



AWS
re:Start
LAB

Amazon Route 53 Failover Routing



WEEK 9





Overview

Amazon Route 53 offers various routing policies that significantly enhance the performance and reliability of your applications. These policies, including weighted, latency, and geolocation routing, allow you to manage DNS queries effectively, directing traffic based on specific needs to optimize user experiences. By configuring health checks within Route 53, you can continuously monitor the health of your endpoints and receive email notifications if an endpoint becomes unhealthy, enabling you to take immediate corrective action.

Failover routing in Route 53 is crucial for maintaining high availability and implementing disaster recovery strategies. This configuration ensures that traffic is automatically redirected to a secondary resource if the primary one fails, using health checks to verify the status of endpoints continuously. By ensuring traffic is only routed to healthy instances, failover routing minimizes downtime and enhances service reliability. This setup guarantees that your application remains accessible even during outages, providing a robust solution for managing DNS traffic and maintaining continuous availability of critical applications.

Topics covered

- Configure a Route 53 health check that sends emails when the health of an HTTP endpoint becomes unhealthy.
- Configure failover routing in Route 53.

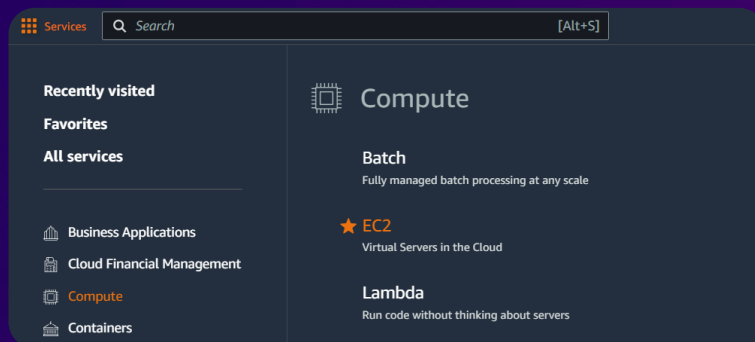


Task 1

Confirming the café websites

Step 1: Access the EC2 Management Console

Open the AWS Management Console, and select EC2.



Step 2: Review Instances

Navigate to the **Instances** section. Two EC2 instances have already been created for you. **CafeInstance1** is running in Cafe Public Subnet 1 (us-west-2a), and **CafeInstance2** is running in Cafe Public Subnet 2 (us-west-2b).

Instances (2) Info							
<input type="text" value="Find Instance by attribute or tag (case-sensitive)"/>				All states ▾		< 1 > ⚙	
<input type="checkbox"/>	Name ↗	Instance ID	Instance state ▾	Status check	Availability Zone ▾	Public IPv4 ... ▾	Security group name ▾
<input type="checkbox"/>	CafeInstance1	i-0a404e56f57ea40fc	Running 🔍 🔍	2/2 checks passed	us-west-2a	44.225.184.93	c117085a279027216749...
<input type="checkbox"/>	CafeInstance2	i-058698d700bd697e1	Running 🔍 🔍	2/2 checks passed	us-west-2b	52.11.119.70	c117085a279027216749...

