SAVITRIBAI PHULE PUNE UNIVERSITY

A MINI PROJECT REPORT ON

Setup own cloud for Software as a Service over the existing LAN

SUBMITTED TOWARDS THE

PARTIAL FULFILLMENT OF THE REQUIREMENTS OF

BACHELOR OF ENGINEERING (Computer Engineering)

BY

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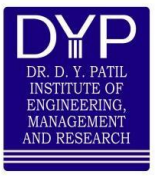
Under The Guidance of

Prof. Suvarna Patil



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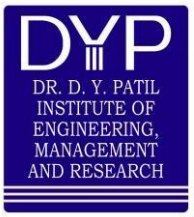

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CERTIFICATE

This is to certify that the Project Entitled

Setup own cloud for Software as a Service (SaaS)
over the existing LAN

Submitted by

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is a bonafide work carried out by Students under the supervision of **Prof. Suvarna Patil** and it is submitted towards the partial fulfillment of the requirement of Bachelor of Engineering (Computer Engineering).

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Sign of External Examiner

PROJECT APPROVAL SHEET

A Project Title

Setup own cloud for software as s service(Saas) over the existing LAN.

Is successfully completed by

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DEPARTMENT OF COMPUTER ENGINEERING

(Dr. D. Y. Patil Institute of Engineering, Management & Research)

SAVITRIBAI PHULE PUNE UNIVERSITY,PUNE ACADEMIC YEAR

2019-2020

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Abstract

Cloud Computing is a field of IT that can revolutionize the traditional computing facilities. Cloud Computing gives a new view to our hardware and software facilities by making them elastic rather than scalable. The system can be scaled up or down according to a user's need. The use of open source technology is a turning point in providing cloud computing infrastructure to reduce the cost by a large magnitude. We can build our own private clouds and share resources viz. hardware and software without making any investment. The aim of this project is to provide open source solution to build a private cloud. saas(Software as a service) implementation means to implement a private cloud wherein we can share hardware resources so as to reduce the cost of IT services of an organization.

It is expected to see a future dominance of the open source model in cloud computing, which will solve the major adoption concerns for users. Even a small own cloud built on our college intranet gives us an idea of the dominance of cloud computing in near future. The scope of the cloud built in is scalable, allocate more capacity only when you need it, allocate more instances only when you need them, dynamic Instance Creation and Termination upon receiving a request.

The present study empirically analyzes the factors that determine the adoption of cloud computing (SaaS model) in firms where this strategy is considered strategic for executing their activity. A research model has been developed to evaluate the factors that influence the intention of using cloud computing that combines the variables found in the technology acceptance model (TAM).

Cloud computing is a rapidly developing and excellent promising technology. It has aroused the concern of the computer society of whole world. Cloud computing is Internet- based computing, whereby shared information, resources, and software, are provided to terminals and portable devices on-demand, like the energy grid.It aims to build and forecast sophisticated service environment with powerful computing capabilities through an array of relatively low-cost computing entity, and using the advanced deployment models like SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service),HaaS (Hardware as a Service) to distribute the powerful computing capacity to end-users. This paper will explore the background and service models and also presents the existing research issues and implications in cloud computing such as security, reliability, privacy, and so on.

Acknowledgments

It gives us great pleasure in presenting the preliminary project report on ' Setup own cloud for Software as a Service (SaaS)'.

I would like to take this opportunity to thank my internal guide **Prof. Suvarna Patil** for giving me all the help and guidance I needed. I am really grateful to them for their kind support. Their valuable suggestions were very helpful.

I am also grateful to **Prof. P.P. Shevtekar**, Head of Computer Engineer- ing Department, Dr. D. Y. Patil Institute of Engineering, Management & Research for his indispensable support, suggestions.

In the end our special thanks to **Prof.Suvarna Patil** for providing various resources such as laboratory with all needed software platforms, continuous Internet connection, for Our Project.

Name & Roll No of Students

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Contents

Chapter 1

Synopsis

1.1 Project Title

Setup own cloud for Software as a Service (SaaS) .

1.2 Project Option

Internal project

1.3 Internal Guide

Ms.Suvarna Patil

1.4 Problem Statement

Setup own cloud for Software as a Service (SaaS) over the existing LAN in your laboratory. In this assignment you have to write your own code for cloud controller using open source technologies without HDFS. Implement the basic operations may be like to upload and download file on/from cloud in encrypted form.

