
 transcribing
                            the audio file.
    :return: Data about the job.
    """
    try:
        job_args = {
            "TranscriptionJobName": job_name,
            "Media": {"MediaFileUri": media_uri},
            "MediaFormat": media_format,
            "LanguageCode": language_code,
        }
        if vocabulary_name is not None:
            job_args["Settings"] = {"VocabularyName": vocabulary_name}
        response = transcribe_client.start_transcription_job(**job_args)
        job = response["TranscriptionJob"]
        logger.info("Started transcription job %s.", job_name)
    except ClientError:
        logger.exception("Couldn't start transcription job %s.", job_name)
        raise
    else:
        return job
```

- For API details, see StartTranscriptionJob in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use `UpdateVocabulary` with an AWS SDK or CLI

The following code examples show how to use `UpdateVocabulary`.

Action examples are code excerpts from larger programs and must be run in context. You can see this action in context in the following code example:

- Create and refine a custom vocabulary

.NET

SDK for .NET

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
    /// <summary>
    /// Update a custom vocabulary with new values. Update overwrites all 
 existing information.
    /// </summary>
    /// <param name="languageCode">The language code of the vocabulary.</param>
    /// <param name="phrases">Phrases to use in the vocabulary.</param>
    /// <param name="vocabularyName">Name for the vocabulary.</param>
    /// <returns>The state of the custom vocabulary.</returns>
    public async Task<VocabularyState> UpdateCustomVocabulary(LanguageCode
 languageCode,
        List<string> phrases, string vocabularyName)
    {
        var response = await _amazonTranscribeService.UpdateVocabularyAsync(
            new UpdateVocabularyRequest()
            {
                LanguageCode = languageCode,
                Phrases = phrases,
                VocabularyName = vocabularyName
            });
        return response.VocabularyState;
    }
```

- For API details, see UpdateVocabulary in *AWS SDK for .NET API Reference*.

CLI

AWS CLI

To update a custom vocabulary with new terms.

The following `update-vocabulary` example overwrites the terms used to create a custom vocabulary with the new ones that you provide. Prerequisite: to replace the terms in a custom vocabulary, you need a file with new terms.

```
aws transcribe update-vocabulary \
    --vocabulary-file-uri s3://amzn-s3-demo-bucket/Amazon-S3-Prefix/custom-
vocabulary.txt \
    --vocabulary-name custom-vocabulary \
    --language-code language-code
```

Output:

```
{
    "VocabularyName": "custom-vocabulary",
    "LanguageCode": "language",
    "VocabularyState": "PENDING"
}
```

For more information, see Custom Vocabularies in the *Amazon Transcribe Developer Guide*.

- For API details, see UpdateVocabulary in *AWS CLI Command Reference*.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
def update_vocabulary(
    vocabulary_name, language_code, transcribe_client, phrases=None,
 table_uri=None
):
    """
    Updates an existing custom vocabulary. The entire vocabulary is replaced with
    the contents of the update.

    :param vocabulary_name: The name of the vocabulary to update.
    :param language_code: The language code of the vocabulary.
    :param transcribe_client: The Boto3 Transcribe client.
    :param phrases: A list of comma-separated phrases to include in the
 vocabulary.
    :param table_uri: A table of phrases and pronunciation hints to include in
 the
                      vocabulary.
    """
    try:
        vocab_args = {"VocabularyName": vocabulary_name, "LanguageCode":
 language_code}
        if phrases is not None:
            vocab_args["Phrases"] = phrases
        elif table_uri is not None:
            vocab_args["VocabularyFileUri"] = table_uri
        response = transcribe_client.update_vocabulary(**vocab_args)
        logger.info("Updated custom vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't update custom vocabulary %s.",
vocabulary_name)
        raise
```

- For API details, see UpdateVocabulary in *AWS SDK for Python (Boto3) API Reference*.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Scenarios for Amazon Transcribe using AWS SDKs

The following code examples show you how to implement common scenarios in Amazon Transcribe with AWS SDKs. These scenarios show you how to accomplish specific tasks by calling multiple functions within Amazon Transcribe or combined with other AWS services. Each scenario includes a link to the complete source code, where you can find instructions on how to set up and run the code.

Scenarios target an intermediate level of experience to help you understand service actions in context.

Examples

Build an Amazon Transcribe streaming app

The following code example shows how to build an app that records, transcribes, and translates live audio in real-time, and emails the results.

JavaScript

SDK for JavaScript (v3)

Shows how to use Amazon Transcribe to build an app that records, transcribes, and translates live audio in real-time, and emails the results using Amazon Simple Email Service (Amazon SES).

For complete source code and instructions on how to set up and run, see the full example on GitHub.

Services used in this example

- Amazon Comprehend
- Amazon SES
- Amazon Transcribe
- Amazon Translate

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Convert text to speech and back to text using an AWS SDK

The following code example shows how to:

- Use Amazon Polly to synthesize a plain text (UTF-8) input file to an audio file.
- Upload the audio file to an Amazon S3 bucket.
- Use Amazon Transcribe to convert the audio file to text.
- Display the text.

Rust

SDK for Rust

Use Amazon Polly to synthesize a plain text (UTF-8) input file to an audio file, upload the audio file to an Amazon S3 bucket, use Amazon Transcribe to convert that audio file to text, and display the text.

For complete source code and instructions on how to set up and run, see the full example on GitHub.

Services used in this example

- Amazon Polly
- Amazon S3
- Amazon Transcribe

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Create and refine an Amazon Transcribe custom vocabulary using an AWS SDK

The following code example shows how to:

- Upload an audio file to Amazon S3.
- Run an Amazon Transcribe job to transcribe the file and get the results.
- Create and refine a custom vocabulary to improve transcription accuracy.
- Run jobs with custom vocabularies and get the results.

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Transcribe an audio file that contains a reading of Jabberwocky by Lewis Carroll. Start by creating functions that wrap Amazon Transcribe actions.

```
def start_job(
    job_name,
    media_uri,
    media_format,
    language_code,
    transcribe_client,
    vocabulary_name=None,
):
    """
    Starts a transcription job. This function returns as soon as the job is
 started.
    To get the current status of the job, call get_transcription_job. The job is
    successfully completed when the job status is 'COMPLETED'.

    :param job_name: The name of the transcription job. This must be unique for
                     your AWS account.
    :param media_uri: The URI where the audio file is stored. This is typically
                      in an Amazon S3 bucket.
    :param media_format: The format of the audio file. For example, mp3 or wav.
    :param language_code: The language code of the audio file.
                          For example, en-US or ja-JP
    :param transcribe_client: The Boto3 Transcribe client.
    :param vocabulary_name: The name of a custom vocabulary to use when
 transcribing
                            the audio file.
    :return: Data about the job.
    """
    try:
        job_args = {
            "TranscriptionJobName": job_name,
            "Media": {"MediaFileUri": media_uri},
            "MediaFormat": media_format,
            "LanguageCode": language_code,
        }
        if vocabulary_name is not None:
            job_args["Settings"] = {"VocabularyName": vocabulary_name}
        response = transcribe_client.start_transcription_job(**job_args)
        job = response["TranscriptionJob"]
        logger.info("Started transcription job %s.", job_name)
    except ClientError:
        logger.exception("Couldn't start transcription job %s.", job_name)
        raise
    else:
        return job
```

```
def get_job(job_name, transcribe_client):
    """
    Gets details about a transcription job.

    :param job_name: The name of the job to retrieve.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: The retrieved transcription job.
    """
    try:
        response = transcribe_client.get_transcription_job(
            TranscriptionJobName=job_name
        )
        job = response["TranscriptionJob"]
        logger.info("Got job %s.", job["TranscriptionJobName"])
    except ClientError:
        logger.exception("Couldn't get job %s.", job_name)
        raise
    else:
        return job



def delete_job(job_name, transcribe_client):
    """
    Deletes a transcription job. This also deletes the transcript associated with
    the job.

    :param job_name: The name of the job to delete.
    :param transcribe_client: The Boto3 Transcribe client.
    """
    try:
        transcribe_client.delete_transcription_job(TranscriptionJobName=job_name)
        logger.info("Deleted job %s.", job_name)
    except ClientError:
        logger.exception("Couldn't delete job %s.", job_name)
        raise



def create_vocabulary(
    vocabulary_name, language_code, transcribe_client, phrases=None,
 table_uri=None
):
    """
    Creates a custom vocabulary that can be used to improve the accuracy of
    transcription jobs. This function returns as soon as the vocabulary
 processing
    is started. Call get_vocabulary to get the current status of the vocabulary.
    The vocabulary is ready to use when its status is 'READY'.

    :param vocabulary_name: The name of the custom vocabulary.
    :param language_code: The language code of the vocabulary.
                          For example, en-US or nl-NL.
    :param transcribe_client: The Boto3 Transcribe client.
    :param phrases: A list of comma-separated phrases to include in the
 vocabulary.
    :param table_uri: A table of phrases and pronunciation hints to include in
 the
                      vocabulary.
    :return: Information about the newly created vocabulary.
    """
    try:
        vocab_args = {"VocabularyName": vocabulary_name, "LanguageCode":
 language_code}
        if phrases is not None:
            vocab_args["Phrases"] = phrases
        elif table_uri is not None:
            vocab_args["VocabularyFileUri"] = table_uri
        response = transcribe_client.create_vocabulary(**vocab_args)
        logger.info("Created custom vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't create custom vocabulary %s.",
 vocabulary_name)
        raise
    else:
        return response



def get_vocabulary(vocabulary_name, transcribe_client):
    """
    Gets information about a custom vocabulary.

    :param vocabulary_name: The name of the vocabulary to retrieve.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: Information about the vocabulary.
    """
    try:
        response =
 transcribe_client.get_vocabulary(VocabularyName=vocabulary_name)
        logger.info("Got vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't get vocabulary %s.", vocabulary_name)
        raise
    else:
        return response



def update_vocabulary(
    vocabulary_name, language_code, transcribe_client, phrases=None,
 table_uri=None
):
    """
    Updates an existing custom vocabulary. The entire vocabulary is replaced with
    the contents of the update.

    :param vocabulary_name: The name of the vocabulary to update.
    :param language_code: The language code of the vocabulary.
    :param transcribe_client: The Boto3 Transcribe client.
    :param phrases: A list of comma-separated phrases to include in the
 vocabulary.
    :param table_uri: A table of phrases and pronunciation hints to include in
 the
                      vocabulary.
    """
    try:
        vocab_args = {"VocabularyName": vocabulary_name, "LanguageCode":
 language_code}
        if phrases is not None:
            vocab_args["Phrases"] = phrases
        elif table_uri is not None:
            vocab_args["VocabularyFileUri"] = table_uri
        response = transcribe_client.update_vocabulary(**vocab_args)
        logger.info("Updated custom vocabulary %s.", response["VocabularyName"])
    except ClientError:
        logger.exception("Couldn't update custom vocabulary %s.",
 vocabulary_name)
        raise
```

```
def list_vocabularies(vocabulary_filter, transcribe_client):
    """
    Lists the custom vocabularies created for this AWS account.

    :param vocabulary_filter: The returned vocabularies must contain this string
 in
                              their names.
    :param transcribe_client: The Boto3 Transcribe client.
    :return: The list of retrieved vocabularies.
    """
    try:
        response =
 transcribe_client.list_vocabularies(NameContains=vocabulary_filter)
        vocabs = response["Vocabularies"]
        next_token = response.get("NextToken")
        while next_token is not None:
            response = transcribe_client.list_vocabularies(
                NameContains=vocabulary_filter, NextToken=next_token
            )
            vocabs += response["Vocabularies"]
            next_token = response.get("NextToken")
        logger.info(
            "Got %s vocabularies with filter %s.", len(vocabs), vocabulary_filter
        )
    except ClientError:
        logger.exception(
            "Couldn't list vocabularies with filter %s.", vocabulary_filter
        )
        raise
    else:
        return vocabs



def delete_vocabulary(vocabulary_name, transcribe_client):
    """
    Deletes a custom vocabulary.

    :param vocabulary_name: The name of the vocabulary to delete.
    :param transcribe_client: The Boto3 Transcribe client.
    """
    try:
        transcribe_client.delete_vocabulary(VocabularyName=vocabulary_name)
        logger.info("Deleted vocabulary %s.", vocabulary_name)
    except ClientError:
        logger.exception("Couldn't delete vocabulary %s.", vocabulary_name)
        raise
```

Call the wrapper functions to transcribe audio without a custom vocabulary and then with different versions of a custom vocabulary to see improved results.

```
def usage_demo():
    """Shows how to use the Amazon Transcribe service."""
    logging.basicConfig(level=logging.INFO, format="%(levelname)s: %(message)s")

    s3_resource = boto3.resource("s3")
    transcribe_client = boto3.client("transcribe")

    print("-" * 88)
    print("Welcome to the Amazon Transcribe demo!")
    print("-" * 88)

    bucket_name = f"jabber-bucket-{time.time_ns()}"
    print(f"Creating bucket {bucket_name}.")
    bucket = s3_resource.create_bucket(
        Bucket=bucket_name,
        CreateBucketConfiguration={
            "LocationConstraint": transcribe_client.meta.region_name
        },
    )
    media_file_name = ".media/Jabberwocky.mp3"
    media_object_key = "Jabberwocky.mp3"
    print(f"Uploading media file {media_file_name}.")
    bucket.upload_file(media_file_name, media_object_key)
    media_uri = f"s3://{bucket.name}/{media_object_key}"

    job_name_simple = f"Jabber-{time.time_ns()}"
    print(f"Starting transcription job {job_name_simple}.")
    start_job(
        job_name_simple,
        f"s3://{bucket_name}/{media_object_key}",
        "mp3",
        "en-US",
        transcribe_client,
    )
    transcribe_waiter = TranscribeCompleteWaiter(transcribe_client)
    transcribe_waiter.wait(job_name_simple)
    job_simple = get_job(job_name_simple, transcribe_client)
    transcript_simple = requests.get(
        job_simple["Transcript"]["TranscriptFileUri"]
    ).json()
    print(f"Transcript for job {transcript_simple['jobName']}:")
    print(transcript_simple["results"]["transcripts"][0]["transcript"])

    print("-" * 88)
    print(
        "Creating a custom vocabulary that lists the nonsense words to try to "
        "improve the transcription."
    )
    vocabulary_name = f"Jabber-vocabulary-{time.time_ns()}"
    create_vocabulary(
        vocabulary_name,
        "en-US",
        transcribe_client,
        phrases=[
            "brillig",
            "slithy",
            "borogoves",
            "mome",
            "raths",
            "Jub-Jub",
            "frumious",
            "manxome",
            "Tumtum",
            "uffish",
            "whiffling",
            "tulgey",
            "thou",
            "frabjous",
            "callooh",
            "callay",
            "chortled",
        ],
    )
    vocabulary_ready_waiter = VocabularyReadyWaiter(transcribe_client)
    vocabulary_ready_waiter.wait(vocabulary_name)
```

```
    job_name_vocabulary_list = f"Jabber-vocabulary-list-{time.time_ns()}"
    print(f"Starting transcription job {job_name_vocabulary_list}.")
    start_job(
        job_name_vocabulary_list,
        media_uri,
        "mp3",
        "en-US",
        transcribe_client,
        vocabulary_name,
    )
    transcribe_waiter.wait(job_name_vocabulary_list)
    job_vocabulary_list = get_job(job_name_vocabulary_list, transcribe_client)
    transcript_vocabulary_list = requests.get(
        job_vocabulary_list["Transcript"]["TranscriptFileUri"]
    ).json()
    print(f"Transcript for job {transcript_vocabulary_list['jobName']}:")
    print(transcript_vocabulary_list["results"]["transcripts"][0]["transcript"])

    print("-" * 88)
    print(
        "Updating the custom vocabulary with table data that provides additional
 "
        "pronunciation hints."
    )
    table_vocab_file = "jabber-vocabulary-table.txt"
    bucket.upload_file(table_vocab_file, table_vocab_file)
    update_vocabulary(
        vocabulary_name,
        "en-US",
        transcribe_client,
        table_uri=f"s3://{bucket.name}/{table_vocab_file}",
    )
    vocabulary_ready_waiter.wait(vocabulary_name)

    job_name_vocab_table = f"Jabber-vocab-table-{time.time_ns()}"
    print(f"Starting transcription job {job_name_vocab_table}.")
    start_job(
        job_name_vocab_table,
        media_uri,
        "mp3",
        "en-US",
        transcribe_client,
        vocabulary_name=vocabulary_name,
    )
    transcribe_waiter.wait(job_name_vocab_table)
    job_vocab_table = get_job(job_name_vocab_table, transcribe_client)
    transcript_vocab_table = requests.get(
        job_vocab_table["Transcript"]["TranscriptFileUri"]
    ).json()
    print(f"Transcript for job {transcript_vocab_table['jobName']}:")
    print(transcript_vocab_table["results"]["transcripts"][0]["transcript"])

    print("-" * 88)
    print("Getting data for jobs and vocabularies.")
    jabber_jobs = list_jobs("Jabber", transcribe_client)
    print(f"Found {len(jabber_jobs)} jobs:")
    for job_sum in jabber_jobs:
        job = get_job(job_sum["TranscriptionJobName"], transcribe_client)
        print(
            f"\t{job['TranscriptionJobName']}, {job['Media']['MediaFileUri']}, "
            f"{job['Settings'].get('VocabularyName')}"
        )

    jabber_vocabs = list_vocabularies("Jabber", transcribe_client)
    print(f"Found {len(jabber_vocabs)} vocabularies:")
    for vocab_sum in jabber_vocabs:
        vocab = get_vocabulary(vocab_sum["VocabularyName"], transcribe_client)
        vocab_content = requests.get(vocab["DownloadUri"]).text
        print(f"\t{vocab['VocabularyName']} contents:")
        print(vocab_content)

    print("-" * 88)
    print("Deleting demo jobs.")
    for job_name in [job_name_simple, job_name_vocabulary_list,
 job_name_vocab_table]:
        delete_job(job_name, transcribe_client)
    print("Deleting demo vocabulary.")
    delete_vocabulary(vocabulary_name, transcribe_client)
    print("Deleting demo bucket.")
    bucket.objects.delete()
    bucket.delete()
    print("Thanks for watching!")
```

- For API details, see the following topics in *AWS SDK for Python (Boto3) API Reference*.

- CreateVocabulary
- DeleteTranscriptionJob
- DeleteVocabulary
- GetTranscriptionJob
- GetVocabulary
- ListVocabularies
- StartTranscriptionJob
- UpdateVocabulary

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Transcribe audio and get job data with Amazon Transcribe using an AWS SDK

The following code examples show how to:

- Start a transcription job with Amazon Transcribe.
- Wait for the job to complete.
- Get the URI where the transcript is stored.

For more information, see Getting started with Amazon Transcribe.

Java

SDK for Java 2.x

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Transcribes a PCM file.

```
/**
 * To run this AWS code example, ensure that you have set up your development
 * environment, including your AWS credentials.
 *
 * For information, see this documentation topic:
 *
 * https://docs.aws.amazon.com/sdk-for-java/latest/developer-guide/get-
started.html
 */

public class TranscribeStreamingDemoFile {
    private static final Region REGION = Region.US_EAST_1;
    private static TranscribeStreamingAsyncClient client;

    public static void main(String args[]) throws ExecutionException,
 InterruptedException {

        final String USAGE = "\n" +
                "Usage:\n" +
                "    <file> \n\n" +
                "Where:\n" +
                "    file - the location of a PCM file to transcribe. In this
 example, ensure the PCM file is 16 hertz (Hz). \n";

        if (args.length != 1) {
            System.out.println(USAGE);
            System.exit(1);
        }

        String file = args[0];
        client = TranscribeStreamingAsyncClient.builder()
                .region(REGION)
                .build();

        CompletableFuture<Void> result =
 client.startStreamTranscription(getRequest(16_000),
                new AudioStreamPublisher(getStreamFromFile(file)),
                getResponseHandler());

        result.get();
        client.close();
    }
    private static InputStream getStreamFromFile(String file) {
        try {
            File inputFile = new File(file);
            InputStream audioStream = new FileInputStream(inputFile);
            return audioStream;

        } catch (FileNotFoundException e) {
            throw new RuntimeException(e);
        }
    }

    private static StartStreamTranscriptionRequest getRequest(Integer
 mediaSampleRateHertz) {
        return StartStreamTranscriptionRequest.builder()
                .languageCode(LanguageCode.EN_US)
                .mediaEncoding(MediaEncoding.PCM)
                .mediaSampleRateHertz(mediaSampleRateHertz)
                .build();
    }

    private static StartStreamTranscriptionResponseHandler getResponseHandler() {
        return StartStreamTranscriptionResponseHandler.builder()
                .onResponse(r -> {
                    System.out.println("Received Initial response");
                })
                .onError(e -> {
                    System.out.println(e.getMessage());
                    StringWriter sw = new StringWriter();
                    e.printStackTrace(new PrintWriter(sw));
                    System.out.println("Error Occurred: " + sw.toString());
                })
                .onComplete(() -> {
                    System.out.println("=== All records stream successfully
 ===");
                })
                .subscriber(event -> {
                    List<Result> results = ((TranscriptEvent)
 event).transcript().results();
                    if (results.size() > 0) {
                        if (!
results.get(0).alternatives().get(0).transcript().isEmpty()) {

 System.out.println(results.get(0).alternatives().get(0).transcript());
                        }
                }
            })
            .build();
    }

    private static class AudioStreamPublisher implements Publisher<AudioStream> {
        private final InputStream inputStream;
        private static Subscription currentSubscription;

        private AudioStreamPublisher(InputStream inputStream) {
            this.inputStream = inputStream;
        }

        @Override
        public void subscribe(Subscriber<? super AudioStream> s) {

            if (this.currentSubscription == null) {
                this.currentSubscription = new SubscriptionImpl(s, inputStream);
            } else {
                this.currentSubscription.cancel();
                this.currentSubscription = new SubscriptionImpl(s, inputStream);
            }
            s.onSubscribe(currentSubscription);
        }
    }

    public static class SubscriptionImpl implements Subscription {
        private static final int CHUNK_SIZE_IN_BYTES = 1024 * 1;
        private final Subscriber<? super AudioStream> subscriber;
        private final InputStream inputStream;
        private ExecutorService executor = Executors.newFixedThreadPool(1);
        private AtomicLong demand = new AtomicLong(0);

        SubscriptionImpl(Subscriber<? super AudioStream> s, InputStream
 inputStream) {
            this.subscriber = s;
            this.inputStream = inputStream;
        }

        @Override
        public void request(long n) {
            if (n <= 0) {
                subscriber.onError(new IllegalArgumentException("Demand must be
 positive"));
```

```
            }

            demand.getAndAdd(n);

            executor.submit(() -> {
                try {
                    do {
                        ByteBuffer audioBuffer = getNextEvent();
                        if (audioBuffer.remaining() > 0) {
                            AudioEvent audioEvent =
 audioEventFromBuffer(audioBuffer);
                            subscriber.onNext(audioEvent);
                        } else {
                            subscriber.onComplete();
                            break;
                        }
                    } while (demand.decrementAndGet() > 0);
                } catch (Exception e) {
                    subscriber.onError(e);
                }
            });
        }

        @Override
        public void cancel() {
            executor.shutdown();
        }

        private ByteBuffer getNextEvent() {
            ByteBuffer audioBuffer = null;
            byte[] audioBytes = new byte[CHUNK_SIZE_IN_BYTES];

            int len = 0;
            try {
                len = inputStream.read(audioBytes);

                if (len <= 0) {
                    audioBuffer = ByteBuffer.allocate(0);
                } else {
                    audioBuffer = ByteBuffer.wrap(audioBytes, 0, len);
                }
            } catch (IOException e) {
                throw new UncheckedIOException(e);
            }
            return audioBuffer;
        }

        private AudioEvent audioEventFromBuffer(ByteBuffer bb) {
            return AudioEvent.builder()
                    .audioChunk(SdkBytes.fromByteBuffer(bb))
                    .build();
        }
    }
}
```

Transcribes streaming audio from your computer's microphone.

```
public class TranscribeStreamingDemoApp {
    private static final Region REGION = Region.US_EAST_1;
    private static TranscribeStreamingAsyncClient client;

    public static void main(String[] args)
            throws URISyntaxException, ExecutionException, InterruptedException,
 LineUnavailableException {

        client = TranscribeStreamingAsyncClient.builder()
                .credentialsProvider(getCredentials())
                .region(REGION)
                .build();

        CompletableFuture<Void> result =
 client.startStreamTranscription(getRequest(16_000),
                new AudioStreamPublisher(getStreamFromMic()),
                getResponseHandler());

        result.get();
        client.close();
    }

    private static InputStream getStreamFromMic() throws LineUnavailableException
 {

        // Signed PCM AudioFormat with 16kHz, 16 bit sample size, mono
        int sampleRate = 16000;
        AudioFormat format = new AudioFormat(sampleRate, 16, 1, true, false);
        DataLine.Info info = new DataLine.Info(TargetDataLine.class, format);

        if (!AudioSystem.isLineSupported(info)) {
            System.out.println("Line not supported");
            System.exit(0);
        }

        TargetDataLine line = (TargetDataLine) AudioSystem.getLine(info);
        line.open(format);
        line.start();

        InputStream audioStream = new AudioInputStream(line);
        return audioStream;
    }

    private static AwsCredentialsProvider getCredentials() {
        return DefaultCredentialsProvider.create();
    }

    private static StartStreamTranscriptionRequest getRequest(Integer 
mediaSampleRateHertz) {
        return StartStreamTranscriptionRequest.builder()
                .languageCode(LanguageCode.EN_US.toString())
                .mediaEncoding(MediaEncoding.PCM)
                .mediaSampleRateHertz(mediaSampleRateHertz)
                .build();
    }

    private static StartStreamTranscriptionResponseHandler getResponseHandler() {
        return StartStreamTranscriptionResponseHandler.builder()
                .onResponse(r -> {
                    System.out.println("Received Initial response");
                })
                .onError(e -> {
                    System.out.println(e.getMessage());
                    StringWriter sw = new StringWriter();
                    e.printStackTrace(new PrintWriter(sw));
                    System.out.println("Error Occurred: " + sw);
                })
                .onComplete(() -> {
                    System.out.println("=== All records stream successfully 
===");
                })
                .subscriber(event -> {
                    List<Result> results = ((TranscriptEvent)
 event).transcript().results();
                    if (results.size() > 0) {
                        if (!
results.get(0).alternatives().get(0).transcript().isEmpty()) {

 System.out.println(results.get(0).alternatives().get(0).transcript());
                        }
                    }
                })
                .build();
    }


    private static class AudioStreamPublisher implements Publisher<AudioStream> {
        private static Subscription currentSubscription;
        private final InputStream inputStream;

        private AudioStreamPublisher(InputStream inputStream) {
            this.inputStream = inputStream;
        }

        @Override
        public void subscribe(Subscriber<? super AudioStream> s) {

            if (currentSubscription == null) {
                currentSubscription = new SubscriptionImpl(s, inputStream);
            } else {
                currentSubscription.cancel();
                currentSubscription = new SubscriptionImpl(s, inputStream);
            }
            s.onSubscribe(currentSubscription);
        }
    }

    public static class SubscriptionImpl implements Subscription {
        private static final int CHUNK_SIZE_IN_BYTES = 1024;
        private final Subscriber<? super AudioStream> subscriber;
        private final InputStream inputStream;
        private final ExecutorService executor = Executors.newFixedThreadPool(1);
        private final AtomicLong demand = new AtomicLong(0);

        SubscriptionImpl(Subscriber<? super AudioStream> s, InputStream
 inputStream) {
```

```
            this.subscriber = s;
            this.inputStream = inputStream;
        }

        @Override
        public void request(long n) {
            if (n <= 0) {
                subscriber.onError(new IllegalArgumentException("Demand must be 
positive"));
            }

            demand.getAndAdd(n);

            executor.submit(() -> {
                try {
                    do {
                        ByteBuffer audioBuffer = getNextEvent();
                        if (audioBuffer.remaining() > 0) {
                            AudioEvent audioEvent = 
audioEventFromBuffer(audioBuffer);
                            subscriber.onNext(audioEvent);
                        } else {
                            subscriber.onComplete();
                            break;
                        }
                    } while (demand.decrementAndGet() > 0);
                } catch (Exception e) {
                    subscriber.onError(e);
                }
            });
        }

        @Override
        public void cancel() {
            executor.shutdown();
        }

        private ByteBuffer getNextEvent() {
            ByteBuffer audioBuffer = null;
            byte[] audioBytes = new byte[CHUNK_SIZE_IN_BYTES];

            int len = 0;
            try {
                len = inputStream.read(audioBytes);
                if (len <= 0) {
                    audioBuffer = ByteBuffer.allocate(0);
                } else {
                    audioBuffer = ByteBuffer.wrap(audioBytes, 0, len);
                }
            } catch (IOException e) {
                throw new UncheckedIOException(e);
            }

            return audioBuffer;
        }

        private AudioEvent audioEventFromBuffer(ByteBuffer bb) {
            return AudioEvent.builder()
                    .audioChunk(SdkBytes.fromByteBuffer(bb))
                    .build();
        }
    }
}
```

- For API details, see the following topics in *AWS SDK for Java 2.x API Reference*.
  - GetTranscriptionJob
  - StartTranscriptionJob

Python

SDK for Python (Boto3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
import time
import boto3


def transcribe_file(job_name, file_uri, transcribe_client):
    transcribe_client.start_transcription_job(
        TranscriptionJobName=job_name,
        Media={"MediaFileUri": file_uri},
        MediaFormat="wav",
        LanguageCode="en-US",
    )

    max_tries = 60
    while max_tries > 0:
        max_tries -= 1
        job = 
 transcribe_client.get_transcription_job(TranscriptionJobName=job_name)
        job_status = job["TranscriptionJob"]["TranscriptionJobStatus"]
        if job_status in ["COMPLETED", "FAILED"]:
            print(f"Job {job_name} is {job_status}.")
            if job_status == "COMPLETED":
                print(
                    f"Download the transcript from\n"
                    f"\t{job['TranscriptionJob']['Transcript']
['TranscriptFileUri']}."
                )
            break
        else:
            print(f"Waiting for {job_name}. Current status is {job_status}.")
        time.sleep(10)


def main():
    transcribe_client = boto3.client("transcribe")
    file_uri = "s3://test-transcribe/answer2.wav"
    transcribe_file("Example-job", file_uri, transcribe_client)


if __name__ == "__main__":
    main()
```

- For API details, see the following topics in *AWS SDK for Python (Boto3) API Reference*.
  - GetTranscriptionJob
  - StartTranscriptionJob

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Security in Amazon Transcribe

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between AWS and you. The shared responsibility model describes this as security *of* the cloud and security *in* the cloud:

- **Security of the cloud**: AWS is responsible for protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also provides you with services you can use securely. Third-party auditors regularly test and verify the effectiveness of our security as part of the AWS Compliance Programs. To learn about the compliance programs that apply to Amazon Transcribe, see AWS Services in Scope by Compliance Program.
- **Security in the cloud**: Your responsibility is determined by the AWS service that you use. You are also responsible for other factors including the sensitivity of your data, your company's requirements, and applicable laws and regulations.

