

**SETTING UP THE APACHE WEBSERVER ON AMAZON EC2
AND CONFIGURING IT TO HOST A WEBSITE ON IT
A PROJECT REPORT**

Submitted by

PRADIPTA NANDI [Reg No:RA2011003010154]

GUNNU JAIRAJ [Reg No:RA2011003010171]

ARPAN GHOSH [Reg No: RA2011003010205]

Under the Guidance of

Dr. Anand. L

Associate Professor, Department of Computing Technologies

in partial fulfillment of the requirements for the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING



**DEPARTMENT OF COMPUTING TECHNOLOGIES
COLLEGE OF ENGINEERING AND TECHNOLOGY
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR– 603 203**

NOV 2023



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR-603 203
BONAFIDE CERTIFICATE

Certified that 18CSE316J Mini project report titled “**Setting up the Apache Webserver on Amazon EC2 and configuring it to host a website on it**” is the bonafide work of **PRADIPTA NANDI [RegNo:RA2011003010154]**, **GUNNU JAIRAJ [RegNo:RA2011003010171]** and **ARPAN GHOSH [RegNo:RA2011003010205]** who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

Dr.L.ANAND
Faculty
Essentials in Cloud and Devops
(18CSE316J)
Associate Professor
Department of Computing Technologie

ACKNOWLEDGEMENT

We express our humble gratitude to **Dr. C. Muthamizhchelvan**, Vice-Chancellor, SRM Institute of Science and Technology, for the facilities extended for the project work and his continued support.

We extend our sincere thanks to Dean-CET, SRM Institute of Science and Technology, **Dr. T. V. Gopal**, for his invaluable support.

We wish to thank **Dr. Revathi Venkataraman**, Professor and Chairperson, School of Computing, SRM Institute of Science and Technology, for her support throughout the project work.

We are incredibly grateful to our Head of the Department, **Dr. M. Pushpalatha**, Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for her suggestions and encouragement at all the stages of the project work.

We want to convey our immeasurable thanks to our Essentials in Cloud and Devops Faculty **Dr. L. Anand**, Associate Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for his valuable inputs during the completion of the project and continuous support.

Finally, we would like to thank our parents, family members, and friends for their unconditional love, constant support and encouragement.

PRADIPTA NANDI [RA2011003010154]

GUNNU JAIRAJ[RA2011003010171]

ARPAN GHOSH [RA2011003010205]

ABSTRACT

In this project we plan to set up and install the Apache web server on Amazon EC2 and then configure it such that we are able to host our website on the web server publicly so that our website is accessible to everyone on the WWW.

INTRODUCTION



The Apache HTTP Server is a free and open-source cross-platform web server software, released under the terms of Apache License 2.0. It is developed and maintained by a community of developers under the auspices of the Apache Software Foundation.

Apache is a web server software that is responsible for accepting HTTP requests from visitors and sending them back the requested information in the form of web pages. Or in simpler terms, it allows visitors to view content on your website.



Amazon Elastic Compute Cloud is a part of Amazon's cloud-computing platform, Amazon Web Services, that allows users to rent virtual computers on which to run their own computer applications. Amazon Elastic Compute Cloud (Amazon EC2) provides on-demand, scalable computing capacity in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 reduces hardware costs so you can develop and deploy applications faster.

TABLE OF CONTENTS

S.no	Title	Page No.
1.	ACKNOWLEDGEMENT	3
2.	ABSTRACT	4
3.	INTRODUCTION	4
4.	TABLE OF CONTENTS	5
5.	LIST OF ABBREVIATIONS	6
6.	IMPLEMENTATION	7
7.	HTML CODE	16
8.	CONCLUSION	17
9.	REFERENCES	17

