**Transcoding Video with S3 and Elastic Transcoder**

Introduction

In this hands-on AWS lab, we'll learn how to convert video files to different formats using Lambda, S3, and Amazon Elastic Transcoder.

Elastic Transcoder is a media service designed to be a highly scalable, easy-to-use, and cost-effective way to convert (or "transcode") media files from their source format into versions that will play back on devices like smartphones, tablets, and PCs.

In this lab, we will upload 4K Ultra HD sample videos to an S3 bucket and configure an Elastic Transcoder pipeline to automatically convert them to different formats. We'll set all this up with our own custom Lambda function — written in Python — using the Boto3 SDK.

* Download the sample 4K videos [here](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/Aerial.mp4) and [here](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/Clouds.mp4).
* Download the Lambda execution role IAM policy [here](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/lambda_execution_role.json).
* Download the Lambda function source code [here](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/lambda_handler.py).

Log in to the AWS Management Console with the credentials provided on the lab instructions page. Make sure you are using the *us-east-1 (N. Virginia)* region.

Subscribe to an SNS Topic

1. In the AWS Management Console, navigate to the SNS service.
2. Click **Topics** in the left sidebar.
3. Select the **Transcoder** topic.
4. Click **Actions**, then **Subscribe to topic**.
5. In the *Protocol* dropdown box, select **Email**.
6. In the *Endpoint* box, type an email address you can use to receive the notification.
7. Click **Create subscription**.
8. Go to your email application and open the message from AWS Notifications.
9. Click the link to confirm your subscription.
10. Go back to your SNS browser tab, and open the **Transcoder** topic to verify that the subscription is confirmed.

Create an Elastic Transcoder Pipeline

1. In the AWS Management Console, navigate to the Elastic Transcoder service.
2. Click **Create a new Pipeline**.
3. Under *Create New Pipeline*, configure the following settings:
   * **Pipeline Name:** MyPipeline (or any name you like)
   * **Input Bucket:** (Select the bucket with source in its name.)
   * **IAM Role:** Create console default role
4. Under *Configuration for Amazon S3 Bucket for Transcoded Files and Playlists*, configure the following settings:
   * **Bucket:** (Select the bucket with transcoded in its name.)
   * **Storage Class:** Standard
5. Under *Configuration for Amazon S3 Bucket for Thumbnails*, configure the following settings:
   * **Bucket:** (Select the bucket with thumbnails in its name.)
   * **Storage Class:** Standard
6. Expand the **Notifications** menu.
7. Select **Use an existing SNS topic** for all of the events.
8. For *Select a Topic*, choose **Transcoder** from the dropdown for all of the events.
9. Click **Create Pipeline**.
10. Note the Pipeline ID. (This is available in the pipeline details and is a different value than the pipeline name.)

Create a Lambda Function

1. In the AWS Management Console, navigate to the Lambda service.
2. Click **Create a function**.
3. Choose the **Author from scratch** option, and configure the following settings:
   * **Name:** TranscodeVideo (or any name you like)
   * **Runtime:** Python 3.7
   * **Role:** Create a custom role
4. In the *Role Summary* screen, click **View Policy Document**.
5. Click **Edit**.
6. In a new browser tab, open [this file](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/lambda_execution_role.json), and copy the contents to your clipboard.
7. Paste the text into the IAM policy document editor, replacing the text that was there before.
8. Click **Allow**.
9. Go back to your Lambda Management Console browser tab, and click **Create function**.
10. Scroll down the list of triggers on the left side of the screen, and select **S3**.
11. Scroll down the page to the *Configure triggers* section, and configure the following settings:
    * **Bucket:** (Select the bucket with source in its name.)
    * **Event type:** All object create events
12. Make sure the box next to **Enable trigger** is checked, then click **Add**.
13. Click the function name (**TranscodeVideo**) at the top of the page.
14. Scroll down the page to the function editor, and remove the default text.
15. In a new browser tab, open [this file](https://raw.githubusercontent.com/linuxacademy/content-lambda-boto3/master/Video-Transcoding/lambda_handler.py) and copy the contents to your clipboard.
16. Go back to the Lambda Management Console, and paste the function body source code into the code editor.
17. Switch back to your Elastic Transcoder tab, and click the magnifying glass icon to view the details for our pipeline.
18. Copy the **Pipeline ID** to your clipboard, and switch back to your Lambda Management Console browser tab.
19. Scroll down to the *Environment variables* section, and set the following variable:
    * **Key:** PIPELINE\_ID | **Value:** (Paste the pipeline ID from the pipeline summary page)
20. Click **Save**.

Upload Video for Transcoding

1. In the AWS Management Console, navigate to the S3 service.
2. Open the S3 bucket with source in its name.
3. Click **Upload**.
4. Click **Add files**.
5. Select one of the 4K sample video files you downloaded to your local machine.
6. Click **Upload**.
7. Open your email application, and check for an email notification from Elastic Transcoder.
8. Go back to the S3 Management Console, and open the S3 bucket with transcoded in its name.
9. Verify that the 1080p and 720p versions of your uploaded video are present.
10. Select one of the transcoded versions of the uploaded video, and verify that it is in the correct format.
11. Go back to the S3 home page, and select the S3 bucket with thumbnails in its name.
12. Select the .png image that was created, and click **Open** to verify that the thumbnail was successfully created.