

EUCALYPTUS

# **Installing Eucalyptus**

**Past, Present, and Future**

# Eucalyptus Overview

- Most widely deployed software platform for on-premise IaaS clouds
- 25,000+ cloud starts as of mid 2011
- AWS-compatible, enterprise-deployed
- Broad partner community fueled by AWS ecosystem
- Open Source (GPL and BSD)



# A Few of Our Customers



# Deep Partner Ecosystem



*Platform*



*Data Center Automation*



*Cloud Services*



*Cloud Services Management*

*Over 150 Registered Partners  
Leverage AWS Partner Ecosystem*

# Eucalyptus IaaS Cloud

## On-premise and Hybrid Cloud Infrastructure-as-a-Service

Self-service  
Resource  
Configuration

Self-service  
Resource  
Provisioning

Dynamic  
Resource  
Management

Resource  
Chargeback  
and Reporting

### IaaS Web Services

#### Virtual Cloud Resources



Compute



Network



Storage



Identity



Virtual and  
Physical  
Resource  
Administration

Virtual Resource System

Physical Resource Management

### Server, Networking, Storage IT Infrastructure



# Eucalyptus IaaS (Cont'd)

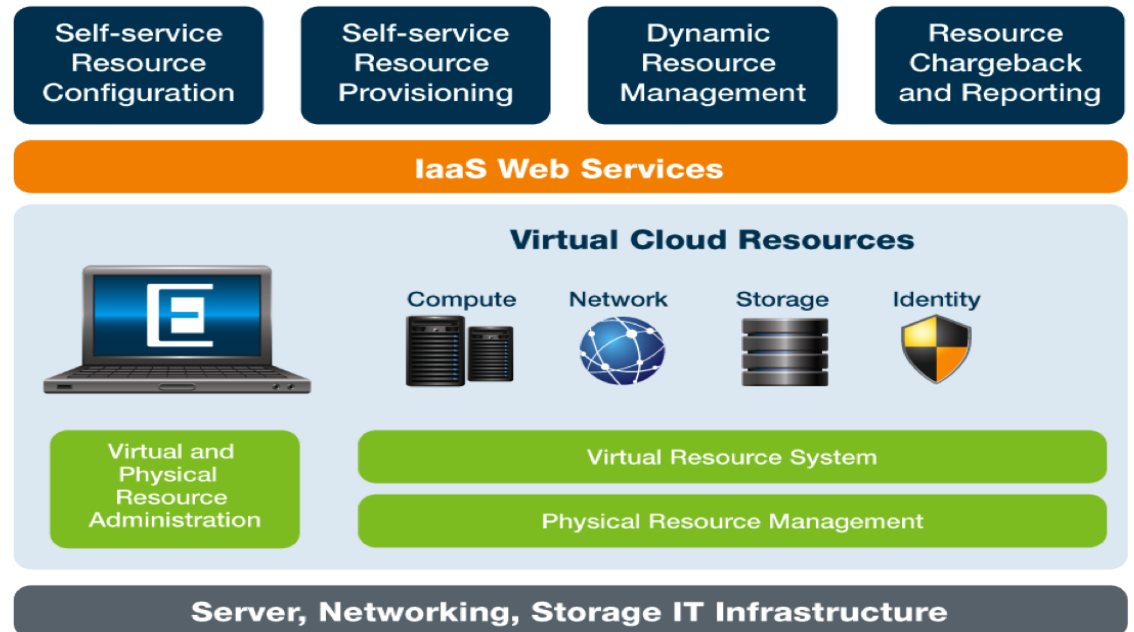
Eucalyptus IaaS Software Supporting:

- RHEL, CentOS, Fedora, Debian, Ubuntu, SUSE
- KVM, Xen, VMware ESX, ESXi
- NetApp, Dell Equallogic

