

## **INFORMATION ACCESS USING CLOUD**

Project report submitted in partial fulfilment of the requirement for the award of the  
Degree of B.Tech

By

**P.Chaya Lakshmi (108W1A0540)**  
**G.Vahini (108W1A0515)**  
**D.Krishna (108W1A0513)**

Under the Esteemed Guidance of

**Mr.S.Rajesh,M.Tech.**



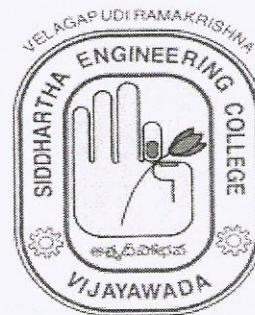
**Department of Computer Science and Engineering**  
**V.R.Siddhartha Engineering College**  
**(Autonomous)**  
**(Affiliated to JNTU,Kakinada)**  
**Approved by AICTE- Accredited by NBA**  
**Vijayawada-520007**  
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**2013**

**VELAGAPUDI RAMAKRISHNA  
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**CERTIFICATE**

This is to certify that the project report entitled **INFORMATION ACCESS USING CLOUD** being submitted by

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in partial fulfillment for the award of the Degree of Bachelor of Technology in Computer Science and Engineering to the JNTU,Kakinada is a record of bonafied work carried out under my guidance and supervision.

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## DECLARATION

We hereby declare that the dissertation entitled "**INFORMATION ACCESS USING CLOUD**" submitted for the degree of Bachelor of Technology in Computer Science and Engineering to the Jawaharlal Nehru Technological University, Kakinada, is our original work. The dissertation and results embodied in this project report have not been submitted to any other University or Institute for the award of any Degree, associateship or any other similar titles.

Place: Vijayawada  
Date: 28-11-2013

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It is our sincere obligation to thank our project guide **Mr.S.Rajesh**, Assistant Professor, Department of Computer Science and Engineering, for his timely valuable guidance and suggestions for this mini project.

We would like to thank to all who have been inspiring guides and committed caretakers and who have given us the moral support in every situation of our engineering career. This encouragement and support by them, especially in carrying out this mini project motivated us to complete this successfully.

We owe our acknowledgements to an equally long list of people who helped us in this mini project. Our sincere thanks to the lab faculty, V.R.Siddhartha Engineering College who helped us in getting much software's required for this mini project.

P.Chaya Lakshmi

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## **ABSTRACT**

**Cloud Computing** is the delivery of computing as a service rather than a product, whereby shared resources, software, and information are provided to computers and other devices as a utility (like the electricity grid) over a network (typically the Internet)

Cloud computing provides computation, software applications, data access, and storage resources without requiring cloud users to know the location and other details of the computing infrastructure.

End users access cloud based applications through a web browser or a light weight desktop or mobile app while the business software and data are stored on servers at a remote location. Cloud application providers strive to give the same or better service and performance as if the software programs were installed locally on end-user computers.

At the foundation of cloud computing is the broader concept of infrastructure convergence (or Converged Infrastructure) and shared services—This type of data centre environment allows enterprises to get their applications up and running faster, with easier manageability and less maintenance, and enables IT to more rapidly adjust IT resources (such as servers, storage, and networking) to meet fluctuating and unpredictable business demand.

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## **1. Introduction**

Cloud computing is a computing environment, where resources such as computing power, storage, network and software are abstracted and provided as services on the internet in a remotely accessible fashion. Billing models for these services are generally similar to the ones adopted for public utilities. On-demand availability, ease of provisioning, dynamic and virtually infinite scalability is some of the key attributes of cloud computing [6].

The main concept behind cloud computing is providing services. It provides various types of services, some of the important services are SaaS, PaaS and IaaS. Software as a service is a model of software deployment whereby a provider licenses an application to customers for use as a service on demand. Platform as a service generates all facilities required to support the complete cycle of construction and delivery of web-based applications wholly available in Internet without the need of downloading software or special installations by developers and finally Infrastructure as a service provides informatics resources, such as servers, connections, storage and other necessary tools to construct an application design prepared to meet different needs of multiple organizations, making it quick, easy and economically viable [4].

Cloud computing is mainly classified into three types based on the deployment model; Public cloud, Private cloud and Hybrid cloud. If the services are provided over the internet then it is public cloud or external cloud and if it is provided within an organization through intranet then it is named as private cloud or internal cloud and Hybrid cloud is an internal/external cloud which allows a public cloud to interact with the clients but keep their data secured within a private cloud [7].

This project explains about EUCLYPTUS: an open-source system that enables the department to establish its own cloud computing environment. Eucalyptus is structured by various components which interact with each other through well-defined interfaces. It is used for implementing on-premise private and hybrid clouds using the hardware and software

infrastructure that is in place, without modification. Also it includes deployment of STUDENT LEARNING SYSTEM into the private cloud built for the department of Computer science.

## 2.Literature survey/Review of Literature

### 2.1. Architecture of Private cloud

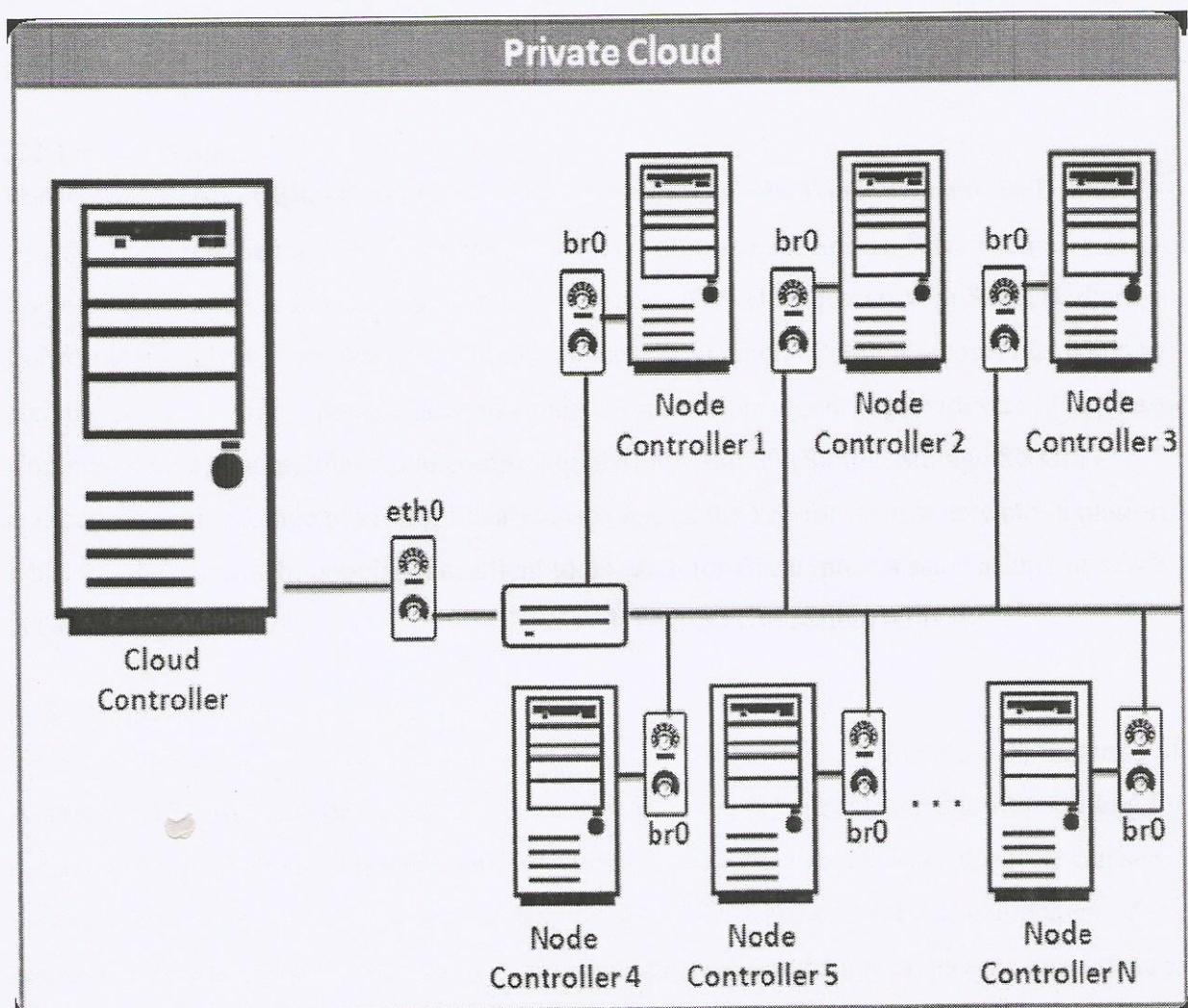


Figure 2.1 – Architecture of Private Cloud

For our installation we will be using two servers, one as a cloud controller and the other as a cloud node. Cloud instances will be running on the node, so unless the systems are identical we will choose the system with more CPU cores and memory as our node controller. This allows us more room for growth in the cloud as we add instance.

We will be using the default network configuration of “Managed-NoVLAN” which provides dynamic IPAssignment for VMs and allows us to control ingress traffic by building iptables profiles known as security groups.

## **2.2.Eucalyptus**

Eucalyptus (Elastic Utility Computing Architecture for Linking Your Programs To Useful Systems) was released in May 2008, creator of the leading Open-Source Private Cloud platform. They were incorporated as an organization in January 2009 Headquartered in Santa Barbara, California. Eucalyptus software is available under GPL (General Public License) that helps in creating and managing a private or even a publicly accessible cloud. It provides an EC2 (Elastic Compute Cloud)-compatible cloud computing platform and S3 (Simple Storage Service)-compatible cloud storage platform. Eucalyptus is one of the key for open source cloud platform which makes it much popular. The client tools used for Eucalyptus is same as that of AWS, because Eucalyptus services are available through EC2/S3 compatible APIs [6].

## **2.3. Amazon AWS Compatibility**

API compatibility layer is build on top of Eucalyptus that explores the functionality in terms of Amazon’s API. Amazon tools, infrastructure and other work that someone put into building for Amazon would also be compatible with Eucalyptus inside the datacenter. In Fig.1 we can see various components of Amazon and Eucalyptus. The EC2 (Elastic Compute) component of Amazon which handles the provisioning of virtual machine and its resources are replaced here with cloud controller similarly Amazon provides storage mechanism EBS (Elastic Block Storage) which provides block storage devices to virtual machines are replaced by Storage Controller and S3 (Simple Storage System) simple object based get put mechanism, here it is implemented as walrus.

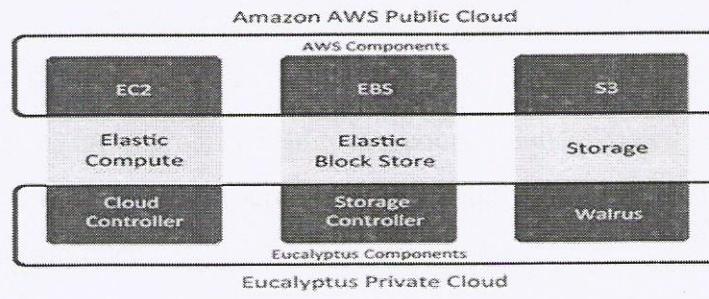


Figure 2.2-Eucalyptus Private Cloud

## 2.4. Building a Private Cloud

Private Cloud is also called an internal cloud which is mainly designed to control the data of an organization, than by getting the resources from other hosted services [12]. This section describes about the basic installation and configuration of Ubuntu Enterprise Cloud as well as the steps for creating a virtual machine image and uploading the image to the private cloud.

### 2.4.1. Getting Started – Building the Cloud Controller

First we will build our cloud controller by booting from the Ubuntu 10.04 Server cdrom and selecting “Install Ubuntu Enterprise Cloud” from the menu.

