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# Cloud: Virtual lab for storage and retrieval of large data by private cloud

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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, platform, security and the most powerful memory storage. Cloud services are supported by Open Source Systems, so make a cloud for storage becomes useful. The project idea is about to provide cloud storage to store and upload the data for teachers, principal and student as study material, Assignments and other stuff by making virtual lab. These drives also allow to the principal and Examination cell authorities to upload the current notices for student. The different types of applications are deployed for students to use the software. One main cloud server is going to store all the types of data which 24\*7 available further for the valid user. The Drive facilitates staff with a separate and limited space to store and upload data with its own access privileges. Whole data can be accessed outside the institute also through the internet

**Keywords—** Internet, private cloud, open nebula, open stack, intranet, cloud server

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## I. INTRODUCTION

A. These features of cloud computing can be used within the day to day environment such as IT Infrastructures, colleges, small organization, government institutes. By taking example of the college set up, the cloud can be formed for such a institutes to secure the data and to form a private cloud. Particularly if college is concerned, to set up of a private cloud in a cluster based environment using open source technologies like Eucalyptus, open nebula, open stack etc.College consists of various department like computer, mechanical, electronic,

electrical etc. Each department has different computer labs like language lab, server lab, and 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.

Cloud computing relies on sharing of resources to achieve coherence and economies of scale similar to a utility over a network. Using the cloud storage, user can store their data on the cloud without worrying of data storage and maintenance. When user stores their data on the cloud, it provides relief of burden for storage management, universal data access with location independence and avoidance of capital expenditure on hardware and software and personal maintenance. It provides services and high-quality

applications from a shared pool of configurable computing resources.

## II. LITERATURE SURVEY

Vinay Khedekar[6] introduces the cloud computing technology for making the private cloud for college and its basic concepts for installation. The popularity of the private cloud for college like virtual lab as well as deployment of private cloud is explained. The paper describes the open nebula open source software's to deploy private clouds. A setup for open nebula open source software is including the basic installation steps to configure the cloud with the help of open nebula. Cloud implementation, programming language, database compatibility, OS compatibility of open nebula is given further.

Girish L S[1] propose a process framework for supporting of the cloud computing and it is proposed that PaaS clouds would have long term commitments because of unavailability of alternative solutions. To meet the quality of private cloud for virtual lab effectively as well as efficiently open nebula is used to implement the cloud platform of the open nebula

## III. PROPOSED SYSTEM ARCHITECTURE

### Architecture of private cloud:

The proposed system architecture of the virtual network will be like following architecture. It has all open stack configuration with virtual network. Controller node i.e. cloud server (having MAAS and Juju with two services). System design for the proposed virtual cloud lab with the extra node with cloud server is shown below:

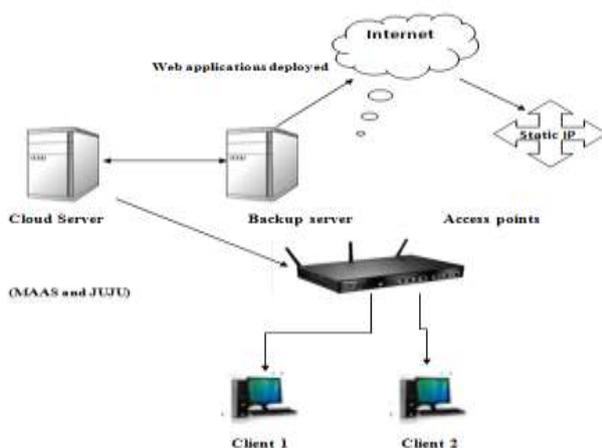


Fig 1: Architectural Overview

### Ubuntu Cloud Infrastructure:

Platform plays an important role to the infrastructure while building a private or public cloud. Platform should be scalable, stable, flexible, highly supportable to all types of services and also built with openness. Ubuntu is the most popular and commonly used platform for cloud computing.

The name cloud Infrastructure is used as name because the structure of the network looks same like a exact cloud. Ubuntu Cloud Infrastructure is an OpenStack based ready to deploy Infrastructure-as-a-Service (IAAS). Ubuntu cloud infrastructure can be used to cloud in a easiest compare to other platform and can deploy both public and private cloud smoothly. It can be deployed locally on one system as a cloud server and on more than one system as well. Ubuntu Cloud Infrastructure is one of the easiest way for forming the private cloud to deploy a cloud based on openstack. Ubuntu Cloud Infrastructure is ready to deploy Infrastructures a-Service (IAAS) based on the OpenStack cloud platform.

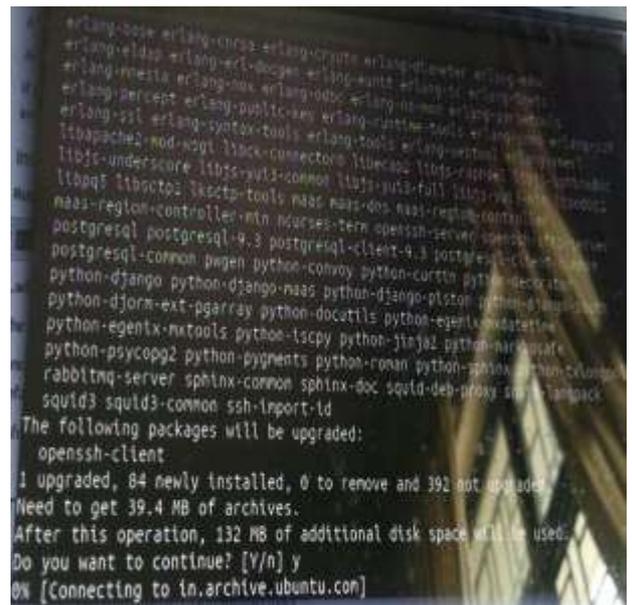


Fig 2: Installation of Ubuntu

It provides all the tools, need to offer a private IAAS cloud on the own hardware". It uses Metal as a service (MAAS) and Juju to setup an openstack based cloud. Ubuntu is the most popular platform for cloud computing Built into Ubuntu Server, Ubuntu Cloud Infrastructure provides easiest way to deploy, scale and maintain a cloud and an OpenStack cloud. Ubuntu Cloud Infrastructure provides the simplest way to deploy an OpenStack Cloud. Ubuntu is the fastest and best supported platform to create an OpenStack cloud.

