

Eucalyptus is a Linux-based open-source software architecture for cloud computing and also a storage platform that implements Infrastructure as a Service (IaaS). It provides quick and efficient computing services. Eucalyptus was designed to provide services compatible with Amazon's EC2 cloud and Simple Storage Service (S3).

Eucalyptus Architecture

Eucalyptus CLIs can handle Amazon Web Services and their own private instances. Clients have the independence to transfer cases from Eucalyptus to Amazon Elastic Cloud. The virtualization layer oversees the Network, storage, and Computing. Occurrences are isolated by hardware virtualization.

Important Features are:-

1. **Images:** A good example is the Eucalyptus Machine Image which is a module software bundled and uploaded to the Cloud.
2. **Instances:** When we run the image and utilize it, it turns into an instance.
3. **Networking:** It can be further subdivided into three modes: Static mode (allocates IP address to instances), System mode (assigns a MAC address and imputes the instance's network interface to the physical network via NC), and Managed mode (achieves local network of instances).
4. **Access Control:** It is utilized to give limitations to clients.
5. **Elastic Block Storage:** It gives block-level storage volumes to connect to an instance.
6. **Auto-scaling and Load Adjusting:** It is utilized to make or obliterate cases or administrations dependent on necessities.

Components of Architecture

- **Node Controller** is the lifecycle of instances running on each node. Interacts with the operating system, hypervisor, and Cluster Controller. It controls the working of VM instances on the host machine.

- **Cluster Controller** manages one or more Node Controller and Cloud Controller simultaneously. It gathers information and schedules VM execution.
- **Storage Controller (Walrus)** Allows the creation of snapshots of volumes. Persistent block storage over VM instances. Walrus Storage Controller is a simple file storage system. It stores images and snapshots. Stores and serves files using S3(Simple Storage Service) APIs.
- **Cloud Controller** Front-end for the entire architecture. It acts as a Complaint Web Services to client tools on one side and interacts with the rest of the components on the other side.

Operation Modes Of Eucalyptus

- **Managed Mode:** Numerous security groups to users as the network is large. Each security group is assigned a set or a subset of IP addresses. Ingress rules are applied through the security groups specified by the user. The network is isolated by VLAN between Cluster Controller and Node Controller. Assigns two IP addresses on each virtual machine.
- **Managed (No VLAN) Node:** The root user on the virtual machine can snoop into other virtual machines running on the same network layer. It does not provide VM network isolation.
- **System Mode:** Simplest of all modes, least number of features. A MAC address is assigned to a virtual machine instance and attached to Node Controller's bridge Ethernet device.
- **Static Mode:** Similar to system mode but has more control over the assignment of IP address. MAC address/IP address pair is mapped to static entry within the DHCP server. The next set of MAC/IP addresses is mapped.

Advantages Of The Eucalyptus Cloud

1. Eucalyptus can be utilized to benefit both the eucalyptus private cloud and the eucalyptus public cloud.
2. Examples of Amazon or Eucalyptus machine pictures can be run on both clouds.
3. Its API is completely similar to all the Amazon Web Services.
4. Eucalyptus can be utilized with DevOps apparatuses like Chef and Puppet.
5. Although it isn't as popular yet but has the potential to be an alternative to OpenStack and CloudStack.
6. It is used to gather hybrid, public and private clouds.
7. It allows users to deliver their own data centers into a private cloud and hence, extend the services to other organizations.