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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.

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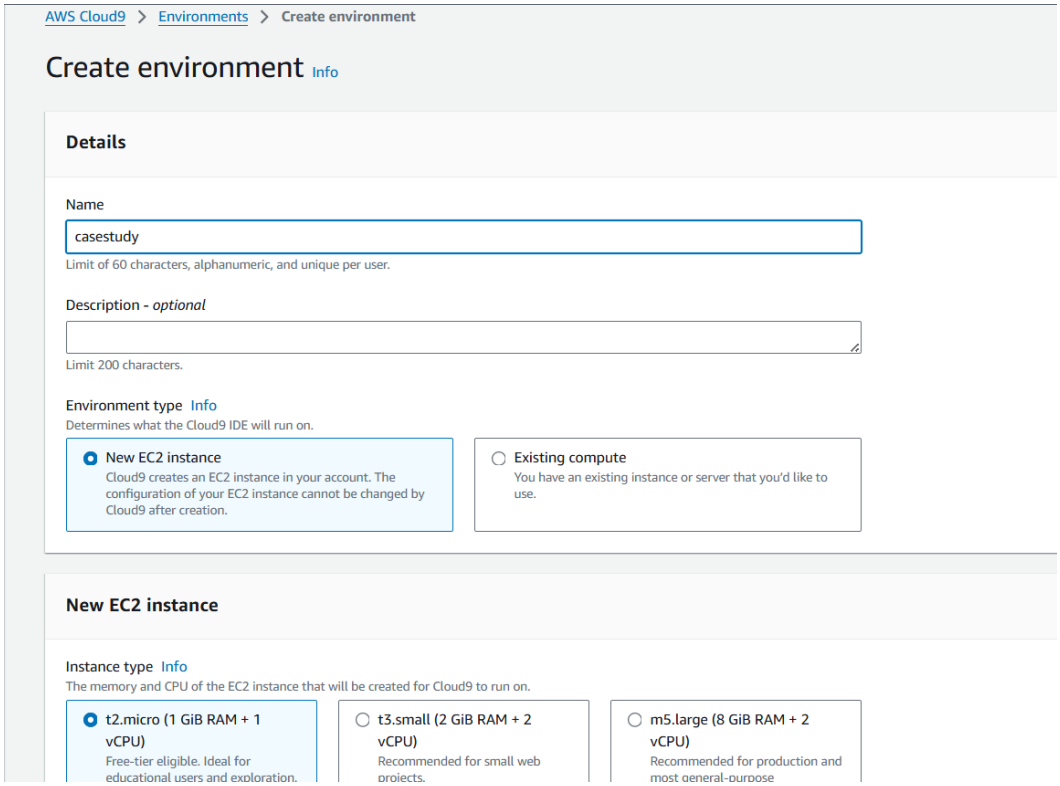
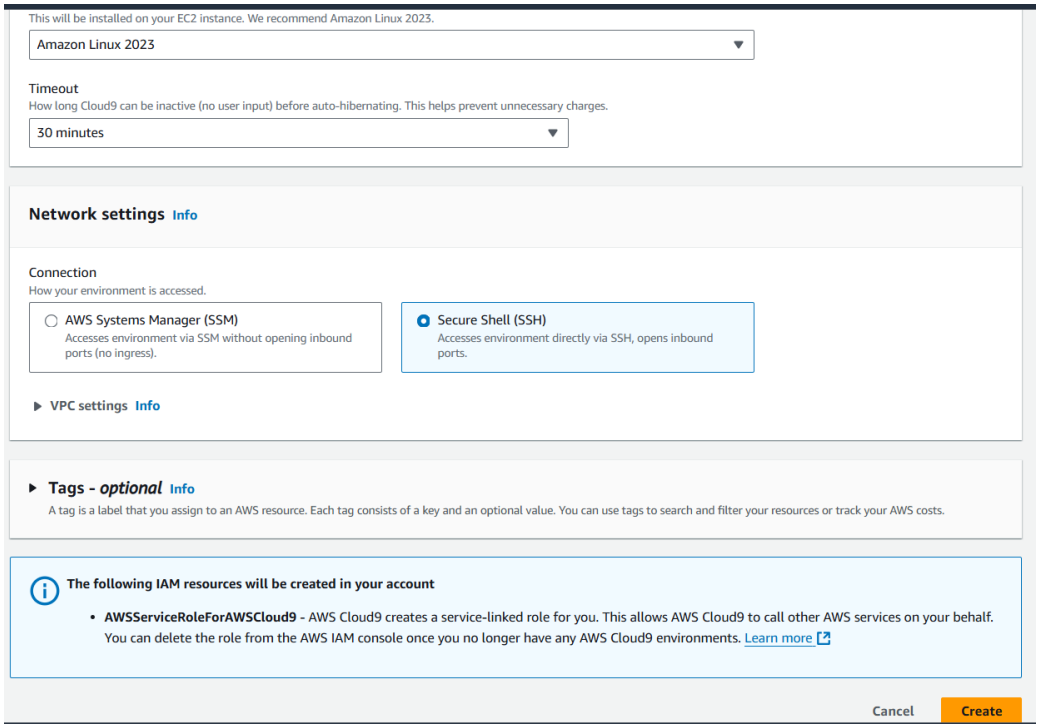
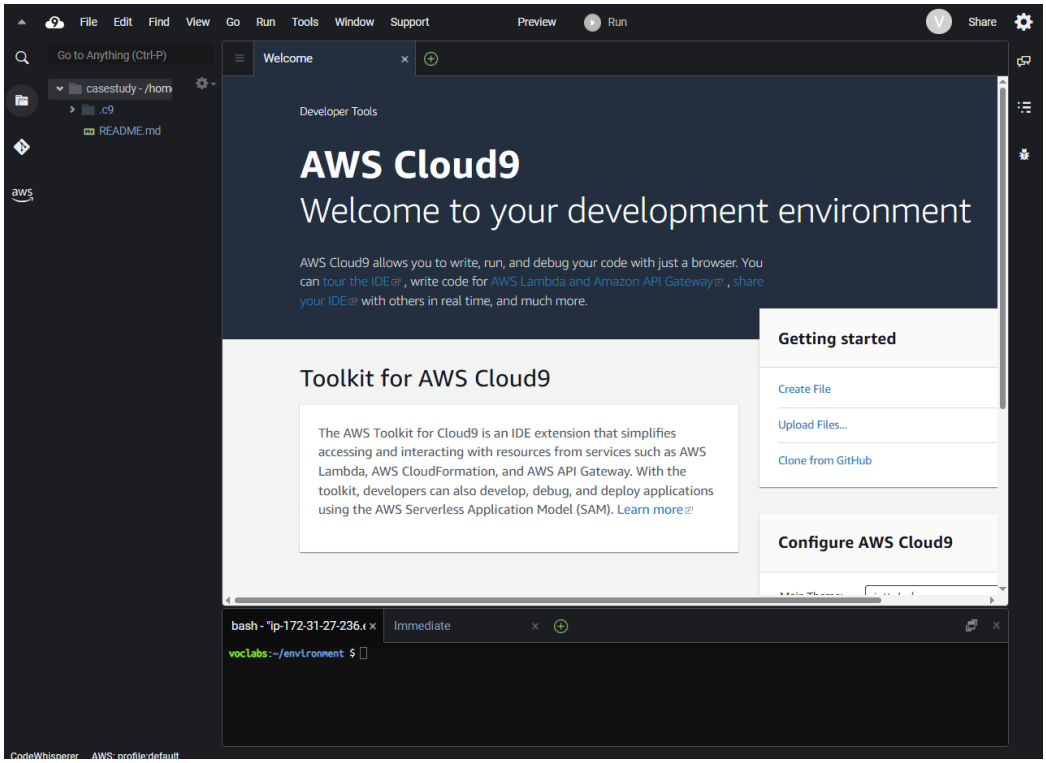
2. Step-by-Step Explanation

