

# Software Development Tracking Using Eucalyptus Cloud

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**Abstract**— The scope of the project is to develop a Private cloud using eucalyptus that reflects the company status as itself. It should contain all details regarding to company necessary, like list of employees in company, employee details with their post, employee working status, details of client projects, assignment of the task or modules to the working employees this all company tracked data will be in one single private cloud. This all can be done in an open source with the help of eucalyptus infrastructure. In today's digital world every Organization related to different fields like corporate sector, educational field and many big company's and even in business sectors require their own cloud that is private cloud. It provide necessary update information of overall company behavior without doing any paper work which is beneficial to both Company and employee because it saves time and money and it maintain accurate information about the company. The administrator, Manager and employees can easily access to their private cloud and they can easily update their status.

**Index Terms**— Cloud Computing; Software Development Tracking; Eucalyptus Cloud; Cluster Controller; Private Cloud.

## I. INTRODUCTION

Now days we are in the era of internet where users don't need to install, run applications or to store their data on their own computers. Every single piece of information is residing on the internet because of Cloud. So "Cloud" is pretty much familiar word for today's internet users but when it is combined with "Computing" it gets bigger & bigger with some inherent risks associated with it. According to many of the analysts & vendors; cloud computing[1] is nothing but an enhanced version of utility computing. It provides virtual storage space widespread over the internet. Some people define it differently as anything goes beyond the firewall is in the cloud, just like conventional outsourcing. In current situation, organization becomes so big; the organization must have a good application which gives the whole and updated information of the employees.

So we built the private cloud using eucalyptus that gives more flexible facilities to the company employees, now employees can upload his daily work on to the cloud up to

date data easily.

We intend to provide various crucial facilities that are needed for the company such as:

- A. Each employee can update his work information i.e. status of his work.
- B. The information is available only to the Manager as well as to the authorized persons of company by connecting to company's private cloud.
- C. If there is new employee company, he/she will be registered by administrator by filling up the personal information on to the private cloud.
- D. With the help of this private cloud we can easily track the company status over all by using World Wide Web.
- E. Our private cloud provides the facility that gives flexible information of the employee.
- F. In future extra features can be added in this application such as data sharing, instant messaging video Conferencing.

## II. INFORMATION GATHERING

Distributed computing is Internet ("cloud") based advancement and utilization of PC innovation ("processing"). It is a style of figuring in which powerfully versatile and frequently virtualized assets are given as an administration over the Internet. Clients require not know about, aptitude in, or control over the innovation foundation "in the cloud" that backings them.

The term cloud is utilized as a representation for the Internet, in light of how the Internet is delineated in PC organizes outlines, and is a reflection for the intricate foundation it hides. The data gathering is the principle errand identified with our undertaking since we give the organization picture to each worker of the organization. The data gathering alludes to accumulation of important information at necessity detail period of undertaking in fitting time.

### A. What is EUCALYPTUS?

Eucalyptus was conceived as a University venture in the MAYHEM labs of the Computer Science Dept. at UC Santa Barbara. The MAYHEM group's involvement in Grid Computing, HPC, and greatly adaptable frameworks (Rich

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Wolski's group of NWS and Every Ware notoriety) made it the regular place for the introduction of Eucalyptus[2][7]. In 2009, the Eucalyptus group began an organization (Eucalyptus Systems Inc.) to market Eucalyptus. Right now there is Eucalyptus, the open source venture, and Eucalyptus EE[12] (Enterprise Edition), which is the business adaptation of Eucalyptus.



Figure 1: Eucalyptus Logo

The name EUCALYPTUS is an acronym and stands for: Elastic, Utility, Computing, Architecture for, Linking, Your, Programs, To, Useful, Systems.

Eucalyptus empowers the production of on-premise private clouds, without any prerequisites for retooling the association's current IT framework or need to present particular equipment. Eucalyptus executes an IaaS (Infrastructure as a Service) private cloud that is open by means of an API good with Amazon EC2 and Amazon S3. For more data on our API see our Developer's Corner. This similarity permits any Eucalyptus cloud to be transformed into a cross breed cloud, fit for drawing register assets from open cloud. What's more, Eucalyptus is perfect with an abundance of devices and applications that additionally hold fast to the true EC2 and S3 principles.