This documentation helps you understand how to apply the shared responsibility model when using Amazon Transcribe. The following topics show you how to configure Amazon Transcribe to meet your security and compliance objectives. You also learn how to use other AWS services to monitor and secure your Amazon Transcribe resources.

Topics

Identity and Access Management for Amazon Transcribe

AWS Identity and Access Management (IAM) is an AWS service that helps an administrator securely control access to AWS resources. IAM administrators control who can be *authenticated* (signed in) and *authorized* (have permissions) to use Amazon Transcribe resources. IAM is an AWS service that you can use with no additional charge.

Topics

Audience

How you use AWS Identity and Access Management (IAM) differs, depending on the work that you do in Amazon Transcribe.

Service user – If you use the Amazon Transcribe service to do your job, then your administrator provides you with the credentials and permissions that you need. As you use more Amazon Transcribe features to do your work, you might need additional permissions. Understanding how access is managed can help you request the right permissions from your administrator. If you cannot access a feature in Amazon Transcribe, see Troubleshooting Amazon Transcribe identity and access.

Service administrator – If you're in charge of Amazon Transcribe resources at your company, you probably have full access to Amazon Transcribe. It's your job to determine which Amazon Transcribe features and resources your service users should access. You must then submit requests to your IAM administrator to change the permissions of your service users. Review the information on this page to understand the basic concepts of IAM. To learn more about how your company can use IAM with Amazon Transcribe, see How Amazon Transcribe works with IAM.

IAM administrator – If you're an IAM administrator, you might want to learn details about how you can write policies to manage access to Amazon Transcribe. To view example Amazon Transcribe identity-based policies that you can use in IAM, see Amazon Transcribe identity-based policy examples.

Authenticating with identities

Authentication is how you sign in to AWS using your identity credentials. You must be *authenticated* (signed in to AWS) as the AWS account root user, as an IAM user, or by assuming an IAM role.

You can sign in to AWS as a federated identity by using credentials provided through an identity source. AWS IAM Identity Center (IAM Identity Center) users, your company's single sign-on authentication, and your Google or Facebook credentials are examples of federated identities. When you sign in as a federated identity, your administrator previously set up identity federation using IAM roles. When you access AWS by using federation, you are indirectly assuming a role.

Depending on the type of user you are, you can sign in to the AWS Management Console or the AWS access portal. For more information about signing in to AWS, see How to sign in to your AWS account in the *AWS Sign-In User Guide*.

If you access AWS programmatically, AWS provides a software development kit (SDK) and a command line interface (CLI) to cryptographically sign your requests by using your credentials. If you don't use AWS tools, you must sign requests yourself. For more information about using the recommended method to sign requests yourself, see AWS Signature Version 4 for API requests in the *IAM User Guide*.

Regardless of the authentication method that you use, you might be required to provide additional security information. For example, AWS recommends that you use multi-factor authentication (MFA) to increase the security of your account. To learn more, see Multi-factor authentication in the *AWS IAM Identity Center User Guide* and AWS Multi-factor authentication in IAM in the *IAM User Guide*.

AWS account root user

When you create an AWS account, you begin with one sign-in identity that has complete access to all AWS services and resources in the account. This identity is called the AWS account *root user* and is accessed by signing in with the email address and password that you used to create the account. We strongly recommend that you don't use the root user for your everyday tasks. Safeguard your root user credentials and use them to perform the tasks that only the root user can perform. For the complete list of tasks that require you to sign in as the root user, see Tasks that require root user credentials in the *IAM User Guide*.

Federated identity

As a best practice, require human users, including users that require administrator access, to use federation with an identity provider to access AWS services by using temporary credentials.

A *federated identity* is a user from your enterprise user directory, a web identity provider, the AWS Directory Service, the Identity Center directory, or any user that accesses AWS services by using credentials provided through an identity source. When federated identities access AWS accounts, they assume roles, and the roles provide temporary credentials.

For centralized access management, we recommend that you use AWS IAM Identity Center. You can create users and groups in IAM Identity Center, or you can connect and synchronize to a set of users and groups in your own identity source for use across all your AWS accounts and applications. For information about IAM Identity Center, see What is IAM Identity Center? in the *AWS IAM Identity Center User Guide*.

IAM users and groups

An *IAM user* is an identity within your AWS account that has specific permissions for a single person or application. Where possible, we recommend relying on temporary credentials instead of creating IAM users who have long-term credentials such as passwords and access keys. However, if you have specific use cases that require long-term credentials with IAM users, we recommend that you rotate access keys. For more information, see Rotate access keys regularly for use cases that require long-term credentials in the *IAM User Guide*.

An *IAM group* is an identity that specifies a collection of IAM users. You can't sign in as a group. You can use groups to specify permissions for multiple users at a time. Groups make permissions easier to manage for large sets of users. For example, you could have a group named *IAMAdmins* and give that group permissions to administer IAM resources.

Users are different from roles. A user is uniquely associated with one person or application, but a role is intended to be assumable by anyone who needs it. Users have permanent long-term credentials, but roles provide temporary credentials. To learn more, see Use cases for IAM users in the *IAM User Guide*.

IAM roles

An *IAM role* is an identity within your AWS account that has specific permissions. It is similar to an IAM user, but is not associated with a specific person. To temporarily assume an IAM role in the AWS Management Console, you can switch from a user to an IAM role (console). You can assume a role by calling an AWS CLI or AWS API operation or by using a custom URL. For more information about methods for using roles, see Methods to assume a role in the *IAM User Guide*.

IAM roles with temporary credentials are useful in the following situations:

- **Federated user access** – To assign permissions to a federated identity, you create a role and define permissions for the role. When a federated identity authenticates, the identity is associated with the role and is granted the permissions that are defined by the role. For information about roles for federation, see Create a role for a third-party identity provider (federation) in the *IAM User Guide*. If you use IAM Identity Center, you configure a permission set. To control what your identities can access after they authenticate, IAM Identity Center correlates the permission set to a role in IAM. For information about permissions sets, see Permission sets in the *AWS IAM Identity Center User Guide*.
- **Temporary IAM user permissions** – An IAM user or role can assume an IAM role to temporarily take on different permissions for a specific task.
- **Cross-account access** – You can use an IAM role to allow someone (a trusted principal) in a different account to access resources in your account. Roles are the primary way to grant cross-account access. However, with some AWS services, you can attach a policy directly to a resource (instead of using a role as a proxy). To learn the difference between roles and resource-based policies for cross-account access, see Cross account resource access in IAM in the *IAM User Guide*.
- **Cross-service access** – Some AWS services use features in other AWS services. For example, when you make a call in a service, it's common for that service to run applications in Amazon EC2 or store objects in Amazon S3. A service might do this using the calling principal's permissions, using a service role, or using a service-linked role.
  - **Forward access sessions (FAS)** – When you use an IAM user or role to perform actions in AWS, you are considered a principal. When you use some services, you might perform an action that then initiates another action in a different service. FAS uses the permissions of the principal calling an AWS service, combined with the requesting AWS service to make requests to downstream services. FAS requests are only made when a service receives a request that requires interactions with other AWS services or resources to complete. In this case, you must have permissions to perform both actions. For policy details when making FAS requests, see Forward access sessions.
  - **Service role** – A service role is an IAM role that a service assumes to perform actions on your behalf. An IAM administrator can create, modify, and delete a service role from within IAM. For more information, see Create a role to delegate permissions to an AWS service in the *IAM User Guide*.

  - **Service-linked role** – A service-linked role is a type of service role that is linked to an AWS service. The service can assume the role to perform an action on your behalf. Service-linked roles appear in your AWS account and are owned by the service. An IAM administrator can view, but not edit the permissions for service-linked roles.
- **Applications running on Amazon EC2** – You can use an IAM role to manage temporary credentials for applications that are running on an EC2 instance and making AWS CLI or AWS API requests. This is preferable to storing access keys within the EC2 instance. To assign an AWS role to an EC2 instance and make it available to all of its applications, you create an instance profile that is attached to the instance. An instance profile contains the role and enables programs that are running on the EC2 instance to get temporary credentials. For more information, see Use an IAM role to grant permissions to applications running on Amazon EC2 instances in the *IAM User Guide*.

Managing access using policies

You control access in AWS by creating policies and attaching them to AWS identities or resources. A policy is an object in AWS that, when associated with an identity or resource, defines their permissions. AWS evaluates these policies when a principal (user, root user, or role session) makes a request. Permissions in the policies determine whether the request is allowed or denied. Most policies are stored in AWS as JSON documents. For more information about the structure and contents of JSON policy documents, see Overview of JSON policies in the *IAM User Guide*.

Administrators can use AWS JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

By default, users and roles have no permissions. To grant users permission to perform actions on the resources that they need, an IAM administrator can create IAM policies. The administrator can then add the IAM policies to roles, and users can assume the roles.

IAM policies define permissions for an action regardless of the method that you use to perform the operation. For example, suppose that you have a policy that allows the `iam:GetRole` action. A user with that policy can get role information from the AWS Management Console, the AWS CLI, or the AWS API.

Identity-based policies

Identity-based policies are JSON permissions policy documents that you can attach to an identity, such as an IAM user, group of users, or role. These policies control what actions users and roles can perform, on which resources, and under what conditions. To learn how to create an identity-based policy, see Define custom IAM permissions with customer managed policies in the *IAM User Guide*.

Identity-based policies can be further categorized as *inline policies* or *managed policies*. Inline policies are embedded directly into a single user, group, or role. Managed policies are standalone policies that you can attach to multiple users, groups, and roles in your AWS account. Managed policies include AWS managed policies and customer managed policies. To learn how to choose between a managed policy or an inline policy, see Choose between managed policies and inline policies in the *IAM User Guide*.

Resource-based policies

Resource-based policies are JSON policy documents that you attach to a resource. Examples of resource-based policies are IAM *role trust policies* and Amazon S3 *bucket policies*. In services that support resource-based policies, service administrators can use them to control access to a specific resource. For the resource where the policy is attached, the policy defines what actions a specified principal can perform on that resource and under what conditions. You must specify a principal in a resource-based policy. Principals can include accounts, users, roles, federated users, or AWS services.

Resource-based policies are inline policies that are located in that service. You can't use AWS managed policies from IAM in a resource-based policy.

Access control lists (ACLs)

Access control lists (ACLs) control which principals (account members, users, or roles) have permissions to access a resource. ACLs are similar to resource-based policies, although they do not use the JSON policy document format.

Amazon S3, AWS WAF, and Amazon VPC are examples of services that support ACLs. To learn more about ACLs, see Access control list (ACL) overview in the *Amazon Simple Storage Service Developer Guide*.

Other policy types

AWS supports additional, less-common policy types. These policy types can set the maximum permissions granted to you by the more common policy types.

- **Permissions boundaries** – A permissions boundary is an advanced feature in which you set the maximum permissions that an identity-based policy can grant to an IAM entity (IAM user or role). You can set a permissions boundary for an entity. The resulting permissions are the intersection of an entity's identity-based policies and its permissions boundaries. Resource-based policies that specify the user or role in the `Principal` field are not limited by the permissions boundary. An explicit deny in any of these policies overrides the allow. For more information about permissions boundaries, see Permissions boundaries for IAM entities in the *IAM User Guide*.

- **Service control policies (SCPs)** – SCPs are JSON policies that specify the maximum permissions for an organization or organizational unit (OU) in AWS Organizations. AWS Organizations is a service for grouping and centrally managing multiple AWS accounts that your business owns. If you enable all features in an organization, then you can apply service control policies (SCPs) to any or all of your accounts. The SCP limits permissions for entities in member accounts, including each AWS account root user. For more information about Organizations and SCPs, see Service control policies in the *AWS Organizations User Guide*.
- **Resource control policies (RCPs)** – RCPs are JSON policies that you can use to set the maximum available permissions for resources in your accounts without updating the IAM policies attached to each resource that you own. The RCP limits permissions for resources in member accounts and can impact the effective permissions for identities, including the AWS account root user, regardless of whether they belong to your organization. For more information about Organizations and RCPs, including a list of AWS services that support RCPs, see Resource control policies (RCPs) in the *AWS Organizations User Guide*.
- **Session policies** – Session policies are advanced policies that you pass as a parameter when you programmatically create a temporary session for a role or federated user. The resulting session's permissions are the intersection of the user or role's identity-based policies and the session policies. Permissions can also come from a resource-based policy. An explicit deny in any of these policies overrides the allow. For more information, see Session policies in the *IAM User Guide*.

Multiple policy types

When multiple types of policies apply to a request, the resulting permissions are more complicated to understand. To learn how AWS determines whether to allow a request when multiple policy types are involved, see Policy evaluation logic in the *IAM User Guide*.

How Amazon Transcribe works with IAM

Before you use IAM to manage access to Amazon Transcribe, learn what IAM features are available to use with Amazon Transcribe.

IAM features you can use with Amazon Transcribe

IAM feature	Amazon Transcribe support
Identity-based policies	Yes
Resource-based policies	No
Policy actions	Yes
Policy resources	Yes
Policy condition keys (service-specific)	Yes
ACLs	No
ABAC (tags in policies)	Partial
Temporary credentials	Yes
Principal permissions	Yes
Service roles	Yes
Service-linked roles	No

To get a high-level view of how Amazon Transcribe and other AWS services work with most IAM features, see AWS services that work with IAM in the *IAM User Guide*.

Identity-based policies for Amazon Transcribe

Supports identity-based policies: Yes

Identity-based policies are JSON permissions policy documents that you can attach to an identity, such as an IAM user, group of users, or role. These policies control what actions users and roles can perform, on which resources, and under what conditions. To learn how to create an identity-based policy, see Define custom IAM permissions with customer managed policies in the *IAM User Guide*.

With IAM identity-based policies, you can specify allowed or denied actions and resources as well as the conditions under which actions are allowed or denied. You can't specify the principal in an identity-based policy because it applies to the user or role to which it is attached. To learn about all of the elements that you can use in a JSON policy, see IAM JSON policy elements reference in the *IAM User Guide*.

Identity-based policy examples for Amazon Transcribe

To view examples of Amazon Transcribe identity-based policies, see Amazon Transcribe identity-based policy examples.

Resource-based policies within Amazon Transcribe

Supports resource-based policies: No

Resource-based policies are JSON policy documents that you attach to a resource. Examples of resource-based policies are IAM *role trust policies* and Amazon S3 *bucket policies*. In services that support resource-based policies, service administrators can use them to control access to a specific resource. For the resource where the policy is attached, the policy defines what actions a specified principal can perform on that resource and under what conditions. You must specify a principal in a resource-based policy. Principals can include accounts, users, roles, federated users, or AWS services.

To enable cross-account access, you can specify an entire account or IAM entities in another account as the principal in a resource-based policy. Adding a cross-account principal to a resource-based policy is only half of establishing the trust relationship. When the principal and the resource are in different AWS accounts, an IAM administrator in the trusted account must also grant the principal entity (user or role) permission to access the resource. They grant permission by attaching an identity-based policy to the entity. However, if a resource-based policy grants access to a principal in the same account, no additional identity-based policy is required. For more information, see Cross account resource access in IAM in the *IAM User Guide*.

Policy actions for Amazon Transcribe

Supports policy actions: Yes

Administrators can use AWS JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The `Action` element of a JSON policy describes the actions that you can use to allow or deny access in a policy. Policy actions usually have the same name as the associated AWS API operation. There are some exceptions, such as *permission-only actions* that don't have a matching API operation. There are also some operations that require multiple actions in a policy. These additional actions are called *dependent actions*.

Include actions in a policy to grant permissions to perform the associated operation.

To see a list of Amazon Transcribe actions, see Actions defined by Amazon Transcribe in the *Service Authorization Reference*.

Policy actions in Amazon Transcribe use the `transcribe` prefix before the action. To specify multiple actions in a single statement, separate them with commas.

```
"Action": [
      "transcribe:action1",
      "transcribe:action2"
]
```

You can specify multiple actions using wildcards (*). For example, to specify all actions that begin with the word `List`, include the following action:

```
"Action": "transcribe:List*"
```

To view examples of Amazon Transcribe identity-based policies, see Amazon Transcribe identity-based policy examples.

Policy resources for Amazon Transcribe

Supports policy resources: Yes

Administrators can use AWS JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The `Resource` JSON policy element specifies the object or objects to which the action applies. Statements must include either a `Resource` or a `NotResource` element. As a best practice, specify a resource using its Amazon Resource Name (ARN). You can do this for actions that support a specific resource type, known as *resource-level permissions*.

For actions that don't support resource-level permissions, such as listing operations, use a wildcard (*) to indicate that the statement applies to all resources.

```
"Resource": "*"
```

To see a list of Amazon Transcribe resource types and their ARNs, see Resources defined by Amazon Transcribe in the *Service Authorization Reference*. To learn with which actions you can specify the ARN of each resource, see Actions defined by Amazon Transcribe.

To view examples of Amazon Transcribe identity-based policies, see Amazon Transcribe identity-based policy examples.

Policy condition keys for Amazon Transcribe

Supports service-specific policy condition keys: Yes

Administrators can use AWS JSON policies to specify who has access to what. That is, which **principal** can perform **actions** on what **resources**, and under what **conditions**.

The `Condition` element (or `Condition` *block*) lets you specify conditions in which a statement is in effect. The `Condition` element is optional. You can create conditional expressions that use condition operators, such as equals or less than, to match the condition in the policy with values in the request.

If you specify multiple `Condition` elements in a statement, or multiple keys in a single `Condition` element, AWS evaluates them using a logical `AND` operation. If you specify multiple values for a single condition key, AWS evaluates the condition using a logical `OR` operation. All of the conditions must be met before the statement's permissions are granted.

You can also use placeholder variables when you specify conditions. For example, you can grant an IAM user permission to access a resource only if it is tagged with their IAM user name. For more information, see IAM policy elements: variables and tags in the *IAM User Guide*.

AWS supports global condition keys and service-specific condition keys. To see all AWS global condition keys, see AWS global condition context keys in the *IAM User Guide*.

To see a list of Amazon Transcribe condition keys, see Condition keys for Amazon Transcribe in the *Service Authorization Reference*. To learn with which actions and resources you can use a condition key, see Actions defined by Amazon Transcribe.

To view examples of Amazon Transcribe identity-based policies, see Amazon Transcribe identity-based policy examples.

ACLs in Amazon Transcribe

Supports ACLs: No

Access control lists (ACLs) control which principals (account members, users, or roles) have permissions to access a resource. ACLs are similar to resource-based policies, although they do not use the JSON policy document format.

ABAC with Amazon Transcribe

Supports ABAC (tags in policies): Partial

Attribute-based access control (ABAC) is an authorization strategy that defines permissions based on attributes. In AWS, these attributes are called *tags*. You can attach tags to IAM entities (users or roles) and to many AWS resources. Tagging entities and resources is the first step of ABAC. Then you design ABAC policies to allow operations when the principal's tag matches the tag on the resource that they are trying to access.

ABAC is helpful in environments that are growing rapidly and helps with situations where policy management becomes cumbersome.

To control access based on tags, you provide tag information in the condition element of a policy using the `aws:ResourceTag/key-name`, `aws:RequestTag/key-name`, or `aws:TagKeys` condition keys.

If a service supports all three condition keys for every resource type, then the value is **Yes** for the service. If a service supports all three condition keys for only some resource types, then the value is **Partial**.

For more information about ABAC, see Define permissions with ABAC authorization in the *IAM User Guide*. To view a tutorial with steps for setting up ABAC, see Use attribute-based access control (ABAC) in the *IAM User Guide*.

For more information about tagging Amazon Transcribe resources, see Tagging resources. For more detailed information on tag-based access control, see Controlling access to AWS resources using tags.

Using temporary credentials with Amazon Transcribe

Supports temporary credentials: Yes

Some AWS services don't work when you sign in using temporary credentials. For additional information, including which AWS services work with temporary credentials, see AWS services that work with IAM in the *IAM User Guide*.

You are using temporary credentials if you sign in to the AWS Management Console using any method except a user name and password. For example, when you access AWS using your company's single sign-on (SSO) link, that process automatically creates temporary credentials. You also automatically create temporary credentials when you sign in to the console as a user and then switch roles. For more information about switching roles, see Switch from a user to an IAM role (console) in the *IAM User Guide*.

You can manually create temporary credentials using the AWS CLI or AWS API. You can then use those temporary credentials to access AWS. AWS recommends that you dynamically generate temporary credentials instead of using long-term access keys. For more information, see Temporary security credentials in IAM.

Cross-service principal permissions for Amazon Transcribe

Supports forward access sessions (FAS): Yes

When you use an IAM user or role to perform actions in AWS, you are considered a principal. When you use some services, you might perform an action that then initiates another action in a different service. FAS uses the permissions of the principal calling an AWS service, combined with the requesting AWS service to make requests to downstream services. FAS requests are only made when a service receives a request that requires interactions with other AWS services or resources to complete. In this case, you must have permissions to perform both actions. For policy details when making FAS requests, see Forward access sessions.

Service roles for Amazon Transcribe

Supports service roles: Yes

A service role is an IAM role that a service assumes to perform actions on your behalf. An IAM administrator can create, modify, and delete a service role from within IAM. For more information, see Create a role to delegate permissions to an AWS service in the *IAM User Guide*.

Warning

Changing the permissions for a service role might break Amazon Transcribe functionality. Edit service roles only when Amazon Transcribe provides guidance to do so.

Service-linked roles for Amazon Transcribe

Supports service-linked roles: No

A service-linked role is a type of service role that is linked to an AWS service. The service can assume the role to perform an action on your behalf. Service-linked roles appear in your AWS account and are owned by the service. An IAM administrator can view, but not edit the permissions for service-linked roles.

Amazon Transcribe doesn't support service-linked roles.

For details about creating or managing service-linked roles for other services, see AWS services that work with IAM. Find a service in the table that includes a `Yes` in the **Service-linked role** column. Choose the **Yes** link to view the service-linked role documentation for that service.

Cross-service confused deputy prevention

A confused deputy is an entity (a service or an account) that is coerced by a different entity to perform an action. This type of impersonation can happen cross-account and cross-service.

To prevent confused deputies, AWS provides tools that help you protect your data for all services using service principals that have been given access to resources in your AWS account. This section focuses on cross-service confused deputy prevention specific to Amazon Transcribe; however, you can learn more about this topic in the confused deputy problem section of the *IAM User Guide*.

To limit the permissions IAM gives to Amazon Transcribe to access your resources, we recommend using the global condition context keys `aws:SourceArn` and `aws:SourceAccount` in your resource policies.

If you use both of these global condition context keys, and the `aws:SourceArn` value contains the AWS account ID, the `aws:SourceAccount` value and the AWS account in `aws:SourceArn` must use the same AWS account ID when used in the same policy statement.

If you want only one resource to be associated with the cross-service access, use `aws:SourceArn`. If you want to associate any resource in that AWS account with cross-service access, use `aws:SourceAccount`.

Note

The most effective way to protect against the confused deputy problem is to use the `aws:SourceArn` global condition context key with the **full ARN** of the resource.

If you don’t know the full ARN, or if you're specifying multiple resources, use the `aws:SourceArn` global context condition key with wildcards (*) for the unknown portions of the ARN. For example, `arn:aws:transcribe::`*`123456789012`*`:*`.

For an example of an assume role policy that shows how you can prevent a confused deputy issue, see Confused deputy prevention policy.

Amazon Transcribe identity-based policy examples

By default, users and roles don't have permission to create or modify Amazon Transcribe resources. They also can't perform tasks by using the AWS Management Console, AWS Command Line Interface (AWS CLI), or AWS API. To grant users permission to perform actions on the resources that they need, an IAM administrator can create IAM policies. The administrator can then add the IAM policies to roles, and users can assume the roles.

To learn how to create an IAM identity-based policy by using these example JSON policy documents, see Create IAM policies (console) in the *IAM User Guide*.

For details about actions and resource types defined by Amazon Transcribe, including the format of the ARNs for each of the resource types, see Actions, resources, and condition keys for Amazon Transcribe in the *Service Authorization Reference*.

Topics

Policy best practices

Identity-based policies determine whether someone can create, access, or delete Amazon Transcribe resources in your account. These actions can incur costs for your AWS account. When you create or edit identity-based policies, follow these guidelines and recommendations:

- **Get started with AWS managed policies and move toward least-privilege permissions** – To get started granting permissions to your users and workloads, use the *AWS managed policies* that grant permissions for many common use cases. They are available in your AWS account. We recommend that you reduce permissions further by defining AWS customer managed policies that are specific to your use cases. For more information, see AWS managed policies or AWS managed policies for job functions in the *IAM User Guide*.
- **Apply least-privilege permissions** – When you set permissions with IAM policies, grant only the permissions required to perform a task. You do this by defining the actions that can be taken on specific resources under specific conditions, also known as *least-privilege permissions*. For more information about using IAM to apply permissions, see Policies and permissions in IAM in the *IAM User Guide*.
- **Use conditions in IAM policies to further restrict access** – You can add a condition to your policies to limit access to actions and resources. For example, you can write a policy condition to specify that all requests must be sent using SSL. You can also use conditions to grant access to service actions if they are used through a specific AWS service, such as AWS CloudFormation. For more information, see IAM JSON policy elements: Condition in the *IAM User Guide*.
- **Use IAM Access Analyzer to validate your IAM policies to ensure secure and functional permissions** – IAM Access Analyzer validates new and existing policies so that the policies adhere to the IAM policy language (JSON) and IAM best practices. IAM Access Analyzer provides more than 100 policy checks and actionable recommendations to help you author secure and functional policies. For more information, see Validate policies with IAM Access Analyzer in the *IAM User Guide*.
- **Require multi-factor authentication (MFA)** – If you have a scenario that requires IAM users or a root user in your AWS account, turn on MFA for additional security. To require MFA when API operations are called, add MFA conditions to your policies. For more information, see Secure API access with MFA in the *IAM User Guide*.

For more information about best practices in IAM, see Security best practices in IAM in the *IAM User Guide*.

Using the AWS Management Console

To access the Amazon Transcribe console, you must have a minimum set of permissions. These permissions must allow you to list and view details about the Amazon Transcribe resources in your AWS account. If you create an identity-based policy that is more restrictive than the minimum required permissions, the console won't function as intended for entities (users or roles) with that policy.

You don't need to allow minimum console permissions for users that are making calls only to the AWS CLI or the AWS API. Instead, allow access to only the actions that match the API operation that they're trying to perform.

To ensure that an entity (users and roles) can use the AWS Management Console, attach one of the following AWS-managed policies to them.

- `AmazonTranscribeFullAccess`: Grants full access to create, read, update, delete, and run all Amazon Transcribe resources. It also allows access to Amazon S3 buckets with `transcribe` in the bucket name.
- `AmazonTranscribeReadOnlyAccess`: Grants read-only access to Amazon Transcribe resources so that you can get and list transcription jobs and custom vocabularies.

Note

You can review the managed permission policies by signing in to the IAM AWS Management Console and searching by policy name. A search for "transcribe" returns both policies listed above (*AmazonTranscribeReadOnly* and *AmazonTranscribeFullAccess*).

You can also create your own custom IAM policies to allow permissions for Amazon Transcribe API actions. You can attach these custom policies to the entities that require those permissions.

Permissions required for IAM roles

If you create an IAM role to call Amazon Transcribe, it must have permission to access the Amazon S3 bucket. If applicable, the KMS key must also be used to encrypt the contents of the bucket. Refer to the following sections for example policies.

Trust policies

The IAM entity you use to make your transcription request must have a trust policy that enables Amazon Transcribe to assume that role. Use the following Amazon Transcribe trust policy. Note that if you're making a real-time Call Analytics request with post-call analytics enabled, you must use 'Trust policy for real-time Call Analytics'.

Trust policy for Amazon Transcribe

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "Service": [
          "transcribe.amazonaws.com"
        ]
      },
      "Action": [
        "sts:AssumeRole"
      ],
      "Condition": {
        "StringEquals": {
          "aws:SourceAccount": "111122223333"
        },
        "StringLike": {
          "aws:SourceArn": "arn:aws:transcribe:us-west-2:111122223333:*"
        }
      }
    }
  ]
}
```

Trust policy for real-time Call Analytics

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "Service": [
          "transcribe.streaming.amazonaws.com"
        ]
      },
      "Action": [
        "sts:AssumeRole"
      ],
      "Condition": {
        "StringEquals": {
          "aws:SourceAccount": "111122223333"
        },
        "StringLike": {
          "aws:SourceArn": "arn:aws:transcribe:us-west-2:111122223333:*"
        }
      }
    }
  ]
}
```

Amazon S3 input bucket policy

The following policy gives an IAM role permission to access files from the specified input bucket.

```
{
    "Version": "2012-10-17",
    "Statement": {
        "Effect": "Allow",
        "Action": [
            "s3:GetObject",
            "s3:ListBucket"
        ],
        "Resource": [
            "arn:aws:s3:::DOC-EXAMPLE-INPUT-BUCKET",
            "arn:aws:s3:::DOC-EXAMPLE-INPUT-BUCKET/*"
        ]
    }
}
```

Amazon S3 output bucket policy

The following policy gives an IAM role permission to write files to the specified output bucket.

```
{
    "Version": "2012-10-17",
    "Statement": {
        "Effect": "Allow",
        "Action": [
            "s3:PutObject"
        ],
        "Resource": [
            "arn:aws:s3:::DOC-EXAMPLE-OUTPUT-BUCKET/*"
        ]
    }
}
```

Permissions required for Amazon S3 encryption keys

If you're using a KMS key to encrypt an Amazon S3 bucket, include the following in the KMS key policy. This gives Amazon Transcribe access to the contents of the bucket. For more information about allowing access to KMS keys, see Allowing external AWS accounts to access an KMS key in the *AWS KMS Developer Guide*.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::111122223333:role/ExampleRole"
      },
      "Action": [
        "kms:Decrypt"
      ],
      "Resource": "arn:aws:kms:us-west-2:111122223333:key/KMS-Example-KeyId"
    }
  ]
}
```

Allow users to view their own permissions

This example shows how you might create a policy that allows IAM users to view the inline and managed policies that are attached to their user identity. This policy includes permissions to complete this action on the console or programmatically using the AWS CLI or AWS API.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "ViewOwnUserInfo",
            "Effect": "Allow",
            "Action": [
                "iam:GetUserPolicy",
                "iam:ListGroupsForUser",
                "iam:ListAttachedUserPolicies",
                "iam:ListUserPolicies",
                "iam:GetUser"
            ],
            "Resource": ["arn:aws:iam::*:user/${aws:username}"]
        },
        {
            "Sid": "NavigateInConsole",
            "Effect": "Allow",
            "Action": [
                "iam:GetGroupPolicy",
                "iam:GetPolicyVersion",
                "iam:GetPolicy",
                "iam:ListAttachedGroupPolicies",
                "iam:ListGroupPolicies",
                "iam:ListPolicyVersions",
                "iam:ListPolicies",
                "iam:ListUsers"
            ],
            "Resource": "*"
        }
    ]
}
```

AWS KMS encryption context policy

The following policy grants the IAM role "`ExampleRole`" permission to use the AWS KMS *Decrypt* and *Encrypt* operations for this particular KMS key. This policy works **only** for requests with at least one encryption context pair, in this case "`color:indigoBlue`". For more information on AWS KMS encryption context, see AWS KMS encryption context.

```
{
  "Version": "2012-10-17",
  "Statement": [
      {
          "Effect": "Allow",
          "Principal": {
              "AWS": "arn:aws:iam::111122223333:role/ExampleRole"
          },
          "Action": [
              "kms:Decrypt",
              "kms:DescribeKey",
              "kms:Encrypt",
              "kms:GenerateDataKey*",
              "kms:ReEncrypt*"
          ],
          "Resource": "*",
          "Condition": {
              "StringEquals": {
                  "kms:EncryptionContext:color":"indigoBlue"
              }
           }
        }
   ]
}
```

Confused deputy prevention policy

Here's an example of an assume role policy that shows how you can use `aws:SourceArn` and `aws:SourceAccount` with Amazon Transcribe to prevent a confused deputy issue. For more information on confused deputy prevention, see Cross-service confused deputy prevention.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "Service": "transcribe.amazonaws.com"
      },
      "Action": [
        "sts:AssumeRole",
      ],
      "Condition": {
        "StringEquals": {
          "aws:SourceAccount": "111122223333"
        },
        "StringLike": {
          "aws:SourceArn": "arn:aws:transcribe:us-west-2:111122223333:*"
```

```
            }
        }
    }
  ]
}
```

Viewing transcription jobs based on tags

You can use conditions in your identity-based policy to control access to Amazon Transcribe resources based on tags. This example shows how you might create a policy that allows viewing a transcription job. However, permission is granted only if the transcription job tag `Owner` has the value of that user's user name. This policy also grants the permissions necessary to complete this action using the AWS Management Console.

You can attach this policy to the IAM entities in your account. If a role named `test-role` attempts to view a transcription job, the transcription job must be tagged `Owner=test-role` or `owner=test-role` (condition key names are not case-sensitive), otherwise they are denied access. For more information, see IAM JSON policy elements: Condition in the *IAM User Guide*.

For more information on tagging in Amazon Transcribe, see Tagging resources.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "ListTranscriptionJobsInConsole",
            "Effect": "Allow",
            "Action": "transcribe:ListTranscriptionJobs",
            "Resource": "*"
        },
        {
            "Sid": "ViewTranscriptionJobsIfOwner",
            "Effect": "Allow",
            "Action": "transcribe:GetTranscriptionJobs",
            "Resource": "arn:aws:transcribe:*:*:transcription-job/*",
            "Condition": {
                "StringEquals": {"aws:ResourceTag/Owner": "${aws:username}"}
            }
        }
    ]
}
```

Troubleshooting Amazon Transcribe identity and access

Use the following information to diagnose and fix common issues that you might encounter when working with Amazon Transcribe and AWS Identity and Access Management (IAM).

