Hosting a Website on AWS

To host a static website on AWS, you will primarily use the following services:

1. **Amazon S3 (Simple Storage Service)**:
    - **Purpose**: Store and serve static website files.
    - **Features Used**: Buckets, Static Website Hosting, Bucket Policies.
2. **Amazon Route 53** (optional but recommended for custom domains):
    - **Purpose**: Manage domain name system (DNS) settings to point your domain to the S3 bucket.
    - **Features Used**: Hosted Zones, DNS Records, Domain Registration.
3. **AWS CloudFront**:
    - **Purpose**: Content delivery network (CDN) to distribute your website globally with low latency.
    - **Features Used**: Distributions, Caching, SSL/TLS.
4. **AWS Certificate Manager (ACM)**:
    - **Purpose**: Provision SSL/TLS certificates for your domain to enable HTTPS.
    - **Features Used**: Certificate Requests, Validation.

S3 Buckets

1: Create the S3 Buckets

1. **Log in to AWS Management Console.**
2. **Navigate to the S3 service.**
3. **Create the first bucket: example.com**
    - Click on **"Create bucket"**.
    - Enter example.com as the Bucket name.
    - Choose the AWS Region.
    - Click **"Create bucket"**.
4. **Create the second bucket: www.example.com**
    - Click on **"Create bucket"**.
    - Enter www.example.com as the Bucket name.
    - Choose the same AWS Region as the first bucket.
    - Click **"Create bucket"**.

2: Configure example.com Bucket to Redirect to example.com

1. **Open the example.com bucket.**
2. **Go to the "Properties" tab.**
3. **In the Bucket Versioning section, click on Edit and enable Versioning.**
4. **Scroll down to the "Static website hosting" section.**
5. **Select "Redirect requests".**
6. **Set the target bucket or domain:**
    - **Target bucket or domain:** www.example.com
    - **Protocol:** http
7. **Go to “Permission” tab**
8. **In the Block public access (bucket settings) section, click on Edit, uncheck all options, and then click Save changes.**
9. **Click "Save".**

3: Enable Static Website Hosting on www.example.com

1. **Open the www.example.com bucket.**
2. **Go to the "Properties" tab.**
3. **In the Bucket Versioning section, click on Edit and enable Versioning, and then click Save changes.**
4. **Scroll down to the "Static website hosting" section.**
5. **Select "Enable".**
6. **Specify the index document:**
    - **Index document:** index.html
    - Optionally, you can also specify an error document.
7. **In the Block public access (bucket settings) section, click on Edit, uncheck all options, and then click Save changes.**
8. **Click "Save".**

(Note: You need to upload Files in www.example.com S3 Bucket)

Buy a Domain from GoDaddy

1. **Go to the GoDaddy website.**
2. **Search for your desired domain name in the search bar.**
3. **Select the domain you want to purchase and add it to your cart.**
4. **Complete the checkout process by providing your payment details and confirming the purchase.**
5. **Log in to your GoDaddy account and go to the "My Products" section to view your purchased domain.**

AWS Route 53

1: Create a Hosted Zone in AWS Route 53

1. **Log in to the AWS Management Console.**
2. **Navigate to the Route 53 service.**
3. **In the Route 53 dashboard, click on "Hosted zones".**
4. **Click on "Create hosted zone".**
    - **Domain name:** Enter your domain name (e.g., example.com).
    - **Type:** Public hosted zone.
    - **Click "Create hosted zone".**

2: Update GoDaddy DNS Settings to Use Route 53

1. **In the Route 53 dashboard, click on your newly created hosted zone.**
2. **Take note of the four nameservers listed in the "Hosted zone details" (e.g., ns-123.awsdns-45.net, ns-234.awsdns-56.org, etc.).**
3. **Log in to your GoDaddy account and go to the "My Products" section.**
4. **Click on "DNS" next to your domain name.**
5. **In the DNS Management section, scroll down to the "Nameservers" section and click on "Change".**
6. **Select "Enter my own nameservers (advanced)" and enter the four nameservers provided by Route 53.**
7. **Click "Save" to update your domain's nameservers.**

Certificate Manager (SSL Certificate)

1: Open AWS Certificate Manager

1. **Log in to the AWS Management Console.**
2. **Navigate to the Certificate Manager (ACM) service.**

2: Request a Public Certificate

1. **In the ACM dashboard, click on "Request a certificate".**
2. **Select "Request a public certificate" and click "Next".**

3: Add Domain Names

1. **Add the domain names you want to include in the certificate:**
   - **Domain name:** example.com
   - **Additional names to add:** www.example.com
2. **Click "Next".**

4: Validate the Domain Names

1. **Choose the validation method:**
   - **DNS validation:** Recommended, as it is simpler and automated.
   - **Email validation:** Requires you to manually approve via email.
2. **Select DNS validation and click "Next".**

5: Review and Request

1. **Review your request details and click "Confirm and request".**

6: Add CNAME Records to Your DNS

1. **After submitting the request, ACM will provide CNAME records for DNS validation.**

2. **Log in to your DNS provider (e.g., GoDaddy for domain purchased from GoDaddy, or Route 53 if using AWS).**
3. **Add the provided CNAME records to your DNS configuration:**
    - **Name:** The CNAME record name provided by ACM.
    - **Value:** The CNAME record value provided by ACM.

