



## **END SEMESTER EVALUATION 2024 (II)**

### **IT 246 - CLOUD COMPUTING**

**SUBMITTED BY**

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**(BSC/WD/22/36/13)**

To the

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**(SIBA CAMPUS)**

**PALLEKELE**

**SRI LANKA**

**2024**

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## **ABSTRACT**

This case study delves into establishing a personal blog using Amazon Web Services (AWS), employing an EC2 instance for hosting and an S3 bucket for storing and delivering static content. It illustrates the setup process, including IAM role creation, EC2 instance launch and setup, and Apache web server installation. Furthermore, it outlines the creation and setup of an S3 bucket for streamlined file storage. This guide equips users with fundamental web development and server management skills to deploy a functional personal blog, capitalizing on AWS's scalability, reliability, and seamless integration capabilities. Ultimately, it offers a robust and economical solution for sharing personal content.

## INTRODUCTION

This case study walks you through creating a personal blog on AWS, offering a dependable and scalable method for sharing your ideas and stories online. It covers setting up a blog hosted on an EC2 instance, with images and static files served from an S3 bucket. By following these instructions, you'll configure your AWS environment, install and configure a web server, set up an S3 bucket, and deploy a basic HTML website. Geared towards individuals with basic web development and server management skills, this project provides practical exposure to AWS's robust and effective infrastructure.

## SET UP THE AWS ENVIRONMENT

Establishing the AWS environment marks the initial phase in hosting a personal blog on an EC2 instance while serving static files from an S3 bucket. This involves creating an IAM role and launching an EC2 instance.

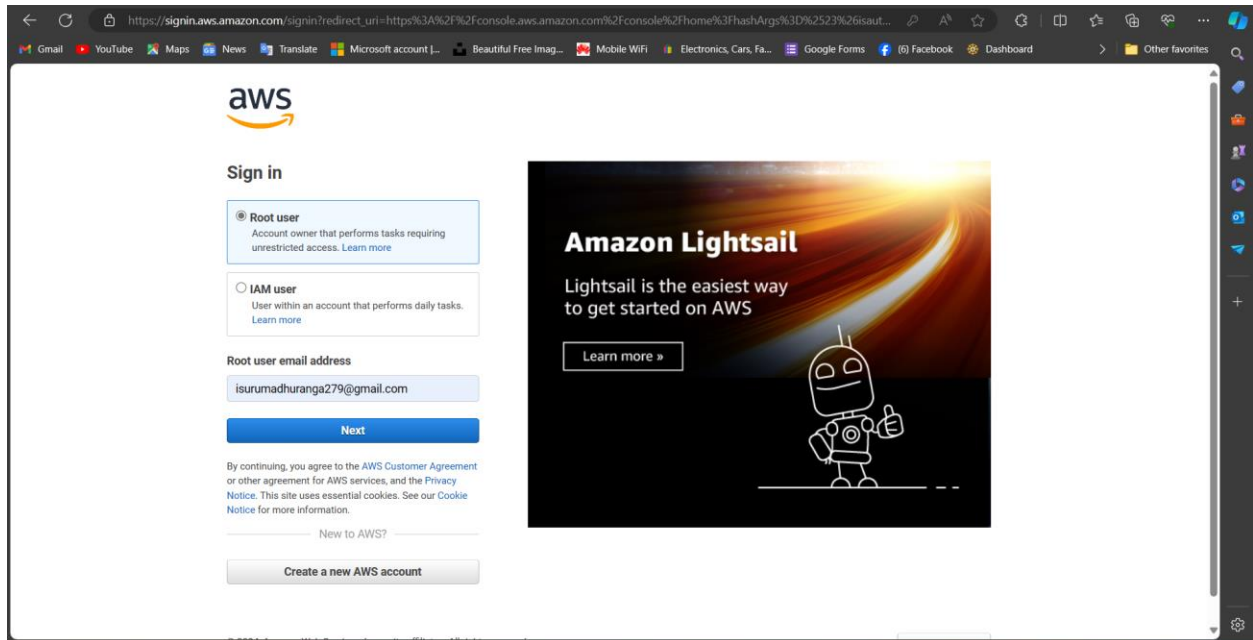
IAM assumes a pivotal role in securely managing access to AWS services and resources. Crafting an IAM role tailored for EC2 instances ensures the instance possesses the requisite permissions to interact with other AWS services, notably S3. This role facilitates EC2 instance access to the S3 bucket housing static files like images.

The launch of an EC2 instance forms the bedrock for hosting the web server responsible for serving the personal blog. Users navigate the AWS Management Console to select the desired Amazon Machine Image (AMI) and instance type, configure security settings, and specify additional details, including IAM role assignments. Configuring security groups is vital to permit inbound traffic on port 80 (HTTP) for web traffic and port 22 (SSH) for remote access.

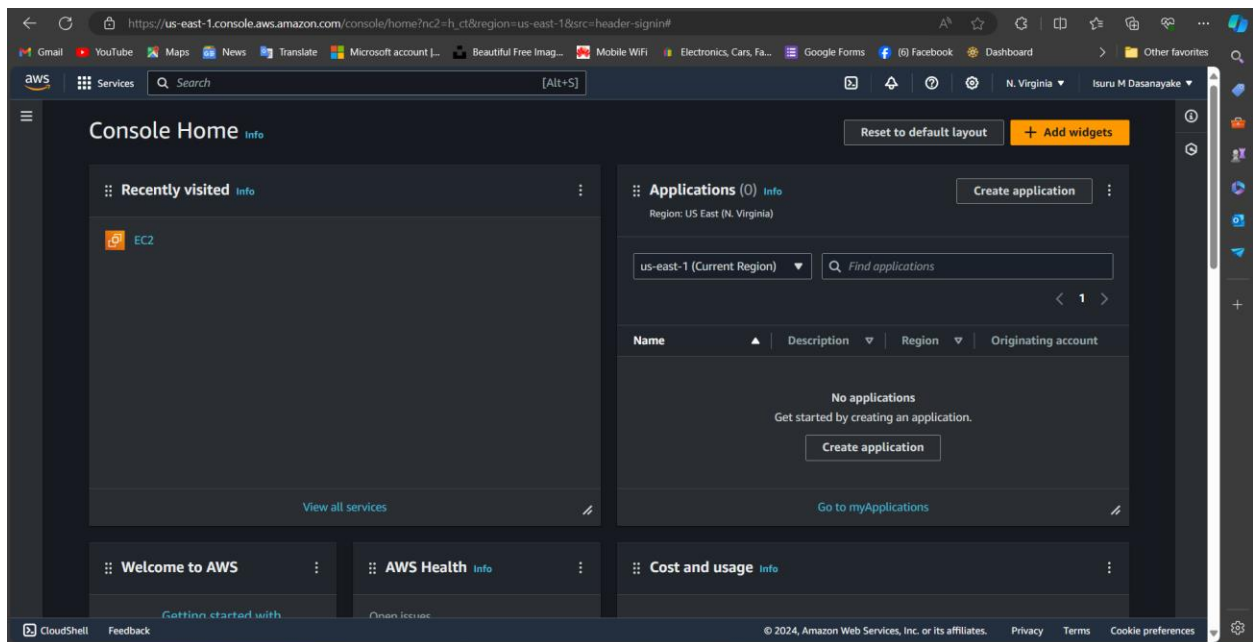
By adeptly setting up the AWS environment, users establish a secure and scalable groundwork for hosting their personal blog, setting the stage for subsequent steps like web server installation, configuration, and S3 bucket setup.