1.5 Abstract

Cloud Computing is a field of IT that can revolutionize the traditional computing facilities. Cloud Computing gives a new view to our hardware and software facilities by making them elastic rather than scalable. The system can be scaled up or down according to a user's need. The use of open source technology is a turning point in providing cloud computing infrastructure to reduce the cost by a large magnitude. We can build our own private clouds and share resources viz. hardware and software without making any investment. The aim of this project is to provide open source solution to build a private cloud. saas(Software as a service) implementation means to implement a private cloud wherein we can share hardware resources so as to reduce the cost of IT services of an organization.

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Cloud computing is a rapidly developing and excellent promising technology. It has aroused the concern of the computer society of whole world. Cloud computing is Internet-based computing, whereby shared information, resources, and software, are provided to terminals and portable devices on-demand, like the energy grid. Cloud computing is the product of the combination of grid computing, distributed computing, parallel computing, and ubiquitous computing. It aims to build and forecast sophisticated service environment with powerful computing capabilities through an array of relatively low-cost computing

entity, and using the advanced deployment models like SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service),HaaS (Hardware as a Service) to distribute the powerful computing capacity to end-users. This paper will explore the background and service models and also presents the existing research issues and implications in cloud computing such as security, reliability, privacy, and so on.

1.6 Goals and Objectives

Goals-

implement the basic operations may be like to upload and download file on/from cloud in encrypted form. The uploading and downloading of file is secure and will be secure from frudes.

Its main purpose is to encrypt files on remote storage services that are connected to your ownCloud server, such as Dropbox and Google Drive. If your ownCloud server is not connected to any remote storage services, then it is better to use some other form of encryption such as file-level or whole disk encryption. Because the keys are kept on your ownCloud server, it is possible for your ownCloud admin to snoop in your files, and if the server is compromised the intruder may get access to your files.

Objective-

Objective of this to upload and download file form cloud in encrypted form.

ownCloud gives organizations the ability to access, control and manage files across applications, on-premises or cloud storage, or other data silos. Open by nature, ownCloud integrates into your existing infrastructure and offers the extensibility required to meet your specific needs.

The purpose of SaaS is to deliver on-demand computing services through applications over the internet. It improves accessibility, scalability, and reliability while minimizing overhead and maintenance costs.

Chapter 2

Technical Keywords

2.1 Area of Project-

cloud computing.

2.2 Technical Keywords-

1)Cloud computing
2)Software as service(Saas)
3)Own (Private) cloud
4)open source Technologies
5)Cloud storage
6)HTML
7)CSS
8)Phpmyadmin
9)PHP

Chapter 3

Introduction

3.1 Project Idea

The idea of the project is occurred from the subject cloud computing now a days cloud computing is the mostly use the many industries so we are set our own cloud for saas on existing lan for downloding and uploading of file in encrypted form.

3.2 Motivation of the Project

Motivation of the project is that the own cloud has many feature which are useful for the industries such as -
Scalability and On-Demand Services - Cloud computing provides resources and services for users on demand. The resources are scalable over several data centers. Quality of Service (QoS) - Cloud computing can guarantee QoS for users in terms of hardware or CPU performance, bandwidth, and memory capacity. User-Centric Interface - Cloud interfaces are location independent and they can be accessed by well established interfaces such as Web services and Web browsers. Autonomous System - Cloud computing systems are autonomous systems managed transparently to users. However, software and data inside clouds can be automatically reconfigured and consolidated to a simple platform depending on user's needs. Pricing - Cloud computing does not require up front investment.

Chapter 4

Problem Definition and scope

4.1 Problem Statement:

Setup your own cloud for Saas.

4.1.1 Goals and objectives:

Goals-

Implement the basic operations may be like to upload and download file on/from cloud in encrypted form. The uploading and downloading of file is secure and will be secure from frudes.
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needs. The purpose of SaaS is to deliver on-demand computing services through applications over the internet. It improves accessibility, scalability, and reliability while minimizing overhead and maintenance costs.

4.1.2 Statement of scope-

Setup the cloud can be integrated to other public clouds which gives rise to hybrid cloud. The integration also enhances the scope of cloud computing as we will be able to use resources of other organizations. The services can also be metered and made as pay-per-use basis. This kind of services are also called Iaas(Infarstructure as a service).The cloud is dependent on internet and can be made to work in a different lan. Further work can be done to manage the private cloud with better resource management and improving the efficiency of the system.

