

PROFESSIONAL TRAINING REPORT

at

**Sathyabama Institute of Science and Technology (Deemed
to be University)**

Submitted in partial fulfillment of requirements for the award
of Bachelor of Technology Degree in Information Technology

By-

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**DEPARTMENT OF INFORMATION TECHNOLOGY SCHOOL OF
COMPUTING**

SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

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CHENNAI – 600119, TAMILNADU

NOVEMBER 2021

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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the Bonafide work of **SOWMYA SREE . T** (Reg No: 39120118) who carried out the project entitled “**Mobile Cloud Computing**” under my supervision from October 2021 to November 2021.

Internal Guide

Dr. JEBERSON RETNA RAJ

Head of Department

DECLARATION

I, **SOWMYA SREE . T** hereby declare that the project report entitled **Mobile Cloud Computing** done by me under the guidance of **Dr. JEBERSON RETNA RAJ** is submitted in partial fulfillment of requirements for the award of Bachelor of Technology Degree in Information Technology.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala M.E., Ph.D., Dean**, School of Computing, **Dr. R. Subhashini M.E., Ph.D., Head of the Department of Information Technology** for providing me necessary support and details at the right time during the progressive reviews.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE



Award of Completion

Sowmya sree Thammina

Has Successfully Completed

Star Cloud Computing

Star Authorized Delivery Partner

Advantage Pro

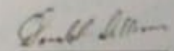
You can verify authenticity of this certificate by visiting
<http://www.starcertification.org/Verification/Participation>

10-11-2021

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DONALD WILLIAM
DIRECTOR
GLOBAL CERTIFICATIONS



ABSTRACT

Mobile Cloud Computing (MCC) is the combination of cloud computing and mobile computing to bring rich computational resources to mobile users, network operators, as well as cloud computing providers. Mobile cloud computing uses cloud computing to deliver applications to mobile devices. These mobile apps can be deployed remotely using speed and flexibility and development tools. Mobile cloud applications can be built or revised quickly using cloud services. They can be delivered to many different devices with different operating systems, computing tasks, and data storage. Thus, users can access applications that could not otherwise be supported. Mobile Cloud Computing is meant to make it possible for rich mobile applications to be executed on a different number of mobile devices. In this technology, data processing, and data storage happen outside of mobile devices. MCC has emerged as a boon to us, it has enhanced battery life, improved data processing and storage capacity, improved reliability and many more, thus in this thesis we dive deeper into understanding mobile cloud computing more deeply, understanding its architecture, its challenges and advantages, how it has been useful to, and to derive conclusions and explore the future of mobile cloud computing.

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LIST OF ABBREVIATIONS

Acronym	Expansion
MCC	Mobile Cloud Computing
BTS	Base transceiver station
AAA	Authentication, Authorization & Accounting
IAAS	Infrastructure as a Service
PAAS	Platform as a Service
SAAS	Software as a Service
AWS	Amazon Web Services
GCP	Google Cloud Platform

CHAPTER 1

INTRODUCTION

Mobile Cloud Computing (MCC) is the combination of cloud computing and mobile computing to bring rich computational resources to mobile users, network operators, as well as cloud computing providers. The ultimate goal of MCC is to enable execution of rich mobile applications on a plethora of mobile devices, with a rich user experience. MCC provides business opportunities for mobile network operators as well as cloud providers. More comprehensively, MCC can be defined as "a rich mobile computing technology that leverages unified elastic resources of varied clouds and network technologies toward unrestricted functionality, storage, and mobility to serve a multitude of mobile devices anywhere, anytime through the channel of Ethernet or Internet regardless of heterogeneous environments and platforms based on the pay-as-you-use principle.

Mobile cloud computing uses cloud computing to deliver applications to mobile devices. These mobile apps can be deployed remotely using speed and flexibility and development tools. Mobile cloud applications can be built or revised quickly using cloud services. They can be delivered to many different devices with different operating systems, computing tasks, and data storage. Thus, users can access applications that could not otherwise be supported.