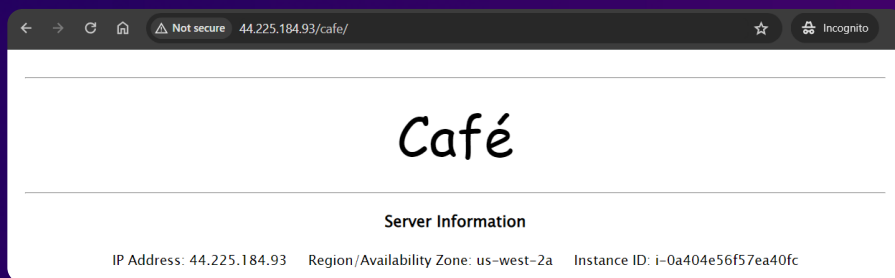


Task 1

Confirming the café websites

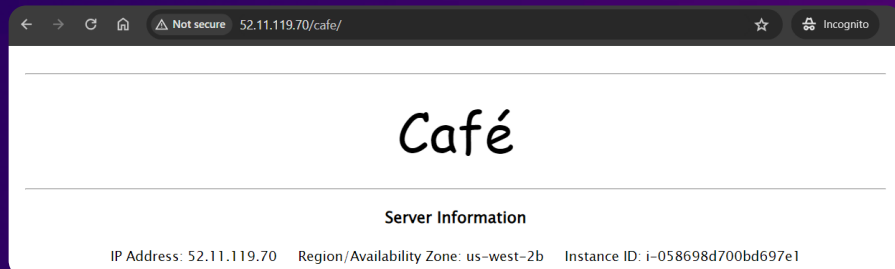
Step 3: Review the Primary Website

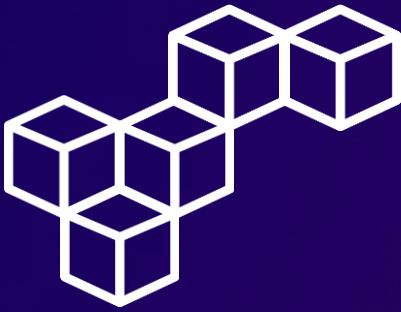
Although both EC2 instances have the same configuration and application installed, one instance is a primary instance. Access the primary instance website URL. Notice the Server Information that is displayed. It shows information about the EC2 instance and the Availability Zone where it is running.



Step 4: Review the Secondary Website

Review the secondary instance website. These configurations confirm that the café application is running on both instances.





Task 1


Confirming the café websites

Step 5: Submit Order


On one of the websites, choose **Menu**. Choose any item on the menu, and choose **Submit Order**.

[Home](#) [Menu](#) [Order History](#)


Pastries



Croissant
\$1.50
Fresh, buttery and fluffy... Simply delicious!
Quantity:



Donut
\$1.00
We have more than half-a-dozen flavors!
Quantity:



Chocolate Chip Cookie
\$2.50
Made with Swiss chocolate with a touch of Madagascar vanilla
Quantity:

Step 6: Review Order Confirmation

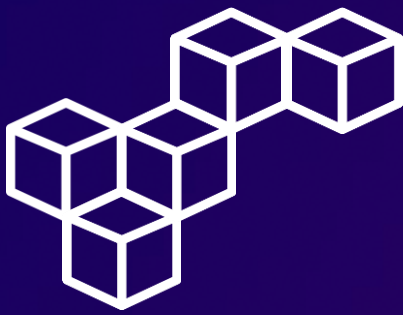
The **Order Confirmation** page reflects the time that the order was placed in the time zone where the web server is running.

Order Confirmation

Thank for your order! It will be available for pickup within 15 minutes. Your order number and details are shown below.

Order Number: 1 Date: 2024-05-22 Time: 12:16:56 Total Amount: \$5.00

Item	Price	Quantity	Amount
Croissant	\$1.50	1	\$1.50
Donut	\$1.00	1	\$1.00
Chocolate Chip Cookie	\$2.50	1	\$2.50

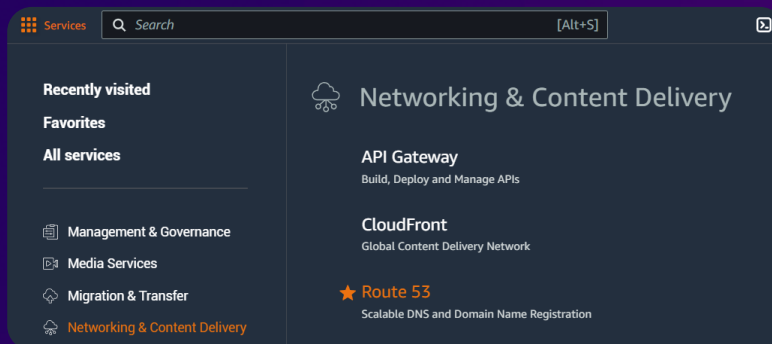


Task 2

Configuring a Route 53 health check

Step 1: Access the Route 53 Console

In the AWS Management Console, select Route 53.



Step 2: Create health check

Navigate to the **Health checks** section, and select [Create health check](#).

Welcome to Route 53 health checks

Route 53 health checks monitor the health and performance of your application's servers, or endpoints, from a network of health checkers in locations around the world. You can specify either a domain name or an IP address and a port to create HTTP, HTTPS, and TCP health checks that check the health of the endpoint. To get started, click [Create health check](#).

