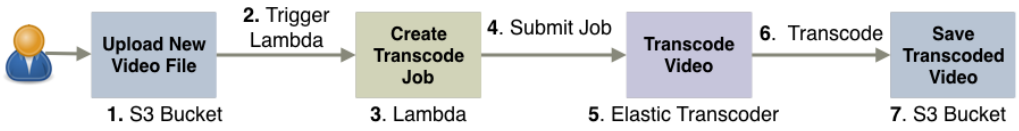
LESSON 1

In lesson 1 we are going to create the engine of our YouTube clone. Make sure you can log in to the AWS console and follow the instructions given below.

Note: please create all your resources in the N. Virginia Region (us-east-1)

This is the system we will end up with at the end of this lesson



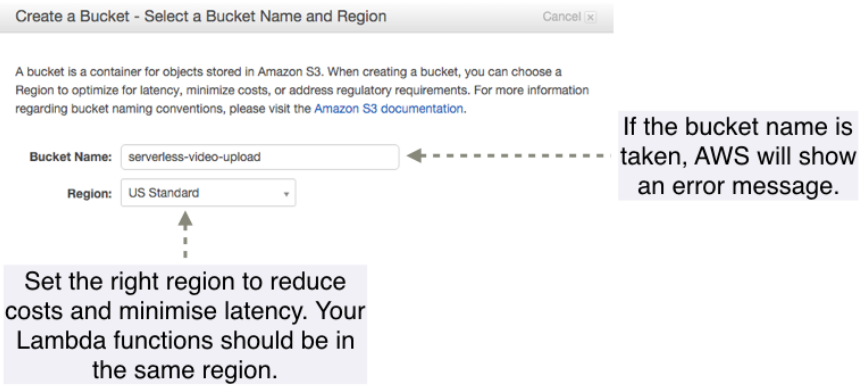
1. SET YOUR REGION TO US. EAST (N. VIRIGINA)

Before we kick-off the build, log in to the AWS console, and set your region to US East (N. Virginia). Please make sure that all resources & services you create are in the same region from here onwards.

2. CREATE 2 S3 BUCKETS

Let's begin by creating two buckets in S3. The first bucket will serve as the upload bucket for new videos. The second bucket will contain transcoded videos put there by the Elastic Transcoder.

- To create a bucket, in the AWS console click on **S3**, and then click ***Create Bucket***.
- Enter a **Bucket Name** (e.g. serverless-video-upload), and choose a **region** (**US Standard**).
- Click **Create** to save your bucket.
- Repeat the process again to create another bucket (e.g. serverless-video-transcoded).



3. MODIFY BUCKET POLICY

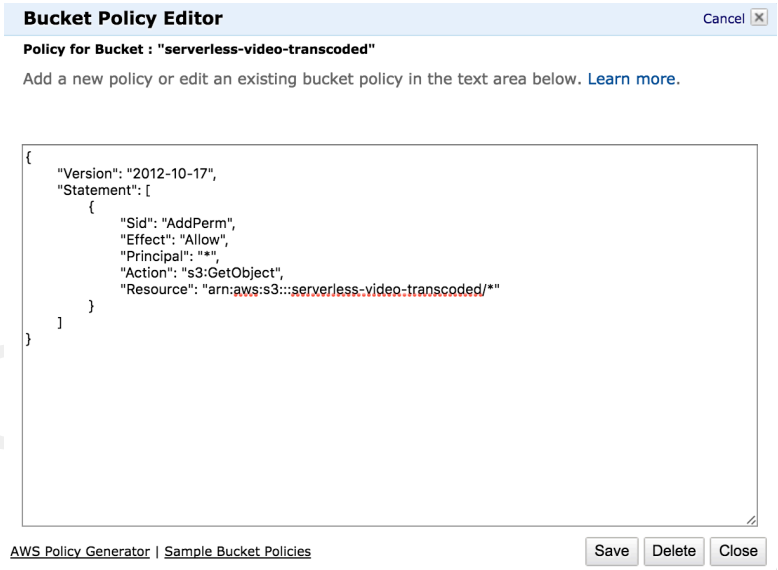
We need to make our transcoded videos publically accessible.