LIST OF ABBREVIATIONS

AWS – Amazon Web Services

EC2 – Elastic Compute Cloud

HTML – Hypertext Markup Language

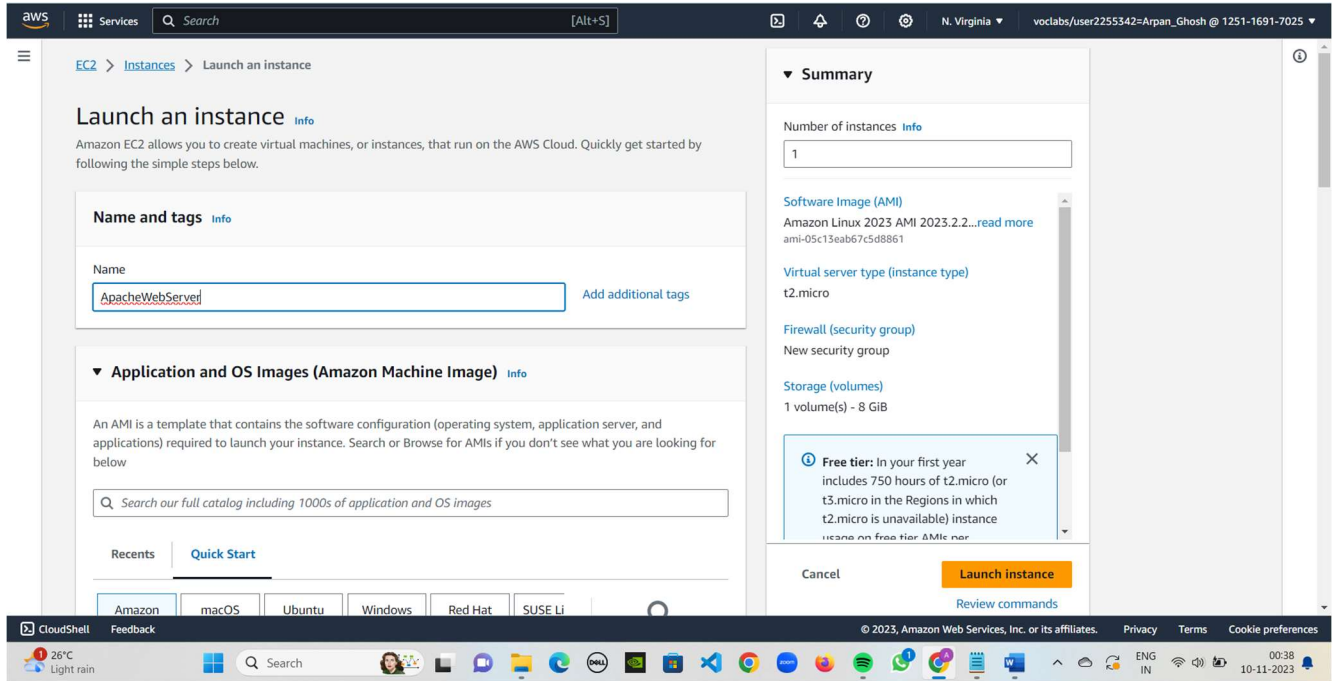
IP – Internet Protocol

sudo – super user do

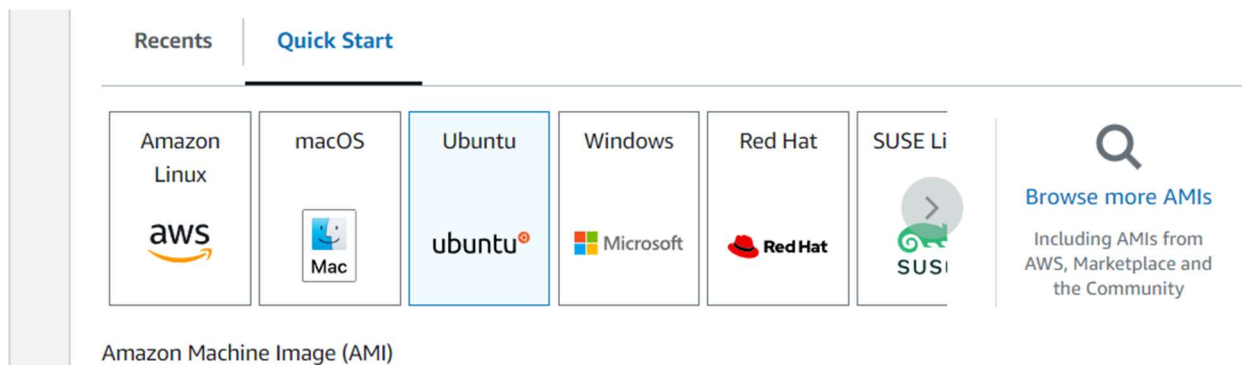
ppk – putty private key

IMPLEMENTATION

1. Creating and Launching an Amazon EC2 Instance



- First click on Launch an Instance and select an appropriate name for the instance. In this case we have named it as ApacheWebServer.