## 01. SET UP THE AWS ENVIRONMENT

- Create AWS Environment

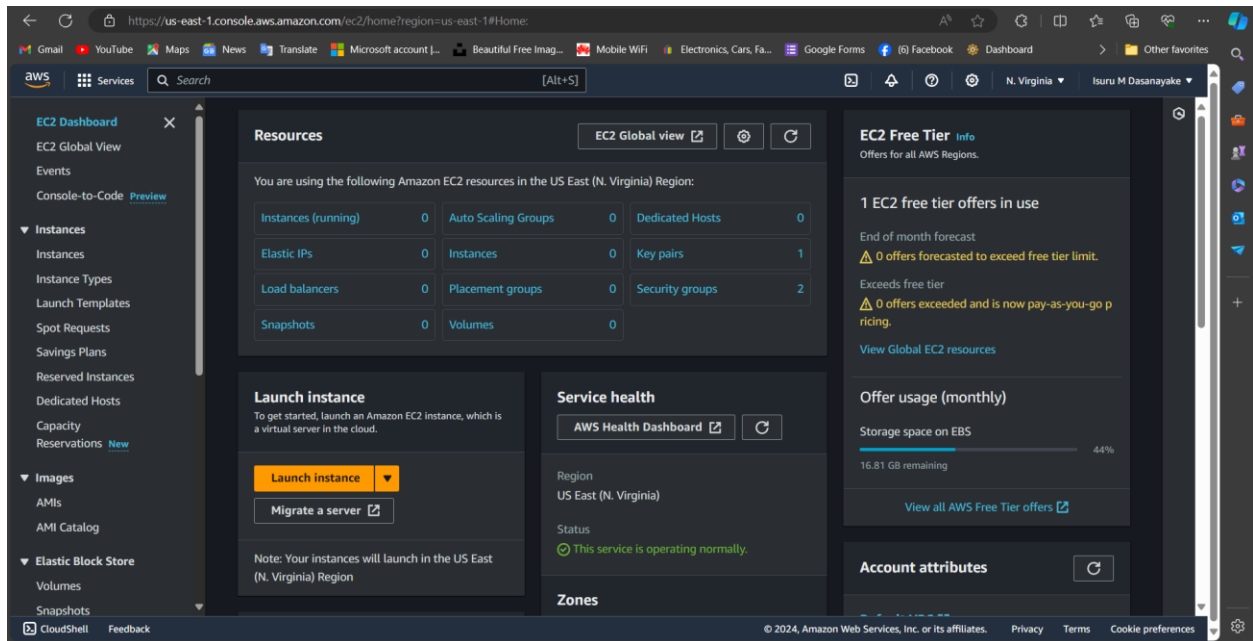


### 1.0 Sign In to AWS

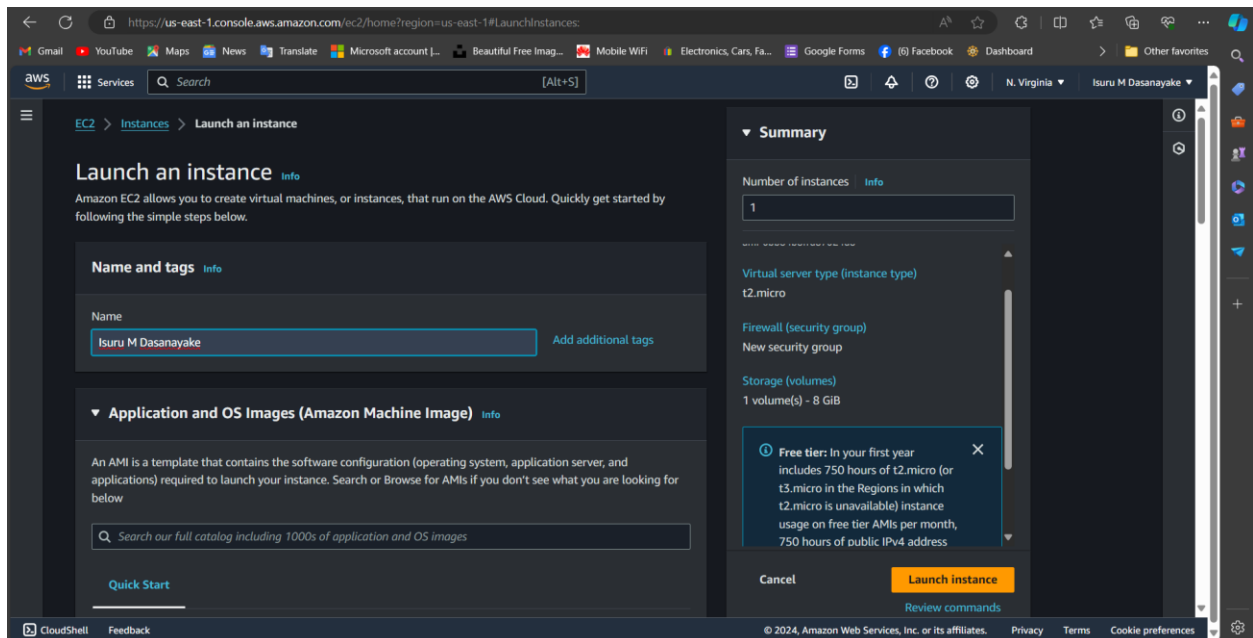


### 1.01 Console Home

- **Launch an EC2 instance**

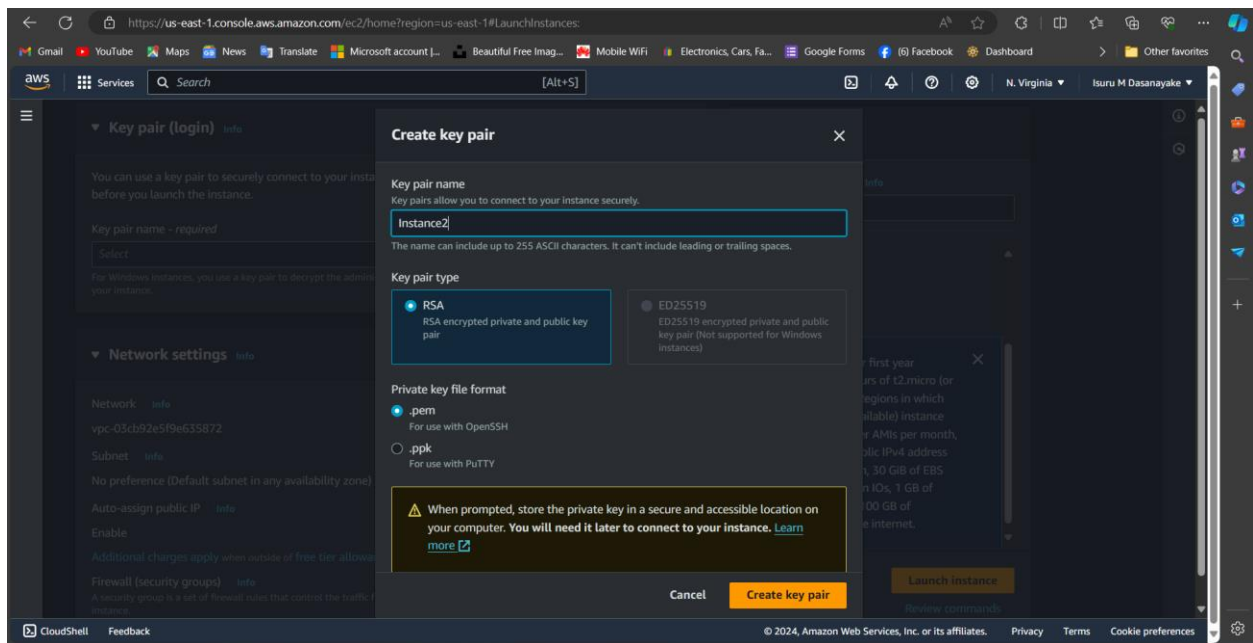


1.02 Figures EC2 Dashboard

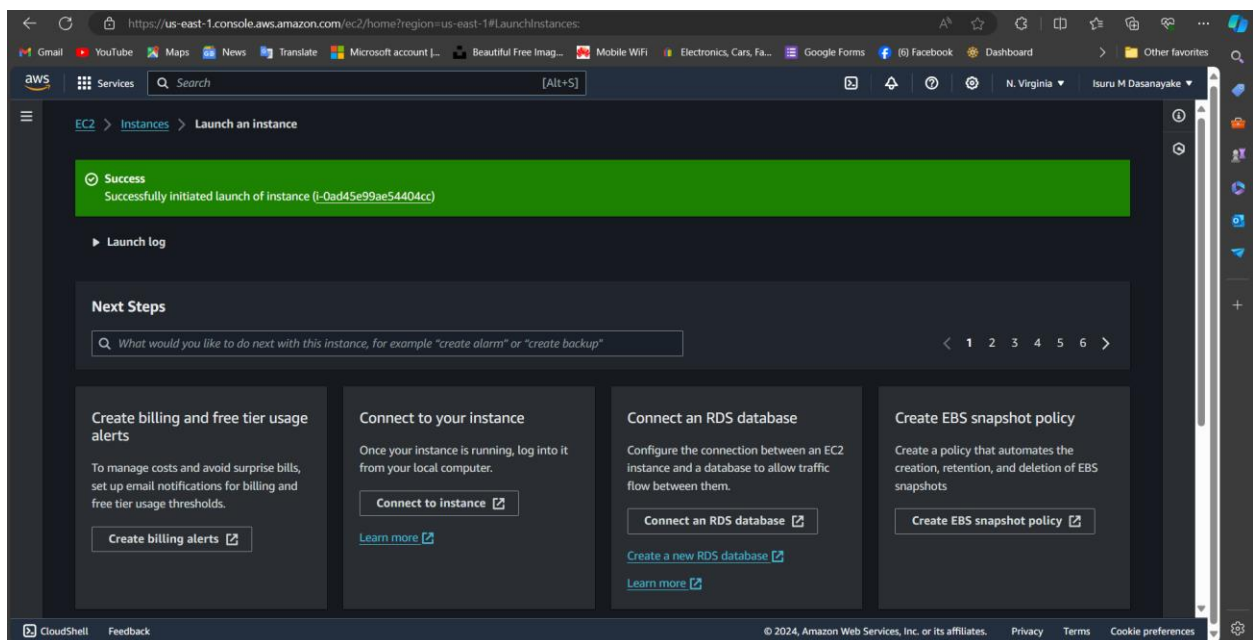


1.03 Figures launch an instance





1.04 Figures Create Key pair



1.05 Figures Successfully Launch Instance

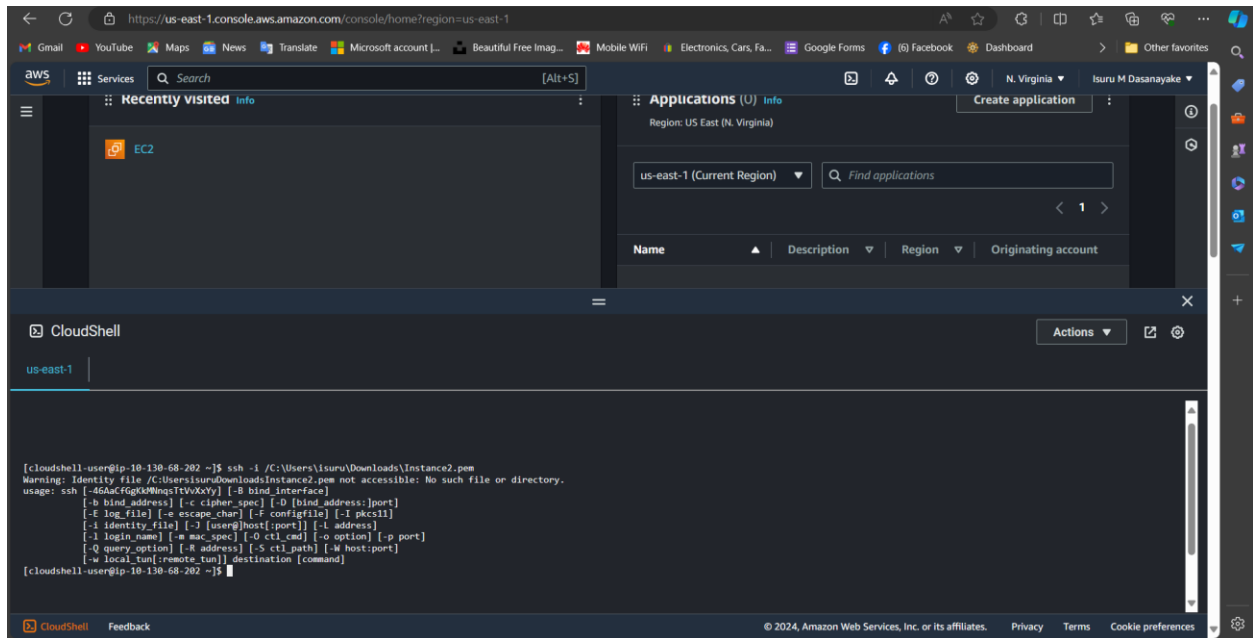
## INSTALL A WEB SERVER- APACHE

Installing a web server is a vital stage in configuring your personal blog on an AWS EC2 instance, and for this project, Apache, a widely used and dependable web server, will be employed. Upon launching and connecting to your EC2 instance via SSH, the initial task involves updating the package lists to ensure all software is current, accomplished with the command `'sudo yum update -y'`. Subsequently, installing Apache is a straightforward process with `'sudo yum install httpd -y'`. Once installed, initiating the web server is achieved by starting the Apache service with `'sudo systemctl start httpd'`, enabling it to serve web pages. To ensure Apache automatically starts on boot, `'sudo systemctl enable httpd'` is executed.