Software and Support Subscription

Customer Technical Support

## On-premise and Hybrid Cloud Infrastructure-as-a-Service



# Eucalyptus IaaS: Compute

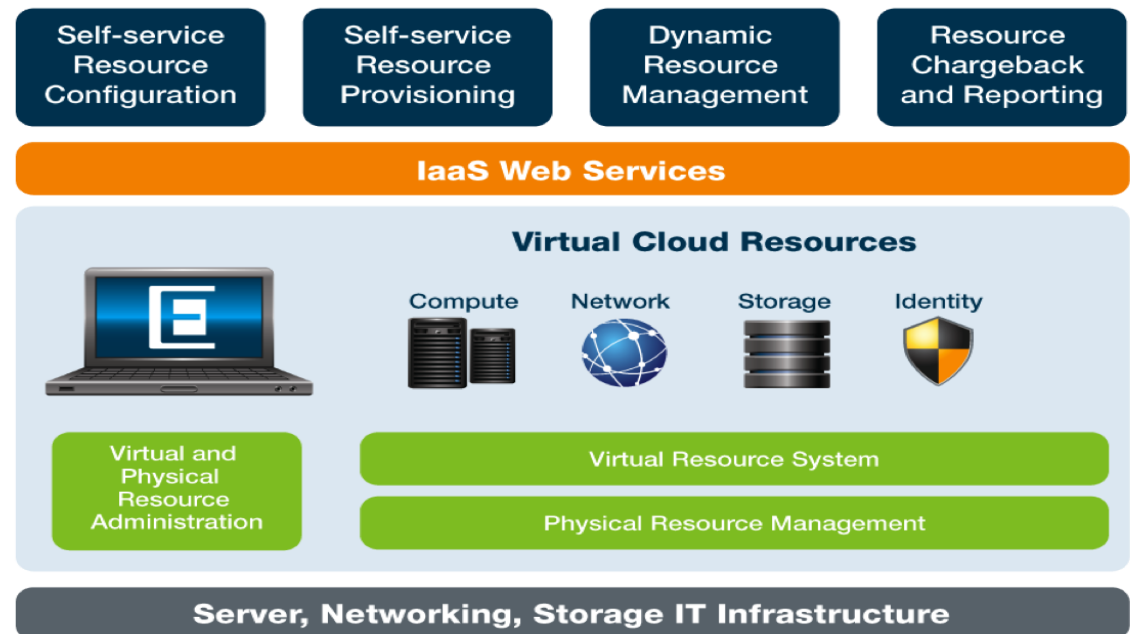
## Features

- On-demand Elastic Compute Services
- Virtual Instance Configurations
  - CPU, Memory, Network
- Instance-based Elastic Block Storage
  - Block-accessed, Network Storage Volumes

## Benefits:

- Fast and efficient
- Uses existing infrastructure
- Ready for automation

## On-premise and Hybrid Cloud Infrastructure-as-a-Service





# Eucalyptus IaaS: Networking

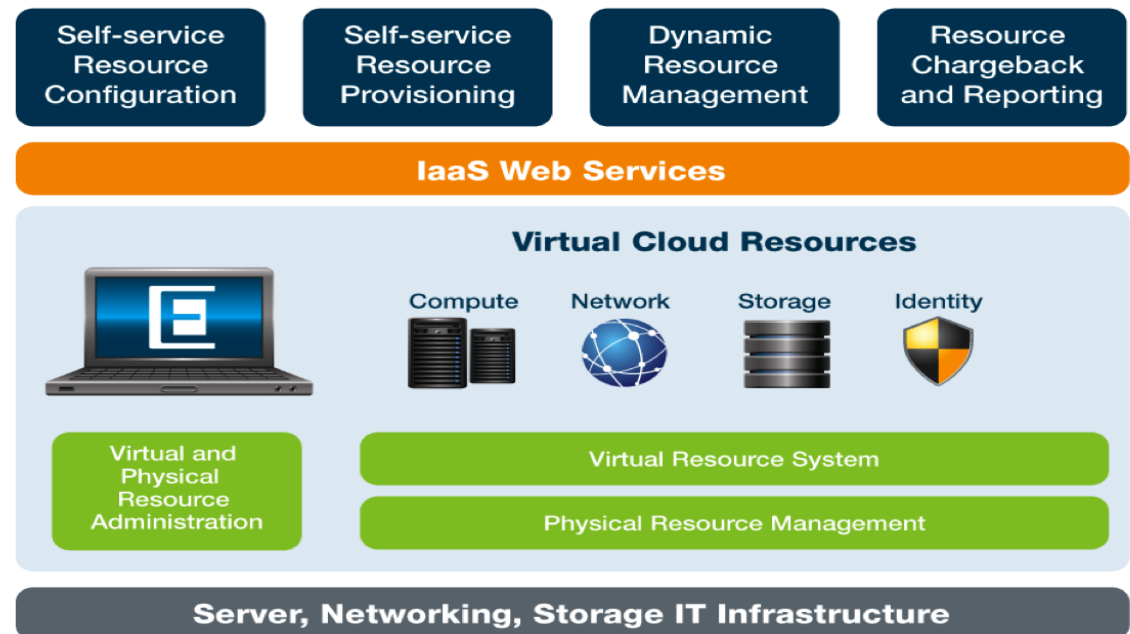
## Features:

- On-demand Elastic IP
- Designed to Act as an Overlay
- Multiple Networking Modes for Assigning Addresses to VMs

## Benefits:

- Control existing datacenter resources
- Conforms to datacenter connectivity topology
- Uses existing infrastructure

## On-premise and Hybrid Cloud Infrastructure-as-a-Service



# Eucalyptus IaaS: Storage

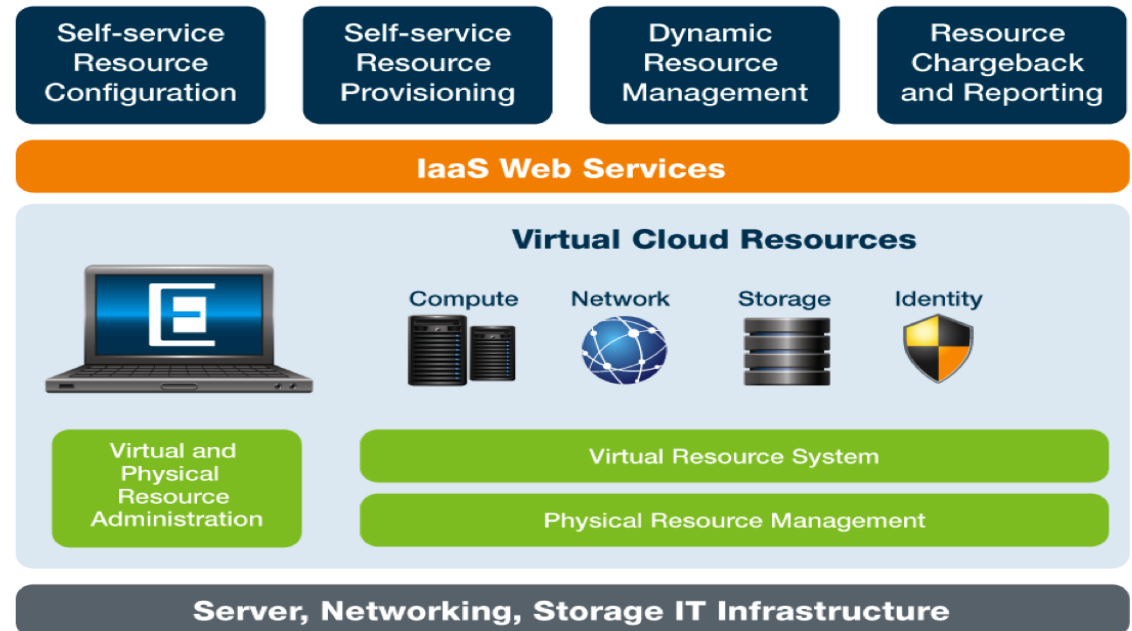
## Features:

- On-demand, Highly Scalable and Secure Bucket Based Object Store
- Put/Get Objects
- Configurable for DAS, NAS, SAN
- Highly Reliable, Elastic Block Storage

## Architecture:

- iSCSI is "universal" transport for block-attached storage
- Integrated with VM, IAM and credentials management
- Internal image caching architecture configurable for local storage architecture

### On-premise and Hybrid Cloud Infrastructure-as-a-Service



# Eucalyptus 3 Features

- High Availability
  - Peered front ends
  - Hot spare backend components
- Enhanced Resource Access Control
  - IAM
  - LDAP integration
- Boot from EBS
- New GUI



# Rite of Initiation

- Every technical employee must install eucalyptus using our documentation.
  - Early on, it was to see if the documentation was correct
  - Now, we look for any ways to improve the docs



