

Advance DevOps Practical Examination Case Study

Assignment & Guidelines

1. Introduction

- **Case Study Overview:**

This case study focuses on deploying a simple HTML page to an AWS S3 bucket for static website hosting, with an EC2 instance set up as a backup server. The project demonstrates a cloud-based deployment pipeline using AWS Cloud9, S3, and EC2, ensuring high availability and redundancy.

- **Key Feature and Application:**

The key feature is the **static website hosting** on S3, which provides a cost-effective and scalable method for hosting static websites. Additionally, the **EC2 instance** acts as a backup server, ensuring website availability if S3 fails. This approach showcases the practical use of cloud infrastructure to achieve resilience in web hosting.

2. Step-by-Step Explanation

- **Step 1: Set Up AWS Cloud9 Environment**

- **Configuration:** In the AWS Management Console, search for **Cloud9**, and create a new environment.
 - Choose an EC2 instance with default settings (such as t2.micro for free-tier).
 - Name your environment and launch it.

Create environment [Info](#)

Details

Name

casestudy

Limit of 60 characters, alphanumeric, and unique per user.

Description - *optional*

Limit 200 characters.

Environment type [Info](#)

Determines what the Cloud9 IDE will run on.

☒ New EC2 instance

Cloud9 creates an EC2 instance in your account. The configuration of your EC2 instance cannot be changed by Cloud9 after creation.

☐ Existing compute

You have an existing instance or server that you'd like to use.

New EC2 instance

Instance type [Info](#)

The memory and CPU of the EC2 instance that will be created for Cloud9 to run on.

☒ t2.micro (1 GiB RAM + 1 vCPU)

Free-tier eligible. Ideal for educational users and exploration.

☐ t3.small (2 GiB RAM + 2 vCPU)

Recommended for small web projects.

☐ m5.large (8 GiB RAM + 2 vCPU)

Recommended for production and most general-purpose

This will be installed on your EC2 instance. We recommend Amazon Linux 2023.

Amazon Linux 2023

Timeout

How long Cloud9 can be inactive (no user input) before auto-hibernating. This helps prevent unnecessary charges.

30 minutes

Network settings [Info](#)

Connection

How your environment is accessed.

☐ AWS Systems Manager (SSM)

Accesses environment via SSM without opening inbound ports (no ingress).

☒ Secure Shell (SSH)

Accesses environment directly via SSH, opens inbound ports.

► VPC settings [Info](#)

► Tags - *optional* [Info](#)

