**Eucalyptus**

Elastic Utility Computing Architecture Linking Your Programs To Useful Systems

* It a simple open architecture for implementing cloud functionality at the IaaS level.
* It is specifically designed to be easy to install and maintain in a research setting, *and* that it is easy to modify, instrument, and extend.
* It can be deployed and executed without modification to the underlying infrastructure.
* Eucalyptus components have well defined interfaces support secure communication (using WS-Security policies), and rely upon industry-standard Web-services software packages (Axis2, Apache, and Rampart).

Why Eucalyptus?

* Open Source we can [download it](http://www.eucalyptus.com/download/eucalyptus) and have the source code at your fingertips.

Eucalyptus allows its components to be installed strategically close to the needed/used resources. For example Walrus can be installed close to the storage, while the Cluster Controller can be installed close to the cluster it will manage.

* Designed to Perform Eucalyptus was designed from the ground up to be scalable and to achieve optimal performance in diverse environments (designed to overlay an existing infrastructure).

Eucalyptus uses the terminology:[[9]](http://en.wikipedia.org/wiki/Eucalyptus_(software)" \l "cite_note-9)

* *Images* - An image is a fixed collection of software modules, system software, application software, and configuration information that is started from a known baseline (immutable/fixed). When bundled and uploaded to the Eucalyptus cloud, this becomes a*Eucalyptus machine image (EMI)*.
* *Instances* - When an image is put to use, it is called an instance. The configuration is executed at runtime, and the Cloud Controller decides where the image will run, and storage and networking is attached to meet resource needs.
* *IP addressing* - Eucalyptus instances can have public and private [IP addresses](http://en.wikipedia.org/wiki/IP_address). An IP address is assigned to an instance when the instance is created from an image. For instances that require a persistent IP address, such as a web-server, Eucalyptus supplies elastic IP addresses. These are pre-allocated by the Eucalyptus cloud and can be reassigned to a running instance.
* *Security* - [TCP/IP](http://en.wikipedia.org/wiki/TCP/IP) security groups share a common set of firewall rules. This is a mechanism to firewall off an instance using IP address and port block/allow functionality. At TCP/IP layer 2 instances are isolated. If this were not present, a user could manipulate the networking of instances and gain access to neighboring instances violating the basic cloud tenet of instance isolation and separation.
* *Networking* - There are three networking modes. In Managed Mode Eucalyptus manages a local network of instances, including security groups and IP addresses. In System Mode, Eucalyptus assigns a [MAC address](http://en.wikipedia.org/wiki/MAC_address) and attaches the instance's network interface to the physical network through the Node Controller's bridge. System Mode does not offer elastic IP addresses, security groups, or VM isolation. In Static Mode, Eucalyptus assigns IP addresses to instances. Static Mode does not offer elastic IPs, security groups, or VM isolation.
* *Access Control* - A user of Eucalyptus is assigned an identity, and identities can be grouped together for access control.

**Benefits of The Eucalyptus**

* Scalable data center infrastructure. Eucalyptus clouds are highly scalable, which enables an organization to efficiently scale-up or scale-down data center resources according to the needs of the enterprise.
* Elastic resource configuration. The elasticity of a Eucalyptus cloud allows users to flexibly reconfigure computing resources as requirements change. This helps the enterprise workforce remain adaptable to sudden changes in business needs.
* Open source innovation. Highly transparent and extensible, Eucalyptus’ open source core architecture remains entirely open and available for value- adding customizations and innovations provided by the open source development community. The Eucalyptus open source software core is available for free download at [www.eucalyptus.com](http://www.eucalyptus.com)

**Installation Process of Eucalyptus:**

* Configure the Eucalyptus package repository on each host that will run a Eucalyptus component:
* Yum install <http://downloads.eucalyptus.com/software/eucalyptus/3.1/rhel/6/x86_64/eucalyptus-release-3.1.noarch.rpm>
* Install the Eucalyptus subscription package on each host that will run a Eucalyptus component:
* yum install eucalyptus-enterprise-release-3.1\*.noarch.rpm
* Install the Eucalyptus cloud controller software on each planned CLC host:

Yum group install eucalyptus-cloud-controller

* Run the following receiver command on the CLC:
* Java -classpath /usr/share/eucalyptus/jgroups-2.11.1.Final.jar org.jgroups.tests.McastReceiverTest -mcast\_addr 224.10.10.10 -port 5555
* Once the receiver command blocks, simultaneously run the following sender command on each Walrus host:
* Java -classpath /usr/share/eucalyptus/jgroups-2.11.1.Final.jar org.jgroups.tests.McastSenderTest -mcast\_addr 224.10.10.10 -port 5555