# Amazon Translate

## Developer Guide

# Amazon Translate: Developer Guide

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# What Is Amazon Translate?

***This is prerelease documentation for a service in preview release. It is subject to change.***

Amazon Translate translates documents from the following six languages into English, and from English into these languages:

- Arabic
- Chinese
- French
- German
- Portuguese
- Spanish

Amazon Translate uses advanced machine learning technologies to provides high-quality translation on demand. Use it to translate unstructured text documents or to build applications that work in multiple languages.

For example, you can:

- Integrate Amazon Translate into your applications to enable multilingual user experiences.
  - Translate user-authored content, such as chats, forum posts, and search queries.
  - Translate company-authored content, such as product data and metadata.
- Use Amazon Translate as part of your company's workflow for incoming data.
  - Process text in many languages.
  - Present text to customers and team members in their native language.
- Integrate Amazon Translate with other AWS services to enable language-independent processing.
  - Use it with Amazon Polly to speak translated content.
  - Use it with Amazon S3 to translate document repositories of any kind.
  - Use it with Amazon Comprehend to extract named entities, sentiment, and key phrases from unstructured text such as social media streams.
  - Use it with Amazon DynamoDB, Amazon Aurora, and Amazon Redshift to translate structured and unstructured text.
  - Use it with AWS Lambda or AWS Glue for seamless workflow integration.

## Are You a First-time User of Amazon Translate ?

If you are a first-time user, we recommend that you read the following sections in order:

1. How It Works (p. 2)—Introduces Amazon Translate.
2. Getting Started with Amazon Translate (p. 4)—Explains how to set up your AWS account and test Amazon Translate.
3. Examples (p. 11)—Provides code examples in Java and Python. Use them to explore how Amazon Translate works.
4. API Reference (p. 38)—Contains reference documentation for Amazon Translate operations.

# How It Works

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Amazon Translate is based on neural networks. Once trained on a language pair, Amazon Translate can translate between the two languages.

The model has two components, the encoder and the decoder. The encoder reads the source sentence one word at a time and constructs a semantic representation that captures the meaning of the source text. The decoder uses the semantic representation to generate a translation one word at a time in the target language.

Amazon Translate uses attention mechanisms to understand context and decide which words in the source are most relevant for generating the next target word. The attention mechanisms enable the decoder to shift focus on certain parts of the source sentence to make sure that ambiguous words or phrases are translated correctly. The next word that the neural network generates becomes an input to the decoder and the network continues generating words until it reaches the end of the sentence.

Amazon Translate machine translates text from one of six languages into English and from English into one of the six languages. You just call the TranslateText (p. 39) method with the text you want to translate, and specify the source and target languages. Amazon Translate returns the translated text.

- **Source text** – The text that you want to translate in UTF-8 format.
- **Output text** – Amazon Translate translates the source text into the target language and returns the translated text in UTF-8 format. The number of characters in the output text may be larger than the input text depending on the source and target languages.

You can translate text from English (en) into the following languages, or from the following languages to English:

| Language | Code |
|---|---|
| Arabic | ar |
| Chinese (Simplified) | zh |
| French | fr |
| German | de |
| Portuguese | pt |
| Spanish | es |

To translate from any non-English language on the list to any other non-English language on the list, first translate the source language into English, and then translate the English text to the target language.

# Error Handling

If you specify a source or target language that isn't supported, Amazon Translate sends one of the following exceptions:

- **UnsupportedLanguagePairException** – Amazon Translate supports translation between English and other languages. Either the source or target language must be English; otherwise, you get this error.

# Getting Started with Amazon Translate

***This is prerelease documentation for a service in preview release. It is subject to change.***

To get started using Amazon Translate, set up an AWS account and create an AWS Identity and Access Management (IAM) user. To use the AWS Command Line Interface (AWS CLI), download and configure it.

**Topics**



## Step 1: Set Up an AWS Account and Create an Administrator User

Before you use Amazon Translate for the first time, complete the following tasks:

1. Sign Up for AWS (p. 4)
2. Create an IAM User (p. 5)

### Sign Up for AWS

When you sign up for Amazon Web Services (AWS), your AWS account is automatically signed up for all AWS services, including Amazon Translate. You are charged only for the services that you use.

With Amazon Translate, you pay only for the resources that you use. If you are a new AWS customer, you can get started with Amazon Translate for free. For more information, see AWS Free Usage Tier.

If you already have an AWS account, skip to the next section.

**To create an AWS account**

1. Open https://aws.amazon.com/, and then choose **Create an AWS Account**.

   **Note**
   This might be unavailable in your browser if you previously signed into the AWS Management Console. In that case, choose **Sign in to a different account**, and then choose **Create a new AWS account**.
2. Follow the online instructions.

Part of the sign-up procedure involves receiving a phone call and entering a PIN using the phone keypad.

Record your AWS account ID because you'll need it for the next task.

## Create an IAM User

AWS services, such as Amazon Translate, require that you provide credentials when you access them. This allows the service to determine whether you have permissions to access the service's resources.

We strongly recommend that you access AWS using AWS Identity and Access Management (IAM), not the credentials for your AWS account. To use IAM to access AWS, create an IAM user, add the user to an IAM group with administrative permissions, and then grant administrative permissions to the IAM user. You can then access AWS using a special URL and the IAM user's credentials.

Exercises in this guide assume that you have an IAM user with administrator privileges called `adminuser`.

**To create an administrator user**

- In your AWS account, create an administrator user called `adminuser`. For instructions, see Creating Your First IAM User and Administrators Group in the *IAM User Guide*.

For more information about IAM, see the following:

- AWS Identity and Access Management (IAM)
- Getting Started
- IAM User Guide

## Next Step

Step 2: Set Up the AWS Command Line Interface (AWS CLI) (p. 5)

# Step 2: Set Up the AWS Command Line Interface (AWS CLI)

You use the AWS CLI to make interactive calls to Amazon Translate.

**To set up the AWS CLI**

1. Download and configure the AWS CLI. For instructions, see the following topics in the *AWS Command Line Interface User Guide*:
   - Getting Set Up with the AWS Command Line Interface
   - Configuring the AWS Command Line Interface
2. In the AWS CLI `config` file, add a named profile for the administrator user:

```
[profile adminuser]
aws_access_key_id = adminuser access key ID
```

```
aws_secret_access_key = adminuser secret access key
region = aws-region
```

You use this profile when executing AWS CLI commands. For more information about named profiles, see Named Profiles in the *AWS Command Line Interface User Guide*. For a list of AWS Regions, see Regions and Endpoints in the *Amazon Web Services General Reference*.

3. Verify the setup by typing the following help command at the command prompt:

```
aws translate help
```

You should see a brief description of Amazon Translate and a list of the available commands.

## Next Step

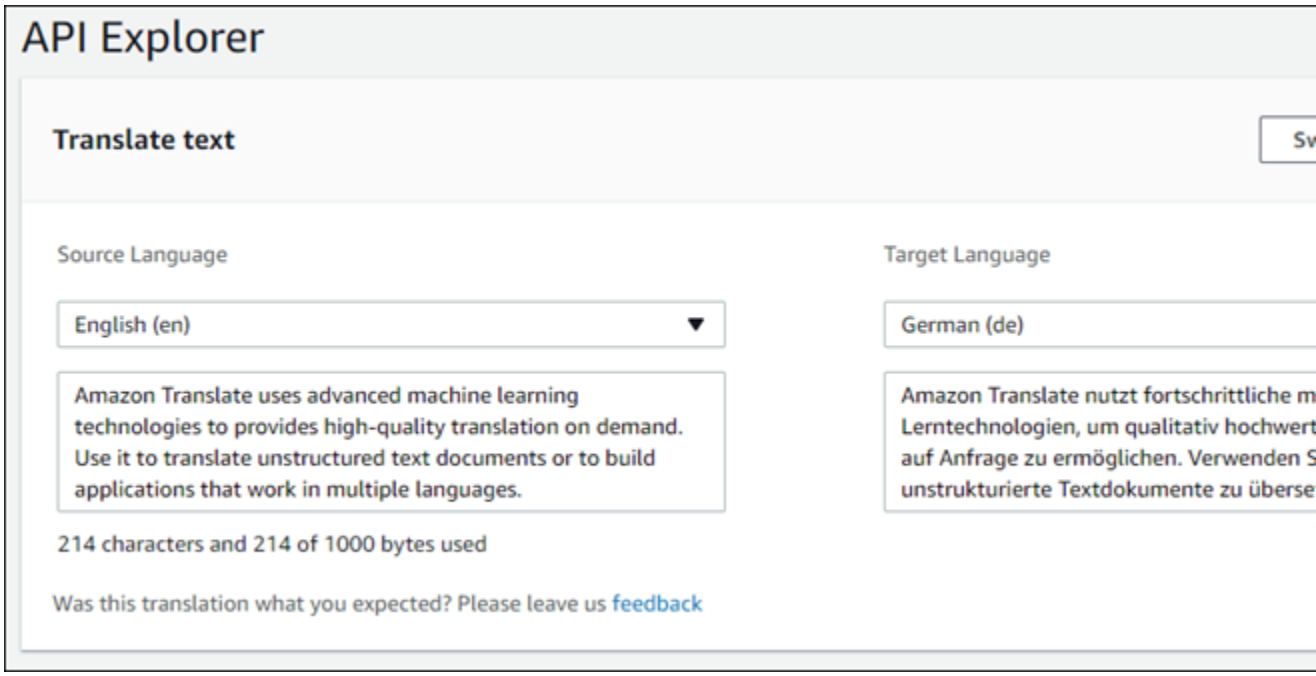
Step 3: Getting Started (Console) (p. 6)