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

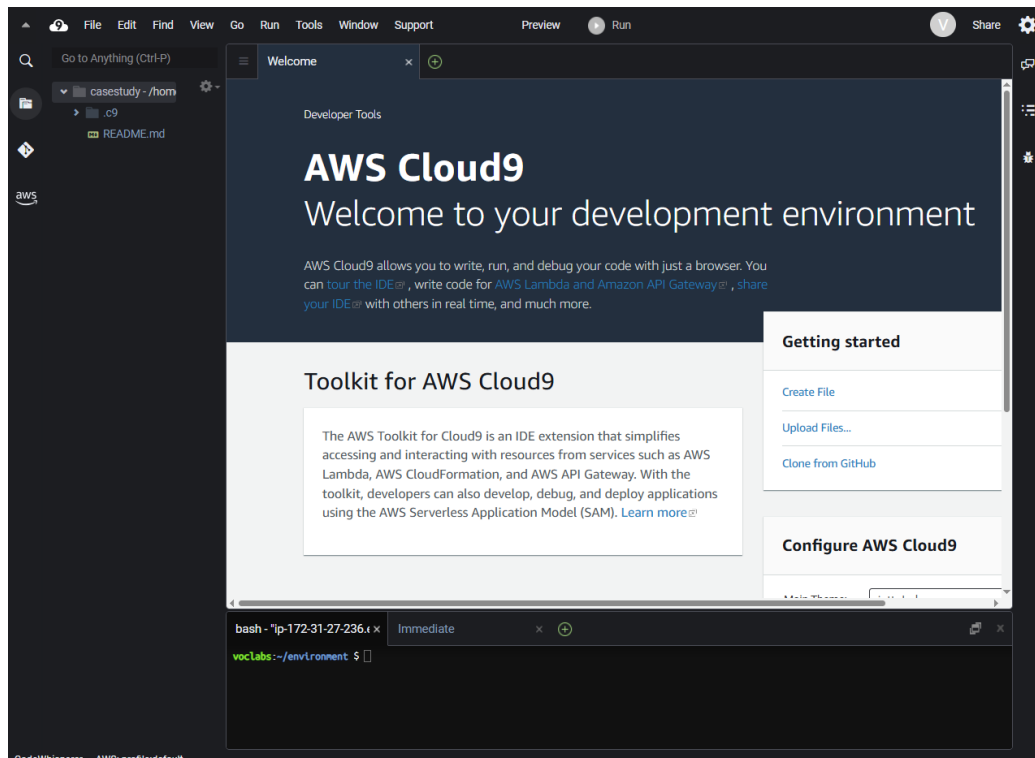


The following IAM resources will be created in your account

- **AWSServiceRoleForAWSCloud9** - AWS Cloud9 creates a service-linked role for you. This allows AWS Cloud9 to call other AWS services on your behalf. You can delete the role from the AWS IAM console once you no longer have any AWS Cloud9 environments. [Learn more](#)

Cancel

Create



- **Write the HTML Page:** In the Cloud9 IDE, create an index.html file with simple content.
Example:

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
  <meta charset="UTF-8">
```

```
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```
<link rel="icon" type="image/x-icon"
```

```
href="https://cdn.shopify.com/s/files/1/0151/1081/products/T-SHIRT-LOGO-TEMPLATES-16_2000x.jpg?v=1525930883">
```

```
  <title>T-shirt Website</title>
```

```
</head>
```

```
<body>
```

```
<figure>
```

```
  
```

```
  </figure>
```

```
</div>
```

```
<hr>
<marquee bgcolor ="aqua" height ="20px">50% off on any t-shirt</marquee>
<br>
<hr>
<section>
<h1 align="center"> Single Colour</h1>
<div>
<center>
<form action="/" method="post">
<fieldset>
<fieldset>
<legend><b><i>Order Details</i></b></legend>
<label for="tagline">Tagline on the Shirt:</label>
<input type="text" id="tagline" name="tagline" required placeholder="Enter your
tagline"><br><br>

<label for="color">Color:</label>
<select id="color" name="color" >
<option value="Default"> White </option>
<option value="Blue"> Blue </option>
<option value="Red"> Red </option>
<option value="Black "> Black </option>
<option value="Grey"> Grey </option>
<option value="Yellow"> Yellow </option>
<option value="Green"> Green </option>
<option value="Pink"> Pink </option>
</select><br><br>

<label for="size">Size:</label>
<select id="size" name="size" required>
<option value=" XS "> XS </option>
```

```
<option value=" S "> S </option>
<option value=" M "> M </option>
<option value=" L "> L </option>
<option value=" XL "> XL </option>
<option value=" XXL "> XXL </option>
</select><br><br>
```

```
<label for="quantity">Quantity:</label>
<input type="number" id="quantity" name="quantity" min="1" required><br><br>
```

```
<label for="deliveryDate">Delivery Date:</label>
<input type="date" id="deliveryDate" name="deliveryDate" required><br><br>
</fieldset>
```

```
<fieldset>
<legend><strong><em>Delivery Details</em></strong></legend>
<label for="Name">Name:</label>
<kbd>
<input type="text" id="Name" name="Name" required></kbd><br><br>
```

```
<label for="address">Address:</label>
<textarea id="address" name="address" rows="4" cols="30"required placeholder="Enter
recipient's address"></textarea><br><br>
```

```
<label for="email">Email:</label>
<input type="email" id="email" name="email" placeholder="enter your email address"
required><br><br>
```

```
<label for="phone">Phone Number:</label>
<input type="tel" id="phone" name="phone" required><br><br>
</fieldset>
```

```
<fieldset>

    <legend>Additional Comments</legend>

<label for="Comments">Additional Comments:</label>

    <textarea id="comments" name="comments" rows="4" cols="28" placeholder="Any
special instructions or comments"></textarea>