Topics

I am not authorized to perform an action in Amazon Transcribe

If you receive an error that you're not authorized to perform an action, your policies must be updated to allow you to perform the action.

The following example error occurs when the `mateojackson` IAM user tries to use the console to view details about a fictional *`my-example-widget`* resource but doesn't have the fictional `transcribe:`*`GetWidget`* permissions.

```
User: arn:aws:iam::123456789012:user/mateojackson is not authorized to perform:
 transcribe:GetWidget on resource: my-example-widget
```

In this case, the policy for the `mateojackson` user must be updated to allow access to the *`my-example-widget`* resource by using the `transcribe:`*`GetWidget`* action.

If you need help, contact your AWS administrator. Your administrator is the person who provided you with your sign-in credentials.

I am not authorized to perform iam:PassRole

If you receive an error that you're not authorized to perform the `iam:PassRole` action, your policies must be updated to allow you to pass a role to Amazon Transcribe.

Some AWS services allow you to pass an existing role to that service instead of creating a new service role or service-linked role. To do this, you must have permissions to pass the role to the service.

The following example error occurs when an IAM user named `marymajor` tries to use the console to perform an action in Amazon Transcribe. However, the action requires the service to have permissions that are granted by a service role. Mary does not have permissions to pass the role to the service.

```
User: arn:aws:iam::123456789012:user/marymajor is not authorized to perform:
 iam:PassRole
```

In this case, Mary's policies must be updated to allow her to perform the `iam:PassRole` action.

If you need help, contact your AWS administrator. Your administrator is the person who provided you with your sign-in credentials.

I want to allow people outside of my AWS account to access my Amazon Transcribe resources

You can create a role that users in other accounts or people outside of your organization can use to access your resources. You can specify who is trusted to assume the role. For services that support resource-based policies or access control lists (ACLs), you can use those policies to grant people access to your resources.

To learn more, consult the following:

- To learn whether Amazon Transcribe supports these features, see How Amazon Transcribe works with IAM.
- To learn how to provide access to your resources across AWS accounts that you own, see Providing access to an IAM user in another AWS account that you own in the *IAM User Guide*.
- To learn how to provide access to your resources to third-party AWS accounts, see Providing access to AWS accounts owned by third parties in the *IAM User Guide*.
- To learn how to provide access through identity federation, see Providing access to externally authenticated users (identity federation) in the *IAM User Guide*.
- To learn the difference between using roles and resource-based policies for cross-account access, see Cross account resource access in IAM in the *IAM User Guide*.

Data protection in Amazon Transcribe

The AWS shared responsibility model applies to data protection in Amazon Transcribe. As described in this model, AWS is responsible for protecting the global infrastructure that runs all of the AWS Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. You are also responsible for the security configuration and management tasks for the AWS services that you use. For more information about data privacy, see the Data Privacy FAQ. For information about data protection in Europe, see the AWS Shared Responsibility Model and GDPR blog post on the *AWS Security Blog*.

For data protection purposes, we recommend that you protect AWS account credentials and set up individual users with AWS IAM Identity Center or AWS Identity and Access Management (IAM). That way, each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources. We require TLS 1.2 and recommend TLS 1.3.
- Set up API and user activity logging with AWS CloudTrail. For information about using CloudTrail trails to capture AWS activities, see Working with CloudTrail trails in the *AWS CloudTrail User Guide*.
- Use AWS encryption solutions, along with all default security controls within AWS services.
- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing sensitive data that is stored in Amazon S3.
- If you require FIPS 140-3 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see Federal Information Processing Standard (FIPS) 140-3.

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form text fields such as a **Name** field. This includes when you work with Amazon Transcribe or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into tags or free-form text fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

Inter-network traffic privacy

An Amazon Virtual Private Cloud (Amazon VPC) endpoint for Amazon Transcribe is a logical entity within a VPC that allows connectivity only to Amazon Transcribe. Amazon VPC routes requests to Amazon Transcribe and routes responses back to the VPC. For more information, see AWS PrivateLink concepts. For information about using Amazon VPC endpoints with Amazon Transcribe see Amazon Transcribe and interface VPC endpoints (AWS PrivateLink).

Data encryption

Data encryption refers to protecting data while in transit and at rest. You can protect your data by using Amazon S3-managed keys or KMS keys at rest, alongside standard Transport Layer Security (TLS) while in transit.

Encryption at rest

Amazon Transcribe uses the default Amazon S3 key (SSE-S3) for server-side encryption of transcripts placed in your Amazon S3 bucket.

When you use the `StartTranscriptionJob` operation, you can specify your own KMS key to encrypt the output from a transcription job.

Amazon Transcribe uses an Amazon EBS volume encrypted with the default key.

Encryption in transit

Amazon Transcribe uses TLS 1.2 with AWS certificates to encrypt data in transit. This includes streaming transcriptions.

Key management

Amazon Transcribe works with KMS keys to provide enhanced encryption for your data. With Amazon S3, you can encrypt your input media when creating a transcription job. Integration with AWS KMS allows encryption of the output from a `StartTranscriptionJob` request.

If you don't specify a KMS key, the output of the transcription job is encrypted with the default Amazon S3 key (SSE-S3).

For more information on AWS KMS, see the *AWS Key Management Service Developer Guide*.

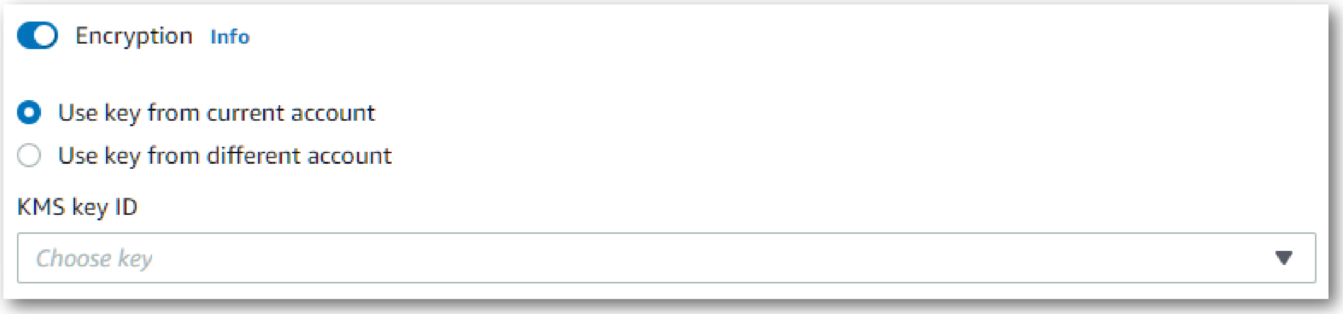
Key management using the AWS Management Console

To encrypt the output of your transcription job, you can choose between using a KMS key for the AWS account that is making the request, or a KMS key from another AWS account.

If you don't specify a KMS key, the output of the transcription job is encrypted with the default Amazon S3 key (SSE-S3).

To enable output encryption:

1. Under **Output data** choose **Encryption**.



2. Choose whether the KMS key is from the AWS account you're currently using or from a different AWS account. If you want to use a key from the current AWS account, choose the key from **KMS key ID**. If you're using a key from a different AWS account, you must enter the key's ARN. To use a key from a different AWS account, the caller must have `kms:Encrypt` permissions for the KMS key. Refer to Creating a key policy for more information.

Key management using the API

To use output encryption with the API, you must specify your KMS key using the `OutputEncryptionKMSKeyId` parameter of the `StartCallAnalyticsJob`, `StartMedicalTranscriptionJob`, or `StartTranscriptionJob` operation.

If using a key located in the **current** AWS account, you can specify your KMS key in one of four ways:

1. Use the KMS key ID itself. For example, `1234abcd-12ab-34cd-56ef-1234567890ab`.
2. Use an alias for the KMS key ID. For example, `alias/ExampleAlias`.
3. Use the Amazon Resource Name (ARN) for the KMS key ID. For example, `arn:aws:kms:region:account-ID:key/1234abcd-12ab-34cd-56ef-1234567890ab`.
4. Use the ARN for the KMS key alias. For example, `arn:aws:kms:region:account-ID:alias/ExampleAlias`.

If using a key located in a **different** AWS account than the current AWS account, you can specify your KMS key in one of two ways:

1. Use the ARN for the KMS key ID. For example, `arn:aws:kms:region:account-ID:key/1234abcd-12ab-34cd-56ef-1234567890ab`.
2. Use the ARN for the KMS key alias. For example, `arn:aws:kms:region:account-ID:alias/ExampleAlias`.

Note that the entity making the request must have permission to use the specified KMS key.

AWS KMS encryption context

AWS KMS encryption context is a map of plain text, non-secret key:value pairs. This map represents additional authenticated data, known as encryption context pairs, which provide an added layer of security for your data. Amazon Transcribe requires a symmetric encryption key to encrypt transcription output into a customer-specified Amazon S3 bucket. To learn more, see Asymmetric keys in AWS KMS.

When creating your encryption context pairs, **do not** include sensitive information. Encryption context is not secret—it's visible in plain text within your CloudTrail logs (so you can use it to identify and categorize your cryptographic operations).

Your encryption context pair can include special characters, such as underscores (_), dashes (-), slashes (/, \) and colons (`:`).

Tip

It can be useful to relate the values in your encryption context pair to the data being encrypted. Although not required, we recommend you use non-sensitive metadata related to your encrypted content, such as file names, header values, or unencrypted database fields.

To use output encryption with the API, set the `KMSEncryptionContext` parameter in the `StartTranscriptionJob` operation. In order to provide encryption context for the output encryption operation, the `OutputEncryptionKMSKeyId` parameter must reference a symmetric KMS key ID.

You can use AWS KMS condition keys with IAM policies to control access to a symmetric encryption KMS key based on the encryption context that was used in the request for a cryptographic operation. For an example encryption context policy, see AWS KMS encryption context policy.

Using encryption context is optional, but recommended. For more information, see Encryption context.

Opting out of using your data for service improvement

By default, Amazon Transcribe stores and uses voice inputs that it has processed to develop the service and continuously improve your experience. You can opt out of having your content used to develop and improve Amazon Transcribe by using an AWS Organizations opt-out policy. For information about how to opt out, see AI services opt-out policies.

Monitoring Amazon Transcribe

Monitoring is an important part of maintaining the reliability, availability, and performance of Amazon Transcribe and your other AWS solutions. AWS provides the following monitoring tools to watch Amazon Transcribe, report when something is wrong, and take automatic actions when appropriate:

- **Amazon CloudWatch** monitors your AWS resources and the applications that you run on AWS in real time. You can collect and track metrics, create customized dashboards, and set alarms that notify you or take actions when a specified metric reaches a threshold that you specify. For example, you can have CloudWatch track CPU usage or other metrics on your Amazon EC2 instances and automatically launch new instances when needed.
- **Amazon CloudWatch Logs** can monitor, store, and access your log files from Amazon EC2 instances, CloudTrail, and other sources. CloudWatch Logs can monitor information in the log files and notify you when certain thresholds are met. You can also archive your log data in highly durable storage.
- **AWS CloudTrail** captures API calls and related events made by or on behalf of your AWS account and delivers the log files to an Amazon S3 bucket that you specify. You can identify which users and accounts called AWS, the source IP address from which the calls were made, and when the calls occurred.

For more information, see the *Amazon CloudWatch User Guide*.

Amazon EventBridge is a serverless service that uses events to connect application components together, making it easier for you to build scalable event-driven applications. EventBridge delivers a stream of real-time data from your own applications, Software as a Service (SaaS) applications, and AWS services and routes that data to targets such as Lambda. You can monitor events that happen in services, and build event-driven architectures. For more information, see the *Amazon EventBridge User Guide*.

Topics

Monitoring Amazon Transcribe with Amazon CloudWatch

You can monitor Amazon Transcribe using CloudWatch, which collects raw data and processes it into readable, near real-time metrics. These statistics are kept for 15 months, so that you can access historical information and gain a better perspective on how your web application or service is performing. You can also set alarms that watch for certain thresholds, and send notifications or take actions when those thresholds are met. For more information, see the *CloudWatch User Guide*.

Using Amazon CloudWatch metrics and dimensions with Amazon Transcribe

Amazon Transcribe supports CloudWatch metrics and dimensions, which are data that can help you monitor performance. Supported metrics categories include traffic, errors, data transfer, and latency associated with your transcription jobs. Supported metrics are located through CloudWatch in the **AWS/Transcribe** namespace.

Note

CloudWatch monitoring metrics are free of charge and don't count against CloudWatch service quotas.

For more information on CloudWatch metrics, see Using Amazon CloudWatch metrics.

Monitoring Amazon Transcribe with AWS CloudTrail

Amazon Transcribe is integrated with AWS CloudTrail, a service that provides a record of actions taken in Amazon Transcribe by an AWS Identity and Access Management (IAM) user or role, or by an AWS service. CloudTrail captures all API calls for Amazon Transcribe. That includes calls from the AWS Management Console and code calls to the Amazon Transcribe APIs, as events. By creating a trail, you can enable continuous delivery of CloudTrail events, including events for Amazon Transcribe, to an Amazon S3 bucket. If you don't create a trail, you can still view the most recent events in the CloudTrail AWS Management Console in **Event history**. Using the information collected by CloudTrail, you can see each request that is made to Amazon Transcribe, the IP address from which the request is made, who made the request, when it is made, and additional details.

To learn more about CloudTrail, refer to the *AWS CloudTrail User Guide*.

Amazon Transcribe and CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in Amazon Transcribe, that activity is recorded in a CloudTrail event along with other AWS service events in the CloudTrail **Event history**. You can view, search, and download recent events in your AWS account. For more information, see Viewing Events with CloudTrail Event History.

To get an ongoing record of events in your AWS account, including events for Amazon Transcribe, create a trail. A *trail* is a configuration that enables CloudTrail to deliver events as log files to a specified Amazon S3 bucket. CloudTrail log files contain one or more log entries. An *event* represents a single request from any source. It includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files aren't an ordered stack trace of the public API calls, so they don't appear in any specific order.

By default, when you create a trail in the AWS Management Console, the trail applies to all AWS Regions. The trail logs events from all AWS Regions in the AWS partition and delivers the log files to the Amazon S3 bucket that you specify. Additionally, you can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see:

- Overview for Creating a Trail
- CloudTrail Supported Services and Integrations
- Configuring Amazon SNS Notifications for CloudTrail
- Receiving CloudTrail Log Files from Multiple Regions and Receiving CloudTrail Log Files from Multiple Accounts

CloudTrail logs all Amazon Transcribe actions, which are documented in the API Reference. For example, the `CreateVocabulary`, `GetTranscriptionJob`, and `StartTranscriptionJob` operations generate entries in the CloudTrail log files. When CloudTrail logs Amazon Transcribe API operations, the CloudTrail log entry uses empty strings for sensitive information in the request and response parameters, such as Amazon S3 URI values.

Every event or log entry contains information about who generated the request. This information helps you determine the following:

- Whether the request is made with root or IAM user credentials
- Whether the request is made with temporary security credentials for an IAM role or federated user
- Whether the request is made by another AWS service

For more information, see the CloudTrail userIdentity Element.

You can also aggregate Amazon Transcribe log files from multiple AWS Regions and multiple AWS accounts into a single Amazon S3 bucket. For more information, see Receiving CloudTrail Log Files from Multiple Regions and Receiving CloudTrail Log Files from Multiple Accounts.

Example: Amazon Transcribe log file entries

A *trail* is a configuration that enables delivery of events as log files to a specified Amazon S3 bucket. CloudTrail log files contain one or more log entries. An *event* represents a single request from any source. It includes such information about the requested action as the date and time of the action, and request parameters. CloudTrail log files aren't an ordered stack trace of the public API calls, so they don't appear in any specific order.

Calls to the `StartTranscriptionJob` and `GetTranscriptionJob` API operations create the following entry.

Note

When CloudTrail logs Amazon Transcribe API operations, the CloudTrail log entry uses empty strings for sensitive information in the request and response parameters, such as Amazon S3 URI values.

```
{
    "Records": [
        {
            "eventVersion": "1.05",
            "userIdentity": {
                "type": "IAMUser",
                "principalId": "111122223333",
                "arn": "arn:aws:iam:us-west-2:111122223333:user/my-user-name",
                "accountId": "111122223333",
                "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
                "userName": "my-user-name"
            },
            "eventTime": "2022-03-07T15:03:45Z",
            "eventSource": "transcribe.amazonaws.com",
            "eventName": "StartTranscriptionJob",
            "awsRegion": "us-west-2",
            "sourceIPAddress": "127.0.0.1",
            "userAgent": "[]",
            "requestParameters": {
                "mediaFormat": "flac",
                "languageCode": "en-US",
                "transcriptionJobName": "my-first-transcription-job",
                "media": {
                    "mediaFileUri": ""
                }
            },
            "responseElements": {
                "transcriptionJob": {
                    "transcriptionJobStatus": "IN_PROGRESS",
                    "mediaFormat": "flac",
                    "creationTime": "2022-03-07T15:03:44.229000-08:00",
                    "transcriptionJobName": "my-first-transcription-job",
                    "languageCode": "en-US",
                    "media": {
                        "mediaFileUri": ""
                    }
                }
            },
            "requestID": "47B8E8D397DCE7A6",
            "eventID": "cdc4b7ed-e171-4cef-975a-ad829d4123e8",
            "eventType": "AwsApiCall",
            "recipientAccountId": "111122223333"
        },
        {
            "eventVersion": "1.05",
            "userIdentity": {
                "type": "IAMUser",
                "principalId": "111122223333",
                "arn": "arn:aws:iam:us-west-2:111122223333:user/my-user-name",
                "accountId": "111122223333",
                "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
                "userName": "my-user-name"
            },
            "eventTime": "2022-03-07T15:07:11Z",
            "eventSource": "transcribe.amazonaws.com",
            "eventName": "GetTranscriptionJob",
            "awsRegion": "us-west-2",
            "sourceIPAddress": "127.0.0.1",
            "userAgent": "[]",
            "requestParameters": {
                "transcriptionJobName": "my-first-transcription-job"
            },
            "responseElements": {
                "transcriptionJob": {
                    "settings": {

                    },
                    "transcriptionJobStatus": "COMPLETED",
                    "mediaFormat": "flac",
                    "creationTime": "2022-03-07T15:03:44.229000-08:00",
                    "transcriptionJobName": "my-first-transcription-job",
                    "languageCode": "en-US",
                    "media": {
                        "mediaFileUri": ""
                    },
                    "transcript": {
                        "transcriptFileUri": ""
                    }
                }
            },
            "requestID": "BD8798EACDD16751",
            "eventID": "607b9532-1423-41c7-b048-ec2641693c47",
            "eventType": "AwsApiCall",
            "recipientAccountId": "111122223333"
        }
    ]
}
```

Using Amazon EventBridge with Amazon Transcribe

With Amazon EventBridge, you can respond to state changes in your Amazon Transcribe jobs by initiating events in other AWS services. When a transcription job changes state, EventBridge automatically sends an event to an event stream. You create rules that define the events that you want to monitor in the event stream and the action that EventBridge should take when those events occur. For example, routing the event to another service (or target), which can then take an action. You could, for example, configure a rule to route an event to an AWS Lambda function when a transcription job has completed successfully. To define EventBridge rules, refer to the following sections.

You can receive notifications for events through multiple channels, including email, Amazon Q Developer in chat applications chat notifications, or AWS Console Mobile Application push notifications. You can also see notifications in the Console Notifications Center. If you want to set up notifications, you can use AWS User Notifications. AWS User Notifications supports aggregation, which can reduce the number of notifications you receive during specific events.

Defining EventBridge rules

To define EventBridge rules, use the AWS Management Console. When you define a rule, use Amazon Transcribe as the service name. For an example of how to create an EventBridge rule, see Amazon EventBridge rules.

Before using EventBridge, note the following definitions:

- **Event**–An event indicates a change in the state of one of your transcription jobs. For example, when the `TranscriptionJobStatus` of a job changes from `IN_PROGRESS` to `COMPLETED`.
- **Target**–A target is another AWS service that processes an event. For example, AWS Lambda or Amazon Simple Notification Service (Amazon SNS). A target receives events in JSON format.
- **Rule**–A rule matches incoming events that you want EventBridge to watch for and routes them to a target or targets for processing. If a rule routes an event to multiple targets, all of the targets process the event in parallel. A rule can customize the JSON sent to the target.

Amazon EventBridge events are emitted on a best-effort basis. For more information about creating and managing events in EventBridge, see Amazon EventBridge events in the *Amazon EventBridge User Guide*.

The following is an example of an EventBridge rule for Amazon Transcribe that's initiated when a transcription job's status changes to `COMPLETED` or `FAILED`.

```
{
    "source": [
        "aws.transcribe"
    ],
    "detail-type": [
        "Transcribe Job State Change"
    ],
    "detail": {
        "TranscriptionJobStatus": [
            "COMPLETED",
            "FAILED"
        ]
    }
}
```

The rule contains the following fields:

- `source`–The source of the event. For Amazon Transcribe, this is always `aws.transcribe`.
- `detail-type`–An identifier for the details of the event. For Amazon Transcribe, this is always `Transcribe Job State Change`.
- `detail`–The new job status of the transcription job. In this example, the rule initiates an event when the job status changes to `COMPLETED` or `FAILED`.

Amazon Transcribe events

Amazon EventBridge logs several Amazon Transcribe events:

- Transcription job events
- Language identification events
- Call Analytics events
- Call Analytics post-call events
- Vocabulary events

These events all contain the following shared fields:

- `version`: The version of the event data. This value is always `0`.
- `id`: A unique identifier generated by EventBridge for the event.
- `detail-type`: An identifier for the details of the event. For example, `Transcribe Job State Change`.
- `source`: The source of the event. For Amazon Transcribe this is always `aws.transcribe`.
- `account`: The AWS account ID of the account that generated the API call.

- `time`: The date and time the event is delivered.
- `region`: The AWS Region in which the request is made.
- `resources`: The resources used by the API call. For Amazon Transcribe, this field is always empty.
- `detail`: Additional details about the event.
  - `FailureReason`: This field is present if the state or status changes to `FAILED`, and describes the reason for the `FAILED` state or status.
  - Each event type has additional unique fields that are displayed under `detail`. These unique fields are defined in the following sections after each event example.

Transcription job events

When a job's state changes from `IN_PROGRESS` to `COMPLETED` or `FAILED`, Amazon Transcribe generates an event. To identify the job that changed state and initiate the event in your target, use the event's `TranscriptionJobName` field. An Amazon Transcribe event contains the following information. A `FailureReason` field is added under `detail` if your transcription job status is `FAILED`.

Note that this event applies only to the `StartTranscriptionJob` API operation.

```
{
    "version": "0",
    "id": "event ID",
    "detail-type":"Transcribe Job State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
          "TranscriptionJobName": "my-first-transcription-job",
          "TranscriptionJobStatus": "COMPLETED" (or "FAILED")
    }
}
```

- `TranscriptionJobName`: The unique name you chose for your transcription job.
- `TranscriptionJobStatus` : The status of the transcription job. This can be `COMPLETED` or `FAILED`.

Language identification events

When you enable automatic language identification, Amazon Transcribe generates an event when the language identification state is COMPLETED or FAILED. To identify the job that changed state and initiate the event in your target, use the event's JobName field. An Amazon Transcribe event contains the following information. A FailureReason field is added under detail if your language identification status is FAILED.

Note that this event applies only to the StartTranscriptionJob API operation when the LanguageIdSettings parameter is included.

```
{
    "version": "0",
    "id": "event ID",
    "detail-type": "Language Identification State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
        "JobType": "TranscriptionJob",
        "JobName": "my-first-lang-id-job",
        "LanguageIdentificationStatus": "COMPLETED" (or "FAILED")
    }
}
```

- JobType: For transcription jobs, this value must be TranscriptionJob.
- JobName: The unique name of your transcription job.
- LanguageIdentificationStatus: The status of language identification in a transcription job. This can be COMPLETED or FAILED.

Call Analytics events

When a Call Analytics job state changes from IN_PROGRESS to COMPLETED or FAILED, Amazon Transcribe generates an event. To identify the Call Analytics job that changed state and initiates the event in your target, use the event's JobName field. An Amazon Transcribe event contains the following information. A FailureReason field is added under detail if your Call Analytics job status is FAILED.

Note that this event applies only to the StartCallAnalyticsJob API operation.

```
{
    "version": "0",
    "id": "event ID",
    "detail-type": "Call Analytics Job State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
        "JobName": "my-first-analytics-job",
        "JobStatus": "COMPLETED" (or "FAILED"),
        "AnalyticsJobDetails": { // only when you enable optional features such as
 Generative Call Summarization
            "Skipped": []
        }
    }
}
```

- `JobName`: The unique name of your Call Analytics transcription job.
- `JobStatus`: The status of your Call Analytics transcription job. This can be either `COMPLETED` or `FAILED`.
- `AnalyticsJobDetails`: The details of your Call Analytics transcription job, including information about skipped analytics features.

Call Analytics post-call events

When a post-call analytics transcription changes state from `IN_PROGRESS` to `COMPLETED` or `FAILED`, Amazon Transcribe generates an event. To identify the Call Analytics post-call job that changed state and initiate the event in your target, use the event's `StreamingSessionId` field.

Note that this event applies only to the `StartCallAnalyticsStreamTranscription` API operation when the `PostCallAnalyticsSettings` parameter is included.

A `COMPLETED` event contains the following information:

```
{
    "version": "0",
    "id": "event ID",
    "detail-type": "Call Analytics Post Call Job State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
        "StreamingSessionId": "session-id",
        "PostCallStatus": "COMPLETED",
        "Transcript": {
            "RedactedTranscriptFileUri": "s3://amzn-s3-demo-bucket/my-output-files/my-
redacted-file.JSON",
            "TranscriptFileUri": "s3://amzn-s3-demo-bucket/my-output-files/my-
file.JSON"
        },
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/my-output-files/my-redacted-
file.WAV",
            "RedactedMediaFileUri": "s3://amzn-s3-demo-bucket/my-output-files/my-
redacted-file.WAV"
        }
    }
}
```

A `FAILED` event contains the following information:

```
{
    "version": "0",
    "id": "event ID",
    "detail-type": "Call Analytics Post Call Job State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
        "StreamingSessionId": "session-id",
        "PostCallStatus": "FAILED"
    }
}
```

- `StreamingSessionId`: The identification number assigned to your real-time Call Analytics transcription request.

- `PostCallStatus`: The status of your post-call Call Analytics transcription. This can be either `COMPLETED` or `FAILED`.
- `Transcript`: The URI of your redacted and unredacted transcripts.
- `Media`: The URI of your redacted and unredacted audio files.

AWS HealthScribe post stream analytics events

When a state changes for a AWS HealthScribe post-stream analytics operation, such as a ClinicalNoteGenerationResult changing from `IN_PROGRESS` to `COMPLETED`, AWS HealthScribe generates an event with the following information:

```
{
   "version":"0",
   "id":"event ID",
   "detail-type":"MedicalScribe Post Stream Analytics Update",
   "source":"aws.transcribe",
   "account":"111122223333",
   "time":"timestamp",
   "region":"us-east-1",
   "resources":[],
   "detail":{
      "SessionId": <SessionID>,
      "UpdateType": "ClinicalNoteGenerationResult",
      "ClinicalNoteGenerationResult": {
          "ClinicalNoteOutputLocation": s3://amzn-s3-demo-bucket/clinical-note-output-
files/clinical-notes.JSON,
          "TranscriptOutputLocation": s3://amzn-s3-demo-bucket/my-output-files/my-
file.JSON,
          "Status": <IN_PROGRESS | COMPLETED | FAILED>,
          "FailureReason": <failure_reason>
    }
   }
}
```

- `UpdateType`: The type of post-stream analytics operation that generated the event. The content of the result object varies depending on the `UpdateType`.
- `SessionId`: The identification number for your AWS HealthScribe stream. Use this ID to identify originating streaming session and then find the post-stream analytics that generated the event.