4.2 Applications:

1) Online File storage.
2)Photo editing software.
3)Digital video software.
4)Twitter-related applications.
5)Creating image-album.
6)Web application for antivirus.
7)Word processing application.
8)Spreadsheets.

4.3 Hardware Resources Required

Sr. No	Parameter	Minimum Requirement
1	Phpmyadmin	RAM, ROM, OS

Table 4.1: Hardware Requirements

4.4 Software Resources Required

1)Phpmyadmin

2)Bootstrap

3)PHP

Chapter 5
Software requirement specification

5.1 Data Description and technologies

5.1.1 Data Description-

1. MYSQL Data:

MYSQL stands for My Strucured Query Language. It is a database which stores the details of the placement management system.

Component of MYSQL:

1. Database : Stores Tables.
2. Tables : Stores Attributes
3. Attributes : Attributes are columns which store data
4. Record : Records are horizontal entity which store data corresponding to all attributes in the table.

2. Technologies -

Amazon services:

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 easierfor developers. Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers. Amazon EC2's simple web service interface allows you to obtain and configure capacity

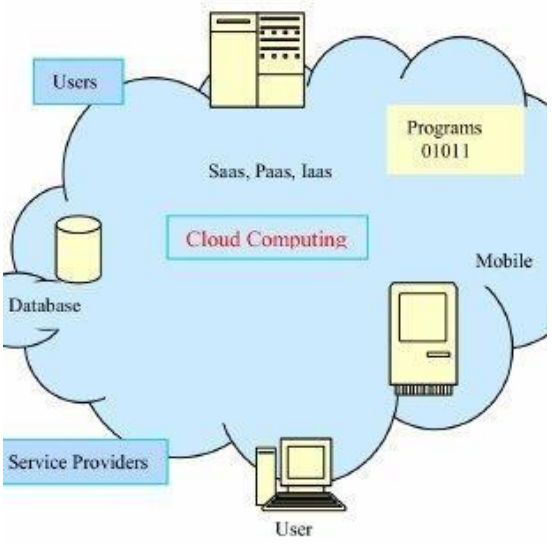
with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use. Amazon EC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.

Putty:

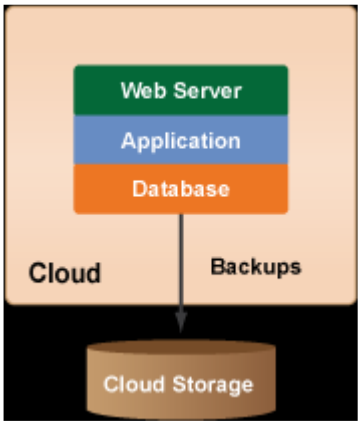
Putty was originally written for Microsoft Windows, but it has been ported various other operating systems. Official ports are available for some Unix-like platforms, with work-in- progress ports to Classic Mac OS and macOS, and unofficial ports have been contributed to platforms such as Symbian,Windows Mobile and Windows Phone. Putty supports many variations on the secure remote terminal, and provides user control over the SSH encryption key and protocol version, alternate ciphers such as AES, 3DES,RC4, Blowfish, DES, and Public-key authentication. PuTTY supports SSO through GSSAPI,including user provided GSSAPI DLLs. It also can emulate control sequences from xterm, VT220, VT102 or ECMA-48 terminal emulation, and allows local, remote, or dynamic portforwarding with SSH (including X11 forwarding). The network communication layer supports IPv6, and the SSH protocol supports. PuTTY comes bundled with command-line SCP and SFTP clients, called "pscp" and "psftp" respectively, and plink, a command-line connection tool, used for non-interactive sessions.

5.2 Functional Model and Description

5.1.2 Cloud computing Diagram:



5.2.2 Functional Model and Discription -



Launch the EC2:

1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.

2. Choose Launch Instance.

3. In Step 1: Choose an Amazon Machine Image (AMI), find an Amazon Linux AMI at the

top of the list and choose Select.

4. In Step 2: Choose an Instance Type, choose Next: Configure Instance Details.

5. In Step 3: Configure Instance Details, provide the following information:

● For Network, choose the entry for the same VPC that you noted when you created

your EFS file system

● For Subnet, choose a default subnet in any Availability Zone.