</fieldset>

</fieldset>

<button type="submit">Place Order</button>

<input type="reset" value="Reset">

</form>
```

```
</div>

</center>

</div>

</section>

<section class="multi">

<h1>Multi-colour</h1>

<div>

<form action="/" method="post">

    <fieldset>

        <legend>Select Colors:</legend>

        <label>

            <input type="checkbox" name="colors" value="red"> Red

        </label>

        <label>

            <input type="checkbox" name="colors" value="blue"> Blue

        </label>

        <label>

            <input type="checkbox" name="colors" value="green"> Green

        </label>
```

```
</fieldset>

<button type="submit">Submit</button>

</form>
</div>
</section>
<footer>
<table width = "100%">
  <tr>
    <td>
      <table width="100%">
        <tr>
          <td>
            <h2>Address</h2>
            <h4><address>
              Hashu Advani Shopping Complex,<br>
              Collector's Colony <br>
              Chembur, Mumbai, Maharashtra <br>
              400074
            </address>
          </h4>
        </td>
      </tr>
    </table>
  </td>

  <td>
    <table width="100%">
      <tr>
        <td>
          <h2>Social links</h2>
          <h4>
```

```

<a href="">Facebook</a><br>

<a href="">Twitter</a><br>

<a href="">Instagram</a><br>

<a href="">LinkedIn</a>

</h4>

</td>

</tr>

</table>

</td>

</tr>

</table>

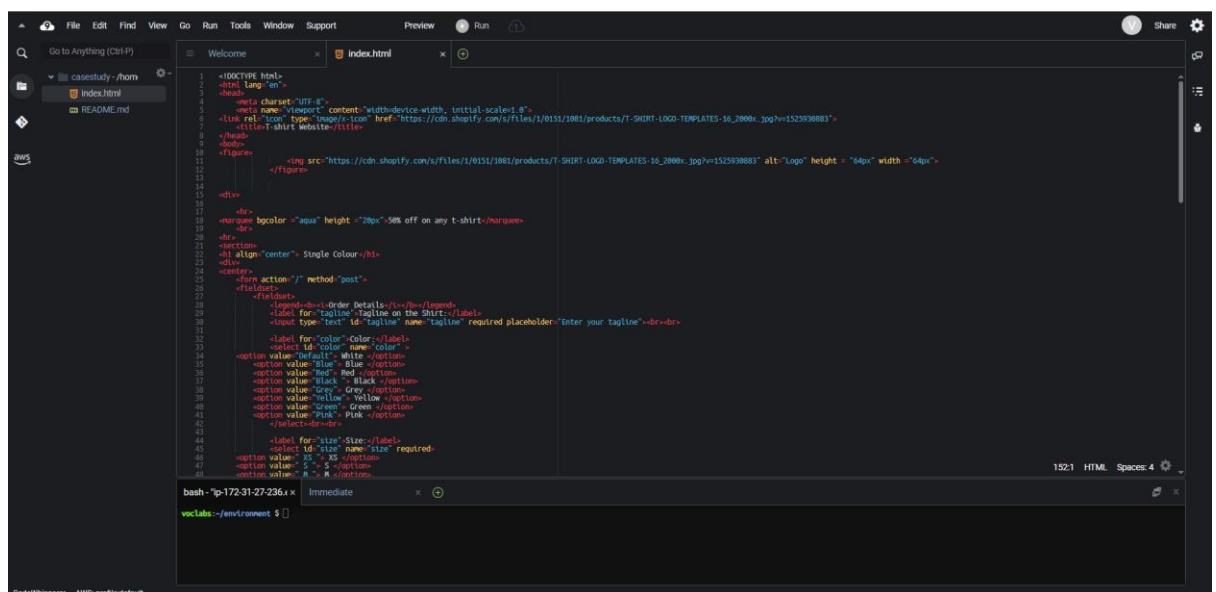
</footer>

</body>

</html>

```

Screenshot: Ensure that the HTML file is visible in the Cloud9 editor.



● Step 2: Deploy HTML Page to S3

- **Create an S3 Bucket:** In the AWS Console, navigate to **S3**, and click **Create Bucket**.
 - Name the bucket (e.g., my-static-website-bucket), and choose a region.
 - Uncheck the "Block all public access" option to make the website accessible.

Create bucket [Info](#)

Buckets are containers for data stored in S3.

General configuration

AWS Region

US East (N. Virginia) us-east-1

Bucket type [Info](#)

☒ General purpose

Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

☐ Directory

Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.

Bucket name [Info](#)

siddhantcasestudybucket

Bucket name must be unique within the global namespace and follow the bucket naming rules. [See rules for bucket naming](#)

Copy settings from existing bucket - *optional*

Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership [Info](#)

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

☒ ACLs disabled (recommended)

All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using

☐ ACLs enabled

Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be

☐ Block all public access

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

☐ Block public access to buckets and objects granted through *new* access control lists (ACLs)

S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.

☐ Block public access to buckets and objects granted through *any* access control lists (ACLs)

S3 will ignore all ACLs that grant public access to buckets and objects.

☐ Block public access to buckets and objects granted through *new* public bucket or access point policies

S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.

☐ Block public and cross-account access to buckets and objects through *any* public bucket or access point policies

S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects.



Turning off block all public access might result in this bucket and the objects within becoming public

