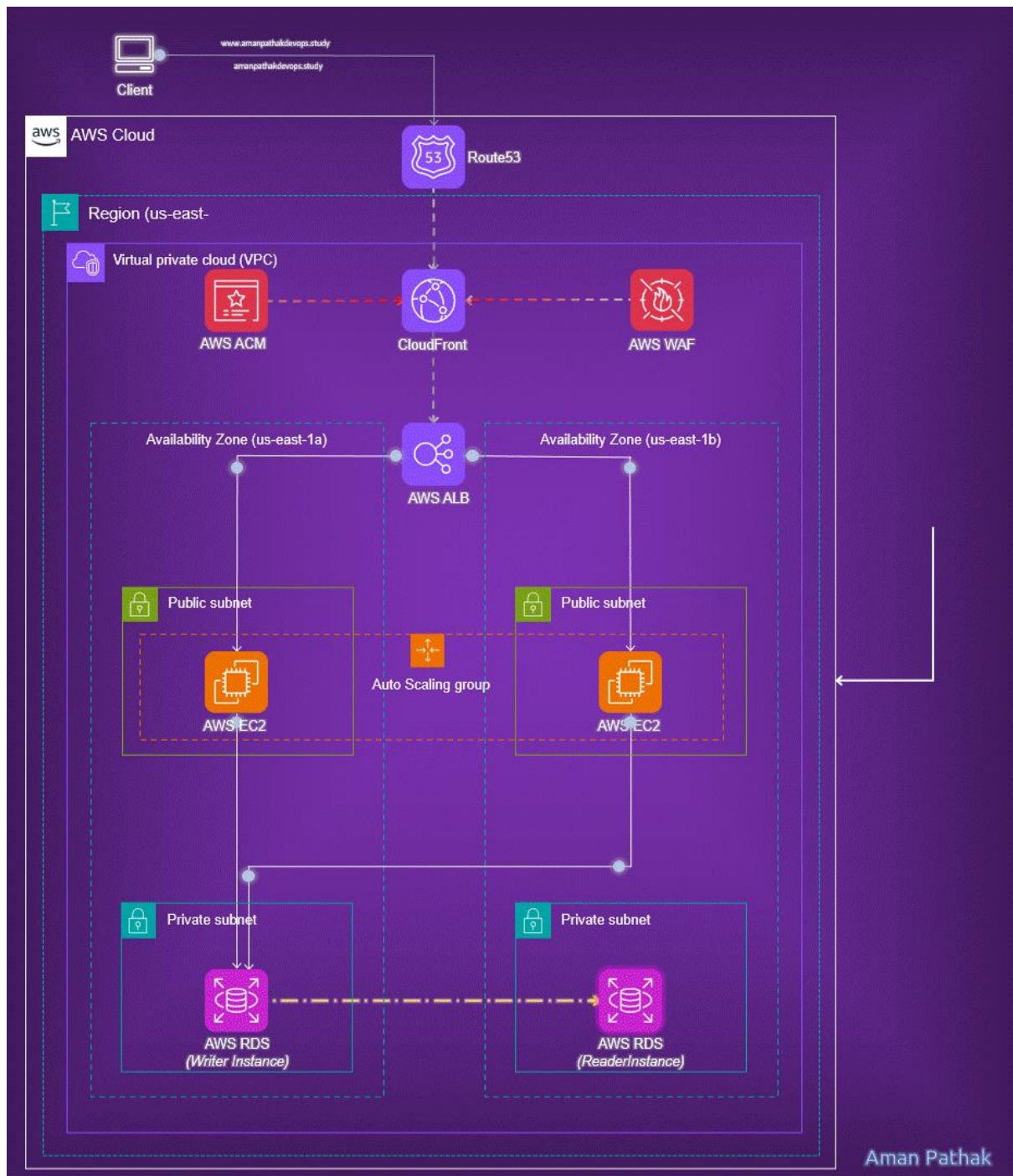


Deploy Two-Tier Architecture on AWS



Creating a Two-Tier architecture on AWS. We'll explore the essential services involved, ensuring high availability, security, and scalability for hosting a static website.