[Create health check](#)



Task 2

Configuring a Route 53 health check

Step 3: Configure health check

In the **Configure health check** section, configure the following settings.

Configure health check ?

Route 53 health checks let you track the health status of your resources, such as web servers or mail servers, and take action when an outage occurs.

Name i

What to monitor ☒ Endpoint i

☐ Status of other health checks (calculated health check)

☐ State of CloudWatch alarm

Step 4: Monitor an endpoint

In the **Monitor an endpoint** section, configure the following settings.

Monitor an endpoint

Multiple Route 53 health checkers will try to establish a TCP connection with the following resource to determine whether it's healthy. [Learn more](#)

Specify endpoint by ☒ IP address ☐ Domain name

Protocol i

IP address * i

Port * i

Path / i



Task 2

Configuring a Route 53 health check

Step 5: Advanced configuration

In the **Advanced configuration** section, configure the following settings.

▼ Advanced configuration

Request interval

☐ Standard (30 seconds)

☒ Fast (10 seconds) ⓘ

Failure threshold *

ⓘ

Step 6: Get notified when health check fails

In the **Get notified when health check fails** section, configure the following settings.

Get notified when health check fails ⓘ

If you want CloudWatch to send you an Amazon SNS notification, such as an email, when the status of the health check changes to unhealthy, create an alarm and specify where to send notifications.

Create alarm

☒ Yes

☐ No ⓘ

CloudWatch sends you an Amazon SNS notification whenever the status of this health check is unhealthy for at least one minute. The alarm will be located in the **us-east-1** region.

Send notification to

☐ Existing SNS topic


☒ New SNS topic ⓘ

Topic name *

ⓘ

Recipient email addresses *

ⓘ

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Task 2

Configuring a Route 53 health check

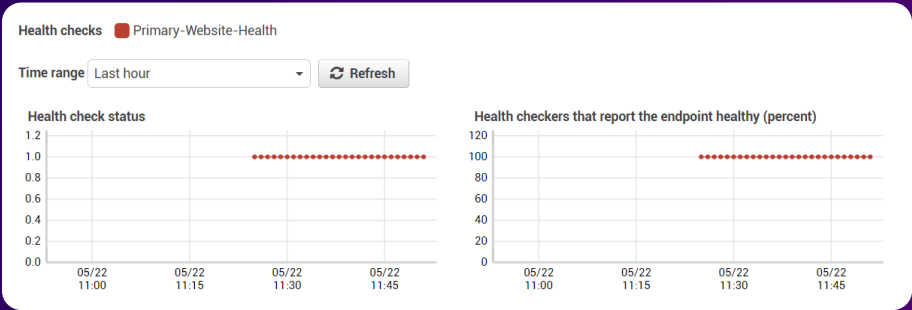
Step 7: Review Health Check Status

Route 53 now checks the health of your site by periodically requesting the domain name that you provided and verifying that it returns a successful response. Review the **Healthy** Health Check Status.

Filter by keyword						<< 1 of 1 health check >>	
Name	Status	Description	Alarms	ID			
<input type="checkbox"/> Primary-Website-Health	15 minutes ago <div><div></div></div> Healthy	http://44.225.184.93:80/cafe	1 of 1 in OK	7b11af7e-75fe-41f7-8412-e31198b97dcd			

Step 8: Monitoring

Select the **Primary-Website-Health** health check, and choose the **Monitoring** tab. This tab provides a view of the status of the health check over time. Review the Health Check charts.



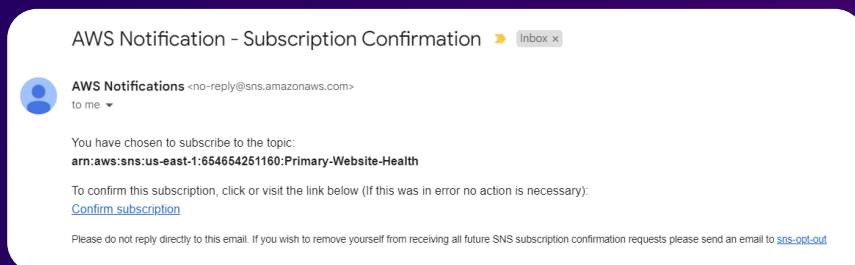


Task 2

Configuring a Route 53 health check

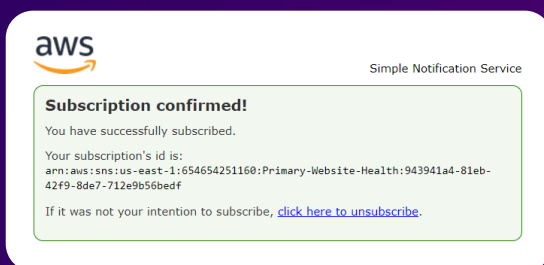
Step 9: Check your email

Check your email. You should have received an email from AWS Notifications.



