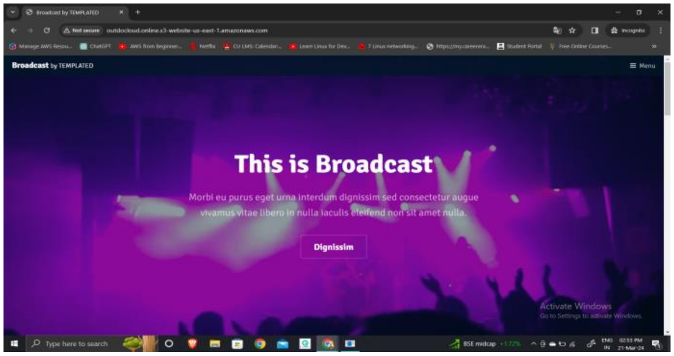
ROUTE 53

Practice: ***Hosting a Static Website on Amazon S3 and Configuring Route 53.***

Hosting a static website on Amazon S3 (Simple Storage Service) and configuring Route 53 for DNS management provides a simple and cost-effective solution for serving web content. This practice involves utilizing Amazon S3 to store the website files and configuring Route 53 to map a custom domain name to the S3 bucket's endpoint using an alias record.

Step 1) ***Create an S3 bucket with the same DNS name.***

- ***Upload the website file (Template) into the bucket.***
- ***Set Permission for public access.***
- ***Edit ACLs and allow "list and read" permissions for public access***
- ***In Bucket Properties, enable the static website hosting.***
- ***Browse the static URL of the bucket and verify website is accessible.***



Broadcast by TEMPLATED

Not secure outdocloud.online.s3-website-us-east-1.amazonaws.com

Broadcast by TEMPLATED
Menu
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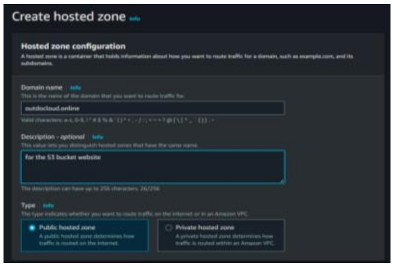
Activate Windows
Go to Settings to activate Windows.
Type here to search
BSE midcap

Here my website is publically accessible using a bucket URL. Now we want to access this website using our domain name.

Step 2) ***Go to the Route 53 service, select the Hosted zone, and click on the Create Hosted zone button.***

Step 3) ***Enter the domain name that you have. Select type as public hosted zone to route traffic on the internet, and click on create hosted zone button.***



Create hosted zone

Hosted zone configuration

A hosted zone is a container that holds information about how you want to route traffic for a domain, such as example.com, and its subdomains.

Domain name: outdocloud.online

Description - optional: for the S3 bucket website

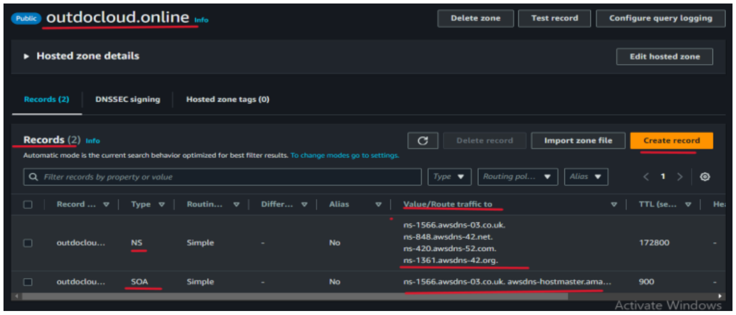
The description can have up to 256 characters. 26/256

Type

● Public hosted zone — A public hosted zone determines how traffic is routed on the internet.