AWS recommends that you turn on block all public access, unless public access is required for specific and verified use cases such as static website hosting.

☒ I acknowledge that the current settings might result in this bucket and the objects within becoming public.

Bucket Versioning

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. [Learn more](#)

Bucket Versioning

☒ Disable

- **Upload HTML File:** Use the AWS CLI from Cloud9 to upload the index.html to the S3 bucket.

aws s3 cp index.html s3://siddhantcasestudybucket/

- **Screenshot:** AWS CLI from Cloud9 to upload the index.html

```
aws - "ip-172-31-27-236.e x Immediate x (+)
voclabs:~/environment $ aws s3 cp index.html s3://siddhantcasestudybucket/
upload: ./index.html to s3://siddhantcasestudybucket/index.html
voclabs:~/environment $
```

- **Enable Static Website Hosting:**
 - In the S3 bucket, go to the **Properties** tab, scroll down to **Static Website Hosting**, and enable it.
 - Set index.html as the root document.
 - Take note of the **Bucket website endpoint** to access the website.
- **Screenshot:** Show the website hosted on S3, accessed via the S3 bucket's URL.

Edit static website hosting [Info](#)

Static website hosting
Use this bucket to host a website or redirect requests. [Learn more](#)

Static website hosting
☐ Disable
☒ Enable

Hosting type
☒ Host a static website
Use the bucket endpoint as the web address. [Learn more](#)
☐ Redirect requests for an object
Redirect requests to another bucket or domain. [Learn more](#)

ⓘ For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see [Using Amazon S3 Block Public Access](#)

Index document
Specify the home or default page of the website.

Error document - optional
This is returned when an error occurs.

https://siddhantcasestudybucket.s3.amazonaws.com/index.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Content-Sha256=UNSIGNED-PAYLOAD...

50% off on any t-shirt

Single Colour

Order Details

Tagline on the Shirt:

Color:

Size:

Quantity:

Delivery Date:

Delivery Details

Name:

Address:

Email:

Phone Number:

Additional Comments

• Step 3: Set Up EC2 Instance as a Backup Server

• Launch EC2 Instance:

- In the AWS Console, go to **EC2**, and launch an instance (Ubuntu 22.04, t2.micro).
- Ensure the security group allows inbound **HTTP (port 80)** traffic.

• Install Apache Web Server:

- SSH into the instance using the public DNS.
- Install and start Apache using the following commands:

```
sudo apt update -y
```

```
sudo apt install apache2
```

```
sudo systemctl start apache2
```

```
sudo systemctl enable apache2
```

• Upload HTML File to EC2:


- Upload the same index.html file to the `/var/www/html/` directory on the EC2 instance:

• Access the EC2 Website:

- Access the EC2 instance's public IP in your browser (e.g., `http://ec2-public-ip`).

• Screenshot: Show the website hosted on EC2.

← ↻ ⚠ Not secure | 50.17.61.114/index1.html ☆ 📄 🏠 🕒 📶 📱 🧑 ⋮



50% off on any t-shirt

Single Colour

Order Details

Tagline on the Shirt:

Color:

Size:

Quantity:

Delivery Date:

Delivery Details

Name:

Address:

Email:

Phone Number:

Additional Comments

● **Guidelines:**

- Always check the security group settings for your EC2 instance to ensure web traffic can access it.
 - Ensure public access is correctly configured for S3 when enabling static website hosting.
 - Use IAM roles for securely granting permissions to AWS resources, avoiding hardcoding credentials.
-