- Choose an Operating System of your choice in this case we are choosing Ubuntu.

Instance type

t2.micro

Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.0716 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

☐ All generations

[Compare instance types](#)

Additional costs apply for AMIs with pre-installed software

- Next choose the instance type. In this case we have chosen the Instance type as “t2.micro”.

Create key pair

Key pair name

Key pairs allow you to connect to your instance securely.

ArpanProject

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type


☒ RSA
RSA encrypted private and public key pair

☐ ED25519
ED25519 encrypted private and public key pair

Private key file format

☐ .pem
For use with OpenSSH

☒ .ppk
For use with PuTTY

 When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Cancel

Create key pair

- Next Create the Key Pair.

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group

☐ Select existing security group

We'll create a new security group called 'launch-wizard-9' with the following rules:

☒ Allow SSH traffic from

Helps you connect to your instance

Anywhere



0.0.0.0/0

☒ Allow HTTPS traffic from the internet

To set up an endpoint, for example when creating a web server

☒ Allow HTTP traffic from the internet

To set up an endpoint, for example when creating a web server

 Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. 

- Next create the security Group and choose your preferences.

Cancel

Launch instance

[Review commands](#)

- Next click on “**Launch Instance**” to launch the instance.

Connect to instance [Info](#)

Connect to your instance i-096741bd4cbc72c6d (ApacheWebServer) using any of these options

[EC2 Instance Connect](#)

[Session Manager](#)

[SSH client](#)

[EC2 serial console](#)

Instance ID

 i-096741bd4cbc72c6d (ApacheWebServer)

Connection Type

☒ Connect using EC2 Instance Connect

Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.

☐ Connect using EC2 Instance Connect Endpoint

Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.


Public IP address

 54.82.66.131

User name

Enter the user name defined in the AMI used to launch the instance. If you didn't define a custom user name, use the default user name, ubuntu.

ubuntu

 **Note:** In most cases, the default user name, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

Cancel

Connect

- Next click “**Connect**” to connect to the EC2 instance.

```
aws Services Search [Alt+S] N. Virginia voclabs/user225342=Arpan_Ghosh @ 1251-1691-7025
System load: 0.1708984375 Processes: 100
Usage of /: 20.5% of 7.57GB Users logged in: 0
Memory usage: 21% IPv4 address for eth0: 172.31.31.32
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-31-32:~$

i-096741bd4cbc72c6d (ApacheWebServer)
PublicIPs: 54.82.66.131 PrivateIPs: 172.31.31.32
```

- Successfully connected to the instance.

2. Installing Apache Webserver on the created EC2 Instance

- Type in the command – **sudo apt install apache2**. This command will install the Apache Server in the present instance.

```
ubuntu@ip-172-31-31-32:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-096741bd4cbc72c6d&osUser=ubuntu&region=us-east-1&sshPort=22#/>
aws Services Search [Alt+S] N. Virginia voclabs/user225342=Arpan_Ghosh @ 1251-1691-7025
Package configuration

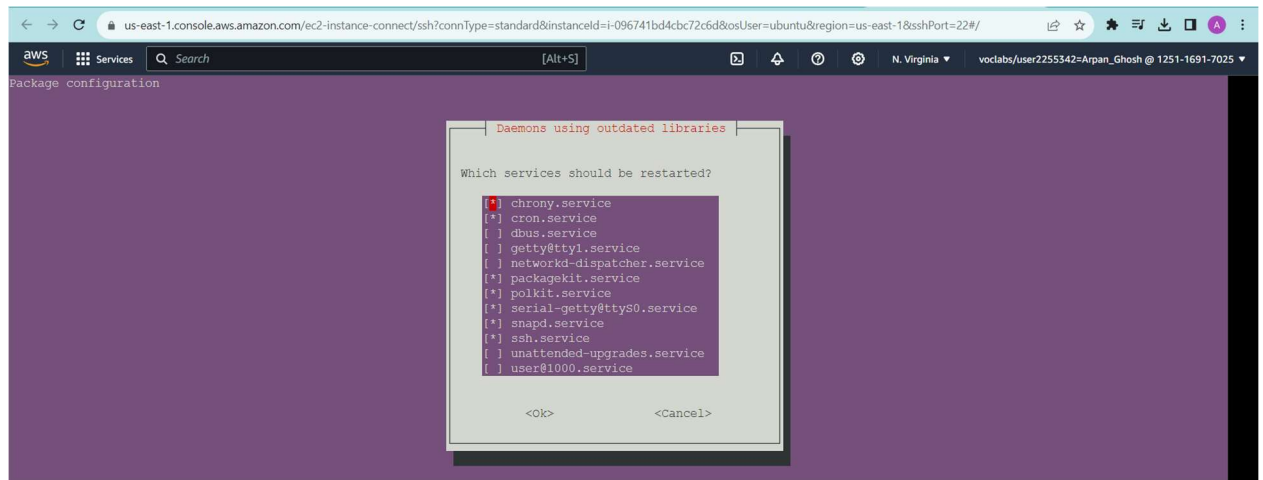
Pending kernel upgrade

Newer kernel available

The currently running kernel version is 6.2.0-1012-aws which is not the expected kernel version 6.2.0-1015-aws.
Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

i-096741bd4cbc72c6d (ApacheWebServer)
PublicIPs: 54.82.66.131 PrivateIPs: 172.31.31.32
```