There are several key features of MCC such as Facilitates the quick development, Shared resources of mobile apps. Supports a variety of development approaches and devices. Improves reliability with information backed up and stored in the cloud. Applications use fewer device resources because they are cloud-supported. Mobile devices are connected to services delivered on an API architecture.

CHAPTER 2

AIM AND SCOPE OF PRESENT INVESTIGATION

2.1 AIM

Mobile Cloud Computing has been a vital assistive technology and its application is significant and widespread, it allows people to access data from anywhere as long as you are connected to internet. You can access the information regardless of the platform you are using, it has brought people closer to information, it has put internet under our fingertips. In this investigation we will see how mobile actually connects to the cloud. We will demonstrate this by launching our website on the cloud and accessing it through our mobile devices.

2.2 SCOPE

Mobile Cloud Computing, or MCC, merges the fast-growing Cloud Computing Applications market with the ubiquitous smartphone. One of the most ground-breaking blends of modern-day technologies, MCC has proved itself to be highly beneficial to all the mobile users and cloud-based service-providers as well.

CHAPTER 3

SYSTEM SPECIFICATION

3.1 HARDWARE SPECIFICATION

Processor	Processor Intel Core i3 and above
Internet	Existing telephone lines, Data Cable
RAM	4GB
Mobile device	Any with an internet connection

3.2 SOFTWARE SPECIFICATION

Operating System	Windows, Mac, Linux
GUI	Visual Studio Code
PUTTY	

PUTTY

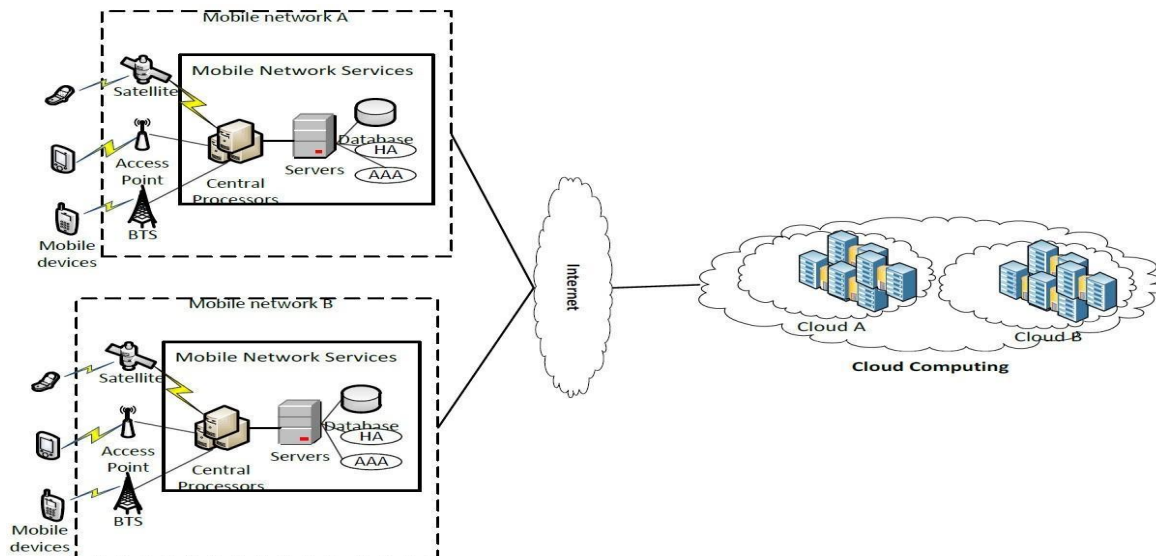
PuTTY is a free and open-source terminal emulator, serial console and network file transfer application. It supports several network protocols, including SCP, SSH, Telnet, rlogin, and raw socket connection. It can also connect to a serial port.

PuTTY was originally written for Microsoft Windows, but it has been ported to various other operating systems. Official ports are available for some Unix-like platforms, with work-in-progress ports to Classic Mac OS and macOS, and unofficial ports have been contributed to platforms such as Symbian, Windows Mobile and Windows Phone.

