# Eucalyptus and UEC

infear

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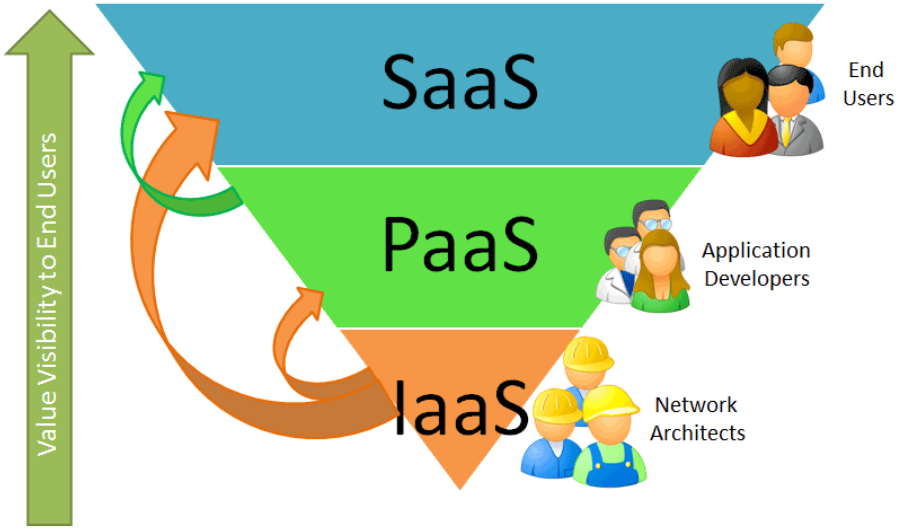
# Eucalyptus Introduction



- Infrastructure as a Service(IaaS)
- Eucalyptus is the world's most widely deployed software platform for on-premise (private) Infrastructure as a Service (IaaS) clouds.



# Why use Eucalyptus



- Open Source:
- Development and Contribution

- Distributed:
- Cluster Controller can be installed close to the cluster

- Compatible with AWS.

- AWS Compatibility
- Implement the AWS API on top of Eucalyptus, so any tool in the cloud ecosystem that communicates with AWS can communicate with Eucalyptus IaaS.

- AWS Agreement
- AWS will support Eucalyptus as they continue to extend compatibility with AWS APIs and customer use cases.

# AWS Compatibility



- Amazon Elastic Compute Cloud (EC2)
- Amazon Elastic Block Storage (EBS)
- Amazon Machine Image (AMI)
- Amazon Simple Storage Service (S3)
- Amazon Identity and Access Management (IAM)

# AWS Compatibility



- Move your applications between on-premise Eucalyptus environments and the AWS Cloud.
- Use Eucalyptus as the open source reference implementation for AWS-compatibility to support new developments, tools, and continuous innovation
- Solve Security problems by using horizontal or vertical inter-cloud between Eucalyptus and AWS.

# UEC Introduction



- Ubuntu Enterprise Cloud(UEC)
- Ubuntu Server with Eucalyptus

# UEC Components Introduction



- Cloud Controller (CLC) - Eucalyptus component that provides the web UI (an https server on port 8443), and implements the Amazon EC2 API. There should be only one Cloud Controller in an installation of UEC.
- Cluster Controller (CC) - Eucalyptus component that manages collections of node resources.
- Walrus - Eucalyptus component that implements the Amazon S3 API, used for storing VM images and user storage using S3 bucket put/get abstractions.
- Storage Controller (SC) - Eucalyptus component that manages dynamic block storage services (EBS). Each 'cluster' in a Eucalyptus installation can have its own Storage Controller.
- Node Controller (NC) - Eucalyptus component that runs on nodes which host the virtual machines that comprise