- On doing the same the following Prompt appears. Press ENTER.



- Again, press Enter/Click OK.
- To check if Apache is successfully installed type the following command – **which apache2**.

```
ubuntu@ip-172-31-31-32:~$ which apache2
/usr/sbin/apache2
```

- To check the version of Apache, type – **apache2 -v**

```
ubuntu@ip-172-31-31-32:~$ apache2 -v
Server version: Apache/2.4.52 (Ubuntu)
Server built: 2023-05-03T20:02:51
ubuntu@ip-172-31-31-32:~$
```

3. Starting the Server

- To start the service type in the following command – **sudo service apache2 start**. This starts the Web Server.

```
ubuntu@ip-172-31-31-32:~$ sudo service apache2 start
```

- To check the status of the web server type in the command – **sudo service apache2 status**.

```
ubuntu@ip-172-31-31-32:~$ sudo service apache2 status
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-11-09 19:41:26 UTC; 7min ago
     Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 14824 (apache2)
    Tasks: 55 (limit: 1121)
   Memory: 5.0M
      CPU: 57ms
   CGroup: /system.slice/apache2.service
           └─14824 /usr/sbin/apache2 -k start
           └─14826 /usr/sbin/apache2 -k start
           └─14827 /usr/sbin/apache2 -k start
```

- The above screenshot shows that the Apache server is running. To confirm it copy the public IP at the bottom left and paste it to open the test page on a new tab.



- The above screenshot shows the Apache2 test page.