Also, we are adopting a modular approach with enhanced security measures. The infrastructure is organized into dedicated modules, ensuring a scalable, maintainable, and secure deployment

- Create an isolated network with the following components:
 - VPC
 - Subnets
 - Route Tables
 - Internet Gateway
 - NAT gateway
 - Security Groups
- Create VPC with CIDR Block range (10.0.0.0/16)

Your VPCs (1/2) [Info](#)

Last updated less than a minute ago [Refresh](#) [Actions](#) [Create VPC](#)

<input type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP
<input type="checkbox"/>	-	vpc-07afcdf9fb49e1aae	Available	172.31.0.0/16	-	do
<input checked="" type="checkbox"/>	Two-tier-project	vpc-09fb9cfdcdbf2701e	Available	10.0.0.0/16	-	do

- Create 4 subnet (2 Public subnets, 2 Private subnet)

[You have successfully created 1 subnet: subnet-0fa74f1dfb0bdebbb](#)

Subnets (4) [Info](#)

Last updated less than a minute ago [Refresh](#) [Actions](#) [Create subnet](#)

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	Private-subnet-1	subnet-0e93425190362fc7d	Available	vpc-09fb9cfdcdbf2701e Two-tier-project	10.0.10.0/24
<input type="checkbox"/>	Private-subnet-2	subnet-07116b52f51f4d17e	Available	vpc-09fb9cfdcdbf2701e Two-tier-project	10.0.20.0/24
<input type="checkbox"/>	Public-subnet-1	subnet-0354469df0866ac09	Available	vpc-09fb9cfdcdbf2701e Two-tier-project	10.0.30.0/24
<input type="checkbox"/>	Public-subnet-2	subnet-0fa74f1dfb0bdebbb	Available	vpc-09fb9cfdcdbf2701e Two-tier-project	10.0.0.0/24

- Create Internet gateway and attach to VPC

Internet gateways (1/1) Info					
<div> <input type="text" value="Search"/> </div> <div> < 1 > ⚙ </div>					
<input checked="" type="checkbox"/>	Name	Internet gateway ID	State	VPC ID	Owner
<input checked="" type="checkbox"/>	My-igw	igw-0c5cd91a9e551c21f	Attached	vpc-09fb9cfdccbf2701e Two-tier-project	97505007955

- Create Two route tables one for Public and Private subnets and add internet gateway to Public route table.

Route tables (2/3) Info						
<div> <input type="text" value="Find resources by attribute or tag"/> </div> <div> Last updated less than a minute ago ⌂ Actions ▾ Create route table </div> <div> < 1 > ⚙ </div>						
<input checked="" type="checkbox"/>	Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
<input checked="" type="checkbox"/>	Public-rt	rtb-0524a70e7ddf69e8f	2 subnets	–	Yes	vpc-09fb9cfdccbf2701e
<input type="checkbox"/>	–	rtb-0bace52a0d9b7a614	–	–	Yes	vpc-07afcdf9fb49e1aa
<input checked="" type="checkbox"/>	Private-rt	rtb-07ab36843f057e6e8	2 subnets	–	No	vpc-09fb9cfdccbf2701e

- Create Security Group, edit inbound rules with SSH and HTTP Port.

Security Groups (1) Info					
<div> <input type="text" value="Find resources by attribute or tag"/> </div> <div> two × Clear filters </div> <div> < 1 > ⚙ </div>					
<input type="checkbox"/>	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	–	sg-024d34b05fb39511f	Two-tier-project	vpc-09fb9cfdccbf2701e	Two-tier-

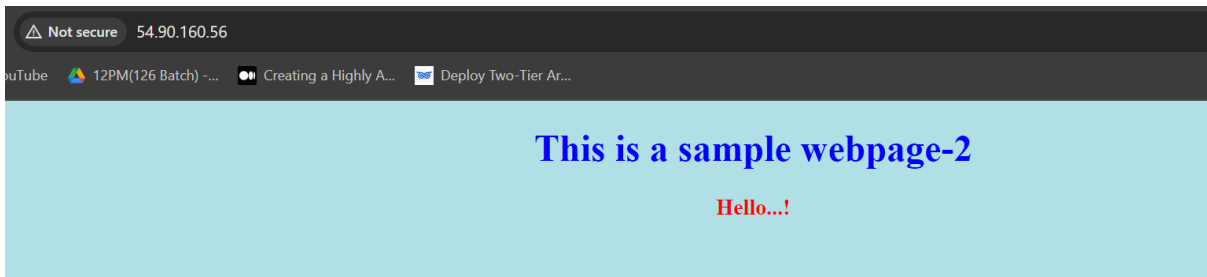
Inbound rules Info					
Type	Protocol	Port range	Source	Description - optional	
SSH	TCP	22	Anyw... <input type="text" value="0.0.0.0/0"/>	<input type="text"/>	Delete
HTTP	TCP	80	Anyw... <input type="text" value="0.0.0.0/0"/>	<input type="text"/>	Delete
HTTPS	TCP	443	Anyw... <input type="text" value="0.0.0.0/0"/>	<input type="text"/>	Delete
Add rule					