The Ubuntu Cloud Infrastructure for virtual server with MAAS and Juju, can be deployed in three steps:

1. Deploy MAAS server
2. Deploy Juju
3. Deploy Ubuntu Cloud Infrastructure with Juju

## IV. IMPLEMENTATION

### Install Maas server:

Installing MAAS from the archive:

Installing MAAS from packages by ubuntu is thankfully straightforward. There are actually several packages that go

into making up a working MAAS install, but many of packages are already have been gathered into a virtual package called ‘MaaS’ which will install necessary components for a ‘seed cloud’, that is a single server that will directly control and manage the group of nodes. The main packages are:

- maas - seed cloud setup- which includes both region controller and the cluster controller below.
- maas-region-controller- Includes the web UI, API and database.
- maas-cluster-controller – controls a group (“cluster”) of nodes including DHCP management.
- maas-dhcp/maas-dns – Required when managing dhcp/dns.

If any need to separate these services of cloud or want to deploy an additional cluster controller, should install the corresponding packages individually for more background on how a typical hardware setup is arranged.

There are two suggested additional packages ‘maas-dhcp’ and ‘maas-dns’. These set up MAAS-controlled DHCP and DNS services which greatly simplify deployment if running a typical setup where the MAAS controller can run the network.

MaaS seed cloud (config) setup, which includes both region controller and cluster controller below

- maas-region-controller - web UI, API and database.
- maas-cluster-controller - controls group clusters of nodes including DHCP management.
- maas-dhcp/maas-dns - required when managing DHCP/DNS

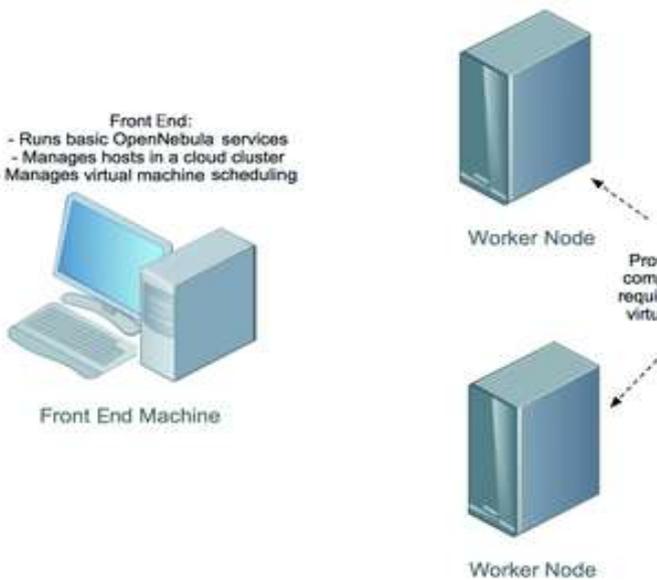


Fig 3: Cloud server deployment

For installation of MAAS with DHCP and DNS:

At the command line, type:

```
$ sudo apt-get install maas maas-dhcp maas-dns
```

To install Juju, need to have the latest juju core package from PPA, following commands can be used to load package:

```
sudo add-apt-repository ppa:juju/stable
sudo apt-get update && sudo apt-get install juju-core
```

**Deploying from the juju Charm:**

When Juju is going is going to deploy charms by fetching them directly from the charm store. This ensures that, up to date version of the charm and "everything just works".

To deploy a charm

```
juju deploy mysql
```

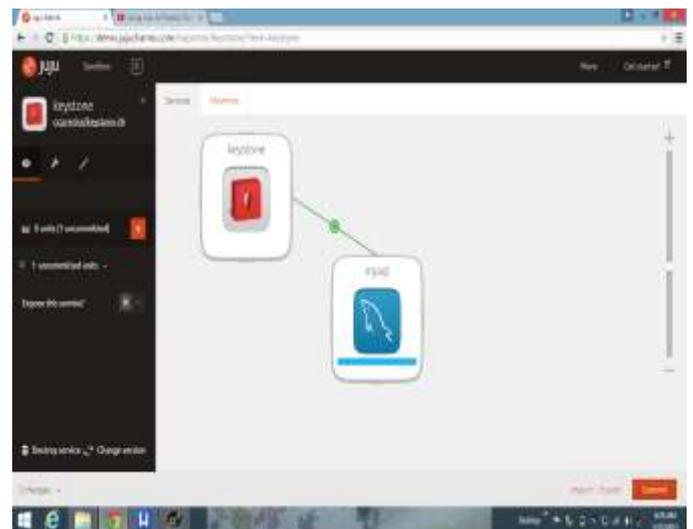


Fig 4: Deploying nodes by Juju

In this way we have seen installation and configuration of private cloud by MAAS and JUJU, open source platform.

**V. CONCLUSION**

Cloud computing is environment where data is shared among the number of users where security increases and data storage capacity is increasing. Set up of a private cloud in a cluster based environment using open source technologies like MAAS and Juju. 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

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