Step 10: Confirm subscription

In the email, choose the [Confirm subscription](#) link to finish setting up the email alerting that you configured when you created the health check.





Task 3

Configuring Route 53 records

Step 1: Review Hosted zones

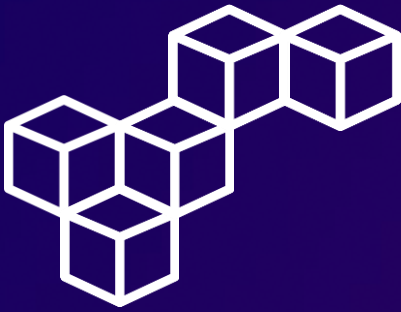
Navigate to the **Hosted Zones** section. A unique domain name has already been created for you. Select your [Hosted zone name](#).

Hosted zones (1)					
Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.					
<input type="text" value="Filter records by property or value"/>					< 1 > ⚙
Hosted zone name	Type	Created by	Record count	Hosted zone ID	
<input type="radio"/> 7645679_1716394085.vocareum.training	Public	Route 53	2	Z027561631K1FOG3V8SKJ	

Step 2: Review Records

Two records that already exist in this hosted zone are displayed, the **NS** or name server record, and the **SOA** or start of authority record. These two records were created when the domain was registered with Route 53. Choose [Create record](#).

Records (2) Info						
Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.						
<input type="text" value="Filter records by property or value"/>						Type ▼ Routing policy ▼ Alias ▼ < 1 > ⚙
<input type="checkbox"/>	Record name	Type	Routing policy	Value/Route traffic to	TTL (seconds)	
<input type="checkbox"/>	7645679_1716394085.vocareum.training	NS	Simple	ns-669.awsdns-19.net. ns-236.awsdns-29.com. ns-1192.awsdns-21.org. ns-1542.awsdns-00.co.uk.	172800	
<input type="checkbox"/>	7645679_1716394085.vocareum.training	SOA	Simple	ns-669.awsdns-19.net. awsdns-...	900	



Task 3

Configuring Route 53 records

Step 3: Create a primary record

In the **Quick create record** section, configure the following settings to create an A record for the primary website.

Quick create record [Switch to wizard](#)

Record name [Info](#)

Record type [Info](#)
A – Routes traffic to an IPv4 address and some AWS resources

Value [Info](#)

TTL (seconds) [Info](#)

Routing policy [Info](#)
Failover

Health check ID [Info](#)

Failover record type
Choose **Primary** to route traffic to the specified resource by default or **Secondary** to route traffic to the specified resource when the primary resource is unavailable. You can create only one failover record of each type.

Record ID [Info](#)

Step 4: Review record

The A-type record that you created should now appear on the Hosted zones page. Choose [Create record](#).

Records (3) [Info](#)

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

1 match 1 match < 1 >

<input type="checkbox"/>	Record name ▾	Type ▾	Routing policy ▾	Value/Route traffic to ▾	TTL (s... ▾	Health check ID ▾	Record ID ▾
<input type="checkbox"/>	www.764567...	A	Failover	44.225.184.93	15	7b11af7e-75fe-...	FailoverPrimary



Task 3

Configuring Route 53 records

Step 5: Create a secondary record

In the **Quick create record** section, configure the following settings to create an A record for the secondary website.

Quick create record [Switch to wizard](#)

Record name [Info](#)

Record type [Info](#)
A – Routes traffic to an IPv4 address and some AWS resources

Value [Info](#)

TTL (seconds) [Info](#)

Routing policy [Info](#)
Failover

Failover record type
Choose **Primary** to route traffic to the specified resource by default or **Secondary** to route traffic to the specified resource when the primary resource is unavailable. You can create only one failover record of each type.
Secondary

Health check ID - optional [Info](#)

Record ID [Info](#)

Step 6: Review records

Another A-type record should now be listed on the Hosted zones page.