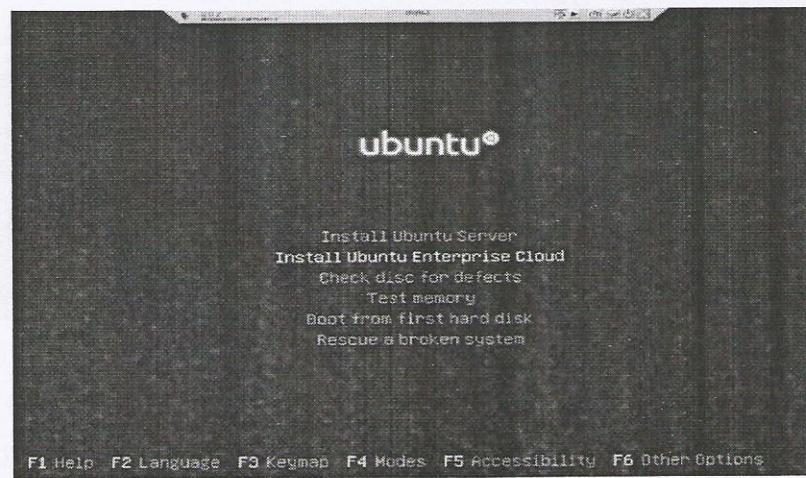
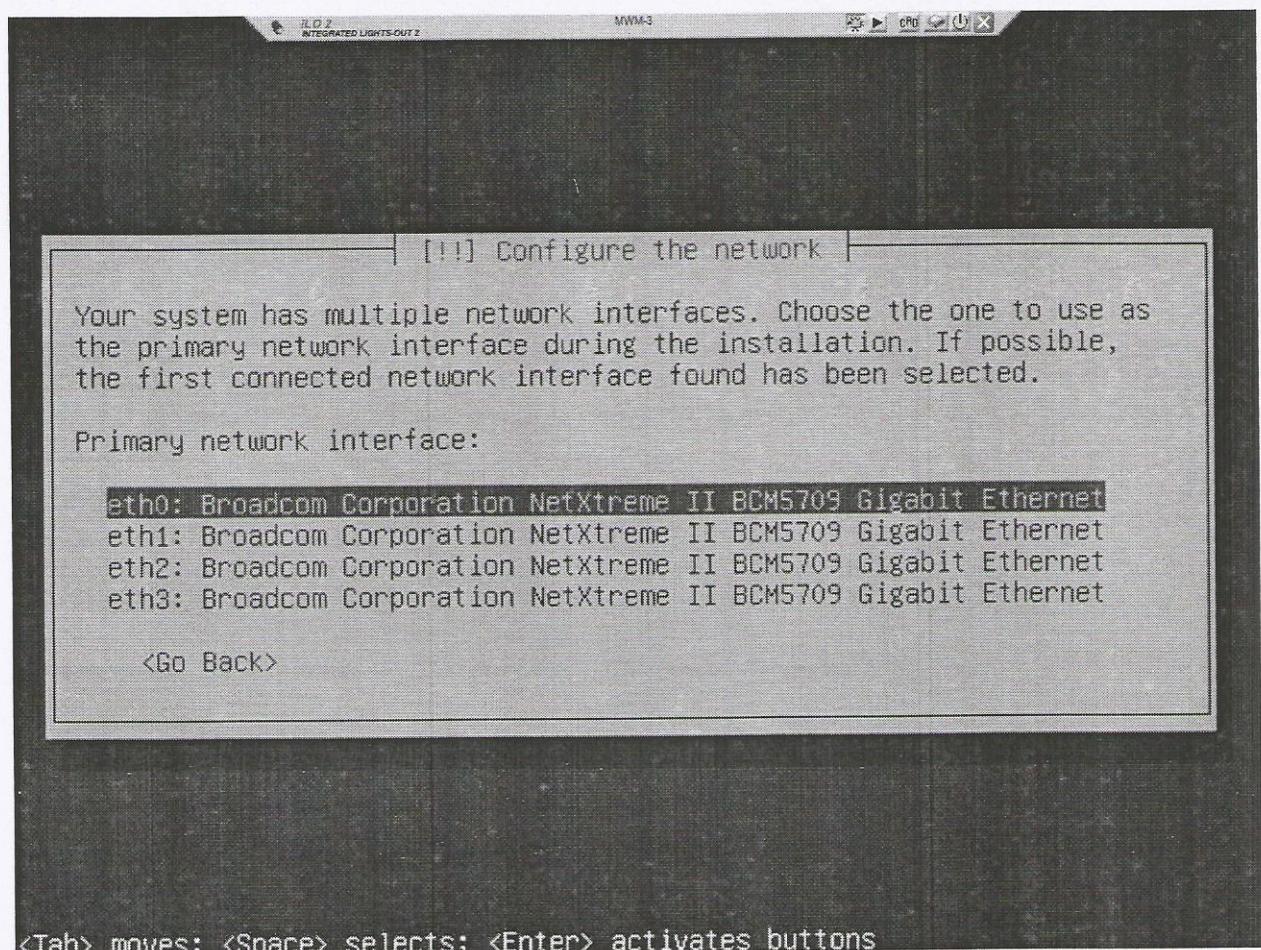


Figure 2.3-Install Ubuntu Enterprise Cloud

Configure the network :

After making the appropriate language, country and keyboard selections, we will be prompted to configure the network. For this lab we will be using eth0 for both the cloud and node controllers.



Configuring the Network chooses a primary network interface. There is no much difference if we choose any other options from the menu.

Host Name for the System :

Next we will assign a hostname. We have chosen the name “cc” for our cloud controller:

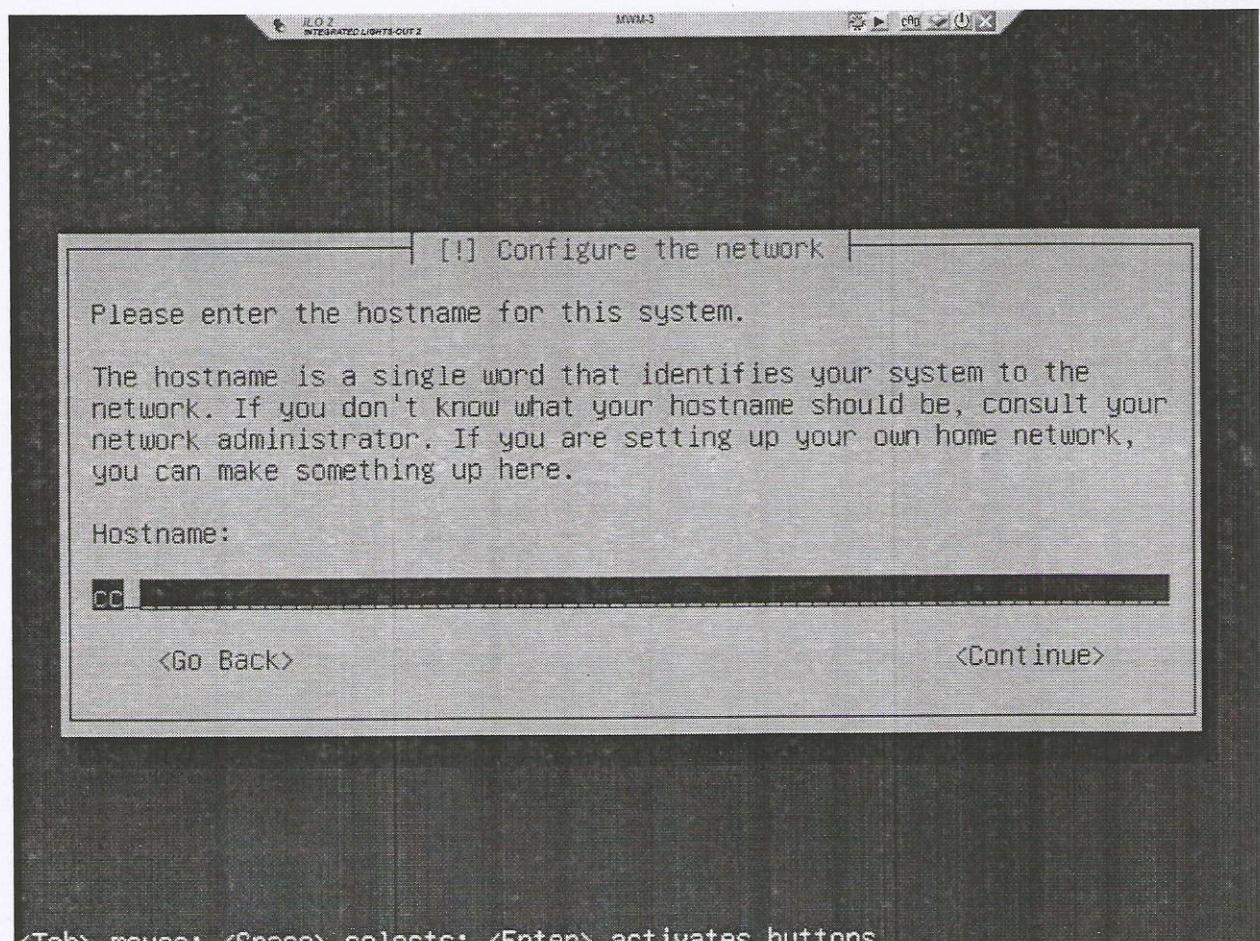


Figure 2.4-Configure the network

Name CC as mentioned here stands for Cloud Controller. Any name can be given depending on the User choice. Cloud Controller is an Eucalyptus component. There should be only one Cloud Controller in any installation of cloud. This service is provided by the Ubuntu eucalyptus-cloud package.

Selection of cloud installation mode :

In this step, the cloud controller address is to be mentioned if any in the system.

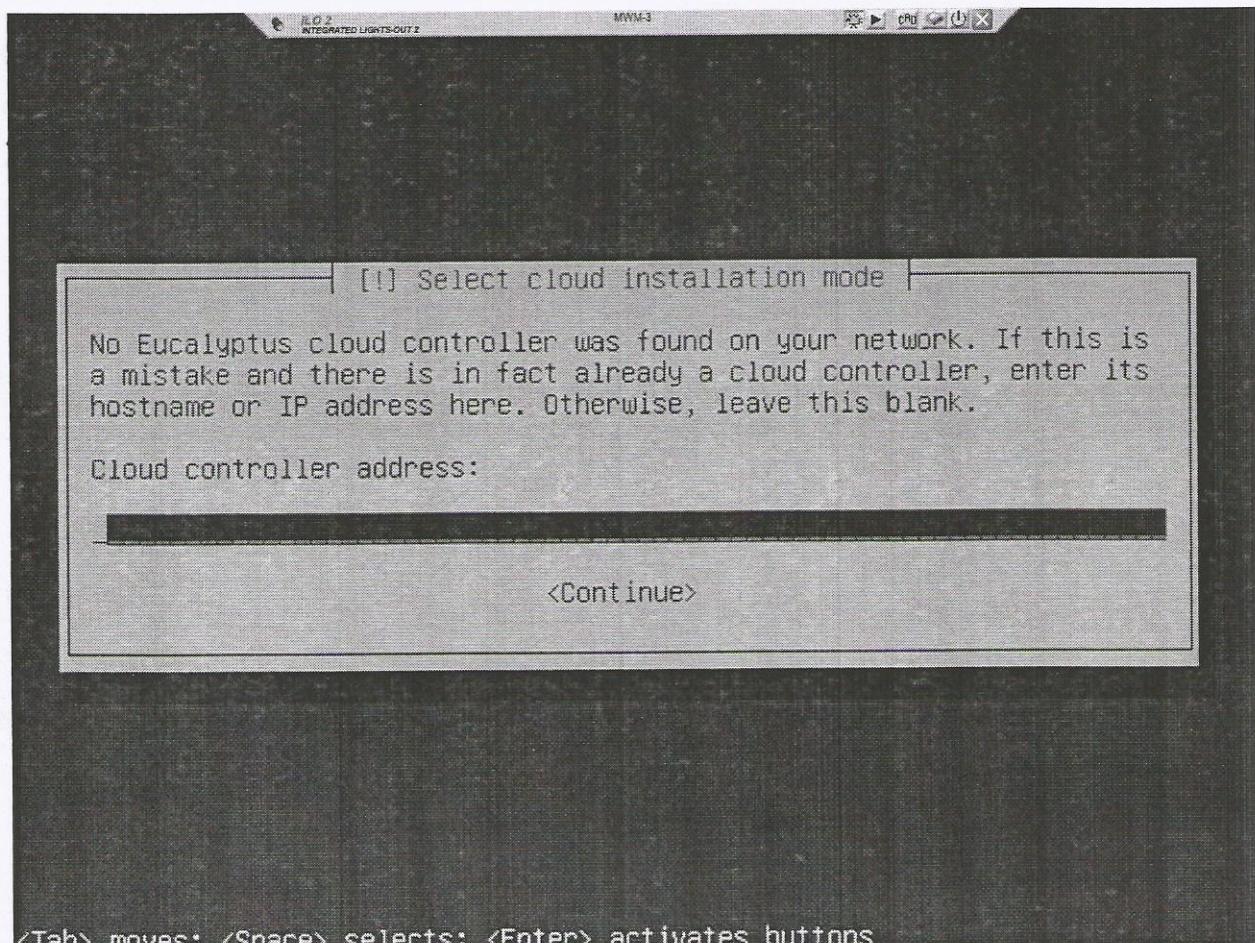


Figure 2.5-cloud installation mode

Eucaluptus cloud controller is not found in the system because it is not yet installed.

Because we don't already have a cloud controller installed on this network, we'll select continue at this screen

### Selection of Cloud Installation Mode :

Here we must choose the role this server will play in our cloud. In larger and/or more complex installations, each of the functions shown in this menu may be divided onto separate physical servers. Eucalyptus private clouds will have a single cloud controller, but there may be multiple cluster controllers within the cloud, and multiple node controllers reporting to each cluster controller. Walrus is the data storage component of Eucalyptus.