● For File systems, make sure that the EFS file system. The path shown next to the

file system ID is the mount point that the EC2 instance will use, which you can

change. Choose Add to user data to mount the file system when the EC2 is

launched.

● Under Advanced Details, confirm that the user data is present in User data.

6. Choose Next: Add Storage.

7. Choose Next: Add Tags.

8. Name your instance and choose Next: Configure Security Group.

9. In Step 6: Configure Security Group, set Assign a security group to Select an existing

security group. Choose the default security group to make sure that it can access your

EFS file system.

10. Choose Review and Launch.

11. Choose Launch.

12. Select the check box for the key pair that you created, and then choose Launch Instances.

Using Putty to access your EC2 Instance:

Step 1. Download puttygen for creating a .ppk file as putty doesn't accept .pem file generated by

AWS.

Step 2. Convert your .pem file to .ppk file using PuttyGen.Load your .pem file generated by

AWS. Then save the private key (.ppk) file.

Step 3. Open Putty

- Add your IP.
- Add user name
- Add your ppk file
- Click on Open.
- Give the ip address or the host name. Then in the data section give the User name for the

instance for linux it's generally "ec2-user".

Step 4. Click open.

Here it is. Now you can access your EC2 instance.

Chapter 6

Project Implementation

6.1 Introduction

Cloud computing is not new concept ,it is originated from the earlier large scale distributed computing technology. However, it will be a subversion technology and cloud computing will be the rapid revolution in the Computer Science and Information Technology field. Which represent the development trend in the IT industry from hardware to software, software to services, and distributed service to centralized service. Cloud computing is also a new mode of business computing is virtualization. It will be widely used in the near future. The core concept of cloud computing is reducing the processing burden on the users. Eventually users use a wide variety of devices, including PCs, Laptops, Smart Phones, and PDAs to access different kinds of utility programs, storage, and application development platforms over the Internet. All these services offered by cloud computing providers. An advantage of the cloud computing technology includes cost savings, high availability, and easy scalability. However, still there exist many problems in cloud computing today, the current researchers or practitioners pointing that data security and privacy risks have become the primary concern for people to transfer or migrate to cloud computing.

The shows six phases of computing paradigms from terminals/mainframes, to PCs, Networking Computing, Internet Computing to Grid and Cloud Computing .Software as a Service (SaaS) - Software as a service (SaaS) is a software distribution model in which a third-party provider hosts applications and makes them available to customers over the Internet. SaaS is one of three main categories of cloud computing, alongside infrastructure as a service (IaaS) and platform as a service (PaaS). SaaS is closely related to the application service provider (ASP) and on demand computing software delivery models. The hosted application management model of SaaS is similar

to ASP, where the provider hosts the customer's software and delivers it to approved end users over the internet. In the software on demand SaaS model, the provider gives customers network-based access to a single copy of an application that the provider created specifically for SaaS distribution. The application's source code is the same for all customers and when new features or functionalities are rolled out, they are rolled out to all customers. Depending upon the service level agreement (SLA), the customer's data for each model may be stored locally, in the cloud or both locally and in the cloud. Organizations can integrate SaaS applications with other software using application programming interfaces (APIs). For example, a business can write its own software tools and use the SaaS provider's APIs to integrate those tools with the SaaS offering. There are SaaS applications for fundamental business technologies, such as email, sales management, customer relationship management (CRM), financial management, human resource management (HRM), billing and collaboration. Leading SaaS providers include Salesforce, Oracle, SAP, Intuit and Microsoft.

Cloud Storage - Cloud storage is a model of computer data storage in which the digital data is stored in logical pools. The physical storage spans multiple servers (sometimes in multiple locations), and the physical environment is typically owned and managed by a hosting company. These cloud storage providers are responsible for keeping the data available and accessible, and the physical environment protected and running. People and organizations buy or lease storage capacity from the providers to store user, organization, or application data. Cloud storage services may be accessed through a colocated cloud computing service, a web service application programming interface (API) or by applications that utilize the API, such as cloud desktop storage, a cloud storage gateway or Web-based content management systems.

