Deploying a Secure Static Website on AWS with WAF Protection

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1 Introduction

This document outlines the step-by-step process of deploying a secure static website on AWS using Amazon S3, Route 53, CloudFront, and AWS WAF. Screenshots are included to illustrate each stage of the deployment.
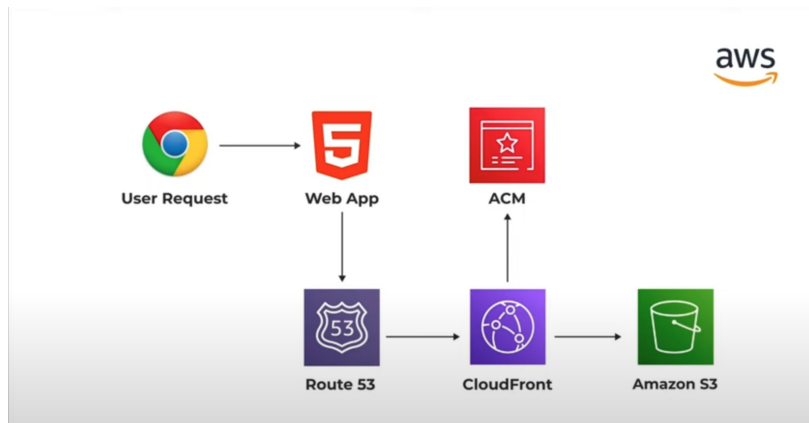

Figure 1: Project skeleton and tools used.

2 Setting Up Route 53

What is Route 53?

- A scalable DNS and domain name registration service.

- Allows the creation of endpoints for routing user requests to specific applications.

3 Enabling CloudFront with HTTPS

3.1 Why CloudFront?

- Enables HTTPS with caching for better security and performance.

- Requires an SSL/TLS certificate from Amazon Certificate Manager (ACM).

3.2   Requesting an SSL Certificate

1. Navigate to **Certificate Manager** in AWS.

2. Request a public certificate using DNS validation.

3. Use RSA 2048-bit encryption for security.

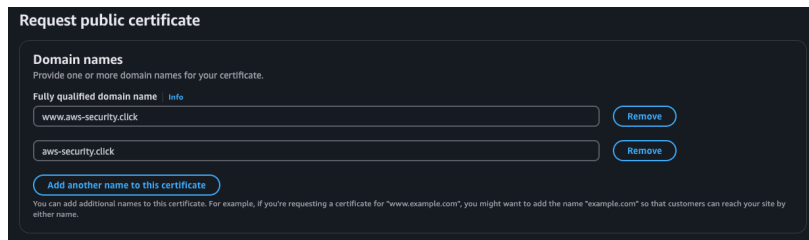4. Once validated, create DNS records in Route 53 by clicking the automated option in ACM.

Figure 2: SSL Certificate request process in ACM.

4   Configuring CloudFront

1. Navigate to CloudFront and create a new distribution.

2. Set the **Origin Domain** by copying the "Static Website Hosting" endpoint from S3.

3. Under **Viewer Protocol Policy**, select **Redirect HTTP to HTTPS**.

4. In **Custom SSL Certificate**, choose the previously created certificate.

5. Under **Alternative Domain Name (CNAME)**, enter the **www** version of your static site.

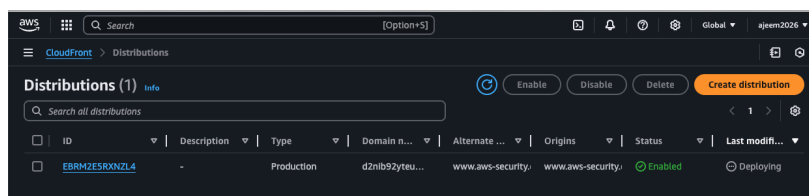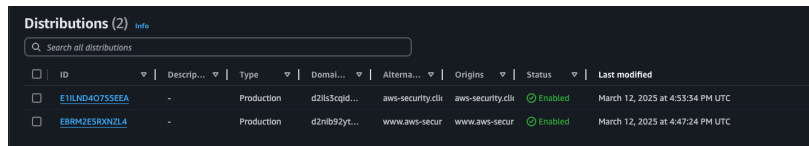6. Enable **AWS WAF** for additional security.

Figure 3: CloudFront distribution setup with HTTPS.

5   Creating Non-WWW Distribution

1. Repeat the CloudFront setup process for the non-www version of the website.

2. Now, both www and non-www versions have distributions.

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Figure 4: CloudFront distributions for both www and non-www versions.
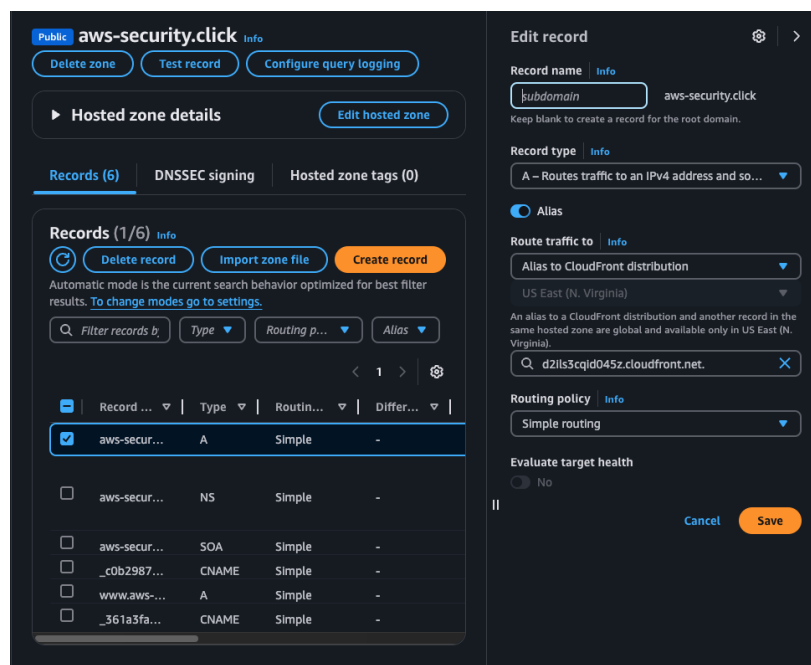
6 Final Configurations: Securing with HTTPS and Updating Route 53

6.1 Enforcing HTTPS in S3

1. Navigate to S3 and edit the **Static Website Hosting** settings.

2. Change the protocol from HTTP to HTTPS.

6.2 Updating Route 53 Records

1. Find the two CNAME records in Route 53.

2. Locate the **A** record and edit it.

3. Change **Route traffic to** from **Alias to S3 website endpoint** to **Alias to CloudFront distribution**.

4. Select the correct distribution from the system-suggested options. Repeat this process for other.

Figure 5: Updating Route 53 records to point to CloudFront.

7   Conclusion

By following these steps, I have successfully deployed a secure static website using AWS S3, Route 53, CloudFront, and AWS WAF. This setup ensures:

- Secure HTTPS access using CloudFront and ACM.

- Optimized routing via Route 53.

- Protection against threats with AWS WAF.

This project showcases my ability to architect, deploy, and secure cloud-based applications, demonstrating my expertise in AWS infrastructure and security.