# Step 3: Getting Started (Console)

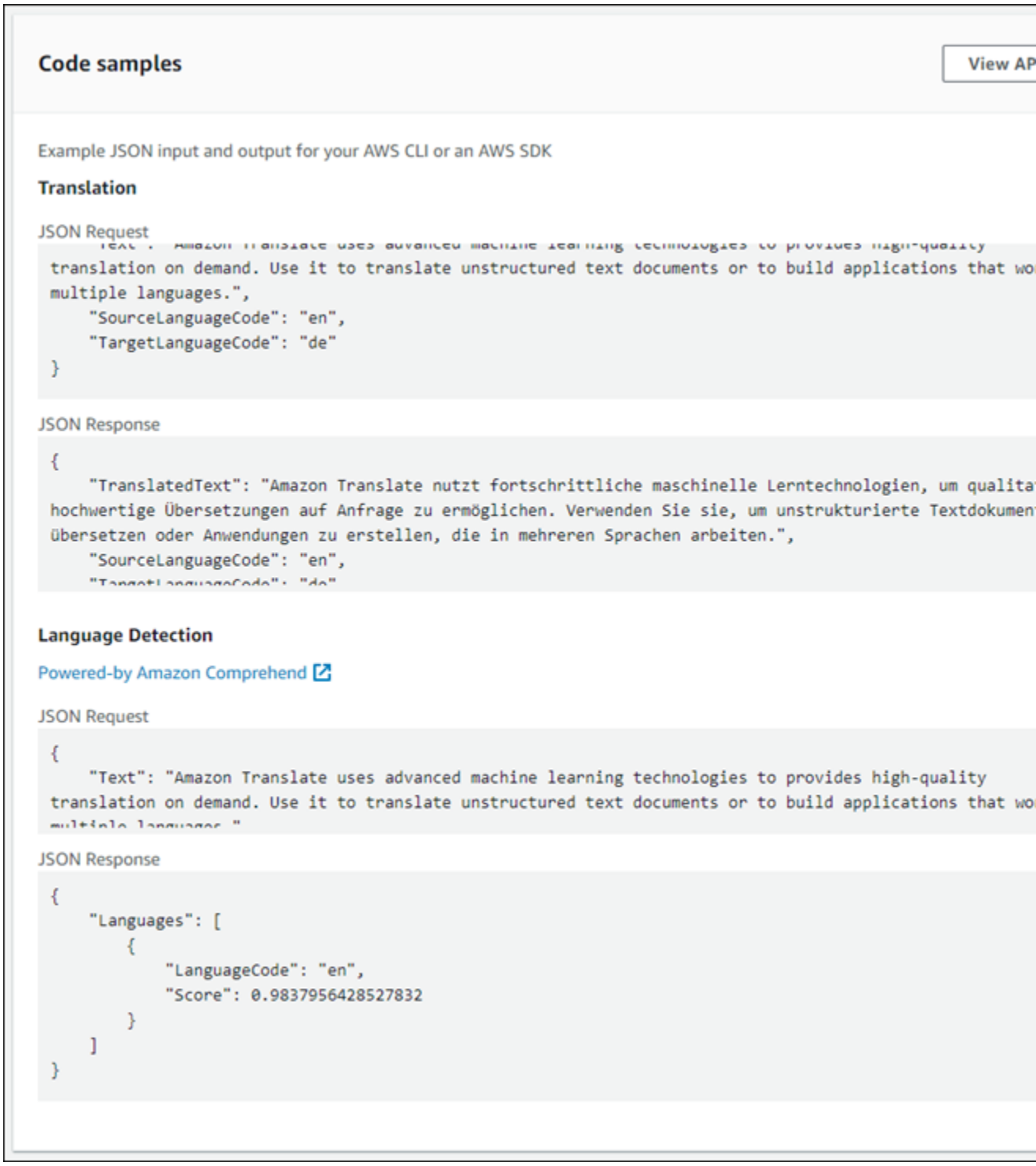
The easiest way to get started with Amazon Translate is to use the console to translate some text. You can translate up to 1,000 characters using the console. If you haven't reviewed the concepts and terminology in How It Works (p. 2), we recommend that you do that before proceeding.

To start translating text, sign in to the AWS Management Console and open the Amazon Translate console. If this is the first time that you've used Amazon Translate, choose **Try Amazon Translate**.

In the **API Explorer**, choose the source and target languages. Enter the text that you want to translate in the left-hand text box. The translated text appears in the right-hand text box.




In the **Code samples** section of the **API Explorer** you can see the JSON input and output to the TranslateText (p. 39) operation.




# Next Step

Step 4: Getting Started (AWS CLI) (p. 8)

# Step 4: Getting Started (AWS CLI)

In the following exercises , you use the AWS command line interface (AWS CLI) to translate text. To complete these exercises, you need to be familiar with the CLI and have a text editor. For more information, see Step 2: Set Up the AWS Command Line Interface (AWS CLI) (p. 5).

There are two ways to use the CLI to translate text with Amazon Translate. For short text, you can provide the text that you want to translate as a parameter of the `translate-text` command. For longer text, you can provide the source language, target language, and text in a JSON file.

To use Amazon Translate from the command line, you need to know the endpoint and region for the service. For a list of available endpoints and regions, see Beta Guidelines and Limits (p. 37).

## Translate Text Using the Command Line

The following example shows how to use the `TranslateText` operation from the command line to translate text. The example is formatted for Unix, Linux, and macOS. For Windows, replace the backslash (\) Unix continuation character at the end of each line with a caret (^). At the command line, type the following.

```
aws translate translate-text \
            --endpoint-url endpoint  \
            --region region \
            --source-language-code "en" \
            --target-language-code "es" \
            --text "hello, world "
```

The response is the following JSON:

```
{
    "TargetLanguageCode": "es",
    "Text": "Hola, mundo",
    "SourceLanguageCode": "en"
}
```

## Translate Text Using a JSON File

This example shows how to use the `translate-text` operation to translate a longer text block from a JSON file. You can specify the source and target language on the command line, but in this example, you specify them in the JSON file.

> **Note**
> The JSON file is formatted for readability. Reformat the `"Text"` field to remove line breaks. The example is formatted for Unix, Linux, and macOS. For Windows, replace the backslash (\) Unix continuation character at the end of each line with a caret (^).

**To translate text using a JSON file**

1. Copy the following text into a JSON file called `translate.json`:

```
{
    "Text": "Amazon Translate translates documents into English from
    six languages and vice versa in real time.  It uses
    advanced machine learning technologies to provides
    high-quality real-time translation. Use it to translate
    documents or to build applications that work in multiple
```

```
    languages.",
    "SourceLanguageCode": "en",
    "TargetLanguageCode": "fr"
}
```

2. In the AWS CLI, run the following command:

```
aws translate translate-text \
            --endpoint-url endpoint \
            --region region \
            --cli-input-json file://translate.json > translated.json
```

The command outputs a JSON file that contains the following JSON text:

```
{
    "TargetLanguageCode": "fr",
    "Text": "Amazon Translate traduit en temps réel des documents en anglais
    de sept langues et vice versa. Il utilise des technologies
    avancées d'apprentissage des machines pour offrir une traduction
    en temps réel de haute qualité. Utilisez-le pour traduire des
    documents ou pour créer des applications qui fonctionnent dans
    plusieurs langues.",
    "SourceLanguageCode": "en"
}
```

## Next Step

To see other ways to use Amazon Translate see Examples (p. 11).

# Step 5: Getting Started (SDK)

The following examples demonstrate how to use Amazon Translate TranslateText (p. 39) operation using Java and Python. Use them to learn about the `TranslateText` operation and as building blocks for your own applications.

To run the Java examples, you need to install the AWS SDK for Java. For instructions for installing the SDK for Java, see Set up the AWS SDK for Java.

**Topics**



## Translating Text Using the AWS SDK for Java

The following example demonstrates using the TranslateText (p. 39) operation in Java. To run this example, you need the AWS SDK for Java. For instructions for installing the SDK for Java, see Set up the AWS SDK for Java.

```
import com.amazonaws.auth.AWSStaticCredentialsProvider;
import com.amazonaws.auth.BasicAWSCredentials;
import com.amazonaws.client.builder.AwsClientBuilder;
import com.amazonaws.services.translate.AWSTranslate;
import com.amazonaws.services.translate.AmazonTranslateClient;
```

```
import com.amazonaws.services.translate.model.TranslateTextRequest;
import com.amazonaws.services.translate.model.TranslateTextResult;

public class App {
    private static final String ENDPOINT = "endpoint";
    private static final String REGION = "region";

    public static void main( String[] args ) {

        BasicAWSCredentials awsCredentials = new BasicAWSCredentials("access key ID",
 "secret access key");
        AwsClientBuilder.EndpointConfiguration endpointConfiguration = new
 AwsClientBuilder.EndpointConfiguration(ENDPOINT, REGION);

        AWSTranslate translate = AmazonTranslateClient.builder()
                .withCredentials(new AWSStaticCredentialsProvider(awsCredentials))
                .withEndpointConfiguration(endpointConfiguration)
                .build();

        TranslateTextRequest request = new TranslateTextRequest()
                .withText("Hello, world")
                .withSourceLanguageCode("en")
                .withTargetLanguageCode("es");
        TranslateTextResult result  = translate.translateText(request);
        System.out.println(result.getTranslatedText());
    }
}
```

You can change the source and target languages subject to the following constraints:

- If the source language is English, you can translate the source text to any of the other supported languages. For a list of supported languages, see How It Works (p. 2).
- If the source language is not English, the target language must be English.

