Cloud Computing Exercise #14

Creating a Simple VPC with One Public Subnet

A. Preparation

1. Sign in to your AWS account as the non-root admin user.

B. Create a VPC

1. Go to the VPC dashboard (Services/VPC), and select “Create VPC” and then “VPC and more” . The configuration should include 1 Availability Zone, 1 Public Subnet, and 1 Private Subnet. Specify 192.168.0.0/16 as the IPv4 CIDR block for the VPC, and give the VPC a name (e.g. “MyVPC”).”Enter 192.168.1.0/24 as the public subnet’s IPv4 CIDR block. Then, click “Create VPC”. You should see a list of all of your VPCs, including the default VPV that was created when your account was created, and the new custom VPC you have just created.
2. Select your VPC and take a look at the VPC parameters and the additional resources that were created (main route table and main ACL). You can also inspect those resources by opening the “VIRTUAL PRIVATE CLOUD” menu on the left side and selecting “Subnets”, “Route tables” and “Internet Gateways”. Notice that an Internet Gateway was also automatically created for the VPC (since it was configured with a public subnet).
3. Look at the route tables that were automatically generated for the VPC (select “Route Tables” on the menu on the left side). You should see two route tables: One main route table, and one route table associated with the subnet. Select the main route table, scroll down to the list of routes, and inspect its content. There should be one route there with destination 192.168.0.0./16 with “local” target. If you select the other route table (associated with the VPC’s only subnet), you should see two routes: one for traffic inside the subnet (with “local” target), and a default route pointing to the Internet Gateway.
4. Now look at the network ACL that was automatically created for the VPC. Go down to the “SECURITY” section of the menu on the left side and select “Network ACLs”. Scroll down and look at both inbound and outbound rules. You should notice how these rules allow any traffic to flow in and out of the subnet.

C. Create and EC2 instance and launch it inside the VPC’s subnet

1. Go to the Elastic IP address dashboard, and allocate a new EIP for your EC2 instance. Make sure that the EIP address is allocated for the same region where your VPC was created).
2. Go to the EC2 dashboard (Services/EC2) and launch a new EC2 instance using the “Amazon Linux 2023” AMI from the AWS Marketplace with t2.micro instance type. In the “Network Settings” click “edit” and change the VPC from default to the VPC you have created (with name “MyVPC”), and launch the instance in the “Public Subnet”. This is how you determine which subnet of which VPC the EC2 instance will be launched in. If you do not change this, the EC2 instance will be launched in the default VPC.
3. Once your instance is running, associate it with the EIP you have allocated previously. Go to “Elastic IPs”, check the selection box for the EIP, and select “Associate Elastic IP Address” from “Actions”. Find and select your instance and click on “Associate”.

D. Connect to your EC2 instance

1. Start an SSH client (or open a terminal window) on your local machine and connect to your EC2 instance via SSH using the allocated EIP address and the previously specified key pair. You should be able to issue CLI commands to your virtual machine. Check the configured IP parameters of your instance and verify that the private IP address assigned to its eth0 or enx-virtual network interface actually falls in the subnet’s 192.168.1.0/24 IP address range. (You can check this with the command “ip a”)

Below is an example of how it should look like:

A screenshot of a computer screen

Description automatically generated

As you can see, my network interface enX0 has an IP address 192.168.1.114/24 which falls in the subnet’s 192.168.1.0/24 IP address range, that we specified.

E. Clean up after yourself

1. Exit the SSH session, terminate the EC2 instance, and release the allocated elastic IP address. **(Please ensure the above is done; otherwise, you may incur a substantial bill on AWS.)**
2. Go to the VPC dashboard (Services/VPC), check the checkbox in front of the VPC you have created (“MyVPC”), and in the “Actions” drop-down menu, select “Delete VPC”. Confirm the VPC deletion and log out of AWS.