- Launch 2 Ec2 Web server and configure with Nginx.
- Create an sample Web Page in index.html

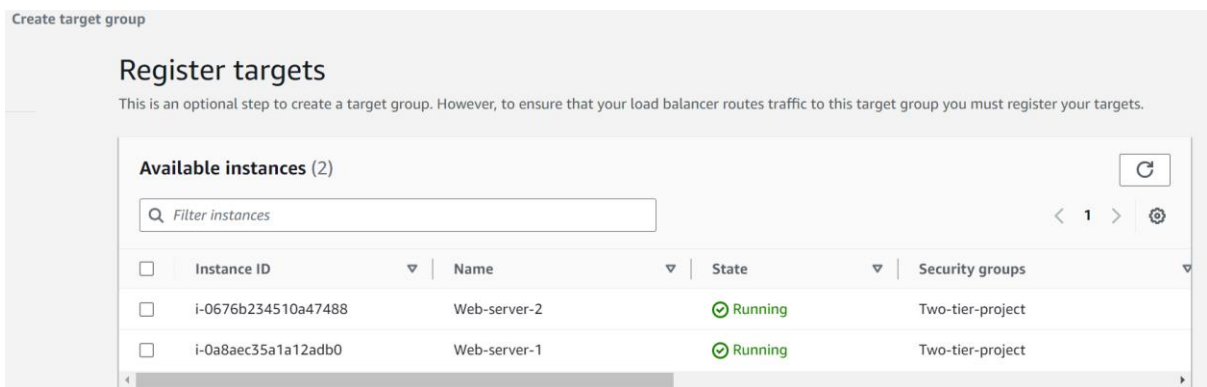
Webserver-1 :



Webserver-2 :



Create Application Load Balancer and add 2 ec2 instances in Target Group



Review targets

Targets (2)

Remove all pending

Filter targets

Show only pending

< 1 >

Instance ID	Name	Port	State	Security groups	Zone	Private IPv4 address	Sub
i-0676b234510a47488	Web-server-2	80	Running	Two-tier-project	us-east-1b	10.0.0.191	subr
i-0a8aec35a1a12adb0	Web-server-1	80	Running	Two-tier-project	us-east-1a	10.0.30.193	subr

2 pending

Cancel

Previous

Create target group

EC2 > Load balancers

Load balancers (1/1)

Actions

Create load balancer

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

< 1 >

	Name	DNS name	State	VPC ID	Availability Zones	Type
<input checked="" type="checkbox"/>	My-ALB	My-ALB-619697448.us-ea...	Provisioning.	vpc-09fb9cfdcbf2701e	2 Availability Zones	application

- Test Load Balancer with Load balancer DNS Name

The image shows two screenshots of a web browser. The top screenshot shows a webpage with the text "This is a sample webpage-1" in blue and "Hello...!" in red. The bottom screenshot shows a webpage with the text "This is a sample webpage-2" in blue and "Hello...!" in red. Both screenshots show the browser address bar with the URL "my-alb-619697448.us-east-1.elb.amazonaws.com".

- For Creation of Autoscaling we required Launch template.

Launch Templates (1/1) [Info](#) 🔄 Actions ▼ Create launch template

🔍 Search

<input checked="" type="checkbox"/>	Launch Template ID ▼	Launch Template Name ▼	Default Version ▼	Latest Version ▼	Create Time ▼	Created By ▼
<input checked="" type="checkbox"/>	lt-0f99810a17e1498fe	Web-template	1	1	2024-07-24T16:36:48.000Z	arn:aw...