● 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.


AWS Cloud9 > Environments > Create environment
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>

        <img src="https://cdn.shopify.com/s/files/1/0151/1081/products/T-SHIRT-LOGO-TEMPLATES-16_2000x.jpg?v=1525930883" alt="Logo" height = "64px" width ="64px">

      </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>
```

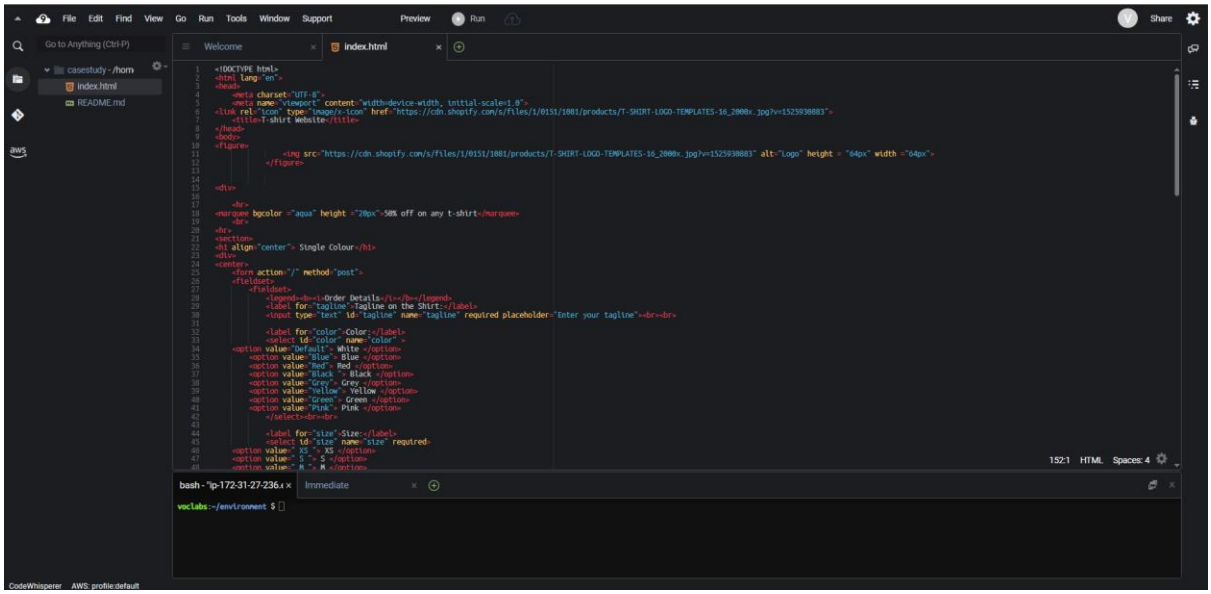
```
<option value=" S "> S </option>
<option value=" M "> M </option>
<option value=" L "> L </option>
<option value=" XL "> XL </option>
<option value=" XXL "> XXL </option>
    </select><br><br>

    <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>
```

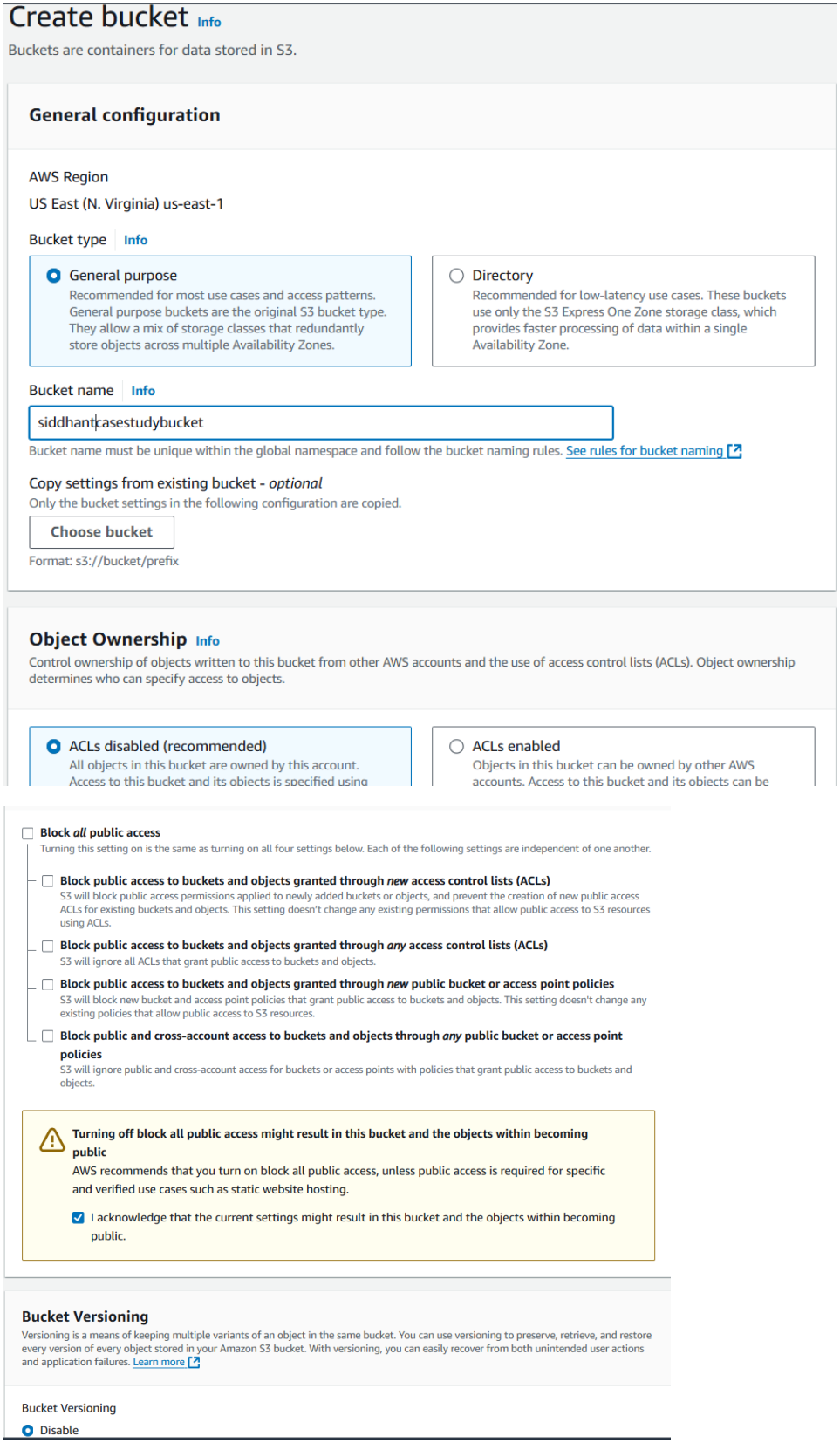
```
      </fieldset>
      <button type="submit">Submit</button>
   </form>
</div>
</section>
<footer>
   <table width = "100%">
      <tr>
         <td>
            <table width="100%">
               <tr>
                  <td>
                     <h2>Address</h2>
                     <h4><address>
                        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.