# Translating Text Using the AWS SDK for Python (Boto)

The following example demonstrates using the TranslateText (p. 39) operation in Python. To run it, you must first install Amazon Translate via the AWS CLI. For instructions, see the section called “Step 2: Set Up the AWS CLI” (p. 5).

```
import boto3

translate = boto3.client(service_name='translate', region_name='region',
            endpoint_url='endpoint', use_ssl=True)

result = translate.translate_text(Text="Hello, World",
            SourceLanguageCode="en", TargetLanguageCode="de")
print('TranslatedText: ' + result.get('TranslatedText'))
print('SourceLanguageCode: ' + result.get('SourceLanguageCode'))
print('TargetLanguageCode: ' + result.get('TargetLanguageCode'))
```

You can change the source and target languages subject to the following constraints:

- If the source language is English, you can translate the source text to any of the other supported languages. For a list of supported languages, see *How It Works* (p. 2).
- If the source language is not English, the target language must be English.

# Examples

***This is prerelease documentation for a service in preview release. It is subject to change.***

The following examples show ways that you can use Amazon Translate.

**Topics**



## Using Amazon Polly with Amazon Translate

To speak translated text, you can use Amazon Polly with Amazon Translate. In this example you'll create a Web page where you can translate text using Amazon Translate and then speak that text using Amazon Polly. The code can be summarized into the following:

- CSS and HTML to create the Web page.
- Initialization code that creates controllers for Amazon Translate and Amazon Polly.
- A function that reads data from the Web page and calls Amazon Translate.
- A function that reads data from the Web page and calls Amazon Polly.
- Utility functions for managing the Web page.

### To configure the example

1. Install and Configure the AWS SDK for JavaScript. For instructions for installing the SDK for JavaScript, see Installing the SDK for JavaScript.
2. Copy the code for the example to an HTML file on your Web server.
3. Update the `<script>` tag to the location where you installed the SDK for JavaScript.
4. Change the region and endpoint to the region where you want to run the Amazon Translate and Amazon Polly operations. For a list of supported regions for Amazon Translate, see Beta Guidelines and Limits (p. 37). For a list of supported regions for Amazon Polly, see AWS Regions and Endpoints in the *Amazon Web Services General Reference*.
5. Create an IAM user with the minimum required permissions to run this example. For information about creating an IAM user, see Creating an IAM User in Your AWS Account in the *AWS Identity and Access Management User Guide*. For the required permissions policies, see Using Identity-Based Polices (IAM Policies) for Amazon Translate (p. 35) and Using Identity-Based Policies (IAM Policies) for Amazon Polly in the *Amazon Polly Developer Guide*.
6. Provide the access ID and secret key of the IAM user created in the previous step.

# Code

The following is the complete code of the example Web page. You can copy this code into an HTML file to run the example on your own Web server.

```
<!DOCTYPE html>
<html>

<head>
    <title>Amazon Translate</title>
    <script src="aws-js-sdk/dist/aws-sdk-all.js"></script>
</head>

<body>
    <h1 style="text-align: left">Amazon Translate Demo</h1>
    <br/>
    <table class="tg">
        <tr>
            <th align="left">
Source Language Code:
                <select id="sourceLanguageCodeDropdown">
                      <option value="en">en</option>
                      <option value="ar">ar</option>
                      <option value="de">de</option>
                      <option value="es">es</option>
                      <option value="fr">fr</option>
                      <option value="pt">pt</option>
                      <option value="zh">zh</option>
                </select>
            </th>
            <th align="left">
Target Language Code:
                <select id="targetLanguageCodeDropdown">
                      <option value="en">en</option>
                      <option value="ar">ar</option>
                      <option value="de">de</option>
                      <option value="es">es</option>
                      <option value="fr">fr</option>
                      <option value="pt">pt</option>
                      <option value="zh">zh</option>
                </select>
            </th>
        </tr>
        <tr>
            <th>
                <textarea id="inputText" name="inputText" rows="10" cols="50"
 placeholder="Text to translate..."></textarea>
            </th>
            <th>
                <textarea id="outputText" name="outputText" rows="10" cols="50"
 placeholder="Translated text..."></textarea>
            </th>
        </tr>
        <tr>
            <th align="left">
                <button type="button" name="translateButton"
 onclick="doTranslate()">Translate</button>
                <button type="button" name="synthesizeButton"
 onclick="doSynthesizeInput()">Synthesize Input Speech</button>
                <button type="button" name="clearButton" onclick="clearInputs()">Clear</
button>
            </th>
            <th align="left">
```

```
            <button type="button" name="synthesizeButton"
onclick="doSynthesizeOutput()">Synthesize Output Speech</button>
          </th>
       </tr>
   </table>
   <script type="text/javascript">
       // set the focus to the input box
       document.getElementById("inputText").focus();

       /**
       * Change the region and endpoint.
       AWS.config.region = 'region'; // Region
       var ep = new AWS.Endpoint('endpoint');

        /**
        * Place your credentials here. The IAM user associated with these credentials must
have permissions to call
        * Amazon Translate. We recommend using the following permissions policy and
nothing more, as anyone that has
        * access to this HTML page will also have access to these hard-coded credentials.
        * {
        *     "Version": "2012-10-17",
        *     "Statement": [
        *         {
        *             "Action": [
        *                 "translate:TranslateText",
        *                 "polly:SynthesizeSpeech"
        *             ],
        *             "Resource": "*",
        *             "Effect": "Allow"
        *         }
        *     ]
        * }
        *
        * For more information about the AWS Credentials object, see:
        *   http://docs.aws.amazon.com/AWSJavaScriptSDK/latest/AWS/Credentials.html
        */
       AWS.config.credentials = new AWS.Credentials("access key", "secret key");

       var translate = new AWS.Translate({endpoint: ep, region: AWS.config.region});
       var polly = new AWS.Polly();

       function doTranslate() {
           var inputText = document.getElementById('inputText').value;
           if (!inputText) {
               alert("Input text cannot be empty.");
               exit();
           }

           // get the language codes
           var sourceDropdown = document.getElementById("sourceLanguageCodeDropdown");
           var sourceLanguageCode =
sourceDropdown.options[sourceDropdown.selectedIndex].text;

           var targetDropdown = document.getElementById("targetLanguageCodeDropdown");
           var targetLanguageCode =
targetDropdown.options[targetDropdown.selectedIndex].text;

           var params = {
               Text: inputText,
               SourceLanguageCode: sourceLanguageCode,
               TargetLanguageCode: targetLanguageCode
           };

           translate.translateText(params, function(err, data) {
               if (err) {
```

```
                    console.log(err, err.stack);
                    alert("Error calling Amazon Translate. " + err.message);
                    return;
                }
                if (data) {
                    var outputTextArea = document.getElementById('outputText');
                    outputTextArea.value = data.TranslatedText;
                }
            });
        }

        function doSynthesizeInput() {
            var text = document.getElementById('inputText').value.trim();
            if (!text) {
                return;
            }
            var sourceLanguageCode =
document.getElementById("sourceLanguageCodeDropdown").value;
            doSynthesize(text, sourceLanguageCode);
        }

        function doSynthesizeOutput() {
            var text = document.getElementById('outputText').value.trim();
            if (!text) {
                return;
            }
            var targetLanguageCode =
document.getElementById("targetLanguageCodeDropdown").value;
            doSynthesize(text, targetLanguageCode);
        }

        function doSynthesize(text, languageCode) {
            var voiceId;
            switch (languageCode) {
                case "de":
                    voiceId = "Marlene";
                    break;
                case "en":
                    voiceId = "Joanna";
                    break;
                case "es":
                    voiceId = "Penelope";
                    break;
                case "fr":
                    voiceId = "Celine";
                    break;
                case "pt":
                    voiceId = "Vitoria";
                    break;
                default:
                    voiceId = null;
                    break;
            }
            if (!voiceId) {
                alert("Speech synthesis unsupported for language code: \"" + languageCode +
"\"");
                return;
            }
            var params = {
                OutputFormat: "mp3",
                SampleRate: "8000",
                Text: text,
                TextType: "text",
                VoiceId: voiceId
            };
            polly.synthesizeSpeech(params, function(err, data) {
```

```
                if (err) {
                    console.log(err, err.stack); // an error occurred
                    alert("Error calling Amazon Polly. " + err.message);
                }
                else {
                    var uInt8Array = new Uint8Array(data.AudioStream);
                    var arrayBuffer = uInt8Array.buffer;
                    var blob = new Blob([arrayBuffer]);
                    var url = URL.createObjectURL(blob);

                    audioElement = new Audio([url]);
                    audioElement.play();
                }
            });
        }

        function clearInputs() {
            document.getElementById('inputText').value = "";
            document.getElementById('outputText').value = "";
            document.getElementById("sourceLanguageCodeDropdown").value = "en";
            document.getElementById("targetLanguageCodeDropdown").value = "en";
        }
    </script>
</body>

</html>
```

# Using Amazon Translate to Translate a Chat Channel

You can use Amazon Translate for real time translation of chat messages. This example uses a Twitch channel, but you can use it as a starting point for other real-time streaming text like other chat platforms, customer service interactions, message boards, and more.

This example uses a web page that shows real-time messages in English and their real-time translations side-by-side. You can send the messages to Amazon Polly to speak the text. To follow a person in the chat, type their user name. The app will speak only messages from that user.

The code can be summarized as follows:

- CSS and HTML to create the Web page.
- Initialization code that creates controllers for Amazon Translate and Amazon Polly.
- A call back function that gets executed when a chat message is received.
- A function that sends a chat message.
- A function that calls Amazon Translate to translate messages.
- A function that calls Amazon Polly to synthesize speech.
- Utility functions for managing the Web page.

### To configure the example

1. Install and Configure the AWS SDK for JavaScript. For instructions for installing the SDK for JavaScript, see Installing the SDK for JavaScript.
2. Copy the code for the example to an HTML file on your Web server.
3. Update the `<script>` tag to the location where you installed the SDK for JavaScript.