- `Status`: The status of the post-stream analytics operation. This can be `IN_PROGRESS`, `COMPLETED`, or `FAILED`.
- `ClinicalNoteOutputLocation`: The URI of the output Amazon S3 bucket for the `ClinicalNoteGenerationResult`.
- `TranscriptOutputLocation`: The URI of your transcript.

Vocabulary events

When a custom vocabulary's state changes from `PENDING` to `READY` or `FAILED`, Amazon Transcribe generates an event. To identify the custom vocabulary that changed state and initiate the event in your target, use the event's `VocabularyName` field. An Amazon Transcribe event contains the following information. A `FailureReason` field is added under `detail` if your custom vocabulary state is `FAILED`.

Note

This event applies only to the `CreateVocabulary` API operation.

```
{
    "version": "0",
    "id": "event ID",
    "detail-type": "Vocabulary State Change",
    "source": "aws.transcribe",
    "account": "111122223333",
    "time": "timestamp",
    "region": "us-west-2",
    "resources": [],
    "detail": {
        "VocabularyName": "unique-vocabulary-name",
        "VocabularyState": "READY" (or "FAILED")
    }
}
```

- `VocabularyName`: The unique name of your custom vocabulary.
- `VocabularyState`: The processing state of your custom vocabulary. This can be `READY` or `FAILED`.

Compliance validation for Amazon Transcribe

To learn whether an AWS service is within the scope of specific compliance programs, see AWS services in Scope by Compliance Program and choose the compliance program that you are interested in. For general information, see AWS Compliance Programs.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading Reports in AWS Artifact.

Your compliance responsibility when using AWS services is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. AWS provides the following resources to help with compliance:

- Security Compliance & Governance – These solution implementation guides discuss architectural considerations and provide steps for deploying security and compliance features.
- HIPAA Eligible Services Reference – Lists HIPAA eligible services. Not all AWS services are HIPAA eligible.
- AWS Compliance Resources – This collection of workbooks and guides might apply to your industry and location.
- AWS Customer Compliance Guides – Understand the shared responsibility model through the lens of compliance. The guides summarize the best practices for securing AWS services and map the guidance to security controls across multiple frameworks (including National Institute of Standards and Technology (NIST), Payment Card Industry Security Standards Council (PCI), and International Organization for Standardization (ISO)).
- Evaluating Resources with Rules in the *AWS Config Developer Guide* – The AWS Config service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- AWS Security Hub – This AWS service provides a comprehensive view of your security state within AWS. Security Hub uses security controls to evaluate your AWS resources and to check your compliance against security industry standards and best practices. For a list of supported services and controls, see Security Hub controls reference.
- Amazon GuardDuty – This AWS service detects potential threats to your AWS accounts, workloads, containers, and data by monitoring your environment for suspicious and malicious activities. GuardDuty can help you address various compliance requirements, like PCI DSS, by meeting intrusion detection requirements mandated by certain compliance frameworks.

- AWS Audit Manager – This AWS service helps you continuously audit your AWS usage to simplify how you manage risk and compliance with regulations and industry standards.

Resilience in Amazon Transcribe

The AWS global infrastructure is built around AWS Regions and Availability Zones. AWS Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. With Availability Zones, you can design and operate applications and databases that automatically fail over between zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about AWS Regions and Availability Zones, see AWS Global Infrastructure.

Infrastructure security in Amazon Transcribe

As a managed service, Amazon Transcribe is protected by AWS global network security. For information about AWS security services and how AWS protects infrastructure, see AWS Cloud Security. To design your AWS environment using the best practices for infrastructure security, see Infrastructure Protection in *Security Pillar AWS Well‐Architected Framework*.

You use AWS published API calls to access Amazon Transcribe through the network. Clients must support the following:

- Transport Layer Security (TLS). We require TLS 1.2 and recommend TLS 1.3.
- Cipher suites with perfect forward secrecy (PFS) such as DHE (Ephemeral Diffie-Hellman) or ECDHE (Elliptic Curve Ephemeral Diffie-Hellman). Most modern systems such as Java 7 and later support these modes.

Additionally, requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the AWS Security Token Service (AWS STS) to generate temporary security credentials to sign requests.

Vulnerability analysis and management in Amazon Transcribe

Configuration and IT controls are a shared responsibility between AWS and you, our customer. For more information, see the AWS shared responsibility model.

Amazon Transcribe and interface VPC endpoints (AWS PrivateLink)

You can establish a private connection between your VPC and Amazon Transcribe by creating an *interface VPC endpoint*. Interface endpoints are powered by AWS PrivateLink, a technology that you can use to privately access Amazon Transcribe APIs without an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection. Instances in your VPC don't need public IP addresses to communicate with Amazon Transcribe APIs. Traffic between your VPC and Amazon Transcribe does not leave the Amazon network.

Each interface endpoint is represented by one or more Elastic Network Interfaces in your subnets.

For more information, see Interface VPC endpoints (AWS PrivateLink) in the *Amazon VPC User Guide*.

Considerations for Amazon Transcribe VPC endpoints

Before you set up an interface VPC endpoint for Amazon Transcribe, make sure that you review Interface endpoint properties and limitations in the *Amazon VPC User Guide*.

Amazon Transcribe supports making calls to all of its API actions from your VPC.

Creating an interface VPC endpoint for Amazon Transcribe

You can create a VPC endpoint for the Amazon Transcribe service using the Amazon VPC AWS Management Console or AWS CLI. For more information, see Creating an interface endpoint in the *Amazon VPC User Guide*.

For batch transcriptions in Amazon Transcribe, create a VPC endpoint using the following service name:

- com.amazonaws.*us-west-2*.transcribe

For streaming transcriptions in Amazon Transcribe, create a VPC endpoint using the following service name:

- com.amazonaws.*us-west-2*.transcribestreaming

If you enable private DNS for the endpoint, you can make API requests to Amazon Transcribe using its default DNS name for the AWS Region, for example, `transcribestreaming.us-east-2.amazonaws.com`.

For more information, see Accessing a service through an interface endpoint in the *Amazon VPC User Guide*.

Creating a VPC endpoint policy for Amazon Transcribe

You can attach an endpoint policy to your VPC endpoint that controls access to the streaming service or batch transcription service of Amazon Transcribe. The policy specifies the following information:

- The principal that can perform actions.
- The actions that can be performed.
- The resources on which actions can be performed.

For more information, see Controlling access to services with VPC endpoints in the *Amazon VPC User Guide*.

Example: VPC endpoint policy for Amazon Transcribe batch transcription actions

The following is an example of an endpoint policy for a batch transcription in Amazon Transcribe. When attached to an endpoint, this policy grants access to the listed Amazon Transcribe actions for all principals on all resources.

```
{
   "Statement":[
      {
         "Principal":"*",
         "Effect":"Allow",
         "Action":[
            "transcribe:StartTranscriptionJob",
            "transcribe:ListTranscriptionJobs"
         ],
         "Resource":"*"
      }
   ]
}
```

Example: VPC endpoint policy for Amazon Transcribe streaming transcription actions

The following is an example of an endpoint policy for a streaming transcription in Amazon Transcribe. When attached to an endpoint, this policy grants access to the listed Amazon Transcribe actions for all principals on all resources.

```
{
   "Statement":[
      {
         "Principal":"*",
         "Effect":"Allow",
         "Action":[
            "transcribe:StartStreamTranscription",
            "transcribe:StartStreamTranscriptionWebsocket"
         ],
         "Resource":"*"
      }
   ]
}
```

Shared subnets

You cannot create, describe, modify, or delete VPC endpoints in subnets that are shared with you. However, you can use the VPC endpoints in subnets that are shared with you. For information about VPC sharing, see Share your VPC with other accounts in the Amazon Virtual Private Cloud guide.

Security best practices for Amazon Transcribe

The following best practices are general guidelines and don’t represent a complete security solution. Because these best practices might not be appropriate or sufficient for your environment, use them as helpful considerations rather than prescriptions.

- **Use data encryption, such as AWS KMS encryption context**

  AWS KMS encryption context is a map of plain text, non-secret key:value pairs. This map represents additional authenticated data, known as encryption context pairs, which provide an added layer of security for your data.

  For more information, refer to AWS KMS encryption context.

- **Use temporary credentials whenever possible**

  Where possible, use temporary credentials instead of long-term credentials, such as access keys. For scenarios in which you need IAM users with programmatic access and long-term credentials, we recommend that you rotate access keys. Regularly rotating long-term credentials helps you familiarize yourself with the process. This is useful in case you are ever in a situation where you must rotate credentials, such as when an employee leaves your company. We recommend that you use *IAM access last used information* to rotate and remove access keys safely.

For more information, see Rotating access keys and Security best practices in IAM.

- **Use IAM roles for applications and AWS services that require Amazon Transcribe access**

  Use an IAM role to manage temporary credentials for applications or services that need to access Amazon Transcribe. When you use a role, you don't have to distribute long-term credentials, such as passwords or access keys, to an Amazon EC2 instance or AWS service. IAM roles can supply temporary permissions that applications can use when they make requests to AWS resources.

  For more information, refer to IAM roles and Common scenarios for roles: Users, applications, and services.
- **Use tag-based access control**

  You can use tags to control access within your AWS accounts. In Amazon Transcribe. tags can be added to: transcription jobs, custom vocabularies, custom vocabulary filters, and custom language models.

  For more information, refer to Tag-based access control.
- **Use AWS monitoring tools**

  Monitoring is an important part of maintaining the reliability, security, availability, and performance of Amazon Transcribe and your AWS solutions. You can monitor Amazon Transcribe using CloudTrail.

  For more information, refer to Monitoring Amazon Transcribe with AWS CloudTrail.
- **Enable AWS Config**

  AWS Config can assess, audit, and evaluate the configurations of your AWS resources. Using AWS Config, you can review changes in configurations and relationships between AWS resources. You can also investigate detailed resource configuration histories and determine your overall compliance against the configurations specified in your internal guidelines. This can help you simplify compliance auditing, security analysis, change management, and operational troubleshooting.

  For more information, refer to What Is AWS Config?

Amazon Transcribe Medical

Amazon Transcribe Medical is an automatic speech recognition (ASR) service designed for medical professionals who want to transcribe medical-related speech, such as physician-dictated notes, drug safety monitoring, telemedicine appointments, or physician-patient conversations. Amazon Transcribe Medical is available through either real-time streaming (via microphone) or transcription of an uploaded file (batch).

Important

Amazon Transcribe Medical is not a substitute for professional medical advice, diagnosis, or treatment. Identify the right confidence threshold for your use case, and use high confidence thresholds in situations that require high accuracy. For certain use cases, results should be reviewed and verified by appropriately trained human reviewers. Amazon Transcribe Medical transcriptions should only be used in patient care scenarios after review for accuracy and sound medical judgment by trained medical professionals.

Amazon Transcribe Medical operates under a shared responsibility model, whereby AWS is responsible for protecting the infrastructure that runs Amazon Transcribe Medical and you are responsible for managing your data. For more information, see Shared Responsibility Model.

Amazon Transcribe Medical is available in US English (en-US).

For best results, use a lossless audio format, such as FLAC or WAV, with PCM 16-bit encoding. Amazon Transcribe Medical supports sample rates of 16,000 Hz or higher.

For analysis of your transcripts, you can use other AWS services, such as Amazon Comprehend Medical.

Supported specialties

Specialty	Sub-specialty	Audio input
Cardiology	none	streaming only
Neurology	none	streaming only
Oncology	none	streaming only

Specialty	Sub-specialty	Audio input
Primary Care	Family Medicine	batch, streaming
Primary Care	Internal Medicine	batch, streaming
Primary Care	Obstetrics and Gynecology (OB-GYN)	batch, streaming
Primary Care	Pediatrics	batch, streaming
Radiology	none	streaming only
Urology	none	streaming only

Region availability and quotas

Call Analytics is supported in the following AWS Regions:

Region	Transcription type
af-south-1 (Cape Town)	batch
ap-east-1 (Hong Kong)	batch
ap-northeast-1 (Tokyo)	batch, streaming
ap-northeast-2 (Seoul)	batch, streaming
ap-south-1 (Mumbai)	batch
ap-southeast-1 (Singapore)	batch
ap-southeast-2 (Sydney)	batch, streaming
ca-central-1 (Canada, Central)	batch, streaming
eu-central-1 (Frankfurt)	batch, streaming
eu-north-1 (Stockholm)	batch

Region	Transcription type
eu-west-1 (Ireland)	batch, streaming
eu-west-2 (London)	batch, streaming
eu-west-3 (Paris)	batch
me-south-1 (Bahrain)	batch
sa-east-1 (São Paulo)	batch, streaming
us-east-1 (N. Virginia)	batch, streaming
us-east-2 (Ohio)	batch, streaming
us-gov-east-1 (GovCloud, US-East)	batch, streaming
us-gov-west-1 (GovCloud, US-West)	batch, streaming
us-west-1 (San Francisco)	batch
us-west-2 (Oregon)	batch, streaming

Note that Region support differs for Amazon Transcribe, Amazon Transcribe Medical, and Call Analytics..

To get the endpoints for each supported Region, see Service endpoints in the *AWS General Reference*.

For a list of quotas that pertain to your transcriptions, refer to the Service quotas in the *AWS General Reference*. Some quotas can be changed upon request. If the **Adjustable** column contains '**Yes**', you can request an increase. To do so, select the provided link.

Medical specialties and terms

When creating a medical transcription job, you specify the language, the medical specialty, and the audio type of the source file. You input US English (en-US) as the language and `PRIMARYCARE` as the medical specialty. Entering primary care as the value enables you to generate transcriptions from source audio in the following medical specialties:

- Family Medicine
- Internal Medicine
- Obstetrics and Gynecology (OB-GYN)
- Pediatrics

You have the choice between dictation and conversation for your audio type. Choose dictation for audio files where the physician is giving a report about a patient visit or procedure. Choose conversation for audio files that involve a conversation between a physician and a patient or a conversation between physicians.

To store the output of your transcription job, select an Amazon S3 bucket that you've already created. For more information on Amazon S3 buckets see Getting Started with Amazon Simple Storage Service.

The following are the minimum number of request parameters to enter in the sample JSON.

```
{
   "MedicalTranscriptionJobName": "my-first-transcription-job",
   "LanguageCode": "en-US",
   "Media": {
       "MediaFileUri": "s3://path to your audio file"
   },
   "OutputBucketName": “your output bucket name",
   "Specialty": "PRIMARYCARE",
   "Type": "CONVERSATION"
}
```

Amazon Transcribe Medical enables you to generate alternative transcriptions. For more information, see Generating alternative transcriptions.

You can also enable speaker partitioning or identify channels in your audio. For more information, see Enabling speaker partitioning and Transcribing multi-channel audio.

Transcribing medical terms and measurements

Amazon Transcribe Medical can transcribe medical terms and measurements. Amazon Transcribe Medical outputs abbreviations for spoken terms. For example, "blood pressure" is transcribed as BP. You can find a list of conventions that Amazon Transcribe Medical uses for medical terms and measurements in the table on this page. The *Spoken Term* column refers to the term spoken in the source audio. The *Output* column refers to the abbreviation you see in your transcription results.

You can see how the terms spoken in source audio correspond to the transcription output here.

Term spoken in source audio	Abbreviation used in output	Example output
Centigrade	C	The patient's temperature is 37.4 C.
Celsius	C	The patient's temperature is 37.4 C.
Fahrenheit	F	The patient's temperature is 101 F.
grams	g	A mass of 100 g was extracted from the patient.
meters	m	The patient is 1.8 m tall.
feet	ft	The patient is 6 ft tall.
kilos	kg	The patient weighs 80 kg.
kilograms	kg	The patient weighs 80 kg.
c c	cc	Patient received 100 cc of saline solution.
cubic centimeter	cc	Patient received 100 cc of saline solution.
milliliter	mL	Patient excreted 100 mL urine.
blood pressure	BP	Patient BP was elevated.
b p	BP	Patient BP was elevated.
X over Y	X/Y	Patient BP was 120/80.

Term spoken in source audio	Abbreviation used in output	Example output
beats per min	BPM	Patient had atrial fibrillation with heart rate of 160 BPM.
beats per minute	BPM	Patient had atrial fibrillation with heart rate of 160 BPM.
O 2	O2	Patient O2 saturation was 98%.
CO2	CO2	Patient required respiratory support for elevated CO2.
post operation	POSTOP	Patient came for POSTOP evaluation.
post op	POSTOP	Patient came for POSTOP evaluation.
cat scan	CT Scan	Patient indication of cerebral hemorrhage required use of CT Scan.
Pulse 80	P 80	Patient vitals were P 80, R 17,...
Respiration 17	R 17	Patient vitals were P 80, R 17,...
in and out	I/O	Patient was I/O sinus rhythm
L five	L5	Lumbar puncture was performed between L4 and L5

Transcribing numbers

Amazon Transcribe Medical transcribes digits as numbers instead of words. For example, the spoken number "one thousand two hundred forty-two" is transcribed as 1242.

Numbers are transcribed according to the following rules.

Rule	Description
Convert cardinal numbers greater than 10 to numbers.	• "Fifty five" > 55 • "a hundred" > 100 • "One thousand and thirty one" > 1031 • "One hundred twenty-three million four hundred fifty six thousand seven hundred eight nine" > 123,456,789
Convert cardinal numbers followed by "million" or "billion" to numbers followed by a word when "million" or "billion" is not followed by a number.	• "one hundred million" > 100 million • "one billion" > 1 billion • "two point three million" > 2.3 million
Convert ordinal numbers greater than 10 to numbers.	• "Forty third" > 43rd • "twenty sixth avenue" > 26th avenue
Convert fractions to their numeric format.	• "a quarter" > 1/4 • "three sixteenths" > 3/16 • "a half" > 1/2 • "a hundredth" > 1/100
Convert numbers less than 10 to digits if there are more than one in a row.	• "three four five" > 345 • "My phone number is four two five five five five one two one two" > 4255551212
Decimals are indicated by "dot" or "point."	• "three hundred and three dot five" > 303.5 • "three point twenty three" > 3.23 • "zero point four" > 0.4

Rule	Description
	• "point three" > 0.3
Convert the word "percent" after a number to a percent sign.	• "twenty three percent" > 23% • "twenty three point four five percent" > 23.45%
Convert the words "dollar," "US dollar," "Australian dollar, "AUD," or "USD" after a number to a dollar symbol before the number.	• "one dollar and fifteen cents" > $1.15 • "twenty three USD" > $23 • "twenty three Australian dollars" > $23
Convert the words "pounds," or "milligrams" to "lbs" or "mg".	• "twenty three pounds" > 23 lbs • "forty-five milligrams" > 45 mg
Convert the words "rupees," "Indian rupees," or "INR" after a number to rupee sign (₹) before the number.	• "twenty three rupees" > ₹23 • "fifty rupees thirty paise" > ₹50.30
Convert times to numbers.	• "seven a m eastern standard time" > 7 a.m. eastern standard time • "twelve thirty p m" > 12:30 p.m.
Combine years expressed as two digits into four. Only valid for the 20th, 21st, and 22nd centuries.	• "nineteen sixty two" > 1962 • "the year is twenty twelve" > the year is 2012 • "twenty nineteen" > 2019 • "twenty one thirty" > 2130
Convert dates to numbers.	• "May fifth twenty twelve" > May 5th 2012 • "May five twenty twelve" > May 5 2012 • "five May twenty twelve" > 5 May 2012
Separate spans of numbers by the word "to."	• "twenty three to thirty seven" > 23 to 37

Transcribing a medical conversation

You can use Amazon Transcribe Medical to transcribe a medical conversation between a clinician and a patient using either a batch transcription job or a real-time stream. Batch transcription jobs enable you to transcribe audio files. To ensure that Amazon Transcribe Medical produces transcription results with the highest possible accuracy, you must specify the medical specialty of the clinician in your transcription job or stream.

You can transcribe a clinician-patient visit in the following medical specialities:

- Cardiology – available in streaming transcription only
- Neurology – available in streaming transcription only
- Oncology – available in streaming transcription only
- Primary Care – includes the following types of medical practice:
  - Family medicine
  - Internal medicine
  - Obstetrics and Gynecology (OB-GYN)
  - Pediatrics
- Urology – available in streaming transcription only

You can improve transcription accuracy by using medical custom vocabularies. For information on how medical custom vocabularies work, see Improving transcription accuracy with medical custom vocabularies.

By default, Amazon Transcribe Medical returns the transcription with the highest confidence level. If you'd like to configure it to return alternative transcriptions, see Generating alternative transcriptions.

For information about how numbers and medical measurements appear in the transcription output, see Transcribing numbers and Transcribing medical terms and measurements.

Topics

Transcribing an audio file of a medical conversation

Use a batch transcription job to transcribe audio files of medical conversations. You can use this to transcribe a clinician-patient dialogue. You can start a batch transcription job in either the `StartMedicalTranscriptionJob` API or the AWS Management Console.

When you start a medical transcription job with the `StartMedicalTranscriptionJob` API, you specify `PRIMARYCARE` as the value of the `Specialty` parameter.

AWS Management Console

To transcribe a clinician-patient dialogue (AWS Management Console)

To use the AWS Management Console to transcribe a clinician-patient dialogue, create a transcription job and choose **Conversation** for **Audio input type**.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.
4. On the **Specify job details** page, under **Job settings** , specify the following.
   a. **Name** – the name of the transcription job.
   b. **Audio input type – Conversation**
5. For the remaining fields, specify the Amazon S3 location of your audio file and where you want to store the output of your transcription job.
6. Choose **Next**.
7. Choose **Create**.

API

To transcribe a medical conversation using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.
  a. For `MedicalTranscriptionJobName`, specify a name unique in your AWS account.
  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in your audio file and the language of your vocabulary filter.

c. For the MediaFileUri parameter of the Media object, specify the name of the audio file that you want to transcribe.

d. For Specialty, specify the medical specialty of the clinician speaking in the audio file as PRIMARYCARE.

e. For Type, specify CONVERSATION.

f. For OutputBucketName, specify the Amazon S3 bucket to store the transcription results.

The following is an example request that uses the AWS SDK for Python (Boto3) to transcribe a medical conversation of a clinician in the PRIMARYCARE specialty and a patient.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-med-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac"
transcribe.start_medical_transcription_job(
      MedicalTranscriptionJobName = job_name,
      Media = {
        'MediaFileUri': job_uri
      },
      OutputBucketName = 'amzn-s3-demo-bucket',
      OutputKey = 'output-files/',
      LanguageCode = 'en-US',
      Specialty = 'PRIMARYCARE',
      Type = 'CONVERSATION'
  )

while True:
    status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName =
 job_name)
    if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

The following example code shows the transcription results of a clinician-patient conversation.

```
{
    "jobName": "conversation-medical-transcription-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "... come for a follow up visit today..."
            }
        ],
        "items": [
            {
            ...
                "start_time": "4.85",
                "end_time": "5.12",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "come"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.12",
                "end_time": "5.29",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "for"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.29",
                "end_time": "5.33",
                "alternatives": [
                    {
                        "confidence": "0.9955",
                        "content": "a"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.33",
                "end_time": "5.66",
                "alternatives": [
                    {
                        "confidence": "0.9754",
                        "content": "follow"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.66",
                "end_time": "5.75",
                "alternatives": [
                    {
                        "confidence": "0.9754",
                        "content": "up"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.75",
                "end_time": "6.02",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "visit"
                    }
                ]
                ...
    },
    "status": "COMPLETED"
}
```

AWS CLI

To transcribe a medical conversation using a batch transcription job (AWS CLI)

- Run the following code.

```
aws transcribe start-medical-transcription-job \
--region us-west-2 \
--cli-input-json file://example-start-command.json
```

The following code shows the contents of `example-start-command.json`.

```
{
      "MedicalTranscriptionJobName": "my-first-med-transcription-job",
      "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-audio-
file.flac"
      },
      "OutputBucketName": "amzn-s3-demo-bucket",
      "OutputKey": "my-output-files/",
      "LanguageCode": "en-US",
      "Specialty": "PRIMARYCARE",
      "Type": "CONVERSATION"
  }
```

Transcribing a medical conversation in a real-time stream

You can transcribe an audio stream of a medical conversation using either the HTTP/2 or WebSocket protocols. For information on how to start a stream using the WebSocket protocol, see Setting up a WebSocket stream. To start an HTTP/2 stream, use the `StartMedicalStreamTranscription` API.

You can transcribe streaming audio in the following medical specialties:

- Cardiology
- Neurology
- Oncology

- Primary Care
- Urology

Each medical specialty includes many types of procedures and appointments. Clinicians therefore dictate many different types of notes. Use the following examples as guidance to help you specify the value of the `specialty` URI parameter of the WebSocket request, or the `Specialty` parameter of the `StartMedicalStreamTranscription` API:

- For electrophysiology or echocardiography consultations, choose `CARDIOLOGY`.
- For medical oncology, surgical oncology, or radiation oncology consultations, choose `ONCOLOGY`.
- For a physician providing a consultation to a patient who had a stroke, either a transient ischemic attack or a cerebrovascular attack, choose `NEUROLOGY`.
- For a consultation around urinary incontinence, choose `UROLOGY`.
- For yearly checkup or urgent care visits, choose `PRIMARYCARE`.
- For inpatient hospitalist visits, choose `PRIMARYCARE`.
- For consultations regarding fertility, tubal ligation, IUD insertion, or abortion, choose `PRIMARYCARE`.

AWS Management Console

To transcribe a streaming medical conversation (AWS Management Console)

To use the AWS Management Console to transcribe a clinician-patient dialogue in real-time stream, choose the option to transcribe a medical conversation, start the stream, and begin speaking into the microphone.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Real-time transcription**.
3. Choose **Conversation**.
4. For **Medical specialty**, choose the clinician's specialty.
5. Choose **Start streaming**.
6. Speak into the microphone.

Transcribing a medical conversation in an HTTP/2 stream

The following is the syntax for the parameters of an HTTP/2 request.

To transcribe an HTTP/2 stream of a medical conversation, use the `StartMedicalStreamTranscription` API and specify the following:

- `LanguageCode` – The language code. The valid value is `en-US`
- `MediaEncoding` – The encoding used for the input audio. Valid values are `pcm`, `ogg-opus`, and `flac`.
- `Specialty` – The specialty of the medical professional.
- `Type` – `CONVERSATION`

To improve transcription accuracy of specific terms in a real-time stream, use a custom vocabulary. To enable a custom vocabulary, set the value of `VocabularyName` parameter to the name of the custom vocabulary that you want to use. For more information, see Improving transcription accuracy with medical custom vocabularies.

To label the speech from different speakers, set the `ShowSpeakerLabel` parameter to `true`. For more information, see Enabling speaker partitioning.

For more information on setting up an HTTP/2 stream to transcribe a medical conversation, see Setting up an HTTP/2 stream.

Transcribing a medical conversation in a WebSocket stream

You can use a WebSocket request to transcribe a medical conversation. When you make a WebSocket request, you create a presigned URI. This URI contains the information needed to set up the audio stream between your application and Amazon Transcribe Medical. For more information on creating WebSocket requests, see Setting up a WebSocket stream.

Use the following template to create your presigned URI.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket
?language-code=languageCode
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
```

```
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&media-encoding=flac
&sample-rate=16000
&session-id=sessionId
&specialty=medicalSpecialty
&type=CONVERSATION
&vocabulary-name=vocabularyName
&show-speaker-label=boolean
```

To improve transcription accuracy of specific terms in a real-time stream, use a custom vocabulary. To enable a custom vocabulary, set the value of `vocabulary-name` to the name of the custom vocabulary that you want to use. For more information, see Improving transcription accuracy with medical custom vocabularies.

To label the speech from different speakers, set the `show-speaker-label` parameter in to `true`. For more information, see Enabling speaker partitioning.

For more information on creating pre-signed URIs, see Setting up a WebSocket stream.

Enabling speaker partitioning

To enable speaker partitioning in Amazon Transcribe Medical, use *speaker diarization*. This enables you to see what the patient said and what the clinician said in the transcription output.

When you enable speaker diarization, Amazon Transcribe Medical labels each speaker *utterance* with a unique identifier for each speaker. An *utterance* is a unit of speech that is typically separated from other utterances by silence. In batch transcription, an utterance from the clinician could receive a label of `spk_0` and an utterance the patient could receive a label of `spk_1`.

If an utterance from one speaker overlaps with an utterance from another speaker, Amazon Transcribe Medical orders them in the transcription by their start times. Utterances that overlap in the input audio don't overlap in the transcription output.

You can enable speaker diarization when you transcribe an audio file using batch transcription job, or in a real-time stream.

Topics

- Enabling speaker partitioning in batch transcriptions
- Enabling speaker partitioning in real-time streams

Enabling speaker partitioning in batch transcriptions

You can enable speaker partitioning in a batch transcription job using either the `StartMedicalTranscriptionJob` API or the AWS Management Console. This enables you to partition the text per speaker in a clinician-patient conversation and determine who said what in the transcription output.

AWS Management Console

To use the AWS Management Console to enable speaker diarization in your transcription job, you enable audio identification and then speaker partitioning.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.
4. On the **Specify job details** page, provide information about your transcription job.
5. Choose **Next**.
6. Enable **Audio identification**.
7. For **Audio identification type**, choose **Speaker partitioning**.
8. For **Maximum number of speakers**, enter the maximum number of speakers that you think are speaking in your audio file.
9. Choose **Create**.

API

To enable speaker partitioning using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `MedicalTranscriptionJobName`, specify a name that is unique in your AWS account.

  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in the audio file.

c. For the MediaFileUri parameter of the Media object, specify the name of the audio file that you want to transcribe.

d. For Specialty, specify the medical specialty of the clinician speaking in the audio file.

e. For Type, specify CONVERSATION.

f. For OutputBucketName, specify the Amazon S3 bucket to store the transcription results.

g. For the Settings object, specify the following.

   i. ShowSpeakerLabels – true.

   ii. MaxSpeakerLabels – An integer between 2 and 10 to indicate the number of speakers that you think are speaking in your audio.

The following request uses the AWS SDK for Python (Boto3) to start a batch transcription job of a primary care clinician patient dialogue with speaker partitioning enabled.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_medical_transcription_job(
    MedicalTranscriptionJobName = job_name,
    Media={
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Specialty = 'PRIMARYCARE',
    Type = 'CONVERSATION',
    OutputBucketName = 'amzn-s3-demo-bucket',
Settings = {'ShowSpeakerLabels': True,
         'MaxSpeakerLabels': 2
         }
         )
while True:
    status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName =
 job_name)
```

```
    if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

The following example code shows the transcription results of a transcription job with speaker partitioning enabled.