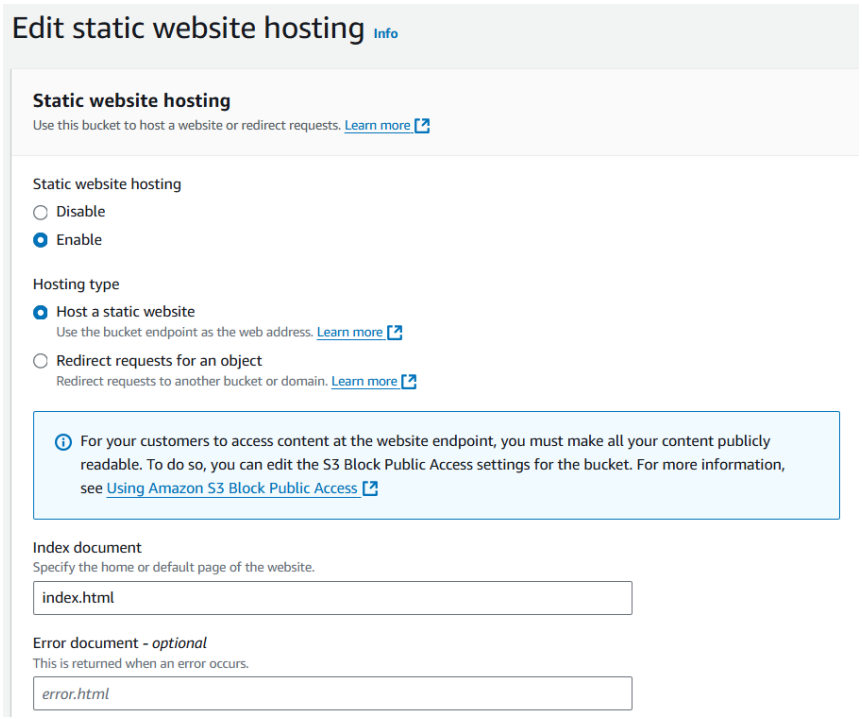
- **Upload HTML File**: Use the AWS CLI from Cloud9 to upload the index.html to the S3 bucket.