# Manual Installation

- The process requires a lot of decisions
- Many manual steps
- Amazingly underwhelming



# Why is this Important?

- Eucalyptus is a fundamentally complicated piece of software
- We need to fit into many different IT environments
- Many things affect choices you make during installation



# Decisions to be Made

- Linux Distro
  - CentOS, Ubuntu, Fedora, OpenSUSE, Debian, RHEL?
- Hypervisor
  - XEN, KVM (VMWare ESXi)?
- Network Mode
  - Static, System, Managed, Managed-novlan?
- Component Topology?
  - Cram it all on one box? Not advised!
- HA or not HA? (that is another question)
- SAN storage?
- Single or multi-cluster?



# More Admin-ey Decisions

- What NTP server to use?
  - Can you use pool.ntp.org or do you run your own?
- Do you have DHCP on your network?
  - probably "yes", so configure it to not conflict with ours
- Multiple NICs? (and therefore, you might use private subnets)
- Do you have root access via ssh?
- Do your machines support hardware virtualization?
- Is your network VLAN-clean?
- Need block of assignable public IPs
- Need private subnet that doesn't overlap with others.

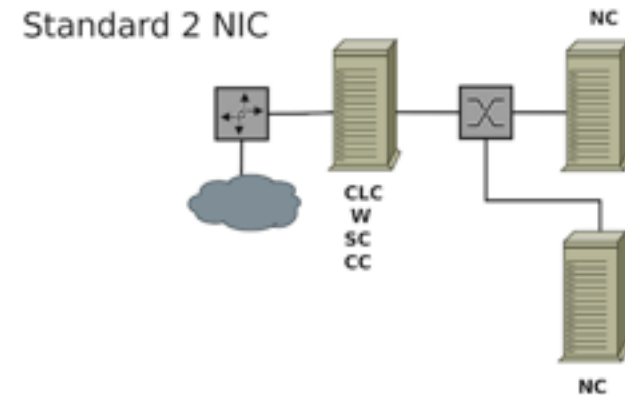
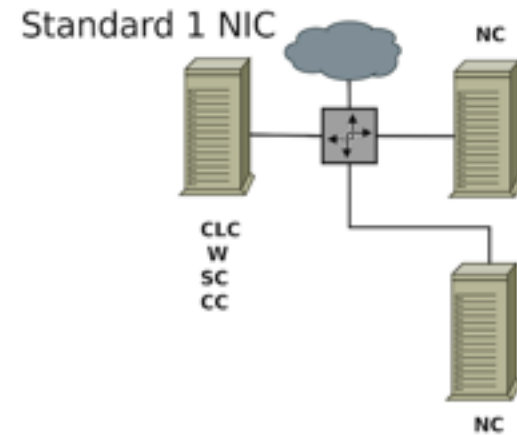




# Deployment Configurations

Simpler single cluster configurations

Normally used for POC or small deployments

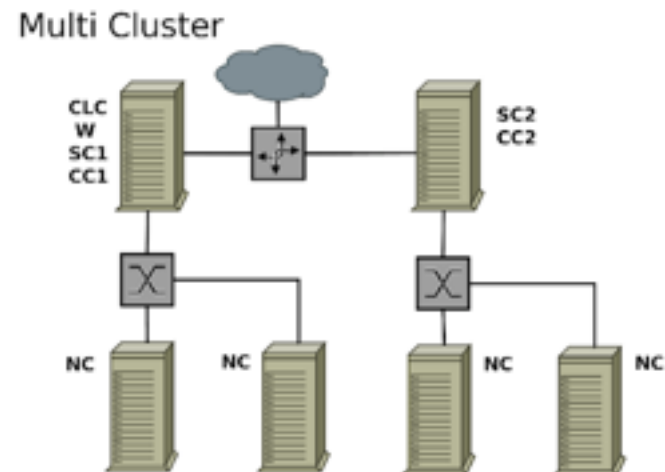
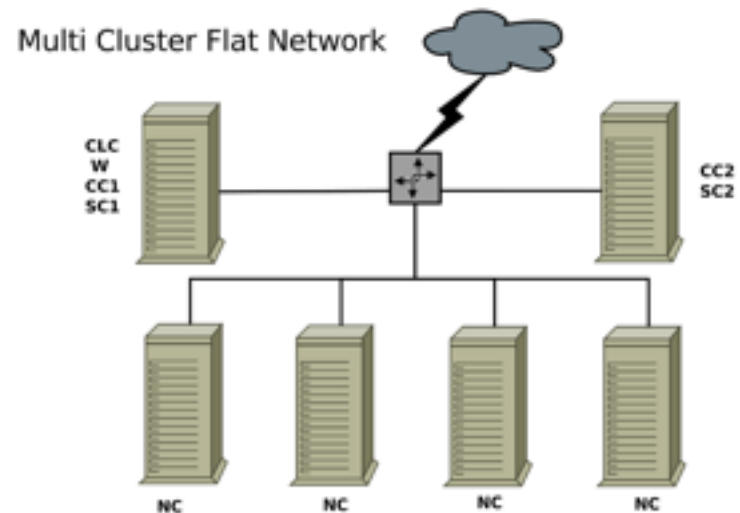