CHAPTER 4

MODEL IMPLEMENTATION

4.1 SYSTEM ARCHITECTURE



MCC is a mix of both the technologies mobile web and cloud computing. It provides users the necessary software, apps, tools and other resources to access services and applications from cloud on the internet...

There are various parts that make up this architecture.

Clouds take charge of data processing and storage, thus mobile devices do not need to incorporate the power of an advanced processor, huge memory capacity and strength.

Mobile devices are connected to the mobile networks via base stations (e.g., base transceiver station (BTS), access point, or satellite) that establish and control the connections (air links) and functional interfaces between the networks and mobile devices. Mobile users' requests and information (e.g., ID and location) are transmitted to the central processors that are connected to servers providing mobile network services.

Here, mobile network operators can provide services to mobile users as authentication, authorization, and accounting (AAA) based on the home agent and subscribers' data stored in databases. After that, the subscribers' requests are delivered to a cloud through the Internet. In the cloud, cloud controllers process the requests to provide mobile users with the corresponding cloud services. These services are developed with the concepts of utility computing, virtualization, and service-oriented architecture (e.g., web, application, and database servers).

4.2 MODULES

- Creating an ec2 Linux instance in aws
- Creating s3 bucket in aws
- Hosting webpage on s3

CREATING AN EC2 INSTANCE IN LINUX

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers. Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment.

Amazon EC2 offers the broadest and deepest compute platform with choice of processor, storage, networking, operating system, and purchase model. We offer the fastest processors in the cloud and we are the only cloud with 400 Gbps ethernet networking. We have the most powerful GPU instances for machine learning training and graphics workloads, as well as the lowest cost-per-inference instances in the cloud. More SAP, HPC, Machine Learning, and Windows workloads run on AWS than any other cloud.

- Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.
- We will choose an ami for the instance.
- Configure the settings and launch the instance.
- Then connect to the instance via ssh for Linux or rdp for windows instance

CREATING A S3 BUCKET IN AWS

Amazon Simple Storage Service (Amazon S3) is an object storage service that offers industry-leading scalability, data availability, security, and performance. Customers of all sizes and industries can use Amazon S3 to store and protect any amount of data for a range of use cases, such as data lakes, websites, mobile applications, backup and restore, archive, enterprise applications, IoT devices, and big data analytics. Amazon S3 provides management features so that you can optimize, organize, and configure access to your data to meet your specific business, organizational, and compliance requirements.

The basic storage units of Amazon S3 are objects which are organized into buckets. Each object is identified by a unique, user-assigned key. Buckets can be managed using either the console provided by Amazon S3, programmatically using the AWS SDK, or with the Amazon S3 REST application programming interface (API). Objects can be managed using the AWS SDK or with the Amazon S3 REST API and can be up

to five terabytes in size with two kilobytes of metadata. Additionally, objects can be downloaded using the HTTP GET interface and the BitTorrent protocol.

- Amazon Simple Storage Service (Amazon S3) is an object storage service offering industry-leading scalability, data availability, security, and performance.
- Creating an s3 bucket is a simple task, go to s3 through aws console.
- Give it a unique name and set its permissions
- Launch it

HOSTING A WEBPAGE ON S3

A web page (or webpage) is a hypertext document provided by a website and displayed to a user in a web browser. A website typically consists of many web pages linked together in a coherent fashion. The name "web page" is a metaphor of paper pages bound together into a book.