Encryption

In cryptography, encryption is the process of encoding a message or information in such a way that only authorized parties can access it and those who are not authorized cannot. Encryption does not itself prevent interference, but denies the intelligible content to a would-be interceptor. In an encryption scheme, the intended information or message, referred to as plaintext, is encrypted using an encryption algorithm – a cipher – generating cipher text that can be read only if decrypted. For technical reasons, an encryption scheme

usually uses a pseudo-random encryption key generated by an algorithm. It is in principle possible to decrypt the message without possessing the key, but, for a well-designed encryption scheme, considerable computational resources and skills are required. An authorized recipient can easily decrypt the message with the key provided by the originator to recipients but not to unauthorized users.

Symmetric key: In symmetric-key schemes, the encryption and decryption keys are the same. Communicating parties must have the same key in order to achieve secure communication. An example of a symmetric key scheme would be the one used by the German Enigma Machine that sent information from a central location to troops in various other locations in secret. When the Allies captured one of these machines and figured out how it worked, they were able to decipher the information encoded within the messages as soon as they could discover the encryption key
for a given day's transmissions.

Public Key: In public-key encryption schemes, the encryption key is published for anyone to use and encrypt messages. However, only the receiving party has access to the decryption key that enables messages to be read. Public-key encryption was first described in a secret document in 1973; before then all encryption schemes were symmetric-key (also called private-key). Although published subsequently, the work of Diffie and Hellman, was published in a journal with a large readership, and the value of the methodology was explicitly described and the method became known as the Diffie Hellman-keyexchange.

6.2 Tools and Technologies Used

6.2.1 Tool:

Tool : Phpmyadmin,amazon serivices
Operating System: WINDOWS
Environment: Putty,aapneal
Support System: Phpmyadmin
Programming Language: HTML, CSS, PHP, MYSQL.

6.2.2 Technology:

1)Phpmyadmin

2)MYSQL

3)PHP

4)HTML

5)CSS

6)Putty

7)Amazoan Services

8)Aapnel

Chapter 7

Software Testing

7.1 Type of Testing Used

7.1.1 Unit testing:

It is a software testing method by which individual units of source code, are tested to determine whether they are fit for use.It provides a sort of living documentation of the system. It is performed by using the White Box testing method. It is performed by software developer. It increase the confidence of changing or maintaining code. It ensure that all statements in the unit have been executed at least once. It tests data structures (like stacks, queues) that represent rela- tionships among individual data elements.

Function:

- Module Interface: Ensure that information flows properly into and out of module.
- Local data structures: Ensure that data stored temporarily maintain its integrity during all steps in an algorithm execution.
- Driver and Stub:
  Driver is a module that takes input from test case, passes this input to the unit to be tested and prints the output produced. Stub is a module that works as a unit referenced by the unit being tested. It uses the interface of the subordinate unit, does minimum data manipulation, and returns control back to the unit being tested

7.1.2 Integration testing:

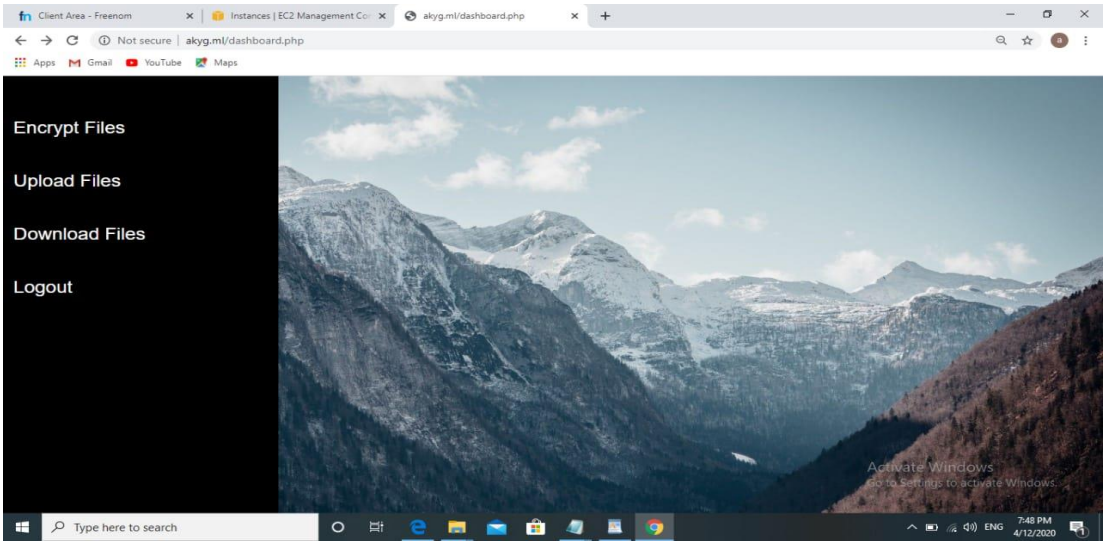
It tests integration or interface between components, interactions to different part of the system. It is to verify the functional, performance, and reliability between the modules that are integrated. Defined as a systematic technique for constructing the software architecture At the same time integration is occurring, conduct tests to uncover errors associated with interfaces.