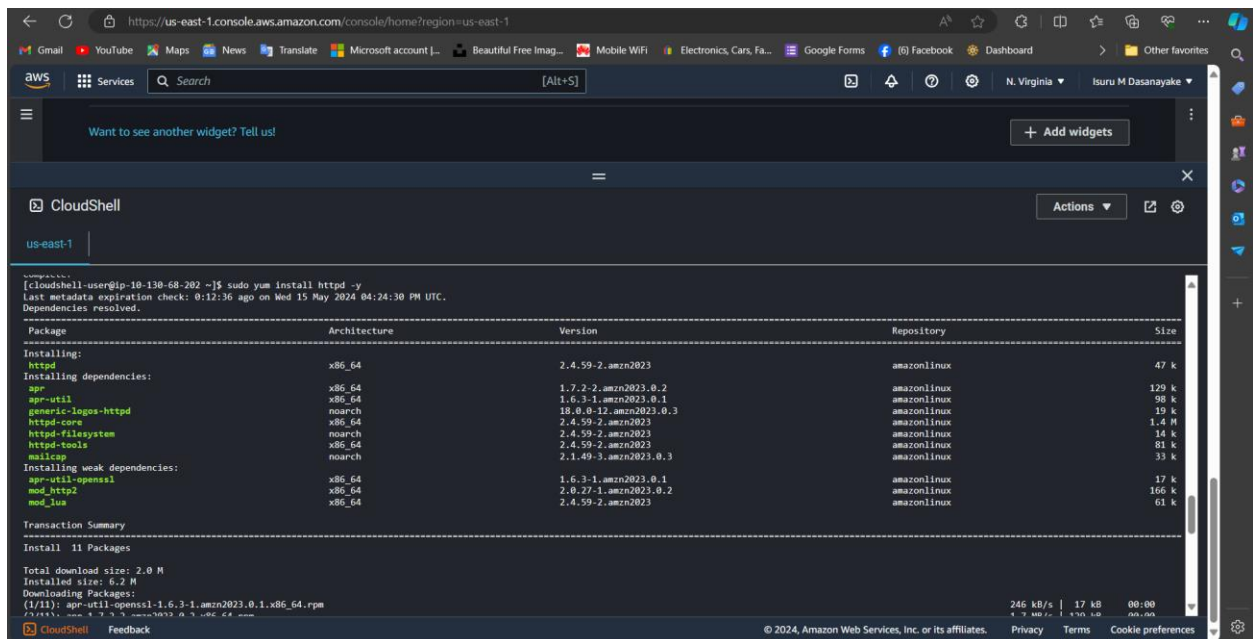
Validating the Apache installation is crucial to confirm the correct setup and operation of the web server. This entails accessing the public IP address of the EC2 instance in a web browser. If Apache is correctly installed and operational, the default Apache test page will be displayed, indicating readiness to host the blog. This stage establishes the core capability of the EC2 instance to deliver web content, paving the way for deploying the HTML website and integrating with the S3 bucket for static file storage.

# INSTALL A WEB SERVER- APACHE

- Connect to EC2 instance via SSH



## 1.06 Figures CloudShell Amazon Linux



## 1.07 Figures Transaction Summary

https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1

aws Services Search [Alt+S]

Want to see another widget? Tell us! + Add widgets

### CloudShell

US-east-1 Actions

```
[cloudshell-user@ip-10-130-68-202 ~]$ sudo yum install httpd -y