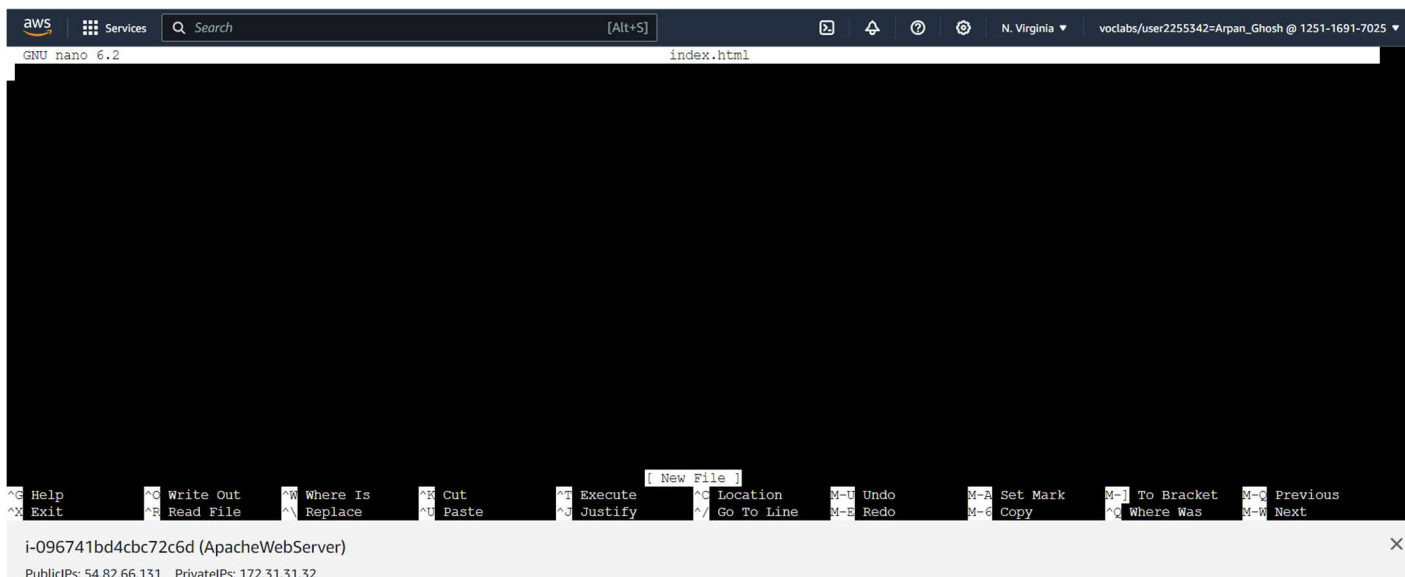
4. Replacing the Test page with our very own Webpage

```
ubuntu@ip-172-31-31-32:~$ cd /var/www/html
ubuntu@ip-172-31-31-32:/var/www/html$ ls
index.html
ubuntu@ip-172-31-31-32:/var/www/html$
```

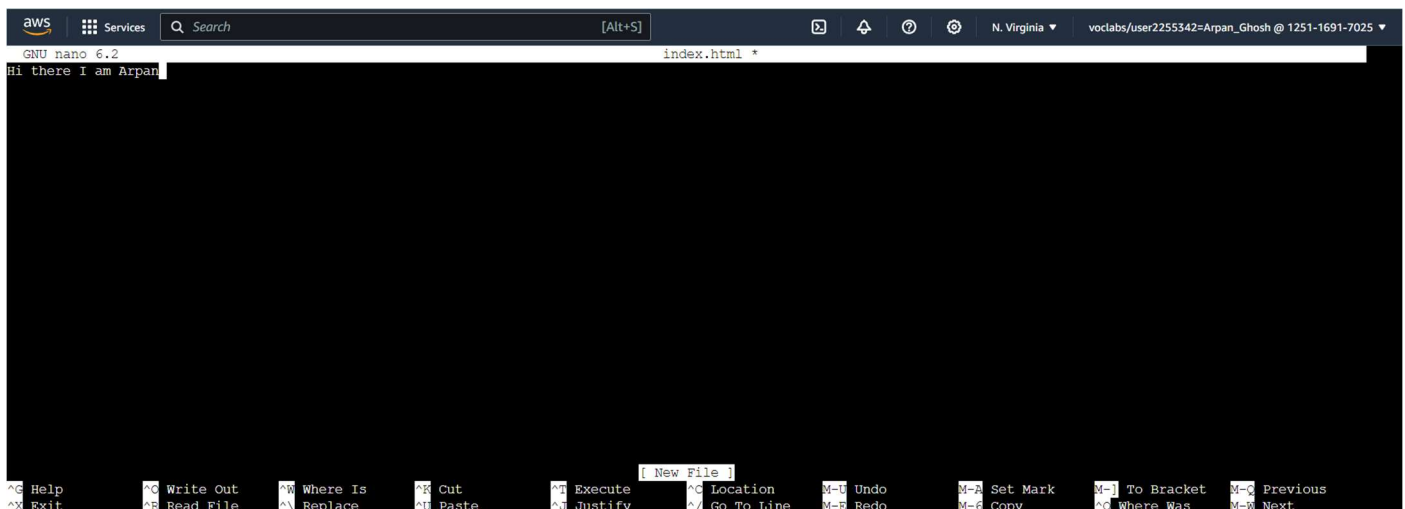
- We need to replace this index.html with our very own index HTML file for our webpage.
- Type in the command - **sudo nano index.html** to open the index.html file in the nano editor.

```
ubuntu@ip-172-31-31-32:/var/www/html$ sudo nano index.html
```

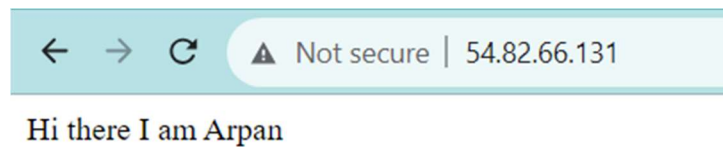
- This opens up the nano editor where we can write our html code.