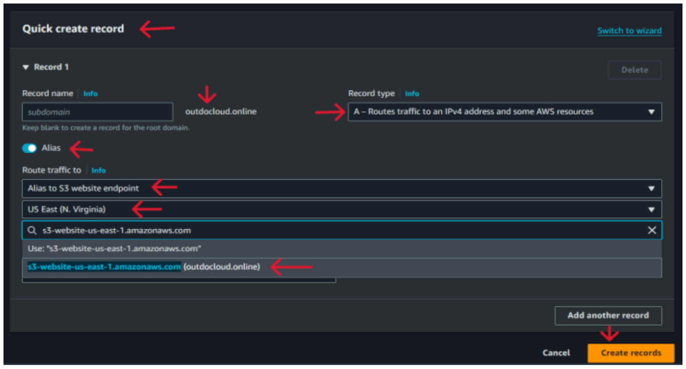
○ Private hosted zone — A private hosted zone determines how traffic is routed within an Amazon VPC.

Step 4) ***By default, Route 53 creates two records: NS (Name Server) and SOA (Start of Authority).***



□	Record ...	Type	Routin...	Differ...	Alias	Value/Route traffic to	TTL (se...	He
□	outdoclou...	NS	Simple	-	No	ns-1566.awsdns-03.co.uk. ns-848.awsdns-42.net. ns-420.awsdns-52.com. ns-1361.awsdns-42.org.	172800	-
□	outdoclou...	SOA	Simple	-	No	ns-1566.awsdns-03.co.uk. awsdns-hostmaster.ama...	900	-

- ***The NS record specifies the name servers for your domain. Configure this NS record with your domain registrar.***
- ***The SOA record contains administrative information about the zone.***
- ***Now we need to create a new record for the bucket.***
- ***Click on Create Record, record name box keeps blank to create a record for the root domain.***
- ***Select the record type as A, and click on the Alias button to select it.***
- ***Select Alias to the S3 website endpoint to route traffic.***
- ***Choose a region where the s3 bucket is created, select the bucket, and then click on Create Record.***



Record name: subdomain outdocloud.online

Keep blank to create a record for the root domain.

Record type: A – Routes traffic to an IPv4 address and some AWS resources

● Alias

Route traffic to: Alias to S3 website endpoint

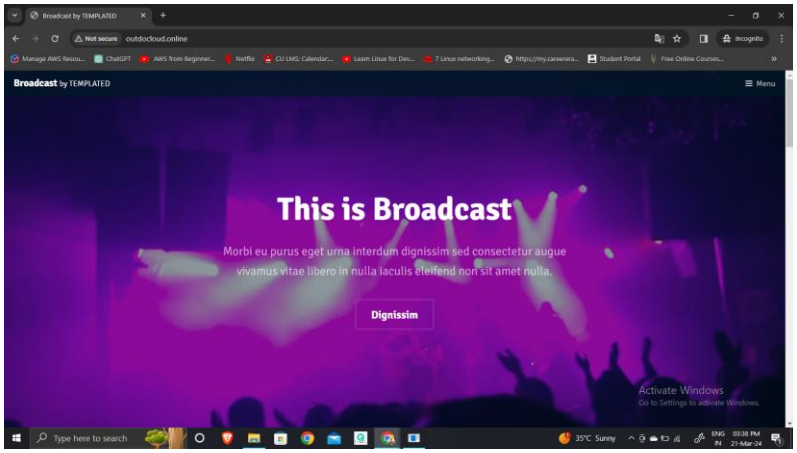
US East (N. Virginia)

s3-website-us-east-1.amazonaws.com

Use: "s3-website-us-east-1.amazonaws.com"

s3-website-us-east-1.amazonaws.com (outdocloud.online)

Step 5) ***Now go to the web browser and search your domain name.***



This is Broadcast

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Here my website is accessible using the domain name.