Last metadata expiration check: 0:12:36 ago on Wed 15 May 2024 04:24:30 PM UTC.
Dependencies resolved.
```

Package	Architecture	Version	Repository	Size
Installing:				
httpd	x86_64	2.4.59-2.amzn2023	amazonlinux	47 k
Installing dependencies:				
apr	x86_64	1.7.2-2.amzn2023.0.2	amazonlinux	129 k
apr-util	x86_64	1.6.3-1.amzn2023.0.1	amazonlinux	98 k
generic-logos-httpd	noarch	18.0.0-12.amzn2023.0.3	amazonlinux	19 k
httpd-core	x86_64	2.4.59-2.amzn2023	amazonlinux	1.4 M
httpd-filesystem	noarch	2.4.59-2.amzn2023	amazonlinux	14 k
httpd-tools	x86_64	2.4.59-2.amzn2023	amazonlinux	81 k
mailcap	noarch	2.1.49-3.amzn2023.0.3	amazonlinux	33 k
Installing weak dependencies:				
apr-util-openssl	x86_64	1.6.3-1.amzn2023.0.1	amazonlinux	17 k
mod_http2	x86_64	2.0.27-1.amzn2023.0.2	amazonlinux	166 k
mod_lua	x86_64	2.4.59-2.amzn2023	amazonlinux	61 k

Transaction Summary

Install 11 Packages

Total download size: 2.0 M  
Installed size: 6.2 M

Downloading Packages:

(1/11): apr-util-openssl-1.6.3-1.amzn2023.0.1.x86\_64.rpm 246 kB/s | 17 kB 00:00

CloudShell Feedback

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## 1.08 Figures Install httpd

