

Privileged Cloud Storage By MaaS JuJu

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Abstract: Cloud Storage is the attractive concept in information which allows people to provide information as per the need. Cloud provides the services on VM whereby user can share resources, software. Cloud services are supported by Open Source Systems. The project idea is about to provide cloud storage to store and upload the data for teachers and student as study material, Assignments and other stuff. These drives also allow to the principal and Examination cell authorities to upload the current notices for student. The designed cloud storage is used within Intranet by using LAN connection and also by using Wi-Fi. The Drive facilitates staff with a separate and limited space to store and upload data with its own access privileges. Additional software and platform can be included in cloud for the benefit of students. Software as well as platform must be updated with new versions.

Keywords: Virtual Machine; open stack; cloud computing; cloud storage; intranet; open source

1. Introduction

Cloud computing is an environment easily available for safe storage and retrieval with the help of cloud such as Amazon, Gmail, where resources such as computing the cloud, storage, network and softwares are being abstracted and provided as services on the internet in a remotely accessible manner. Models for these cloud services are generally similar to the ones adopted for public utilities for the ease of use. As per need of user to check the availability of data, ease of provisioning, dynamic and virtually infinite scalability is some of the attributes of cloud computing. The main aim of cloud computing is providing services as easy as possible.

It provides various types of services some services for cloud computing are SaaS, PaaS and IaaS. [9]. Eucalyptus the open source software for cloud was released in May 2008. Until now Eucalyptus 4.0.1 is in the market. After that open stack also was the open platform for the cloud The data stored can be used in many ways in the same organization. Even a private cloud helps smooth functioning of an organization

SaaS: SaaS is a software delivery methodology that provides licensed access to software for this platform and its functions remotely as a web based services of the cloud.

- Usually billed based on the usage
- Usually multi tenant environment

IaaS: IaaS is infrastructure the delivery of technology as an on demand scalable service

- Usually billed based on usage
- Can be coupled with managed cloud Services for Operating System and application support.[9]

PaaS: PaaS provides all the facilities required to support complete life cycle of platform for building and delivering web applications and services entirely from the Internet.

- Typically the applications must be developed with a particularly in platform for cloud
- Environments
- Highly scalable and usable multi-tierd architecture[9]

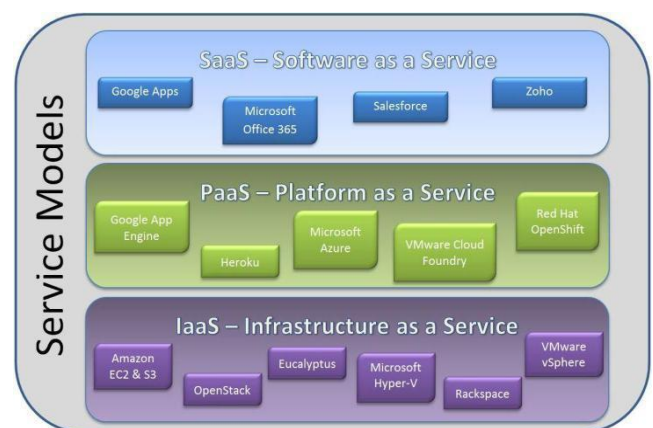


Figure 1: Service models of cloud computing

In this project work proposed idea of the design of Eucalyptus and Implementation of cloud service at college .The existing system in market are like implementation of cloud on larger scales in companies like Amazon etc[9], but not for college level. To design a cloud setup for institution like college where request patterns and infrastructure are quite different from commercial patterns and infrastructure. The college can benefit significantly from private cloud infrastructure to service its various branches, research, and teaching requirements for staff and students.

2. Existing System for College

College consists of various department like computer, mechanical, electronic, electrical etc. Each department has different computer labs like language lab, server lab, experimental lab .Each branch requires different software, which are purchased by the college which needs to be installed on every computer of different labs according to the requirement of department. Thus by setting up the cloud there will be no need of doing so much work individually .All the software and form need to be installed only once which will be stored on cloud server i.e. main server. Principal of the college will be admin or vendor. So the all activities performed by staff members and students will be known to vendor. Each student and staff member will be assigned a unique and specific id for login purpose which will help in maintaining security.

