Assignment 2

COS20019 Cloud Computing Architecture

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**Website of Album:** [album.php](http://assign2-elb-1843566538.us-east-1.elb.amazonaws.com/photoalbum/album.php)

**ELB DNS**: <http://assign2-elb-1843566538.us-east-1.elb.amazonaws.com/>

# Configure NAT instance.

* Configure **NAT instance** (i-02401b2c1cc305b8d) with private subnet **10.0.1.0/24** in the **TMinh-vpc** (vpc-0792da80bd447f802)
* Assign it with **the auto sign public IP** so that it can have public IP otherwise it will be empty.

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# Configure NAT

* It is configured to be in private subnet 10.0.1.0/24 of TMinh-vpc (vpc-0792da80bd447f802)
* This will help all the **private instances can communicate** with the public internet whose private IP addresses will be translated by the NAT device.

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# Configure Dev instance.

* Dev instance (i-09504928dcb3c285f) with private subnet **10.0.2.0/24** in TMinh-vpc (vpc-0792da80bd447f802)
* It is attached with the EIP (**34.199.140.184**) for having the **unchanged public IP address.**
* I also assigned it to the IAM **LabRole** which is already configured so that it can have the **permission** to access the resource.

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# RDS Information

* Attach it to the TMinh-vpc (vpc-0792da80bd447f802)
* Adjust it **publicly accessible** to No which only allows the connection from those who are in the same VPC.

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# Configure database by using AWS CLI

* Connect to RDS end point (db-assignment2) through AWS CLI
* Create suitable database for current assignment.
* **Full command line** to connect to this RDS: mysql -h db-assignment2.c0q4nsrtv7xy.us-east-1.rds.amazonaws.com -u admin -p

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* Query to create table **photos** in the current database **db\_assignment2**.

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# Configure target group.

* I have pointed the path of target group to HTTP **/photoalbum/album.php** for later con can check the **health check** for the instances in this target group.
* I also configure it to be in TMinh-vpc (vpc-0792da80bd447f802)

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# Configure ELB

* It is attached to 2 **public subnets** of TMinh-vpc (vpc-0792da80bd447f802) to **receive the internet traffic.**
* It is also listened to **port HTTP:80** at the route **photoalbum/album.php** from the target group web app.

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# S3 bucket

* With the same configuration for the policy for the old S3 bucket, this new one I just added the **Condition** part where it allows only the **ELB** to access, get, put, list object.
* I also added the **Action** where to provide the permission to **Put** the object **(s3:PutObject)**

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# Create AMI for web server.

* Create image from the Dev instance (i-09504928dcb3c285f) to save time and resources

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# Configuration Auto scaling group

* It is created from the launch template which I have already configured

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* It will only create auto scaling instances in these 2 private subnets and in the TMinh-vpc (vpc-0792da80bd447f802)

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* Attach it to the ELB which I have created above.

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* The minimum of instance for this group size is 2 and the maximum is 3 so it can be scaled up and default is 2 running instances
* There is also a tracking policy where it will execute Average CPU utilization at 30%

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* Name of new instances in this auto scaling group are “Web Server Instances.”

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# Lambda function

* After creating Lambda function with the IAM role LabRole which allow the Lambda to access the resources in the S3 and can modify it.
* I also have uploaded the zip file of this assignment to this lambda.

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* I have generated the test case for this function for the image schedule.png in the S3 bucket.

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* The result is succeededA screenshot of a computer

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# Security groups

1. Security group for Dev instance

I have allowed all traffic for the security group of Dev instance for both inbound and outbound.

The Dev security group (**sg-08b1dd0c352abe663**) is in TMinh-vpc (**vpc-0792da80bd447f802**)

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1. Security group for NAT instance

The Nat-tier security group (**sg-032b93ade3415e304**) is in TMinh-vpc (**vpc-0792da80bd447f802**)

It is allow the traffic from HTTPS/HTTP for web application and traffic from the web servers instance

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1. Security group for Web servers

The Web-tier security group (**sg-0e0a29ffa3760548a**) is in TMinh-vpc (**vpc-0792da80bd447f802**)

It allows the traffic from the web application and the DB security group (sg-059a267eeb38b8392)

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1. Security group for RDS instance

The DB security group (**sg-059a267eeb38b8392**) is in TMinh-vpc (**vpc-0792da80bd447f802**)

It allow the traffic from the port 3306from the web-tier security group (**sg-0e0a29ffa3760548a**)

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1. Security group for Application Load balancer

The ELB security group ([**sg-0cce48c73f0eaefaa**](https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroup:groupId=sg-0cce48c73f0eaefaa)) is in TMinh-vpc (**vpc-0792da80bd447f802**)

It allow the traffic for web applications from port 80 and 443

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# NACL

The NACL (**acl-005806cc4a57b0b33**) is in TMinh-vpc (**vpc-0792da80bd447f802**)

It allows the traffic for the web application and other TCP server go through port 1024-65535 from the NAT instance.

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* It allows the traffic of RDS can go out and other services from port 1024-65535

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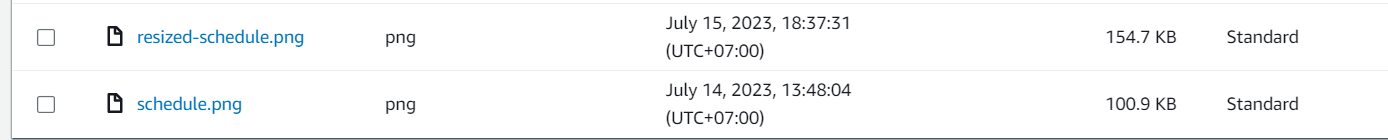
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* 2 private subnets associated with it 10.0.3.0/24 and 10.0.4.0/24.

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# Some Testing case

* Example of my schedule image was uploaded: <https://bucket-assignment2.s3.amazonaws.com/schedule.png> which can only be seen at album.php
* The evidence of the resized image by lambda function: 
* The website it accessible from the LEB: [photouploader.php](http://assign2-elb-1843566538.us-east-1.elb.amazonaws.com/photoalbum/photouploader.php)