UCSB CS 189
Capstone Project Course
5 Jan 2011

Dr. Steven Fitzgerald, VP., Technical Services
About Us: Eucalyptus Systems

• Pre-revenue company with products
  – Eucalyptus 1.5, 1.6, 2.0, 2.0.1 (Nov’10)
  – Eucalyptus Enterprise Edition 2.x, (Aug’10)
• Incorporated: January, 2009
• About 40 employees
• Offices in Goleta, Palo Alto, & China
• Funded by Venture Capital

• And most importantly,
  – Began as a HPC research project at UCSB
  – Progenitor: Prof. Richard Wolski
  – 6 of the 7 founders affiliated with UCSB
Cloud Computing

• What is Cloud Computing?
  – depends on who is using the term!

• Layers of Cloud Computing:
  – SaaS: Software as a Service
  – PaaS: Platform as a Service
  – IaaS: Infrastructure as a Service

• IaaS:
  – Data-center space, servers, network equipment, etc.
    is outsourced (abstracted)
  – Example:
    Amazon’s (Elastic Computing Cloud) EC2
What is Eucalyptus?

- Open-Source Software using the Open Core model
- implements on-premise and hybrid clouds
- compatible with the AWS API

- A user can control/manage their own OS and associated applications without dealing with the hardware layer
- A user’s OS is isolated from other OSes and the infrastructure.
Eucalyptus Architecture
What we are looking for?

• UCSB has deep roots within Cloud Computing
• Eucalyptus has deep roots within UCSB
• We want to continue and strengthen our ongoing relationship with UCSB
• We want to foster and promote your creative ideas

• Here is a sample project for your consideration:
Scenario

• Given:
  – A University Lab environment where either:
    • Computers are not maintained (free for all?)
    • Computers are maintained (locked down?)
  – and where access to remote storage is either
    • Access to data is not managed (only local data?)
    • Access to data is managed (where is my data?)
  – Issues:
    • Do I have enough flexibility?
    • How do I get secure access to my data?
Wants and Objectives

• User Wants:
  – Control over OS (root) and secure access to data, regardless of their physical location
  – Utilize the provided hardware to its full advantage

• University Wants:
  – No security holes, reduced maintenance cost, etc.

• Objective:
  – Uncouple your desktop OS from the hardware
    • Move your desktop OS into the Cloud
    • Make my current hardware part of the cloud
  – Define the minimal HW/SW configuration to bootstrap the local hardware
    (?Desktop Virtualization / Bare Metal Provisioning?)
Possible Approach

• Treat the provided desktop hardware as a empty “thin client”

• Generalized steps:
  – Plug in USB drive
  – Manual reboot the desktop from the USB
  – Pull down the appropriate image
  – Provide menu system to select OS and mode
  – Either
    • Setup desktop as local hardware for your OS cloud
    • Pull down your desktop image
  – Automatically connect to your desktop in the cloud
Other Information

• Our Website
  – http://www.eucalyptus.com
  – http://open.eucalyptus.com
  – 18K community members

• Eucalyptus Community Cloud
  – http://open.eucalyptus.com/CommunityCloud
  – http://ecc.eucalyptus.com
  – 2K registered users

• Amazon links:
  – http://aws.amazon.com/ec2/
Thank you!

Steven Fitzgerald
steve@eucalyptus.com