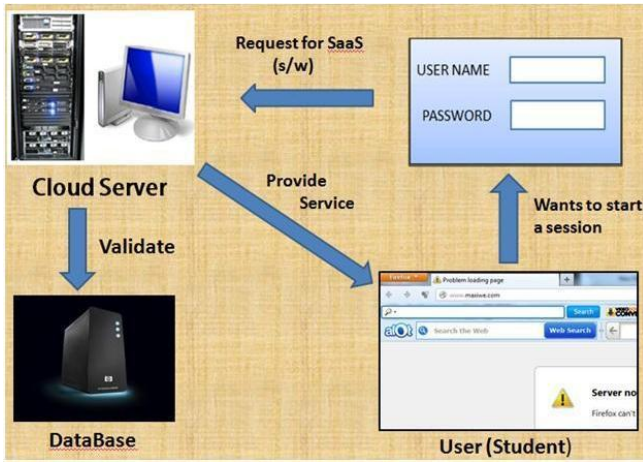


Figure 2: After setup working of cloud setup

Principal or Admin-

- He can upload notices regarding with student and teachers.
- He can give suggestion to teachers and students daily.

Faculty-

- Rights to upload data.
- Rights to upload Softwares.
- Rights to download data.
- Rights to add platform, software etc.
- User name as login ID.
- Password will be specific for every staff

Student

- They can give feedback to teachers.
- Passwords and user ID for each student

3. Physical Setup for Cloud

OpenStack was released on 5th April 2012. OpenStack is a project by Rackspace and NASA later on released as free Open source software under Apache License. NASA's Nebula cloud platform and Rackspace's cloud platform was integrated to build Openstack. OpenStack has a modular architecture that related with the three components:

- Compute (Nova)
- Object Storage (Swift)
- Image Service (Glance)

Physical Setup for Cloud

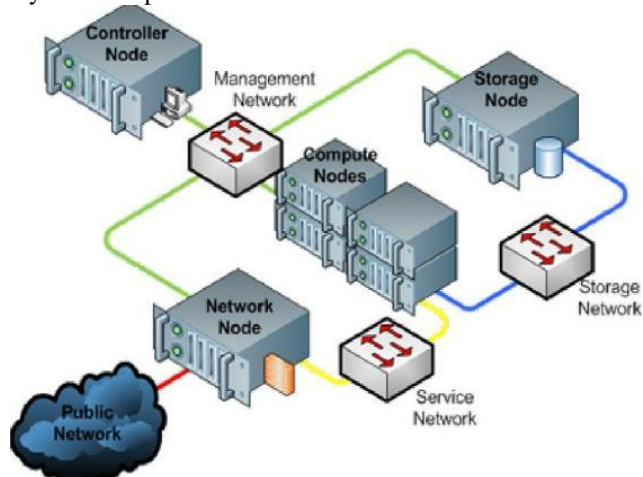


Figure 3: Physical Setup for open stack cloud

For physical setup of cloud, requirements will be as follows:

Two servers:

1. Server 1 [Server]
2. Server 2 [Node Controller]

Multiple clients: Users The user will be communicates with server1 [Server] with the help of public switch. The server 1 and server 2 will communicate with each other using private switch which is in fig 3.

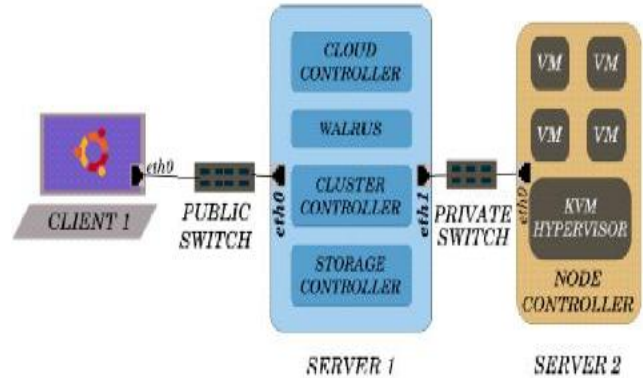


Figure 4: Physical setup of cloud

4. Implementation

A. Eucalyptus Design

In proposed system, eucalyptus design is totally based on the controller of the cloud such as node controller etc. The installation of eucalyptus is easy by the use of open stack cloud platform.