Route 53 – Health Checks

Route 53 Health Checks is a service provided by Amazon Web Services (AWS) as part of its Route 53 DNS (Domain Name System) service. It allows you to monitor the health and performance of your web applications and resources by periodically sending requests to your endpoints, such as websites, web servers, or other resources, and checking their responsiveness. Here's how it works and why it's considered global:

- ***Monitoring Endpoints:*** ***Route 53 Health Checks regularly monitors the health of your endpoints by sending requests (HTTP, HTTPS, TCP, or UDP) to these endpoints from multiple locations around the world.***

- ***Configurable Parameters:*** ***You can configure various parameters for these health checks, such as the frequency of checks, the protocol used, the endpoint to check, and the expected response. This flexibility allows you to tailor the health checks according to the specific needs of your applications.***

- ***Health Check Status:*** ***Based on the responses received from the endpoints, Route 53 Health Checks determines the health status of each endpoint. If an endpoint fails to respond or responds with an unexpected status code, it's considered unhealthy.***

- ***DNS Failover:*** ***Route 53 Health Checks can be used in conjunction with DNS failover to route traffic away from unhealthy endpoints to healthy ones automatically. This ensures high availability and reliability for your applications.***

- ***Global Reach:*** ***One of the key features of Route 53 Health Checks is its global reach. AWS has multiple monitoring locations around the world, allowing it to perform health checks from various geographic locations. This global coverage ensures that your applications are monitored from diverse locations, giving you a comprehensive view of their health and performance.***

- ***Highly Available:*** ***Route 53 Health Checks itself is designed to be highly available and reliable. It operates on the same infrastructure that powers Amazon's global network of data centers, ensuring minimal downtime and robust performance.***

- ***Integration with Other AWS Services*****:** ***Route 53 Health Checks seamlessly integrates with other AWS services like Route 53 DNS, Amazon Cloudwatch, and AWS Lambda, allowing you to automate responses to health check events and gain deeper insights into the health and performance of your applications.***

Overall, Route 53 Health Checks is a powerful tool for monitoring the health and performance of your applications globally, ensuring that they remain available and responsive to users around the world.

Practice: Monitoring Multi-Region Websites with Route 53 Health Checks

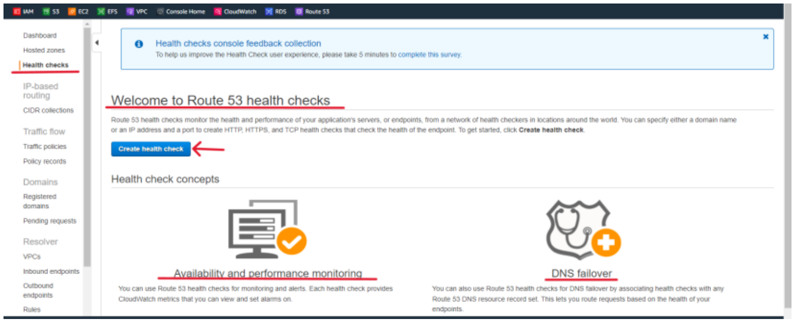
In this practice, we'll see how to use Route 53 Health Checks to keep an eye on websites hosted in different regions. We'll set up these checks to make sure your websites are working well and can handle visitors from anywhere.

Step 1) ***Launch 2 Ec2 Instances in two different regions.***

- ***Allow SSH and HTTP rules.***
- ***Add script in user data of both Instances:***

```
#!/bin/bash
sudo -i
yum install httpd -y
systemctl start httpd
systemctl enable httpd
echo “Hello everyone, this  “Region Name” > /var/www/html/index.html
```

Step 2) ***Go to Route 53 Dashboard and select Health Checks service.***



Health checks console feedback collection

To help us improve the Health Check user experience, please take 5 minutes to complete this survey.

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**.

Health check concepts

Availability and performance monitoring

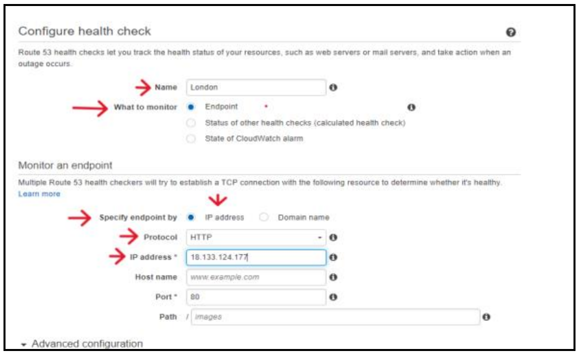
You can use Route 53 health checks for monitoring and alerts. Each health check provides CloudWatch metrics that you can view and set alarms on.

