Assignment 2

Developing a highly available Photo Album website

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***Abstract*—This document will present all my work in Assignment 2.**

Keywords—Cloud Computing, AWS Services.

Here are links for your reference:

<http://loadbalancerwebserver-893289495.us-east-1.elb.amazonaws.com/photoalbum/album.php>

(Elastic Load Balancer to view album page)

<http://loadbalancerwebserver-893289495.us-east-1.elb.amazonaws.com/photoalbum/photouploader.php>

(Elastic Load Balancer to upload photos)

<http://ec2-34-227-153-76.compute-1.amazonaws.com/phpmyadmin>

(Dev Server instance to manage database)

- Assignment Checklist:

Infrastructure requirements:

1. VPC configured with 2AZs both with public and private subnets. Public and private route

tables route to IGW and NAT, respectively.

1.1 – Create VPC

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Figure 1: Created VPC (TTongVPC-ASM2).

1.2 – Create subnets:

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Figure 2: Created subnets.

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Figure 3: Attach igw to public route table.

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Figure 4: Associate NAT gateway to private route table to allow internet to enter private subnets.

2. Security groups created and properly configured

In the inbound rule of the ELB security group, I allowed HTTP traffic from any IPv4, and set outbound rule to forward that traffic to Web Servers security group.

In the inbound rule of the WebServer SG, I allowed HTTP traffic from ELB security group, and set the outbound rule to forward MySQL traffic to DB security group.

In the inbound rule of the DBServerSG, I allowed MySQL traffic from both the WebServerSG and DevServerSG for development purposes.

I didn’t use the NATServerSG since I configured NAT gateway and routes in route table.

The DevServerSG will allow traffic from everywhere for development purposes.

3. NACL correctly configured

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Figure 5: PrivateSubnetsNACL inbound rule block ICMP traffic from Dev Instance and allows HTTP traffic.

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Figure 6: PrivateSubnetsNACL outbound rule block ICMP traffic from Dev Instance and allows HTTP traffic.

4. IAM roles properly configured

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Figure 7: IAM role of WebServer launch template.

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Figure 8: IAM role of lambda function.

5. ASG configured and working correctly

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Figure 9: Dev Server AMI created.

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Figure 10: Auto Scaling Group detail configuration.

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Figure 11: Config the auto scaling group with the launch template of Dev Server.

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Figure 12: Target tracking scaling policy.

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Figure 13: Auto scaling group launch instances into private subnets.

6. ELB configured and working correctly with associated Elastic Public IP address

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Figure 14: Create target group for ELB.

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Figure 15: Create Elastic Load Balancer in Public Subnets to receive internet.

7. Photos stored in S3 are correctly accessible. S3 bucket policy is correct.

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Figure 16: Photos are accessed from the ELB.

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Figure 17: Photos could not be accessed publicly.

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Figure 18: Bucket policy to allow only S3 connection from ELB.

8. Lambda configured and working correctly

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Figure 19: Test case.

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Figure 20: Resized object created.

9. RDS configured and working correctly

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Figure 21: RDS is managed through Dev Server instance.

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Figure 22: Dev Server IP (Elastic).

Functional Requirements:

1. Website accessible via ELB
2. Photos and their meta-data displayed on album.php page.

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Figure 23: ELB can access S3 bucket and display photos-metadata.

1. Photos and their meta-data can be uploaded to the S3 bucket and RDS database.

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Figure 24: Upload test photo.

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Figure 25: Image is uploaded to S3, RDS, and display.

1. Photos are resized by the Lambda function.

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Figure 26: Resized image is created.

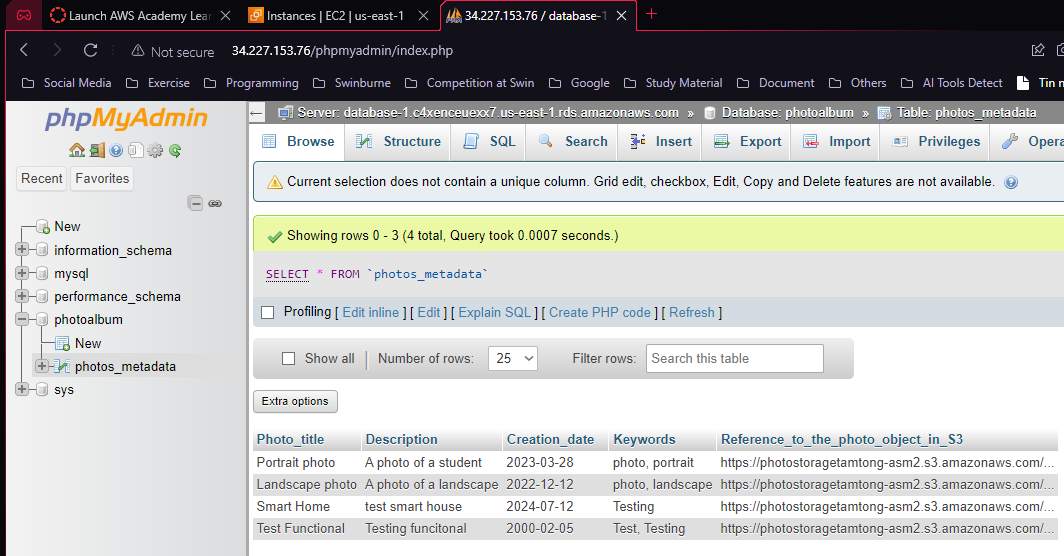


Figure 27: Photo-metadata is automatically recorded in RDS.

Functionality Testing

1. Terminate EC2 instance to see if new instances are replaced.

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Figure 28: Terminate instance.

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Figure 29: Target group lost 1 instance.

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Figure 30: New instance is created.

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Figure 31: Functionality of website is preserved.

1. The PhotoAlbum website is accessible through the load balancer only.
2. All EC2 instances are healthy.

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1. Direct access to S3 is blocked.

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1. Test ICMP ping

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Description automatically generatedWhen I tried to ping from Dev Server to Web Server in private subnets, it couldn’t ping, even with or without the NACL. I didn’t understand this.