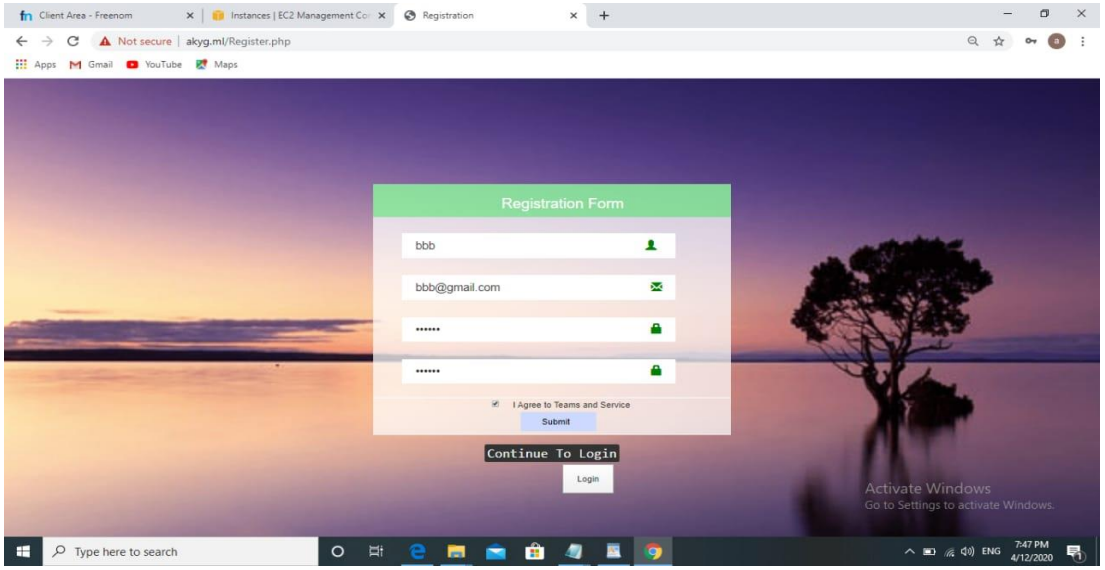
Objective is to take unit tested modules and build a program structure based on the prescribed design. It ensures that all modules work together properly and transfer accurate data across their interfaces. It is performed with an intention to uncover errors that lie in the interfaces among the integrated components. It tests those components that are new or have been modified .