[EC2](#) > Auto Scaling groups

Auto Scaling groups (1) [Info](#) 🔄 Launch configurations Launch templates ↗ Actions ▼ Create Auto Scaling group

🔍 Search your Auto Scaling groups

<input type="checkbox"/>	Name ▼	Launch template/configuration ↗ ▼	Instances ▼	Status ▼	Desired capacity ▼	Min
<input type="checkbox"/>	My-Test-Autoscaling	Web-template Version Default	2	-	2	1

Instances (4) [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 ▼	Instance type ▼	Status check	Alarm status	Availability Zone ▼	Public
<input type="checkbox"/>		i-0bfb6c65f0224fdc6f	Running 📄 🔍	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-
<input type="checkbox"/>		i-0648620a695baf73	Running 📄 🔍	t2.micro	2/2 checks passed	View alarms +	us-east-1b	-
<input type="checkbox"/>	Web-server-2	i-0676b234510a47488	Running 📄 🔍	t2.micro	2/2 checks passed	View alarms +	us-east-1b	-
<input type="checkbox"/>	Web-server-1	i-0a8aec35a1a12adb0	Running 📄 🔍	t2.micro	2/2 checks passed	View alarms +	us-east-1a	-

- Create RDS and attach 2 Ec2 instances to the RDS for database access

[RDS](#) > [Databases](#) > database-1

database-1 🔄 Modify Actions ▼

Related

🔍 Filter by databases < 1 > ⚙️

<input type="checkbox"/>	DB identifier ▲	Status ▼	Role ▼	Engine ▼	Region & AZ ▼	Size ▼
<input checked="" type="radio"/>	database-1	Modifying	Multi-AZ DB cluster	MySQL Community	us-east-1	3
<input type="radio"/>	database-1-instance-1	Modifying	Writer instance	MySQL Community	us-east-1d	db
<input type="radio"/>	database-1-instance-2	Configuring-enhanced-monitoring	Reader instance	MySQL Community	us-east-1a	db
<input type="radio"/>	database-1-instance-3	Configuring-enhanced-monitoring	Reader instance	MySQL Community	us-east-1f	db

- Tested writer instance in Public server

```
mysql> [root@ip-10-0-30-193 ~]# mysql -h database-1.cluster-cxm6w4oeu37.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 33
Server version: 8.0.35 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database rajesh;
Query OK, 1 row affected (0.00 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| rajesh |
| sys |
+-----+
5 rows in set (0.00 sec)

mysql> |
```

- Now connected to Reader instance and tried create database but it shows “—read-only” Option.

```
[root@ip-10-0-30-193 ~]# mysql -h database-1-instance-2.cxm6w4oeu37.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 58
Server version: 8.0.35 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| rajesh |
| sys |
| test |
+-----+
6 rows in set (0.01 sec)

mysql> create database test;
ERROR 1290 (HY000): The MySQL server is running with the --read-only option so it cannot execute this statement
mysql> |
```

- **Create Hostedzone in Route 53**

Route 53 > Hosted zones > rajeshweb.online

Public **rajeshweb.online** Info Delete zone Test record Configure query logging

► Hosted zone details Edit hosted zone

Records (2) DNSSEC signing Hosted zone tags (0)

Records (2) Info Refresh Delete record Import zone file Create record

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

Filter records by property or value Type Routing policy Alias < 1 > ⚙️

<input type="checkbox"/>	Record ... ▼	Type ▼	Routin... ▼	Differ... ▼	Alias ▼	Value/Route traffic to ▼	TTL (s... ▼	Health ... ▼
<input type="checkbox"/>	rajeshweb...	NS	Simple	-	No	ns-1085.awsdns-07.org. ns-1743.awsdns-25.co.uk. ns-974.awsdns-57.net. ns-239.awsdns-29.com.	172800	-
<input type="checkbox"/>	rajeshweb...	SOA	Simple	-	No	ns-1085.awsdns-07.org. aws...	900	-

Route 53 > Hosted zones > rajeshweb.online > Create record

Create record Info

Quick create record [Switch to wizard](#)

▼ Record 1 Delete

Record name Info rajeshweb.online Record type Info A – Routes traffic to an IPv4 address and some AWS resources

Keep blank to create a record for the root domain.

☒ Alias

Route traffic to Info

Alias to Application and Classic Load Balancer ▼

US East (N. Virginia) ▼

X

Alias hosted zone ID: Z35SXDOTRQ7X7K

Routing policy Info Simple routing ▼ Evaluate target health ☒ Yes

- **Configure Nameservers in Domain purchased website**
- **I have purchued domain in Godaddy.**
- **So editing my own Nameservers in Godaddy website.**

< [Domain Portfolio](#)

rajeshweb.online

[Overview](#) [DNS](#) [Products](#)

[DNS Records](#) [Forwarding](#) [Nameservers](#) [Premium DNS](#) [Hostnames](#) [DS Records](#)

Nameservers determine where your DNS is hosted and where you add, edit or delete your DNS records.