4. Change the region and endpoint to the region where you want to run the Amazon Translate and Amazon Polly operations. For a list of supported regions for Amazon Translate, see Beta Guidelines and Limits (p. 37). For a list of supported regions for Amazon Polly, see AWS Regions and Endpoints in the *Amazon Web Services General Reference*.
5. Create an IAM user with the minimum required permissions to run this example. For information about creating an IAM user, see Creating an IAM User in Your AWS Account in the *AWS Identity and Access Management User Guide*. For the required permissions policies, see Using Identity-Based Polices (IAM Policies) for Amazon Translate (p. 35) and Using Identity-Based Policies (IAM Policies) for Amazon Polly in the *Amazon Polly Developer Guide*.
6. Provide the access ID and secret key of the IAM user created in the previous step.
7. Provide a Twitch user name and OAuth token for your account. You can create a Twitch account at https://www.twitch.tv. You can create a Twitch OAuth token at https://twitchapps.com/tmi.

```
<!doctype html>
<html lang="en">
<head>
  <title>Amazon Translate</title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">

  <!-- Latest compiled and minified CSS for Bootstrap -->
  <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/
bootstrap.min.css" integrity="sha384-BVYiiSIFeK1dGmJRAkycuHAHRg32OmUcww7on3RYdg4Va+PmSTsz/
K68vbdEjh4u" crossorigin="anonymous">

   <!-- Custom CSS -->
   <style>
     .topHeader
     {
       background-color: #6441a4;
       padding: 10px;
       border-bottom: solid 1px #cacaca;
       color: white
     }

     .panelHeading
     {
       background-color: #6441a4 !important;
     }

     .panelBody
     {
      min-height: 450px;  max-height: 450px;overflow-y: scroll;
     }

     body{
        margin-left: 0px;
        margin-right: 0px;
        height: 100%;
      }
   </style>
</head>
<body>
  <div class="container-fluid">
    <!--Top Header-->
    <div class="row topHeader">
      <div class="col-md-12">
          <h4>Amazon Translate - Artificial Intelligence on AWS - Powerful machine learning
 for all Developers and Data Scientists</h4>
      </div>
    </div>
```

```
   <!--Status Label-->
   <div class="row">
     <div class="col-md-12">
       <p class="bg-info">
       <div id="connecting-div"></div>
       </p>
     </div>
   </div>

   <div class="row" style="padding: 10px;">
     <div class="col-md-6">
         <div class="form-inline">
           <div class="form-group">
             <input type="text" id="channel" class="form-control" value=""
placeholder="Channel"/>
           </div>
           <div class="form-group">
             <select id="sourceLanguage" class="form-control">
                 <option value="en">en</option>
                 <option value="ar">ar</option>
                 <option value="de" selected="selected">de</option>
                 <option value="es">es</option>
                 <option value="fr">fr</option>
                 <option value="pt">pt</option>
                 <option value="zh">zh</option>
               </select>
           </div>
           <div class="form-group">
             <select id="targetLanguage" class="form-control">
               <option value="en" selected="selected">en</option>
               <option value="ar">ar</option>
               <option value="de">de</option>
               <option value="es">es</option>
               <option value="fr">fr</option>
               <option value="pt">pt</option>
               <option value="zh">zh</option>
             </select>
           </div>
           <div class="form-group">
             <button type="button" class="form-control" id="btn-go"
onclick="connect()">Go</button>
             <button type="button" class="form-control" id="btn-stop"
onclick="location.href='index.html';">Stop</button>
             <span id="status"></span>
           </div>
         </div>
       </div>
       <div class="col-md-6">
           <div class="form-inline">
             <div class="form-group">
                 <input type="checkbox" id="cbSpeak" value="Speak"> Speak Live Translation
                 <input type="text" id="follow" class="form-control" value=""
placeholder="follow"/>
               </div>
           </div>
         </div>
     </div>

   <!--Chat Boxes-->
   <div class="row">
     <!--Live Chat-->
     <div class="col-md-6">
       <div class="panel panel-primary">
         <div class="panel-heading panelHeading">Live Chat</div>
           <div id="livechatc" class="panel-body panelBody">
```

```
            <div class="subscribe" id="livechat"></div>
          </div>
        </div>
      </div>
      <!--Live Chat-->
      <!--Translated Chat-->
      <div class="col-md-6">
        <div class="panel panel-primary">
          <div class="panel-heading panelHeading">Live Translation</div>
            <div id="livetranslationc" class="panel-body panelBody">
              <div class="imageDetected" id="livetranslation"></div>
          </div>
        </div>
      </div>
      <!--Translated Chat-->
    </div>

    <!--Send Message-->
    <div class="row">
        <div class="col-md-11">
            <input type="text" id="message" class="form-control"/>
        </div>
        <div class=" col-md-1">
          <button type="button" class="form-control btn btn-default" id="btn-send"
 onclick="sendMessage()">Send</button>
        </div>
    </div>
  </div>

   <!-- Latest compiled and minified JavaScript -->
   <!-- jQuery first, then Bootstrap JS -->
   <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
 integrity="sha384-KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/GpGFF93hXpG5KkN"
 crossorigin="anonymous"></script>
   <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"
 integrity="sha384-Tc5IQib027qvyjSMfHjOMaLkfuWVxZxUPnCJA7l2mCWNIpG9mGCD8wGNIcPD7Txa"
 crossorigin="anonymous"></script>

   <script src="aws-js-sdk/dist/aws-sdk-all.js"></script>
   <script src="http://cdn.tmijs.org/js/1.2.1/tmi.min.js" integrity="sha384-
eE0n7sm1W7DOUI2Xh5I4qSpZTe6hupAO0ovLfqEy0yVJtGRBNfssdmjbJhEYm6Bw"
 crossorigin="anonymous"></script>
   <script>
     cred = {
          twitchUsername: "Twitch user name",
          twitchOAuthToken: "Twitch OAuth token",
          awsAccessKeyId: "access key",
          awsSecretAccessKey: "secret key"
     };

     AWS.config.region = 'region';
     ep = new AWS.Endpoint('endpoint');

     AWS.config.credentials = new AWS.Credentials(cred.awsAccessKeyId,
 cred.awsSecretAccessKey);
     window.translator = new AWS.Translate({endpoint: ep, region: AWS.config.region});

     /*************************Init and Connect to Chat*************************/
     function connect(){
       init();

       //Twitch Client
       var options = {
           options: {
             debug: false
           },
```

```
        connection: {
          cluster: "aws",
          reconnect: true
        },
        identity: {
          username: cred.twitchUsername,
          password: cred.twitchOAuthToken
        },
        channels: [con.channel]
    };

    window.client = tmi.client(options);

    window.client.connect();

    //Attached Handlers
    window.client.on("chat", onChat);
    window.client.on("connecting", onConnecting);
    window.client.on("connected", onConnected);

    //Disable UI Elements
    document.getElementById("sourceLanguage").disabled = true;
    document.getElementById("targetLanguage").disabled = true;
    document.getElementById("channel").disabled = true;
    document.getElementById("btn-go").disabled = true;
  }

  function init(){
    //Get UI Controls
    var lc = document.getElementById("livechat");
    var lt = document.getElementById("livetranslation")
    var lcc = document.getElementById("livechatc");
    var ltc = document.getElementById("livetranslationc")
    var cbspeak = document.getElementById("cbSpeak")
    var follow = document.getElementById("follow");
    var sendMessage = document.getElementById("message");

    //Cache values
    con = {
      channel: document.getElementById("channel").value,
      sourceLanguage: document.getElementById("sourceLanguage").value,
      targetLanguage: document.getElementById("targetLanguage").value,
      liveChatUI: lc,
      liveTranslationUI: lt,
      liveChatUIContainer: lcc,
      liveTranslationUIContainer: ltc,
      cbSpeak: cbspeak,
      follow: follow,
      sendMessage: sendMessage
    }

      lc.innerHTML = '';
      lt.innerHTML = '';

      //Speaker
     var voiceId = "Joanna";
     if(con.targetLanguage == "en")
        voiceId = "Joanna";
     else if(con.targetLanguage == "de")
          voiceId = "Marlene";
     else if(con.targetLanguage == "es")
         voiceId = "Conchita";
     else if(con.targetLanguage == "fr")
        voiceId = "Celine";
     else if(con.targetLanguage == "pt")
        voiceId = "Ines";
```

```
       else
          voiceId = "Joanna";
        window.audioPlayer = AudioPlayer(voiceId);
    }
    /*************************Init and Connect to Chat*****************************/

    /*************************Receive and Translate Chat*****************************/
    function onChat (channel, userstate, message, self) {
        // Don't listen to my own messages..
        if (self) return;

        //Translate
        if (message) {
          var username = userstate['username'];

          var params = {
              Text: message,
              SourceLanguageCode: con.sourceLanguage,
              TargetLanguageCode:  con.targetLanguage
          };

          window.translator.translateText(params, function onIncomingMessageTranslate(err,
data) {
              if (err) {
                 console.log("Error calling Translate. " + err.message + err.stack);
             }
              if (data) {
                  console.log("M: " + message);
                  console.log("T: " + data.TranslatedText);

                  //Print original message in chat UI
                  con.liveChatUI.innerHTML += '<strong>' + username + '</strong>: ' +
message + '<br>';

                  //Print translation in translation UI
                  con.liveTranslationUI.innerHTML += '<strong>' + username + '</strong>: '
+ data.TranslatedText + '<br>';

                  //If speak translation in enabled, speak translated message
                  if(con.cbSpeak.checked){
                    if(con.follow.value == "" || username == con.follow.value)
                      audioPlayer.Speak(username + " says " + data.TranslatedText);
                  }

                  //Scroll chat and translated UI to bottom to keep focus on latest
messages
                  con.liveChatUIContainer.scrollTop = con.liveChatUIContainer.scrollHeight;
                  con.liveTranslationUIContainer.scrollTop =
con.liveTranslationUIContainer.scrollHeight;
               }
          });
        }
    }
    /*************************Receive and Translate Chat*****************************/

    /*************************Client Connecting*****************************/
    function onConnecting (address, port) {
        document.getElementById("status").innerHTML = " [ Connecting...]"
    }

    function onConnected (address, port) {
        document.getElementById("status").innerHTML = " [ Connected ]"
        window.audioPlayer.Speak("Connected to channel " + con.channel + ". You should now
be getting live chat messages.");
    }
    /*************************Client Connecting*****************************/
```

```
    /*************************Send Message*****************************/
    function sendMessage(){
         if(con.sendMessage.value){
           message = con.sendMessage.value;
           var params = {
               Text: con.sendMessage.value,
               SourceLanguageCode: con.targetLanguage,
               TargetLanguageCode:  con.sourceLanguage
           };

           window.translator.translateText(params, function onSendMessageTranslate(err,
data) {
                 if (err) {
                    console.log("Error calling Translate. " + err.message + err.stack);
                 }
                 if (data) {
                     console.log("M: " + message);
                     console.log("T: " + data.TranslatedText);

                     //Send message to chat
                     window.client.action(con.channel, data.TranslatedText);

                     //Clear send message UI
                     con.sendMessage.value = "";

                     //Print original message in Translated UI
                     con.liveTranslationUI.innerHTML += '<strong> ME: </strong>: ' +
message + '<br>';

                     //Print translated message in Chat UI
                     con.liveChatUI.innerHTML += '<strong> ME: </strong>: ' +
data.TranslatedText + '<br>';

                     //Scroll chat and translated UI to bottom to keep focus on latest
messages
                     con.liveChatUIContainer.scrollTop =
con.liveChatUIContainer.scrollHeight;
                     con.liveTranslationUIContainer.scrollTop =
con.liveTranslationUIContainer.scrollHeight;
                 }
           });
         }
    }
    /*************************Send Message*****************************/

    /*************************Audio player*****************************/
    function AudioPlayer(voiceId) {
        var audioPlayer = document.createElement('audio');
        audioPlayer.setAttribute("id", "audioPlayer");
        document.body.appendChild(audioPlayer);

        var isSpeaking = false;

        var speaker = {
            self: this,
            playlist:[],

            Speak: function (text) {
                //If currently speaking a message, add new message to the playlist
                if (isSpeaking) {
                    this.playlist.push(text);
                } else {
                    speakTextMessage(text).then(speakNextTextMessage)
                }
            }
```

```
        }

        // Speak text message
        function speakTextMessage(text) {
            return new Promise(function (resolve, reject) {
                isSpeaking = true;
                getAudioStream(text).then(playAudioStream).then(resolve);
            });
        }

        // Speak next message in the list
        function speakNextTextMessage() {
            var pl = speaker.playlist;
            if (pl.length > 0) {
                var txt = pl[0];
                pl.splice(0, 1);
                speakTextMessage(txt).then(speakNextTextMessage);
            }
        }

        // Get synthesized speech from Amazon polly
        function getAudioStream(textMessage) {
            return new Promise(function (resolve, reject) {
                var polly = new AWS.Polly();
                var params = {
                    OutputFormat: 'mp3',
                    Text: textMessage,
                    VoiceId: voiceId
                }
                polly.synthesizeSpeech(params, function (err, data) {
                    if (err)
                        reject(err);
                    else
                        resolve(data.AudioStream);
                });
            });
        }

        // Play audio stream
        function playAudioStream(audioStream) {
            return new Promise(function (resolve, reject) {
                var uInt8Array = new Uint8Array(audioStream);
                var arrayBuffer = uInt8Array.buffer;
                var blob = new Blob([arrayBuffer]);

                var url = URL.createObjectURL(blob);
                audioPlayer.src = url;
                audioPlayer.addEventListener("ended", function () {
                    isSpeaking = false;
                    resolve();
                });
                audioPlayer.play();
            });
        }

        return speaker;
    }
    /**************************Audio player*****************************/
  </script>
</body>
</html>
```

