School of Information Studies

Syracuse University

IST 615 – Cloud Management

Lab #3
AWS Storage and Service Integration Lab

IMPORTANT INSTRUCTIONS[1]:

i) Read this document in its entirety BEFORE starting the lab.
ii) You will need an AWS educate account to complete this lab.
iii) The list of items and questions that should be included in your report are mentioned at the end of this document.

I. Lab objectives:

- Understand the processes and requirements involved in the use of the S3 - Simple Storage Service – of Amazon AWS.
- Understand how different AWS services can be integrated to work together.

II. Pre-Requisites:

BEFORE executing the lab procedures mentioned in this lab, make sure you satisfy the following requirements:

a. You have an AWS Academy account. If you are doing this lab on a private AWS account (not on AWS academy), you will need to replace the actions of steps 14 and 15 of this lab with the steps mentioned here: https://repost.aws/knowledge-center/ec2-instance-access-s3-bucket
b. You have a working EC2 instance that operates as a web server and for which you have SSH access. An EC2 instance created with the procedures mentioned in Lab #2 will satisfy this requirement. Make sure you can display the webpage contained in the server and that you have SSH access to the server too. (Note: For this lab, you don't have to resize your EC2 instance to a t2.small size as requested in Lab 2. You can keep your EC2 instance as a t2.micro)
c. You have a web page (or pages) of content that you have authored and that you would be

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interested in showing publicly. The content MUST mention your name. Suggestions for content are: Your resume, a summary of a project you've done in the past along with its results, etc. The content must consist of one or several HTML based web pages and can include graphics/pictures as long as they don't violate any privacy, decency, and/or copyright rules. The files can be distributed in one or multiple folders if your web page navigation structure requires it but, in any case, there must be one main ***index.html*** file where the navigation to your content will start from.

d. Find the definitions for the following concepts and **include them in your final report**:
   - S3 bucket
   - IAM Policy
   - IAM role

III. Lab Procedures

You will configure your EC2 based web server to host a set of web pages of your choosing. To achieve this objective, you will also configure your EC2 instance to access an S3 bucket where the web pages will be stored and which you will transfer to the EC2 instance.

A. Setting up an S3 storage bucket

1. Start your AWS Management Console and go to the Amazon S3 service section. You can perform a search for *S3* in the console and it will take you to the service.
2. Click in the orange "**Create Bucket**" button (on the right side of the screen) to start the process of creating an Amazon S3 storage bucket.
3. Give your bucket a name (in the *Bucket name* field). **For the purposes of this lab guide, we will use *mylabfiles* as the name of the bucket but you MUST select a different name for it and adapt the instructions in this guide accordingly[2].** Do not change any of the options for the bucket. Please note that by default public access to the contents of the bucket is blocked. Do not change this setting.
4. Proceed to complete the bucket creation by clicking the orange "**Create Bucket**" button (you might need to scroll down the screen).
5. ***SCS01 - FOR YOUR REPORT***: Capture a screenshot showing that your *mylabfiles* bucket has been created

B. Uploading files to your S3 bucket

6. Select the *mylabfiles* bucket you created in the previous step and proceed to upload the web page files you prepared previously (see the pre-requisites section if you have not met this

[2] Bucket names must be GLOBALLY unique across all users in AWS. (Name suggestion: add "lab3" to your initials)

requirement). Please note that can use the "**Upload**" button to upload individual files and folders. You might have to upload individual files in separate steps or you can drag and drop the files for your personal website to the appropriate location on the Upload web page. In any case, to complete the transfer of the files from your local system to your S3 bucket, you must click on the orange "**Upload**" button and. ***IMPORTANT***: make sure there is an *index.html* file in the set of files that you upload as this will be the starting point for navigating the web content you are uploading.

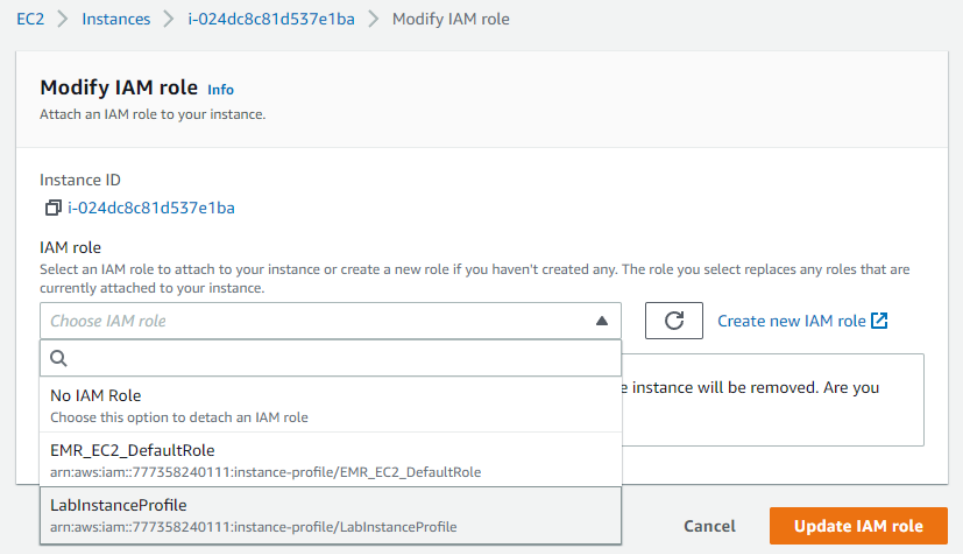
7. ***SCS02 - FOR YOUR REPORT:*** Capture a screenshot showing all the files that are now contained inside your *mylabfiles* bucket.