- In S3 click on the **second** bucket you have created (this will be the serverless-video-transcoded bucket).
- Click **edit bucket policy**
- Type in the following to the bucket policy:

```
{
	"Version": "2012-10-17",
	"Statement": [
		{
			"Sid": "AddPerm",
			"Effect": "Allow",
			"Principal": "*",
			"Action": "s3:GetObject",
			"Resource": "arn:aws:s3:::<YOUR-BUCKET-NAME>/*"
		}
	]
}
```

Make sure to substitute YOUR-BUCKET-NAME with the actual name of your transcoded bucket.

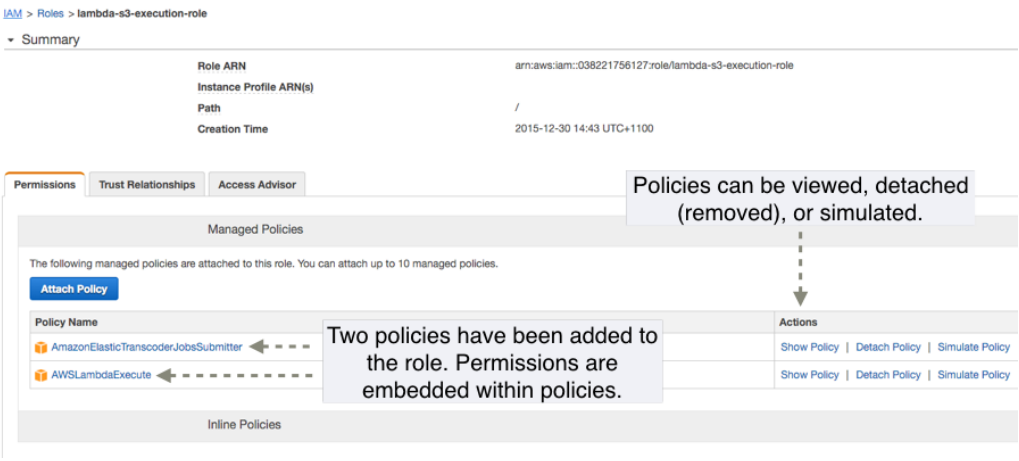
- Click **Save**



4. CREATE AN IAM ROLE FOR YOUR FIRST LAMBDA FUNCTION

Now we need to create an IAM role for our future Lambda functions. This role will allow functions to interact with S3 and the Elastic Transcoder.

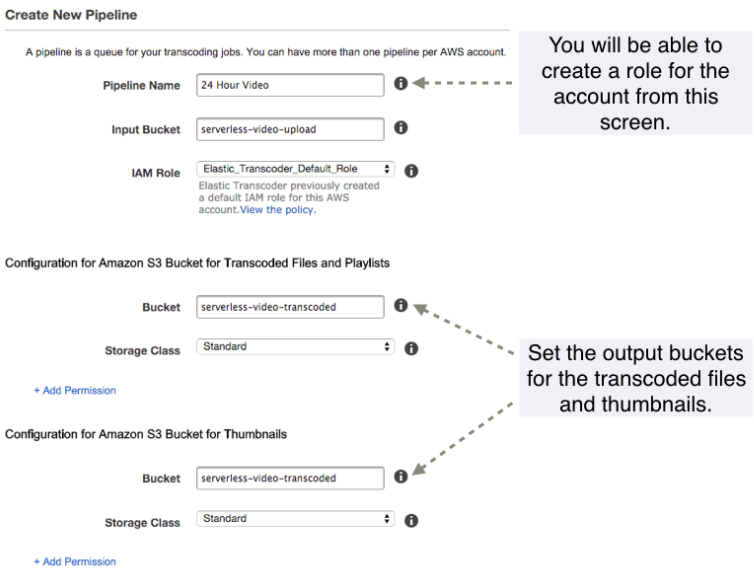
- In the AWS console, click **Identity & Access Management** and then click **Roles**.
- Click **Create New Role** and name it **lambda-s3-execution-role**
- Click **Next Step** to proceed to Role Type selection.
- Under the AWS Service Roles click **AWS Lambda** and then select the following two policies:
    - **AWSLambdaExecute**
    - **AmazonElasticTranscoderJobsSubmitter**
- Click **Next Step** to attach both policies to the role and then click **Create Role** to save.
- You will be taken back to the role summary page. Click **lambda-s3-execution-role** again to see the two attached policies:



5. CONFIGURE ELASTIC TRANSCODER

Now we need to set up an Elastic Transcoder pipeline to perform video transcoding to different formats and bitrates.

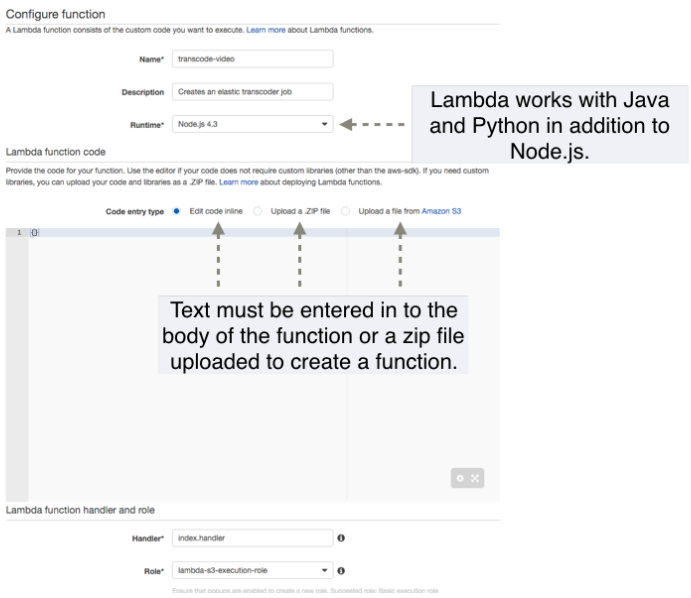
- In the AWS console click on ***Elastic Transcoder*** and then click ***Create a New Pipeline***.
- Give your pipeline a **name**, such as 24 Hour Video, and specify the **input bucket**, which in our case is the first upload bucket. ***(see figure below)***
- Leave the IAM role as it is. Elastic Transcoder creates a default IAM role automatically.
- Under Configuration for Amazon S3 Bucket for Transcoded Files and Playlists **specify the transcoded videos bucket**, which in our case was *serverless-video-transcoded*.
- The **Storage Class** can be set to **Standard**.
- We are not generating thumbnails but we should still select a bucket and a storage class. Use the second, transcoded videos bucket for it again.
- Click ***Create Pipeline*** to save.



6. CREATE LAMBDA FUNCTION IN AWS

It is finally time to create the first Lambda function although we are not going to provide an implementation for it just yet.

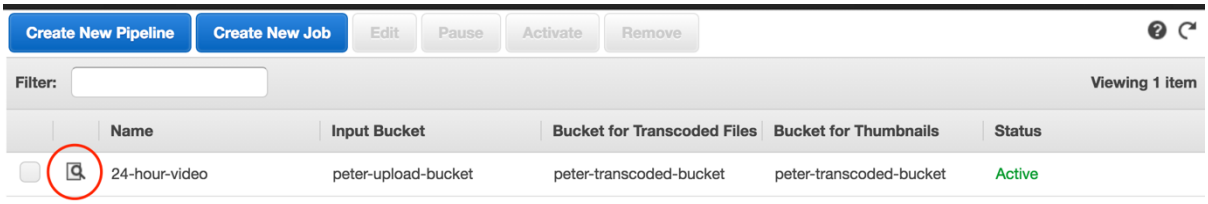
- In the AWS console, click **Lambda**, and then click ***Create a Lambda Function***.
- Skip over the blueprint.
- **Name** the function **transcode-video** and make sure that **Node.js 4.3** is selected in the ***Runtime*** dropdown.
- In the space for the **function code** enter two curly braces: **{}**. If you leave function code empty you will not be able to save.
- Under Role select ***lambda-s3-execution-role***.
- Set the **timeout** to 30 seconds.
- Click ***Next*** to go the Review screen and from there click ***Create function*** to finish.