# Using Amazon Translate with Amazon DynamoDB

This example shows you how to translate a product review and store it in Amazon DynamoDB. If you request the same review later, DynamoDB returns it without Amazon Translate needing to translate it again.

In this example, you:

- Use AWS CloudFormation to create DynamoDB tables to store the translation and a Lambda function that calls the TranslateText (p. 39) operation.
- Test the function using the AWS Lambda console.

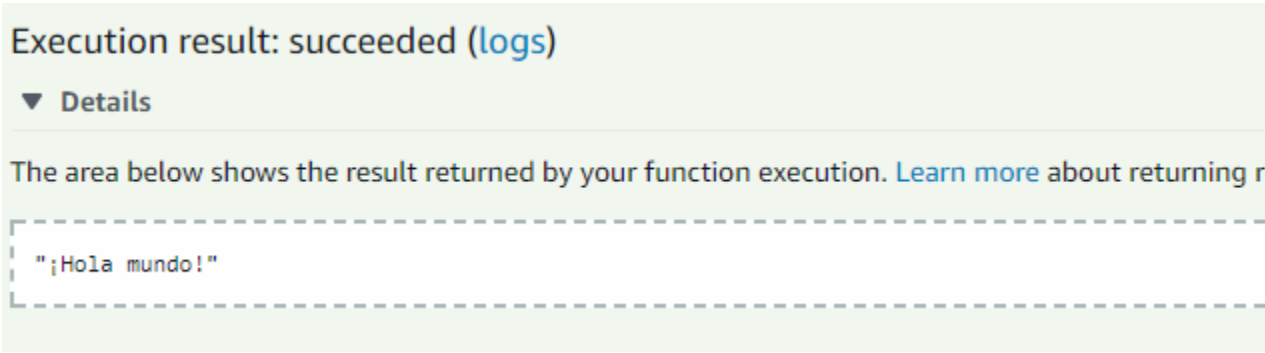
### To run the example

1. Copy the contents of `example.py`, which you can find in Python Lambda Function (p. 24), to a file named `example.py`. `example.py` is a Lambda function that calls the TranslateText (p. 39) operation. Compress the file to a zip archive named `example.zip`. Store it in an S3 bucket in the same AWS Region where you want to run the function.
2. Create a new file named `template.yaml`. Copy the AWS CloudFormation template code, which you can find in AWS CloudFormation Template (p. 25), into the file. AWS CloudFormation uses the template to create resources for the sample application. Change `BUCKET_NAME` to the name of the S3 bucket that contains `example.zip`. Save the file in a local directory.
3. Sign in to the AWS Management Console and open the AWS CloudFormation console at https://console.aws.amazon.com/cloudformation.
4. Choose **Create new stack**.
5. Choose **Upload a template to Amazon S3**, and then choose **Choose file**. Choose `template.yaml`, that you created in Step 2, then **Next**.
6. Type a name for the stack, then choose **Next**.
7. On the **Options** page, choose **Next**.
8. Choose **I acknowledge that AWS CloudFormation might create IAM resources** and **I acknowledge that AWS CloudFormation might create IAM resources with custom names**. For more information, see Controlling Access with AWS Identity and Access Management in the *AWS CloudFormation User Guide*.
9. Choose **Create Change Set**.
10. After AWS CloudFormation creates the change set, choose **Execute**. Wait until AWS CloudFormation creates the stack.
11. Sign in to the AWS Management Console and open the AWS Lambda console at https://console.aws.amazon.com/lambda/.
12. Choose the new function. Its name starts with `TestTranslate-ReviewTranslate`.
13. On the function detail page, choose **Test**.
14. For **Event name**, type **`TestTranslate`**. For **Configure test event**, replace the JSON with the following:

```
{
   "review": "hello world",
   "target_language": "es",
   "source_language": "en",
   "review_id": "1"
}
```

Choose **Create**.

15. Make sure that **TestTranslate** is selected, then choose **Test**. When the test finishes, you receive the following message:




# Example Code

Use the following code to create the example.

## Python Lambda Function

The following is the contents of the Python Lambda function. The Lambda function call the `TranlateText` operation and passes the review, the source language, and the target language to get the translated review. Save this file as `example.py` and them compress it in a .zip archive called `example.zip`. Save the file in an S3 bucket in the same region that you are running the example..

```
import logging
import json
import boto3
import os

translate = boto3.client('translate')
dynamodb = boto3.client('dynamodb')
firehose = boto3.client('firehose')

TABLE_NAME = os.getenv('TABLE_NAME')

logger = logging.getLogger()
logger.setLevel(logging.INFO)

def lambda_handler(event, context):

    logger.info(event)

    if 'source_language' in event and 'target_language' in event and 'review' in event and
 'review_id' in event:
        review_id = event['review_id']
        source_language = event['source_language']
        target_language = event['target_language']
        review = event['review']

        try:
            # The Lambda function queries the Amazon DynamoDB table to check whether
            # the review has already been translated. If the translated review
            # is already stored in Amazon DynamoDB, the function returns it.
            response = dynamodb.get_item(
                TableName=TABLE_NAME,
                Key={
                    'review_id': {
```

```
                        'N': review_id,
                    },
                    'language': {
                        'S': target_language,
                    },
                }
            )
            logger.info(response)
            if 'Item' in response:
                return response['Item']['review']['S']
        except Exception as e:
            logger.error(response)
            raise Exception("[ErrorMessage]: " + str(e))

        try:
            # The Lambda function calls the TranslateText operation and passes the
            # review, the source language, and the target language to get the
            # translated review.
            result = translate.translate_text(Text=review,
 SourceLanguageCode=source_language, TargetLanguageCode=target_language)
            logging.info("Translation output: " + str(result))
        except Exception as e:
            logger.error(response)
            raise Exception("[ErrorMessage]: " + str(e))

        try:
            # After the review is translated, the function stores it using
            # the Amazon DynamoDB putItem operation. Subsequent requests
            # for this translated review are returned from Amazon DynamoDB.
            response = dynamodb.put_item(
            TableName=TABLE_NAME,
            Item={
                'review_id': {
                    'N': review_id,
                },
                'language': {
                    'S': target_language,
                },
                'review': {
                    'S': result.get('TranslatedText')
                }
                }
            )
            logger.info(response)
        except Exception as e:
                logger.error(e)
                raise Exception("[ErrorMessage]: " + str(e))
        return result.get('TranslatedText')
    else:
        logger.error(e)
        raise Exception("[ErrorMessage]: Invalid input ")
```