## CONFIGURE THE S3 BUCKET

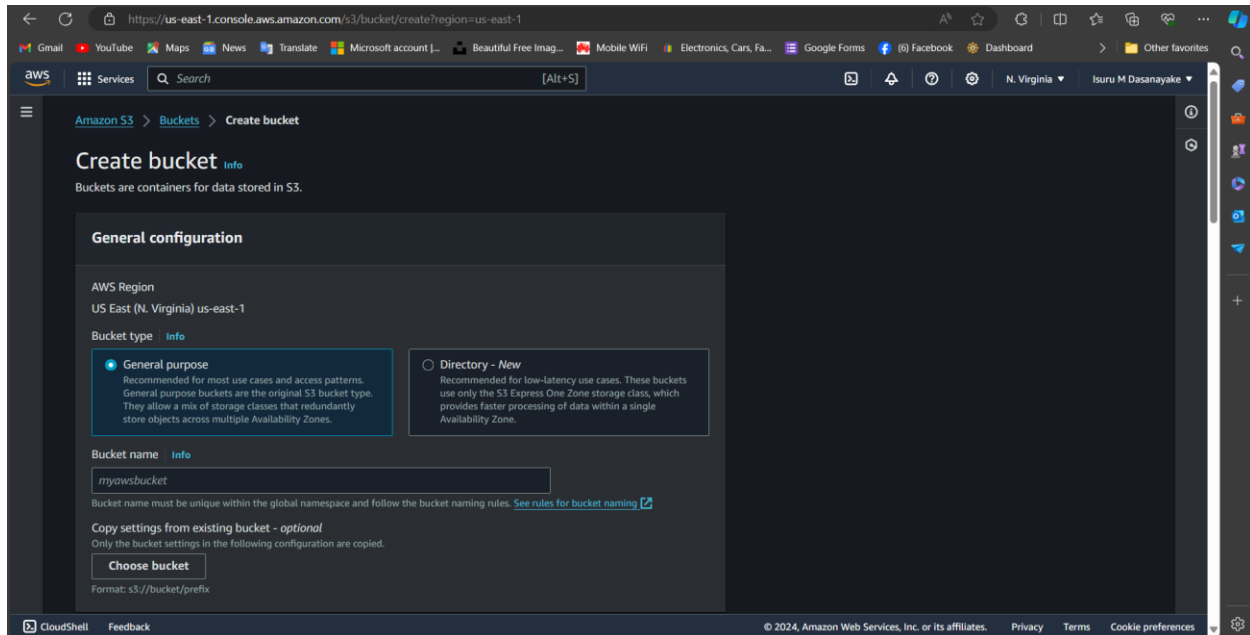
Setting up the S3 bucket is a crucial step in establishing your personal blog, facilitating efficient storage and retrieval of static files like images. Begin by logging into the AWS Management Console and accessing the S3 service. Initiate the creation of a new bucket by clicking the "Create bucket" button, where you'll specify a unique name and select the region that aligns with your requirements. Generally, sticking to default settings is advisable unless specific needs for versioning or logging arise. Upon bucket creation, you'll have a secure and scalable storage solution primed for integration with your EC2 instance.

Once the bucket is established, proceed to upload your static files. Navigate to the newly created bucket, then utilize the "Upload" button to add images and other static content. You can opt to drag and drop files or use the file picker to select them from your local system. Following the upload, each file will possess a unique URL, essential for embedding them in your HTML code. For instance, a file named `profile.jpg` uploaded to the bucket will sport a URL structured as `https://your-bucket-name.s3.amazonaws.com/profile.jpg`, enabling efficient content delivery.

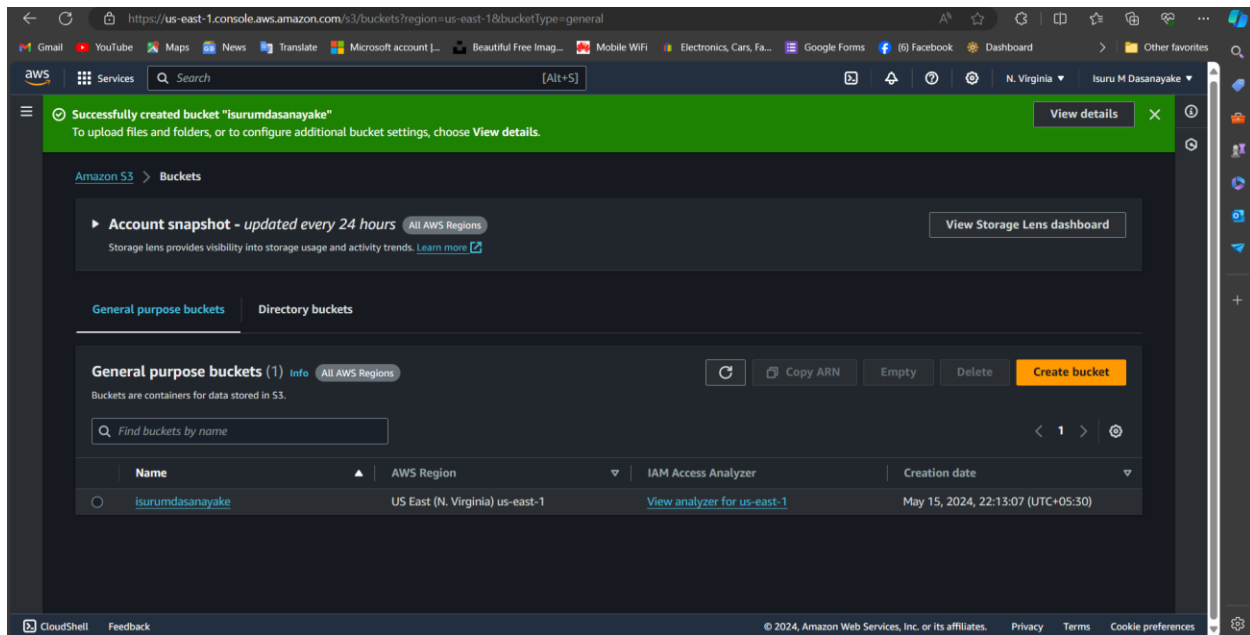
To render your static files publicly accessible, adjust the bucket's permissions. Navigate to the "Permissions" tab of your S3 bucket and configure settings to allow public read access to the files. This can be executed by tweaking the bucket policy or utilizing the S3 console to set appropriate permissions. Exercise caution with these settings to expose only necessary components for your website. Once permissions are configured, your static files will be reachable via their URLs, seamlessly integrating into your HTML website hosted on the EC2 instance. This setup harnesses AWS S3's scalability and cost-effectiveness for static file delivery.