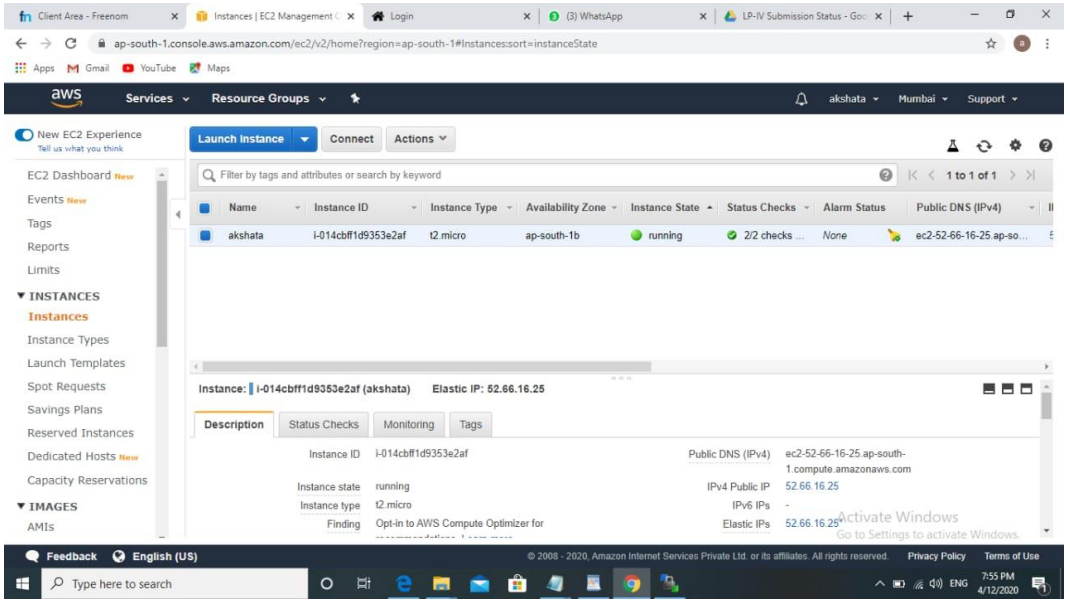
Chapter 8

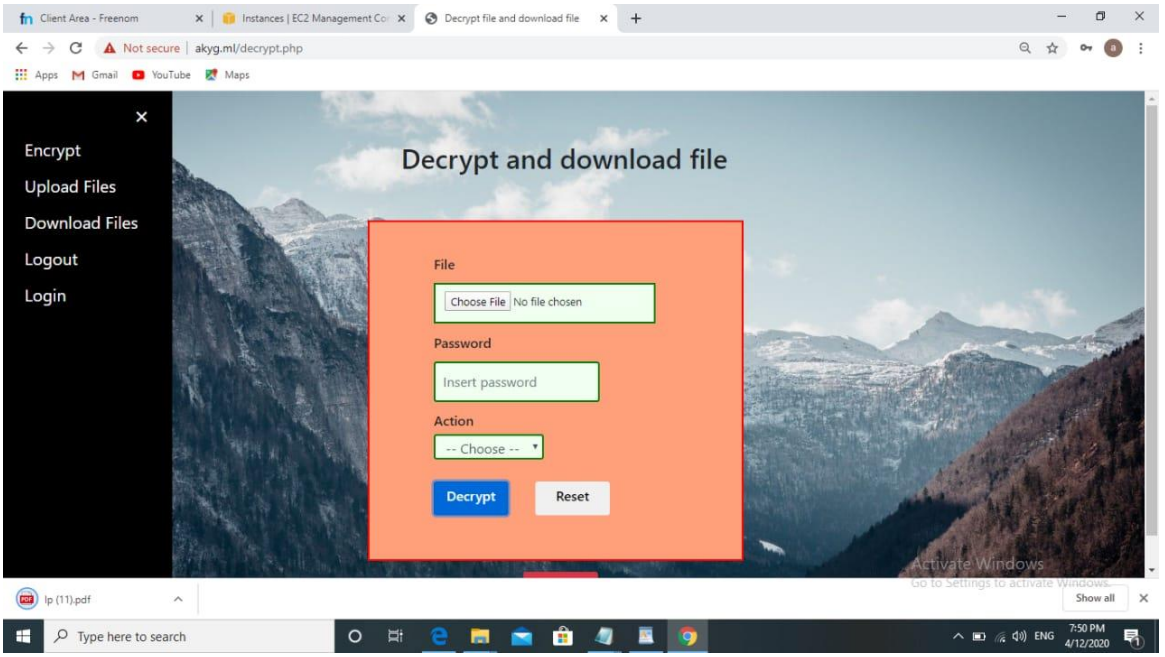
Results

8.1 Outputs






Launch Instance
Connect
Actions
Instance: i-014cbff1d9353e2af (akshata)
Elastic IP: 52.66.16.25
Description
Status Checks
Monitoring
Tags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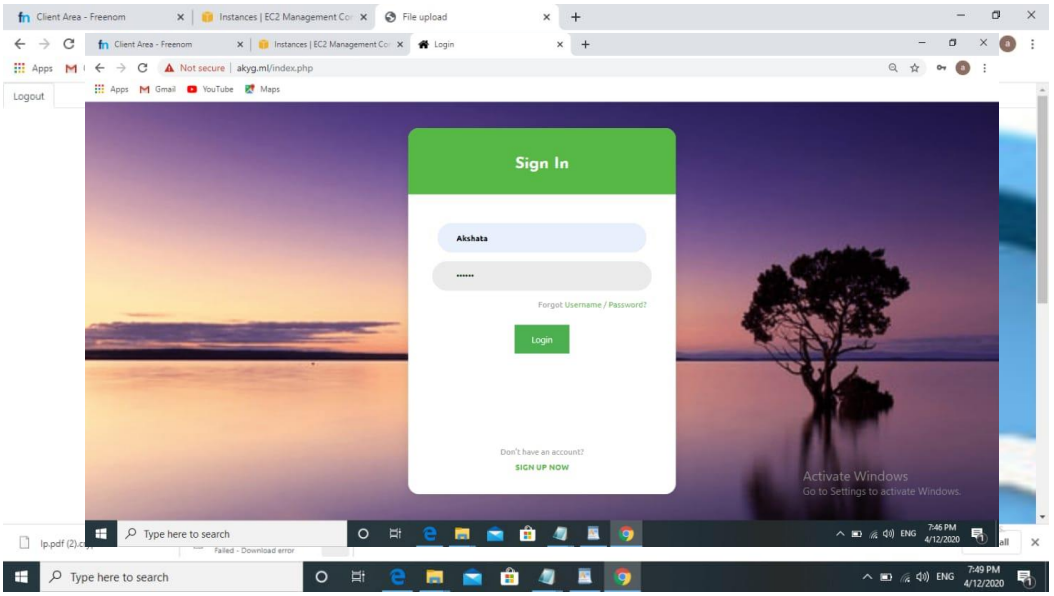
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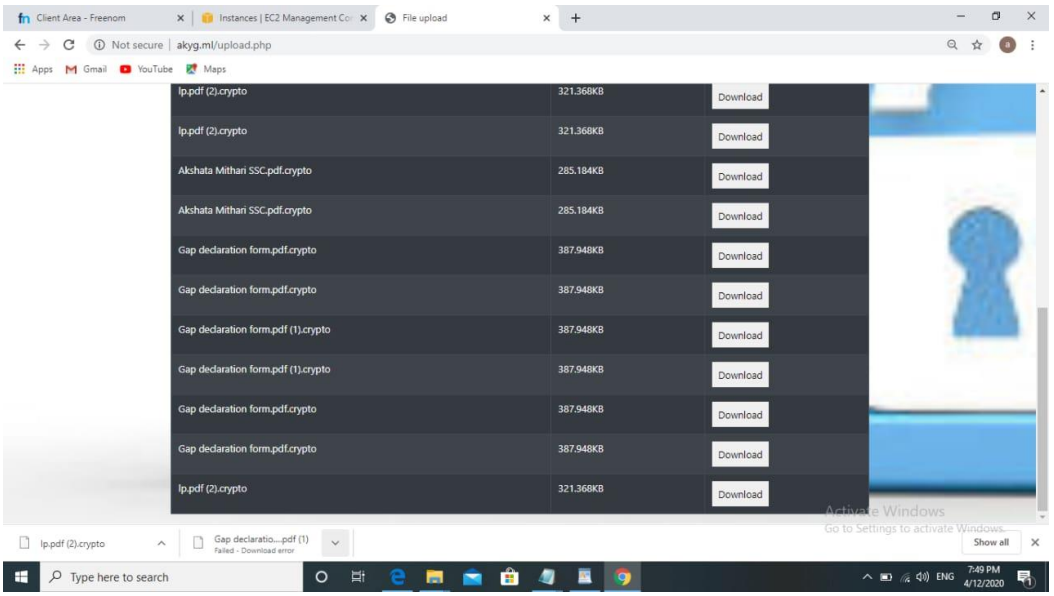
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Chapter 9

Conclusion and future scope

Conclusion-

Cloud computing is a colossal field, with which we can share our resources and couple them as in the private cloud. We have read many research papers, articles, web discussion about configuring a private cloud in the form of IaaS and managed to find a way of building it using open source softwares.

We setup our own cloud for software as service over a existing LAN,we sucessfully write a cloud controller code using open source softwares for generating the own cloud.

The uploading and the downloading of the file in encrypted form on our own cloud happen.

Future Scope -

The cloud can be integrated to other public clouds which gives rise to hybrid cloud. The integration also enhances the scope of cloud computing as we will be able to use resources of other organizations. They services can also be metered and made as pay-per-use basis. This kind of services are also called Iaas(Infarstructure as a service).The cloud is dependent on internet and can be made to work in a different lan. Further work can be done to manage the private cloud with better resource management and improving system.

Chapter 10

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