Here are a portion of the qualities that make Eucalyptus the most broadly conveyed cloud stage for the private (on-commence) cloud:

1. Open Source: Eucalyptus is open source: on the off chance that you need to alter it, add to it, evaluate its security or simply gain from it you can download it and have the source code readily available. The Eucalyptus advancement process is in the open, as are bug reports, group commitments and security advisories.
2. Modular: Eucalyptus configuration is secluded. The Eucalyptus parts have all around characterized interfaces (by means of WSDL, since they are web administrations) and in this manner can be effectively swapped out for custom segments.
3. Distributed: Eucalyptus enables its segments to be introduced deliberately near the required/utilized assets. For instance Walrus can be introduced near the capacity, while the Cluster Controller can be introduced near the bunch it will oversee.
4. Designed to Perform: Eucalyptus was outlined from the beginning to be adaptable and to accomplish ideal execution in assorted conditions (intended to overlay a current foundation).

5. Flexible: Eucalyptus is adaptable and can be introduced on an extremely negligible setup. However it can be introduced on a huge number of centers and terabytes of capacity. What's more, it can do as such as an overlay over a current foundation.
6. Compatible: Eucalyptus is good with the most well known and broadly utilized Cloud API as of now accessible: Amazon EC2 and S3. Eucalyptus' outline takes into consideration some other API to be actualized, however to date no other genuine Cloud API contender is as entire and as asked for as Amazon's.
7. Hypervisor Agnostic: Eucalyptus is intended to effortlessly bolster most accessible and future hypervisors. As of now Eucalyptus completely bolsters KVM and Xen. Furthermore, the Enterprise Edition underpins the restrictive VMware hypervisor[3].
8. The Eucalyptus Open Source Private Cloud: Eucalyptus is a Linux-based open source programming engineering that actualizes effectiveness improving private and half and half clouds inside an undertaking's current IT Infrastructure.
9. Secure Cloud: An Eucalyptus private cloud is conveyed over a venture's "on-start" information enters Infrastructure and is gotten to by clients over big business intranet. Therefore touchy information remains totally secure from outer interruption behind the undertaking firewall.
10. Carefully built for compatibility: Initially created to help the High Performance Computing (HPC) research of Professor Rich Woolskin's examination assemble at the University of California, Santa Barbara, Eucalyptus is designed by outline rule that guarantee similarity with existing Linux-based server farm establishments. Eucalyptus can be sent without change on all significant Linux OS appropriations, including Ubuntu, RHEL Centos and Debian. Also, Ubuntu appropriations now incorporate the Eucalyptus programming center as the key part of the Ubuntu Enterprise Cloud.
11. Technology: Eucalyptus was composed starting from the earliest stage to be anything but difficult to introduce and as non-nosy as could reasonably be expected. The product system is exceptionally secluded, with industry standard, dialect skeptic correspondence. Eucalyptus is additionally extraordinary by giving a virtual system overlay that both detaches arrange activity of various clients and enables at least two bunches to seem to have a place with a similar Local Area Network (LAN). The outer interface to Eucalyptus can likewise be utilized to be good with numerous open clouds.

### B. Cloud Controller

Cloud Controller (CLC) is the passage point into the cloud for overseers, engineers, venture managers, and end-clients. The CLC is in charge of questioning the hub directors for data about assets, settling on abnormal state booking choices, and executing them by making solicitations to cluster controllers.

The CLC[4], as appeared in Figure above, is likewise the interface to the administration stage. In essence, the CLC is in charge of uncovering and managing the basic virtualized assets (servers, system, and capacity) by means of an all around characterized industry standard API (Amazon EC2) and a Web-based UI. At that point elements of cloud controller are as per the following:

1. Monitor the availability of resources on various components of the cloud infrastructure, including hypervisor nodes that are used to actually provision the instances and the cluster controllers that manage the hypervisor nodes.
2. Resource arbitration – deciding which clusters will be used for provisioning the instances.
3. Monitoring the running instances.

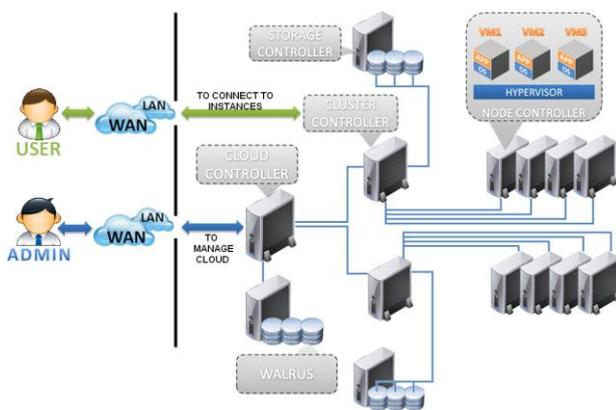


Figure 2: Eucalyptus Components Architecture

In short, CLC has a comprehensive knowledge of the availability and usage of resources in the cloud and the state of the cloud.

