**AWS Route 53 Hands-On Guide**

**Prerequisites**

1. AWS account with Route 53 service access.
2. Basic understanding of DNS concepts (e.g., records, zones).
3. AWS CLI installed and configured (optional).

**Exercise 1: Create a Public Hosted Zone**

1. **Navigate to Route 53 in AWS Console:**
   * Open the AWS Management Console.
   * Search for and select **Route 53**.
2. **Create a Public Hosted Zone:**
   * In the left-hand navigation, click on **Hosted Zones**.
   * Click the **Create hosted zone** button.
   * Fill in the details:
     + **Domain name**: Enter a domain name (e.g., example.com). Even if you don’t own it, this is for simulation.
     + **Type**: Select **Public Hosted Zone**.
   * Click **Create hosted zone**.
3. **Understand the Name Servers:**
   * Note the **NS** (Name Server) records that AWS automatically creates. These are used to delegate your domain to AWS Route 53.
   * If you owned a domain, you would update your domain registrar's DNS settings with these NS values.

**Exercise 2: Add DNS Records**

1. **Create an A Record (IP Address):**
   * In the hosted zone, click **Create record**.
   * Fill in the details:
     + **Record name**: www (for www.example.com).
     + **Record type**: A.
     + **Value**: Enter a public IP address (e.g., 192.168.1.10).
     + **TTL**: Default (300 seconds).
   * Click **Create records**.
2. **Create a CNAME Record (Alias):**
   * Click **Create record**.
   * Fill in the details:
     + **Record name**: app (for app.example.com).
     + **Record type**: CNAME.
     + **Value**: www.example.com.
     + **TTL**: Default (300 seconds).
   * Click **Create records**.
3. **Verify the Records:**
   * Use a public DNS lookup tool (e.g., dig or nslookup) to verify your records.

bash

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dig www.example.com

dig app.example.com

**Exercise 3: Use Private Hosted Zone (Optional)**

If your domain isn’t live or you want to practice internal DNS resolution:

1. **Create a Private Hosted Zone:**
   * In the hosted zone, click **Create hosted zone**.
   * Fill in the details:
     + **Domain name**: example.internal.
     + **Type**: **Private Hosted Zone**.
     + **VPC association**: Select an existing VPC in your account.
   * Click **Create hosted zone**.
2. **Create DNS Records in the Private Zone:**
   * Follow steps in **Exercise 2** to add A and CNAME records.
   * Ensure the private zone is associated with your VPC.
3. **Test the Records:**
   * Launch an EC2 instance in the associated VPC.
   * SSH into the instance and query the private DNS:

bash

Copy code

dig www.example.internal

dig app.example.internal

**Exercise 4: Health Checks and Routing Policies**

1. **Create a Health Check:**
   * Go to **Route 53** > **Health Checks** > **Create health check**.
   * Fill in details:
     + **Name**: MyHealthCheck.
     + **Endpoint type**: IP Address.
     + **IP Address**: Enter the IP of a web server or service.
     + **Port**: 80 (for HTTP).
     + Configure other parameters as required.
   * Click **Create health check**.
2. **Associate Health Check with Record:**
   * Go to your hosted zone and edit the A record.
   * Enable health check and associate it with the one you created.
3. **Routing Policies:**
   * Experiment with different routing policies (simple, weighted, failover, geolocation):
     + **Weighted**: Divide traffic between multiple IPs.
     + **Failover**: Route traffic to a secondary resource if the primary fails.

**Wrap-Up**

1. Even without owning a domain, you can learn how to:
   * Create and manage hosted zones.
   * Add DNS records.
   * Configure health checks.
   * Test with private hosted zones and internal DNS.
2. **Cleanup:**
   * Delete any hosted zones, health checks, and records you created.