- To test it type something in the index.html file in the editor.



- Save it and type the command – **sudo service apache2 restart**, to restart the server.
- Now on going to the website we see the replaced content.



- Now again type the command – **sudo nano index.html** to open up the index HTML file and type the HTML code for the webpage there.

```

}
#makers
{
  text-align: center;
}
</style>
<body>
<h2><marquee direction="left" behaviour="alternate" width="50%" id="makers">Setting up the Apache Webserver on Amazon EC2 and configuring it to host a website on it.</marquee>
<div class="image_container1"></div>
<div class="image_container2"></div>
<p id="content">
A webserver is software run by your website hosting provider so that visitors can view the web pages on your site. The Apache HTTP Server is a free and open-source
In this project we have set-up the Apache Webserver on Amazon EC2 and have configured it to host this particular website of ours on it.
</p>
<p id="makers">
<i>Project by Pradipta Nandi(RA154), Gunnu Jairaj(RA171) and Arpan Ghosh(RA205)</i>
</p>
</body>
</html>

```

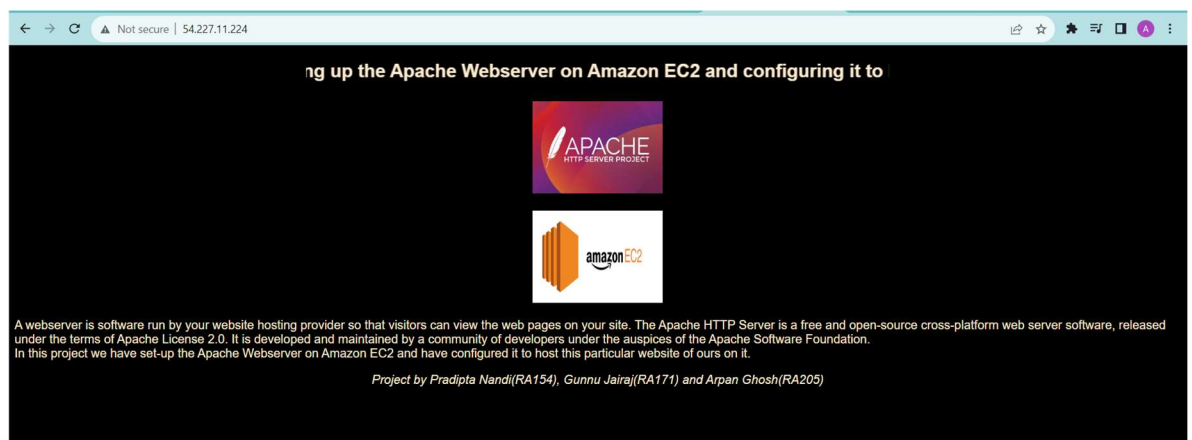
- After saving, press Ctrl X to exit the nano editor and type the following command in the Ubuntu terminal – **sudo service apache2 restart** to again restart the service.

```

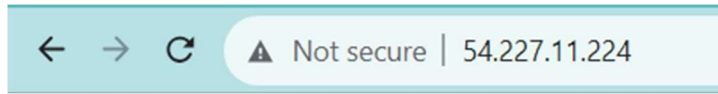
ubuntu@ip-172-31-25-244:/var/www/html$ sudo service apache2 restart
ubuntu@ip-172-31-25-244:/var/www/html$

```

- Now refresh the website or paste the public IP address on a new tab to view the website.