```
{
    "jobName": "job ID",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "Professional answer."
            }
        ],
        "speaker_labels": {
            "speakers": 1,
            "segments": [
                {
                    "start_time": "0.000000",
                    "speaker_label": "spk_0",
                    "end_time": "1.430",
                    "items": [
                        {
                            "start_time": "0.100",
                            "speaker_label": "spk_0",
                            "end_time": "0.690"
                        },
                        {
                            "start_time": "0.690",
                            "speaker_label": "spk_0",
                            "end_time": "1.210"
                        }
                    ]
                }
            ]
        },
        "items": [
            {
                "start_time": "0.100",
                "end_time": "0.690",
                "alternatives": [
                    {
                        "confidence": "0.8162",
                        "content": "Professional"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "0.690",
                "end_time": "1.210",
                "alternatives": [
                    {
                        "confidence": "0.9939",
                        "content": "answer"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "alternatives": [
                    {
                        "content": "."
                    }
                ],
                "type": "punctuation"
            }
        ]
    },
    "status": "COMPLETED"
}
```

AWS CLI

To transcribe an audio file of a conversation between a clinician practicing primary care and a patient (AWS CLI)

- Run the following code.

```
aws transcribe start-transcription-job \
--region us-west-2 \
--cli-input-json file://example-start-command.json
```

The following code shows the contents of `example-start-command.json`.

```
{
    "MedicalTranscriptionJobName": "my-first-med-transcription-job",
     "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac"
      },
      "OutputBucketName": "amzn-s3-demo-bucket",
      "OutputKey": "my-output-files/",
      "LanguageCode": "en-US",
      "Specialty": "PRIMARYCARE",
      "Type": "CONVERSATION",
      "Settings":{
          "ShowSpeakerLabels": true,
          "MaxSpeakerLabels": 2
        }
}
```

Enabling speaker partitioning in real-time streams

To partition speakers and label their speech in a real-time stream, use the AWS Management Console or a streaming request. Speaker partitioning works best for between two and five speakers in a stream. Although Amazon Transcribe Medical can partition more than five speakers in a stream, the accuracy of the partitions decrease if you exceed that number.

To start an HTTP/2 request, use the `StartMedicalStreamTranscription` API. To start a WebSocket request, use a pre-signed URI. The URI contains the information required to set up bi-directional communication between your application and Amazon Transcribe Medical.

Enabling speaker partitioning in audio that is spoken into your microphone (AWS Management Console)

You can use the AWS Management Console to start a real-time stream of a clinician-patient conversation, or a dictation that is spoken into your microphone in real-time.

1. Sign in to the AWS Management Console.
2. In the navigation pane, for Amazon Transcribe Medical choose **Real-time transcription**.
3. For **Audio input type**, choose the type of medical speech that you want to transcribe.
4. For **Additional settings**, choose **Speaker partitioning**.
5. Choose **Start streaming** to start transcribing your real-time audio.
6. Speak into the microphone.

Enabling speaker partitioning in an HTTP/2 stream

To enable speaker partitioning in an HTTP/2 stream of a medical conversation, use the `StartMedicalStreamTranscription` API and specify the following:

- For `LanguageCode`, specify the language code that corresponds to the language in the stream. The valid value is `en-US`.
- For `MediaSampleHertz`, specify the sample rate of the audio.
- For `Specialty`, specify the medical specialty of the provider.
- `ShowSpeakerLabel` – `true`

For more information on setting up an HTTP/2 stream to transcribe a medical conversation, see Setting up an HTTP/2 stream.

Enabling speaker partitioning in a WebSocket request

To partition speakers in WebSocket streams with the API, use the following format to create a pre-signed URI to start a WebSocket request and set `show-speaker-label` to `true`.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket
?language-code=languageCode
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&media-encoding=flac
&sample-rate=16000
&session-id=sessionId
&specialty=medicalSpecialty
&type=CONVERSATION
&vocabulary-name=vocabularyName
&show-speaker-label=boolean
```

The following code shows the truncated example response of a streaming request.

```
{
  "Transcript": {
    "Results": [
      {
        "Alternatives": [
          {
            "Items": [
              {
                "Confidence": 0.97,
                "Content": "From",
                "EndTime": 18.98,
                "Speaker": "0",
                "StartTime": 18.74,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
              {
                "Confidence": 1,
                "Content": "the",
                "EndTime": 19.31,
                "Speaker": "0",
                "StartTime": 19,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
              {
                "Confidence": 1,
                "Content": "last",
                "EndTime": 19.86,
                "Speaker": "0",
                "StartTime": 19.32,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
             ...
              {
                "Confidence": 1,
                "Content": "chronic",
                "EndTime": 22.55,
                "Speaker": "0",
                "StartTime": 21.97,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
              ...
                "Confidence": 1,
                "Content": "fatigue",
                "EndTime": 24.42,
                "Speaker": "0",
                "StartTime": 23.95,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
              {
                "EndTime": 25.22,
                "StartTime": 25.22,
                "Type": "speaker-change",
                "VocabularyFilterMatch": false
              },
              {
                "Confidence": 0.99,
                "Content": "True",
                "EndTime": 25.63,
                "Speaker": "1",
                "StartTime": 25.22,
                "Type": "pronunciation",
                "VocabularyFilterMatch": false
              },
              {
                "Content": ".",
                "EndTime": 25.63,
                "StartTime": 25.63,
                "Type": "punctuation",
                "VocabularyFilterMatch": false
              }
            ],
            "Transcript": "From the last note she still has mild sleep deprivation and
 chronic fatigue True."
          }
        ],
        "EndTime": 25.63,
        "IsPartial": false,
        "ResultId": "XXXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXX",
        "StartTime": 18.74
      }
    ]
  }
}
```

Amazon Transcribe Medical breaks your incoming audio stream based on natural speech segments, such as a change in speaker or a pause in the audio. The transcription is returned progressively to your application, with each response containing more transcribed speech until the entire segment is transcribed. The preceding code is a truncated example of a fully-transcribed speech segment. Speaker labels only appear for entirely transcribed segments.

The following list shows the organization of the objects and parameters in a streaming transcription output.

`Transcript`

Each speech segment has its own `Transcript` object.

`Results`

Each `Transcript` object has its own `Results` object. This object contains the `isPartial` field. When its value is `false`, the results returned are for an entire speech segment.

`Alternatives`

Each `Results` object has an `Alternatives` object.

`Items`

Each `Alternatives` object has its own `Items` object that contains information about each word and punctuation mark in the transcription output. When you enable speaker partitioning, each word has a `Speaker` label for fully-transcribed speech segments. Amazon Transcribe Medical uses this label to assign a unique integer to each speaker in the stream. The `Type` parameter having a value of `speaker-change` indicates that one person has stopped speaking and that another person is about to begin.

`Transcript`

Each Items object contains a transcribed speech segment as the value of the `Transcript` field.

For more information about WebSocket requests, see Setting up a WebSocket stream.

Transcribing multi-channel audio

If you have an audio file or stream that has multiple channels, you can use *channel identification* to transcribe the speech from each of those channels. Amazon Transcribe Medical transcribes the speech from each channel separately. It combines the separate transcriptions of each channel into a single transcription output.

Use channel identification to identify the separate channels in your audio and transcribe the speech from each of those channels. Enable this in situations such as a caller and agent scenario. Use this to distinguish a caller from an agent in recordings or streams from contact centers that perform drug safety monitoring.

You can enable channel identification for both batch processing and real-time streaming. The following list describes how to enable it for each method.

- Batch transcription – AWS Management Console and `StartMedicalTranscriptionJob` API
- Streaming transcription – WebSocket streaming and `StartMedicalStreamTranscription` API

Transcribing multi-channel audio files

When you transcribe an audio file, Amazon Transcribe Medical returns a list of *items* for each channel. An item is a transcribed word or punctuation mark. Each word has a start time and an end time. If a person on one channel speaks over a person on a separate channel, the start times and end times of the items for each channel overlap while the individuals are speaking over each other.

By default, you can transcribe audio files with two channels. You can request a quota increase if you need to transcribe files that have more than two channels. For information about requesting a quota increase, see AWS service quotas.

To transcribe multi-channel audio in a batch transcription job, use the AWS Management Console or the `StartMedicalTranscriptionJob` API.

AWS Management Console

To use the AWS Management Console to enable channel identification in your batch transcription job, you enable audio identification and then channel identification. Channel identification is a subset of audio identification in the AWS Management Console.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.
4. On the **Specify job details** page, provide information about your transcription job.
5. Choose **Next**.
6. Enable **Audio identification**.
7. For **Audio identification type**, choose **Channel identification**.
8. Choose **Create**.

API

To transcribe a multi-channel audio file (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `TranscriptionJobName`, specify a name unique to your AWS account.

  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in the audio file. The valid value is `en-US`.

c. For the `MediaFileUri` parameter of the `Media` object, specify the name of the media file that you want to transcribe.

d. For the `Settings` object, set `ChannelIdentification` to `true`.

The following is an example request using the AWS SDK for Python (Boto3).

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-transcription-job"
job_name = "my-first-med-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_medical_transcription_job(
      MedicalTranscriptionJobName = job_name,
      Media = {
        'MediaFileUri': job_uri
      },
      OutputBucketName = 'amzn-s3-demo-bucket',
      OutputKey = 'output-files/',
      LanguageCode = 'en-US',
      Specialty = 'PRIMARYCARE',
      Type = 'CONVERSATION',
      Settings = {
        'ChannelIdentification': True
      }
)
while True:
    status = transcribe.get_transcription_job(MedicalTranscriptionJobName = job_name)
    if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

AWS CLI

To transcribe a multi-channel audio file using a batch transcription job (AWS CLI)

- Run the following code.

  ```
  aws transcribe start-medical-transcription-job \
  --region us-west-2 \
  --cli-input-json file://example-start-command.json
  ```

  The following is the code of `example-start-command.json`.

  ```
  {
        "MedicalTranscriptionJobName": "my-first-med-transcription-job",
        "Media": {
            "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-audio-
  file.flac"
        },
        "OutputBucketName": "amzn-s3-demo-bucket",
        "OutputKey": "my-output-files/",
        "LanguageCode": "en-US",
        "Specialty": "PRIMARYCARE",
        "Type": "CONVERSATION",

          "Settings":{
            "ChannelIdentification": true
          }
  }
  ```

The following code shows the transcription output for an audio file that has a conversation on two channels.

```
{
  "jobName": "job id",
  "accountId": "111122223333",
  "results": {
    "transcripts": [
```

```
      {
        "transcript": "When you try ... It seems to ..."
      }
    ],
    "channel_labels": {
      "channels": [
        {
          "channel_label": "ch_0",
          "items": [
            {
              "start_time": "12.282",
              "end_time": "12.592",
              "alternatives": [
                {
                  "confidence": "1.0000",
                  "content": "When"
                }
              ],
              "type": "pronunciation"
            },
            {
              "start_time": "12.592",
              "end_time": "12.692",
              "alternatives": [
                {
                  "confidence": "0.8787",
                  "content": "you"
                }
              ],
              "type": "pronunciation"
            },
            {
              "start_time": "12.702",
              "end_time": "13.252",
              "alternatives": [
                {
                  "confidence": "0.8318",
                  "content": "try"
                }
              ],
              "type": "pronunciation"
            },
            ...
         ]
      },
      {
          "channel_label": "ch_1",
          "items": [
            {
              "start_time": "12.379",
              "end_time": "12.589",
              "alternatives": [
                {
                  "confidence": "0.5645",
                  "content": "It"
                }
              ],
              "type": "pronunciation"
            },
            {
              "start_time": "12.599",
              "end_time": "12.659",
              "alternatives": [
                {
                  "confidence": "0.2907",
                  "content": "seems"
                }
              ],
              "type": "pronunciation"
            },
            {
              "start_time": "12.669",
              "end_time": "13.029",
              "alternatives": [
                {
                  "confidence": "0.2497",
                  "content": "to"
                }
              ],
              "type": "pronunciation"
            },
            ...
        ]
    }
}
```

Transcribing multi-channel audio streams

You can transcribe audio from separate channels in either HTTP/2 or WebSocket streams using the `StartMedicalStreamTranscription` API.

By default, you can transcribe streams with two channels. You can request a quota increase if you need to transcribe streams that have more than two channels. For information about requesting a quota increase, see AWS service quotas.

Transcribing multi-channel audio in an HTTP/2 stream

To transcribe multi-channel audio in an HTTP/2 stream, use the StartMedicalStreamTranscription API and specify the following:

- `LanguageCode` – The language code of the audio. The valid value is `en-US`.
- `MediaEncoding` – The encoding of the audio. Valid values are `ogg-opus`, `flac`, and `pcm`.
- `EnableChannelIdentification` – `true`
- `NumberOfChannels` – the number of channels in your streaming audio.

For more information on setting up an HTTP/2 stream to transcribe a medical conversation, see Setting up an HTTP/2 stream.

Transcribing multi-channel audio in a WebSocket stream

To partition speakers in WebSocket streams, use the following format to create a pre-signed URI and start a WebSocket request. Specify `enable-channel-identification` as `true` and the number of channels in your stream in `number-of-channels`. A pre-signed URI contains the information needed to set up bi-directional communication between your application and Amazon Transcribe Medical.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket
?language-code=languageCode
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
```

```
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&media-encoding=flac
&sample-rate=16000
&session-id=sessionId
&enable-channel-identification=true
&number-of-channels=2
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

For more information about WebSocket requests, see Setting up a WebSocket stream.

Multi-channel streaming output

The output of a streaming transcription is the same for HTTP/2 and WebSocket requests. The following is an example output.

```
{
    "resultId": "XXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXX",
    "startTime": 0.11,
    "endTime": 0.66,
    "isPartial": false,
    "alternatives": [
        {
            "transcript": "Left.",
            "items": [
                {
                    "startTime": 0.11,
                    "endTime": 0.45,
                    "type": "pronunciation",
                    "content": "Left",
                    "vocabularyFilterMatch": false
                },
                {
                    "startTime": 0.45,
                    "endTime": 0.45,
                    "type": "punctuation",
                    "content": ".",
                    "vocabularyFilterMatch": false
                }
            ]
        }
    ],
    "channelId": "ch_0"
}
```

For each speech segment, there is a `channelId` flag that indicates which channel the speech belongs to.

Transcribing a medical dictation

You can use Amazon Transcribe Medical to transcribe clinician-dictated medical notes using either a batch transcription job or a real-time stream. Batch transcription jobs enable you to transcribe audio files. You specify the medical specialty of the clinician in your transcription job or stream to ensure that Amazon Transcribe Medical produces transcription results with the highest possible accuracy.

You can transcribe a medical dictation in the following specialties:

- Cardiology – available in streaming transcription only
- Neurology – available in streaming transcription only
- Oncology – available in streaming transcription only
- Primary Care – includes the following types of medical practice:
  - Family medicine
  - Internal medicine
  - Obstetrics and Gynecology (OB-GYN)
  - Pediatrics
- Radiology – available in streaming transcription only
- Urology – available in streaming transcription only

You can improve transcription accuracy by using custom vocabularies. For information on how medical custom vocabularies work, see Improving transcription accuracy with medical custom vocabularies.

By default, Amazon Transcribe Medical returns the transcription with the highest confidence level. If you'd like to configure it to return alternative transcriptions, see Generating alternative transcriptions.

For information about how numbers and medical measurements appear in the transcription output, see Transcribing numbers and Transcribing medical terms and measurements.

Topics

Transcribing an audio file of a medical dictation

Use a batch transcription job to transcribe audio files of medical conversations. You can use this to transcribe a clinician-patient dialogue. You can start a batch transcription job in either the `StartMedicalTranscriptionJob` API or the AWS Management Console.

When you start a medical transcription job with the `StartMedicalTranscriptionJob` API, you specify `PRIMARYCARE` as the value of the `Specialty` parameter.

AWS Management Console

To transcribe a clinician-patient dialogue (AWS Management Console)

To use the AWS Management Console to transcribe a clinician-patient dialogue, create a transcription job and choose **Conversation** for **Audio input type**.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.
4. On the **Specify job details** page, under **Job settings** , specify the following.
   a. **Name –** the name of the transcription job.
   b. **Audio input type – Dictation**
5. For the remaining fields, specify the Amazon S3 location of your audio file and where you want to store the output of your transcription job.
6. Choose **Next**.
7. Choose **Create**.

API

To transcribe a medical conversation using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `MedicalTranscriptionJobName`, specify a name unique in your AWS account.

  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in your audio file and the language of your vocabulary filter.

  c. In the `MediaFileUri` parameter of the `Media` object, specify the name of the audio file that you want to transcribe.

  d. For `Specialty`, specify the medical specialty of the clinician speaking in the audio file.

  e. For `Type`, specify `DICTATION`.

  f. For `OutputBucketName`, specify the Amazon S3 bucket to store the transcription results.

  The following is an example request that uses the AWS SDK for Python (Boto3) to transcribe a medical dictation of a clinician in the `PRIMARYCARE` specialty.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe')
job_name = "my-first-med-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac"
transcribe.start_medical_transcription_job(
    MedicalTranscriptionJobName = job_name,
    Media = {
       'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Specialty = 'PRIMARYCARE',
    Type = 'DICTATION'
)
while True:
    status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName = 
job_name)
```

```
    if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

The following example code shows the transcription results of a medical dictation.

```
{
    "jobName": "dictation-medical-transcription-job",
    "accountId": "111122223333",
    "results": {
        "transcripts": [
            {
                "transcript": "... came for a follow up visit today..."
            }
        ],
        "items": [
            {
            ...
                "start_time": "4.85",
                "end_time": "5.12",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "came"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.12",
                "end_time": "5.29",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "for"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.29",
                "end_time": "5.33",
                "alternatives": [
                    {
                        "confidence": "0.9955",
                        "content": "a"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.33",
                "end_time": "5.66",
                "alternatives": [
                    {
                        "confidence": "0.9754",
                        "content": "follow"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.66",
                "end_time": "5.75",
                "alternatives": [
                    {
                        "confidence": "0.9754",
                        "content": "up"
                    }
                ],
                "type": "pronunciation"
            },
            {
                "start_time": "5.75",
                "end_time": "6.02",
                "alternatives": [
                    {
                        "confidence": "1.0",
                        "content": "visit"
                    }
                ]
                ...
    },
    "status": "COMPLETED"
}
```

AWS CLI

To enable speaker partitioning in a batch transcription job (AWS CLI)

- Run the following code.

```
aws transcribe start-medical-transcription-job \
--region us-west-2 \
--cli-input-json file://example-start-command.json
```

The following code shows the contents of `example-start-command.json`.

```
{
      "MedicalTranscriptionJobName": "my-first-med-transcription-job",
      "Media": {
      "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac"
      },
      "OutputBucketName": "amzn-s3-demo-bucket",
      "OutputKey": "my-output-files/",
      "LanguageCode": "en-US",
      "Specialty": "PRIMARYCARE",
      "Type": "DICTATION"
}
```

Transcribing a medical dictation in a real-time stream

Use a WebSocket stream to transcribe a medical dictation as an audio stream. You can also use the AWS Management Console to transcribe speech that you or others speak directly into a microphone.

For an HTTP/2 or a WebSocket stream, you can transcribe audio in the following medical specialties:

- Cardiology
- Oncology
- Neurology
- Primary Care
- Radiology
- Urology

Each medical specialty includes many types of procedures and appointments. Clinicians therefore dictate many different types of notes. Use the following examples as guidance to help you specify the value of the `specialty` URI parameter of the WebSocket request, or the `Specialty` parameter of the [`StartMedicalStreamTranscription`] API:

- For a dictation after electrophysiology or echocardiogram procedure, choose `CARDIOLOGY`.
- For a dictation after a surgical oncology or radiation oncology procedure, choose `ONCOLOGY`.
- For a physician dictating notes indicating a diagnosis of encephalitis, choose `NEUROLOGY`.
- For a dictation of procedure notes to break up a bladder stone, choose `UROLOGY`.
- For a dictation of clinician notes after an internal medicine consultation, choose `PRIMARYCARE`.
- For a dictation of a physician communicating the findings of a CT scan, PET scan, MRI, or radiograph, choose `RADIOLOGY`.
- For a dictation of physician notes after a gynecology consultation, choose `PRIMARYCARE`.

To improve transcription accuracy of specific terms in a real-time stream, use a custom vocabulary. To enable a custom vocabulary, set the value of `vocabulary-name` to the name of the custom vocabulary you want to use.

Transcribing a dictation spoken into your microphone with the AWS Management Console

To use the AWS Management Console to transcribe streaming audio of a medical dictation, choose the option to transcribe a medical dictation, start the stream, and begin speaking into the microphone.

To transcribe streaming audio of a medical dictation (AWS Management Console)

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Real-time transcription**.
3. Choose **Dictation**.
4. For **Medical specialty**, choose the medical specialty of the clinician speaking in the stream.
5. Choose **Start streaming**.
6. Speak into the microphone.

Transcribing a dictation in an HTTP/2 stream

To transcribe an HTTP/2 stream of a medical dictation, use the `StartMedicalStreamTranscription` API and specify the following:

- `LanguageCode` – The language code. The valid value is `en-US`
- `MediaEncoding` – The encoding used for the input audio. Valid values are `pcm`, `ogg-opus`, and `flac`.
- `Specialty` – The specialty of the medical professional.
- `Type` – `DICTATION`

For more information on setting up an HTTP/2 stream to transcribe a medical dictation, see Setting up an HTTP/2 stream.

Using a WebSocket streaming request to transcribe a medical dictation

To transcribe a medical dictation in a real-time stream using a WebSocket request, you create a presigned URI. This URI contains the information needed to set up the audio stream between your application and Amazon Transcribe Medical. For more information on creating WebSocket requests, see Setting up a WebSocket stream.

Use the following template to create your presigned URI.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket
?language-code=languageCode
&X-Amz-Algorithm=AWS4-HMAC-SHA256
```

```
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&media-encoding=flac
&sample-rate=16000
&session-id=sessionId
&specialty=medicalSpecialty
&type=DICTATION
&vocabulary-name=vocabularyName
&show-speaker-label=boolean
```

For more information on creating pre-signed URIs, see Setting up a WebSocket stream.

Improving transcription accuracy with medical custom vocabularies

To improve transcription accuracy in Amazon Transcribe Medical, create and use one or more medical custom vocabularies. A *custom vocabulary* is a collection of words or phrases that are domain-specific. This collection helps improve the performance of Amazon Transcribe Medical in transcribing those words or phrases.

You are responsible for the integrity of your own data when you use Amazon Transcribe Medical. Do not enter confidential information, personal information (PII), or protected health information (PHI), into a custom vocabulary.

For best results, create separate small custom vocabularies that each help transcribe a specific audio recording. You receive greater improvements in transcription accuracy than if you created one large custom vocabulary to use with all of your recordings.

By default, you can have up to 100 custom vocabularies in your AWS account. A custom vocabulary can't exceed 50 KB in size. For information on requesting an increase to the number of custom vocabularies that you can have in your AWS account, see AWS service quotas.

Custom vocabularies are available in US English (en-US).

Topics

Creating a text file for your medical custom vocabulary

To create a custom vocabulary, you create a text file that is in UTF-8 format. In this file, you create a four column table, with each column specifying a field. Each field tells Amazon Transcribe Medical either how the domain-specific terms are pronounced or how to display these terms in your transcriptions. You store the text file containing these fields in an Amazon S3 bucket.

Understanding how to format your text file

To create a medical custom vocabulary, you enter the column names as a header row. You enter the values for each column beneath the header row.

The following are the names of the four columns of the table:

- `Phrase` – column required, values required
- `IPA` – column required, values can be optional
- `SoundsLike` – column required, values can be optional
- `DisplayAs` – column required, values can be optional

When you create a custom vocabulary, make sure that you:

- Separate each column with a single Tab character. Amazon Transcribe throws an error message if you try to separate the columns with spaces or multiple Tab characters.
- Make sure that there's no trailing spaces or white space after each value within a column.

Make sure that the values that you enter for each column:

- Have fewer than 256 characters, including hyphens
- Use only characters from the allowed character set, see Character set for Amazon Transcribe Medical.

Entering values for the columns of the table

The following information shows you how to specify values for the four columns of the table:

- **`Phrase`** – The word or phrase that should be recognized. You must enter values in this column.

  If the entry is a phrase, separate the words with a hyphen (-). For example, enter **`cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy`** as **`cerebral-autosomal-dominant-arteriopathy-with-subcortical-infarcts-and-leukoencephalopathy`**.

  Enter acronyms or other words whose letters should be pronounced individually as single letters followed by dots, such as **`D.N.A.`** or **`S.T.E.M.I.`**. To enter the plural form of an acronym, such as "STEMIs," separate the "s" from the acronym with a hyphen: "**`S.T.E.M.I-s`**" You can use either uppercase or lowercase letters for acronyms.

  The `Phrase` column is required. You can use any of the allowed characters for the input language. For allowed characters, see Character set for Amazon Transcribe Medical. If you don't specify the `DisplayAs` column, Amazon Transcribe Medical uses the contents of the `Phrase` column in the output file.

- **`IPA`** (column required, values can be optional) – To specify the pronunciation of a word or phrase, you can include characters in the International Phonetic Alphabet (IPA) in this column. The `IPA` column can't contain leading or trailing spaces, and you must use a single space to separate each phoneme in the input. For example, in English you would enter the phrase **`acute-respiratory-distress-syndrome`** as **`ə k j u t # # s p # # ə t # # i d # s t # # s s # n d # o# m`**. You would enter the phrase **`A.L.L.`** as **`e# # l # l`**.

  Even if you don't specify the contents of the `IPA` column, you must include a blank `IPA` column. If you include values in the `IPA` column, you can't provide values for the `SoundsLike` column.

  For a list of allowed IPA characters for a specific language, see Character set for Amazon Transcribe Medical. US English is the only language available in Amazon Transcribe Medical.

- **`SoundsLike`** (column required, values can be optional) – You can break a word or phrase down into smaller segments and provide a pronunciation for each segment using the standard orthography of the language to mimic the way that the word sounds. For example, you can provide pronunciation hints for the phrase **`cerebral-autosomal-dominant-arteriopathy-with-subcortical-infarcts-and-leukoencephalopathy`** like this:

sir-e-brul-aut-o-som-ul-dah-mi-nant-ar-ter-ri-o-pa-thy-with-sub-cor-ti-cul-in-farcts-and-lewk-o-en-ce-phul-ah-pu-thy. The hint for the phrase **atrioventricular-nodal-reentrant-tachycardia** would look like this: **ay-tree-o-ven-trick-u-lar-node-al-re-entr-ant-tack-ih-card-ia**. You separate each part of the hint with a hyphen (-).

  Even if you don't provide values for the SoundsLike column, you must include a blank SoundsLike column. If you include values in the SoundsLike column, you can't provide values for the IPA column.

  You can use any of the allowed characters for the input language. For the list of allowed characters, see Character set for Amazon Transcribe Medical.

- **DisplayAs** (column required, values can be optional) – Defines how the word or phrase looks when it's output. For example, if the word or phrase is **cerebral-autosomal-dominant-arteriopathy-with-subcortical-infarcts-and-leukoencephalopathy**, you can specify the display form as cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy, so that the hyphen is not present. You can also specify DisplayAs as CADASIL if you'd like to show the acronym instead of the full term in the output.

  If you don't specify the DisplayAs column, Amazon Transcribe Medical uses the Phrase column from the input file in the output.

  You can use any UTF-8 character in the DisplayAs column.

You can include spaces only for the values in the IPA and DisplayAs columns.

To create the text file of your custom vocabulary, place each word or phrase in your text file on a separate line. Separate the columns with Tab characters. Include spaces only for values in the IPA and DisplayAs columns. Save the file with the extension .txt in an Amazon S3 bucket in the same AWS Region where you use Amazon Transcribe Medical to create your custom vocabulary.

If you edit your text file in Windows, make sure that your file is in LF format and not in CRLF format. Otherwise, you will be unable to create your custom vocabulary. Some text editors enable you to change the formatting with Find and Replace commands.

The following examples show text that you can use to create custom vocabularies. To create a custom vocabulary from these examples, copy an example into a text editor, replace [TAB] with a Tab character, and upload the saved text file to Amazon S3.

```
Phrase[TAB]IPA[TAB]SoundsLike[TAB]DisplayAs
acute-respiratory-distress-syndrome[TAB][TAB][TAB]acute respiratory distress syndrome
A.L.L.[TAB]eɪ ɛ l ɛ l[TAB][TAB]ALL
atrioventricular-nodal-reentrant-tachycardia[TAB][TAB]ay-tree-o-ven-trick-u-lar-node-
al-re-entr-ant-tack-ih-card-ia[TAB]
```

You can enter columns in any order. The following examples show other valid structures for the custom vocabulary input file.

```
Phrase[TAB]SoundsLike[TAB]IPA[TAB]DisplayAs
acute-respiratory-distress-syndrome[TAB][TAB][TAB]acute respiratory distress syndrome
A.L.L.[TAB][TAB]eɪ ɛ l ɛ l[TAB]ALL
atrioventricular-nodal-reentrant-tachycardia[TAB]ay-tree-o-ven-trick-u-lar-node-al-re-
entr-ant-tack-ih-card-ia[TAB][TAB]
```

```
DisplayAs[TAB]SoundsLike[TAB]IPA[TAB]Phrase
acute respiratory distress syndrome[TAB][TAB][TAB]acute-respiratory-distress-syndrome
ALL[TAB][TAB]eɪ ɛ l ɛ l[TAB]A.L.L.
[TAB]ay-tree-o-ven-trick-u-lar-node-al-re-entr-ant-tack-ih-card-ia[TAB]
[TAB]atrioventricular-nodal-reentrant-tachycardia
```

For reading ease, the following tables show the preceding examples more clearly in html format. They are meant only to illustrate the examples.

Phrase	IPA	SoundsLike	DisplayAs
acute-respiratory-distress-syndrome			acute respiratory distress syndrome
A.L.L.	eɪ ɛ l ɛ l		ALL

Phrase	IPA	SoundsLike	DisplayAs
atrioventricular-nodal-reentrant-tachycardia		ay-tree-o-ven-trick-u-lar-node-al-re-entr-ant-tack-ih-card-ia	

Phrase	SoundsLike	IPA	DisplayAs
acute-respiratory-distress-syndrome			acute respiratory distress syndrome
atrioventricular-nodal-reentrant-tachycardia	ay-tree-o-ven-trick-u-lar-node-al-re-entr-ant-tack-ih-card-ia		
A.L.L.		eɪ ɛ l ɛ l	ALL

DisplayAs	SoundsLike	IPA	Phrase
acute respiratory distress syndrome			acute-respiratory-distress-syndrome
ALL		eɪ ɛ l ɛ l	A.L.L.
	ay-tree-o-ven-trick-u-lar-node-al-re-entr-ant-tack-ih-card-ia		atrioventricular-nodal-reentrant-tachycardia

Using a text file to create a medical custom vocabulary

To create a custom vocabulary, you must have prepared a text file that contains a collection a words or phrases. Amazon Transcribe Medical uses this text file to create a custom vocabulary that you can use to improve the transcription accuracy of those words or phrases. You can create a custom vocabulary using the `CreateMedicalVocabulary` API or the Amazon Transcribe Medical console.

AWS Management Console

To use the AWS Management Console to create a custom vocabulary, you provide the Amazon S3 URI of the text file containing your words or phrases.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Custom vocabulary**.
3. For **Name**, under **Vocabulary settings**, choose a name for your custom vocabulary.
4. Specify the location of your audio file or video file in Amazon S3:
   - For **Vocabulary input file location on S3** under **Vocabulary settings**, specify the Amazon S3 URI that identifies the text file you will use to create your custom vocabulary.
   - For **Vocabulary input file location in S3**, choose **Browse S3** to browse for the text file and choose it.
5. Choose **Create vocabulary**.

You can see the processing status of your custom vocabulary in the AWS Management Console.

API

To create a medical custom vocabulary (API)

- For the `StartTranscriptionJob` API, specify the following.

  a. For `LanguageCode`, specify `en-US`.

  b. For `VocabularyFileUri`, specify the Amazon S3 location of the text file that you use to define your custom vocabulary.

  c. For `VocabularyName`, specify a name for your custom vocabulary. The name you specify must be unique within your AWS account.

To see the processing status of your custom vocabulary, use the `GetMedicalVocabulary` API.

The following is an example request using the AWS SDK for Python (Boto3) to create a custom vocabulary.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
vocab_name = "my-first-vocabulary"
response = transcribe.create_medical_vocabulary(
    VocabularyName = job_name,
    VocabularyFileUri = 's3://amzn-s3-demo-bucket/my-vocabularies/my-vocabulary-
table.txt'
    LanguageCode = 'en-US',
  )

while True:
    status = transcribe.get_medical_vocabulary(VocabularyName = vocab_name)
    if status['VocabularyState'] in ['READY', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

AWS CLI

To enable speaker partitioning in a batch transcription job (AWS CLI)

- Run the following code.