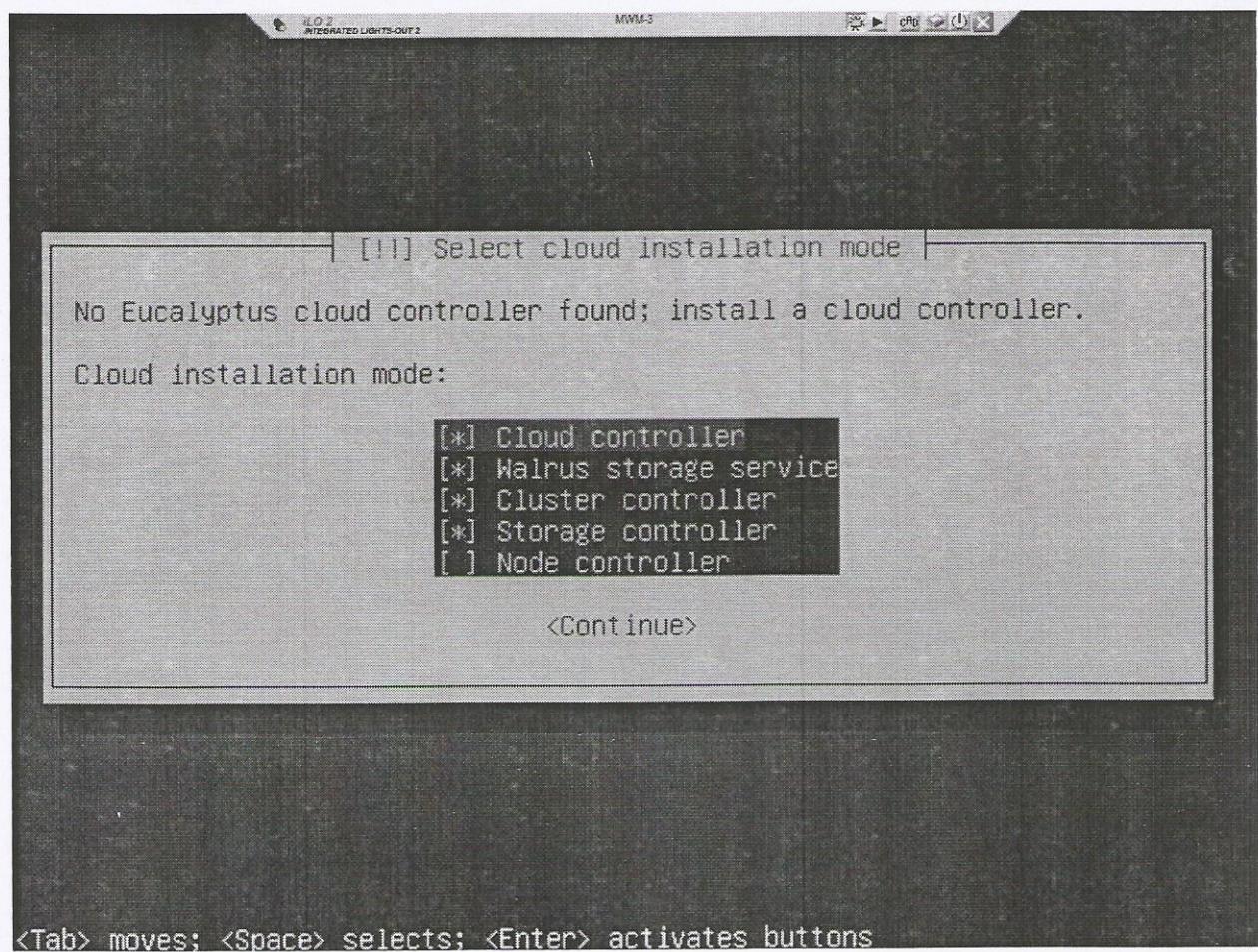


Figure 2.6-Select cloud controller

## Cloud Installation Mode :

In our lab we will use the eth0 interface to connect to the public network and to communicate with the node.

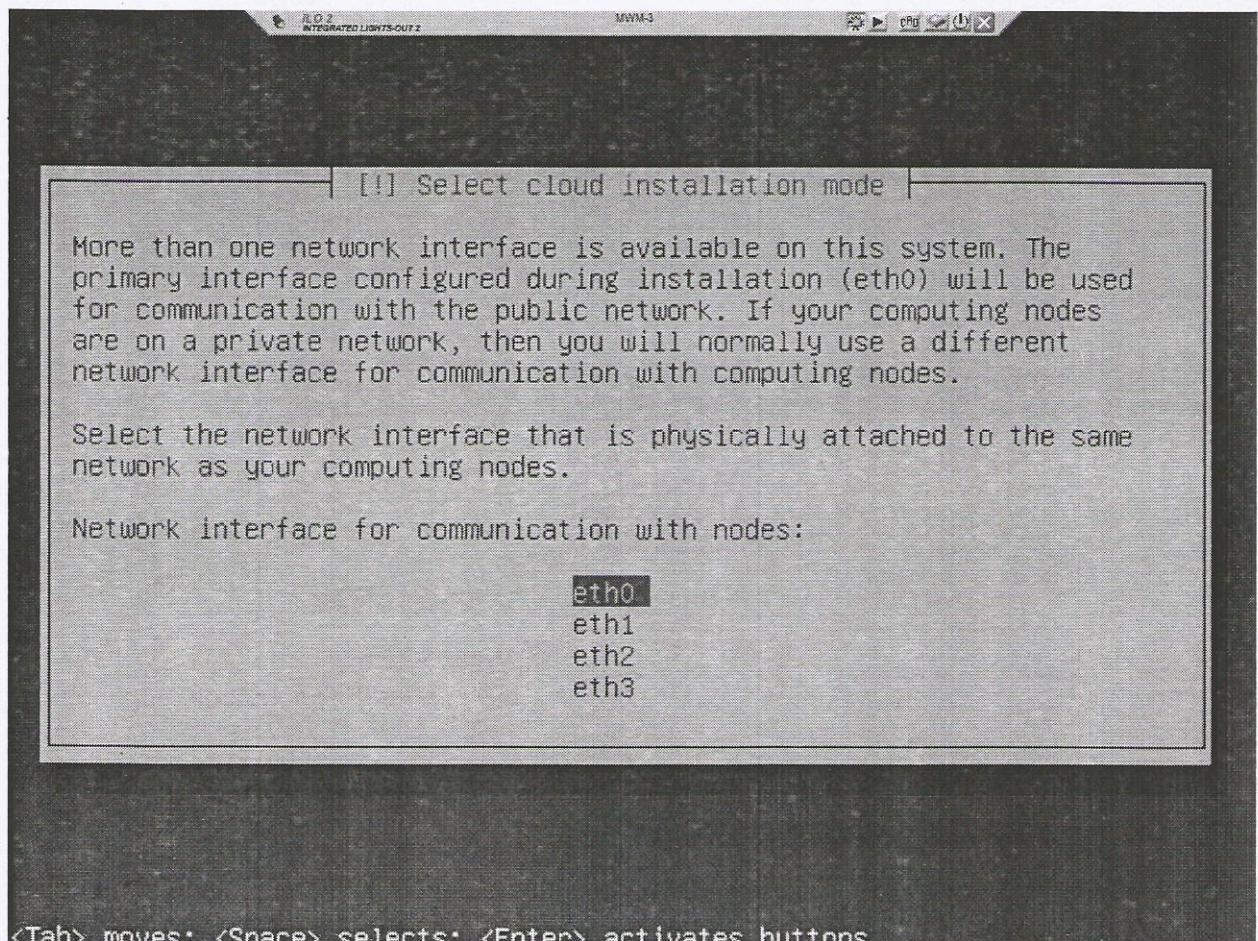


Figure 2.7-Select Network Interface

## Partition of Disks :

The next several screens show us accepting the default proposal for partitioning the disks:

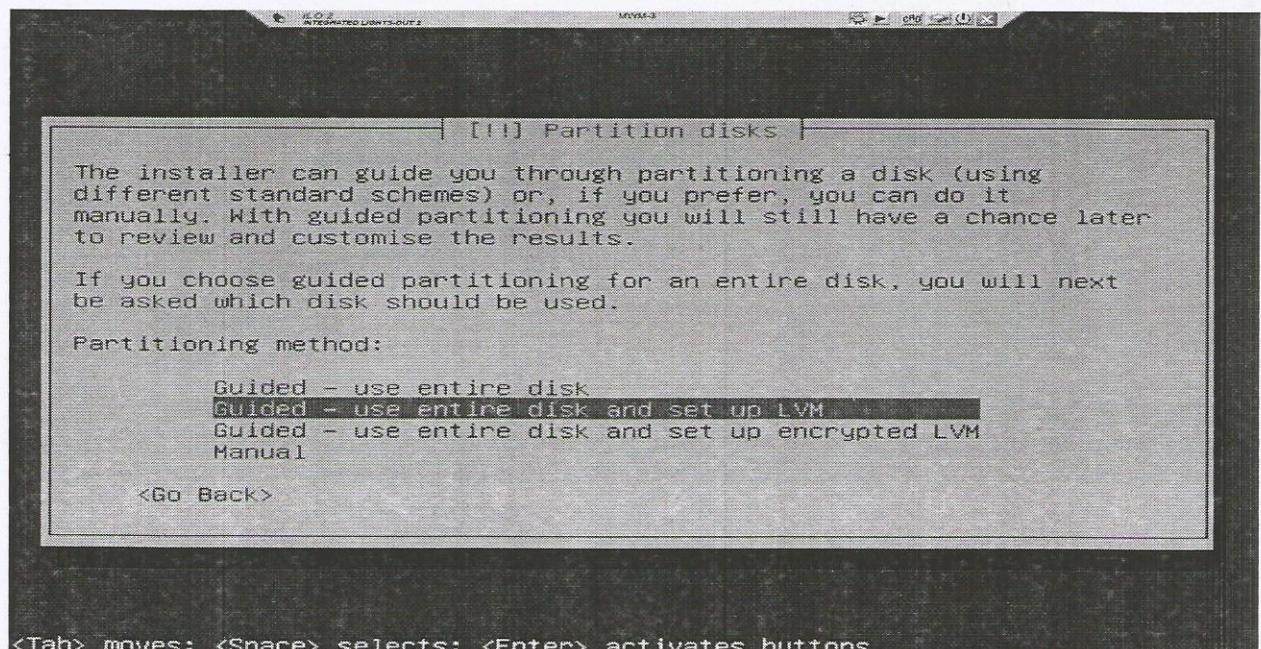
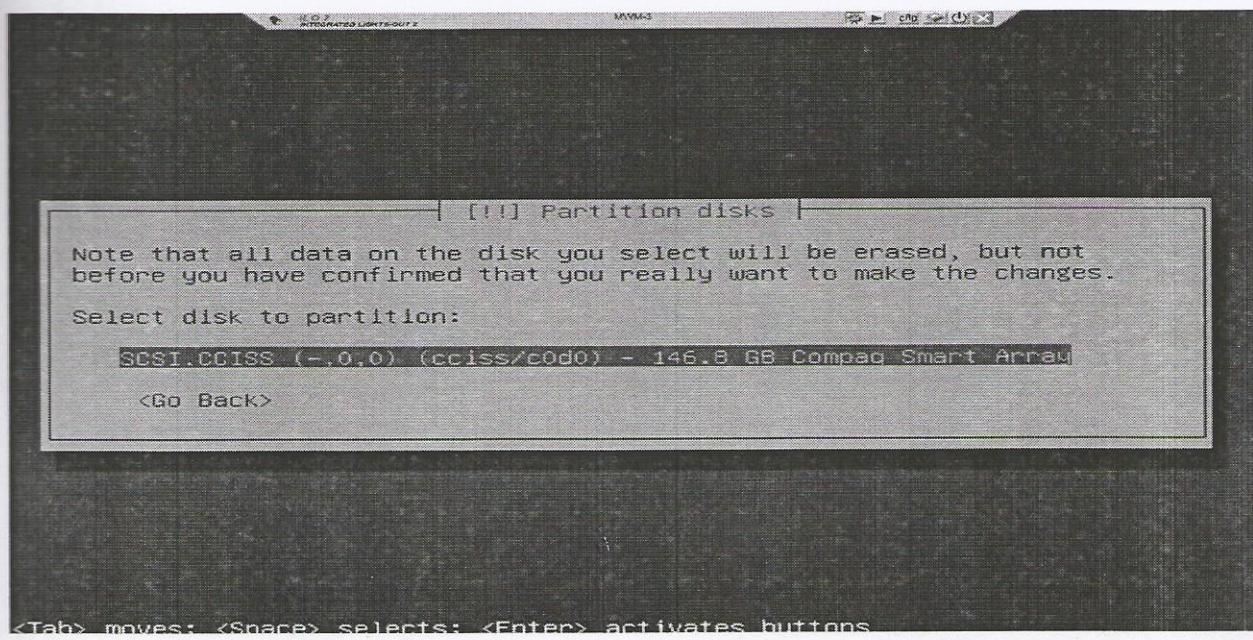


Figure 2.8- Partition of Disks

It is recommended to select the whole memory of the system for the partitioning because it may give The Cloud Controller a better performance and memory utilization. We have one disk to present to the Ubuntu installer, which is a RAID 1+0 array we built using the HP smart array bios.



If existing data is detected, you will notice a screen similar to this:

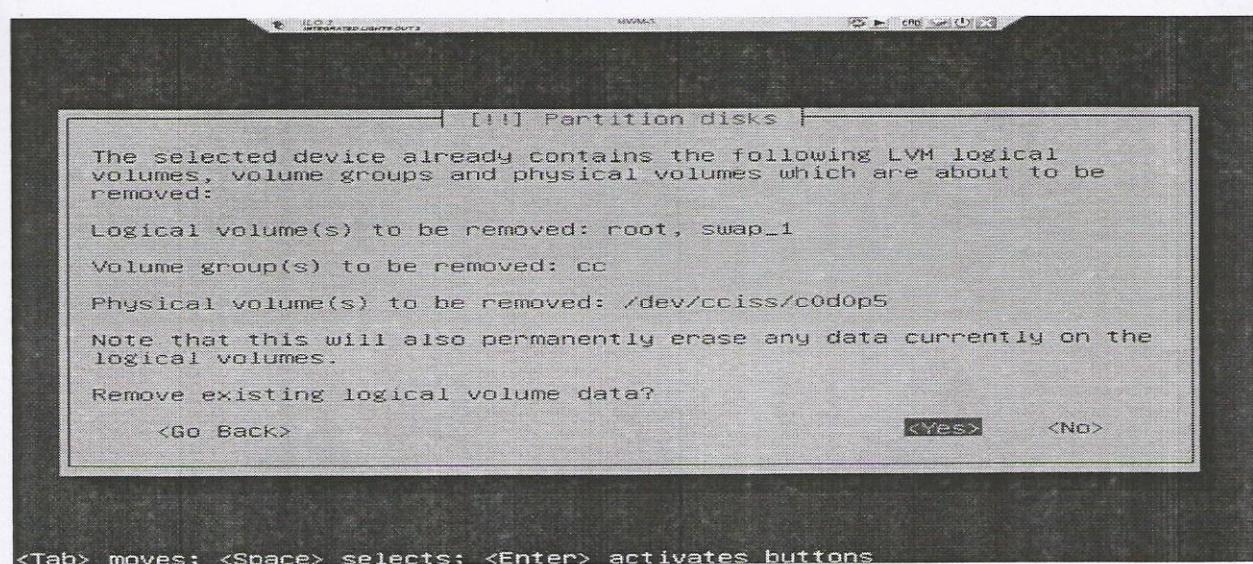


Figure 2.9-Data Partition

The Cloud setup asks whether to remove the existing data or not. The data in the disk is permanently Replaced if we choose yes option here. In the next step, will accept the default partitioning and configure Linux Volume Manager (LVM).