## AWS CloudFormation Template

The following is the template file that you use with AWS CloudFormation to create and configure the Lambda function and the DynamoDB tables. Use this file when you create the AWS CloudFormation stack for the example. Update `BUCKET_NAME` to the name of the S3 bucket that contains the `example.zip` file and then save it to a local directory as `template.yaml`.

```
AWSTemplateFormatVersion: '2010-09-09'
Transform: 'AWS::Serverless-2016-10-31'
Resources:  ReviewTranslate:
    Type: 'AWS::Serverless::Function'
```

```
    Properties:
        Handler: example.lambda_handler
        Runtime: python2.7
        CodeUri:
          Bucket: BUCKET_NAME
          Key: example.zip
        Policies:
         - AWSLambdaFullAccess
         - TranslateReadOnly
        Environment:
          Variables:
            TABLE_NAME: !Ref ReviewTable
        Tracing: "Active"
  ReviewTable:
    Type: 'AWS::DynamoDB::Table'
    Properties:
        AttributeDefinitions:
            - AttributeName: "review_id"
              AttributeType: "N"
            - AttributeName: "language"
              AttributeType: "S"
        KeySchema:
            - AttributeName: "review_id"
              KeyType: "HASH"
            - AttributeName: "language"
              KeyType: "RANGE"
        ProvisionedThroughput:
            ReadCapacityUnits: 5
            WriteCapacityUnits: 5
```

# Using Amazon Translate to Translate a Web Page

You can use Amazon Translate to translate the contents of a Web page. The following Java program translates a specified Web page from English to Spanish and creates an HTML file that contains the result of the translation. There are two functions in the program:

- A function that reads data from the source Web page, separates it into HTML elements, and then calls the second function to translate the element. At the end of the document, it writes the results to an HTML file.
- A function that calls the Amazon Translate service to translate the contents of an HTML element.

### To configure the example

1. Install and configure the AWS SDK for Java. For instructions for installing the SDK for Java, see Set up the AWS SDK for Java.
2. Install the jsoup Java HTML parser. For instructions, see jsoup.
3. Create an IAM user with the minimum required permissions to run this example. For information about creating an IAM user, see Creating an IAM User in Your AWS Account in the *AWS Identity and Access Management User Guide*. For the required permissions policies, see Using Identity-Based Polices (IAM Policies) for Amazon Translate (p. 35).
4. Set up the credentials needed to run the sample. For instructions, see Set up AWS Credentials and Region for Development in the *AWS SDK for Java Developer Guide*.
5. Create a new project in your Java IDE and copy the source code.
6. Change the region and endpoint to the region where you want to run the Amazon Translate operation. For a list of supported regions for Amazon Translate, see Beta Guidelines and Limits (p. 37).

```
package com.amazonaws.translateweb;

import com.amazonaws.auth.AWSCredentialsProviderChain;
import com.amazonaws.auth.EnvironmentVariableCredentialsProvider;
import com.amazonaws.auth.SystemPropertiesCredentialsProvider;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.client.builder.AwsClientBuilder;
import com.amazonaws.services.translate.AmazonTranslate;
import com.amazonaws.services.translate.AmazonTranslateClient;
import com.amazonaws.services.translate.model.TranslateTextRequest;
import com.amazonaws.services.translate.model.TranslateTextResult;
import com.amazonaws.AmazonServiceException;

import java.io.IOException;
import java.io.PrintWriter;

import org.jsoup.Jsoup;
import org.jsoup.nodes.Document;
import org.jsoup.nodes.Element;

import org.jsoup.select.Elements;


public class TranslateWebPage {

   public static void main(String[] args) throws InterruptedException {

   // Define the URL of the HTML content to translate
   String url = "http://example.com/source.html";

   // Create credentials using a provider chain that will evaluate in order;
   // a) Any Java system properties
   // b) Any environment variables
   // c) Any profile file
   AWSCredentialsProviderChain DefaultAWSCredentialsProviderChain = new
 AWSCredentialsProviderChain(
         new SystemPropertiesCredentialsProvider(),
         new EnvironmentVariableCredentialsProvider(),
         new ProfileCredentialsProvider()
      );

   // Create an endpoint configuration for the Translate service
   AwsClientBuilder.EndpointConfiguration endpointConfiguration = new
 AwsClientBuilder.EndpointConfiguration(
      "endpoint", "region");

   // Create a client for the Translate service
   AmazonTranslate translate = AmazonTranslateClient.builder()
      .withCredentials(DefaultAWSCredentialsProviderChain)
      .withEndpointConfiguration(endpointConfiguration).build();


   // Record the begining of translating the HTML content at the url
   System.out.println("Translating URL: " + url);

   // Create an empty HTML document to store the parsed data
   Document doc;

   try {
      // Retrieve the HTML located at the URL
      doc = Jsoup.connect(url).get();

      // Select all of the elements in the HTML
      Elements eles = doc.select("*");
```

```
      // For each element
      for (Element ele : eles) {

          // Translate the element
          translateElement(ele, translate);

          // If you encounter service throttling when translating large web
          // pages, you can request a service limit increase. For details,
          // see https://aws.amazon.com/premiumsupport/knowledge-center/manage-service-
limits/,
          // or you can throttle your requests by inserting a sleep statement.
          // Thread.sleep(1000);
      }

      // Configure an output file for the translated HTML
      String fname = "output HTML file name";
      PrintWriter pw = new PrintWriter(fname, "UTF-8");

      // Write our translated HTML to the output file
      pw.println(doc);
      pw.close();

      // Record that the file has been saved
      System.out.println("Saved file "+fname);


      // Catch any exceptions in retrieving the HTML
   } catch (IOException e1) {
      e1.printStackTrace();
   }
}

   // This function is used to translate each individual element
   public static void translateElement(Element ele, AmazonTranslate translate) {

      // Check if the element has any text
      if (!ele.ownText().isEmpty()) {

         // Retrieve the text of the HTML element
         String text = ele.ownText();

         // Now translate the element's text
         try {

            // Translate from English to Spanish
            TranslateTextRequest request = new TranslateTextRequest()
                .withText(text)
                .withSourceLanguageCode("en")
                .withTargetLanguageCode("es");

            // Retrieve the result
            TranslateTextResult result  = translate.translateText(request);

            // Record the original and translated text
            System.out.println("Original text: " + text + " - Translated text: "+
 result.getTranslatedText());

            // Update the HTML element with the translated text
            ele.text(result.getTranslatedText());

            // Catch any translation errors
         } catch (AmazonServiceException e) {
                   System.err.println(e.getErrorMessage());
                   System.exit(1);
         }
      } else {
```

```
        // We have found a non-text HTML element. No action required.
      }
    }
}
```

# Using Amazon Translate to Translate Large Documents

You can split large documents into smaller parts to keep the total document size below the document size limit. For more information about document size limits, see Limits (p. 37). The following Java program breaks long text documents into individual sentences and then translates each sentence from the source language to the target language. The program contains two sections:

- The `SentenceSegmenter` class that is responsible for breaking the source string into individual sentences. The sample uses the International Components for Unicode (ICU) `BreakIterator` class. You can use the Java `BreakIterator` class as an alternative. For more information, see Using the Java BreakIterator Class (p. 31).

- The `main` function that calls the `Translate` operation for each sentence in the source string. The `main` function also handles authentication with Amazon Translate.

