LESSON 4

In this lesson are going to add the ability to upload videos from the browser to an S3 bucket. To do this we are going to:

- 1. Create a Lambda function to grant us credentials/policy to upload a files to an S3 bucket.
- 2. Configure API Gateway to allow our website to access this Lambda function and retrieve the necessary policy document.
- 3. Update the website to request the policy document and upload the file to S3.

NOTE: PLEASE CREATE ALL YOUR RESOURCES IN THE N. VIRGINIA REGION (US-EAST-1)

CREATE A LAMBDA FUNCTION

You will need to create a new Lambda function in the AWS console. This Lambda function will generate a policy document to allow our users upload videos to S3. Step through the following:

- Click Lambda in the AWS Console
- Create a blank new function (skip blueprint and skip over configure triggers)
- Name the function get-upload-policy
- Add two brackets to the body of the function (e.g. {})
- Assign the lambda-s3-execution-role policy to it (the same policy created in lesson 1)
- Leave all other settings on default and save

2. CREATE IAM USER

The policy and the credentials that we are going to generate in the Lambda function need to be signed by an IAM user that has permissions to upload files to S3. Let's create this user now.

- Open IAM console
- Click Users and create a new user called upload-s3
- Download the user's access & secret keys. You will need these.
- Click the upload-s3 user and click the Permissions tab
- Expand Inline Policies
- Create to create new Inline Policy, select Custom Policy, and click Select
- Set the name of the policy as upload-policy
- Copy the following to the Policy Document and save (make sure to specify your upload bucket name in the policy).

```
{
    "Effect": "Allow",
    "Action": [
        "s3:PutObject"
    ],
    "Resource": [
        "arn:aws:s3:::YOUR_UPLOAD_BUCKET_NAME/*"
    ]
}
```

Review Policy

Customize permissions by editing the following policy document. For more information about the access policy language, see Overview of Policies in the Using IAM guide. To test the effects of this policy before applying your changes, use the IAM Policy Simulator.

Policy Name

```
upload-policy
Policy Document
                    "Lffect": "Allow",
"Action": [
   6 +
                         "s3:ListBucket"
                    "Resource": [
   8
   9 +
  10
                         "arn:aws:s3:::serverless-video-upload"
                    ]
                },
  13 -
                {
                    "Effect": "Allow",
  15 -
                    "Action": [
                         "s3:PutObject"
  16
  17
  18 -
                     "Resource": [
  19
                         "arn:aws:s3:::serverless-video-upload/*"
✓ Use autoformatting for policy editing
                                                                                                  Validate Policy
                                                                                                                   Apply Policy
```

3. CONFIGURE FUNCTION

Open the Lambda function provided in Lesson 4 on your computer. It's located in **lesson-4/lambda/create-s3-upload-policy-document**.

- Open config.js and update:
 - o **UPLOAD_BUCKET** to be the name of your upload bucket
 - o ACCESS_KEY and SECRET_ACCESS_KEY to match the user you created in step 2

```
config.js

var env={};

env.UPLOAD_BUCKET = 'serverless-video-upload';

env.SECRET_ACCESS_KEY = 'asd0+sCwfH8zoUvgYR8lBb+qi+';

env.ACCESS_KEY = 'AKIAIKQM14JQAWCABQ';

env.UPLOAD_URI = 'https://s3.amazonaws.com';

module.exports = env;
```

• Open a terminal / command-prompt and navigate to the following folder:

lesson-4/lambda/create-s3-upload-policy-document

· 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-4/lambda/create-s3-upload-policy-document folder via the Windows Explorer GUI, or using a utility such as 7zip. (Note: don't zip the create-s3-upload-policy-document folder. Zip up the files inside of it).

4. DEPLOY FUNCTION

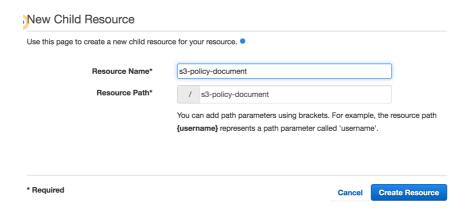
Now we need to deploy the function to AWS.

- In the AWS console click Lambda.
- Click get-upload-policy in the function list.
- Click Upload to upload the function, select the ZIP file created in the previous step and then click
 Save.

5. CREATE RESOURCE & METHOD IN THE API GATEWAY

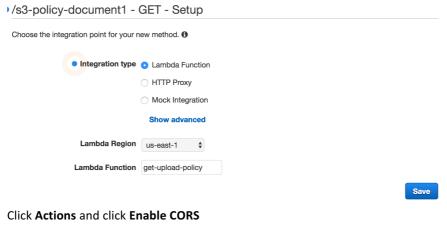
In this step we will create a resource and a method in the API Gateway. We will use it to invoke the Lambda function we deployed in the previous step.