DNS failover

You can also use Route 53 health checks for DNS failover by associating health checks with any Route 53 DNS resource record set. This lets you route requests based on the health of your endpoints.

- ***Click on the Create Health Check button.***
- ***Name the health check the same as your Instance to identify.***
- ***Select Endpoint: (You can enter the domain name or IP address of the endpoint you want to monitor. This could be a website, an API endpoint, a load balancer, an EC2 instance, or any other resource accessible over the internet.)***
- ***Enter Ec2 Instance IP Address.***
- ***Check Advance Configuration and Specify as required.***
- ***If you want CloudWatch to send you an Amazon SNS notification whenever the status of this health check is unhealthy for at least one minute then click on Create alarm.***
- ***Click on the Create Health Check button.***
- ***Create a new health check for the second instance following the steps outlined above.***

Images reference for the above steps



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: London

What to monitor: ● Endpoint ○ Status of other health checks (calculated health check) ○ State of CloudWatch alarm

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: HTTP

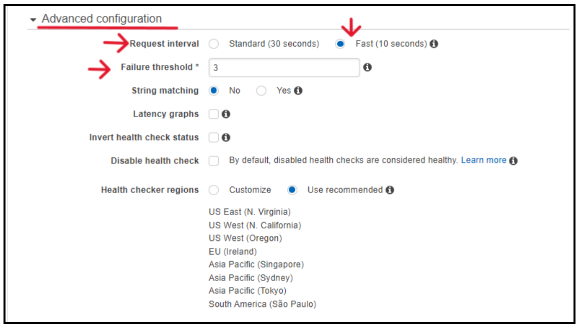
IP address *: 18.133.124.177

Host name: www.example.com

Port *: 80

Path: / images

Advanced configuration



Advanced configuration

Request interval: ○ Standard (30 seconds) ● Fast (10 seconds)

Failure threshold *: 3

String matching: ● No ○ Yes

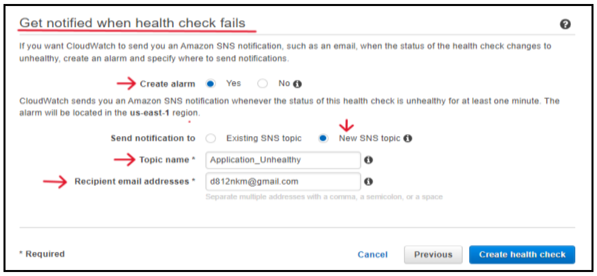
Latency graphs: □

Invert health check status: □

Disable health check: □ By default, disabled health checks are considered healthy. Learn more

Health checker regions: ○ Customize ● Use recommended

US East (N. Virginia)
US West (N. California)
US West (Oregon)
EU (Ireland)
Asia Pacific (Singapore)
Asia Pacific (Sydney)
Asia Pacific (Tokyo)
South America (São Paulo)