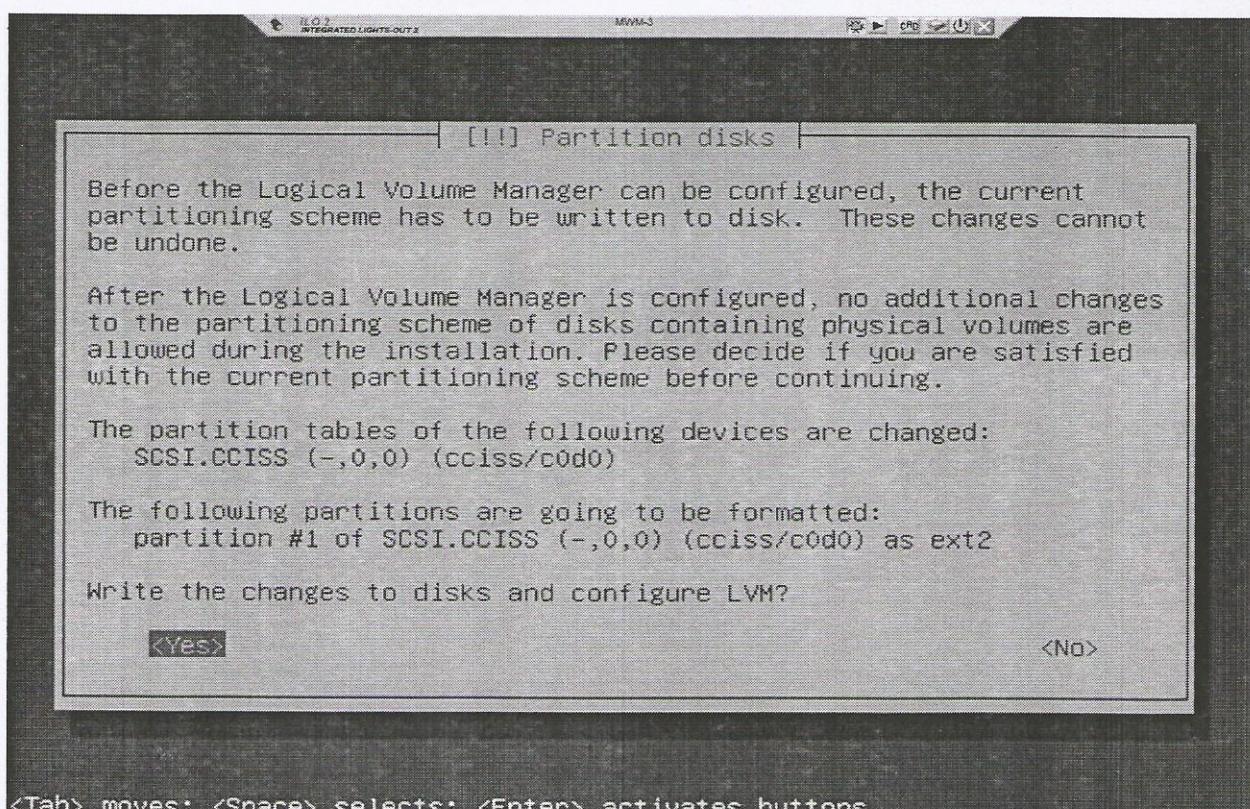
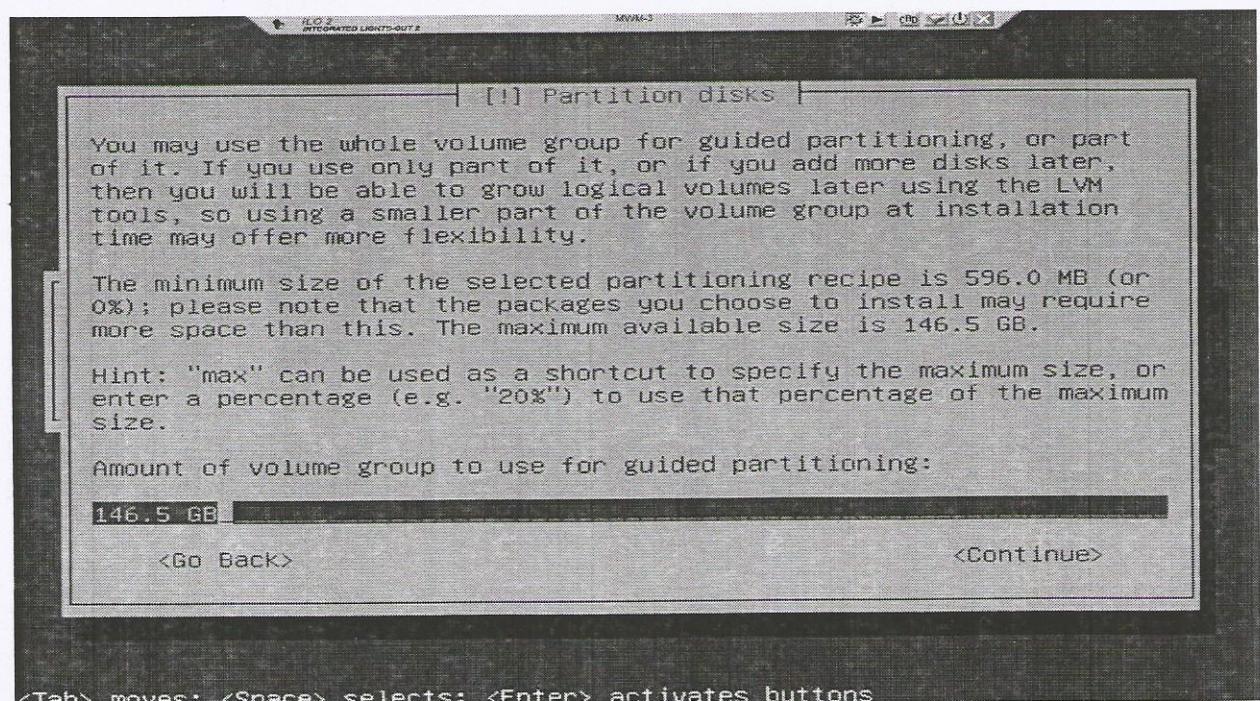


Figure 2.10-Write Changes to disk

In our Lab we will keep it simple and use the entire volume group for guided partitioning.



The amount of memory used for the partitioning depends upon the usage of the cloud. Here we will Write the new changes to disk.

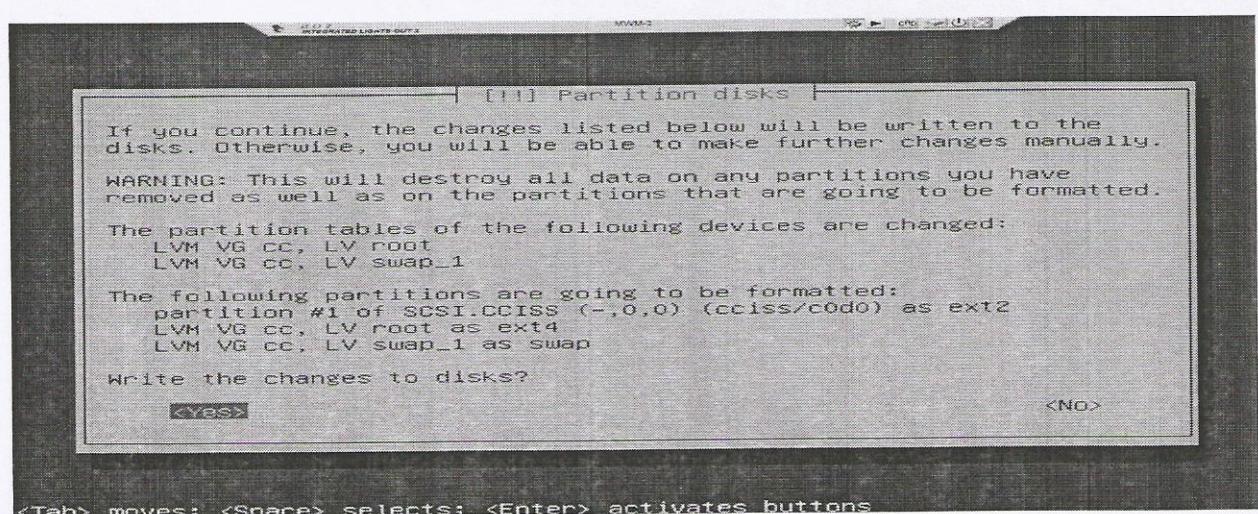


Figure 2.11-Setup LVM

### Install the base system :

Next, the installer will format the partitions and install the base system. Various packages are installed Select and Install software step is continued next to base system installation.

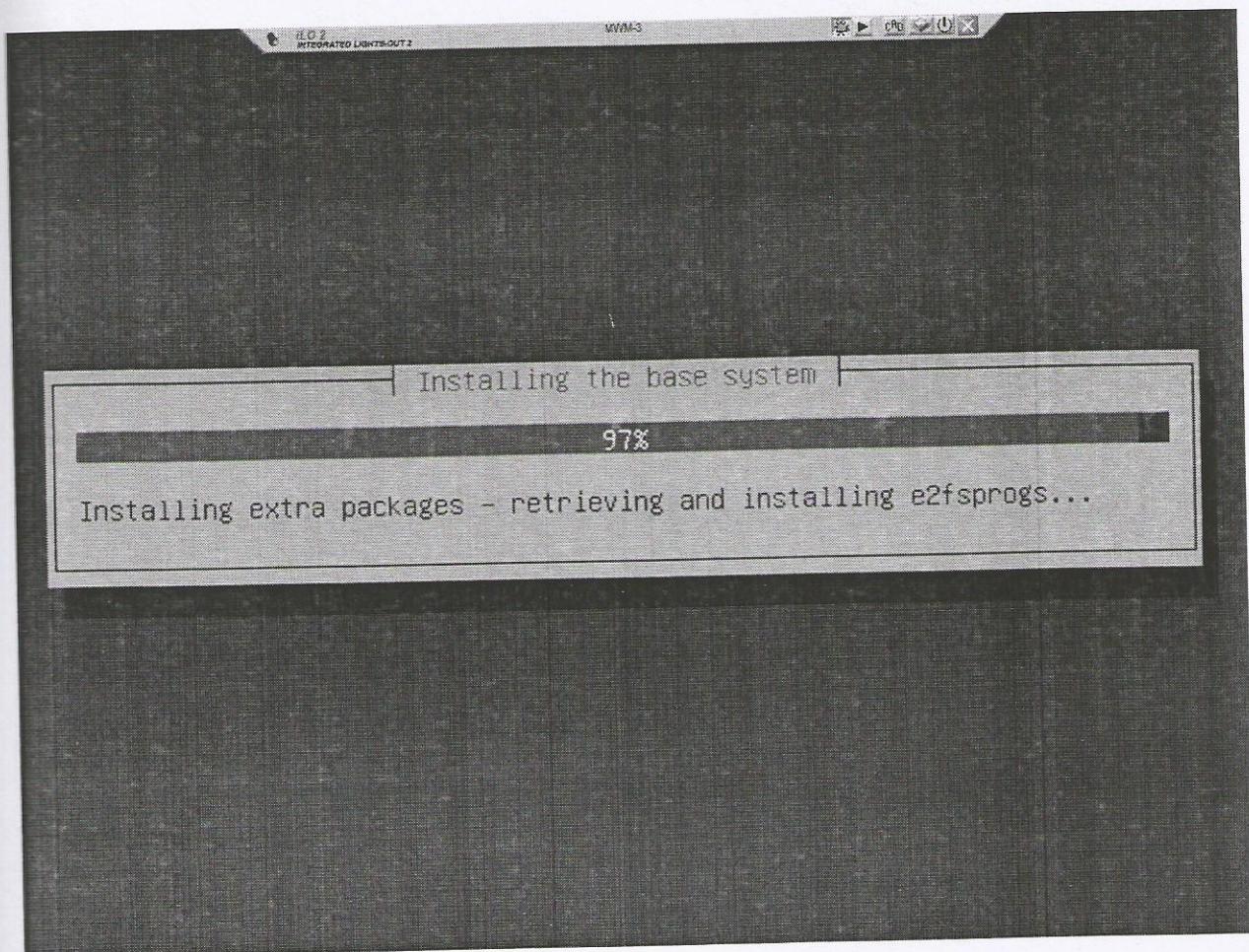


Figure 2.12-Install Base system

### Setup Usernames and Passwords :

Here we are prompted to create a user account which will have sudo privileges. We chose “cladmin” As our username, with a password of “cloud”:

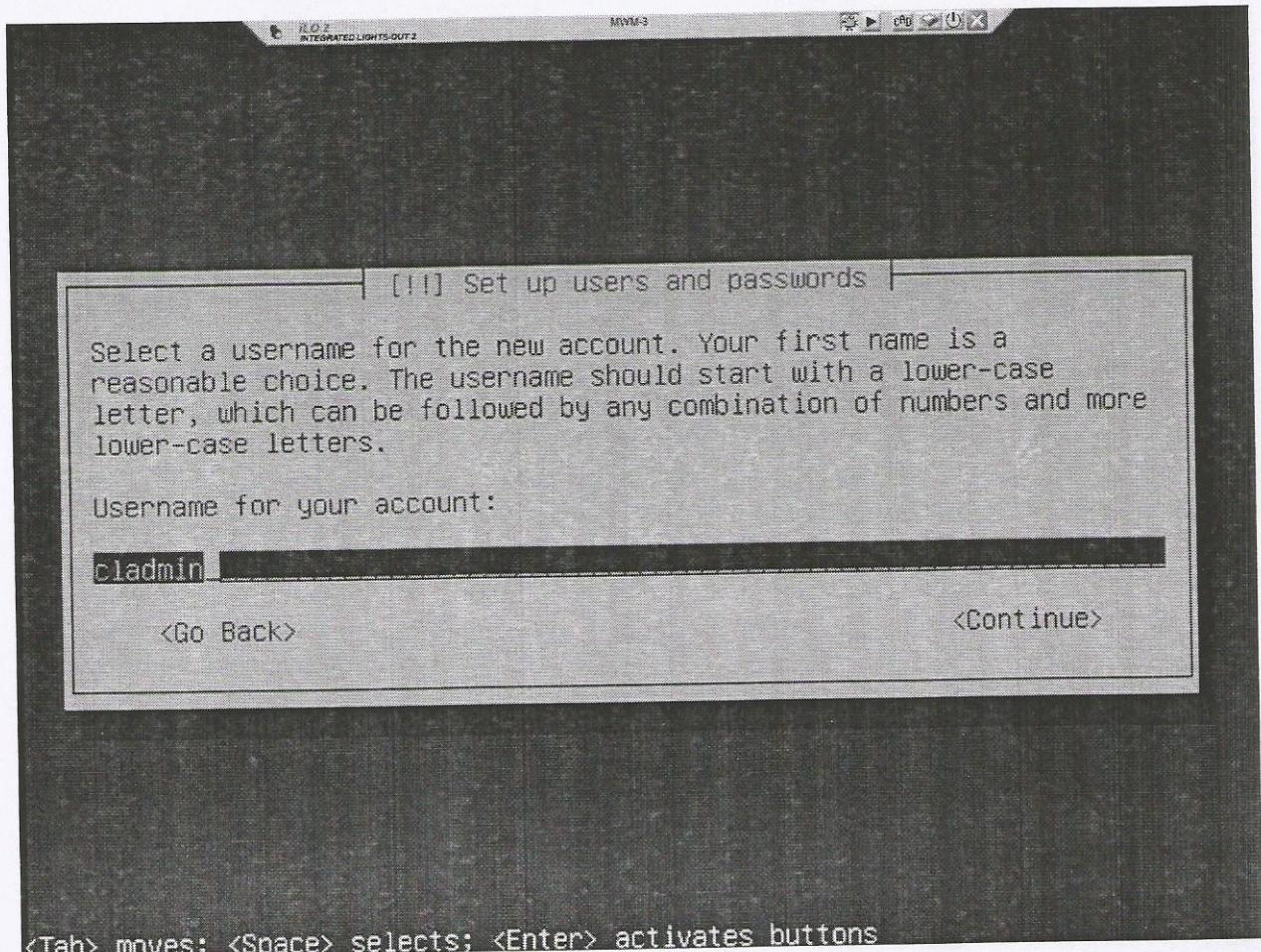


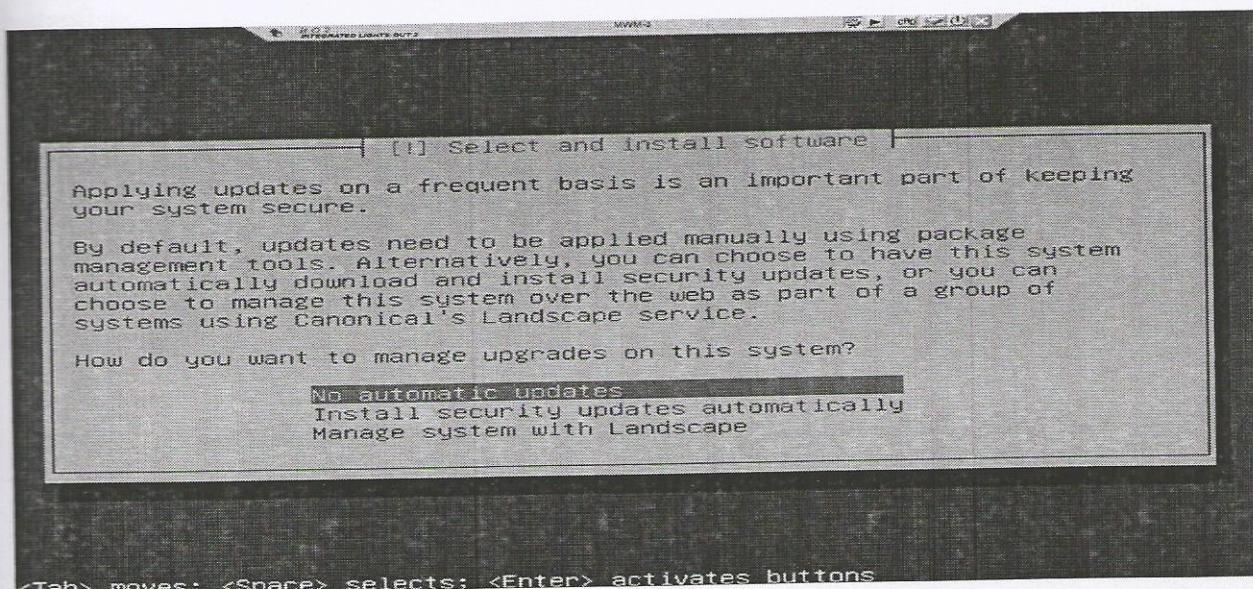
Figure 2.13 –Setup Username and Password

The same Window is shown to set up login page for every user. The Username asked ar for both cloud administrator and the system user.

### Select and Install software :

Although we aren't using automatic updates in our demonstration, it is recommended .

A system mail address is needed to give notification for updates.



After answering several email-related questions, It will ask two other cloud-specific questions during the course of the install:

Name of your cluster, e.g. *cluster1*.

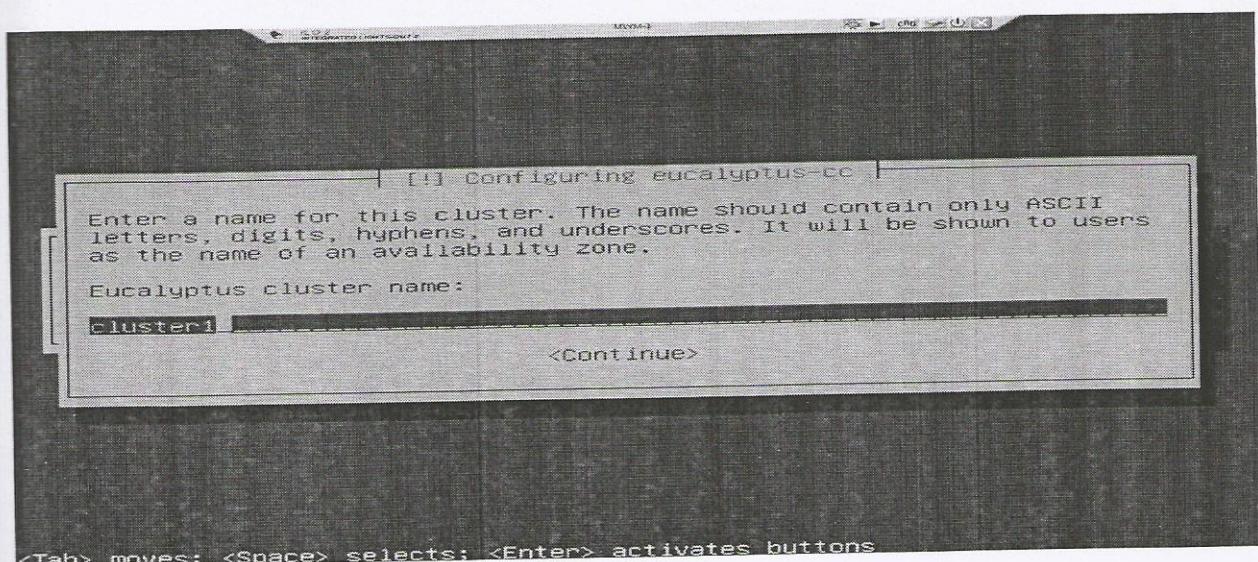


Figure 2.14-Select and Install Software

### Configuring Ecalyptus-CC :

Here we provide a pool of addresses that will be automatically assigned to VMs as they are instantiated. These addresses will be automatically assigned to cloud instances to make them accessible from outside the cloud:

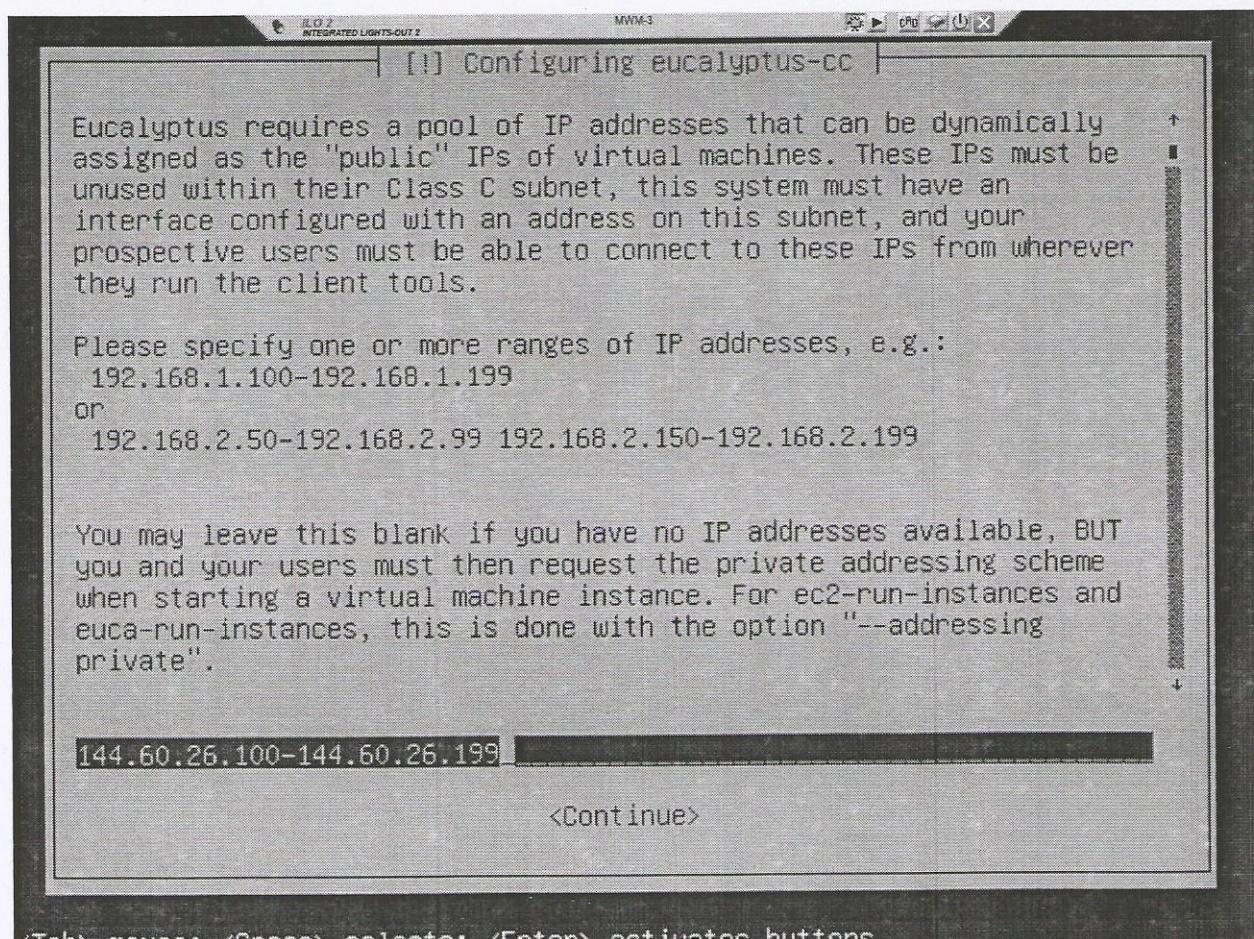
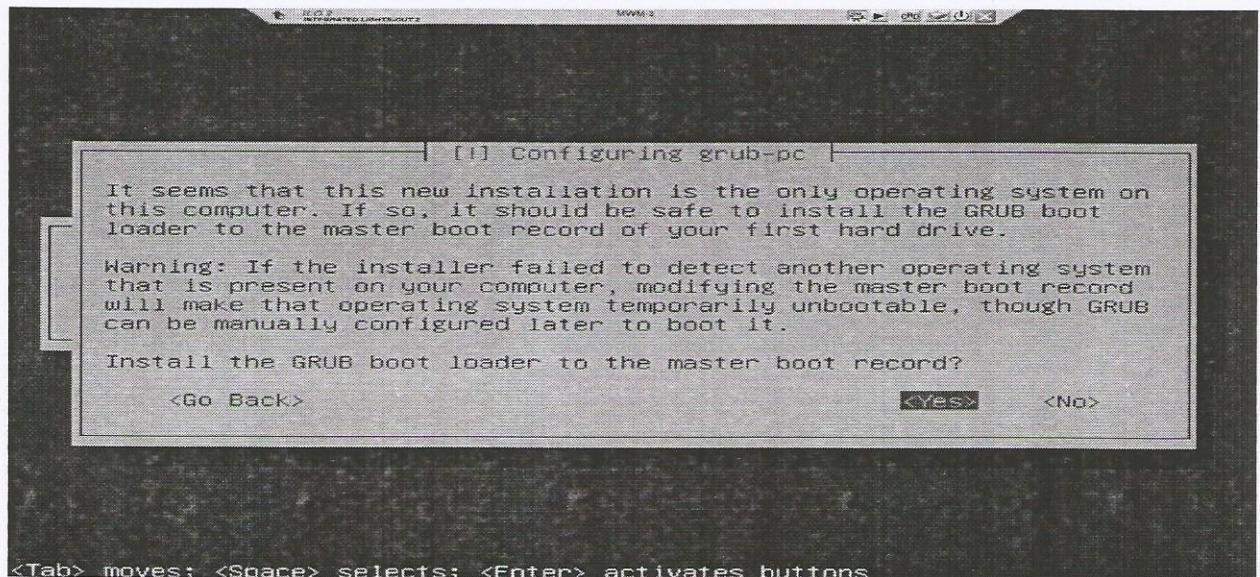


Figure 2.15-Setup IP Address

A range of public IP addresses on the LAN that the cloud can allocate to instances, e.g. 192.168.1.200-192.168.1.249.