# Topology



- machine A: CLC/Walrus/CC/SC/NC

- machine A: CLC/Walrus/CC/SC
- machine B: NC

- machine A: CLC/Walrus
- machine B: CC/SC
- machine C: NC

- machine A: CLC
- machine B: Walrus
- machine C: CC/SC
- machine D: NC

# Front End Requirements



1. Cloud Controller (CLC)
2. Cluster Controller (CC)
3. Walrus (the S3-like storage service)
4. Storage Controller (SC)

**UEC Front End Requirements**

| Hardware | Minimum | Suggested | Notes |
|---|---|---|---|
| CPU | 1 GHz | 2 x 2 GHz | For an *all-in-one* front end, it helps to have at least a dual core processor. |
| Memory | 2 GB | 4 GB | The Java web front end benefits from lots of available memory. |
| Disk | 5400 RPM IDE | 7200 RPM SATA | Slower disks will work, but will yield much longer instance startup times. |
| Disk Space | 40 GB | 200 GB | 40GB is only enough space for only a single image, cache, etc., Eucalyptus does not like to run out of disk space. |
| Networking | 100 Mbps | 1000 Mbps | Machine images are hundreds of MB, and need to be copied over the network to nodes. |

# Node Requirements



1. the Node Controller (NC)

**UEC Node Requirements**

| Hardware | Minimum | Suggested | Notes |
|---|---|---|---|
| CPU | VT Extensions | VT, 64-bit, Multicore | 64-bit can run both i386, and amd64 instances; by default, Eucalyptus will only run 1 VM per CPU core on a Node. |
| Memory | 1 GB | 4 GB | Additional memory means more, and larger guests. |
| Disk | 5400 RPM IDE | 7200 RPM SATA or SCSI | Eucalyptus nodes are disk-intensive; I/O wait will likely be the performance bottleneck. |
| Disk Space | 40 GB | 100 GB | Images will be cached locally, Eucalyptus does not like to run out of disk space. |
| Networking | 100 Mbps | 1000 Mbps | Machine images are hundreds of MB, and need to be copied over the network to nodes. |

# Installing the Cloud/Cluster/Storage/Walrus Front End Server



1. Download the Ubuntu 11.10 Server ISO file, and burn it to a CD.
2. When you boot, select *"Install Ubuntu Enterprise Cloud"*. The installer will detect if any other Eucalyptus components are present.
3. You can then choose which components to install, based on your chosen topology.
4. When asked whether you want a *"Cluster"* or a *"Node"* install, select *"Cluster"*.
5. It will ask two other cloud-specific questions during the course of the install:
    1. Name of your cluster.
        1. e.g. *cluster1*.
    2. A range of public IP addresses on the LAN that the cloud can allocate to instances.
        1. e.g. *192.168.1.200-192.168.1.249*.

# Installing the Node Controller(s)



The node controller install is even simpler. Just make sure that you are connected to the network on which the cloud/cluster controller is already running.

1. Boot from the same ISO on the node(s).
2. When you boot, select *"Install Ubuntu Enterprise Cloud"*.
3. Select *"Install Ubuntu Enterprise Cloud"*.
4. It should detect the Cluster and preselect *"Node"* install for you.
5. Confirm the partitioning scheme.
6. The rest of the installation should proceed uninterrupted; complete the installation and reboot the node.

# Register the Node(s)



Nodes are the physical systems within *UEC* that actually run the virtual machine instances of the cloud.

All component registration should be automatic, assuming:

1. Public SSH keys have been exchanged properly.
2. The services are configured properly.
3. The appropriate *uec-component-listener* is running.
4. Verify Registration.

Steps a to e should only be required if you're using the UEC/PackageInstall method. Otherwise, if you are following this guide, these steps should already be completed automatically for you, and therefore you can skip *"a"* to *"e"*.

# Obtain Credentials



## From a Web Browser

1. From your web browser (either remotely or on your Ubuntu server) access the following URL:

   ```
   https://<cloud-controller-ip-address>:8443/
   ```

   > You must use a secure connection, so make sure you use "https" not "http" in your URL. You will get a security certificate warning. You will have to add an exception to view the page. If you do not accept it you will not be able to view the Eucalyptus configuration page.

2. Use username *'admin'* and password *'admin'* for the first time login (you will be prompted to change your password).
3. Then follow the on-screen instructions to update the admin password and email address.
4. Once the first time configuration process is completed, click the *'credentials'* tab located in the top-left portion of the screen.
5. Click the *'Download Credentials'* button to get your certificates.
6. Save them to `~/.euca`.
7. Unzip the downloaded zip file into a safe location (`~/.euca`).