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

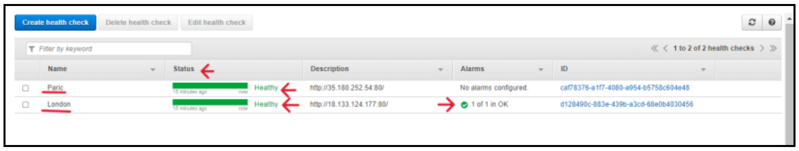
Topic name *: Application_Unhealthy

Recipient email addresses *: d812nkm@gmail.com

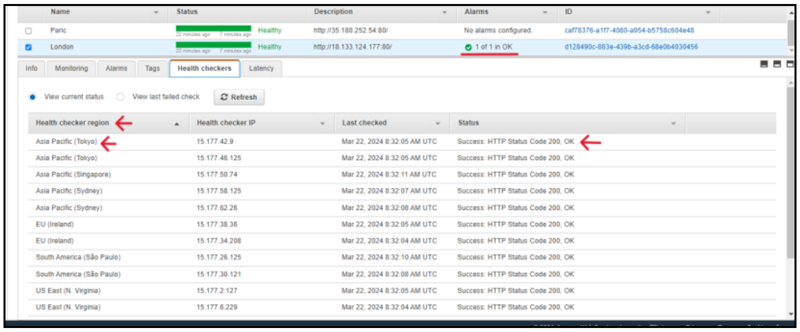
Separate multiple addresses with a comma, a semicolon, or a space

* Required

In the below image, we can see our both instances are healthy.



	Name	Status	Description	Alarms	ID
□	Paric	15 minutes ago now Healthy	http://35.180.252.54:80/	No alarms configured.	caf78376-a1f7-4080-a954-b5758c604e48
□	London	15 minutes ago now Healthy	http://18.133.124.177:80/	✓ 1 of 1 in OK	d128490c-883e-439b-a3cd-68e0b4030456



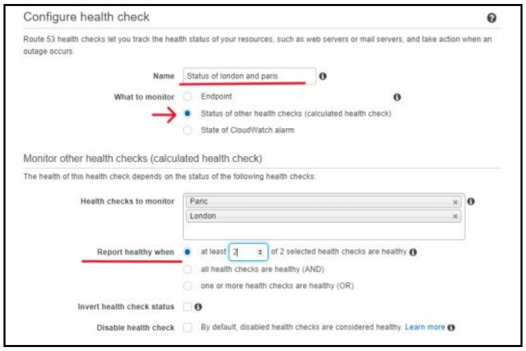
	Name	Status	Description	Alarms	ID
□	Paric	22 minutes ago 7 minutes ago Healthy	http://35.180.252.54:80/	No alarms configured.	caf78376-a1f7-4080-a954-b5758c604e48
☑	London	22 minutes ago 7 minutes ago Healthy	http://18.133.124.177:80/	✓ 1 of 1 in OK	d128490c-883e-439b-a3cd-68e0b4030456

● View current status ○ View last failed check

Health checker region	Health checker IP	Last checked	Status
Asia Pacific (Tokyo)	15.177.42.9	Mar 22, 2024 8:32:05 AM UTC	Success: HTTP Status Code 200, OK
Asia Pacific (Tokyo)	15.177.46.125	Mar 22, 2024 8:32:05 AM UTC	Success: HTTP Status Code 200, OK
Asia Pacific (Singapore)	15.177.50.74	Mar 22, 2024 8:32:11 AM UTC	Success: HTTP Status Code 200, OK
Asia Pacific (Sydney)	15.177.58.125	Mar 22, 2024 8:32:07 AM UTC	Success: HTTP Status Code 200, OK
Asia Pacific (Sydney)	15.177.62.26	Mar 22, 2024 8:32:08 AM UTC	Success: HTTP Status Code 200, OK
EU (Ireland)	15.177.38.36	Mar 22, 2024 8:32:05 AM UTC	Success: HTTP Status Code 200, OK
EU (Ireland)	15.177.34.208	Mar 22, 2024 8:32:04 AM UTC	Success: HTTP Status Code 200, OK
South America (São Paulo)	15.177.26.125	Mar 22, 2024 8:32:10 AM UTC	Success: HTTP Status Code 200, OK
South America (São Paulo)	15.177.30.121	Mar 22, 2024 8:32:08 AM UTC	Success: HTTP Status Code 200, OK
US East (N. Virginia)	15.177.2.127	Mar 22, 2024 8:32:05 AM UTC	Success: HTTP Status Code 200, OK
US East (N. Virginia)	15.177.6.229	Mar 22, 2024 8:32:04 AM UTC	Success: HTTP Status Code 200, OK