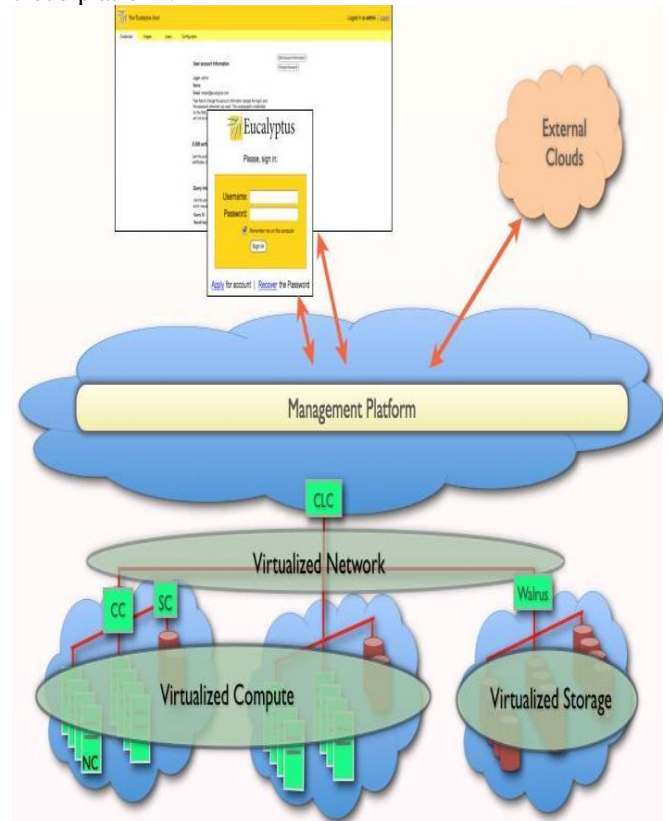


Figure 5: Representation of cloud with eucalyptus

One of the advantage of eucalyptus is that no need to install the software on every PC at departmental level of college. In this project idea two servers will be created for cloud setup. Algorithms for that two will be explained later in this paper.

How the controllers are controls the cloud are as follows:

Node Controller:

It controls the execution, inspection, and terminating of Virtual Machine instances on the host where itExecutes. And node controller will maintained by the server no. 2[9]

Cluster Controller:

It collects information and schedules VM for execution on node controllers, and manages virtual instance network. Virtual machine instances will be managed by the cluster controller for the ease of the cloud setup by clustering of the data. [9]

Storage Controller (Walrus):

It is a put or get storage service that implements Amazon’s interface, providing a mechanism for storing and accessing virtual machine images and user data. [9]

Cloud Controller:

It is the entry-point into the cloud for users and admin i.e. Principal. It queries node managersfor information about resources, makes high-level scheduling decisions, and implements them bymaking requests to cluster controllers. This type of server in the project will be maintained by the server no.1 [9]

To Add the OpenStack OS (Ubuntu) Cloud Archive repository.

Now install latest stable release of the Openstack from Ubuntu’s cloud archive:

```
# apt-get install python-software-properties//installation
# add-apt-repository cloud-archive //to archive the cloud
# apt-get update //get update
# apt-get dist-upgrade (Optional)
```

Install MySQL server (Query Processing)

OpenStack service requires a database to store information and supports many popular database engines to include the tools. In this project will use MySQL as database backend.

```
# apt-get install python mysqldbmysql server
```

The following step is optional for installation of single node installation of the node. If nodes are required (ex. storage nodes) run MySQL on all interfaces as by default it runs on localhost.

```
# /etc/mysql/my.cnf
#bind-address 192.168.--
.--//Comment out this
line or change 192.168.--
.--to 0.0.0.0)
```