If you are using Route 53, you can use the following steps:

3. **Go to Route 53 in the AWS Management Console.**
4. **Navigate to the "Hosted zones" section.**
5. **Select your hosted zone for example.com.**
6. **Click on "Create record".**
7. **Select "CNAME" as the record type.**
8. **Enter the details provided by ACM.**
9. **Click "Create records".**

7: Validate and Use the Certificate

1. **Wait for the DNS changes to propagate and ACM to validate the domain ownership. This can take a few minutes to several hours.**
2. **Once validated, the certificate status in ACM will change to "Issued".**

CloudFront

1: Create a CloudFront Distribution

1. **Log in to the AWS Management Console.**
2. **Navigate to the CloudFront service.**
3. **Click on "Create Distribution".**

2: Configure the CloudFront Distribution

1. **Origin Settings:**
    - **Origin Domain Name:** Select your S3 bucket (e.g., www.example.com.s3.amazonaws.com).
    - **Origin Path:** Leave blank.
    - **Origin ID:** Automatically filled, but you can customize it.
    - **Restrict Bucket Access:** Yes.
    - **Origin Access Identity:** Create a new identity.
    - **Grant Read Permissions on Bucket:** Yes, Update Bucket Policy.
2. **Default Cache Behavior Settings:**
    - **Viewer Protocol Policy:** Redirect HTTP to HTTPS (for better security).
    - **Allowed HTTP Methods:** GET, HEAD (default).
3. **Distribution Settings:**
    - **Price Class:** Use the default or select the desired price class.
    - **Alternate Domain Names (CNAMEs):** Add your domain names (www.example.com).
    - **SSL Certificate:** Choose "Custom SSL Certificate" and select your ACM certificate.
4. **Default root object** - Index.html
5. **Click "Create Distribution".**

3: Update S3 Bucket Policy for CloudFront Access

AWS CloudFront can automatically update the bucket policy when you create the distribution with restricted bucket access. However, you might need to manually verify and update the bucket policy to ensure it grants CloudFront the necessary permissions.

1. **Open the S3 service in the AWS Management Console.**
2. **Select the bucket (e.g., example.com).**
3. **Go to the "Permissions" tab.**
4. **In the "Bucket Policy" section, click "Edit".**
5. **Ensure the bucket policy includes the CloudFront Origin Access Identity (OAI) permissions:**

json

```
{
  "Version": "2012-10-17",
  "Id": "PolicyForCloudFrontPrivateContent",
  "Statement": [
    {
      "Sid": "GrantCloudFrontAccess",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::cloudfront:user/CloudFront Origin Access
Identity YOUR_OAI_ID"
      },
      "Action": "s3:GetObject",
      "Resource": "arn:aws:s3:::example.com/*"
    }
  ]
}
```

Replace YOUR_OAI_ID with the actual OAI ID created by CloudFront.

4: Configure DNS Settings

Update your DNS settings to point your domain to the CloudFront distribution.

1. **Go to Route 53 in the AWS Management Console.**
2. **Select your hosted zone for example.com.**
3. **Create an A record for example.com:**
    - **Record name:** Leave blank (represents the root domain example.com).
    - **Record type:** A (Alias).
    - **Alias target:** Select the CloudFront distribution.
    - **Click "Create records".**

Create one more CloudFront Distribution

1. **Origin Settings:**
    - **Origin Domain Name:** (To set up a redirect from a domain name to an S3 bucket named "example.com", navigate to the Permissions tab of the bucket in S3. Scroll down to the Static Website Hosting section, then copy the redirect link provided and use it in the domain name configuration.)
    - **Origin Path:** Leave blank.
    - **Origin ID:** Automatically filled, but you can customize it.
    - **Restrict Bucket Access:** No.
    - **Origin Protocol Policy:** HTTP Only.
2. **Default Cache Behavior Settings:**
    - **Viewer Protocol Policy:** Redirect HTTP to HTTPS.
    - **Allowed HTTP Methods:** GET, HEAD (default).
    - **Cache policy and origin request policy:** CachingDisabled
3. **Distribution Settings:**
    - **Alternate Domain Names (CNAMEs):** Add example.com.

- **SSL Certificate:** Choose "Custom SSL Certificate" and select your ACM certificate that includes example.com and www.example.com.

4. **Click "Create Distribution".**

5: Update DNS Settings to Point to CloudFront

1. **Go to Route 53 in the AWS Management Console.**
2. **Select your hosted zone for example.com.**
3. **Create an A record for example.com:**
   - **Record name:** Leave blank (represents the root domain example.com).
   - **Record type:** A (Alias).
   - **Alias target:** Select the CloudFront distribution you just created.
   - **Click "Create records".**

Final Verification:

1. **Static Website Hosting Link (S3)**:
   - URL: http://<bucket-name>.s3-website-<AWS-region>.amazonaws.com
   - Example: http://example-bucket.s3-website-us-west-2.amazonaws.com
2. **CloudFront Distribution Link**:
   - URL: https://<distribution-id>.cloudfront.net
   - Example: https://d123456789abcdef.cloudfront.net
3. **Domain Name**:
   - URL: https://<your-domain-name>
   - Example: https://www.example.com