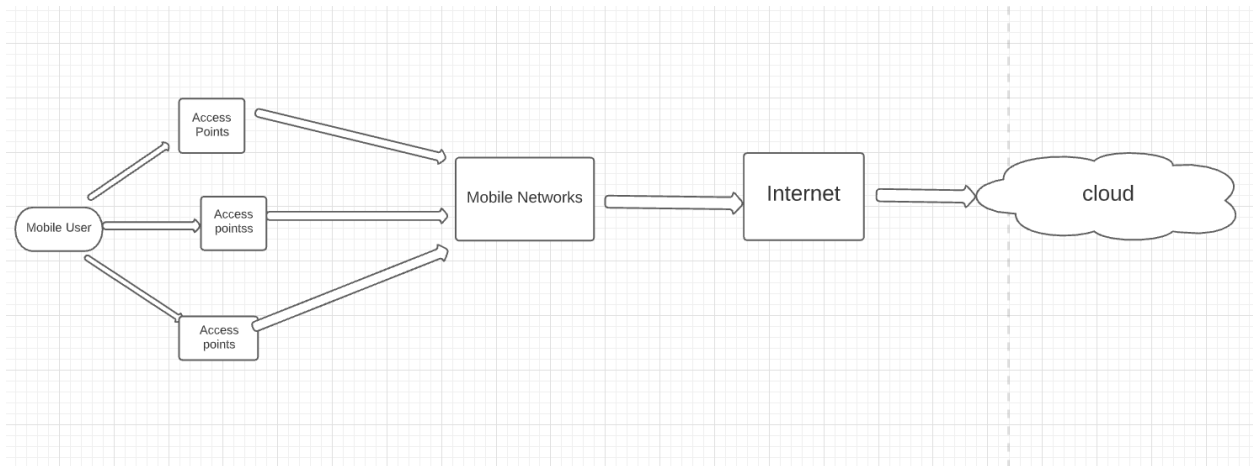
We will create a simple static website just for the demonstration of how mobile access the cloud, the webpage will be hosted on s3, which is also a cloud-based service, and we can access the webpage using our mobile device hence implementing our purpose of mobile cloud computing.

- Create a static website
- Upload it to s3 bucket
- Change its permissions to public so that it can be viewed
- Access it through your mobile phone using its URL

CHAPTER 5

SYSTEM DESIGN

5.1 FLOWCHART DIAGRAM



Mobile devices are connected to the mobile networks via base stations (e.g., base transceiver station (BTS), access point, or satellite) that establish and control the connections (air links) and functional interfaces between the networks and mobile devices. Mobile users' requests and information (e.g., ID and location) are transmitted to the central processors that are connected to servers providing mobile network services.

Here, mobile network operators can provide services to mobile users as authentication, authorization, and accounting (AAA) based on the home agent and subscribers' data stored in databases. After that, the subscribers' requests are delivered to a cloud through the Internet. In the cloud, cloud controllers process the requests to provide mobile users with the corresponding cloud services. These services are developed with

the concepts of utility computing, virtualization, and service-oriented architecture (e.g., web, application, and database servers).

CHAPTER 6

FUTURE WORKS

The interface of MCC has undeniably enabled us to accommodate videos, music files, digital images and more, right into our petite smart-phones. Here are a few reasons that explain why MCC is considered to be the future for mobile devices:

1. **Extended Battery Life:** As the major role of processing is handled by the cloud, mobile devices' battery usage is reduced automatically.
2. **Abundant Storage Space:** Enormous storage capacity that a mobile user can access happens to be the most highlighted USP of the cloud service. Mobile users shall no longer need to worry about their devices' limited storage capacity and spend money on memory cards.
3. **Improved data-synching techniques:** Cloud storage enables the user to store and manage their data by speedy data synchronization between the device and any other desktop or device chosen by the user. This instantly benefits the users by eliminating their problems of storing all their data files and maintaining a back-up.
4. **Enhanced processing facilities:** The processor of any mobile device determines its speed and performance. However, in the case of mobile cloud computing, most of the processing is performed at the cloud level. This takes the load off the device and thereby enhances its overall performance.

5. Superior user-experience: In case of MCC it is always the user who benefits the most by using this platform. The wide range of benefits offered by this platform makes for an optimum productivity and an enhanced user experience.

Scope to embrace new technologies: MCC can easily adjust to the ever-evolving nature of technologies. It is capable enough to perform efficiently with all the upgrades in cloud computing methods and changes in the smart-phones' designs and features.

CHAPTER 7

CONCLUSION

The global mobile cloud market is in its evolutionary stage and is exhibiting rapid growth. The global market is expected to grow in the years to come with fast-paced adoption among enterprises. Nowadays, enterprises and consumers are seeking more mobility to remain connected on real-time basis. The continuous development in the field of mobile has improved business communication by providing connectivity to organizational information on the go. The cloud technology has opened better ways of service delivery and IT usage providing scalability and data synchronization to businesses. The amalgamation of cloud and mobile has further enhanced the term mobility as it provides instantaneous information.