```
aws transcribe create-medical-vocabulary \
--vocabulary-name my-first-vocabulary \
--vocabulary-file-uri s3://amzn-s3-demo-bucket/my-vocabularies/my-vocabulary-
file.txt \
--language-code en-US
```

Transcribing an audio file using a medical custom vocabulary

Use the `StartMedicalTranscriptionJob` or the AWS Management Console to start a transcription job that uses a custom vocabulary to improve transcription accuracy.

AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.

4. On the **Specify job details** page, provide information about your transcription job.
5. Choose **Next**.
6. Under **Customization**, enable **Custom vocabulary**.
7. Under **Vocabulary selection**, choose a custom vocabulary.
8. Choose **Create**.

API

To enable speaker partitioning in an audio file using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `MedicalTranscriptionJobName`, specify a name that is unique in your AWS account.
  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in your audio file and the language of your vocabulary filter.
  c. For the `MediaFileUri` parameter of the `Media` object, specify the name of the audio file that you want to transcribe.
  d. For `Specialty`, specify the medical specialty of the clinician speaking in the audio file.
  e. For `Type`, specify whether the audio file is a conversation or a dictation.
  f. For `OutputBucketName`, specify the Amazon S3 bucket to store the transcription results.
  g. For the `Settings` object, specify the following.

     - `VocabularyName` – the name of your custom vocabulary.

The following request uses the AWS SDK for Python (Boto3) to start a batch transcription job with a custom vocabulary.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-med-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_medical_transcription_job(
   MedicalTranscriptionJobName = job_name,
   Media = {
       'MediaFileUri': job_uri
   },
   OutputBucketName = 'amzn-s3-demo-bucket',
   OutputKey = 'my-output-files/',
   LanguageCode = 'en-US',
   Specialty = 'PRIMARYCARE',
   Type = 'CONVERSATION',
   Settings = {
       'VocabularyName': 'example-med-custom-vocab'
       }
 )

while True:
   status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName =
 job_name)
   if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Transcribing a real-time stream using a medical custom vocabulary

To improve transcription accuracy in a real-time stream, you can use a custom vocabulary using either HTTP/2 or WebSocket streams. To start an HTTP/2 request, use the `StartMedicalStreamTranscription` API. You can use a custom vocabulary in real-time using either the AWS Management Console, the `StartMedicalStreamTranscription` API, or by using the WebSocket protocol.

Transcribing a dictation that is spoken into your Microphone (AWS Management Console)

To use the AWS Management Console to transcribe streaming audio of a medical dictation, choose the option to transcribe a medical dictation, start the stream, and begin speaking into the microphone.

To transcribe streaming audio of a medical dictation (AWS Management Console)

1. Sign in to the AWS Management Console.

2. In the navigation pane, under Amazon Transcribe Medical, choose **Real-time transcription**.
3. For **Medical specialty**, choose the medical specialty of the clinician speaking in the stream.
4. For **Audio input type**, choose either **Conversation** or **Dictation**.
5. For **Additional settings**, choose **Custom vocabulary**.
   - For **Vocabulary selection**, choose the custom vocabulary.
6. Choose **Start streaming**.
7. Speak into the microphone.

Enabling speaker partitioning in an HTTP/2 stream

The following is the syntax for the parameters of an HTTP/2 request.

```
POST /medical-stream-transcription HTTP/2
host: transcribestreaming.us-west-2.amazonaws.com
authorization: Generated value
x-amz-target: com.amazonaws.transcribe.Transcribe.StartMedicalStreamTranscription
x-amz-content-sha256: STREAMING-MED-AWS4-HMAC-SHA256-EVENTS
x-amz-date: 20220208T235959Z
x-amzn-transcribe-session-id: my-first-http2-med-stream
x-amzn-transcribe-language-code: en-US
x-amzn-transcribe-media-encoding: flac
x-amzn-transcribe-sample-rate: 16000
x-amzn-transcribe-vocabulary-name: my-first-med-vocab
x-amzn-transcribe-specialty: PRIMARYCARE
x-amzn-transcribe-type: CONVERSATION
x-amzn-transcribe-show-speaker-label: true
Content-type: application/vnd.amazon.eventstream
transfer-encoding: chunked
```

Parameter descriptions:

- **host**: Update the AWS Region ('us-west-2' in the preceding example) with the AWS Region you are calling. For a list of valid AWS Regions, see AWS Regions and Endpoints.
- **authorization**: This is a generated field. To learn more about creating a signature, see Signing AWS requests with Signature Version 4.
- **x-amz-target**: Don't alter this field; use the content shown in the preceding example.

- **x-amz-content-sha256**: This is a generated field. To learn more about calculating a signature, see Signing AWS requests with Signature Version 4.
- **x-amz-date**: The date and time the signature is created. The format is YYYYMMDDTHHMMSSZ, where YYYY=year, MM=month, DD=day, HH=hour, MM=minute, SS=seconds, and 'T' and 'Z' are fixed characters. For more information, refer to Handling Dates in Signature Version 4.
- **x-amzn-transcribe-session-id**: The name for your streaming session.
- **x-amzn-transcribe-language-code**: The encoding used for your input audio. Refer to `StartMedicalStreamTranscription` or Supported languages and language-specific features for a list of valid values.
- **x-amzn-transcribe-media-encoding**: The encoding used for your input audio. Valid values are `pcm`, `ogg-opus`, and `flac`.
- **x-amzn-transcribe-sample-rate**: The sample rate of the input audio (in Hertz). Amazon Transcribe supports a range from 8,000 Hz to 48,000 Hz. Low-quality audio, such as telephone audio, is typically around 8,000 Hz. High-quality audio typically ranges from 16,000 Hz to 48,000 Hz. Note that the sample rate you specify **must** match that of your audio.
- **x-amzn-transcribe-vocabulary-name**: The name of the vocabulary you want to use with your transcription.
- **x-amzn-transcribe-specialty**: The medical specialty being transcribed.
- **x-amzn-transcribe-type**: Choose whether this is a dictation or a conversation.
- **x-amzn-transcribe-show-speaker-label**: To enable diarization, this value must be `true`.
- **content-type**: Don't alter this field; use the content shown in the preceding example.

Enabling speaker partitioning in a WebSocket request

To partition speakers in WebSocket streams with the API, use the following format to create a pre-signed URI to start a WebSocket request and set `vocabulary-name` to the name of the custom vocabulary.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket
?language-code=en-US
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
```

```
&X-Amz-Security-Token=security-token
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&media-encoding=flac
&sample-rate=16000
&session-id=sessionId
&specialty=medicalSpecialty
&type=CONVERSATION
&vocabulary-name=vocabularyName
&show-speaker-label=boolean
```

Character set for Amazon Transcribe Medical

To use custom vocabularies in Amazon Transcribe Medical, use the following character set.

English character set

For English custom vocabularies, you can use the following characters in the `Phrase` and `SoundsLike` columns:

- a - z
- A - Z
- ' (apostrophe)
- - (hyphen)
- . (period)

You can use the following International Phonetic Alphabet (IPA) characters in the `IPA` column of the vocabulary input file.

Character	Code	Character	Code
aʊ	0061 028A	w	0077
aɪ	0061 026A	z	007A
b	0062	æ	00E6
d	0064	ð	00F0

Character	Code	Character	Code
eɪ	0065 026A	ŋ	014B
f	0066	ɑ	0251
g	0067	ɔ	0254
h	0068	ɔɪ	0254 026A
i	0069	ə	0259
j	006A	ɛ	025B
k	006B	ɝ	025D
l	006C	ɡ	0261
l̩	006C 0329	ɪ	026A
m	006D	ɹ	0279
n	006E	ʃ	0283
n̩	006E 0329	ʊ	028A
oʊ	006F 028A	ʌ	028C
p	0070	ʍ	028D
s	0073	ʒ	0292
t	0074	ʤ	02A4
u	0075	ʧ	02A7
v	0076	θ	03B8

Identifying personal health information (PHI) in a transcription

Use *Personal Health Information Identification* to label personal health information (PHI) in your transcription results. By reviewing labels, you can find PHI that could be used to identify a patient.

You can identify PHI using either a real-time stream or batch transcription job.

You can use your own post-processing to redact the PHI identified in the transcription output.

Use Personal Health Information Identification to identify the following types of PHI:

- Personal PHI:
  - Names – Full name or last name and initial
  - Gender
  - Age
  - Phone numbers
  - Dates (not including the year) that directly relate to the patient
  - Email addresses
- Geographic PHI:
  - Physical address
  - Zip code
  - Name of medical center or practice
- Account PHI:
  - Fax numbers
  - Social security numbers (SSNs)
  - Health insurance beneficiary numbers
  - Account numbers
  - Certificate or license numbers
- Vehicle PHI:
  - Vehicle identification number (VIN)
  - License plate number
- Other PHI:
  - Web Uniform Resource Location (URL)
  - Internet Protocol (IP) address numbers

Amazon Transcribe Medical is a Health Insurance Portability and Accountability Act of 1996 (HIPAA) eligible service. For more information, see Amazon Transcribe Medical. For information about identifying PHI in an audio file, see Identifying PHI in an audio file. For information about identifying PHI in a stream, see Identifying PHI in a real-time stream.

Topics

Identifying PHI in an audio file

Use a batch transcription job to transcribe audio files and identify the personal health information (PHI) within them. When you activate Personal Health Information (PHI) Identification, Amazon Transcribe Medical labels the PHI that it identified in the transcription results. For information about the PHI that Amazon Transcribe Medical can identify, see Identifying personal health information (PHI) in a transcription.

You can start a batch transcription job using either the `StartMedicalTranscriptionJob` API or the AWS Management Console.

AWS Management Console

To use the AWS Management Console to transcribe a clinician-patient dialogue, create a transcription job and choose **Conversation** for **Audio input type**.

To transcribe an audio file and identify its PHI (AWS Management Console)

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.
4. On the **Specify job details** page, under **Job settings** , specify the following.
    a. **Name** – The name of the transcription job that is unique to your AWS account.
    b. **Audio input type** – **Conversation** or **Dictation**.
5. For the remaining fields, specify the Amazon S3 location of your audio file and where you want to store the output of your transcription job.
6. Choose **Next**.

7. Under **Audio settings**, choose **PHI Identification**.
8. Choose **Create**.

API

To transcribe an audio file and identify its PHI using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `MedicalTranscriptionJobName`, specify a name that is unique to your AWS account.

  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in your audio file.

  c. For the `MediaFileUri` parameter of the `Media` object, specify the name of the audio file that you want to transcribe.

  d. For `Specialty`, specify the medical specialty of the clinician speaking in the audio file as `PRIMARYCARE`.

  e. For `Type`, specify either `CONVERSATION` or `DICTATION`.

  f. For `OutputBucketName`, specify the Amazon S3 bucket where you want to store the transcription results.

  The following is an example request that uses the AWS SDK for Python (Boto3) to transcribe an audio file and identify the PHI of a patient.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe')
job_name = "my-first-transcription-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac"
transcribe.start_medical_transcription_job(
      MedicalTranscriptionJobName = job_name,
      Media = {'MediaFileUri': job_uri},
      LanguageCode = 'en-US',
      ContentIdentificationType = 'PHI',
      Specialty = 'PRIMARYCARE',
        Type = 'type', # Specify 'CONVERSATION' for a medical conversation. Specify
 'DICTATION' for a medical dictation.
        OutputBucketName = 'amzn-s3-demo-bucket'
  )
while True:
    status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName =
 job_name)
    if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

The following example code shows the transcription results with patient PHI identified.

```
{
    "jobName": "my-medical-transcription-job-name",
    "accountId": "111122223333",
    "results": {
        "transcripts": [{
            "transcript": "The patient's name is Bertrand."
        }],
        "items": [{
                "id": 0,
            "start_time": "0.0",
            "end_time": "0.37",
            "alternatives": [{
                "confidence": "0.9993",
                "content": "The"
            }],
            "type": "pronunciation"
        }, {
                "id": 1,
            "start_time": "0.37",
            "end_time": "0.44",
            "alternatives": [{
                "confidence": "0.9981",
                "content": "patient's"
            }],
            "type": "pronunciation"
        }, {
                "id": 2,
            "start_time": "0.44",
            "end_time": "0.52",
            "alternatives": [{
                "confidence": "1.0",
                "content": "name"
            }],
            "type": "pronunciation"
        }, {
                "id": 3,
            "start_time": "0.52",
            "end_time": "0.92",
            "alternatives": [{
                "confidence": "1.0",
                "content": "is"
            }],
            "type": "pronunciation"
        }, {
                "id": 4,
            "start_time": "0.92",
            "end_time": "0.9989",
            "alternatives": [{
                "confidence": "1.0",
                "content": "Bertrand"
            }],
            "type": "pronunciation"
        }, {
                "id": 5,
            "alternatives": [{
                "confidence": "0.0",
                "content": "."
            }],
            "type": "punctuation"
        }],
        "entities": [{
            "content": "Bertrand",
            "category": "PHI*-Personal*",
            "startTime": 0.92,
            "endTime": 1.2,
            "confidence": 0.9989
        }],
        "audio_segments": [
            {
                "id": 0,
                "transcript": "The patient's name is Bertrand.",
                "start_time": "0.0",
                "end_time": "0.9989",
                "items": [
                    0,
                    1,
                    2,
                    3,
                    4,
                    5
                ]
            }
        ]
    },
    "status": "COMPLETED"
}
```

AWS CLI

To transcribe an audio file and identify PHI using a batch transcription job (AWS CLI)

- Run the following code.

```
aws transcribe start-medical-transcription-job \
--medical-transcription-job-name my-medical-transcription-job-name\
--language-code en-US \
--media MediaFileUri="s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac" \
--output-bucket-name amzn-s3-demo-bucket \
--specialty PRIMARYCARE \
--type type \ # Choose CONVERSATION to transcribe a medical conversation.
 Choose DICTATION to transcribe a medical dictation.
--content-identification-type PHI
```

Identifying PHI in a real-time stream

You can identify Personal Health Information (PHI) in either HTTP/2 or WebSocket streams. When you activate PHI Identification, Amazon Transcribe Medical labels the PHI that it identifies in the transcription results. For information about the PHI that Amazon Transcribe Medical can identify, see Identifying personal health information (PHI) in a transcription.

Identifying PHI in a dictation that is spoken into your microphone

To use the AWS Management Console to transcribe the speech picked up by your microphone and identify any PHI, choose **Dictation** as the audio input type, start the stream, and begin speaking into the microphone on your computer.

To identify PHI in a dictation using the AWS Management Console

1. Sign in to the AWS Management Console.
2. In the navigation pane, choose **Real-time transcription**.
3. For **Audio input type**, choose **Dictation**.
4. For **Additional settings**, choose **PHI identification**.
5. Choose **Start streaming** and speak into the microphone.
6. Choose **Stop streaming** to end the dictation.

Identifying PHI in an HTTP/2 stream

To start an HTTP/2 stream with PHI Identification activated, use the `StartMedicalStreamTranscription` API and specify the following:

- For `LanguageCode`, specify the language code for the language spoken in the stream. For US English, specify `en-US`.
- For `MediaSampleHertz`, specify the sample rate of the audio.
- For `content-identification-type`, specify `PHI`.

Identifying PHI in a WebSocket stream

To a start a WebSocket stream with PHI Identification activated, use the following format to create a presigned URL.

```
GET wss://transcribestreaming.us-west-2.amazonaws.com:8443/medical-stream-
transcription-websocket?
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE%2F20220208%2Fus-
west-2%2Ftranscribe%2Faws4_request
&X-Amz-Date=20220208T235959Z
&X-Amz-Expires=300
&X-Amz-Security-Token=security-token
&X-Amz-Signature=Signature Version 4 signature
&X-Amz-SignedHeaders=host
&language-code=en-US
&media-encoding=flac
&sample-rate=16000
&specialty=medical-specialty
&content-identification-type=PHI
```

Parameter definitions can be found in the API Reference; parameters common to all AWS API operations are listed in the Common Parameters section.

Generating alternative transcriptions

When you use Amazon Transcribe Medical, you get the transcription that has the highest confidence level. However, you can configure Amazon Transcribe Medical to return additional transcriptions with lower confidence levels.

Use alternative transcriptions to see different interpretations of the transcribed audio. For example, in an application that enables a person to review the transcription, you can present the alternative transcriptions for the person to choose from.

You can generate alternative transcriptions with the AWS Management Console or the `StartMedicalTranscriptionJob` API.

AWS Management Console

To use the AWS Management Console to generate alternative transcriptions, you enable alternative results when you configure your job.

1. Sign in to the AWS Management Console.
2. In the navigation pane, under Amazon Transcribe Medical, choose **Transcription jobs**.
3. Choose **Create job**.

4. On the **Specify job details** page, provide information about your transcription job.
5. Choose **Next**.
6. Enable **Alternative results**.
7. For **Maximum alternatives**, enter an integer value between 2 and 10, for the maximum number of alternative transcriptions you want in the output.
8. Choose **Create**.

API

To separate text per speaker in an audio file using a batch transcription job (API)

- For the `StartMedicalTranscriptionJob` API, specify the following.

  a. For `MedicalTranscriptionJobName`, specify a name that is unique in your AWS account.

  b. For `LanguageCode`, specify the language code that corresponds to the language spoken in your audio file and the language of your vocabulary filter.

  c. In the `MediaFileUri` parameter of the `Media` object, specify the location of the audio file you want to transcribe.

  d. For `Specialty`, specify the medical specialty of the clinician speaking in the audio file.

  e. For `Type`, specify whether you're transcribing a medical conversation or a dictation.

  f. For `OutputBucketName`, specify the Amazon S3 bucket to store the transcription results.

  g. For the `Settings` object, specify the following.

     i. `ShowAlternatives` – `true`.

     ii. `MaxAlternatives` - An integer between 2 and 10 to indicate the number of alternative transcriptions you want in the transcription output.

The following request uses the AWS SDK for Python (Boto3) to start a transcription job that generates up to two alternative transcriptions.

```
from __future__ import print_function
import time
import boto3
transcribe = boto3.client('transcribe', 'us-west-2')
```

```
job_name = "my-first-transcription-job"
job_uri = s3://amzn-s3-demo-bucket/my-input-files/my-audio-file.flac
transcribe.start_medical_transcription_job(
    MedicalTranscriptionJobName = job_name,
    Media = {
        'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    OutputKey = 'my-output-files/',
    LanguageCode = 'en-US',
    Specialty = 'PRIMARYCARE',
    Type = 'CONVERSATION',
    Settings = {
        'ShowAlternatives': True,
        'MaxAlternatives': 2
    }
)

while True:
   status = transcribe.get_medical_transcription_job(MedicalTranscriptionJobName =
 job_name)
   if status['MedicalTranscriptionJob']['TranscriptionJobStatus'] in ['COMPLETED',
 'FAILED']:
       break
   print("Not ready yet...")
   time.sleep(5)
print(status)
```

AWS CLI

To transcribe an audio file of a conversation between a primary care clinician and a patient in an audio file (AWS CLI)

- Run the following code.

```
aws transcribe start-transcription-job \
--cli-input-json file://filepath/example-start-command.json
```

The following code shows the contents of `example-start-command.json`.

```
{
      "MedicalTranscriptionJobName": "my-first-transcription-job",
      "LanguageCode": "en-US",
      "Specialty": "PRIMARYCARE",
      "Type": "CONVERSATION",
      "OutputBucketName":"amzn-s3-demo-bucket",
      "Media": {
          "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-audio-
file.flac"
        },
      "Settings":{
          "ShowAlternatives": true,
          "MaxAlternatives": 2
        }
}
```

Amazon Transcribe Medical and interface VPC endpoints (AWS PrivateLink)

You can establish a private connection between your VPC and Amazon Transcribe Medical by creating an *interface VPC endpoint*. Interface endpoints are powered by AWS PrivateLink, a technology that enables you to privately access Amazon Transcribe Medical APIs without an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection. Instances in your VPC don't need public IP addresses to communicate with Amazon Transcribe Medical APIs. Traffic between your VPC and Amazon Transcribe Medical does not leave the Amazon network.

Each interface endpoint is represented by one or more Elastic Network Interfaces in your subnets.

For more information, see Interface VPC endpoints (AWS PrivateLink) in the *Amazon VPC User Guide*.

Considerations for Amazon Transcribe Medical VPC endpoints

Before you set up an interface VPC endpoint for Amazon Transcribe Medical, ensure that you review Interface endpoint properties and limitations in the *Amazon VPC User Guide*.

Amazon Transcribe Medical supports making calls to all of its API actions from your VPC.

Creating an interface VPC endpoint for Amazon Transcribe Medical

You can create a VPC endpoint for the Amazon Transcribe Medical service using either the AWS Management Console or the AWS CLI. For more information, see Creating an interface endpoint in the *Amazon VPC User Guide*.

For batch transcription in Amazon Transcribe Medical, create a VPC endpoint using the following service name:

- com.amazonaws.*`us-west-2`*.transcribe

For streaming transcription in Amazon Transcribe Medical, create a VPC endpoint using the following service name:

- com.amazonaws.*`us-west-2`*.transcribestreaming

If you enable private DNS for the endpoint, you can make API requests to Amazon Transcribe Medical using its default DNS name for the AWS Region, for example, `transcribestreaming.us-east-2.amazonaws.com`.

For more information, see Accessing a service through an interface endpoint in the *Amazon VPC User Guide*.

Creating a VPC endpoint policy for Amazon Transcribe Medical streaming

You can attach an endpoint policy to your VPC endpoint that controls access to Amazon Transcribe Medical. The policy specifies the following information:

- The principal that can perform actions.
- The actions that can be performed.
- The resources on which actions can be performed.

For more information, see Controlling access to services with VPC endpoints in the *Amazon VPC User Guide*.

Example: VPC endpoint policy for Amazon Transcribe Medical streaming transcription actions

The following is an example of an endpoint policy for streaming transcription in Amazon Transcribe Medical. When attached to an endpoint, this policy grants access to the listed Amazon Transcribe Medical actions for all principals on all resources.

```
{
   "Statement":[
      {
         "Principal":"*",
         "Effect":"Allow",
         "Action":[
            "transcribe:StartMedicalStreamTranscription",
         ],
         "Resource":"*"
      }
   ]
}
```

Example: VPC endpoint policy for Amazon Transcribe Medical batch transcription actions

The following is an example of an endpoint policy for batch transcription in Amazon Transcribe Medical. When attached to an endpoint, this policy grants access to the listed Amazon Transcribe Medical actions for all principals on all resources.

```
{
   "Statement":[
      {
         "Principal":"*",
         "Effect":"Allow",
         "Action":[
            "transcribe:StartMedicalTranscriptionJob"
         ],
         "Resource":"*"
      }
   ]
}
```

Shared subnets

You cannot create, describe, modify, or delete VPC endpoints in subnets that are shared with you. However, you can use the VPC endpoints in subnets that are shared with you. For information about VPC sharing, see Share your VPC with other accounts in the Amazon Virtual Private Cloud guide.

AWS HealthScribe

AWS HealthScribe is a HIPAA-eligible machine learning (ML) capability that combines speech recognition and generative AI to transcribe patient-clinician conversations and generate easy-to-review clinical notes. AWS HealthScribe helps healthcare software vendors build clinical applications that reduce the documentation burden and improve consultation experience. The service automatically provides rich conversation transcripts, identifies speaker roles, classifies dialogues, extracts medical terms, and generates preliminary clinical notes. AWS HealthScribe combines these capabilities to remove the need to integrate and optimize separate AI services, enabling you to expedite implementation.

Common use cases:

- **Reduce documentation time** — Enable clinicians to quickly complete clinical documentation with AI-generated clinical notes that are easy to review, adjust, and finalize in your application.
- **Boost medical scribe efficiency** — Equip medical scribes with AI-generated transcript and clinical notes, along with the consultation audio, to expedite documentation turn-around time.
- **Efficient patient visit recap** — Create an experience that enables users to quickly recollect key highlights of their conversation in your application.

Important

The results produced by AWS HealthScribe are probabilistic and may not always be accurate due to various factors, including audio quality, background noise, speaker clarity, the complexity of medical terminology, context-specific language nuances, and the nature of machine learning and generative AI. AWS HealthScribe is designed to be used in an assistive role for clinicians and medical scribes. AWS HealthScribe output should only be used in patient care scenarios, including, but not limited to as part of Electronic Health Records, after review for accuracy and imposition of sound medical judgment by trained medical professionals. AWS HealthScribe output is not a substitute for professional medical advice, diagnosis, or treatment, and is not intended to cure, treat, mitigate, prevent, or diagnose any disease or health condition.

Topics

- Service availability
- Technical requirements
- Supported Medical Specialties
- Workflows
- AWS HealthScribe Transcript file
- AWS HealthScribe Clinical Documentation file
- AWS HealthScribe transcription jobs
- AWS HealthScribe streaming
- Data Encryption at rest for AWS HealthScribe

Security

AWS HealthScribe operates under a shared responsibility model, whereby AWS is responsible for protecting the infrastructure that runs AWS HealthScribe and you are responsible for managing your data. For more information, see Shared Responsibility Model.

By default, AWS HealthScribe provides encryption at rest to protect sensitive customer data using Amazon S3-managed keys. When you create AWS HealthScribe transcription job or start a stream, you can specify a customer managed key. This adds a second layer of encryption. For more information, see Data Encryption at rest for AWS HealthScribe.

Service availability

AWS HealthScribe is available in the US East (N. Virginia) region.

Technical requirements

- **Supported Language:** US English (en-US)
- **Recommended Audio Format:** Lossless audio (such as FLAC or WAV)
- **Encoding:** PCM 16-bit
- **Sample Rate:** 16,000 Hz or higher

Supported Medical Specialties

AWS HealthScribe currently supports the following specialties:

- General Medicine
- Orthopedics

Workflows

AWS HealthScribe workflows include transcription jobs and streaming. After you run a transcription job or complete a stream, AWS HealthScribe generates a transcript file, with turn-by-turn transcription output and insights for each conversation turn. Also it generates a clinical documentation file, with summaries and evidence links. For more information see AWS HealthScribe Transcript file and AWS HealthScribe Clinical Documentation file.

- **Transcription jobs** – With transcription jobs, AWS HealthScribe analyzes completed medical consultation media files from an Amazon S3 bucket. The following are API operations specific to AWS HealthScribe transcription jobs.
  - StartMedicalScribeJob
  - ListMedicalScribeJobs
  - GetMedicalScribeJob
  - DeleteMedicalScribeJob

  For more information, including code examples, see AWS HealthScribe transcription jobs.
- **Streaming** – AWS HealthScribe streaming is a real-time HTTP2 based bi-directional service that accepts audio stream on one channel and vends an audio transcription on the other channel.

  The following are API operations specific to AWS HealthScribe streaming:
  - StartMedicalScribeStream
  - GetMedicalScribeStream

  For more information, including code examples, see AWS HealthScribe streaming.

AWS HealthScribe Transcript file

In the transcript file, in addition to standard turn-by-turn transcription output with word level timestamps, AWS HealthScribe provides you with:

- **Participant role detection** so you can distinguish the patients from the clinicians in the conversation transcript.
- **Transcript sectioning**, which categorizes transcript dialogues based on their clinical relevance like small talk, subjective, objective, etc. This can be used to show specific portions of the transcript.
- **Clinical entities**, which includes structured information like medications, medical conditions, and treatments mentioned in the conversation.

In addition, the following insights are provided for each conversation turn:

- **Participant role** — Each participant is labeled as either a clinician or a patient. If a conversation has more than one participant in each category, each participant is assigned a number. For example, `CLINICIAN_0`, `CLINICIAN_1` and `PATIENT_0`, `PATIENT_1`.
- **Section** — Each dialogue turn is assigned to one of four possible sections based on the content identified.
  - **Subjective** — Information provided by the patient about their health concerns.
  - **Objective** — Information observed by the clinician through physical exam, lab, imaging, or diagnostic tests.
  - **Assessment and Plan** — Information that relates to the doctor's assessment and treatment plan.
  - **Visit Flow Management** — Information related to small talk or transitions.
- **Insights** — Extract clinically relevant entities (`ClinicalEntity`) present in the conversation. AWS HealthScribe detects all clinical entities supported by Amazon Comprehend Medical.

For an example of a transcript from a transcription job, see the transcript output in Transcription job output examples. For an example of a transcript from streaming, see the transcript output in Streaming transcription output examples.

AWS HealthScribe Clinical Documentation file

AWS HealthScribe can use one of the following templates for the clinical note summary. The default is `HISTORY_AND_PHYSICAL`.

- HISTORY_AND_PHYSICAL: Provides summaries for key sections of the clinical documentation. Examples of sections include Chief Complaint, History of Present Illness, Review of Systems, Past Medical History, Assessment, and Plan.
- GIRPP: Provides summaries based on the patients progress toward goals. Examples of sections include Goal, Intervention, Response, Progress, and Plan.

To specify what template to use, do the following:

- For transcription jobs, specify the template to use in the `NoteTemplate` of the ClinicalNoteGenerationSettings of the `Settings` of your StartMedicalScribeJob API operation.
- For streaming, you specify the template to use in the `NoteTemplate` of the ClinicalNoteGenerationSettings of the `PostStreamAnalyticsSettings` of your MedicalScribeConfigurationEvent.

Topics

- HISTORY_AND_PHYSICAL template sections
- GIRPP template sections

HISTORY_AND_PHYSICAL template sections

The HISTORY_AND_PHYSICAL insights template includes the following sections.