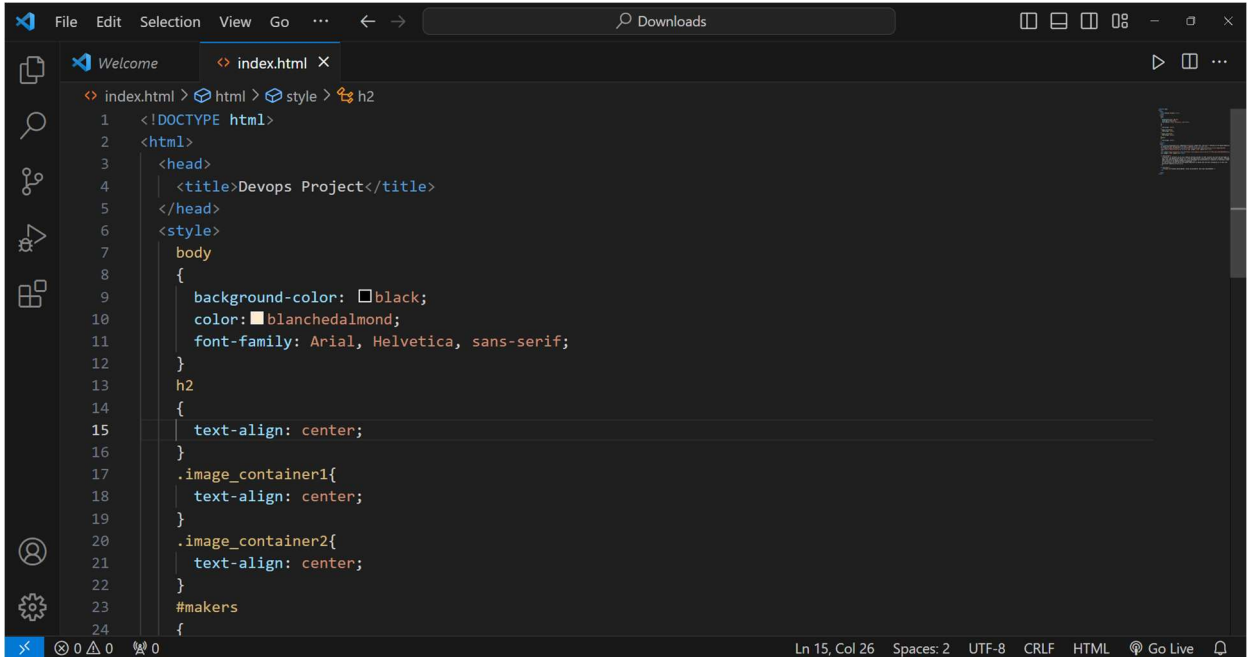


- We can observe that our website has an IP Address to it.