   ```
   unzip -d ~/.euca mycreds.zip
   ```

# Obtain Credentials

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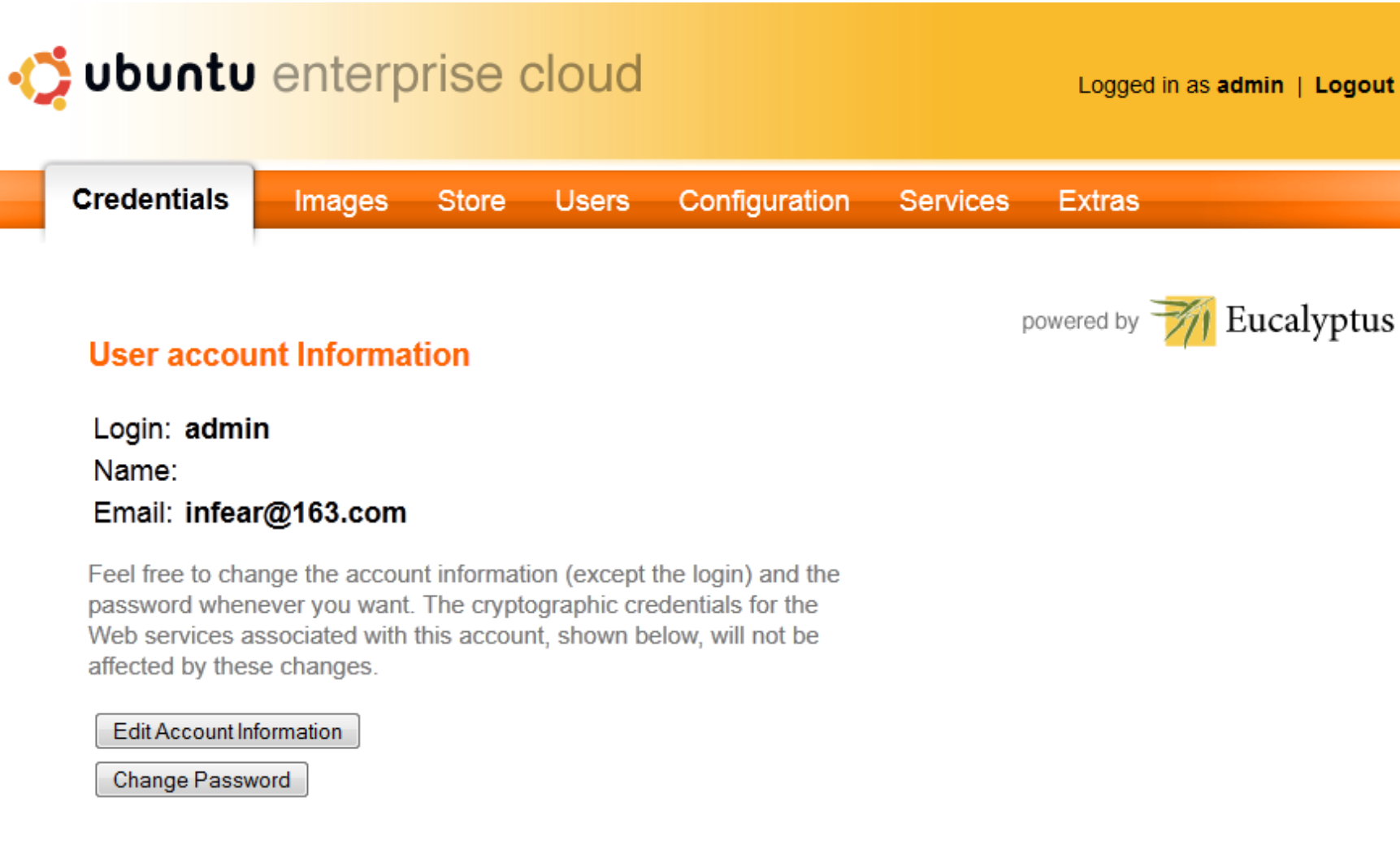