Section	Description
CHIEF COMPLAINT	Brief description for the patient's reason for visiting the clinician.
HISTORY OF PRESENT ILLNESS	Notes that provide information on patient's illness, including reference to severity, onset,

Section	Description
	timing of symptoms, current treatments, and the affected areas.
REVIEW OF SYSTEMS	Patient-reported evaluation of symptoms across different body systems.
PAST MEDICAL HISTORY	Details a patient's previous medical conditions, surgeries, and treatments.
ASSESSMENT	Notes that provide information on clinician's assessment of patient's health.
PLAN	Notes that reference any medical treatments, lifestyle adjustments, and further appointme nts.
PHYSICAL_EXAMINATION	Documentation of clinician's findings from physical examination of patient's body systems and vital signs.
PAST_FAMILY_HISTORY	Information about health conditions that run in the patient's family.
PAST_SOCIAL_HISTORY	Details about patient's social life, habits, occupation, and environmental factors affecting health.
DIAGNOSTIC_TESTING	Results and interpretation of laboratory tests, imaging studies, and other diagnostic procedures.

Each sentence present in the `Summary` includes `EvidenceLinks` that provide the `SegmentId` for the relevant dialogues in the transcript that were summarized. This helps users validate accuracy of the summary in your application. Like explainability, providing traceability and transparency for AI-generated insights is consistent with Responsible AI principles. Providing these references along with the summary notes to clinicians or medical scribes helps foster trust and encourage the safe use of AI in the clinical settings.

For an example of a Clinical Documentation file from a transcription job, see the a Clinical Documentation file example in Transcription job output examples. For an example of a Clinical Documentation file from streaming, see the a Clinical Documentation file example in Streaming transcription output examples.

GIRPP template sections

The GIRPP insights template includes the following sections.

Section	Description
Goal	The identified problem, challenge, or behavior that needs to be addressed through treatment .
Intervention	The specific treatment, method, or technique used by the clinician to help the patient address the identified goal.
Response	How the patient responded to the intervent ion, including their participation level, reactions, and feedback.
Progress	The clinician's assessment of movement toward treatment goals, including observati ons of patient improvement or barriers.
Plan	The next steps in treatment, including future interventions, homework assignments, and referrals.

AWS HealthScribe transcription jobs

An AWS HealthScribe transcription job processes media files from an Amazon S3 bucket. When it processes a media file, it transcribes patient-clinician conversations and analyzes medical consultation to produces two JSON output files: a transcript file and a clinical documentation file.

The following are API operations specific to AWS HealthScribe transcription jobs:

- StartMedicalScribeJob
- ListMedicalScribeJobs
- GetMedicalScribeJob
- DeleteMedicalScribeJob

Starting an AWS HealthScribe transcription job

You can start an AWS HealthScribe job using the AWS CLI or AWS SDKs.

AWS CLI

This example uses the start-medical-scribe-job command. For more information, see StartMedicalScribeJob.

```
aws transcribe start-medical-scribe-job \
--region us-west-2 \
--medical-scribe-job-name my-first-medical-scribe-job \
--media MediaFileUri=s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac \
--output-bucket-name amzn-s3-demo-bucket \
--DataAccessRoleArn=arn:aws:iam::111122223333:role/ExampleRole \
--settings ShowSpeakerLabels=false,ChannelIdentification=true \
--channel-definitions ChannelId=0,ParticipantRole=CLINICIAN
 ChannelId=1,ParticipantRole=PATIENT
```

Here is another example using the start-medical-scribe-job command, and a request body with additional settings.

```
aws transcribe start-medical-scribe-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-medical-scribe-job.json
```

The file `my-first-medical-scribe-job.json` contains the following request body.

```
{
  "MedicalScribeJobName": "my-first-medical-scribe-job",
  "Media": {
    "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
   },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole",
  "Settings": {
    "ShowSpeakerLabels": false,
    "ChannelIdentification": true
  },
  "ChannelDefinitions": [
    {
      "ChannelId": 0,
      "ParticipantRole":"CLINICIAN"
    }, {
      "ChannelId": 1,
      "ParticipantRole":"PATIENT"
    }
  ]
}
```

AWS SDK for Python (Boto3)

The following example uses the AWS SDK for Python (Boto3) to make a start_medical_scribe_job request. For more information, see StartMedicalScribeJob.

```
from __future__ import print_functionimport timeimport boto3
transcribe = boto3.client('transcribe', 'us-west-2')
job_name = "my-first-medical-scribe-job"
job_uri = "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
transcribe.start_medical_scribe_job(
    MedicalScribeJobName = job_name,
    Media = {
      'MediaFileUri': job_uri
    },
    OutputBucketName = 'amzn-s3-demo-bucket',
    DataAccessRoleArn = 'arn:aws:iam::111122223333:role/ExampleRole',
    Settings = {
      'ShowSpeakerLabels': false,
      'ChannelIdentification': true
    },
    ChannelDefinitions = [
      {
        'ChannelId': 0,
        'ParticipantRole': 'CLINICIAN'
      }, {
        'ChannelId': 1,
        'ParticipantRole': 'PATIENT'
      }
    ]
)
while True:
    status = transcribe.get_medical_scribe_job(MedicalScribeJobName = job_name)
    if status['MedicalScribeJob']['MedicalScribeJobStatus'] in ['COMPLETED', 'FAILED']:
        break
    print("Not ready yet...")
    time.sleep(5)
print(status)
```

Note

The AWS Management Console does not currently support AWS HealthScribe jobs.

Transcription job output examples

In addition to a transcript, `StartMedicalScribeJob` requests generate a separate clinical documentation file. Both files are in JSON format and are stored in the output location you specify in your request. Here are examples of each output type:

Example transcript output

An AWS HealthScribe transcript file (from a `StartMedicalScribeJob` request) has the following format:

```
{
  "Conversation": {
    "ConversationId": "sampleConversationUUID",
    "JobName": "sampleJobName",
    "JobType": "ASYNC",
    "LanguageCode": "en-US",
    "ClinicalInsights": [
      {
        "Attributes": [],
        "Category": "MEDICAL_CONDITION",
        "InsightId": "insightUUID1",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 12,
            "Content": "pain",
            "EndCharacterOffset": 15,
            "SegmentId": "uuid1"
          }
        ],
        "Type": "DX_NAME"
      },
      {
        "Attributes": [],
        "Category": "TEST_TREATMENT_PROCEDURE",
        "InsightId": "insightUUID2",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 4,
            "Content": "mammogram",
            "EndCharacterOffset": 12,
            "SegmentId": "uuid2"
          }
        ],
        "Type": "TEST_NAME"
      },
      {
        "Attributes": [],
        "Category": "TEST_TREATMENT_PROCEDURE",
        "InsightId": "insightUUID3",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 15,
            "Content": "pap smear",
            "EndCharacterOffset": 23,
            "SegmentId": "uuid3"
          }
        ],
        "Type": "TEST_NAME"
      },
      {
        "Attributes": [],
        "Category": "MEDICATION",
        "InsightId": "insightUUID4",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 28,
            "Content": "phentermine",
            "EndCharacterOffset": 38,
            "SegmentId": "uuid4"
          }
        ],
        "Type": "GENERIC_NAME"
      },
      {
        "Attributes": [
          {
            "AttributeId": "attributeUUID1",
            "Spans": [
              {
                "BeginCharacterOffset": 38,
                "Content": "high",
                "EndCharacterOffset": 41,
                "SegmentId": "uuid5"
              }
            ],
            "Type": "TEST_VALUE"
          }
        ],
        "Category": "TEST_TREATMENT_PROCEDURE",
        "InsightId": "insightUUID5",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 14,
            "Content": "weight",
            "EndCharacterOffset": 19,
            "SegmentId": "uuid6"
          }
        ],
        "Type": "TEST_NAME"
      },
      {
        "Attributes": [],
        "Category": "ANATOMY",
        "InsightId": "insightUUID6",
        "InsightType": "ClinicalEntity",
        "Spans": [
          {
            "BeginCharacterOffset": 60,
            "Content": "heart",
            "EndCharacterOffset": 64,
            "SegmentId": "uuid7"
          }
        ],
        "Type": "SYSTEM_ORGAN_SITE"
      }
    ],
    "TranscriptItems": [
      {
        "Alternatives": [
          {
            "Confidence": 0.7925,
            "Content": "Okay"
          }
        ],
        "BeginAudioTime": 0.16,
        "EndAudioTime": 0.6,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 0,
            "Content": "."
          }
        ],
        "BeginAudioTime": 0.17,
        "EndAudioTime": 0.9,
        "Type": "PUNCTUATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 1,
            "Content": "Good"
```

```
          }
        ],
        "BeginAudioTime": 0.61,
        "EndAudioTime": 0.92,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 1,
            "Content": "afternoon"
          }
        ],
        "BeginAudioTime": 0.92,
        "EndAudioTime": 1.54,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 0,
            "Content": "."
          }
        ],
        "BeginAudioTime": 0,
        "EndAudioTime": 0,
        "Type": "PUNCTUATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 0.9924,
            "Content": "You"
          }
        ],
        "BeginAudioTime": 1.55,
        "EndAudioTime": 1.88,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 1,
            "Content": "lost"
          }
        ],
        "BeginAudioTime": 1.88,
        "EndAudioTime": 2.19,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 1,
            "Content": "one"
          }
        ],
        "BeginAudioTime": 2.19,
        "EndAudioTime": 2.4,
        "Type": "PRONUNCIATION"
      },
      {
        "Alternatives": [
          {
            "Confidence": 1,
            "Content": "lb"
          }
        ],
        "BeginAudioTime": 2.4,
        "EndAudioTime": 2.97,
        "Type": "PRONUNCIATION"
      }
    ],
    "TranscriptSegments": [
      {
        "BeginAudioTime": 0.16,
        "Content": "Okay.",
        "EndAudioTime": 0.6,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "SUBJECTIVE"
        },
        "SegmentId": "uuid1"
      },
      {
        "BeginAudioTime": 0.61,
        "Content": "Good afternoon.",
        "EndAudioTime": 1.54,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "OTHER"
        },
        "SegmentId": "uuid2"
      },
      {
        "BeginAudioTime": 1.55,
        "Content": "You lost one lb.",
        "EndAudioTime": 2.97,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "SUBJECTIVE"
        },
        "SegmentId": "uuid3"
      },
      {
        "BeginAudioTime": 2.98,
        "Content": "Yeah, I think it, uh, do you feel more energy?",
        "EndAudioTime": 6.95,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "SUBJECTIVE"
        },
        "SegmentId": "uuid5"
      },
      {
        "BeginAudioTime": 6.96,
        "Content": "Yes.",
        "EndAudioTime": 7.88,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "SUBJECTIVE"
        },
        "SegmentId": "uuid6"
      },
      {
        "BeginAudioTime": 7.89,
        "Content": "Uh, how about craving for the carbohydrate or sugar or fat or
anything?",
        "EndAudioTime": 17.93,
        "ParticipantDetails": {
          "ParticipantRole": "CLINICIAN_0"
        },
        "SectionDetails": {
          "SectionName": "SUBJECTIVE"
        },
        "SegmentId": "uuid7"
      }
    ]
  }
}
```

Here is another example using the start-medical-scribe-job command, and a request body with additional settings.

```
aws transcribe start-medical-scribe-job \
--region us-west-2 \
--cli-input-json file://filepath/my-first-medical-scribe-job.json
```

The file `my-first-medical-scribe-job.json` contains the following request body.

```
{
  "MedicalScribeJobName": "my-first-medical-scribe-job",
  "Media": {
    "MediaFileUri": "s3://amzn-s3-demo-bucket/my-input-files/my-media-file.flac"
   },
  "OutputBucketName": "amzn-s3-demo-bucket",
  "DataAccessRoleArn": "arn:aws:iam::111122223333:role/ExampleRole",
  "Settings": {
    "ShowSpeakerLabels": false,
    "ChannelIdentification": true
  },
  "ChannelDefinitions": [
    {
      "ChannelId": 0,
      "ParticipantRole":"CLINICIAN"
    }, {
      "ChannelId": 1,
      "ParticipantRole":"PATIENT"
    }
  ]
}
```

Example clinical documentation output

A documentation insights file (from a `StartMedicalScribeJob` request) has the following format:

```
{
  "ClinicalDocumentation": {
    "Sections": [
      {
        "SectionName": "CHIEF_COMPLAINT",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid1"
              },
              {
                "SegmentId": "uuid2"
              },
              {
                "SegmentId": "uuid3"
              },
              {
                "SegmentId": "uuid4"
              },
              {
                "SegmentId": "uuid5"
              },
              {
                "SegmentId": "uuid6"
              }
            ],
            "SummarizedSegment": "Weight loss."
          }
        ]
      },
      {
        "SectionName": "HISTORY_OF_PRESENT_ILLNESS",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid7"
              },
              {
                "SegmentId": "uuid8"
              },
              {
                "SegmentId": "uuid9"
              },
              {
                "SegmentId": "uuid10"
              }
            ],
            "SummarizedSegment": "The patient is seen today for a follow-up of weight 
  loss."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid11"
              },
              {
                "SegmentId": "uuid12"
              },
              {
                "SegmentId": "uuid13"
              }
            ],
            "SummarizedSegment": "They report feeling more energy and craving 
  carbohydrates, sugar, and fat."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid14"
              },
              {
                "SegmentId": "uuid15"
              },
              {
                "SegmentId": "uuid16"
              }
            ],
            "SummarizedSegment": "The patient is up to date on their mammogram and pap
 smear."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid17"
              },
              {
                "SegmentId": "uuid18"
              },
              {
                "SegmentId": "uuid19"
              },
              {
                "SegmentId": "uuid20"
              }
            ],
            "SummarizedSegment": "The patient is taking phentermine and would like to
 continue."
          }
        ]
      },
      {
        "SectionName": "REVIEW_OF_SYSTEMS",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid21"
              },
              {
                "SegmentId": "uuid22"
              }
            ],
            "SummarizedSegment": "Patient reports intermittent headaches, occasional 
 chest pains but denies any recent fevers or chills."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid23"
              },
              {
                "SegmentId": "uuid24"
              }
            ],
            "SummarizedSegment": "No recent changes in vision, hearing, or any 
 respiratory complaints."
          }
        ]
      },
      {
        "SectionName": "PAST_MEDICAL_HISTORY",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid25"
              },
              {
                "SegmentId": "uuid26"
              }
            ],
            "SummarizedSegment": "Patient has a history of hypertension and was 
 diagnosed with Type II diabetes 5 years ago."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid27"
              },
              {
                "SegmentId": "uuid28"
              }
            ],
            "SummarizedSegment": "Underwent an appendectomy in the early '90s and had a 
 fracture in the left arm during childhood."
```

```
          }
        ]
      },
      {
        "SectionName": "ASSESSMENT",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid29"
              },
              {
                "SegmentId": "uuid30"
              }
            ],
            "SummarizedSegment": "Weight loss"
          }
        ]
      },
      {
        "SectionName": "PLAN",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid31"
              },
              {
                "SegmentId": "uuid32"
              },
              {
                "SegmentId": "uuid33"
              },
              {
                "SegmentId": "uuid34"
              }
            ],
            "SummarizedSegment": "For the condition of Weight loss: The patient was 
 given a 30-day supply of phentermine and was advised to follow up in 30 days."
          }
        ]
      }
    ]
  }
```

```
}
```

AWS HealthScribe streaming

With AWS HealthScribe streaming, you can transcribe medical conversations in real-time. AWS HealthScribe streaming is a real-time HTTP2 based bi-directional service that accepts audio stream on one channel and vends an audio transcription on the other channel. After streaming is complete, AWS HealthScribe analyzes the stream contents and produces a transcript JSON file and a clinical note JSON file.

To start streaming, use the StartMedicalScribeStream API operation. This API starts an HTTP2 based bi-directional channel that you use to stream audio events.

When you start a stream, first specify the stream configuration in a `MedicalScribeConfigurationEvent`. This event includes channel definitions, encryption settings, and post-stream analytics settings, such as the output configuration for aggregated transcript and clinical note generation.

After you start streaming audio, you manage the stream as follows:

- When you are finished, to start processing the results with post-stream analytics, send a `MedicalScribeSessionControlEvent` with a `Type` of `END_OF_SESSION` and AWS HealthScribe starts the analytics.
- To pause streaming, complete the input stream without sending the `MedicalScribeSessionControlEvent`.
- To resume a paused stream, use the `StartMedicalScribeStream` API operation and specify the same `SessionId`. This is the `SessionId` you used when you originally started the stream.

Topics

Guidelines and requirements

The following are guidelines and requirements for AWS HealthScribe streaming:

- Before you send audio events, you must first specify the stream configuration in a `MedicalScribeConfigurationEvent`.
- To run post-stream analytics, the `ResourceAccessRoleArn` in your `MedicalScribeConfigurationEvent` must have the correct permissions. For more information, see ResourceAccessRoleArn role permissions.
- You can resume a session any number of times within 5 hours from the initial stream creation.
- You can stream at most 2 hours of audio over a session across all streaming requests.
- By default, AWS HealthScribe provides encryption at rest to protect sensitive customer data using Amazon S3-managed keys. When you start a stream, you can specify a AWS KMS key for a second layer of encryption. Your `ResourceAccessRoleArn` must have permission to use your AWS KMS key. For more information, see Data Encryption at rest for AWS HealthScribe.
- You can use AWS HealthScribe streaming with the AWS SDKs, excluding the SDK for Python (Boto3) and SDK for PHP.
- If a `LimitExceededException` exception occurs after you end a stream, you can restart the session and still generate post-stream analytics. To restart the stream, use the StartMedicalScribeStream API and use same `SessionID`. Then send a `MedicalScribeSessionControlEvent` with a `Type` of `END_OF_SESSION` and AWS HealthScribe starts the analytics.

ResourceAccessRoleArn role permissions

To run post-stream analytics, the `ResourceAccessRoleArn` in your `MedicalScribeConfigurationEvent` must be able to access your Amazon S3 output bucket and, if you provide it, your AWS KMS key. Also, the role's trust policy must grant the `transcribe.streaming.amazonaws.com` service permission to assume the role.

The following is an example IAM policy that grants Amazon S3 bucket permissions and AWS KMS key permissions. For more information, see Data Encryption at rest for AWS HealthScribe.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "s3:PutObject"
            ],
            "Resource": [
                "arn:aws:s3:::amzn-s3-demo-bucket",
                "arn:aws:s3:::amzn-s3-demo-bucket/*"
            ],
            "Effect": "Allow"
        },
        {
            "Action": [
                "kms:DescribeKey",
                "kms:Decrypt",
                "kms:Encrypt",
                "kms:GenerateDataKey*"
            ],
            "Resource": "arn:aws:kms:us-
west-2:123456789012:key/1234abcd-12ab-34cd-56ef-123456SAMPLE",
            "Effect": "Allow",
        }
    ]
}
```

The following is an example trust policy.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "Service": [
                    "transcribe.streaming.amazonaws.com"
                ]
            },
            "Action": "sts:AssumeRole"
        }
    ]
}
```

Starting AWS HealthScribe streaming transcription

The following code example shows how to set up a AWS HealthScribe streaming transcription using the AWS SDKs.

Topics

- SDK for Java 2.x
- Streaming transcription output examples

SDK for Java 2.x

The following example uses the SDK for Java 2.x to set up streaming and make a StartMedicalScribeStream request.

```
package org.example;

import io.reactivex.rxjava3.core.BackpressureStrategy;
import io.reactivex.rxjava3.core.Flowable;
import org.reactivestreams.Publisher;
import org.reactivestreams.Subscriber;
import software.amazon.awssdk.auth.credentials.AwsCredentialsProvider;
import software.amazon.awssdk.auth.credentials.DefaultCredentialsProvider;
import software.amazon.awssdk.core.SdkBytes;
import software.amazon.awssdk.regions.Region;
import
 software.amazon.awssdk.services.transcribestreaming.TranscribeStreamingAsyncClient;
import
 software.amazon.awssdk.services.transcribestreaming.model.ClinicalNoteGenerationSettings;
import software.amazon.awssdk.services.transcribestreaming.model.LanguageCode;
import software.amazon.awssdk.services.transcribestreaming.model.MediaEncoding;

import
 software.amazon.awssdk.services.transcribestreaming.model.MedicalScribeInputStream;
import
 software.amazon.awssdk.services.transcribestreaming.model.MedicalScribePostStreamAnalyticsSett
import
 software.amazon.awssdk.services.transcribestreaming.model.MedicalScribeSessionControlEventType
import
 software.amazon.awssdk.services.transcribestreaming.model.MedicalScribeTranscriptEvent;
import
 software.amazon.awssdk.services.transcribestreaming.model.MedicalScribeTranscriptSegment;
import
 software.amazon.awssdk.services.transcribestreaming.model.StartMedicalScribeStreamRequest;
import
 software.amazon.awssdk.services.transcribestreaming.model.StartMedicalScribeStreamResponseHand
import
 software.amazon.awssdk.services.transcribestreaming.model.medicalscribeinputstream.DefaultConf
```

```
import software.amazon.awssdk.http.nio.netty.NettyNioAsyncHttpClient;

import javax.sound.sampled.AudioFormat;
import javax.sound.sampled.AudioInputStream;
import javax.sound.sampled.AudioSystem;
import javax.sound.sampled.DataLine;
import javax.sound.sampled.LineUnavailableException;
import javax.sound.sampled.TargetDataLine;
import java.io.BufferedInputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.UncheckedIOException;
import java.util.Arrays;
import java.util.concurrent.CompletableFuture;


public class HealthScribeStreamingDemoApp {
    private static final int CHUNK_SIZE_IN_BYTES = 6400;
    private static final int SAMPLE_RATE = 16000;
    private static final Region REGION = Region.US_EAST_1;
    private static final String sessionId = "1234abcd-12ab-34cd-56ef-123456SAMPLE";
    private static final String bucketName = "amzn-s3-demo-bucket";
    private static final String resourceAccessRoleArn =
 "arn:aws:iam::123456789012:role/resource-access-role";
    private static TranscribeStreamingAsyncClient client;

    public static void main(String args[]) {

        client = TranscribeStreamingAsyncClient.builder()
                .credentialsProvider(getCredentials())
                .httpClientBuilder(NettyNioAsyncHttpClient.builder())
                .region(REGION)
                .build();
        try {
            StartMedicalScribeStreamRequest request =
 StartMedicalScribeStreamRequest.builder()
                    .languageCode(LanguageCode.EN_US.toString())
                    .mediaSampleRateHertz(SAMPLE_RATE)
                    .mediaEncoding(MediaEncoding.PCM.toString())
                    .sessionId(sessionId)
                    .build();

            MedicalScribeInputStream endSessionEvent =
 MedicalScribeInputStream.sessionControlEventBuilder()
```

```
                    .type(MedicalScribeSessionControlEventType.END_OF_SESSION)
                    .build();

            CompletableFuture<Void> result = client.startMedicalScribeStream(
                    request,
                    new AudioStreamPublisher(getStreamFromMic(),
getConfigurationEvent(),endSessionEvent),
                    getMedicalScribeResponseHandler());
            result.get();
            client.close();
        } catch (Exception e) {
            System.err.println("Error occurred: " + e.getMessage());
            e.printStackTrace();
        }
    }

    private static AudioInputStream getStreamFromMic() throws LineUnavailableException
{
        // Signed PCM AudioFormat with 16kHz, 16 bit sample size, mono
        AudioFormat format = new AudioFormat(SAMPLE_RATE, 16, 1, true, false);
        DataLine.Info info = new DataLine.Info(TargetDataLine.class, format);

        if (!AudioSystem.isLineSupported(info)) {
            System.out.println("Line not supported");
            throw new LineUnavailableException("The audio system microphone line is not
supported.");
        }
        TargetDataLine line = (TargetDataLine) AudioSystem.getLine(info);
        int bufferSize = (CHUNK_SIZE_IN_BYTES / format.getFrameSize()) *
format.getFrameSize();
        line.open(format);
        line.start();

        // Create a wrapper class that can be closed when Enter is pressed
        AudioInputStream audioStream = new AudioInputStream(line);

        // Start a thread to monitor for Enter key
        System.out.println("Recording... Press Enter to stop");
        Thread monitorThread = new Thread(() -> {
            try {
                System.in.read();
                line.stop();
                line.close();
            } catch (IOException e) {
                e.printStackTrace();
            }
        });
        monitorThread.setDaemon(true);  // Set as daemon thread so it doesn't prevent
 JVM shutdown
        monitorThread.start();

        return new AudioInputStream(
            new BufferedInputStream(new AudioInputStream(line)),
            format,
            AudioSystem.NOT_SPECIFIED
        );
    }

    private static AwsCredentialsProvider getCredentials() {
        return DefaultCredentialsProvider.create();
    }

    private static StartMedicalScribeStreamResponseHandler
 getMedicalScribeResponseHandler() {

        return StartMedicalScribeStreamResponseHandler.builder()
            .onResponse(r -> {
                System.out.println("Received Initial response");
            })
            .onError(Throwable::printStackTrace)
            .onComplete(() -> {
                System.out.println("=== All records streamed successfully ===");
            })
            .subscriber(event -> {
                if (event instanceof MedicalScribeTranscriptEvent) {
                    MedicalScribeTranscriptSegment segment =
 ((MedicalScribeTranscriptEvent) event).transcriptSegment();
                    if (segment != null && segment.content() != null && !
segment.content().isEmpty()) {
                        System.out.println(segment.content());
                    }
                }
            })
            .build();
    }

    private static DefaultConfigurationEvent getConfigurationEvent() {
        MedicalScribePostStreamAnalyticsSettings postStreamSettings =
 MedicalScribePostStreamAnalyticsSettings
                .builder()
                .clinicalNoteGenerationSettings(
                        ClinicalNoteGenerationSettings.builder()
                                .outputBucketName(bucketName)
                                .build()
                )
                .build();
        return (DefaultConfigurationEvent)
 MedicalScribeInputStream.configurationEventBuilder()
                .resourceAccessRoleArn(resourceAccessRoleArn)
                .postStreamAnalyticsSettings(postStreamSettings)
                .build();
    }

    private static class AudioStreamPublisher implements
 Publisher<MedicalScribeInputStream> {
        private final InputStream audioInputStream;
        private final MedicalScribeInputStream configEvent;
        private final MedicalScribeInputStream endSessionEvent;

        private AudioStreamPublisher(AudioInputStream audioInputStream,
                                     MedicalScribeInputStream configEvent,
                                     MedicalScribeInputStream endSessionEvent) {
            this.audioInputStream = audioInputStream;
            this.configEvent = configEvent;
            this.endSessionEvent = endSessionEvent;
        }

        @Override
        public void subscribe(Subscriber<? super MedicalScribeInputStream> subscriber)
 {
            createAudioFlowable()
                    .doOnComplete(() -> {
                        try {
                            audioInputStream.close();
                        } catch (IOException e) {
                            throw new UncheckedIOException(e);
                        }
                    })
                    .subscribe(subscriber);
        }
        private Flowable<MedicalScribeInputStream> createAudioFlowable() {
            // Start with config event
            Flowable<MedicalScribeInputStream> configFlow = Flowable.just(configEvent);

            // Create audio chunk flowable
            Flowable<MedicalScribeInputStream> audioFlow = Flowable.create(emitter -> {
                byte[] buffer = new byte[CHUNK_SIZE_IN_BYTES];
                int bytesRead;

                try {
                    while (!emitter.isCancelled() && (bytesRead =
 audioInputStream.read(buffer)) > 0) {
                        byte[] audioData = bytesRead < buffer.length
                                ? Arrays.copyOfRange(buffer, 0, bytesRead)
                                : buffer;

                        MedicalScribeInputStream audioEvent =
 MedicalScribeInputStream.audioEventBuilder()
                                .audioChunk(SdkBytes.fromByteArray(audioData))
                                .build();

                        emitter.onNext(audioEvent);
                    }
                    emitter.onComplete();
                } catch (IOException e) {
                    emitter.onError(e);
                }
            }, BackpressureStrategy.BUFFER);

            // End with session end event
            Flowable<MedicalScribeInputStream> endFlow =
 Flowable.just(endSessionEvent);

            // Concatenate all flows
            return Flowable.concat(configFlow, audioFlow, endFlow);
        }
    }
}
```

Streaming transcription output examples

After streaming is complete, AWS HealthScribe analyzes the stream contents and produces a transcript JSON file and a clinical note JSON file. Here are examples of each output type:

Example transcript output

The following is an example of a AWS HealthScribe transcript file from a streaming session.

```
{
    "Conversation": {
        "ClinicalInsights": [{
            "Attributes": [],
            "Category": "MEDICAL_CONDITION",
            "InsightId": "insightUUID1",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 12,
                "Content": "pain",
                "EndCharacterOffset": 15,
                "SegmentId": "uuid1"
            }],
            "Type": "DX_NAME"
        }, {
            "Attributes": [],
            "Category": "TEST_TREATMENT_PROCEDURE",
            "InsightId": "insightUUID2",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 4,
                "Content": "mammogram",
                "EndCharacterOffset": 12,
                "SegmentId": "uuid2"
            }],
            "Type": "TEST_NAME"
        }, {
            "Attributes": [],
            "Category": "TEST_TREATMENT_PROCEDURE",
            "InsightId": "insightUUID3",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 15,
                "Content": "pap smear",
                "EndCharacterOffset": 23,
                "SegmentId": "uuid3"
            }],
            "Type": "TEST_NAME"
        }, {
            "Attributes": [],
            "Category": "MEDICATION",
            "InsightId": "insightUUID4",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 28,
                "Content": "phentermine",
                "EndCharacterOffset": 38,
                "SegmentId": "uuid4"
            }],
            "Type": "GENERIC_NAME"
        }, {
            "Attributes": [{
                "AttributeId": "attributeUUID1",
                "Spans": [{
                    "BeginCharacterOffset": 38,
                    "Content": "high",
                    "EndCharacterOffset": 41,
                    "SegmentId": "uuid5"
                }],
                "Type": "TEST_VALUE"
            }],
            "Category": "TEST_TREATMENT_PROCEDURE",
            "InsightId": "insightUUID5",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 14,
                "Content": "weight",
                "EndCharacterOffset": 19,
                "SegmentId": "uuid6"
            }],
            "Type": "TEST_NAME"
        }, {
            "Attributes": [],
            "Category": "ANATOMY",
            "InsightId": "insightUUID6",
            "InsightType": "ClinicalEntity",
            "Spans": [{
                "BeginCharacterOffset": 60,
                "Content": "heart",
                "EndCharacterOffset": 64,
                "SegmentId": "uuid7"
            }],
            "Type": "SYSTEM_ORGAN_SITE"
        }],
        "ConversationId": "sampleConversationUUID",
        "LanguageCode": "en-US",
        "SessionId": "sampleSessionUUID",
        "TranscriptItems": [{
            "Alternatives": [{
                "Confidence": 0.7925,
                "Content": "Okay"
            }],
            "BeginAudioTime": 0.16,
            "EndAudioTime": 0.6,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 0,
                "Content": "."
            }],
            "BeginAudioTime": 0,
            "EndAudioTime": 0,
            "Type": "PUNCTUATION"
        },
        {
            "Alternatives": [{
                "Confidence": 1,
                "Content": "Good"
            }],
            "BeginAudioTime": 0.61,
            "EndAudioTime": 0.92,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 1,
                "Content": "afternoon"
            }],
            "BeginAudioTime": 0.92,
            "EndAudioTime": 1.54,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 0,
                "Content": "."
            }],
            "BeginAudioTime": 0,
            "EndAudioTime": 0,
            "Type": "PUNCTUATION"
        },
        {
            "Alternatives": [{
                "Confidence": 0.9924,
                "Content": "You"
            }],
            "BeginAudioTime": 1.55,
            "EndAudioTime": 1.88,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 1,
                "Content": "lost"
            }],
            "BeginAudioTime": 1.88,
            "EndAudioTime": 2.19,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 1,
                "Content": "one"
            }],
            "BeginAudioTime": 2.19,
            "EndAudioTime": 2.4,
            "Type": "PRONUNCIATION"
        },
        {
            "Alternatives": [{
                "Confidence": 1,
                "Content": "lb"
            }],
            "BeginAudioTime": 2.4,
            "EndAudioTime": 2.97,
            "Type": "PRONUNCIATION"
        }
        ],
        "TranscriptSegments": [{
            "BeginAudioTime": 0.16,
            "Content": "Okay.",
            "EndAudioTime": 0.6,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "SUBJECTIVE"
            },
            "SegmentId": "uuid1"
        }, {
            "BeginAudioTime": 0.61,
            "Content": "Good afternoon.",
            "EndAudioTime": 1.54,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "OTHER"
            },
            "SegmentId": "uuid2"
        }, {
            "BeginAudioTime": 1.55,
            "Content": "You lost one lb.",
            "EndAudioTime": 2.97,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "SUBJECTIVE"
            },
            "SegmentId": "uuid3"
        }, {
            "BeginAudioTime": 2.98,
            "Content": "Yeah, I think it, uh, do you feel more energy?",
            "EndAudioTime": 6.95,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "SUBJECTIVE"
            },
            "SegmentId": "uuid4"
        }, {
            "BeginAudioTime": 6.96,
            "Content": "Yes.",
            "EndAudioTime": 7.88,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "SUBJECTIVE"
            },
            "SegmentId": "uuid5"
        }, {
            "BeginAudioTime": 7.89,
            "Content": "Uh, how about craving for the carbohydrate or sugar or fat or
 anything?",
            "EndAudioTime": 17.93,
            "ParticipantDetails": {
                "ParticipantRole": "CLINICIAN_0"
            },
            "SectionDetails": {
                "SectionName": "SUBJECTIVE"
            },
            "SegmentId": "uuid6"
        }]
    }
}
```