Records (4) [Info](#)

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

2 matches 2 matches < 1 >

<input type="checkbox"/>	Record name ▾	Type ▾	Routing policy ▾	Value/Route traffic to ▾	TTL (s...) ▾	Health check ID ▾	Record ID ▾
<input type="checkbox"/>	www.764567...	A	Failover	44.225.184.93	15	7b11af7e-75fe-4...	FailoverPrimary
<input type="checkbox"/>	www.764567...	A	Failover	52.11.119.70	15	-	FailoverSecondary

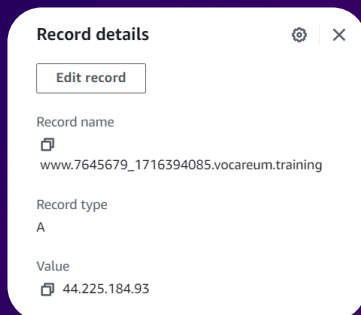


Task 4

Verifying the DNS resolution

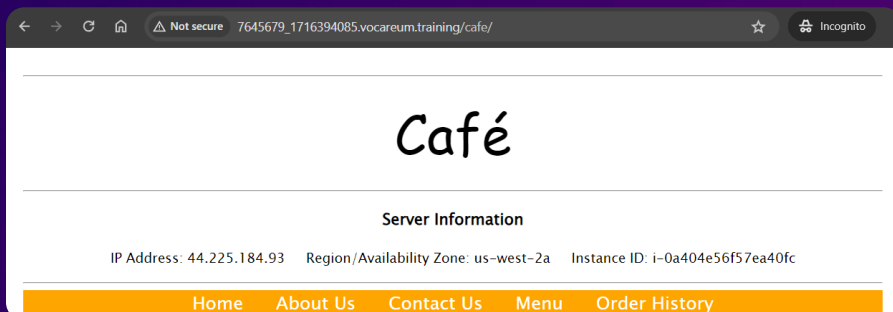
Step 1: Review Record details

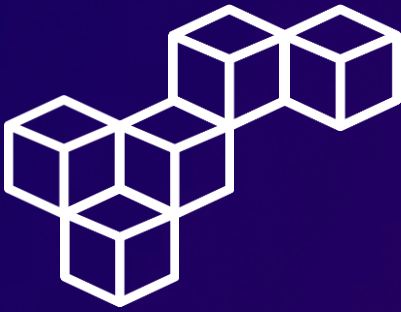
Select the check box for either one of the A records. A Record details panel appears that includes the Record name.



Step 2: Access the Record name

Access the Record name, enter /cafe at the end of the URL, and then load the page. The café primary website should load, as indicated by the Server Information section of the page, which should display the Region/Availability Zone.





Task 5

Verifying the failover functionality

Step 1: Simulate a failure

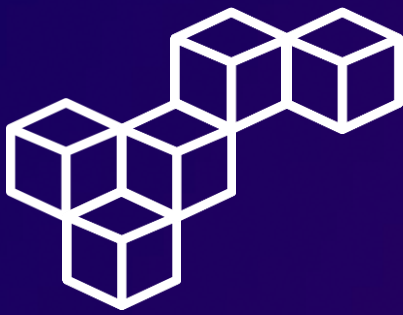
Simulate a failure by manually stopping **CafeInstance1**.
Navigate to the **Instances** section, select the **CafeInstance1** instance, and choose **Stop instance**.

Instances (1/2) Info					Connect	Instance state ▲	Actions ▼	Launch instances ▼	
Find Instance by attribute or tag (case-sensitive)					All states ▼	Stop instance			< 1 > ⚙
						Start instance	Public IPv4 ... ▼	Security group ... ▼	
<input checked="" type="checkbox"/>	CafeInstance1	i-0a404e56f57ea40fc	Running	2/2 checks passed		Reboot instance	44.225.184.93	c117085a279027...	
<input type="checkbox"/>	CafeInstance2	i-058698d700bd697e1	Running	2/2 checks passed		Hibernate instance	52.11.119.70	c117085a279027...	
						Terminate instance			

Step 2: Review Instance state

The **CafeInstance1** Instance state changed to Stopped.