Step 3) ***Now we will create a Health Check for the status of other Health Checks.***

- ***Click on Create a Health check***
- ***Select the option Status of other Health Checks.***
- ***Select both health checks in the "Health Checks to Monitor" option.***
- ***Determine the method when this status reports healthy status, here we determining the report healthy, when both health checks are healthy, which means one of the health checks is the unhealthy status will unhealthy.***
- ***Click on the next button, select the alarm option yes or no, and click on the Create Health Check button.***



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: Status of london and paris

What to monitor:
○ Endpoint
● Status of other health checks (calculated health check)
○ State of CloudWatch alarm

Monitor other health checks (calculated health check)

The health of this health check depends on the status of the following health checks:

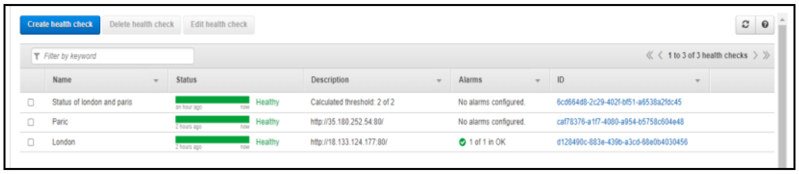
Health checks to monitor: Paric ×, London ×

Report healthy when:
● at least 2 of 2 selected health checks are healthy
○ all health checks are healthy (AND)
○ one or more health checks are healthy (OR)

Invert health check status □

Disable health check □ By default, disabled health checks are considered healthy. Learn more

Step 4) ***Now check the status of health checks***



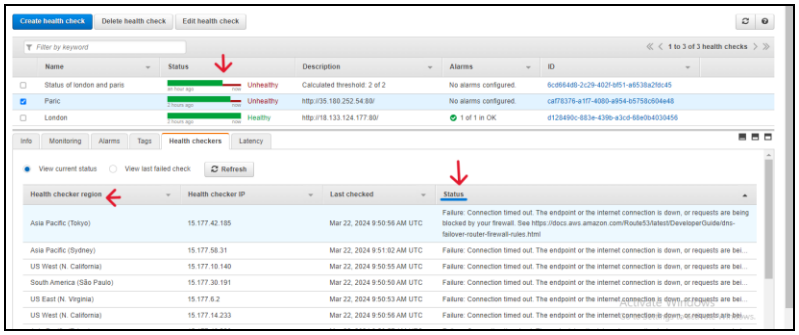
Create health check | Delete health check | Edit health check

Filter by keyword — 1 to 3 of 3 health checks

	Name	Status	Description	Alarms	ID
□	Status of london and paris	Healthy	Calculated threshold: 2 of 2	No alarms configured.	6cd664d8-2c29-402f-bf51-a6538a2fdc45
□	Paric	Healthy	http://35.180.252.54:80/	No alarms configured.	caf78376-a1f7-4080-a954-b5758c604e48
□	London	Healthy	http://18.133.124.177:80/	✓ 1 of 1 in OK	d128490c-883e-439b-a3cd-68e0b4030456

We can see here both region's Instances are healthy, that's why the "Status of London and Paris" health check is also healthy.

Step 5) ***Now stop the Paris Instance and then again check the health Status.***



Create health check | Delete health check | Edit health check

Filter by keyword — 1 to 3 of 3 health checks

	Name	Status	Description	Alarms	ID
□	Status of london and paris	Unhealthy	Calculated threshold: 2 of 2	No alarms configured.	6cd664d8-2c29-402f-bf51-a6538a2fdc45
☑	Paric	Unhealthy	http://35.180.252.54:80/	No alarms configured.	caf78376-a1f7-4080-a954-b5758c604e48
□	London	Healthy	http://18.133.124.177:80/	✓ 1 of 1 in OK	d128490c-883e-439b-a3cd-68e0b4030456