Example Clinical Documentation output

The following is an example of a AWS HealthScribe clinical documentation insights file from a streaming session.

```
{
  "ClinicalDocumentation": {
    "Sections": [
      {
        "SectionName": "CHIEF_COMPLAINT",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid1"
              },
              {
                "SegmentId": "uuid2"
              },
              {
                "SegmentId": "uuid3"
              },
              {
                "SegmentId": "uuid4"
              },
              {
                "SegmentId": "uuid5"
              },
              {
                "SegmentId": "uuid6"
              }
            ],
            "SummarizedSegment": "Weight loss."
          }
        ]
      },
      {
        "SectionName": "HISTORY_OF_PRESENT_ILLNESS",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid7"
              },
              {
                "SegmentId": "uuid8"
              },
              {
                "SegmentId": "uuid9"
              },
              {
                "SegmentId": "uuid10"
              }
            ],
            "SummarizedSegment": "The patient is seen today for a follow-up of weight
 loss."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid11"
              },
              {
                "SegmentId": "uuid12"
              },
              {
                "SegmentId": "uuid13"
              }
            ],
            "SummarizedSegment": "They report feeling more energy and craving
carbohydrates, sugar, and fat."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid14"
              },
              {
                "SegmentId": "uuid15"
              },
              {
                "SegmentId": "uuid16"
              }
            ],
            "SummarizedSegment": "The patient is up to date on their mammogram and pap
smear."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid17"
              },
              {
                "SegmentId": "uuid18"
              },
              {
                "SegmentId": "uuid19"
              },
              {
                "SegmentId": "uuid20"
              }
            ],
            "SummarizedSegment": "The patient is taking phentermine and would like to
continue."
          }
        ]
      },
      {
        "SectionName": "REVIEW_OF_SYSTEMS",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid21"
              },
              {
                "SegmentId": "uuid22"
              }
            ],
            "SummarizedSegment": "Patient reports intermittent headaches, occasional
 chest pains but denies any recent fevers or chills."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid23"
              },
              {
                "SegmentId": "uuid24"
              }
            ],
            "SummarizedSegment": "No recent changes in vision, hearing, or any
 respiratory complaints."
          }
        ]
      },
      {
        "SectionName": "PAST_MEDICAL_HISTORY",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid25"
              },
              {
                "SegmentId": "uuid26"
              }
            ],
            "SummarizedSegment": "Patient has a history of hypertension and was
 diagnosed with Type II diabetes 5 years ago."
          },
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid27"
              },
              {
                "SegmentId": "uuid28"
              }
            ],
            "SummarizedSegment": "Underwent an appendectomy in the early '90s and had a
 fracture in the left arm during childhood."
          }
        ]
      },
      {
        "SectionName": "ASSESSMENT",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid29"
              },
              {
                "SegmentId": "uuid30"
              }
            ],
            "SummarizedSegment": "Weight loss"
          }
        ]
      },
      {
        "SectionName": "PLAN",
        "Summary": [
          {
            "EvidenceLinks": [
              {
                "SegmentId": "uuid31"
              },
              {
                "SegmentId": "uuid32"
              },
              {
                "SegmentId": "uuid33"
              },
              {
                "SegmentId": "uuid34"
              }
            ],
            "SummarizedSegment": "For the condition of Weight loss: The patient was
 given a 30-day supply of phentermine and was advised to follow up in 30 days."
          }
        ]
      }
    ],
    "SessionId": "sampleSessionUUID"
  }
}
```

Data Encryption at rest for AWS HealthScribe

By default, AWS HealthScribe provides encryption at rest to protect sensitive customer data using AWS HealthScribe managed AWS Key Management Service (AWS KMS) keys. Encryption of data at rest by default helps reduce the operational overhead and complexity involved in protecting sensitive data. Also, it enables you to build secure applications that meet strict encryption compliance and regulatory requirements. When you create an AWS HealthScribe transcription job or start a stream, you can specify a customer managed key. This adds a second layer of encryption.

- **AWS HealthScribe managed AWS KMS keys** — AWS HealthScribe uses AWS HealthScribe managed AWS Key Management Service (AWS KMS) keys by default to automatically encrypt intermediate files. You can't disable this layer of encryption or choose an alternate encryption type. You can't view, manage, or use the keys, or audit their use. However, you don't have to take any action or change any programs to protect the keys that encrypt your data.
- **Customer managed keys** — AWS HealthScribe supports the use of a symmetric customer managed key that you create, own, and manage to add a second layer of encryption over the existing AWS owned encryption. Because you have full control of this layer of encryption, you can perform such tasks as:
  - Establishing and maintaining key policies
  - Establishing and maintaining IAM policies and grants
  - Enabling and disabling key policies
  - Rotating key cryptographic material
  - Adding tags

- Creating key aliases
- Scheduling keys for deletion

For more information, see customer managed key in the AWS Key Management Service Developer Guide.

Note

AWS HealthScribe automatically enables encryption at rest using AWS-owned keys to protect personally identifiable data at no charge. However, AWS KMS charges apply for using a customer managed key. For more information about pricing, see AWS Key Management Service pricing.
For more information on AWS KMS, see What is AWS Key Management Service.

Topics

Creating a customer managed key

You can create a symmetric customer managed key by using the AWS Management Console, or the AWS KMS APIs. To create a symmetric customer managed key, follow the steps for Creating symmetric customer managed key in the AWS Key Management Service Developer Guide.

Key policies control access to your customer managed key. Every customer managed key must have exactly one key policy, which contains statements that determine who can use the key and how they can use it. When you create your customer managed key, you can specify a key policy. For more information, see Managing access to customer managed keys in the AWS Key Management Service Developer Guide.

AWS KMS key policies for AWS HealthScribe

If you are using a key in the same account as the IAM role you specify as the `DataAccessRole` in your StartMedicalScribeJob or `ResourceAccessRole` in your StartMedicalScribeStream request, you don't need to update the Key Policy. To use your customer managed key in a different account as your DataAccessRole (for transcription jobs) or ResourceAccessRole (for streaming), you must trust the respective role in the Key Policy for the following actions:

- `kms:Encrypt` — Allows encryption using the customer managed key
- `kms:Decrypt` — Allows decryption using the customer managed key
- `kms:DescribeKey` — Provides the customer managed key details to allow AWS HealthScribe to validate the key

The following is an example key policy you can use to grant your ResourceAccessRole cross account permissions to use your customer managed key for AWS HealthScribe streaming. To use this policy for transcription jobs, update the `Principal` to use the DataAccessRole ARN, and remove or modify the encryption context.

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Sid": "Allow access for key administrators",
         "Effect": "Allow",
         "Principal": {
            "AWS": "arn:aws:iam::123456789012:root"
         },
         "Action" : [
           "kms:*"
         ],
         "Resource": "*"
      },
      {
         "Sid":"Allow access to the ResourceAccessRole for StartMedicalScribeStream",
         "Effect":"Allow",
         "Principal":{
            "AWS": "arn:aws:iam::123456789012:role/ResourceAccessRole"
         },
         "Action":[
            "kms:Encrypt",
                "kms:Decrypt",
                "kms:GenerateDataKey*"
            ]
            "Resource":"*",
            "Condition": {
                "StringEquals": {
                    "EncryptionContext":[
                        "aws:us-east-1:transcribe:medical-scribe:session-
id": "1234abcd-12ab-34cd-56ef-123456SAMPLE"
                    ]
                }
            }
        },
        {
            "Sid":"Allow access to the ResourceAccessRole for DescribeKey",
            "Effect":"Allow",
            "Principal":{
                "AWS": "arn:aws:iam::123456789012:role/ResourceAccessRole"
            },
            "Action": "kms:DescribeKey",
            "Resource":"*"
        }
    ]
}
```

IAM policy permissions for access roles

The IAM policy attached to your DataAccessRole or ResourceAccessRole must grant permissions to perform the necessary AWS KMS actions, regardless of whether the customer-managed key and role are in the same or different accounts. Also, the role's trust policy must grant AWS HealthScribe permission to assume the role.

The following IAM policy example shows how to grant a ResourceAccessRole permissions for AWS HealthScribe streaming. To use this policy for transcription jobs, replace `transcribe.streaming.amazonaws.com` with `transcribe.amazonaws.com` and remove or modify the encryption context.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "kms:Encrypt",
                "kms:Decrypt",
                "kms:GenerateDataKey*"
            ],
            "Resource": "arn:aws:kms:us-west-2:123456789012:key/Key_ID",
            "Effect": "Allow",
            "Condition": {
                "StringEquals": {
                    "kms:ViaService": "transcribe.streaming.amazonaws.com",
                    "EncryptionContext":[
                        "aws:us-east-1:transcribe:medical-scribe:session-id":
 "1234abcd-12ab-34cd-56ef-123456SAMPLE"
                    ]
                }
            }
        },
        {
            "Action": [
                "kms:DescribeKey"
            ],
            "Resource": "arn:aws:kms:us-west-2:123456789012:key/Key_ID",
            "Effect": "Allow",
            "Condition": {
                "StringEquals": {
                    "kms:ViaService": "transcribe.streaming.amazonaws.com"
                }
            }
        }
    ]
}
```

The following is trust policy example for the ResourceAccessRole. For DataAccessRole, replace `transcribe.streaming.amazonaws.com` with `transcribe.amazonaws.com`.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "Service": "transcribe.streaming.amazonaws.com"
            },
            "Action": "sts:AssumeRole",
            "Condition": {
                "StringEquals": {
                    "aws:SourceAccount": "123456789012"
                    },
                "StringLike": {
                    "aws:SourceArn": "arn:aws:transcribe:us-west-2:123456789012:*"
                }
            }
        }
    ]
}
```

For more information about specifying permissions in a policy or troubleshooting key access, see the AWS Key Management Service Developer Guide.

Specifying a customer managed key for AWS HealthScribe

You can specify a customer managed key as a second layer encryption for transcription jobs or streaming.

- For transcription jobs, you specify your key in the OutputEncryptionKMSKeyId of your StartMedicalScribeJob API operation.
- For streaming, you specify the key in the MedicalScribeEncryptionSettings in your MedicalScribeConfigurationEvent.

AWS KMS encryption context

AWS KMS encryption context is a map of plain text, non-secret key:value pairs. This map represents additional authenticated data, known as encryption context pairs, which provide an added layer of security for your data. AWS HealthScribe requires a symmetric encryption key to encrypt AWS HealthScribe output into a customer-specified Amazon S3 bucket. To learn more, see Asymmetric keys in AWS KMS.

When creating your encryption context pairs, *do not* include sensitive information. Encryption context is not secret — it is visible in plain text within your CloudTrail logs (so you can use it to identify and categorize your cryptographic operations). Your encryption context pair can include special characters, such as underscores (_), dashes (-), slashes (/, \) and colons (:).

Tip

It can be useful to relate the values in your encryption context pair to the data being encrypted. Although not required, we recommend you use non-sensitive metadata related to your encrypted content, such as file names, header values, or unencrypted database fields.

To use output encryption with the API, set the KMSEncryptionContext parameter in the StartMedicalScribeJob operation. In order to provide encryption context for the output encryption operation, the OutputEncryptionKMSKeyId parameter must reference a symmetric AWS KMS key ID.

For streaming, you specify the key value pairs for the `KmsEncryptionContext` in the MedicalScribeEncryptionSettings in your MedicalScribeConfigurationEvent.

You can use AWS KMS condition keys with IAM policies to control access to a symmetric encryption AWS KMS key based on the encryption context that was used in the request for a cryptographic operation. For an example encryption context policy, see AWS KMS encryption context policy.

Using encryption context is optional, but recommended. For more information, see Encryption context.

AWS HealthScribe encryption context

AWS HealthScribe uses the same encryption context in all AWS Key Management Service cryptographic operations. The encryption context is a map of String to String that can be customized to anything you want.

```
"encryptionContext": {
   "ECKey": "ECValue"
   ...
}
```

For AWS HealthScribe streams, the following is the default service generated encryption context. It applies this context on top of any encryption context that you provide.

```
"encryptionContext": {
  "aws:<region>:transcribe:medical-scribe:session-id":
 "1234abcd-12ab-34cd-56ef-123456SAMPLE"
}
```

For AWS HealthScribe transcription jobs, the following is the default service generated encryption context. It applies this context on top of any encryption context that you provide.

```
"encryptionContext": {
  "aws:<region>:transcribe:medical-scribe:job-name": "<job-name>",
  "aws:<region>:transcribe:medical-scribe:start-time-epoch-ms": "<job-start-time>"
}
```

If you don't provide any encryption context, only service generated encryption context will be used for all AWS KMS cryptographic operations.

Monitoring AWS HealthScribe with encryption context

When you use a symmetric customer managed key to encrypt your data at rest in AWS HealthScribe, you can also use the encryption context in audit records and logs to identify how the customer managed key is being used. The encryption context also appears in logs generated by AWS CloudTrail or CloudWatch Logs.

Using encryption context to control access to your customer managed key

You can use the encryption context in key policies and IAM policies as conditions to control access to your symmetric customer managed key.

The following are example key policy statements to grant access to a customer managed key for a specific encryption context. The condition in this policy statement requires that the KMS key usages have an encryption context constraint that specifies the encryption context.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid":"Allow access to the ResourceAccessRole for
 StartMedicalScribeStream",
            "Effect":"Allow",
            "Principal":{
                "AWS": "arn:aws:iam::123456789012:role/ResourceAccessRole"
            },
            "Action":[
                "kms:Encrypt",
                "kms:Decrypt",
                "kms:GenerateDataKey*"
            ],
            "Resource":"arn:aws:kms:us-west-2:123456789012:key/Key_ID",
            "Condition": {
                "StringEquals": {
                    // below is the service generated encryption context example
                    "kms:EncryptionContext:aws:us-east-1:transcribe:medical-
scribe:session-id":"1234abcd-12ab-34cd-56ef-123456SAMPLE",
                    // plus any encryption context that you specify in the request
                    "kms:EncryptionContext:${ECKey}": "${ECValue}"
                }
            }
        },
        {
            "Sid":"Allow access to the ResourceAccessRole for DescribeKey",
            "Effect":"Allow",
            "Principal":{
                "AWS": "arn:aws:iam::123456789012:role/ResourceAccessRole"
            },
            "Action": "kms:DescribeKey",
            "Resource":"arn:aws:kms:us-west-2:123456789012:key/Key_ID"
        }
}
```

Monitoring your encryption keys for AWS HealthScribe

When you use an AWS Key Management Service customer managed key with AWS HealthScribe, you can use AWS CloudTrail or CloudWatch logs to track requests that AWS HealthScribe sends to AWS KMS.

The following examples are CloudTrail Encrypt and Decrypt events you can use that allow you to monitor how AWS HealthScribe uses of your customer managed key.

Encrypt

```
{
   "eventVersion":"1.09",
   "userIdentity":{
      "type":"AssumedRole",
      "principalId":"AROAIGDTESTANDEXAMPLE:Sampleuser01",
      "arn":"arn:aws:sts::123456789012:assumed-role/Admin/Sampleuser01",
      "accountId":"123456789012",
      "accessKeyId":"AKIAIOSFODNN7EXAMPLE3",
      "sessionContext":{
         "sessionIssuer":{
            "type":"Role",
            "principalId":"AROAIGDTESTANDEXAMPLE:Sampleuser01",
            "arn":"arn:aws:sts::123456789012:assumed-role/Admin/Sampleuser01",
            "accountId":"123456789012",
            "userName":"Admin"
         },
         "attributes":{
            "creationDate":"2024-08-16T01:10:05Z",
            "mfaAuthenticated":"false"
         }
      },
      "invokedBy":"transcribe.streaming.amazonaws.com"
   },
   "eventTime":"2024-08-16T01:10:05Z",
   "eventSource":"kms.amazonaws.com",
   "eventName":"Encrypt",
   "awsRegion":"us-east-1",
   "sourceIPAddress":"transcribe.streaming.amazonaws.com",
   "userAgent":"transcribe.streaming.amazonaws.com",
   "requestParameters":{
      "encryptionContext":{
         "aws:us-east-1:transcribe:medical-scribe:session-
id":"1234abcd-12ab-34cd-56ef-123456SAMPLE"
      },
      "encryptionAlgorithm":"SYMMETRIC_DEFAULT",
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   "responseElements":null,
   "requestID":"cbe0ac33-8cca-49e5-9bb5-dc2b8dfcb389",
   "eventID":"1b9fedde-aa96-48cc-9dd9-a2cce2964b3c",
   "readOnly":true,
   "resources":[
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         "type":"AWS::KMS::Key",
         "ARN":"arn:aws:kms:us-
west-2:123456789012:key/1234abcd-12ab-34cd-56ef-123456SAMPLE"
      }
   ],
   "eventType":"AwsApiCall",
   "managementEvent":true,
   "recipientAccountId":"123456789012",
   "eventCategory":"Management"
}
```

Decrypt

```
{
   "eventVersion":"1.09",
   "userIdentity":{
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      "principalId":"AROAIGDTESTANDEXAMPLE:Sampleuser01",
      "arn":"arn:aws:sts::123456789012:assumed-role/Admin/Sampleuser01",
      "accountId":"123456789012",
      "accessKeyId":"AKIAIOSFODNN7EXAMPLE3",
      "sessionContext":{
         "sessionIssuer":{
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            "principalId":"AROAIGDTESTANDEXAMPLE:Sampleuser01",
            "arn":"arn:aws:sts::123456789012:assumed-role/Admin/Sampleuser01",
            "accountId":"123456789012",
            "userName":"Admin"
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         "attributes":{
            "creationDate":"2024-08-16T20:47:04Z",
            "mfaAuthenticated":"false"
         }
      },
      "invokedBy":"transcribe.streaming.amazonaws.com"
   },
   "eventTime":"2024-08-16T20:47:04Z",
   "eventSource":"kms.amazonaws.com",
   "eventName":"Decrypt",
   "awsRegion":"us-east-1",
   "sourceIPAddress":"transcribe.streaming.amazonaws.com",
   "userAgent":"transcribe.streaming.amazonaws.com",
   "requestParameters":{
      "keyId":"mrk-de27f019178f4fbf86512ab03ba860be",
      "encryptionAlgorithm":"SYMMETRIC_DEFAULT",
      "encryptionContext":{
         "aws:us-east-1:transcribe:medical-scribe:session-
id":"1234abcd-12ab-34cd-56ef-123456SAMPLE"
      }
   },
   "responseElements":null,
   "requestID":"8b7fb865-48be-4e03-ac3d-e7bee3ba30a1",
   "eventID":"68b7a263-d410-4701-9e2b-20c196628966",
   "readOnly":true,
   "resources":[
      {
         "accountId":"123456789012",
         "type":"AWS::KMS::Key",
         "ARN":"arn:aws:kms:us-
west-2:123456789012:key/1234abcd-12ab-34cd-56ef-123456SAMPLE"
      }
   ],
   "eventType":"AwsApiCall",
   "managementEvent":true,
   "recipientAccountId":"123456789012",
   "eventCategory":"Management"
}
```

Document history for Amazon Transcribe

- **Latest documentation update:** 13 November 2023

The following table describes important changes in each release of Amazon Transcribe. For notification about updates to this documentation, you can subscribe to an RSS feed.

Change	Description	Date
New feature	AWS HealthScribe now supports a GIRPP template for the clinical note summary. For more information, see AWS HealthScribe Clinical Documentation file.	February 4, 2025
New feature	AWS HealthScribe now supports streaming for transcribing medical conversations in real time.	January 29, 2025
Section Update	Updating ar-SA language support for 8000 frequency.	January 16, 2025
Section Update	Updating ar-SA language support for 8000 frequency.	January 16, 2025
Section Update	Updating the supported language section with unsupported language code that we do not support in AWS GovCloud (US) (US-West, us-gov-west-1), AWS GovCloud (US) (US-East, us-gov-east-1), or Africa (Cape Town, af-south-1) regions.	January 14, 2025

Section Update	Extend Transcribe Batch json output with new field called "audio_segments".	July 15, 2024
Feature Update	Update Max Speakers in diarization to be 30 instead of 10.	May 10, 2024
Section Update	Updates to generative call summarization and add error output details.	April 30, 2024
Section Update	Updates on custom vocabular y columns - IPA and SoundsLike.	April 30, 2024
Feature Update	Amazon Transcribe Call Analytics now supports generative call summariza tion.	November 29, 2023
Section Update	Update new PII redaction and Language Identification output format.	November 13, 2023
Feature Update	Diarization can now be combined with channel identification.	March 6, 2023
Feature Update	Channel identification can now be combined with diarization.	March 6, 2023
Section Update	IAM best practices have been updated.	February 13, 2023
New languages	Amazon Transcribe now supports Vietnamese and Swedish.	December 6, 2022

New feature	Amazon Transcribe now supports real-time Call Analytics.	November 28, 2022
Feature Update	Streaming redaction and identification is now available with Hindi and Thai.	November 11, 2022
Section Update	New PII categories are available for streaming redaction and identification.	September 14, 2022
Section Update	The custom language model section has been revised.	June 18, 2022
Section Update	Batch language identification can now identify multiple languages per audio file.	May 31, 2022
Guide Update	The Amazon Transcribe API Reference is now a standalone guide.	April 1, 2022
New chapter	A new comparison table for Amazon Transcribe, Amazon Transcribe Medical, and Amazon Transcribe Call Analytics is included.	March 21, 2022
New chapter	A new SDK code examples chapter is included.	March 21, 2022
Feature update	Call Analytics now provides call summarization.	March 21, 2022
Chapter update	The introductory chapter now showcases Amazon Transcribe use cases.	March 21, 2022

Chapter update	The Getting started chapter has been updated to be method-specific.	March 21, 2022
Chapter update	The Streaming chapter has been updated and restructu red.	March 21, 2022
Feature update	Language identification now supports custom vocabularies and custom vocabulary filters with streaming transcriptions.	March 11, 2022
New event	There is a new event type: Vocabulary events.	February 7, 2022
Section update	Updates have been made to the custom vocabularies section.	January 20, 2022
New feature	Language identification can now be used with streaming transcriptions.	November 23, 2021
New feature	Language identification can now be used with custom language models, custom vocabularies, vocabular y filtering, and content redaction.	October 29, 2021
New feature	Amazon Transcribe now supports custom language models with streaming transcriptions.	October 20, 2021

New feature	Amazon Transcribe can now generate subtitles for your video files.	September 16, 2021
New feature	Amazon Transcribe now supports PII redaction and identification for streaming.	September 14, 2021
New feature	Amazon Transcribe now supports AWS KMS encryptio n context for an added level of security for your AWS account resources.	September 10, 2021
New languages	Amazon Transcribe now supports Afrikaans, Danish, Mandarin Chinese (Traditio nal), Thai, New Zealand English, and South African English.	August 26, 2021
New feature	Amazon Transcribe now supports resource tagging.	August 24, 2021
New feature	Amazon Transcribe now supports Call Analytics for batch transcription jobs.	August 4, 2021
New feature	Amazon Transcribe now supports using custom vocabularies with batch custom language models.	May 12, 2021
New feature	Amazon Transcribe now supports partial result stabilization for streaming transcription.	May 11, 2021

New feature	Amazon Transcribe now supports Australian English, British English, Hindi, and US Spanish for custom language models.	March 19, 2021
New feature	Amazon Transcribe now supports OGG/OPUS and FLAC codecs for streaming audio transcription.	November 24, 2020
New languages	Amazon Transcribe adds support for Italian and German for streaming audio transcription.	November 4, 2020
AWS Region expansion	Amazon Transcribe is now available in the Frankfurt (eu-central-1) and London (eu-west-2).	November 4, 2020
New feature	Amazon Transcribe adds support for interface VPC endpoints in batch transcrip tion.	October 9, 2020
New feature	Amazon Transcribe adds support for channel identific ation in streaming.	September 17, 2020
New feature	Amazon Transcribe adds support for automatic language identification in batch transcription.	September 15, 2020
New feature	Amazon Transcribe adds support for speaker partition ing in streaming.	August 19, 2020

New feature	Amazon Transcribe adds support for custom language models.	August 5, 2020
New feature	Amazon Transcribe adds support for interface VPC endpoints in streaming.	June 26, 2020
New feature	Amazon Transcribe adds support for vocabulary filtering in streaming.	May 20, 2020
New feature	Amazon Transcribe adds support for automatically redacting personally identifia ble information.	February 26, 2020
New feature	Amazon Transcribe adds support for creating a custom vocabulary of words to filter from a transcription.	December 20, 2019
New feature	Amazon Transcribe adds support for queueing transcription jobs.	December 19, 2019
New languages	Amazon Transcribe adds support for Gulf Arabic, Hebrew, Japanese, Malay, Swiss German, Telugu, and Turkish.	November 21, 2019
AWS Region expansion	Amazon Transcribe is now available in the Asia Pacific (Tokyo) (ap-northeast-1).	November 21, 2019

New feature	Amazon Transcribe adds support for alternative transcriptions.	November 20, 2019
New languages	Amazon Transcribe adds support for Dutch, Farsi, Indonesian, Irish English, Portuguese, Scottish English, Tamil, and Welsh English.	November 12, 2019
New language	Amazon Transcribe now supports streaming transcrip tion for Australian English (en-AU).	October 25, 2019
AWS Region expansion	Amazon Transcribe is now available in the China (Beijing) (cn-north-1) and China (Ningxia) (cn-northwest-1).	October 9, 2019
New feature	Amazon Transcribe allows you to provide your own KMS key to encrypt your transcription output files. For more information, see the OutputEncryptionKMSKeyId parameter of the StartStre amTranscription API.	September 24, 2019
New languages	Amazon Transcribe adds support for Chinese (Mandarin), Simplified, Mainland China and Russian.	August 23, 2019
New feature	Amazon Transcribe adds support for streaming audio transcription using the WebSocket protocol.	July 19, 2019

New feature	AWS CloudTrail now records events for the StartStreamTranscription API.	July 19, 2019
AWS Region expansion	Amazon Transcribe is now available in the US West (N. California) (us-west-1).	June 27, 2019
New language	Amazon Transcribe adds support for Modern Standard Arabic.	May 28, 2019
New feature	Amazon Transcribe now transcribes numeric words into numbers for US English. For example, "forty-two" is transcribed as "42".	May 23, 2019
New language	Amazon Transcribe adds support for Hindi and Indian English.	May 15, 2019
New SDK	The AWS SDK for C++ now supports Amazon Transcribe.	May 8, 2019
New language	Amazon Transcribe adds support for Spanish.	April 19, 2019
AWS Region expansion	Amazon Transcribe is now available in the EU (Frankfurt) (eu-central-1) and Asia Pacific (Seoul) (ap-northeast-2).	April 18, 2019
New language	Amazon Transcribe adds support for streaming transcription in British English, French, and Canadian French.	April 5, 2019

New feature	The AWS SDK for Ruby V3 now supports Amazon Transcribe	March 25, 2019
New feature	Amazon Transcribe allows custom vocabularies, which are lists of specific words that you want Amazon Transcrib e to recognize in your audio input.	March 25, 2019
New languages	Amazon Transcribe adds support for German and Korean.	March 22, 2019
New language	Amazon Transcribe now supports streaming transcrip tion for US Spanish (es-US).	February 7, 2019
AWS Region expansion	Amazon Transcribe is now available in the South America (São Paulo) (sa-east-1).	February 7, 2019
AWS Region expansion	Amazon Transcribe is now available in the Asia Pacific (Mumbai) (ap-south-1), Asia Pacific (Singapore) (ap-south east-1), EU (London) (eu-west-2), and EU (Paris) (eu-west3).	January 24, 2019
New languages	Amazon Transcribe adds support for French, Italian, and Brazilian Portuguese.	December 20, 2018

New feature	Amazon Transcribe now supports transcription of audio streams.	November 19, 2018
New languages	Amazon Transcribe adds support for Australian English, British English, and Canadian French.	November 15, 2018
AWS Region expansion	Amazon Transcribe is now available in Canada (Central) (ca-central-1) and Asia Pacific (Sydney) (ap-southeast-2).	July 17, 2018
New feature	You can now specify your own location to store the output from a transcription job.	July 11, 2018
New feature	Added AWS CloudTrail and Amazon CloudWatch Events integration.	June 28, 2018
New feature	Amazon Transcribe adds support for custom vocabular ies.	April 4, 2018
New guide	This is the first release of the *Amazon Transcribe Developer Guide*.	November 29, 2017

AWS Glossary

For the latest AWS terminology, see the AWS glossary in the *AWS Glossary Reference*.