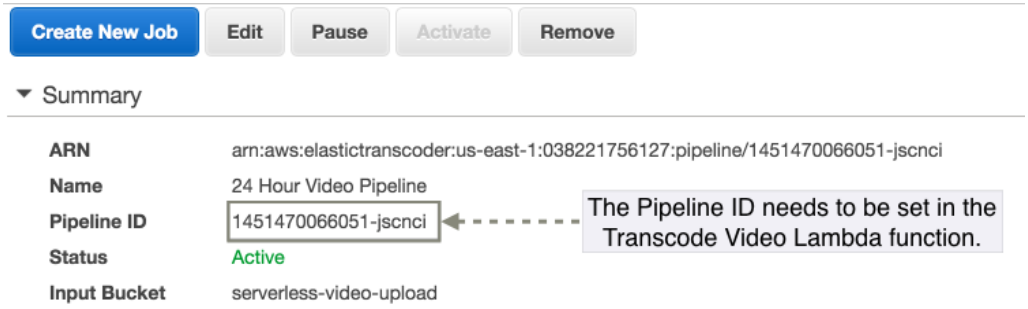
7. PREPARE & DEPLOY LAMBDA

Finally, we can have a look at the actual Lambda function and deploy it to AWS.

- Open the Lambda function provided in lesson 1 in your favourite text editor.
- In the config.js file change **ELASTIC_TRANSCODER_PIPELINE_ID** to correspond to your Elastic Transcoder pipeline ID (you can find it in the Elastic Transcoder console by clicking on the details icon):



This is the Pipeline ID you need to copy and change in config.js



You need to get your Pipeline ID and add it to the function

- **Install npm packages**
  In the terminal / command-prompt, change to the directory of the function:

```
cd lesson-1/lambda/video-transcoder
```

  Install npm packages by typing:

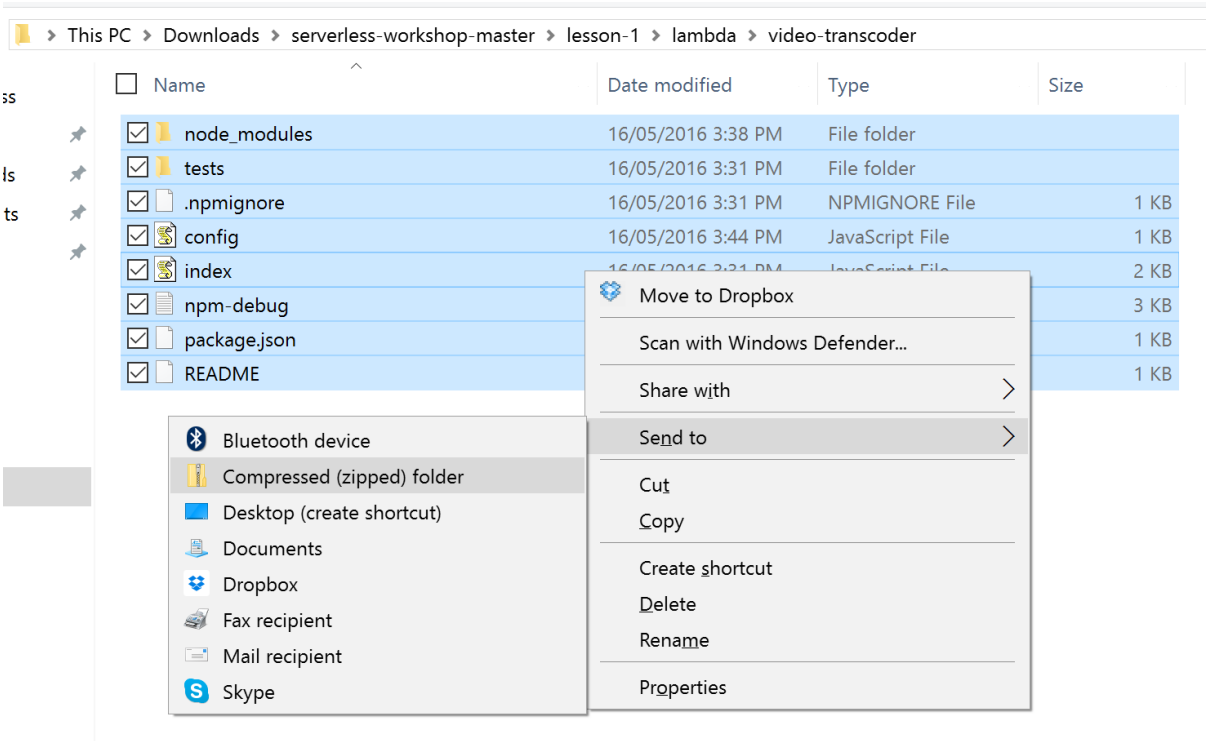
```
npm install
```

- **Zip Lambda function**

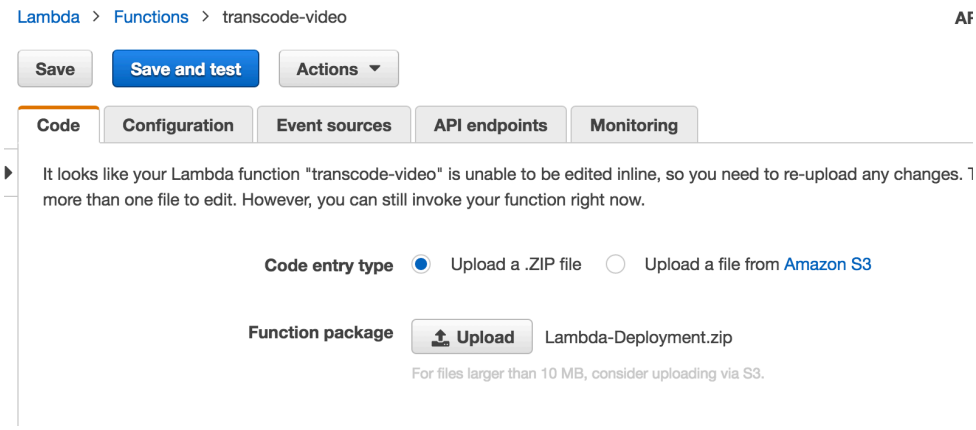
  For OS X / Linux Users
  Now create create a ZIP file of the function, by typing:

```
npm run predeploy
```

  For Windows
  You will need to **zip up all the files** in the **lesson-1/lambda/video-transcoder** folder via the Windows Explorer GUI, or using a utility such as 7zip. (**Note: don't zip the video-transcoder folder. Zip up the files inside of it**).



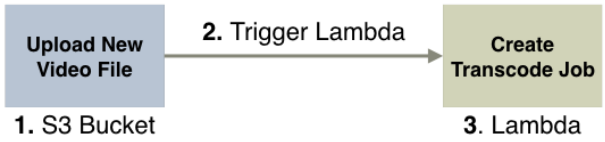
- In the AWS console click Lambda, select your function, and click Upload:



