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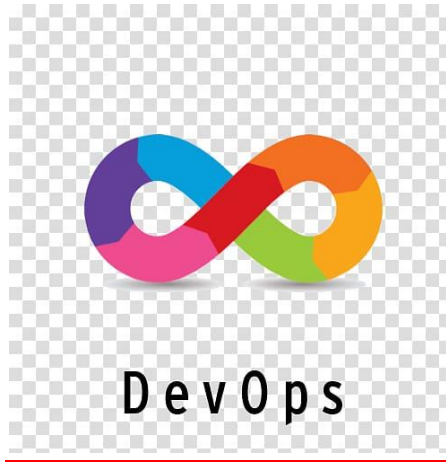**عمارة 4 ــ شارع محمد توفيق دياب ــ عباس العقاد - مدينة نصر ــ الدورال 1**

DevOps Engineer Diploma

AWS Labs
Lab 20

Configuring Internal DNS and Connectivity Between App Servers in AWS

Lab Objectives

- Creating and Managing Private Hosted Zones in Route 53
- Configuring DNS Settings for VPCs
- Launching EC2 Instances in Private Subnets
- Creating DNS A-records for Application Servers
- Verifying DNS Name Resolution between EC2 Instances
- Testing Internal Connectivity and Network Resolution

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Objective

This lab focuses on setting up an internal DNS architecture within an AWS Virtual Private Cloud (VPC) and ensuring that two application servers can communicate with each other using DNS names. You will use Amazon Route 53 to create a private hosted zone, configure DNS settings, and verify name resolution and connectivity between two EC2 instances.

Scenario Overview

You are tasked with creating a private DNS solution in AWS for an internal network. The internal DNS will be used to resolve the names of two EC2 instances that run application services in a private subnet. The goal is to configure a private hosted zone and ensure that the two application servers can resolve each other's names.

Lab Tasks

Step 1 – Create a Private Hosted Zone

The first step is to create a private hosted zone using Amazon Route 53. This zone will be used to manage the internal DNS records for the EC2 instances.

- **Action:** Create a private hosted zone with a domain name such as **corp.internal**. This will ensure that DNS queries for resources within the domain are handled internally by AWS Route 53, without exposing them to the public internet.
- **Action:** Associate the hosted zone with the VPC that will contain your EC2 instances. This association ensures that DNS queries from resources within the VPC can resolve the internal domain.

Step 2 – Prepare the VPC

To use internal DNS within AWS, you need to configure the VPC's DNS settings.

- **Action:** Ensure that **DNS Hostnames** and **DNS Resolution** are enabled for the VPC. These settings are essential for the VPC to support name resolution and the proper operation of Route 53's DNS functionality.
  - **DNS Hostnames:** Enables the VPC to resolve public and private hostnames.
  - **DNS Resolution:** Allows instances within the VPC to resolve domain names to IP addresses.

Step 3 – Create Two EC2 Instances (App Servers)

You need to deploy two EC2 instances that will act as application servers in a private subnet within the same VPC.

- **Action:** Launch two EC2 instances in private subnets within the same VPC. These instances will represent the application servers, and their private IP addresses will be used for internal communication.
- **Naming:** Assign each EC2 instance a name in the format of **app1.corp.internal** and **app2.corp.internal**. These names will be used in the DNS records to resolve their private IPs.

Step 4 – Create DNS Records

Once the EC2 instances are created, you will need to create DNS records in the Route 53 private hosted zone to resolve the internal names to the private IP addresses of the instances.

- **Action:** In the private hosted zone, create two **A-records**:
    - **app1 → Private IP of Instance 1**
    - **app2 → Private IP of Instance 2**

These A-records will map the hostnames **app1.corp.internal** and **app2.corp.internal** to the corresponding private IP addresses of the EC2 instances.

Step 5 – Validate Name Resolution

Once the DNS records are created, you need to verify that the name resolution is working properly.

- **Action:** SSH into **App Server 1** (app1) and run a command (e.g., **dig**) to check the resolution of **app2.corp.internal**.
- **Action:** SSH into **App Server 2** (app2) and run a similar command to check the resolution of **app1.corp.internal**.
- You should ensure that both commands return the correct private IP addresses for the respective application servers.

Step 6 – Connectivity Check

Now that the DNS resolution is working, you need to verify that the two application servers can communicate with each other using their DNS names.

- **Action:** From **app1**, ping **app2.corp.internal** to check connectivity.
- **Action:** From **app2**, ping **app1.corp.internal** to verify two-way connectivity.

This step ensures that not only is DNS resolution working, but that the network connectivity between the instances is functioning as expected.

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Expected Outcome

By completing this lab, you will:

- Set up a **private DNS architecture** within an AWS VPC using **Route 53**.
- Configure **DNS settings for a VPC** to enable internal name resolution.
- Deploy **two EC2 instances** in a private subnet with internal DNS names.
- Create **DNS records** in Route 53 to map EC2 instance names to private IP addresses.
- **Verify name resolution** and **test connectivity** between the EC2 instances.

Deliverables

At the end of this lab, you should provide the following:

- Screenshots of the **Route 53 private hosted zone** and **DNS records** for the EC2 instances.
- Output of the **dig** or **nslookup** command showing the resolution of the internal DNS names to their respective private IPs.
- Screenshots or terminal output showing the **ping** test results from both EC2 instances, confirming network connectivity.

You are Welcome