# Multi-cluster Configurations

Some, but not all large scale installations use multi-cluster

Network isolation a factor in choosing private subnets vs flat network

Most network modes route instance traffic through cluster controller, which does scale really well!



# The Install Process

- Prep Machines
  - Install OS
  - setup network
    - vlans
    - bridge
  - configure hypervisor on NCs
  - disable selinux
  - adding loop devices
- Installing Software
  - configure repo(s)
  - run install (yum, apt)



# Installation Contd

- Configuration
  - hypervisor
  - network mode
  - public address block
  - private subnet
- What HA?
  - configure DRBD
  - additional hardware
  - arbitrators
- Registration
  - register components
  - get credentials
  - GO!



# Simplifying

- We realize that a lot of people want a way to evaluate our software
- Removing a lot of those questions we talked about before makes this a whole lot easier
- Enter: FastStart



# FastStart

- 1 Operating System
- 1 Hypervisor
- 1 Networking Mode
- 1 fast install!



# Walkthrough

- Minimal CentOS install
- Install Node Controller with 1 yes/no question
- Install Front End by telling it about your network environment
- Cloud is validated
- Guest image is installed
- < 30 minutes!



# Demonstration

- FastStart video is here: <http://vimeo.com/25163094>





# Adoption

- over 1000 downloads from our web site
- over 500 USB sticks handed out at events
- Partnership with RightScale: free version of myCloud
- internal use by Sales Engineers



# Puppet

- It's not just for installs
- Continuous Configuration Management
- Modules for each Eucalyptus component
  - <https://github.com/puppetlabs/puppetlabs-eucalyptus>
- Map components to physical nodes based on your topology
- Puppet handles
  - configuring dependencies
  - installing packages
  - key sync
  - component registration



# Silvereye

- It's the name of a bird, but it's really a play on "Silver iodide" which is used to seed clouds.
- This is an effort to build a generalized installer.
- Bare-metal provisioning
- Initial install / ongoing cloud maintenance
- The basic notion is 1 machine gets installed from media, the rest installed over the network.



# State of Silvereye

- Early stages
  - Bootable CD to install each node
- There are many things we could leverage
  - Cobbler
  - Crowbar
  - Puppet
  - Chef



# Challenges

- Multiple Distro support
- Varied network and component topologies
- Conflicts with in-house services
  - dhcp
  - pxe
  - config mgmt
- Provide an exceptional UX



# Next Steps

- Need to base CD installer on Eucalyptus 3 devel code
- Going beyond CD installer with network provisioning
- Design a configuration wizard for initial setup
  - Give choice of common configuration settings for POC
  - Allow user to go full custom
- Meetings are being held in IRC (freenode #eucalyptus-meeting) Join in!



# Links

- [eucalyptus.com](http://eucalyptus.com) - corporate site
- [projects.eucalyptus.com](http://projects.eucalyptus.com) - community projects
- [github.com/eucalyptus](https://github.com/eucalyptus) - source
- [launchpad.net/eucalyptus](https://launchpad.net/eucalyptus) - more source

IRC - [freenode.net](http://freenode.net)

[#eucalyptus](#)

[#eucalyptus-meeting](#)



# Thank you.

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