When you submit your final version, after your paper has been accepted, prepare it in two-column format, including figures and tables.

### C. Cluster Controller

Cluster Controller (CC) by and large executes on a group front-end machine or any machine that has arrange network to both the hubs running NCs and to the machine running the CLC. CCs assemble data about an arrangement of VMs and calendars VM execution on particular NCs. The CC additionally deals with the virtual example arrange and takes an interest in the requirement of SLAs as coordinated by the CLC. All hubs served by a solitary CC must be in a similar communicated space (Ethernet). The elements of cluster controller are as per the following:

1. To receive requests from CLC to deploy instances.
2. To decide NCs for deploying the instances on.
3. To control the virtual network available
4. To collect information about the NCs registered with it and report it to the CLC.

### D. Node Controller

Node / Hub Controller (NC) is executed on each hub that is assigned for facilitating VM examples. A UEC hub is a VT-empowered server equipped for running KVM as the hypervisor. UEC naturally introduces KVM when the client introduces the UEC hub. The VMs running on the hypervisor and controlled by UEC are called occurrences. Eucalyptus underpins different hypervisors like Xen separated from KVM; however Canonical has picked KVM as the favored hypervisor for UEC. The NC keeps running on every hub and controls the life cycle of examples running on the hub. The NC interacts with the OS and the hypervisor running on the hub on one side and the CC on the opposite side. NC inquiries the working framework running on the hub to find the hub's physical assets – the quantity of centers, the extent of memory, and the accessible circle space. It additionally finds out about the territory of VM occasions running on the hub and propagates this information up to the CC. The elements of hub controller as take after:

1. Collection of data related to the resource availability and utilization on the node and reporting the data to CC.
2. Instance life cycle management.

### E. Storage Controller

Storage / Capacity Controller (SC) executes square got to organize capacity (e.g., Amazon Elastic Block Storage - EBS) and is fit for interfacing with different capacity frameworks (NFS, iSCSI, and so forth.). A flexible square store is a Linux piece gadget that can be connected to a virtual machine however sends plate activity over the privately appended system to a remote stockpiling area. An EBS volume can't be shared crosswise over occasions however allows a depiction to be made and put away in a focal stockpiling framework, for example, Walrus, the Eucalyptus stockpiling administration. The elements of capacity controller as take after:

1. Creation of persistent EBS devices.
2. Providing the block storage over AoE or iSCSI protocol to the instances.
3. Allowing creation of snapshots of volumes.

### F. WALRUS

Walrus (put/get capacity) enables clients to store persistent information, sorted out as inevitably reliable buckets and items. It enables clients to make, erase, list containers, put, get, and erase protests, and set access control approaches. Walrus[5] is interface good with Amazon's S3, and backings the Amazon Ma-chine Image (AMI) picture

administration interface, along these lines giving a component to putting away and accessing both the virtual machine pictures and client information. Utilizing Walrus, clients can store steady information, which is sorted out as containers and articles. WS3 is a document level stockpiling framework, when contrasted with the square level stockpiling arrangement of Storage Controller.

For utilizing Walrus to oversee Eucalyptus VM pictures, you can utilize Amazon's instruments to store/enroll/erase them from Walrus. Other outsider instruments can likewise be utilized to collaborate with Walrus specifically.

### III. SYSTEM ARCHITECTURE

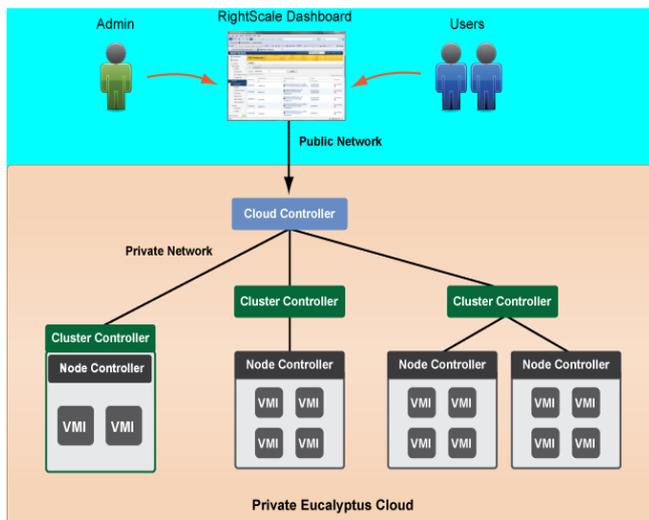


Figure 3: Conceptual Representation of the Eucalyptus Cloud

A class diagram shows set of classes, interfaces and collaboration and their relationships. Class diagram are important not only for visualizing, specifying, and documenting structural models, but also for constructing executable system through forward and reverse engineering.

