IT3061 – Massive Data Processing and Cloud Computing

Cloud Computing Assignment – Semester 2, 2021

You are supposed to create a simple website showing your student number (ex:- ITXXXXXX) and name. The EC2 instance should only be created through an Autoscaling group and the site should be accessible through an application load balancer. Make sure it is accessible from your browser. There should be no manual intervention by SSH to instance and installing the relevant software and configuring apache. You should create the resources manually without using CloudFormation (Infrastructure as code). It would be wise to use North Virginia region and you should create the VPC, subnet, security groups, route tables without using the default ones. Delete default resources before you start this practical scenario. Also, all the resources you create should be in the same region.

1. Make sure you create the following resources. Most importantly make sure you tag(name) them as per the given instructions below.
    - **VPC** (name = **<your-index-number>-vpc-1**, VPC CIDR block must be **10.5.0.0/22)**
    - **Subnet** (name = **<your-index-number>-subnet-1**, Subnet CIDR block must be 10.5.1.0/25)
    - Create the "*internet gateway*" and set proper "*routes*" to the subnets.
    - Create a new key-pair to SSH once you have created the EC2 instance (name = **<your-index-number>-key-1**)
    - Create a security group (name = **<your-index-number>-sg-1**). Open SSH and HTTP traffic for the public network. You should not open access globally (Note: In real situations you should not use 0.0.0.0/0 for production applications)
    - Create Launch Configuration instead of Launch template and make sure to add the following as user data to install the web server and host the site. Make sure to use the AMI **ami-0cfc05f17eac80275**.

```
#!/bin/bash

sudo apt-get update -y; sudo apt-get install apache2 -y
cd /var/www/html; sudo touch <your-index>.html
sudo chmod 766 <your-index>.html
echo "<your-index>-<your-name>" > <your-index>.html
sudo service apache2 restart
```

- ❖ Create the Auto scaling group with your index number and use the Launch configuration created above.
- ❖ When creating the Autoscaling group, make sure to create an Application Load balancer with a new target group created. The Load balancer should be an internet-facing one.

2. You should be able to access the Apache2 server from your browser through the Load balancer.

Take screen captures of the following (Total screen capture = 13) and paste them into a word document in the order they were taken. File name should be your student number.

1. Summary of the VPC you created (When you select the VPC, there is a TAB named **Details**. - (**1** screen capture)

2. Go to Subnets, when you select the subnet you created, there is a TAB named **Description** and **Route Table** - Take screen captures of both. - (**2** screen captures)

3. The description of the EC2 instance (there is a TAB named **Description** when you select the EC2 instance) - (**2** screen captures)
    - This should clearly show
        - IPv4 Public IP address
        - Private IP

        - Key-Pair name
        - Subnet
        - Security groups
        - VPC and Subnet IDs
        - Tags (This should be a separate screen capture)

4. Security group with inbound rules (When you select the security group you have created, there is a TAB named **Inbound Rules**). - (**1** screen capture)

5. Launch Configuration details which include the following. - (2 screen captures)
    - AMI ID
    - Instance type
    - Key name
    - Create time
    - User data (This should be a separate screen capture)

6. Autoscaling Group details which includes the following. - (3 screen captures)
    - Group details
    - Launch configuration
    - Activity history in Activity tab (This should be a separate screen capture)
    - Instance Management tab (This should be a separate screen capture)

7. Apache2 home page when you access the public load balancer (make sure you take a screen capture of the entire browser) - (**1** screen capture)

8. Load balancer details which include the following. (1 screen capture)
    - Name
    - DNS name
    - Type