These IP addresses are used by the cloud controller to assign the clients the respective IP addresses. Class C IP subnet mask is used.

Next we install the Grand Unified Boot loader, GRUB:



This completes the initial installation of the cloud controller.

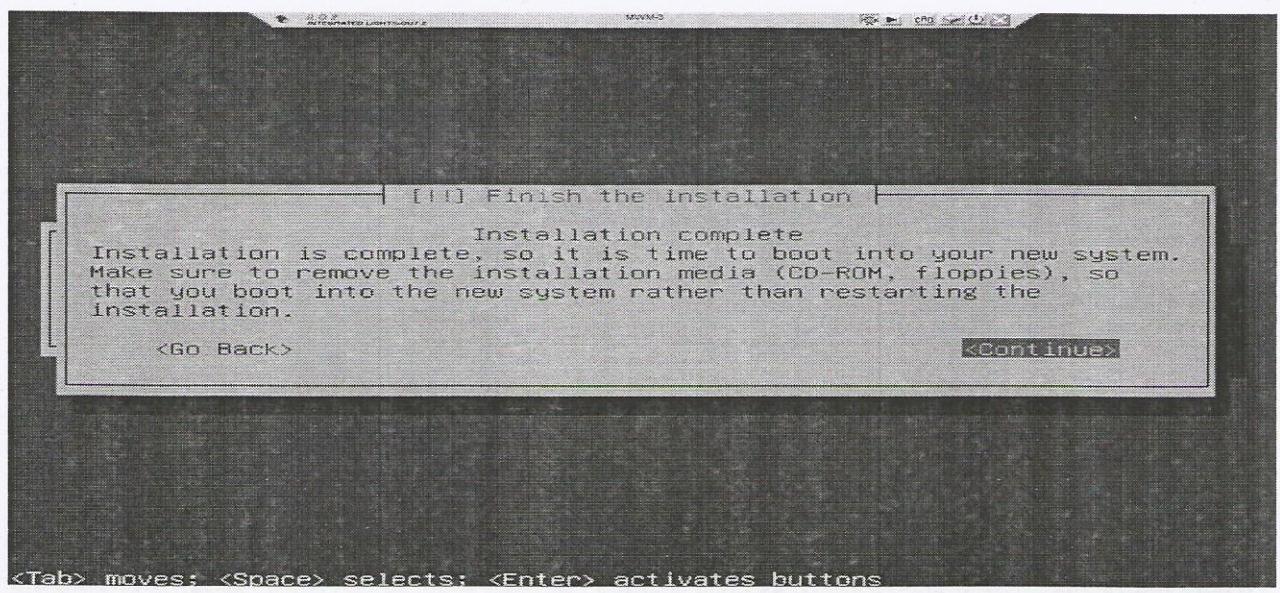


Figure 2.16-Configure Grub

### **2.4.2.Building the Node Controller :**

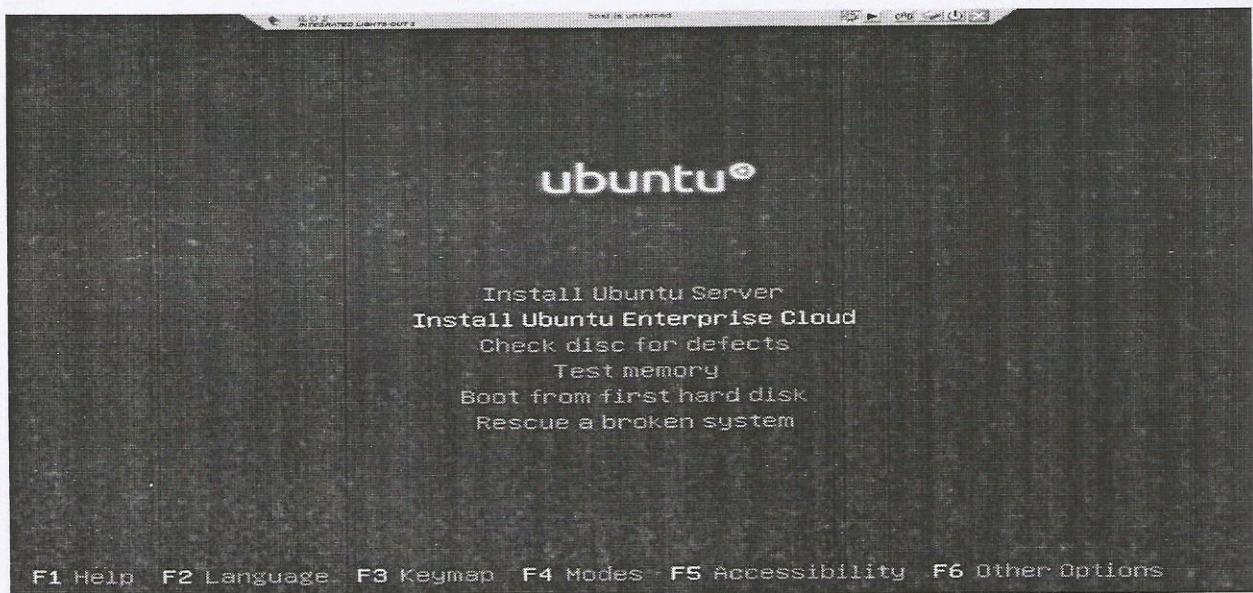
Now that our cloud controller (and cluster controller, walrus, storage controller) has been built, we will move on to the next server. To begin build our node controller we will boot from the Ubuntu 10.04.

The node controller install is even simpler. Just make sure that you are connected to the network on which the cloud/cluster controller is already running.

- 1.Boot from the same ISO on the node(s)
- 2.Select “Install Ubuntu Enterprise Cloud”
- 3.It should detect the Cluster and preselect “Node” install for you
- 4.Confirm the partitioning scheme
- 5.The rest of the installation should proceed uninterrupted;  
complete the installation and reboot the node

You can login in the node by using the username and password defined for the cloud controller host.

Server cdrom and select “Install Ubuntu Enterprise Cloud” from the menu:



Configuring the network :

After making the appropriate language, country, keyboard selections and network interface, we will be prompted for the hostname. We entered “nc” as the hostname of our node controller.

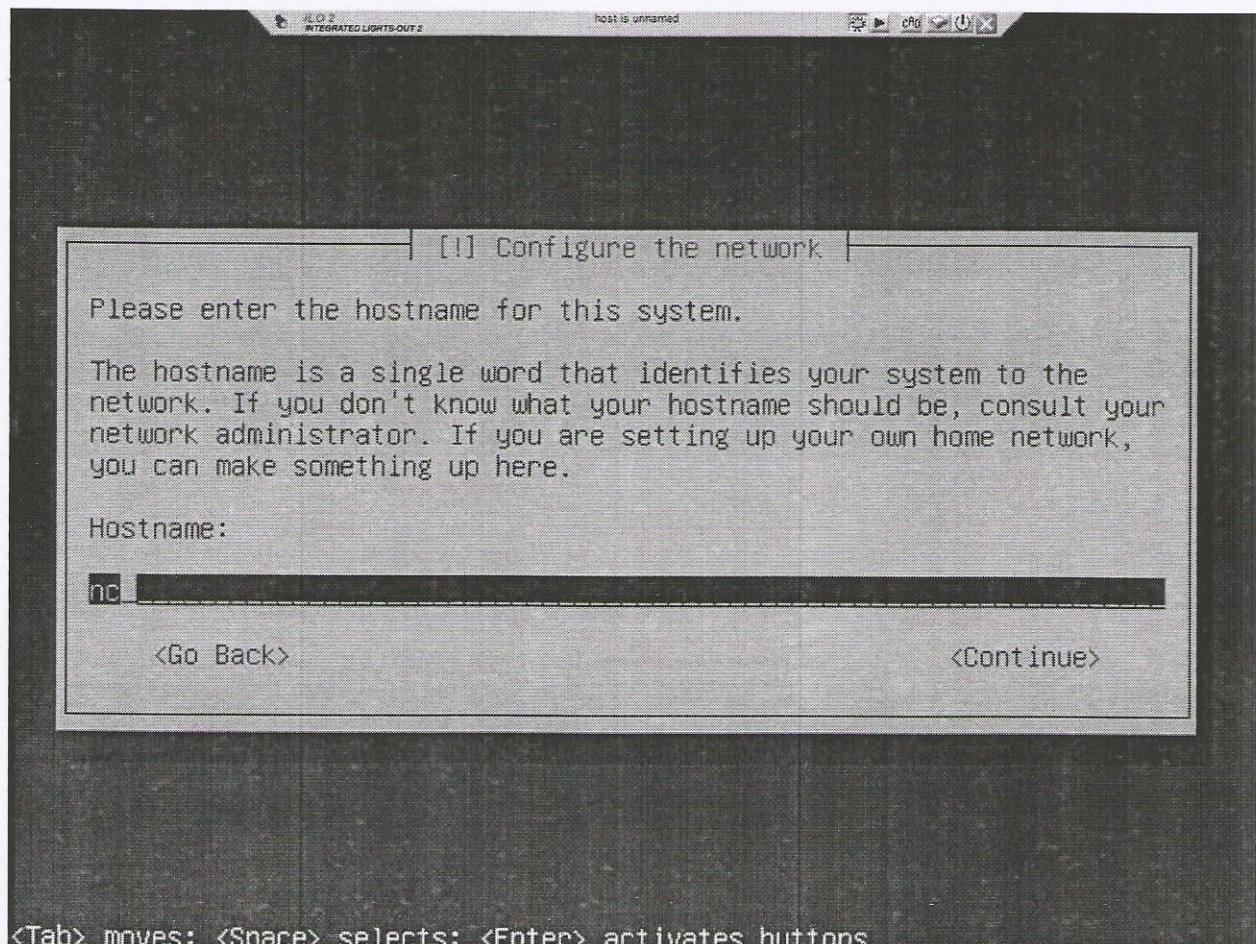
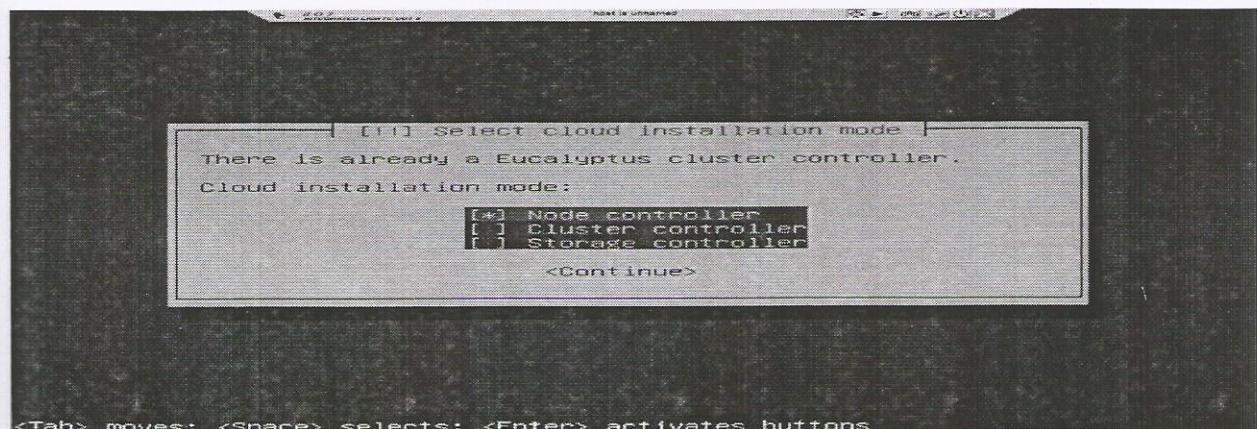


Figure 2.17-Configure Node Controller

Select Cloud Installation Mode :

The installer will detect the cluster controller already running on our network, and default to a cloud installation mode of “Node Controller” which we will accept:



After selecting the cloud installation mode, you might see a screen similar to this one if there is more than one cluster controller on the subnet.

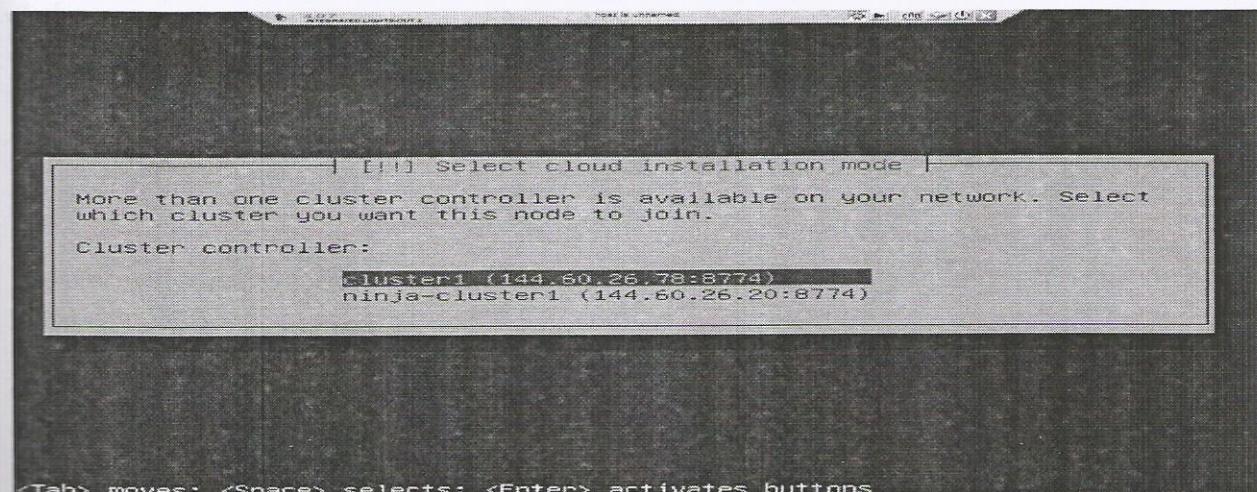


Figure 2.18-Select Installation Mode

The next several installation screens will present us with disk partitioning options, and we will use the same settings that were used for the cloud controller, then the installation will finish the node will be rebooted.