# CONFIGURE THE S3 BUCKET

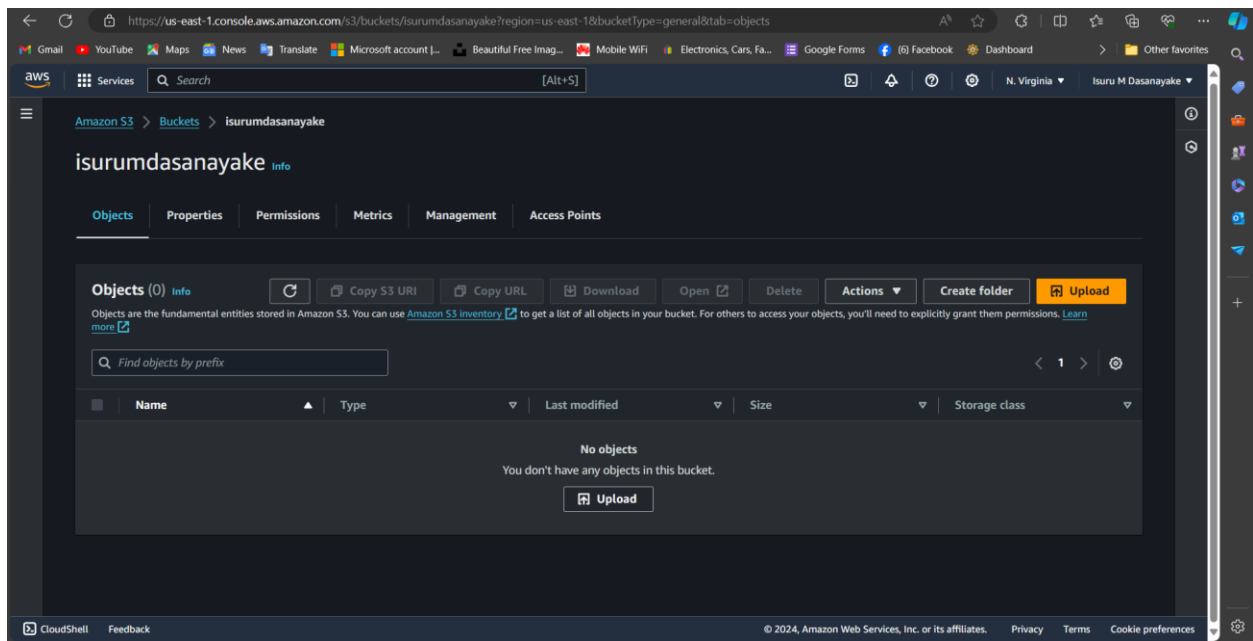
## ● Create an S3 bucket



### 1.09 Create S3 Bucket

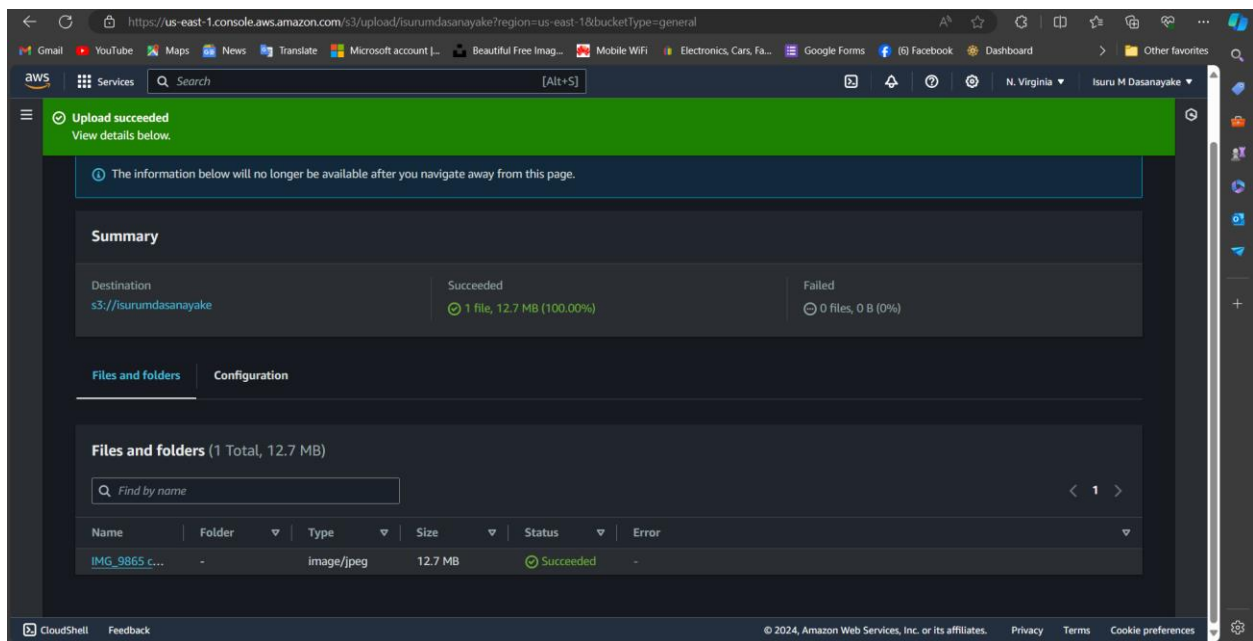


### 1.10 Figures General Purpose Bucket



1.11 Figures Upload file in Bucket

- Upload required image/s



1.12 Figures Upload succeeded in Bucket

## CREATE AND DEPLOY THE WEBSITE

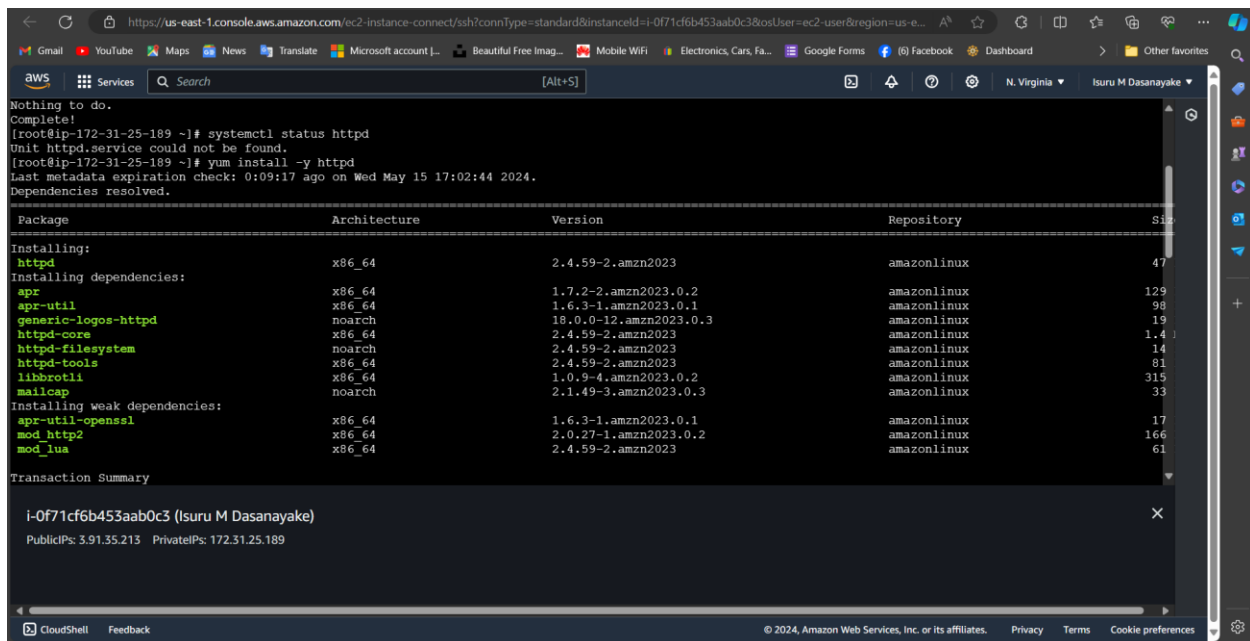
Developing and deploying the website entails crafting HTML content and ensuring it's accurately hosted on the EC2 instance, with static assets linked from the S3 bucket. Begin by establishing an SSH connection to your EC2 instance and navigating to the Apache root directory, typically located at `/var/www/html`. Within this directory, create your primary HTML file, such as `index.html`, employing a text editor like `nano`. Within this HTML file, structure your webpage, incorporating images and other static content using the URLs provided by your S3 bucket. For instance, you may include an image using a tag like ``.

Once the HTML content is composed, save the file and ensure it's appropriately positioned in the Apache root directory. This placement guarantees that when users visit your EC2 instance's public IP address, the server serves the correct HTML content. To confirm the deployment, launch a web browser and enter the public IP address of your EC2 instance. If everything is configured accurately, your personal blog should load, showcasing the HTML content and images stored in the S3 bucket. This stage concludes the deployment process, rendering your blog publicly accessible and showcasing the seamless integration of AWS services for delivering a dynamic and scalable web application.



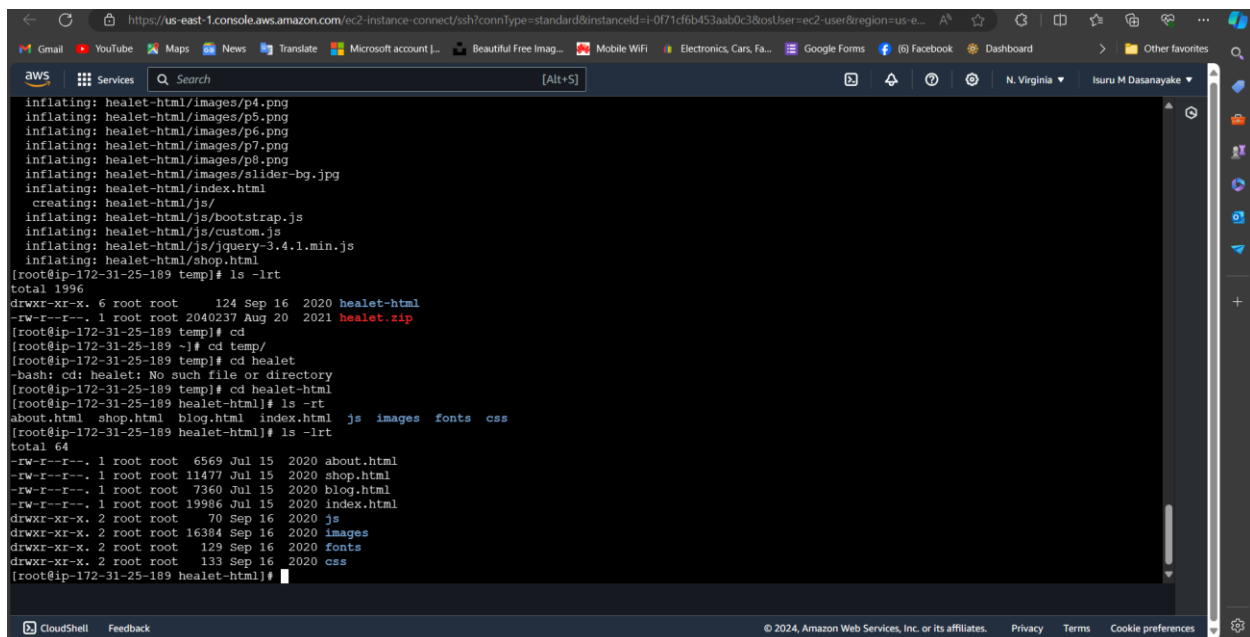
# CREATE AND DEPLOY THE WEBSITE

- Create the HTML file on the EC2 instance