Info | Monitoring | Alarms | Tags | Health checkers | Latency

● View current status ○ View last failed check — Refresh

Health checker region	Health checker IP	Last checked	Status
Asia Pacific (Tokyo)	15.177.42.185	Mar 22, 2024 9:50:56 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are being blocked by your firewall. See https://docs.aws.amazon.com/Route53/latest/DeveloperGuide/dns-failover-router-firewall-rules.html
Asia Pacific (Sydney)	15.177.58.31	Mar 22, 2024 9:51:02 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are bei...
US West (N. California)	15.177.10.140	Mar 22, 2024 9:50:55 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are bei...
South America (São Paulo)	15.177.30.191	Mar 22, 2024 9:50:50 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are bei...
US East (N. Virginia)	15.177.6.2	Mar 22, 2024 9:50:53 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are bei...
US West (N. California)	15.177.14.233	Mar 22, 2024 9:50:56 AM UTC	Failure: Connection timed out. The endpoint or the internet connection is down, or requests are bei...

Here we can see the health status is unhealthy after stopping the Instance.

Route 53 Hosted Zone Routing Policy

A hosted zone routing policy is a configuration option within Amazon Route 53, which is a highly available and scalable cloud Domain Name System (DNS) web service provided by Amazon Web Services (AWS). Route 53 allows users to manage DNS routing for their domain names.

When you create a hosted zone in Route 53, you have the option to specify how DNS queries for your domain name are directed to your resources. The routing policy determines how Route 53 handles DNS queries based on factors like health checks, latency, geographic location, and weighted distribution.

types of routing policies available in Amazon Route 53:

1) ***Simple Routing:*** ***Simple routing associates a single resource (like a server) with a DNS record. It's straightforward and directs all traffic to the specified resource.***

   Example: ***You have a website hosted on a single server with the IP address 203.0.113.1. You create a DNS record that maps your domain name (example.com) to this IP address.***

2) ***Weighted Routing:*** ***Weighted routing allows you to distribute traffic among different resources based on assigned weights. This is useful for load balancing or A/B testing.***

   Example: ***You have two servers: Server A (203.0.113.1) and Server B (198.51.100.1). You assign 70% of the traffic to Server A and 30% to Server B.***

3) ***Latency-Based Routing:*** ***This routing policy directs users to the server with the lowest latency or shortest network path, improving website performance.***

   Example: ***Users in Asia are directed to a server located in Singapore, while users in North America are directed to a server located in the United States.***

4) ***Failover Routing:*** ***Failover routing sets up primary and secondary resources. If the primary resource becomes unavailable, traffic is automatically routed to the standby resource.***

   Example: ***Your primary website server is in Region A. You set up a backup server in Region B. If the primary server goes down, traffic is redirected to the backup server in Region B.***

5) ***Geolocation Routing:*** ***Geolocation routing directs users to different resources based on their geographic location. It's useful for serving region-specific content.***

Example: Users in Europe are directed to a server in Frankfurt, while users in South America are directed to a server in São Paulo.

6) ***Geoproximity Routing:*** ***Geoproximity routing considers both user location and resource location to direct traffic. It helps optimize routing based on proximity.***

   Example: ***Users in India are directed to the nearest server location, which might be in Mumbai or Chennai, depending on their actual location.***

7) ***IP-Based Routing:*** ***IP-based routing directs traffic based on the IP address of the DNS resolver. It's useful for directing traffic from specific networks or regions.***

   Example: ***Traffic from corporate offices with IP range 192.0.2.0/24 is directed to an internal server, while traffic from the public internet is directed to an external server.***

8) ***Multivalue Answer Routing:*** ***This routing policy returns multiple IP addresses in response to DNS queries, allowing for basic load balancing across multiple resources.***

   Example: ***You have three identical web servers hosting your website. With Multivalue Answer Routing, Route 53 can return the IP addresses of all three servers to DNS queries. When users access your website, their DNS resolver will randomly select one of these IP addresses, distributing the incoming traffic evenly across your servers and improving overall performance and reliability.***