Using custom nameservers

[Change Nameservers](#)

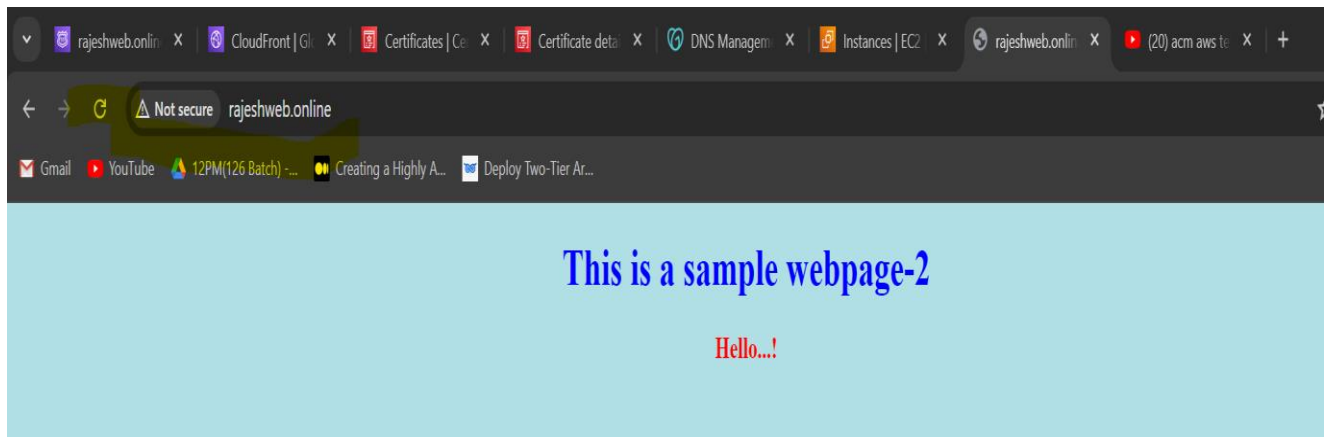
Nameservers [?](#)

ns-1701.awsdns-20.co.uk

ns-1168.awsdns-18.org

ns-745.awsdns-29.net

ns-343.awsdns-42.com



- In order to secure a webpage we required SSL/TLS Certificates in ACM
- Create Amazon Certificate Manager(ACM) and attach to Cloud Front

[AWS Certificate Manager](#) > Certificates

Certificates (1)

↻

Delete

Manage expiry events

Import

Request

<

1

>

⚙

	Domain name	Type	Status	In use	Renewal eligibility	Key algorithm
	rajeshweb.online	Amazon Issued	Issued	No	Ineligible	RSA 2048

- Creating Cloud Front and configuring

[CloudFront](#) > [Distributions](#) > Create

Create distribution

Origin

Origin domain

Choose an AWS origin, or enter your origin's domain name.

🔍

my-alb-619697448.us-east-1.elb.amazonaws.com

✕

Protocol

Info

☒ HTTP only

☐ HTTPS only

☐ Match viewer

HTTP port

Enter your origin's HTTP port. The default is port 80.

80

Origin path - optional

Enter a URL path to append to the origin domain name for origin requests.

/rajeshweb.online

Default cache behavior

Path pattern [Info](#)

Default (*)

Compress objects automatically [Info](#)

- ☐ No
- ☒ Yes

Viewer

Viewer protocol policy

- ☐ HTTP and HTTPS
- ☒ Redirect HTTP to HTTPS
- ☐ HTTPS only

Allowed HTTP methods

- ☐ GET, HEAD
- ☐ GET, HEAD, OPTIONS
- ☒ GET, HEAD, OPTIONS, PUT, POST, PATCH, DELETE

Cache HTTP methods

GET and HEAD methods are cached by default.

- ☐ OPTIONS

Cache key and origin requests

We recommend using a cache policy and origin request policy to control the cache key and origin requests.

- ☒ Cache policy and origin request policy (recommended)
- ☐ Legacy cache settings

Cache policy

Choose an existing cache policy or create a new one.

UseOriginCacheControlHeaders **Recommended for Elastic Load Balancing** ▼
Policy for origins that return Cache-Control headers. Query strings are not included in the ...