The cloud-based apps are increasingly being used as they shift computational tasks on cloud that enhances the functioning of limited memory mobile devices. The growing multi-purpose usage of Smartphones and improved Internet speed has further encouraged consumers to use cloud-based apps. With the emergence of mobile workforce, enterprises are increasingly adopting mobile cloud, to provide real-time information to employees and enable business continuity, so as to provide an enhanced rich user experience to its customers.

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APPENDIX

SNAPSHOTS

Launching an ec2 instance

aws

Services ▾

Q

Search for services, features, blogs, docs, and more

[Alt+S]

AWSlearn ▾Mumbai ▾Support ▾

1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Q

Search for an AMI by entering a search term e.g. "Windows"

X

Search by Systems Manager parameter

Quick Start

1 to 42 of 42 AMIs

My AMIs

AWS Marketplace

Community AMIs

☐ Free tier only ⓘ



Amazon Linux

Free tier eligible

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0f1fb91a596abf28d (64-bit x86) / ami-059150cc43ff13d66 (64-bit Arm)

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is now under maintenance only mode and has been removed from this wizard.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes



macOS

macOS Big Sur 11.6 - ami-0ec547d2b0d3be4c7

The macOS Big Sur AMI is an EBS-backed, AWS-supported image. This AMI includes the AWS Command Line Interface,

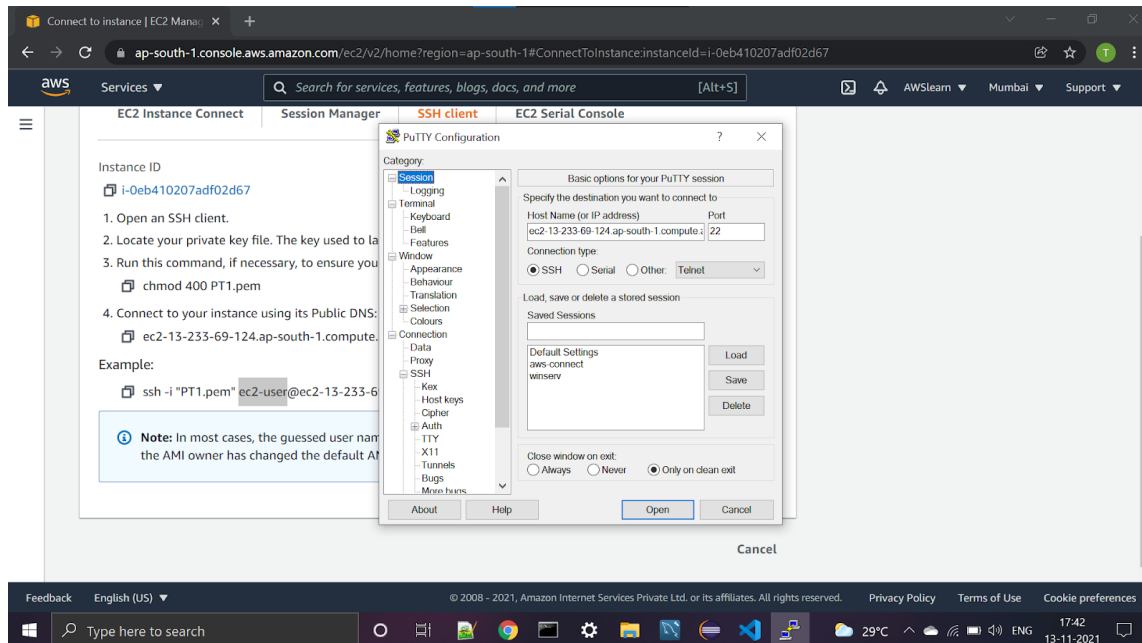
Select

☒ 64-bit (x86)
☐ 64-bit (Arm)