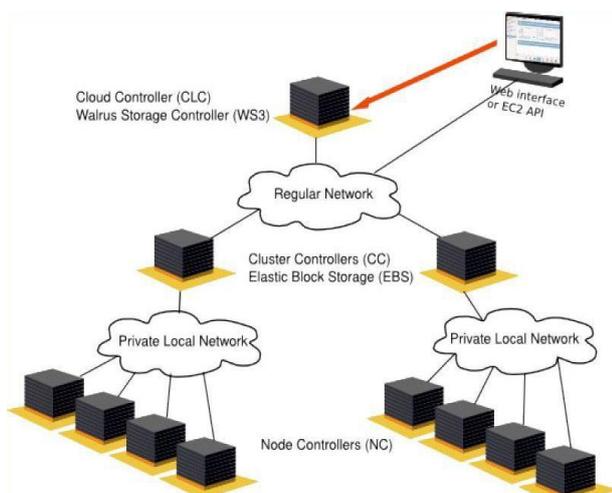


Figure 4: Architectural Design of eucalyptus cloud

### IV. SYSTEM IMPLEMENTATION

The goal of system design is to produce a model or representation that exhibit, commodity and delight. It provides information about the application domain for the software to be built. It fully describes the internal details of each module. Regarding to our application we have provided many links to give information about that specific field. The following is the description of that field.

#### 1. Home Page

Whenever a particular user logins with his user name and password it goes to his authorized page such as if an employee is the project manager if he enter his login id and password it directly links to the project management home page similarly for client management and employee management Using this home page link we can direct to home if you are on the other page.

#### 2. Admin functionality:

Administrator can login through his authorized user name and password and can manages different things like News Management: Administrator can add new employee and also can remove the employee after leaving the company. Administrator can add or remove plans and projects. Administrator can also add the technical information.

#### 3. Project Manager

In the project manager field, project manager creates number of modules of project and assigns the different team leaders to different project modules.

#### 4. Client Management

In client management, we can add new clients and their information such as clients address; clients contact number, name etc.

#### 5. Employee Management

In company, admin can add new employee such as project manager, team leader and team member.

### V. INSTALLATION & MAINTENANCE

The most straightforward approach to introduce Eucalyptus is to introduce Cloud-in-a-Box[6][8]. It is likewise the slightest like a real cloud; however it's an awesome approach to take in the nuts and bolts about how Eucalyptus functions. All segments are introduced in a solitary framework, and the vast majority of the design is taken care of naturally. To install Cloud-in-a-Box:

1. Boot the objective framework from the Eucalyptus Quick Start media[9]. Wait for the boot screen to stack. At the point when the boot screen loads, select "Introduce Cloud-in-a-Box"
2. You might be made a request to check the media, to guarantee that there are no information issues. You may check the media, or you may Skip to proceed onward to the subsequent stage. You will then be

made a request to choose dialect and console choices.

3. Next, you will be requested system data. Static systems administration is suggested; DHCP will work much of the time, however in the event that DHCP leases change, your Eucalyptus cloud will never again be practical.
4. Next, you will be made a request to choose time zone, and after that you will be approached to enter the root watchword for the framework.
5. Next, you will be requested cloud setup choices. Most are defaults that you ought not touch unless you are an accomplished Eucalyptus manager; see the Administration Guide for points of interest. The one parameter you should enter here is the scope of open IP addresses. New virtual occasions made by Eucalyptus will get IP addresses from inside this predefined run. Enter the lower and higher scope of accessible open IP addresses, a dash between them.
6. Next, you will be requested please introduce alternatives. Eucalyptus is planned to be the essential application on the framework; as a matter of course, it will take up all circle space on the framework. Experienced Linux administrators can set up a different segment for Eucalyptus here.
7. At this point, the Eucalyptus establishment will start. Programming will be introduced, and a default Eucalyptus machine Image (EMI) will be constructed. At the point when this procedure is finished, you will be provoked to reboot the framework.
8. When the framework reboots, you will be incited for a progression of inquiries amid the first boot procedure. You will be made a request to acknowledge the permit, make a non-root login, and turn on NTP.

The establishment is presently total. You may discover that your cloud is running by tapping on the web program joins from the Desktop.