Install Messaging server

Open Stack requires a Messaging service to communicate between its services. We will use Rabbit-MQ but Qpid and ZeroMQ (OMQ) are also supported.

```
# apt-get install rabbitmq-server
```

It is optional to change the password in the dev environment but is recommended in production. By default guest user is created with password guest.

```
# rabbitmqctlchange password guest < Pass >
```

Enable IP Forwarding

We need to enable Packet forwarding for networking to work, we can option this to configure during the installation of network.

```
# vi/etc/sysctl.conf //configure the system
net.ipv4.ip_forward = 1
Now, the single node has been successfully
installed. Install the NTP service of node:
$ apt-get install -y ntp
```

B. System Requirements

Software requirements: -

- Ubuntu 12.04 64-bit Server [1]
- Hardware requirement:

Table 1

Elements	Server 1 AMD64-bit (1 GHz)	Server 2 Intel Core i4 (3 GHz)	Clients Intel Core i4 (3 GHz)
Memory	10 GB Minimum	10 GB Minimum	4 GB Minimum
Disk	7200 rpm	5400 rpm	5400 rpm
Disk Space	160 GB	80 GB	80 GB
Networking	100 Mbps	100 Mbps	100 Mbps

C. Installation of a single node Open Stack

Open Stack is configurable to meet the different needs by providing numerous storage and networking options. The first step to design your own architecture of single node is to choose whether to use a single node or multi-node configuration of the node selection.

Multi-Node:

Multi Node installation runs different OpenStack services on different nodes. The basic Nodes required for the installation are as follows:

Controller Node:

Controller Node runs control services of cloud, such as database, message queue as well as API services for the Identity Service, Image Service and Compute.

Network Node:

Network Node runs on the networking services and it is responsible for virtual networking needed for people to create public or private networks, and their virtual machines into external networks.

Compute Node:

Compute nodes runs the virtual machine instances in OpenStack. Additional nodes can be added as per requirements of the cloud which may include the Storage node, an additional Network, compute or nodes.

Single Node:

Single Node Installation runs all Open Stack services in one node including Control the node, Network, Compute node requirements, Storage services.

D. Setup Configuration

Steps Description/commands

1. Install Ubuntu Server in Server 1
2. Boot the Server off for installation: Setup IP address details.
3. IP (././././.) (Please do that for eth0): Cloud Controller Address of IP.
4. Leave this IP blank as Server1 is the Cloud

Controller in this setup

Cloud Installation Mode Select —Cloud controller", —Walrus storage service", —Cluster controller" and —Storage controller". Network interface for communication Select eth1 node Eucalyptus cluster name Cluster 1.[8]

Installation Procedure for Server 2

Install Ubuntu Server in Server 2 Boot the Server off for installation Setup the IP address for the one interface. Please do that for eth1 by setting up the private IP

Cloud Installation by server 2

Mode Select —Node Controller" Gateway (IP of the Cloud Controller)

Installation Procedure for Client 1

Install Ubuntu Desktop Client Boot the Desktop off for installation IP Address. The Desktop will be on enterprise network and will obtain an IP address through DHCP.

E. Algorithm

Installing server 1

1. Boot the server off the Ubuntu Server and proceed with the basic installation steps.
2. Installation only set up the IP address details for the one interface (for eth0 and eth1)
3. We need to choose certain configuration options during the course of the install.
4. Cloud Controller Address Cloud Controller in this setup
5. Cloud Installation Mode of cloud - Select —Cloud controller", —Walrus|[8]

Installing server 2

1. Boot the server off the Ubuntu and proceed with the basic installation steps.
2. Installation only lets to set up IP address for one interface. For eth1 by setting up the private IP [8]
3. Then choose certain configuration options for UEC, the course of the install. Ignore all settings, except the following steps:
4. Cloud Controller Address
5. Cloud Installation Mode—Select the —Node Controller"
6. Gateway (IP of the Cloud Controller) [8]

Installation for Client-1

Installation Procedure for Server for cloud The purpose of Client-1 is to interact with cloud setup, for bundling and registering new Eucalyptus Machine Images (EMI) for cloud set up.