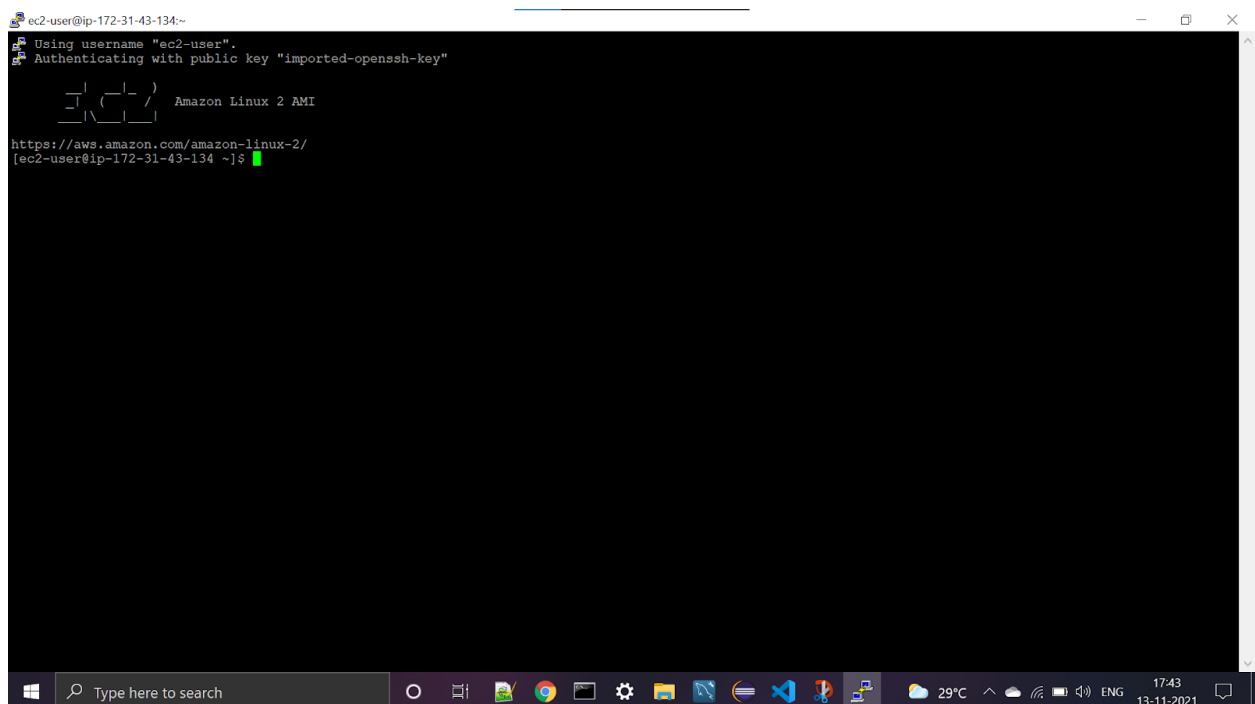
Select

64-bit (Mac)