C. Configuring EC2 to access S3

8. After completing the setup of your S3 storage bucket, proceed to the AWS EC2 dashboard to manage your EC2 web server instance. You can type EC2 in the AWS search bar (near the top of the screen) and it will provide you a way to get to the EC2 dashboard quickly.
9. Go to the "Instances" section of the EC2 dashboard and make sure your EC2 web server instance is in the "Running" state.
10. Connect to your EC2 web server instance using SSH. The procedure for this was explained in lab #2.
11. Once you are the command line interface (terminal) of your EC2 web server instance, issue the following command to see what S3 buckets your EC2 instances has access to:

```
aws s3 ls
```

12. You should have obtained a response mentioning "*Unable to locate credentials…".* This means that your EC2 instance does not have access to your S3 bucket. This is expected – don't worry. Keep your SSH connection active, don't close it.
13. ***SCS03 - FOR YOUR REPORT:*** Capture a screenshot showing all the result of step 12. This was your first attempt at accessing an S3 bucket from an EC2 instance.
14. Go back to the EC2 Instances screen. Select your web server instance. Go to the "Actions" drop down menu. Select *Security* and then *Modify IAM Role*
15. (See figure below) In the *Modify IAM Role* window, go to dropdown menu in *IAM Role* and select the *LabInstanceProfile* role. Click the "Update IAM role" button.



16. Go back to the SSH session you have with your EC2 web server, and once more execute the command:

    ```
    aws s3 ls
    ```

    this time you should see the *mylabfiles* bucket listed in the output of your command. This means that assigning the LabInstanceProfile role to your EC2 instance has given it access to your other AWS services, including your S3 bucket.

17. In the window with the SSH session, execute the command (replace *mylabfiles* with the name of your actual bucket):

    ```
    aws s3 ls s3://mylabfiles
    ```

    you should see the files inside your *mylabfiles* bucket.

18. ***SCS04 - FOR YOUR REPORT:*** Capture a screenshot showing the output of steps 16 and 17.

D. Using the files in your S3 bucket

We will proceed to copy the files (web pages) from your S3 bucket into your EC2 instance and have their content available via the web server capabilities of your EC2 instance.

19. In the window with the SSH session you have with your EC2 web server, execute the commands:

    ```
    cd /var/www/html
    ls
    ```

    you should see that your *index.html* file is present. This the original web page created as part of the tasks from Lab #2.

20. Execute the following command to create a backup copy of your original *index.html* file

```
sudo cp index.html indexbak.html
```

21. Now let's copy the contents of your S3 bucket into the current directory of your EC2 instance – make sure you replace *mylabfiles* with the name of your bucket (Note: be careful and put all the spaces and slashes (/) in the right place when typing this command)

```
sudo aws s3 cp s3://mylabfiles/ ./ --recursive
```

(Note: just for reference, the underscore characters in the next line indicate where spaces should be present when executing the previous command line

```
sudo_aws_s3_cp_s3://mylabfiles/_./_--recursive                    )
```

22. If no errors showed up, execute the following command to see a detailed listing of the files in the current directory (Note: the current directory should still be /var/www/html). You should see a listing with the files that were in your s3 bucket and that you now copied into your EC2 instance.

```
ls -al
```

23. ***SCS05 - FOR YOUR REPORT:*** Capture a screenshot showing the results of the previous step.

24. If in the files contained in your *mylabfiles* bucket there was an *index.html* file and this file was not inside another folder, **you can proceed to the next step. Otherwise**, you need to change the name of the file that will present your web content to *index.html* . For that purpose, you could use the *mv* command in this way:

```
sudo mv somefilename.html index.html
```

where *somefilename.html* is the name of the file that you created and that is the main page for your web content

25. Open a web browser and point it to the public IP address of your EC2 web server. You should now see a web page with your customized web/HTML content.

26. ***SCS06 - FOR YOUR REPORT:*** Capture a screenshot showing the webpage with your customized web content.

IV. Lab Report

1. (15 points) As mentioned in part c. of Section II, find the definitions for the following concepts and include them in your report:
    a. S3 bucket
    b. IAM Policy
    c. IAM role
2. Submit the screenshots requested in the steps of section III. Include a brief description of each screenshot. You can include additional screenshots that you consider meaningful/interesting. (75 points)
3. Provide a comment (or comments) on what was the most difficult and/or interesting step of this lab (10 points)

- Don't forget to include a cover page!