**To configure the example**

1. Install and configure the AWS SDK for Java. For instructions for installing the SDK for Java, see Set up the AWS SDK for Java.
2. Download and install the ICU jar files from http://site.icu-project.org/download. If you are using Maven, set up dependencies from https://mvnrepository.com/artifact/com.ibm.icu/icu4j.
3. Create an IAM user with the minimum required permissions to run this example. For information about creating an IAM user, see Creating an IAM User in Your AWS Account in the *AWS Identity and Access Management User Guide*. For the required permissions policies, see Using Identity-Based Polices (IAM Policies) for Amazon Translate (p. 35).
4. Set up the credentials needed to run the sample. For instructions, see Set up AWS Credentials and Region for Development in the *AWS SDK for Java Developer Guide*.
5. Create a new project in your Java IDE and copy the source code.
6. Change the region to the region where you want to run the Amazon Translate operation. For a list of supported regions for Amazon Translate, see Beta Guidelines and Limits (p. 37).
7. Change the source and target languages to the languages to translate between.
8. Run the sample to see the translated text on standard output.

```
import com.amazonaws.auth.AWSCredentialsProviderChain;
import com.amazonaws.auth.EnvironmentVariableCredentialsProvider;
import com.amazonaws.auth.SystemPropertiesCredentialsProvider;
import com.amazonaws.auth.profile.ProfileCredentialsProvider;
import com.amazonaws.services.translate.AmazonTranslate;
import com.amazonaws.services.translate.AmazonTranslateClient;
import com.amazonaws.services.translate.model.TranslateTextRequest;
import com.amazonaws.services.translate.model.TranslateTextResult;
import com.ibm.icu.text.BreakIterator;
import java.util.ArrayList;
import java.util.List;
import java.util.Locale;
```

```
public class MultiSentenceTranslator {

    public static void main(String[] args) {
        // Define the text to be translated here
        String region = "region";
        String text = "Text to be translated";

        String sourceLang = "source language";
        String targetLang = "target language";

        // Break text into sentences
        SentenceSegmenter sentenceSegmenter = new SentenceSegmenter();
        List<String> sentences = new ArrayList<>();
        try {
            sentences = sentenceSegmenter.segment(text, sourceLang);
        } catch (Exception e) {
            System.out.println(e);
            System.exit(1);
        }

        // Create credentials using a provider chain that will evaluate in order;
        // a) Any Java system properties
        // b) Any environment variables
        // c) Any profile file
        AWSCredentialsProviderChain DefaultAWSCredentialsProviderChain = new
 AWSCredentialsProviderChain(
                new SystemPropertiesCredentialsProvider(),
                new EnvironmentVariableCredentialsProvider(),
                new ProfileCredentialsProvider()
        );

        // Create an Amazon Translate client
        AmazonTranslate translate = AmazonTranslateClient.builder()
                .withCredentials(DefaultAWSCredentialsProviderChain)
                .withRegion(region)
                .build();

        // Translate sentences and print the results to stdout
        for (String sentence : sentences) {
            TranslateTextRequest request = new TranslateTextRequest()
                    .withText(sentence)
                    .withSourceLanguageCode(sourceLang)
                    .withTargetLanguageCode(targetLang);
            TranslateTextResult result = translate.translateText(request);
            System.out.println("Original text: " + sentence);
            System.out.println("Translated text: " + result.getTranslatedText());
        }
    }

}

class SentenceSegmenter {
    public List<String> segment(final String text, final String lang) throws Exception {
        List<String> res = new ArrayList<>();
        BreakIterator sentenceIterator = BreakIterator.getSentenceInstance(new
 Locale(lang));
        sentenceIterator.setText(text);
        int prevBoundary = sentenceIterator.first();
        int curBoundary = sentenceIterator.next();
        while (curBoundary != BreakIterator.DONE) {
            String sentence = text.substring(prevBoundary, curBoundary);
            res.add(sentence);
            prevBoundary = curBoundary;
            curBoundary = sentenceIterator.next();
        }
```

```
        return res;
    }

}
```

# Using the Java BreakIterator Class

Depending on the language pair and your use case, the Java `BreakIterator` class may provide better performance. You should not use it if the source language is Arabic (ar). If you want to use the Java `BreakIterator`, make the following changes to the sample:

1. Remove the following line from the imports section of the sample:

   ```
   import com.ibm.icu.text.BreakIterator;
   ```

2. Add the following line to the imports section of the sample:

   ```
   import java.text.BreakIterator;
   ```

The sample will now use the Java `BreakIterator` class.

# Authentication and Access Control for Amazon Translate

Access to Amazon Translate requires credentials that AWS can use to authenticate your requests. Those credentials must have permissions to access Amazon Translate actions. The following sections provide details on how you can use AWS Identity and Access Management (IAM) and Amazon Translate to help secure your resources by controlling who can access them.



## Authentication

You can access AWS as any of the following types of identities:

- **AWS account root user** – When you first create an AWS account, you begin with a single 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 do not use the root user for your everyday tasks, even the administrative ones. Instead, adhere to the best practice of using the root user only to create your first IAM user. Then securely lock away the root user credentials and use them to perform only a few account and service management tasks.
- **IAM user** – An IAM user is an identity within your AWS account that has specific custom permissions (for example, permissions to create in Amazon Translate). You can use an IAM user name and password to sign in to secure AWS webpages like the AWS Management Console, AWS Discussion Forums, or the AWS Support Center.

  In addition to a user name and password, you can also generate access keys for each user. You can use these keys when you access AWS services programmatically, either through one of the several SDKs or by using the AWS Command Line Interface (CLI). The SDK and CLI tools use the access keys to cryptographically sign your request. If you don't use AWS tools, you must sign the request yourself. Amazon Translate supports *Signature Version 4*, a protocol for authenticating inbound API requests. For more information about authenticating requests, see Signature Version 4 Signing Process in the *AWS General Reference*.

- **IAM role** – An IAM role is an IAM identity that you can create in your account that has specific permissions. It is similar to an *IAM user*, but it is not associated with a specific person. An IAM role enables you to obtain temporary access keys that can be used to access AWS services and resources. IAM roles with temporary credentials are useful in the following situations:

  - **Federated user access** – Instead of creating an IAM user, you can use existing user identities from AWS Directory Service, your enterprise user directory, or a web identity provider. These are known as *federated users*. AWS assigns a role to a federated user when access is requested through an identity provider. For more information about federated users, see Federated Users and Roles in the *IAM User Guide*.

- **AWS service access** – You can use an IAM role in your account to grant an AWS service permissions to access your account's resources. For example, you can create a role that allows Amazon Redshift to access an Amazon S3 bucket on your behalf and then load data from that bucket into an Amazon Redshift cluster. For more information, see Creating a Role to Delegate Permissions to an AWS Service in the *IAM User Guide*.

- **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 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 Using an IAM Role to Grant Permissions to Applications Running on Amazon EC2 Instances in the *IAM User Guide*.

# Access Control

You can have valid credentials to authenticate your requests. For example, you must have permissions to call an Amazon Translate action.

The following sections describe how to manage permissions for Amazon Translate. We recommend that you read the overview first.



# Overview of Managing Access Permissions to Your Amazon Translate Resources

Permissions to access an action are governed by permissions policies. An account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) to manage access to actions.

> **Note**
> An *account administrator* (or administrator user) is a user with administrator privileges. For more information, see IAM Best Practices in the *IAM User Guide*.

When granting permissions, you decide who is getting the permissions and the actions they get permissions for.

**Topics**



## Managing Access to Actions

A *permissions policy* describes who has access to what. The following section explains the available options for creating permissions policies.

**Note**
This section discusses using IAM in the context of Amazon Translate. It doesn't provide detailed information about the IAM service. For complete IAM documentation, see What Is IAM? in the *IAM User Guide*. For information about IAM policy syntax and descriptions, see AWS IAM Policy Reference in the *IAM User Guide*.

Policies attached to an IAM identity are referred to as *identity-based* policies (IAM polices) and policies attached to a resource are referred to as *resource-based* policies. Amazon Translate supports only identity-based policies.

## Identity-Based Policies (IAM Policies)

You can attach policies to IAM identities. For example, you can do the following:

- **Attach a permissions policy to a user or a group in your account** – To grant a user or a group of users permissions to call and Amazon Translate action, you can attach a permissions policy to a user or group that the user belongs to.
- **Attach a permissions policy to a role (grant cross-account permissions)** – To grant cross-account permissions, you can attach an identity-based permissions policy to an IAM role. For example, the administrator in Account A can create a role to grant cross-account permissions to another AWS account (for example, Account B) or an AWS service as follows:
  1. Account A administrator creates an IAM role and attaches a permissions policy to the role that grants permissions on resources in Account A.
  2. Account A administrator attaches a trust policy to the role identifying Account B as the principal who can assume the role.
  3. Account B administrator can then delegate permissions to assume the role to any users in Account B. Doing this allows users in Account B to create or access resources in Account A. If you want to grant an AWS service permissions to assume the role, the principal in the trust policy can also be an AWS service principal.

  For more information about using IAM to delegate permissions, see Access Management in the *IAM User Guide*.

For more information about using identity-based policies with Amazon Translate, see Using Identity-Based Polices (IAM Policies) for Amazon Translate (p. 35). For more information about users, groups, roles, and permissions, see Identities (Users, Groups, and Roles) in the *IAM User Guide*.

## Resource-Based Policies

Other services, such as Lambda, support resource-based permissions policies. For example, you can attach a policy to an S3 bucket to manage access permissions to that bucket. Amazon Translate doesn't support resource-based policies.

# Specifying Policy Elements: Actions, Effects, and Principals

Amazon Translate defines a set of API operations (see Actions (p. 38)). To grant permissions for these API operations, Amazon Translate defines a set of actions that you can specify in a policy.

The following are the most basic policy elements:

- **Resource** – In a policy, you use an Amazon Resource Name (ARN) to identify the resource to which the policy applies. For Amazon Translate, the resource is always `"*"`.

- **Action** – You use action keywords to identify operations that you want to allow or deny. For example, depending on the specified `Effect`, `translate:TranslateText` either allows or denies the user permissions to perform the Amazon Translate `TranslateText` operation.
- **Effect** – You specify the effect of the action that occurs when the user requests the specific action —this can be either allow or deny. If you don't explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny access to a resource. You might do this to make sure that a user cannot access the resource, even if a different policy grants access.
- **Principal** – In identity-based policies (IAM policies), the user that the policy is attached to is the implicit principal.

To learn more about IAM policy syntax and descriptions, see AWS IAM Policy Reference in the *IAM User Guide*.

For a table showing all of the Amazon Translate API actions, see Amazon Translate API Permissions: Actions, Resources, and Conditions Reference (p. 36).

## Specifying Conditions in a Policy

When you grant permissions, you use the IAM policy language to specify the conditions under which a policy should take effect. For example, you might want a policy to be applied only after a specific date. For more information about specifying conditions in a policy language, see Condition in the *IAM User Guide*.

AWS provides a set of predefined condition keys for all AWS services that support IAM for access control. For example, you can use the `aws:userid` condition key to require a specific AWS ID when requesting an action. For more information and a complete list of AWS-wide keys, see Available Keys for Conditions in the *IAM User Guide*.

> **Note**
> Condition keys are case sensitive.

Amazon Translate does not provide any additional condition keys.

# Using Identity-Based Polices (IAM Policies) for Amazon Translate

This topic provides examples of identity-based policies that demonstrate how an account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) and thereby grant permissions to perform Amazon Translate actions.