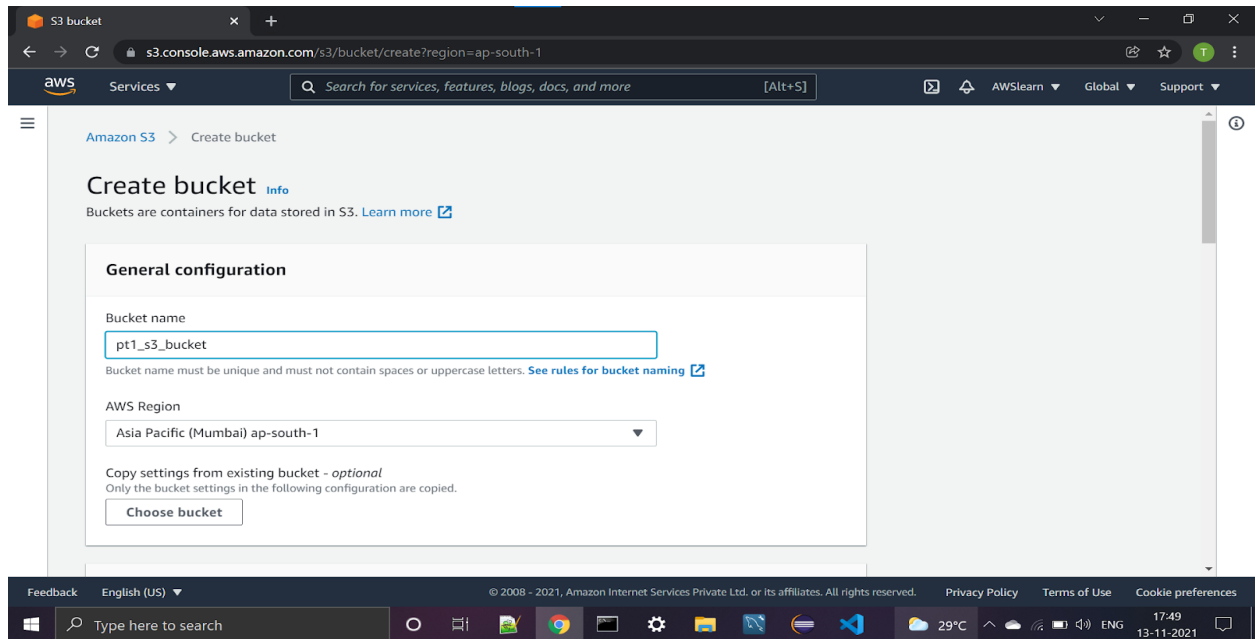
Launching an ec2 instance



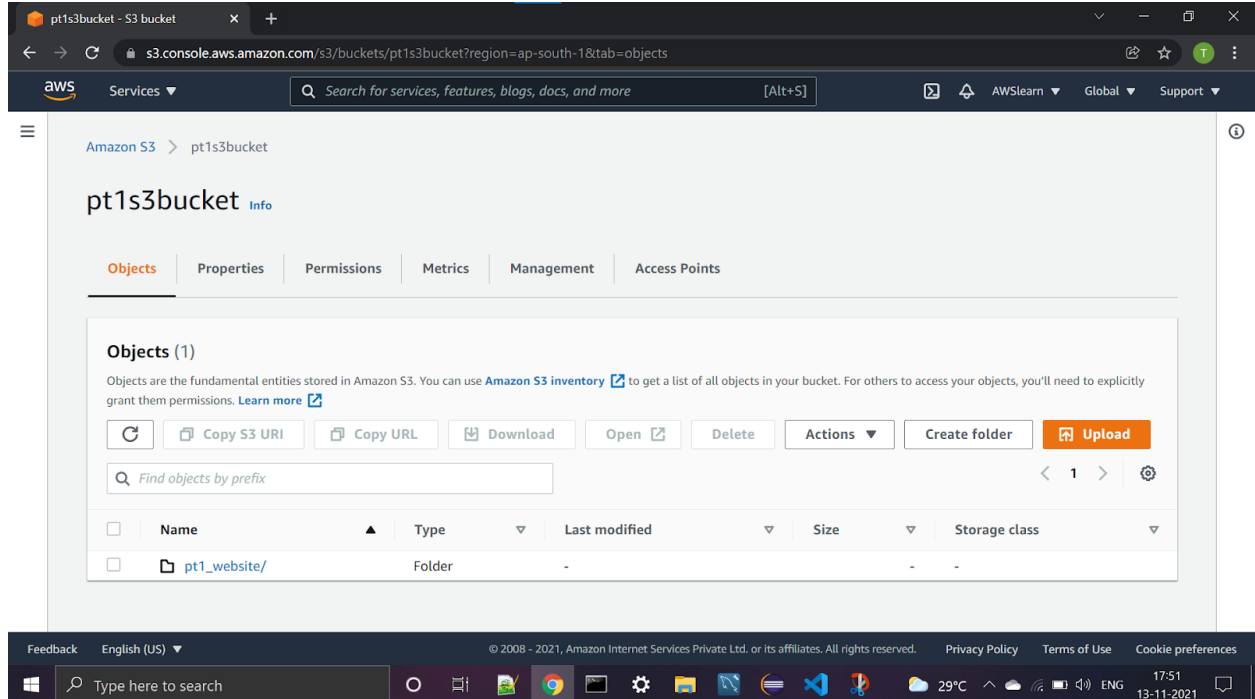
Instance Launched



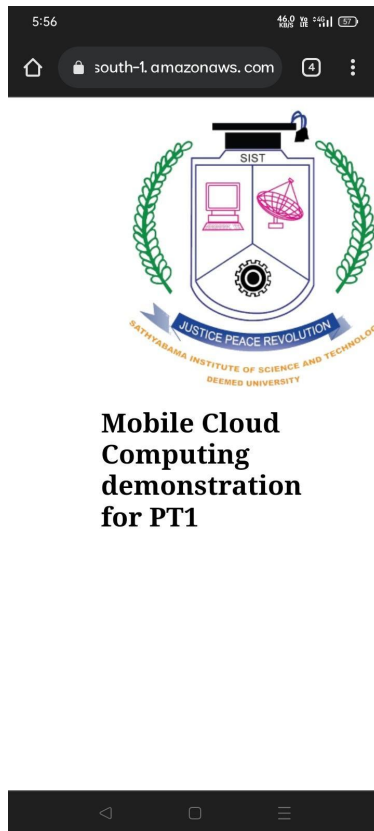
Creating s3 bucket



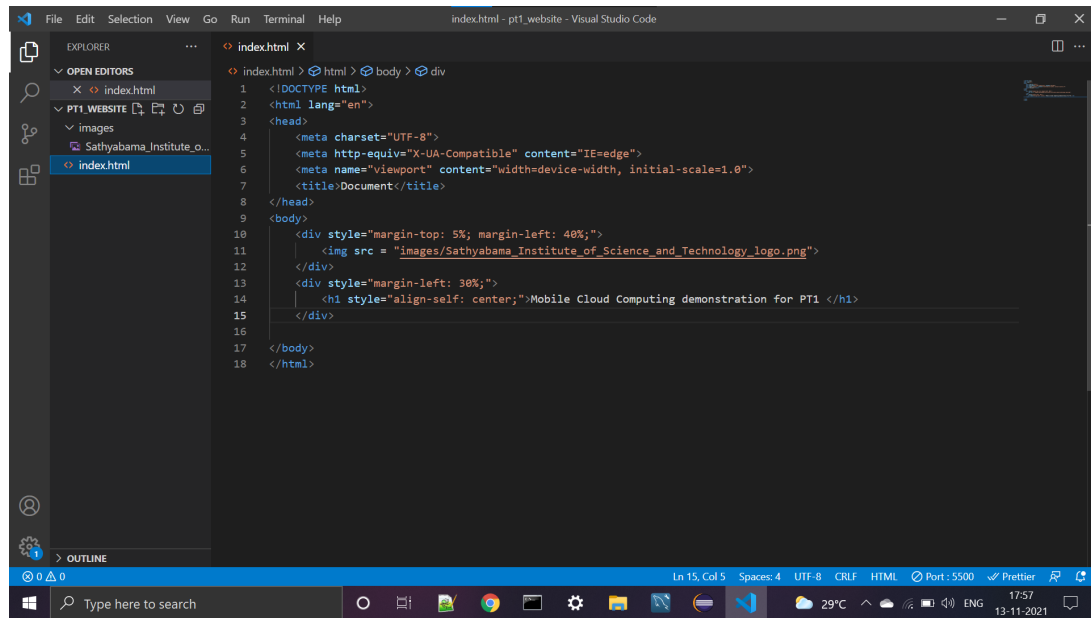
Uploading webpage on s3



Accessing the webpage on a mobile device



Code for the webpage



```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <title>Document</title>
8 </head>
9 <body>
10   <div style="margin-top: 5%; margin-left: 40%;">
11     <img src = "images/Sathyabama_Institute_of_Science_and_Technology_logo.png">
12   </div>
13   <div style="margin-left: 30%;">
14     <h1 style="align-self: center;">Mobile Cloud Computing demonstration for PT1 </h1>
15   </div>
16 </body>
17 </html>
```