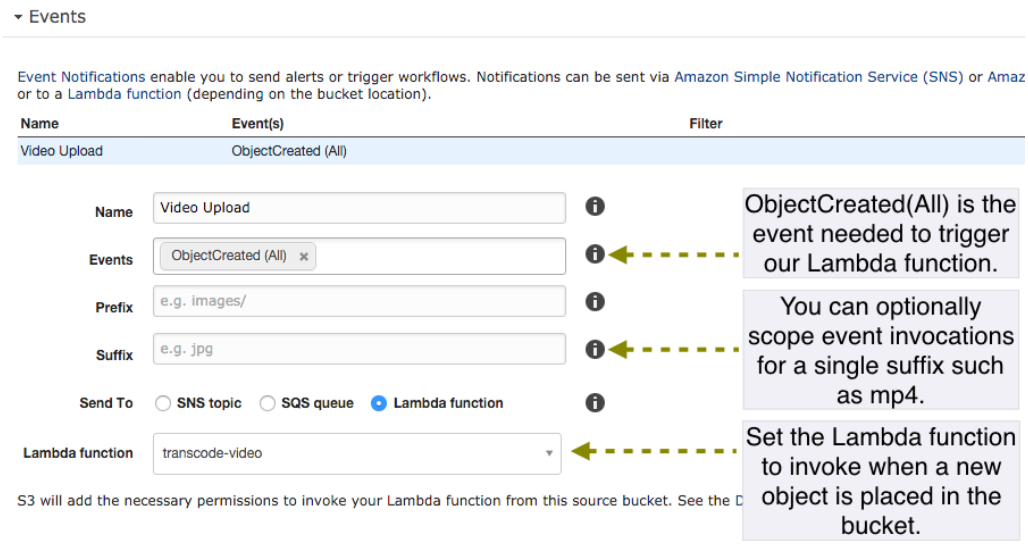
- Select the ZIP file of the Lambda function you had created earlier.
- Click the **Save** button to upload the function.

8. CONNECT S3 TO LAMBDA

The last step before we can test the function in AWS is to connect S3 to Lambda. S3 will invoke our lambda function:



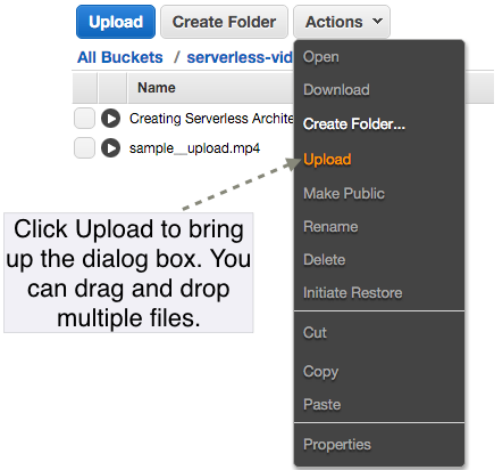
- Open the upload bucket (e.g. serverless-video-upload) in the AWS console, select **Properties**, expand **Events**, and click ***Add Notification***.
- Give your event a **name**, such as **Video Upload**, and in the **Events** dropdown select ***ObjectCreated (All)*.**
- Click the ***Lambda function*** radio button, right below it select the **transcode-video** Lambda function from the dropdown and save:


Events
Event Notifications enable you to send alerts or trigger workflows. Notifications can be sent via Amazon Simple Notification Service (SNS) or Amaz
or to a Lambda function (depending on the bucket location).
Name
Event(s)
Filter
Video Upload
ObjectCreated (All)
Name
Video Upload
Events
ObjectCreated (All)
Prefix
e.g. images/
Suffix
e.g. jpg
Send To
SNS topic
SQS queue
Lambda function
Lambda function
transcode-video
S3 will add the necessary permissions to invoke your Lambda function from this source bucket. See the D
ObjectCreated(All) is the event needed to trigger our Lambda function.
You can optionally scope event invocations for a single suffix such as mp4.
Set the Lambda function to invoke when a new object is placed in the bucket.

9. TESTING IN AWS

Need a video for testing? Download our test videos from: http://bit.ly/1TEkvuR

To test the function in AWS, upload a video to the upload bucket. To do this click the bucket, click ***Actions*** and then select ***Upload***:



After a period of time, you should see three new videos appear in the transcoded videos bucket. These files should appear in a folder rather than in the root of the bucket:

Congratulations – you now have your very own serverless video transcoding pipeline!