- Click API Gateway in the AWS console
- Select 24-hour-video
- Click Actions and then click Create Resource
- Set the Resource Name to s3-policy-document



- Click Create Resource
- Make sure that s3-policy-document is selected under Resources and click Actions
- Click Create Method
- From the dropdown box under the resource name, select GET and click the tick button to save

- In the screen that immediately appears:
 - Select Lambda Function radio
 - Set us-east-1 as the Lambda Region
 - o Type get-upload-policy in Lambda Function textbox
 - Click **Save**. Click **OK** in the dialog box that appears.



Enable CORS

Click Enable CORS and replace existing CORS headers

Cross-Origin Resource Sharing (CORS) allows browsers to make HTTP requests to servers with a different domain/origin. Specify which methods in the /s3-policy-document1 resource are available to CORS requests. To define static values surround the value in single quotes (eg. 'amazon.com'). To define mappings use the syntax described in the Method Editor (eg. method.request.query string.my Query String).Methods* ✓ GET ✓ OPTIONS 6 Access-Control-Allow-Methods GET, OPTIONS 1 Access-Control-Allow-Headers 'Content-Type,X-Amz-Date,Authorization' Access-Control-Allow-Origin* | 1×1 **0** 🛕 Advanced

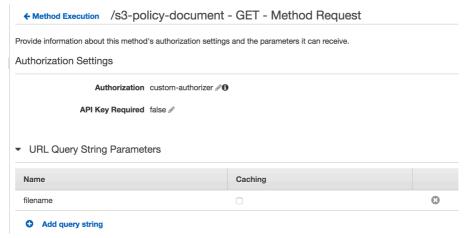
Enable CORS and replace existing CORS headers

Click Yes, replace existing values

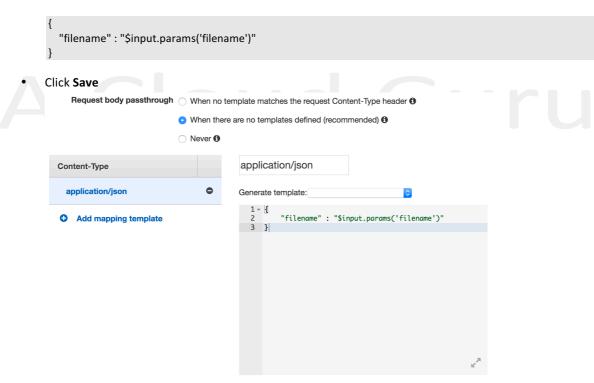
API GATEWAY MAPPING AND SECURITY 6.

There are two more things we need to do in the API Gateway. We are going to pass a query string parameter in our request. This parameter will contain the filename of the file which we need to upload. We need to create mapping in the API Gateway to correctly pass this information in to a Lambda function. Finally, we need to enable a custom authorizer so that only authenticated users can invoke our function.

- In the API Gateway click on 24-hour-video under APIs
- Click GET under /s3-policy-document in Resources
- Click Method Request
- **Expand URL Query String Parameters**
- Click Add query string
- Type in **filename** and click the tick button to save.



- Click Method Execution to go back to the main Method Execution screen
- Click Integration Request
- Expand Body Mapping Templates
- Click Add mapping template
- Type in application/json and click the tick button to save
- Click Yes, secure this integration
- In the template section type in the following:



Exercise: can you enable the custom authorizer for this method?

7. DEPLOY API GATEWAY

Finally, we need to deploy the API so that our changes go live.

- Click Actions
- Select Deploy API
- In the popup select dev as the Deployment stage
- Click **Deploy** to provision the API

8. ENABLE CORS FOR THE S3 BUCKET

To be able to upload direct to an S3 bucket we also need to enable CORS for the bucket.

- Click **\$3** in the AWS console.
- Click on the **upload** bucket (e.g. severless-video-upload)
- Click Properties
- Expand Permissions
- Click Add CORS Configuration
- Paste in the following CORS configuration and click Save

9. TESTING

Now we are ready to test our upload functionality via the website.

- Copy the config.js file containing your account specific settings, from the last lesson.
 Copy lesson-3/website/js/config.js to lesson-4/website/js/config.js
- Open a terminal / command-prompt and navigate to the following folder:

lesson-4/website

• Run the following command to make sure that required npm components are installed:

npm install

Run the following command to start the website:

npm start

 Open the website and sign in. Click on the plus button to upload a movie file. You will see a progress bar while the upload takes place.



Jump in to the AWS console and have a look at the buckets. Did the file upload to the upload S3 bucket? Are there new files in the transcoded S3 bucket?

If something didn't work make sure to check that:

- 1. The config.js file in your website contains the right Auth0 credentials and API Gateway URL.
- 2. You have followed steps 1-7 exactly and copied everything exactly as specified in this lesson plan.

We are nearly there! There's one more lesson left and you'll have your full YouTube clone ©