Now that our cloud controller and node controller have been installed, we are ready to configure administrative access to the cloud.

Please note that from here on, we may use the hostnames “cc” and “nc” in commands. If DNS is not configured on your network, you will need to specify the IP address instead of the hostname.

### **Configuring Access for the Eucalyptus User**

NOTE: These steps are not needed if the node controller detected the cloud controller during installation.

#### **Step1:**

Here we will set a temporary password for the eucalyptus account. Login to the node controller as user “cladmin”.  
password :“cloud”:

```
cladmin@nc:~$ sudo passwd eucalyptus
```

Type “cloud” for the password.

#### **Step2:**

Here we will login to the cloud controller and copy the ssh public key for the eucalyptus user to the node controller:

```
cladmin@cc:~$ sudo -u eucalyptus ssh-copy-id -i ~eucalyptus/.ssh/id_rsa.pub  
eucalyptus@nc
```

#### **Step3:**

Now, from our node controller we'll remove the temporary password:

```
cladmin@nc:~$ sudo passwd -d eucalyptus
```

### **2.4.3. Installing Cloud Administrative Credentials through the Eucalyptus Web Interface**

Before we can use the ubuntu command-line utilities to interact with the cloud, we will need to install credentials which consist of x.509 certificates and environment variables.

Step 1:

Browse to the URL <https://cc:8443>

Login with the default username and password of admin, admin.



Figure 2.19-Cloud Credentials

Step 2:

Set a new password for the admin account and supply an email address. The cloud host IP is automatically filled in and is the public facing IP for the cloud controller.

 **ubuntu enterprise cloud**

**First-time Configuration**

Please, supply the following parameters to activate your Eucalyptus installation:

Administrator's new password:

The password, again:

Administrator's email address:

User signup requests will be sent to this address and messages from Eucalyptus will have this address in the From: field. (If you want to change this behavior, edit the appropriate values in the `eucalyptus-web.properties` file of your Eucalyptus installation. We still need an email address now, though.)

Cloud Host:

We made a guess about the external IP of the machine running the Cloud Controller. Please, make sure that it is correct, as this IP will be embedded in the credentials generated by Eucalyptus. Although it can be changed later, doing so will require that you perform extra tasks and may cause existing users from being unable to access the system

Figure 2.20-Admin Credentials

This form is essential to fill up for the activation of Eucalyptus installation. The old password for cloud controller is “cloud”..

### Step 3:

Now we will download our credentials. The web front end of Eucalyptus is currently limited, so after the initial configuration much of the administration will be done from the command lines.

On Ubuntu the name of the package is “euca2ools” and is conveniently installed by default on our cloud controller, so we’ll be using the cloud controller as our command-line headquarters for managing the cloud later in this guide.

To download credentials, click the “Credentials” tab and click “Download Credentials” :

The screenshot shows the Ubuntu Enterprise Cloud web interface. At the top, there's a navigation bar with tabs for 'Credentials' (which is highlighted in blue), 'Images', 'Store', 'Users', 'Configuration', and 'Services'. To the right of the tabs, it says 'Logged'. Below the navigation bar, the main content area has a title 'User account information'. Underneath, it shows 'Login: admin', 'Name:', and 'Email: cladmin@labs.att.com'. A note below states: 'Feel free to change the account information (except the login) and the password whenever you want. The cryptographic credentials for the Web services associated with this account, shown below, will not be affected by these changes.' There are two buttons: 'Edit Account Information' and 'Change Password'. Further down, there's a section titled 'Credentials ZIP-file' with the instruction: 'Click the button to download a ZIP file with your Eucalyptus credentials. Use the public/private key pair included therein with tools that require X.509 certificates, such as Amazon's EC2 command-line tools.' A single button labeled 'Download Credentials' is present.

Figure 2.21-Download Credentials

Step 4:

Copy the downloaded file euca2-admin-x509.zip to /home/cladmin folder on the cloud controller. You can use scp, ftp, sftp, or any other preferred method.

Step 5:

Now we will create a hidden folder on the cloud controller and extract the zip file to this folder:

```
cladmin@cc:~$ mkdir ~/.euca  
cladmin@cc:~$ cd ~/.euca  
cladmin@cc:~/.euca$ unzip ./euca2-admin-x509.zip
```

Step 6:

Because the credentials file contains information allowing administrative access to the cloud, it is recommended to remove the zip file and apply permissions to the .euca folder and its contents:

```
cladmin@cc:~/.euca$ rm ~/euca2-admin-x509.zip  
cladmin@cc:~/.euca$ chmod 0700 ~/.euca  
cladmin@cc:~/.euca$ chmod 0600 ~/.euca/*
```

Step 7:

Next we will add a line to the ~/.bashrc file on the cloud controller to ensure the necessary environment variables are initialized upon login:

```
cladmin@cc:~/.euca$ echo ". ~/.euca/eucarc" >> ~/.bashrc
```

Step 8:

Next we will source the .bashrc file to ensure our settings take effect:

```
cladmin@cc:~/.euca$ source ~/.bashrc
```

You can log off and back on in order to ensure these settings are active.

### **3. Software Requirement Analysis**

Here we are designing a Student Learning system and it consists of 3 modules namely:

- 1)Student module
- 2)Lecturers module
- 3)Admin module

#### **3.1.Student Module**

Here we first provide login page which is common to all users of cse and student must first get logged into that page.This provides first level of security.After first level of authentication the students enters a page where he can select one year out of 3 years.After it makes the student ro enter a page corresponding to that year where he can view all the names, corresponding subject codes and corresponding lecturers names and the notes of various subjects uploaded by the teachers.Then the student can download the subject material he wants to study.

#### **3.2.Lecturers Module**

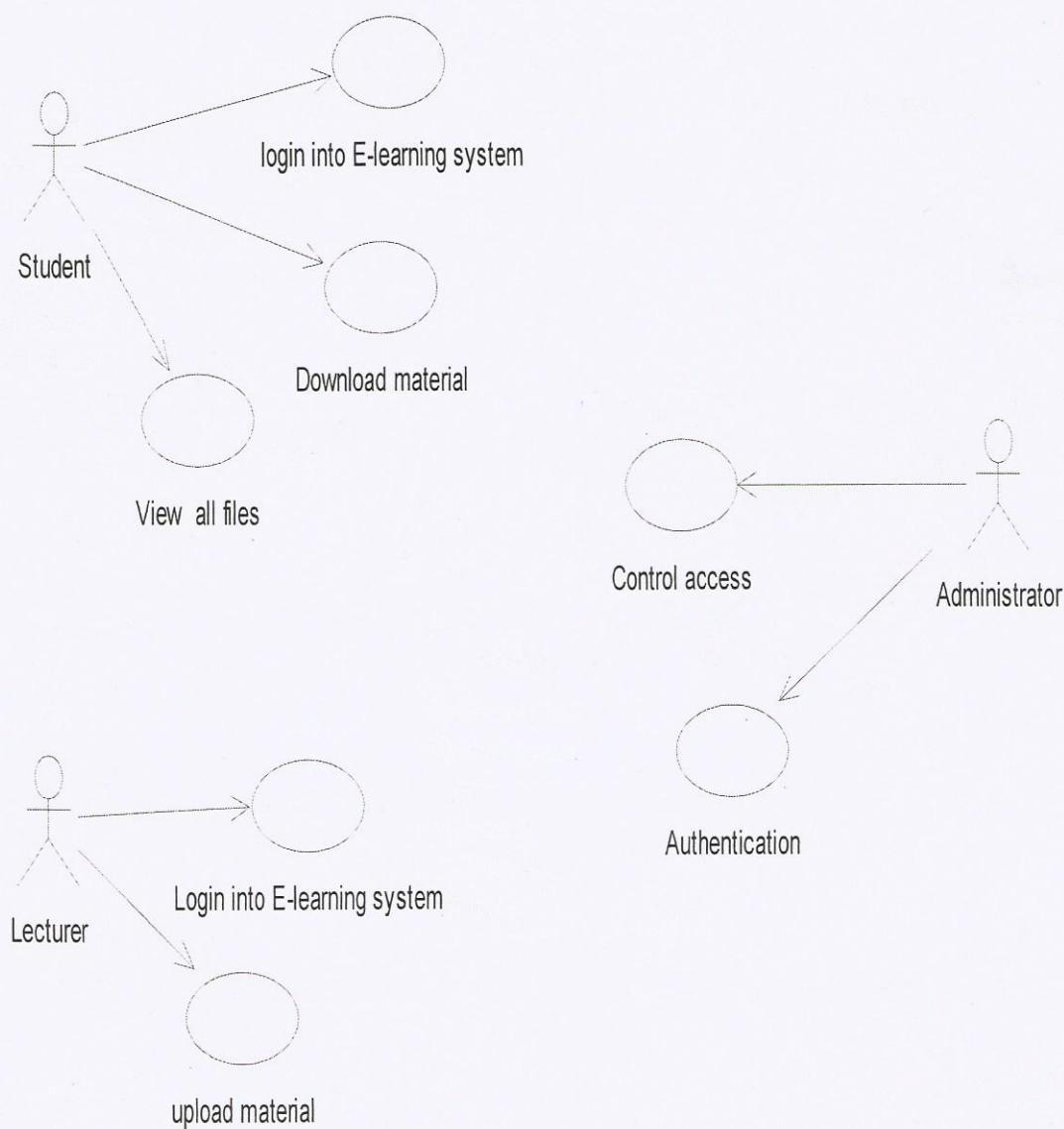
After entering the home page after crossing the first level of authentication the lecturer must select the staff link to login into his/her page to view the uploaded notes and to upload new notes.The lecturer can log into his/her page using the id and password given by the admin. After authentication the lecturer can upload the notes and can also download the notes.

#### **3.3.Admin Module**

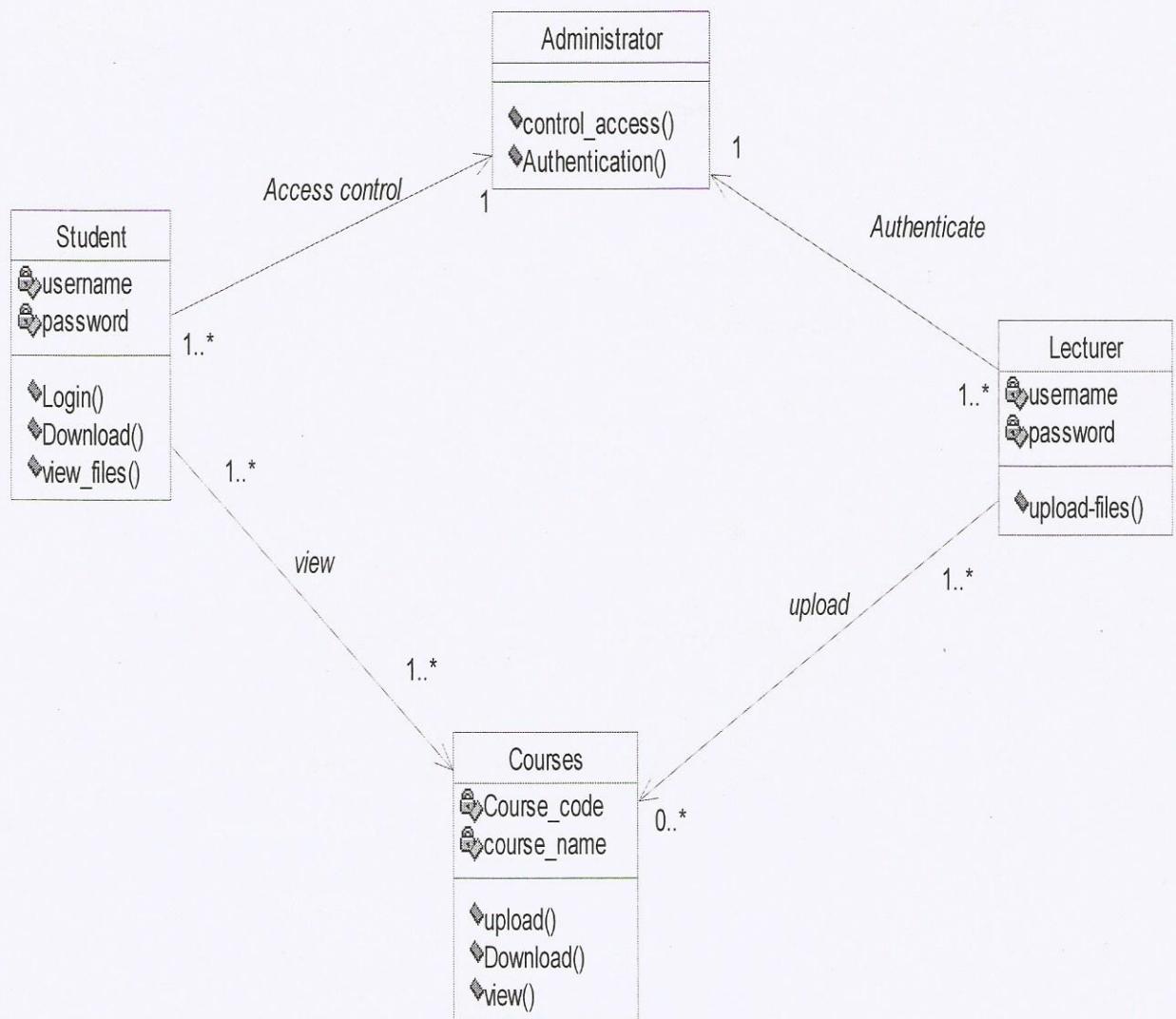
The main duty of the admin is to provide access to only authenticated users.He must the users and passwords to the lecturers.

