Domain Name System (DNS) and Amazon Route 53

EXERCISE - 7.1

Create a New Zone

1. Log in to the AWS Management Console.

2. Navigate to Amazon Route 53, and create a hosted zone.

3. Enter your domain name, and create your new zone file.

4. In the new zone file, you will see the SOA record and name servers. You will need to log in to your domain registrar's website, and update the name servers with your AWS name servers.

5. After you update your name servers with your domain registrars, Amazon Route 53 will be configured to serve DNS requests for your domain.

You have now created your first Amazon Route 53 zone.

EXERCISE - 7.2

Create Two Web Servers in Two Different Regions

In this exercise, you will create two new Amazon EC2 web servers in different AWS regions. You will use these in the following exercises when setting up Amazon Route 53 to access the web servers.

Create an Amazon EC2 Instance

1. Log in to the AWS Management Console.

2. Change your region to Asia Pacific (Sydney).

3. In the Compute section, load the Amazon EC2 dashboard. Launch an instance, and select the first Amazon Linux Amazon Machine Image (AMI).

4. Select the instance type, and configure your instance details. Take a close look at the different options available to you, and change your instance's storage device settings as necessary.

5. Name the instance `sydney,` and add a security group that allows HTTP.

6. Launch your new Amazon EC2 instance, and verify that it has launched properly.

Connect to Your Amazon EC2 Instance

7. Navigate to the Amazon EC2 instance in the AWS Management Console, and copy the public IP address to your clipboard.

8. Using a Secure Shell (SSH) client of your choice, connect to your Amazon EC2 instance using the public IP address, the user name `ec2-user`, and your

private key.

9. When prompted about the authenticity of the host, type `Yes`, and continue.

10. You should now be connected to your Amazon EC2 instance. Elevate your privileges to root by typing `#sudo su`.

11. While you're logged in as the root user to your Amazon EC2 instance, run the following command to install Apache `httpd`:

    `#yum install httpd -y`

12. After the installation has completed, run the command `#service httpd start` followed by `#chkconfig httpd on`.

13. Navigate to the EC2 instance, and type: `cd /var/www/html`

14. Type `#nano index.html` and press Enter.

15. In Nano, type `This is the Sydney Server` and then press Ctrl+X.

16. Type `y` to confirm that you want to save the changes, and then press Enter.

17. Type `#ls`. You should now see your newly created `index.html` file.

18. In your browser, navigate to http://yourpublicipaddress/index.html.

You should now see your "This is the Sydney Server" home page. If you do not see this, check your security group to make sure you allowed access for port 80.

Create an Elastic Load Balancing Load Balancer

19. Return to the AWS Management Console, and navigate to the Amazon EC2 dashboard.

20. Create a load balancer named `sydney`, leaving the settings at their default values.

21. Create your security group, and allow all traffic in on port 80.

22. Configure health check, leaving the settings at their default values.

23. Select your newly added instance. Add tags here if you want to tag your instances.

24. Click Create to provision your load balancer.

Create These Resources in a Second Region

25. Return to the AWS Management Console, and change your region to South America (Sao Paulo).

26. Repeat the three procedures in this section to add a second Amazon EC2 instance and a load balancer in this new region.
    You have now created two web servers in different regions of the world and placed these regions behind Elastic Load Balancing load balancers.

EXERCISE - 7.3

Create an Alias A Record with a Simple Routing Policy

1. Log in to the AWS Management Console, and navigate to the Amazon Route 53 dashboard.

2. Select your newly-created zone domain name, and create a record set with the name `A " IPv4 Address`

3. Create an alias, leaving your routing policy set to Simple.

4. In your web browser, navigate to your domain name. You should now see a welcome screen for the Sydney region. If you do not see this, check that your Amazon EC2 instance is attached to your load balancer and that the instance is in service. If the instance is not in service, this means that it is failing its health check. Check that Apache HTTP Server (HTTPD) is running and that your `index.html` document is accessible.