Instances (2) Info									Connect	Instance state ▼	Actions ▼	Launch instances ▼	
Find Instance by attribute or tag (case-sensitive)									All states ▼				< 1 > ⚙
<input type="checkbox"/>	Name ↗	Instance ID	Instance state ▼	Status check	Availability Zone ▼	Public IPv4 ... ▼	Security group ... ▼						
<input type="checkbox"/>	CafeInstance1	i-0a404e56f57ea40fc	Stopped	-	us-west-2a	44.225.184.93	c117085a279027...						
<input type="checkbox"/>	CafeInstance2	i-058698d700bd697e1	Running	2/2 checks passed	us-west-2b	52.11.119.70	c117085a279027...						



Task 5

Verifying the failover functionality

Step 3: Review Health Check Status

The primary website now stops functioning. The Route 53 health check that you configured notices that the application is not responding, and the record entries that you configured cause DNS traffic to fail over to the secondary EC2 instance. Navigate to the **Health checks** section. Review the **Unhealthy** Health Check Status.

Filter by keyword						<< 1 of 1 health check >>	
Name	Status	Description	Alarms	ID			
<input type="checkbox"/> Primary-Website-Health	<div><div></div>Unhealthy</div>	http://44.225.184.93:80/cafe	1 of 1 in ALARM	7b11af7e-75fe-41f7-8412-e31198b97dcd			

Step 4: Review Monitoring

Select the **Primary-Website-Health** health check, and choose the **Monitoring** tab. You should see failed health checks within minutes of stopping the EC2 instance.



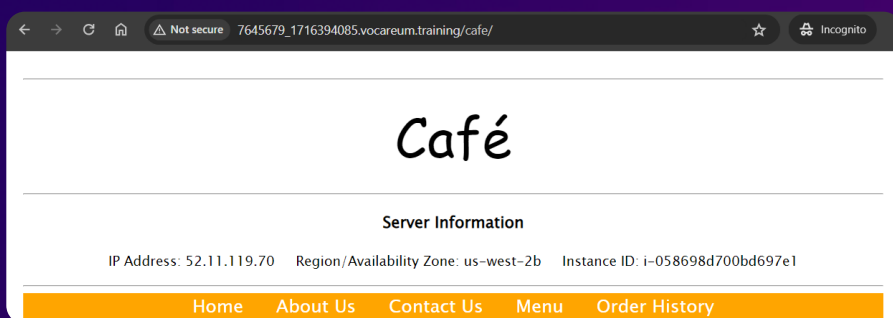


Task 5

Verifying the failover functionality

Step 5: Review failover

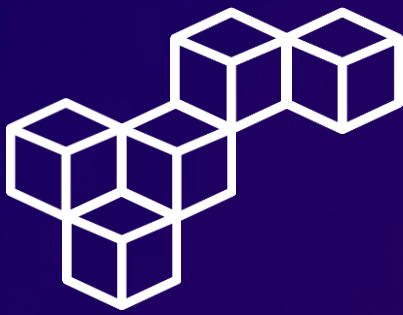
Reload the website accessed using the Record name. Notice that the Region/Availability Zone value now displays a different Availability Zone (us-west-2b instead of us-west-2a). You are now seeing the website served from your **CafeInstance2** instance.



Step 6: Review alarm email

Check your email. You should have received an email from AWS Notifications titled "ALARM: Primary-Website-Health-awsroute53-..." with details about what initiated the alarm.





Conclusions

Amazon Route 53 Routing Policies

Amazon Route 53 Routing Policies enhance traffic management by directing DNS queries based on weighted, latency, geolocation, and other criteria.

Failover Routing

Failover Routing in Route 53 ensures high availability by automatically redirecting traffic to a secondary resource if the primary endpoint fails.

Amazon Route 53 Health Checks

Amazon Route 53 Health Checks continuously monitor the status of endpoints and notify administrators via email when an endpoint becomes unhealthy.

Hosted Zones

Hosted Zones in Route 53 represent a domain and contain the DNS records that define how traffic is routed for that domain.

Records

DNS records in Route 53, such as A, CNAME, and MX records, are crucial for directing traffic and specifying resource locations within hosted zones.



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