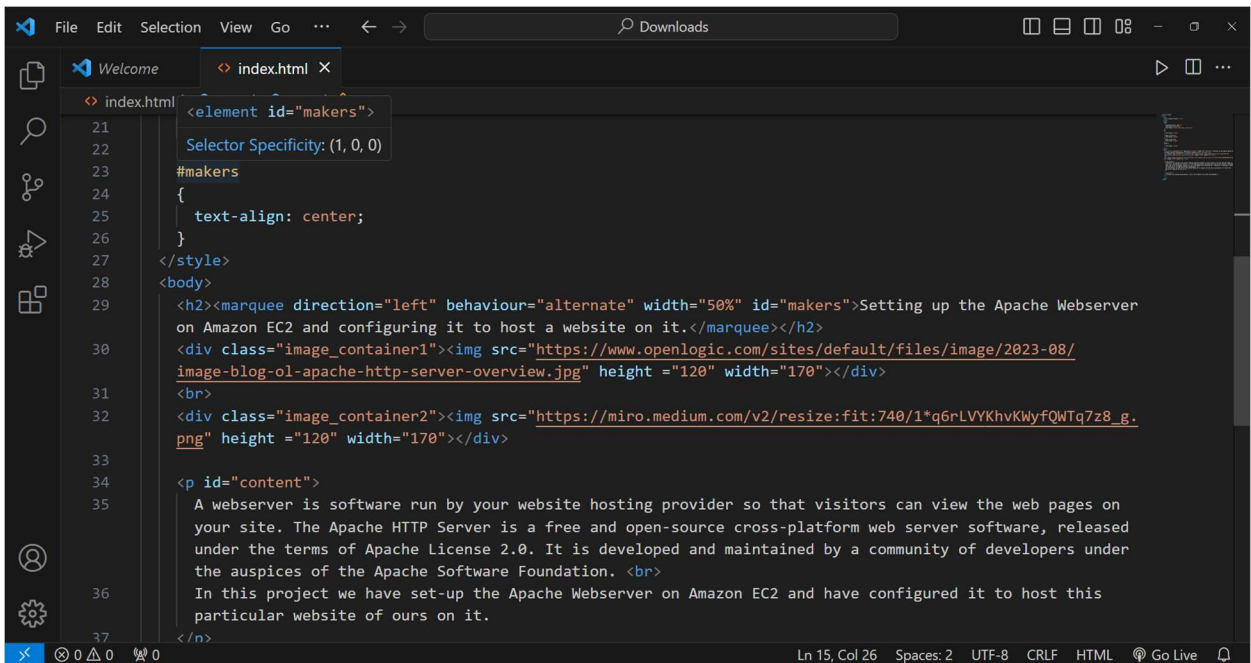


- We can map this to a domain name through the DNS but that is not in the scope of this project.
- Hence, we were successfully able to launch an EC2 instance and install and set up Apache on it and were able to host our website on this web server.

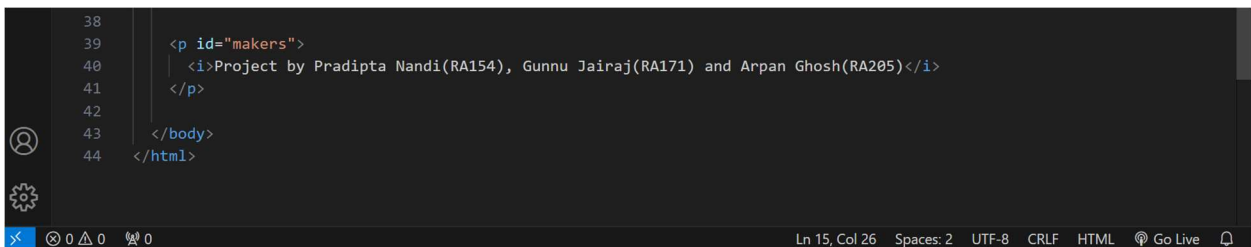
HTML CODE



```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>Devops Project</title>
5   </head>
6   <style>
7     body
8     {
9       background-color: black;
10      color: blanchedalmond;
11      font-family: Arial, Helvetica, sans-serif;
12    }
13    h2
14    {
15      text-align: center;
16    }
17    .image_container1{
18      text-align: center;
19    }
20    .image_container2{
21      text-align: center;
22    }
23    #makers
24    {
```



```
21 <element id="makers">
22   Selector Specificity: (1, 0, 0)
23   #makers
24   {
25     text-align: center;
26   }
27 </style>
28 <body>
29   <h2><marquee direction="left" behaviour="alternate" width="50%" id="makers">Setting up the Apache Webserver
30   on Amazon EC2 and configuring it to host a website on it.</marquee></h2>
31   <div class="image_container1"></div>
33   <br>
34   <div class="image_container2"></div>
36   <p id="content">
37     A webserver is software run by your website hosting provider so that visitors can view the web pages on
38     your site. The Apache HTTP Server is a free and open-source cross-platform web server software, released
39     under the terms of Apache License 2.0. It is developed and maintained by a community of developers under
40     the auspices of the Apache Software Foundation. <br>
41     In this project we have set-up the Apache Webserver on Amazon EC2 and have configured it to host this
42     particular website of ours on it.
43   </p>
44 </body>
45 </html>
```



```
38 <p id="makers">
39   <i>Project by Pradipta Nandi(RA154), Gunnu Jairaj(RA171) and Arpan Ghosh(RA205)</i>
40 </p>
41 </body>
42 </html>
```


CONCLUSION

Hence, we were successfully able to set up and install the Apache Server on an Amazon EC2 instance and were also successfully able to host our website publicly on the web server for everyone to view our website on the World Wide Web.

REFERENCES

- <https://httpd.apache.org/>
- https://en.wikipedia.org/wiki/Apache_HTTP_Server
- <https://www.openlogic.com/sites/default/files/image/2023-08/image-blog-ol-apache-http-server-overview.jpg>
- https://miro.medium.com/v2/resize:fit:740/1*q6rLVYKhvKWvfQWTq7z8_g.png
- https://devopsdatacenter.files.wordpress.com/2024/04/amazon_ec2.png