You have now created your first Alias A record for the zone apex using the simple routing policy.

EXERCISE - 7.4

Create a Weighted Routing Policy

1. Return to the AWS Management Console, and navigate to the Amazon Route 53 dashboard.

2. Navigate to hosted zones, and select your newly-created zone domain name.

3. Create a record set with type set to developer. This will create a subdomain of `developer.yourdomainname.com`.

4. Select your Sydney load balancer. Change the routing policy to Weighted with a value of 50 and a type of Sydney. Leave the other values at their defaults. Click Create. You will now see your newly-created DNS entry.

5. Create another record set with type set to developer. This will add a new record with the same name you created earlier. Both records will work together.

6. Select your Sao Paulo load balancer. Change the routing policy to Weighted with a value of 50 and type of Sao Paulo. Leave the other values at their defaults. Click Create. You will now see your newly-created DNS entry.

7. Test your DNS by visiting http://developer.yourdomainname.com and refreshing the page. You should be accessing the Sydney server 50 percent of the time and the Sao Paulo server the other 50 percent of the time.
   You have now created a weighted DNS routing policy. You can continue to experiment with other routing policies by following the documentation at http://docs.aws.amazon.com/Route53/latest/DeveloperGuide/routing-policy.html.

EXERCISE - 7.5

Create a Hosted Zone for Amazon Virtual Private Cloud (Amazon VPC)

Amazon VPC details are covered in Chapter 4, "Amazon Virtual Private Cloud (Amazon VPC)."

Create a Private Hosted Zone

1. Return to the AWS Management Console, and navigate to the Amazon Route 53 dashboard.

2. Create a hosted zone, and enter your private domain name.

3. Select the default Amazon VPC that you used in Exercise 9.2 to deploy the first server in the Asia Pacific (Sydney) region. Click Create. This will create a new zone file.

Verify Amazon VPC Configuration

4. Return to the AWS Management Console, and change your region to Asia Pacific (Sydney).

5. In the Amazon VPC dashboard, choose your Amazon VPC.

6. Click on the default Amazon VPC from the list. Ensure that both DNS resolution and DNS host names are enabled. These settings need to use private hosted zones.

Create Resource Record Sets

7. Return to the AWS Management Console, and navigate to the Amazon Route 53 dashboard.

8. Select your newly-created private zone domain name, and create a record set.

9. Enter the name you want to give to your Amazon EC2 instance (for example, `webserver1`), and select IPv4 address with no alias.

10. Enter the internal IP address of your Amazon EC2 instance that you noted in Exercise 9.2.

11. Leave your routing policy set to Simple, and click Create.

Connect to Your Amazon EC2 Instance

12. On the Amazon EC2 instances screen, wait until you see your virtual machine's instance state as running. Copy the public IP address to your clipboard.

13. Using an SSH client of your choice, connect to your Amazon EC2 instance using the public IP address, the user name `ec2-user`, and your private key. For example, if you're using Terminal in OSX, you would type the following command:

```
ssh ec2-user@publicipaddresshere -i MyPrivateKey.pem
```

14. When prompted about the authenticity of the host, type `Yes` and continue. You should now be connected to your Amazon EC2 instance.

15. While you're logged in to your Amazon EC2 instance, run the following command to check if the host names in Amazon Route 53 are resolving:

```
nslookup webserver1.yourprivatehostedzone.com
```

16. You should receive a non-authoritative answer with the host name and IP address for the record set that you created in Amazon Route 53.

You have now created a private hosted zone in Amazon Route 53 and associated it with an Amazon VPC. You can continue to add instances in Amazon VPC and create resource record sets for them in Amazon Route 53. These new instances would be able to inter- communicate with the instances in the same Amazon VPC using the domain name that you created.

Remember to delete your Amazon EC2 instances and Elastic Load Balancing load balancers after you've finished experimenting with your different routing policies. You may also want to delete the zone if you are no longer using it.