1. Boot the Desktop off the Ubuntu and install. The Desktop will be on the enterprise network and will obtain an IP address of controller through DHCP.
2. Install KVM to help to install platform and bundle:
\$APT_GET INSTALL QEMU_KVM.

Algorithm to Invoke the Web Interface

- 1) Login to the web interface of CLC. The default username is —admin" and the default password is —---
- 2) Authorize the browser to access the server with the self signed certificate.
- 3) When you login for first time, web interface prompts to change the password and provide the email ID of the principal
- 4) After completing this mandatory step, download the other stuff.
- 5) Extract the credentials archive: \$
cd .euca \$ unzip mycreds.zip
- 6) Source eucarc script to make sure that the environmental variables used by euca2ools are as:
\$. ~/.euca/eucarc

5. Logic Developed

Step 1: Created MAAS network in Virtual machine

Edit -> Connection details
Virtual Networks tab
Added a network

Step 2: Created MAAS Controller

Created a new virtual machine via VMM and installed from Ubuntu.

Step 3: Configured MAAS Controller

Step 4: Configured the MAAS Controller network

Step 5: Added node(s) to MAAS

Step 6: Set up Juju (Juju installed)

6. Result

Cloud computing is the computing environment where data are delivered on-demand to authenticated devices in a secured manner for easy access and users utilize a shared and Infrastructure. This paper briefly explains the set up of a private cloud in a cluster based environment technologies like Eucalyptus, Openstack, MAAS and Juju. For this project input will be required data and software which is stored on cloud. And output will be like all users will access data with the authentication of the students and other user. Until now network is created in the virtual machine (VMM) with the help of MAAS and Juju.

7. Conclusion

In this project work college centric implementation is done on the basis of intranet to provide the easy access for all to use the cloud. Cloud computing is environment where data is shared among the number of users where security increases. In this paper, set up of a private cloud in a cluster based environment using open source technologies like Eucalyptus. The virtual machine images are available in the cloud and upon user request; its instances are created and run in cloud. Services were included successfully and made available to the user. The future scope of this project will be like to update the software and platform. Various parameters of a college can be kept centrally like software, time table etc. The open source software like eucalyptus, open stack can be useful in developing the cloud. In future work eucalyptus version and platform can be upgraded and also the clients can be increased.

References

- [1] Study of Cloud Setup for College Campusl, International Journal of Advanced Research , Computer Science and Software Engineering, Vol 2, Issue 10, October 2012
- [2] Johnson D, KiranMurari, Murthy Raju, Suseendran RB,
- [3] YogeshGirikumar (2010), Eucalyptus Beginner's Guide -UEC Edition, CSS Open Source Services, UEC Guide.v1.0. (Ubuntu Server 10.04 - Lucid Lynx).
- [4] Judith H, Robin B, Marcia K, and Dr. Fern H, Dummies.com,Comparing-Public-Private-and-Hybrid-cloud-computing.Wiley Publishing, Inc.2009.
- [5] Intermittent cloud connection, International Institution of Information technology banglore
- [6] Installing the Eucalyptus Cloud/Cluster/Storage Node on Ubuntu Karmic 9.10 dustinkirkland
- [7] Cloud Computing (2010), Wikipedia;en.wikipedia.org/
- [8] wiki
- [7]Privatecloud,(2008)SearchCloudComputing.com,Def inition s;Whatls.com
- [9] Setting up of an Open Source based Private Cloudl
- [10]Dr.G.R.Karpagam, International Journal, Computer Science Issues, Vol. 8, Issue 3, No. 1, May 2011
- [11]Guidelines for Building a Private Cloud Infrastructure, IT University of Copenhagen, Denmark, 2012
- [12]The Eucalyptus Open-source Cloud-computing System,Computer Science DepartmentUniversity of California