Setting Up a Virtual Private Cloud (VPC) with Subnets, EC2 Instance, Internet Gateway, and Route Table

Introduction

This document outlines the step-by-step process for creating a Virtual Private Cloud (VPC) on AWS, setting up subnets, launching an EC2 instance, and configuring an Internet Gateway and Route Table for internet access.

Prerequisites

- An AWS account with appropriate permissions to create VPC, subnets, EC2 instances, Internet Gateways, and Route Tables.
- Familiarity with AWS Management Console or AWS CLI.

Steps to Set Up the Infrastructure

Step 1: Create a Virtual Private Cloud (VPC)

1. Navigate to the **VPC** service in the AWS Management Console.
2. Click on **Create VPC**.
3. Provide the following details:
    - **Name tag**: `MyVPC`
    - **IPv4 CIDR block**: `10.0.0.0/16`
    - Leave other settings at default and click **Create VPC**.
4. Confirm that the VPC has been successfully created.

Step 2: Create Subnets

1. Go to the **Subnets** section within the VPC dashboard.
2. Click on **Create Subnet** and provide the following details:
    - **Name tag**: `PublicSubnet`
    - **VPC**: Select `MyVPC`.
    - **Availability Zone**: Select a specific zone (e.g., `us-east-1a`).
    - **CIDR block**: `10.0.1.0/24`

3. Repeat the above steps to create another subnet (e.g., `PrivateSubnet`) with a CIDR block of `10.0.2.0/24`.

Step 3: Create an Internet Gateway (IGW)

1. Navigate to the **Internet Gateways** section.
2. Click **Create Internet Gateway** and provide a name (e.g., `MyIGW`).
3. Once created, attach the IGW to `MyVPC` by selecting the IGW and clicking **Attach to VPC**.

Step 4: Configure the Route Table

1. In the **Route Tables** section, locate the route table associated with `MyVPC`.
2. Add a **Name tag** to the route table (e.g., `PublicRouteTable`).
3. Click on **Routes** and then **Edit routes**.
4. Add a new route:
    - **Destination**: `0.0.0.0/0`
    - **Target**: `MyIGW`
5. Save the route.
6. Associate the `PublicSubnet` with this route table by navigating to **Subnet Associations** and selecting `PublicSubnet`.

Step 5: Launch an EC2 Instance

1. Navigate to the **EC2** service and click **Launch Instance.**
2. Provide the following details:
    - **Name**: `MyInstance`
    - **AMI**: Select an appropriate Amazon Machine Image (e.g., Amazon Linux 2).
    - **Instance Type**: Choose a suitable instance type (e.g., `t2.micro`).
    - **VPC**: Select `MyVPC`.
    - **Subnet**: Choose `PublicSubnet`.
    - Enable **Auto-assign Public IP**.
3. Configure security groups to allow inbound SSH (port 22) and other necessary ports (e.g., HTTP port 80 for web servers).
4. Add a key pair for SSH access.
5. Launch the instance.

Step 6: Verify Connectivity

1. Use your key pair to SSH into the EC2 instance using its public IP.
2. Verify internet connectivity by pinging an external website (e.g., `ping google.com`).

Conclusion

You have successfully created a VPC with subnets, an EC2 instance, an Internet Gateway, and a Route Table. This setup provides the foundational networking components for deploying applications on AWS.