## 4. Software Design

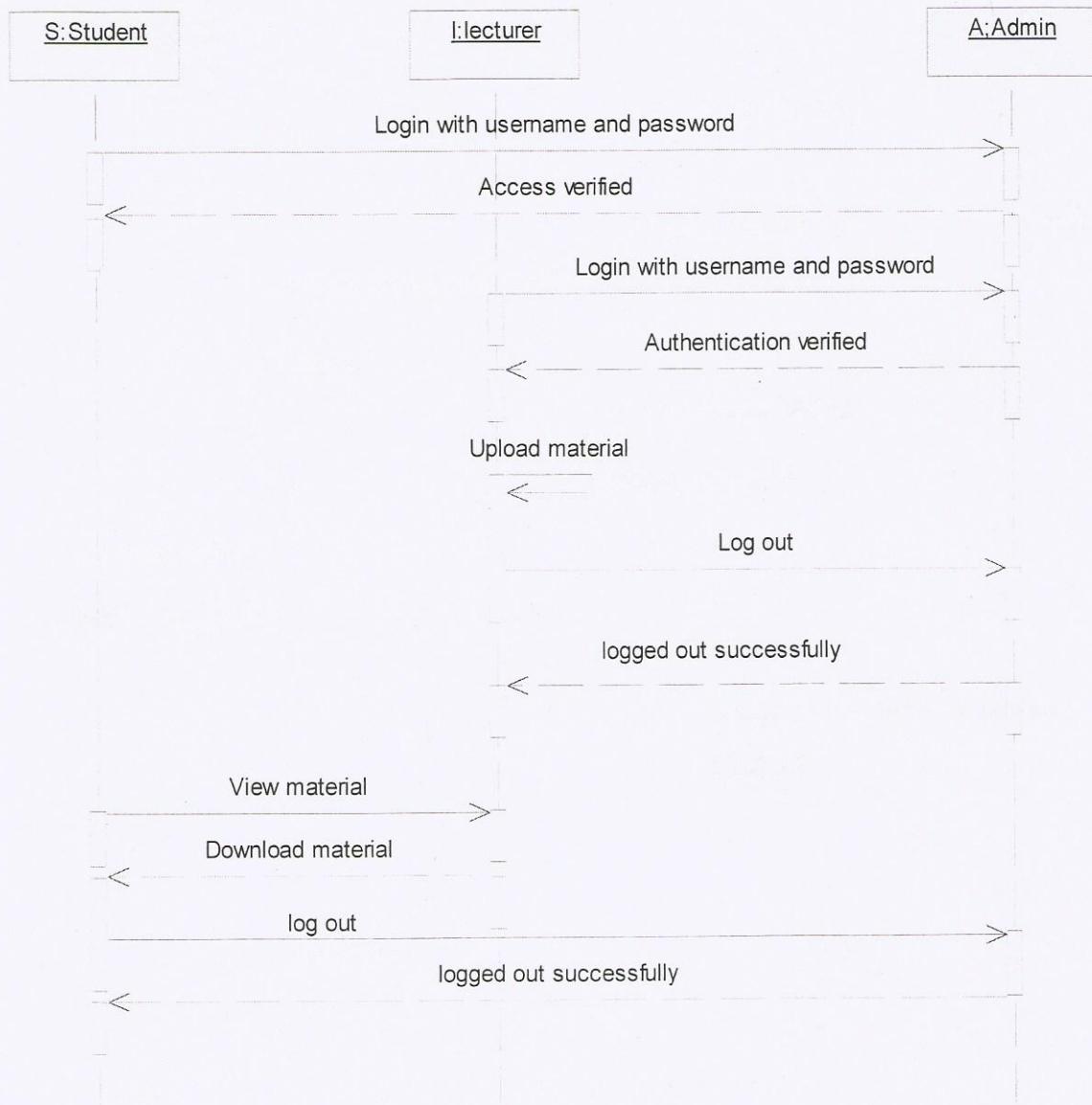
### 4.1. Use case Diagram



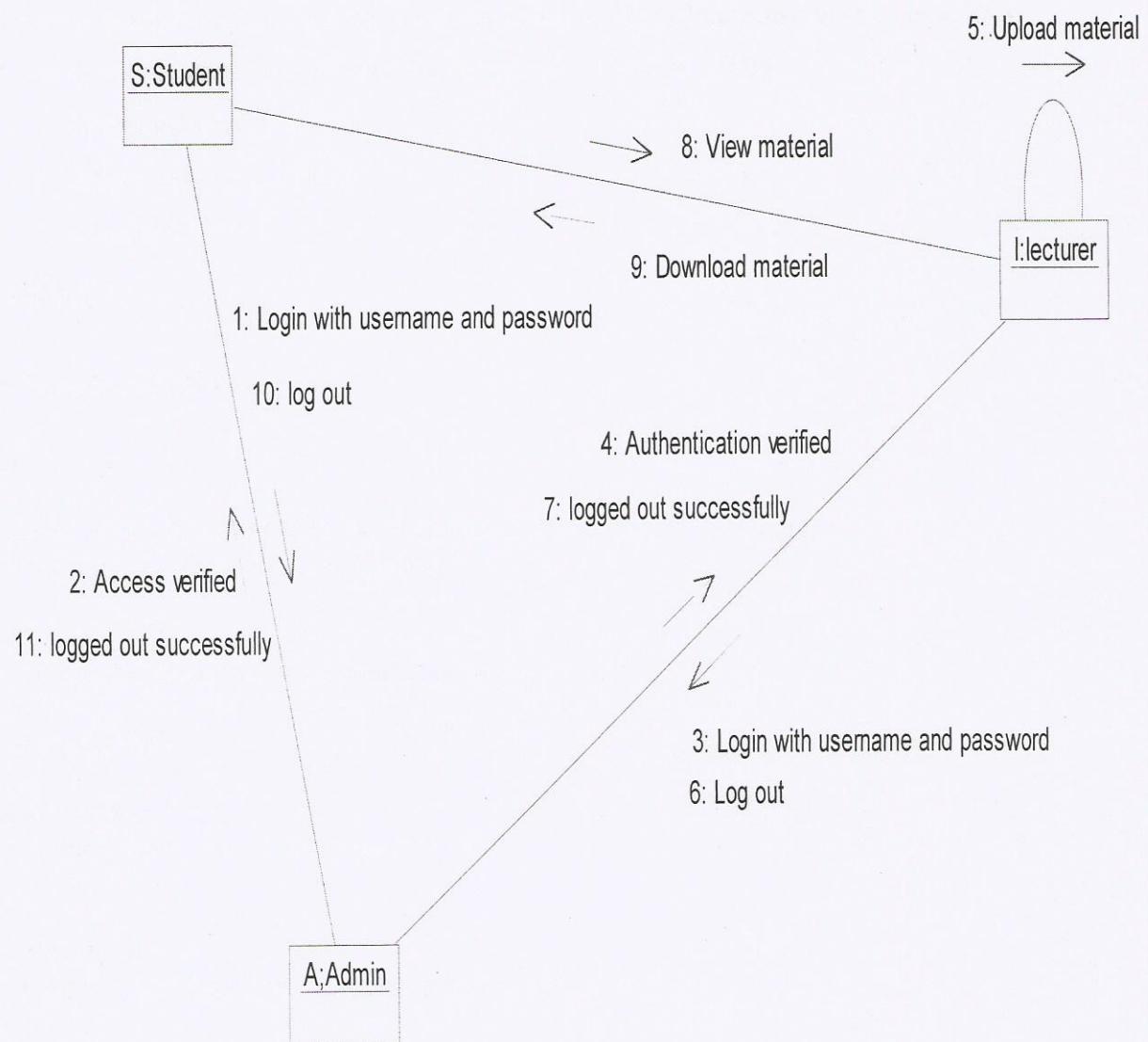
## 4.2. Class Diagram



### 4.3.Sequence diagram



#### 4.4.Collaboration Diagram



## **5.Hardware and software requirements**

Hardware requirements:Two systems with 4GB RAM,500GB harddisk with i3 processor

Software requirements:ISO-image of ubuntu server of version 10.04

Language used:PHP

Editor used:Notepad++

Localhostserver

## **6.Coding**

### **6.1.Common login page**

```
<?php
?>
<center><h1>VRSEC CLOUD E-LEARNING SYSTEM</h1></center>
<center></center>
<br>
<br>
<form method="post" action="second.php">
<center>
<table border="1">
<tr>
<th> Username </th>
<td> <input type="text" name="user"></td>
</tr>
<tr>
<th> Password </th>
<td> <input type="password" name="pass"></td>
</tr>
<tr>
<td colspan="2" align="center">
<input type="submit" value="Log in">
</td>
</tr>
</table>
</center>
</form>
```

## 6.2.Home page

```
<?php
?>
<frameset rows="40%,*">
<frame src="top.php" name="top"/>
<frameset cols="25%,*">
<frame src="left.php" name="left"/>
<frame src="right.php" name="right"/>
</frameset>
</frameset>
```

## 6.3.Staff login page

```
<?php
?>
<center><h1>Staff login<h1></center>
<center>
<form method="post" action="teachlogcheck.php">
<table border="1">
<tr>
<th> Username </th>
<td> <input type="text" name="user"></td>
</tr>
<tr>
<th> Password </th>
<td> <input type="password" name="pass"></td>
</tr>
<tr>
<td colspan="2" align="center">
<input type="submit" value="Log in">
</td>
</tr>
</table>
</center>
</form>
<?php
$db=mysql_connect("localhost","root","chandrakala")or die(mysql_error());
$db_select=mysql_select_db("users",$db)or die(mysql_error());
$username=$_POST['user'];
$password=$_POST['pass'];
$username=mysql_real_escape_string($username);
$password=mysql_real_escape_string($password);
```

```

$login = mysql_query("select * from loginusers where username='\$username' and
password = '\$password'");
if(mysql_num_rows($login) == 1) {
header('Location: upload.php');
}
else {
echo "Username and Password does not Match";
header('Location:teachlogin.php');

}

?>

```

## 6.4.File Upload

```

<?php
?>
<!DOCTYPE html>
<head>
<title>MySQL file upload example</title>
<meta http-equiv="content-type" content="text/html; charset=UTF-8">
</head>
<body>
<form action="add_file.php" method="post" enctype="multipart/form-data">
<input type="file" name="uploaded_file"><br>
<input type="submit" value="Upload file">
</form>
<p>
<a href="list_files.php">See all files</a>
</p>
</body>
</html>

```

## 6.5.File download

```

<?php
// Make sure an ID was passed
if(isset($_GET['id'])) {
// Get the ID
$id = intval($_GET['id']);

```

```

// Make sure the ID is in fact a valid ID
if($id <= 0) {
    die('The ID is invalid!');
}
else {
    // Connect to the database
    $dbLink = new mysqli('localhost', 'root', 'chandrakala', 'student');
    if(mysqli_connect_errno()) {
        die("MySQL connection failed: ". mysqli_connect_error());
    }

    // Fetch the file information
    $query = "
        SELECT `mime`, `name`, `size`, `data`
        FROM `file`
        WHERE `id` = {$id}";
    $result = $dbLink->query($query);

    if($result) {
        // Make sure the result is valid
        if($result->num_rows == 1)
            $row = mysqli_fetch_assoc($result);
            header("Content-Type: ". $row['mime']);
            header("Content-Length: ". $row['size']);
            header("Content-Disposition: attachment; filename=". $row['name'])
            echo $row['data'];
        }
        else {
            echo 'Error! No image exists with that ID.';
        }

        @mysqli_free_result($result);
    }
    else {
        echo "Error! Query failed: <pre>{$dbLink->error}</pre>";
    }
    @mysqli_close($dbLink);
}

else {
    echo 'Error! No ID was passed.';
}
?>

```

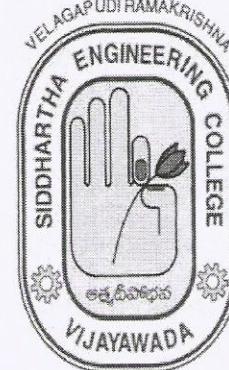
## 7. Output Screens

### VRSEC CLOUD E-LEARNING SYSTEM



Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Log in"/>	

WELCOME TO THE STUDENT LEARNING SYSTEM OF CSE



STAFF

SECOND YEAR

COURSES

THIRD YEAR

FOURTH YEAR

Name	Mime	Size (bytes)	Created	
about us.txt	text/plain	0	2013	<a href="#">Download</a>
about us.txt	text/plain	0	2013	<a href="#">Download</a>
termpaper 2.docx	application	662363	2013	<a href="#">Download</a>

Staff login

Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Log in"/>	

[See all files](#)

Success! Your file was successfully added!

Click [here](#) to go back

## **8.Conclusion**

Considering the recent advances and offerings in cloud computing,it is clear that this technology is here to stay.Currently, all of the big players in the IT industry such as Google,Microsoft,Amazon etc has some sort of cloud computing offering.Cloud computing is really cheap way for companies to have all the resources they need in one's place.It is much better way to spread cloud resources, and it becomes easier to access things from longer distances.

## **9,Future work**

A cloud can provide service either to private or public cloud. In public cloud, based on demand the services are provided to the client and in a private cloud the service is provided to a single client [10]. The combination of both public and private cloud is called hybrid private cloud, here the private cloud is hosted in a public cloud.So we would like to extend this to our major project and we would like to do it on either providing various services or on providing security

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