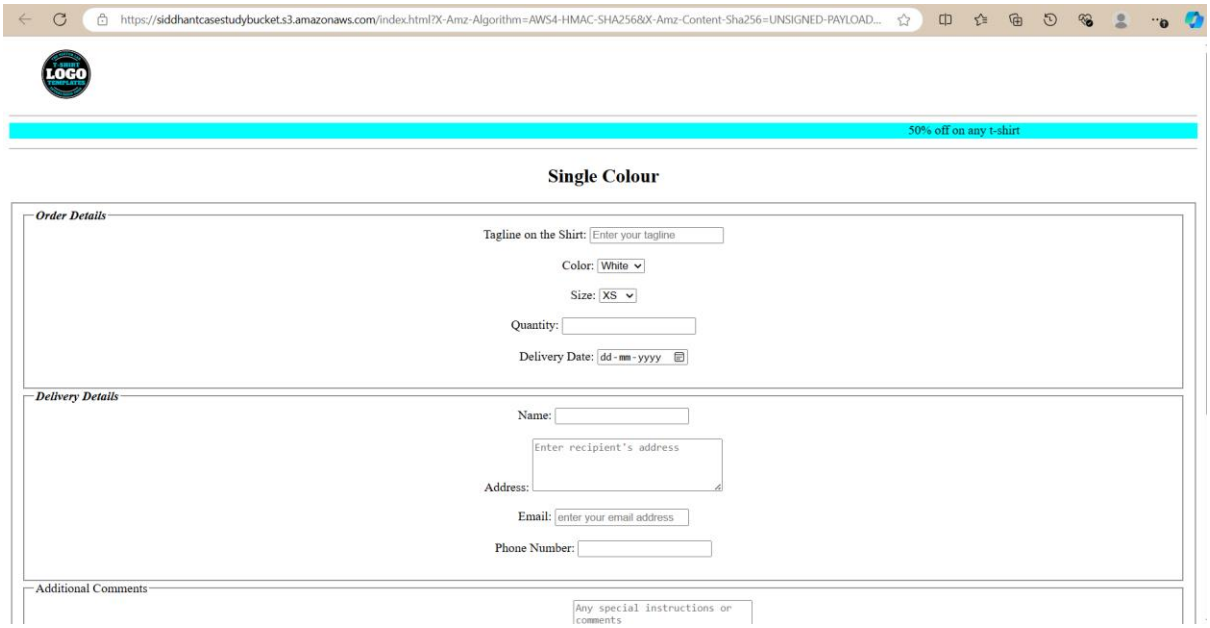
aws s3 cp index.html s3://siddhantcasestudybucket/

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

```
aws - "ip-172-31-27-236.e ×   Immediate ×
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.





● 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:

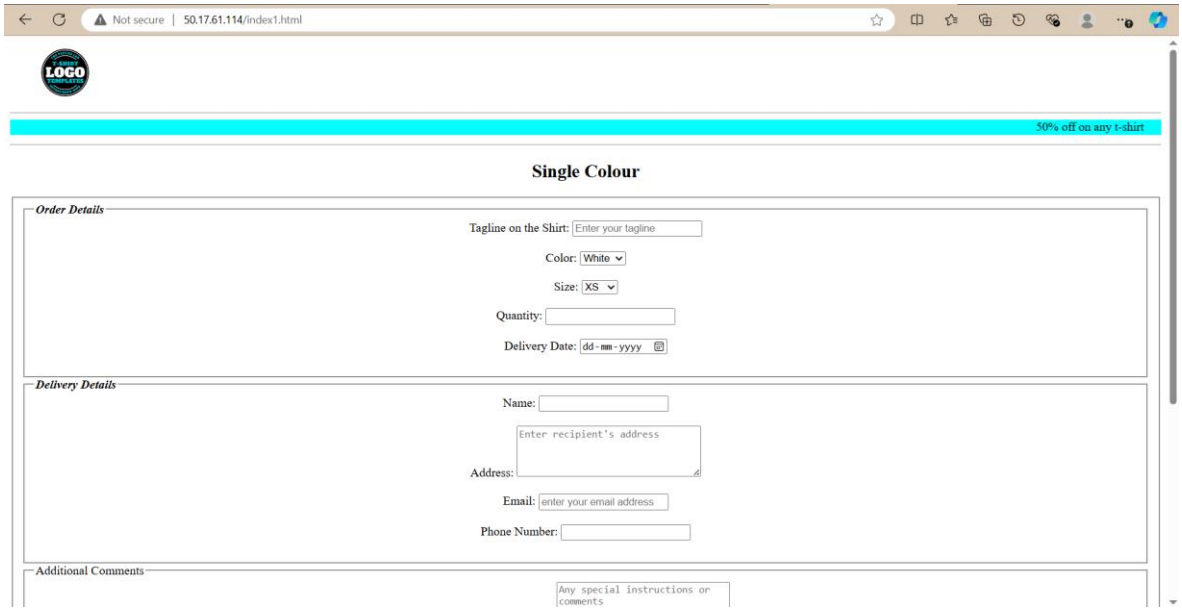
sudo apt update -y

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.



- **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.