```
Nothing to do.
Complete!
[root@ip-172-31-25-189 ~]# systemctl status httpd
Unit httpd.service could not be found.
[root@ip-172-31-25-189 ~]# yum install -y httpd
Last metadata expiration check: 0:09:17 ago on Wed May 15 17:02:44 2024.
Dependencies resolved.
=====
Package                                Architecture      Version            Repository          Size
-----
Installing:
httpd                                  x86_64            2.4.59-2.amzn2023  amazonlinux         47
Installing dependencies:
apr                                    x86_64            1.7.2-2.amzn2023.0.2  amazonlinux         129
apr-util                              x86_64            1.6.3-1.amzn2023.0.1  amazonlinux         98
generic-logos-httpd                  noarch            18.0.0-12.amzn2023.0.3  amazonlinux         19
httpd-core                            x86_64            2.4.59-2.amzn2023    amazonlinux         1.4
httpd-filesystem                     noarch            2.4.59-2.amzn2023    amazonlinux         14
httpd-tools                          x86_64            2.4.59-2.amzn2023    amazonlinux         81
libbrotli                             x86_64            1.0.9-4.amzn2023.0.2  amazonlinux        315
mailcap                               noarch            2.1.49-3.amzn2023.0.3  amazonlinux         33
Installing weak dependencies:
apr-util-openssl                     x86_64            1.6.3-1.amzn2023.0.1  amazonlinux         17
mod_http2                            x86_64            2.0.27-1.amzn2023.0.2  amazonlinux        166
mod_lua                              x86_64            2.4.59-2.amzn2023    amazonlinux         61
Transaction Summary
-----
i-Of71cf6b453aab0c3 (Isuru M Dasanayake)
PublicIPs: 3.91.35.213  PrivateIPs: 172.31.25.189
```