# Install Image

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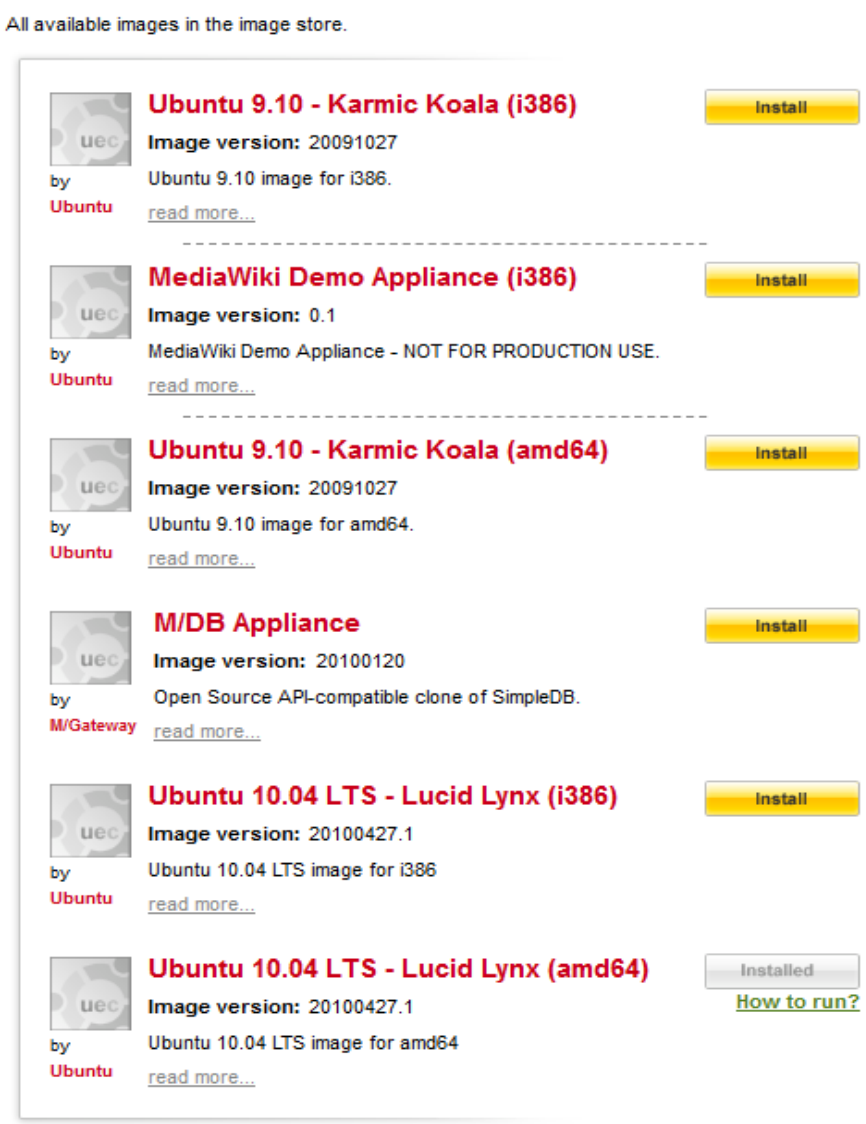

# Configuration

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**Clusters:**

**Name:** cluster1 [Deregister Cluster]

Cluster Controller

Host: 192.168.1.150

Port: 8774

☑ Dynamic public IP address assignment

Reserve for assignment 10 public IP addresses

Maximum of 5 public IP addresses per user

Use VLAN tags 10 through 4095

Storage Controller

Host: 192.168.1.150

Interface: eth0

Volumes path: //var/lib/eucalyptus/volumes

Max volume size: 10 GB

Disk space reserved for volumes: 50 GB

☐ Zero-fill volumes

[Register cluster] [Save cluster configuration] Clusters up to date

**VM Types:**

| Name | CPUs | Memory (MB) | Disk (GB) |
|---|---|---|---|
| m1.small | 1 | 64 | 2 |
| c1.medium | 1 | 256 | 5 |
| m1.large | 2 | 512 | 10 |
| m1.xlarge | 2 | 1024 | 20 |
| c1.xlarge | 4 | 2048 | 20 |

[Save VmTypes]

# THANK YOU