#### Launch the Default Quick Start Image

To launch the default image included with Quick Start:

1. First we need to locate default image by using below command:

```
euca-describe-images
```

The output is the list of images available. For new Quick Start installations, a default image is

provided - in this example, the image ID is `emi-72613A2E`:

```
IMAGE eki-D313397A
admin/vmlinuz-2.6.28-11-generic.manifest.xml 508678674223 available public i386 kernel instance-store
IMAGE emi-72613A2E
admin/euca-centos-5.8-2012.05.14-x86_64.manifest.xml 508678674223 available public i386 machine eki-D313397A eri-F9A83F12 instance-store
IMAGE eri-F9A83F12
admin/initrd.img-2.6.28-11-generic.manifest.xml 508678674223 available public i386 ramdisk instance-store
```

2. Next we have to create a key pair using the `euca-add-keypair` command[10]. This will create public half of key pair & make it available for cloud instances. Save this output to a file for future use, as in the following example:

```
euca-add-keypair euca-kp1 > euca-kp1.private
```

3. Then lets change permissions on the private keypair so that only we can access and change it:

```
chmod 0600 euca-kp1.private
```

4. Use `euca-run-instances` command, specifying the appropriate image ID and the name of the key pair you just created. This will run the instance. For example:

```
euca-run-instances -k euca-kp1 emi-72613A2E
```

This will return output similar to the following:

```
RESERVATION    r-CCE33FC0
449455269925   default
INSTANCE i-68A24092 emi-72613A2E
0.0.0.0 0.0.0.0 pending euca-kp1
0
m1.small      2012-05-17T10:36:46.232Z
PARTI00 eki-D313397A eri-F9A83F12
monitoring-disabled 0.0.0.0
0.0.0.0 instance-store
```

5. Use `euca-describe-instances` command to check availability of your instance:

```
euca-describe-instances i-68A24092
```

6. When the instance is ready, this command will return output similar to the following:

```
RESERVATION    r-CCE33FC0
449455269925   default
```

```
INSTANCE    i-68A24092    emi-72613A2E
192.168.9.91    10.93.7.76    running
euca-kp1      0
m1.small     2012-05-17T10:36:46.232Z
PARTI00     eki-D313397A    eri-F9A83F12
monitoring-disabled    192.168.9.91
10.93.7.76 instance-store
```

7. Connect to the running instance using SSH[11], specifying the private key file and the IP address of the instance. For example: This command returns output similar to the following:

```
Ssh -i kp1.pem ec2_user@192.168.43.200
Warning: Permanently added
'192.168.43.200' (RSA) to the list of
known hosts.
Last login: Thu Feb 17 03:39:58 2013
from eucahost-9-91.eucalyptus
-bash-3.2#
```

Just like same use SCP as a secure copy. Copy the files safely.

```
Scp -i kp1.pem jre
ec2_user@192.168.43.200:/home?ec2_us
er/temp
Scp -i kp1.pem -r apache_tomcat_6.0.36
ec2_user@192.168.43.200:/home?ec2_us
er/temp
```

Network configuration in our project:

```
Username: root
Password: root12
Network interface: eth0
CIB (cloud in box) IP: 192.168.43.101
Netmask: 255.255.255.0
Default Gateway: 192.168.43.10
DNS server list: 8.8.8.8
Public IP range list: 192.168.43.200 – 192.168.43.220
(Advance operations)
Private Subnet: 172.31.254.0
Private Network: 255.255.254.0
Public N/W interface: eth0
Private N/W interface: br0
NC bridge IP: 172.31.252.1
```

Eucalyptus instance accounts:

```
Admin console URL: https://192.168.43.101:8443/
Account: eucalyptus
Username: admin
Password: root12
User console URL: https://192.168.43.101:8888/
Account: demo
Username: admin
Password: admin12
```

## VI. CONCLUSION

Concentrating on the cost advantage for IT foundation and server farm administration, Eucalyptus gives a remarkable structure an assortment of interfaces to deal with the assets.

The equipment, system, and capacity can without much of a stretch be united under the Eucalyptus cloud, concealing the heterogeneity in equipment, programming stack, strategies, and designs. Eucalyptus Systems creates venture review innovation arrangements based on the open source Eucalyptus programming for private and mixture distributed computing. Initially created as a component of a scholastic research venture, Eucalyptus innovation is rapidly turning into the standard for on-introduce distributed computing, conveying the cost efficiencies and adaptability of cloud design with the security and control of sending without anyone else IT framework. Programming Development Tracking's central goal is to help the open source Eucalyptus stage and to convey private and crossover distributed computing answers for huge scale undertaking organizations.

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