1.13 Figures Yum Update -y



```
inflating: healet-html/images/p4.png
inflating: healet-html/images/p5.png
inflating: healet-html/images/p6.png
inflating: healet-html/images/p7.png
inflating: healet-html/images/p8.png
inflating: healet-html/images/slider-bg.jpg
inflating: healet-html/index.html
creating: healet-html/js/
inflating: healet-html/js/bootstrap.js
inflating: healet-html/js/custom.js
inflating: healet-html/js/jquery-3.4.1.min.js
inflating: healet-html/shop.html
[root@ip-172-31-25-189 temp]# ls -lrt
total 1996
drwxr-xr-x. 6 root root 124 Sep 16 2020 healet-html
-rw-r--r--. 1 root root 2040237 Aug 20 2021 healet.zip
[root@ip-172-31-25-189 temp]# cd
[root@ip-172-31-25-189 ~]# cd temp/
[root@ip-172-31-25-189 temp]# cd healet
-bash: cd: healet: No such file or directory
[root@ip-172-31-25-189 temp]# cd healet-html
[root@ip-172-31-25-189 healet-html]# ls -rt
about.html  shop.html  blog.html  index.html  images  fonts  css
[root@ip-172-31-25-189 healet-html]# ls -lrt
total 64
-rw-r--r--. 1 root root 6569 Jul 15 2020 about.html
-rw-r--r--. 1 root root 11477 Jul 15 2020 shop.html
-rw-r--r--. 1 root root 7360 Jul 15 2020 blog.html
-rw-r--r--. 1 root root 19986 Jul 15 2020 index.html
drwxr-xr-x. 2 root root 70 Sep 16 2020 js
drwxr-xr-x. 2 root root 16384 Sep 16 2020 images
drwxr-xr-x. 2 root root 129 Sep 16 2020 fonts
drwxr-xr-x. 2 root root 133 Sep 16 2020 css
[root@ip-172-31-25-189 healet-html]#
```

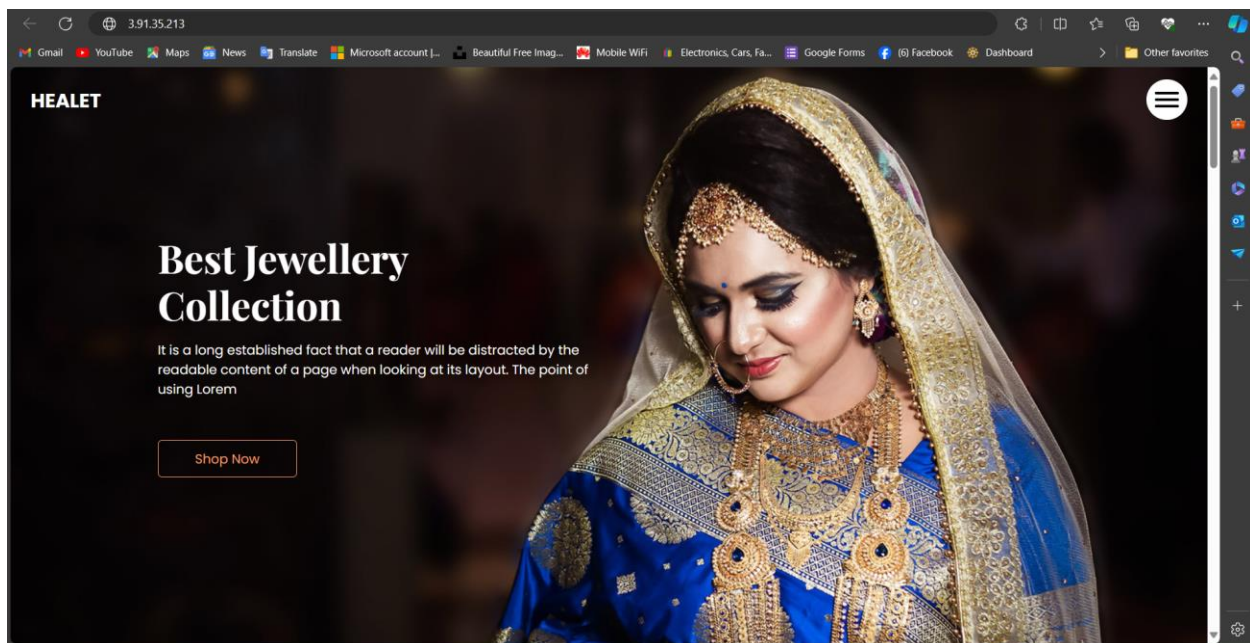
1.14 Figures Unzip Zip folder

```
aws
Services
Search [Alt+S]
N. Virginia Isuru M Dasanayake

-rw-r--r--. 1 root root 19986 Jul 15 2020 index.html
drwxr-xr-x. 2 root root 70 Sep 16 2020 js
drwxr-xr-x. 2 root root 16384 Sep 16 2020 images
drwxr-xr-x. 2 root root 129 Sep 16 2020 fonts
drwxr-xr-x. 2 root root 133 Sep 16 2020 css
[root@ip-172-31-25-189 html]# systemctl status httpd
o httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
   Active: inactive (dead)
     Docs: man:httpd.service(8)
[root@ip-172-31-25-189 html]# systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service -> /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-25-189 html]# systemctl start httpd
[root@ip-172-31-25-189 html]# systemctl status httpd
• httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Wed 2024-05-15 17:31:55 UTC; 8s ago
     Docs: man:httpd.service(8)
  Main PID: 26741 (httpd)
    Status: "Started, listening on: port 80"
    Tasks: 177 (limit: 1114)
   Memory: 12.9M
      CPU: 68ms
   CGroup: /system.slice/httpd.service
           └─26741 /usr/sbin/httpd -DFOREGROUND
             └─26742 /usr/sbin/httpd -DFOREGROUND
               └─26743 /usr/sbin/httpd -DFOREGROUND
                 └─26744 /usr/sbin/httpd -DFOREGROUND
                   └─26745 /usr/sbin/httpd -DFOREGROUND

May 15 17:31:55 ip-172-31-25-189.ec2.internal systemd[1]: Starting httpd.service - The Apache HTTP Server...
May 15 17:31:55 ip-172-31-25-189.ec2.internal systemd[1]: Started httpd.service - The Apache HTTP Server.
May 15 17:31:55 ip-172-31-25-189.ec2.internal httpd[26741]: Server configured, listening on: port 80
[root@ip-172-31-25-189 html]#
```

1.15 Figures Unzipping Zip folder



1.16 Figures Created Web Site