[Create cache policy](#) [View policy](#)

Origin request policy - optional

Choose an existing origin request policy or create a new one.

AllViewer **Recommended for Elastic Load Balancing** ▼
Policy to forward all parameters in viewer requests



[Create origin request policy](#) [View policy](#)



If your application serves different content based on query string values

Select the UseOriginCacheHeaders-QueryString managed cache policy.
This includes the query strings in your cache key.

An example use case is an ID parameter in the query string that your application uses to decide which content to display (/articles?id=10).

[Update my cache policy](#)

Response headers policy - optional

Web Application Firewall (WAF) [Info](#)

☒ Enable security protections

Keep your application secure from the most common web threats and security vulnerabilities using AWS WAF. Blocked requests are stopped before they reach your web servers.

☐ Do not enable security protections

Select this option if your application does not need security protections from AWS WAF.

☐ Use monitor mode

Count how many of your requests would be blocked by this WAF configuration. When ready, you can disable monitor mode to begin blocking requests.

Price class [Info](#)

Choose the price class associated with the maximum price that you want to pay.

- ☒ Use all edge locations (best performance)
- ☐ Use only North America and Europe
- ☐ Use North America, Europe, Asia, Middle East, and Africa

Alternate domain name (CNAME) - *optional*

Add the custom domain names that you use in URLs for the files served by this distribution.

[Add item](#)

[i](#) To add a list of alternative domain names, use the [bulk editor](#).

Custom SSL certificate - *optional*

Associate a certificate from AWS Certificate Manager. The certificate must be in the US East (N. Virginia) Region (us-east-1).

rajeshweb.online (20ad4db5-c9f4-4db4-a351-bfd2d4c56f7a) ▼



☒ rajeshweb.online [Request certificate](#)

Legacy clients support - \$600/month prorated charge applies. Most customers do not need this.
CloudFront allocates dedicated IP addresses at each CloudFront edge location to serve your content over HTTPS.

☐ Enabled

Security policy

The security policy determines the SSL or TLS protocol and the specific ciphers that CloudFront uses for HTTPS connections v
viewers (clients).

☒ TLSv1.2_2021 (recommended)

☐ TLSv1.2_2010

[CloudFront](#) > Distributions

Distributions (3) [Info](#)

< 1 >

☒

ID

☐

Description

☐

Type

☐

Domain name

☐

Alternate do...

☐

Origins

☐

Status

☐

Last modified

☒

E3R18S1X0JZWEA

-

Production

d37p7v3bv1o7...

rajeshweb.online

my-alb-619697448.u

☒

Enabled

☐

Deploying

- Create a record in Route 53 add Cloud front in record.

Create record [Info](#)

Quick create record

[Switch to wizard](#)

▼ Record 1

Delete

Record name [Info](#)

subdomain

rajeshweb.online

Keep blank to create a record for the root domain.

Record type [Info](#)

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

☒ Alias

Route traffic to [Info](#)

Alias to CloudFront distribution

US East (N. Virginia)

An alias to a CloudFront distribution and another record in the same hosted zone are global and available only in US East (N. Virginia).

Q d37p7v3bv1o72r.cloudfront.net

Routing policy [Info](#)

Simple routing

Evaluate target health

☐ No

Records (4)

[DNSSEC signing](#)

Hosted zone tags (0)

Records (4) [Info](#)



Delete record

Import zone file

Create record

Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings.

Q Filter records by property or value

Type ▼

Routing policy ▼

Alias ▼

< 1 >



<input type="checkbox"/>	Record ... ▼	Type ▼	Routin... ▼	Differ... ▼	Alias ▼	Value/Route traffic to ▼	TTL (s... ▼	Health ...
<input type="checkbox"/>	rajeshweb...	A	Simple	-	Yes	d37p7v3bv1o72r.cloudfront....	-	-
<input type="checkbox"/>	rajeshweb...	NS	Simple	-	No	ns-1085.awsdns-07.org. ns-1743.awsdns-25.co.uk. ns-974.awsdns-57.net. ns-239.awsdns-29.com.	172800	-
<input type="checkbox"/>	rajeshweb...	SOA	Simple	-	No	ns-1085.awsdns-07.org. aws...	900	-
<input type="checkbox"/>	_a6afc1ff...	CNAME	Simple	-	No	_c82b48ae44bc9eb9ec8a97...	300	-

- Test the out with our own DNS Name.
My Domain name is rajeshweb.online