> **Important**
> Before you proceed, we recommend that you review Overview of Managing Access Permissions to Your Amazon Translate Resources (p. 33).

The following is the permissions policy required to use Amazon Translate and the Amazon Translate console:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "translate:TranslateText"
             ],
```

```
            "Resource": "*"
        }
    ]
}
```

The policy has one statement that grants permission to use the `TranslateText` action.

The policy doesn't specify the `Principal` element because you don't specify the principal who gets the permission in an identity-based policy. When you attach a policy to a user, the user is the implicit principal. When you attach a permissions policy to an IAM role, the principal identified in the role's trust policy gets the permissions.

For a table showing all of the Amazon Translate API actions and the resources that they apply to, see Amazon Translate API Permissions: Actions, Resources, and Conditions Reference (p. 36).

# Amazon Translate API Permissions: Actions, Resources, and Conditions Reference

Use the following table as a reference when setting up Access Control (p. 33) and writing a permissions policy that you can attach to an IAM identity (an identity-based policy). The list includes each Amazon Translate API operation, the corresponding action for which you can grant permissions to perform the action, and the AWS resource for which you can grant the permissions. You specify the actions in the policy's `Action` field, and you specify the resource value in the policy's `Resource` field.

To express conditions, you can use AWS-wide condition keys in your Amazon Translate policies. For a complete list of AWS-wide keys, see Available Keys in the *IAM User Guide*.

**Note**
To specify an action, use the `translate:` prefix followed by the API operation name, for example, `translate:TranslateText`.

# Beta Guidelines and Limits

***This is prerelease documentation for a service in preview release. It is subject to change.***

## Guidelines

The beta for Amazon Translate is available in the following region.

| Region Name | Region | Endpoint | Protocol |
|---|---|---|---|
| US East (Ohio) | us-east-2 | https://translate.us-east-2.amazonaws.com | HTTPS |
| US East (N. Virginia) | us-east-1 | https://translate.us-east-1.amazonaws.com | HTTPS |
| US West (Oregon) | us-west-2 | https://translate.us-west-2.amazonaws.com | HTTPS |

## Limits

The beta release of Amazon Translate has the following limitations:

- The maximum document size is 1,000 bytes of UTF-8 characters per request.

# API Reference

This section contains the API Reference documentation.

## Actions

The following actions are supported:

- TranslateText (p. 39)

# TranslateText

Translates input text from the source language to the target language. You can translate between English (en) and one of the following languages, or between one of the following languages and English.

- Arabic (ar)
- Chinese (Simplified) (zh)
- French (fr)
- German (de)
- Portuguese (pt)
- Spanish (es)

## Request Syntax

```
{
   "SourceLanguageCode": "string",
   "TargetLanguageCode": "string",
   "Text": "string"
}
```

## Request Parameters

For information about the parameters that are common to all actions, see Common Parameters (p. 43).

The request accepts the following data in JSON format.

**SourceLanguageCode (p. 39)**

One of the supported language codes for the source text. If the `TargetLanguageCode` is not "en", the `SourceLanguageCode` must be "en".

Type: String

Length Constraints: Minimum length of 2. Maximum length of 5.

Required: Yes

**TargetLanguageCode (p. 39)**

One of the supported language codes for the target text. If the `SourceLanguageCode` is not "en", the `TargetLanguageCode` must be "en".

Type: String

Length Constraints: Minimum length of 2. Maximum length of 5.

Required: Yes

**Text (p. 39)**

The text to translate.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 1000.

Required: Yes

## Response Syntax

```
{
   "SourceLanguageCode": "string",
   "TargetLanguageCode": "string",
   "TranslatedText": "string"
}
```

## Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The following data is returned in JSON format by the service.

**SourceLanguageCode (p. 40)**

The language code for the language of the input text.

Type: String

Length Constraints: Minimum length of 2. Maximum length of 5.

**TargetLanguageCode (p. 40)**

The language code for the language of the translated text.

Type: String

Length Constraints: Minimum length of 2. Maximum length of 5.

**TranslatedText (p. 40)**

The text translated into the target language.

Type: String

Length Constraints: Minimum length of 1.

## Errors

For information about the errors that are common to all actions, see Common Errors (p. 41).

**InternalServerException**

An internal server error occurred. Retry your request.

HTTP Status Code: 500

**InvalidRequestException**

The request is invalid.

HTTP Status Code: 400

**ServiceUnavailableException**

Amazon Translate is unavailable. Retry your request later.

HTTP Status Code: 400

**TextSizeLimitExceededException**

The size of the input text exceeds the length constraint for the `Text` field. Try again with a shorter text.

HTTP Status Code: 400

**TooManyRequestsException**

The number of requests exceeds the limit. Resubmit your request later.

HTTP Status Code: 400

**UnsupportedLanguagePairException**

Amazon Translate cannot translate input text in the source language into this target language. For more information, see Error Handling (p. 2).

HTTP Status Code: 400

## See Also

For more information about using this API in one of the language-specific AWS SDKs, see the following:

- AWS Command Line Interface
- AWS SDK for .NET
- AWS SDK for C++
- AWS SDK for Go
- AWS SDK for Java
- AWS SDK for JavaScript
- AWS SDK for PHP V3
- AWS SDK for Python
- AWS SDK for Ruby V2

# Data Types

There are no separate data types in this API.

# Common Errors

This section lists the errors common to the API actions of all AWS services. For errors specific to an API action for this service, see the topic for that API action.

**AccessDeniedException**

You do not have sufficient access to perform this action.

HTTP Status Code: 400

**IncompleteSignature**

The request signature does not conform to AWS standards.

HTTP Status Code: 400

**InternalFailure**

The request processing has failed because of an unknown error, exception or failure.

HTTP Status Code: 500

**InvalidAction**

The action or operation requested is invalid. Verify that the action is typed correctly.

HTTP Status Code: 400

**InvalidClientTokenId**

The X.509 certificate or AWS access key ID provided does not exist in our records.

HTTP Status Code: 403

**InvalidParameterCombination**

Parameters that must not be used together were used together.

HTTP Status Code: 400

**InvalidParameterValue**

An invalid or out-of-range value was supplied for the input parameter.

HTTP Status Code: 400

**InvalidQueryParameter**

The AWS query string is malformed or does not adhere to AWS standards.

HTTP Status Code: 400

**MalformedQueryString**

The query string contains a syntax error.

HTTP Status Code: 404

**MissingAction**

The request is missing an action or a required parameter.

HTTP Status Code: 400

**MissingAuthenticationToken**

The request must contain either a valid (registered) AWS access key ID or X.509 certificate.

HTTP Status Code: 403

**MissingParameter**

A required parameter for the specified action is not supplied.

HTTP Status Code: 400

**OptInRequired**

The AWS access key ID needs a subscription for the service.

HTTP Status Code: 403

**RequestExpired**

The request reached the service more than 15 minutes after the date stamp on the request or more than 15 minutes after the request expiration date (such as for pre-signed URLs), or the date stamp on the request is more than 15 minutes in the future.

HTTP Status Code: 400

**ServiceUnavailable**

The request has failed due to a temporary failure of the server.

HTTP Status Code: 503

**ThrottlingException**

The request was denied due to request throttling.

HTTP Status Code: 400

**ValidationError**

The input fails to satisfy the constraints specified by an AWS service.

HTTP Status Code: 400

# Common Parameters

The following list contains the parameters that all actions use for signing Signature Version 4 requests with a query string. Any action-specific parameters are listed in the topic for that action. For more information about Signature Version 4, see Signature Version 4 Signing Process in the *Amazon Web Services General Reference*.

**Action**

The action to be performed.

Type: string

Required: Yes

**Version**

The API version that the request is written for, expressed in the format YYYY-MM-DD.

Type: string

Required: Yes

**X-Amz-Algorithm**

The hash algorithm that you used to create the request signature.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Valid Values: `AWS4-HMAC-SHA256`

Required: Conditional

**X-Amz-Credential**

The credential scope value, which is a string that includes your access key, the date, the region you are targeting, the service you are requesting, and a termination string ("aws4_request"). The value is expressed in the following format: *access_key*/*YYYYMMDD*/*region*/*service*/aws4_request.

For more information, see Task 2: Create a String to Sign for Signature Version 4 in the *Amazon Web Services General Reference*.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

**X-Amz-Date**

The date that is used to create the signature. The format must be ISO 8601 basic format (YYYYMMDD'T'HHMMSS'Z'). For example, the following date time is a valid X-Amz-Date value: `20120325T120000Z`.

Condition: X-Amz-Date is optional for all requests; it can be used to override the date used for signing requests. If the Date header is specified in the ISO 8601 basic format, X-Amz-Date is not required. When X-Amz-Date is used, it always overrides the value of the Date header. For more information, see Handling Dates in Signature Version 4 in the *Amazon Web Services General Reference*.

Type: string

Required: Conditional

**X-Amz-Security-Token**

The temporary security token that was obtained through a call to AWS Security Token Service (AWS STS). For a list of services that support temporary security credentials from AWS Security Token Service, go to AWS Services That Work with IAM in the *IAM User Guide*.

Condition: If you're using temporary security credentials from the AWS Security Token Service, you must include the security token.

Type: string

Required: Conditional

**X-Amz-Signature**

Specifies the hex-encoded signature that was calculated from the string to sign and the derived signing key.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

**X-Amz-SignedHeaders**

Specifies all the HTTP headers that were included as part of the canonical request. For more information about specifying signed headers, see Task 1: Create a Canonical Request For Signature Version 4 in the *Amazon Web Services General Reference*.

Condition: Specify this parameter when you include authentication information in a query string instead of in the HTTP authorization header.

Type: string

Required: Conditional

# AWS Glossary

For the latest AWS terminology, see the AWS Glossary in the *AWS General Reference*.