

# 1-2-3 Cloud Introducing the openSUSE Cloud projects

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# Overview

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- Introduction
- Cloud - what is it
- The openSUSE projects
  - Eucalyptus
  - OpenNebula
  - OpenStack
- Resources

# Introduction



# About me

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- Work at SUSE in the ISV Engineering team
  - Work closely with IBM
  - Work with other ISVs
  - Based near Boston, MA, USA
- openSUSE involvement
  - Kiwi - Wiki Cookbook
  - Cloud projects
  - Maintain some Perl and other packages
- Other
  - Contribute to KIWI
  - Active member of LSB Workgroup

Cloud - what is it



# Cloud - what is it

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- Cloud takes Virtualization concept to the next level
  - Cloud runs Virtual Machines (VMs)
  - Hardware
    - One or more machines
    - Generally x86-64 server machines
      - CPUs have virtualization instructions
      - Plenty of RAM in a box
      - Lots of storage
    - Basically a cluster set up
      - No high speed interconnect required
      - Machines are basically independent



# Cloud - what is it

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- Cloud takes Virtualization concept to the next level
  - Software
    - Some type of hypervisor
      - KVM, Xen, others
    - Cloud infrastructure software
      - Some type of controller - runs on head node
      - Possibly code on the cloud nodes
      - Possibly code inside the Vms
      - Web based UI



# Cloud - what is it

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- Cloud 2 ½ major distinctions
  - Public Cloud
    - A Cloud setup accessible to anyone through the Internet
      - Trust your cloud provider to keep your data safe
      - Willing to put your data onto someone else's hardware
    - EC2, Rackspace, IBM, others
  - Private Cloud
    - Operated by individual or company no access by public
      - Your data is as safe as the rest of your network
      - You know where your data is located





# Cloud - what is it

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- Cloud 2 ½ major distinctions
  - Hybrid Cloud
    - A setup that allows you to push “work-loads” Vms from a private cloud to an account in a public cloud

# openSUSE Cloud Projects



# openSUSE Cloud Projects

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- Cloud projects aim to package the Cloud infrastructure software
  - Make it reasonably easy to set up a Cloud
- We have 3 projects
  - Eucalyptus
  - OpenNebula
  - OpenStack
- Projects are found on OBS in Virtualization:/Cloud:/
- About 5 people actively work on the projects

Eucalyptus



# Eucalyptus

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- Possibly the first “open source” Cloud infrastructure code
- Current release 2.0.3
- Next release 3.0
- Not completely open source
  - Not all features available in open source implementation
  - Available tarball contains pre-compiled Java code
- Eucalyptus 3.0 supposedly will have more source code released
- Contribution requires contributor agreement
- Implementation primarily in Java



# Eucalyptus

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- Designed for multitenant, i.e. multi-controller
- Eucalyptus is designed to be EC2 compatible
  - Separated boot kernel etc.
- Cloud can be built based on KVM or Xen
- Eucalyptus (the company) operates community cloud
  - <http://open.eucalyptus.com/try/community-cloud>
- Tools provided work with EC2
  - Can manage EC2 instances with Eucalyptus tools



# Eucalyptus

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- openSUSE packages available for 2.0.2
  - Setup to use Xen virtualization infrastructure
    - Maximize EC2 compatibility
  - Work on 2.0.3 packages in is progress, but
    - I am traveling a lot recently not time for testing
- Project home Virtualization:/Cloud:/Eucalyptus
- Current setup also requires packages from
  - Java:/packages
  - Virtualization
  - Virtualization:/Cloud
  - system:/aoetools



# Eucalyptus

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- openSUSE packages from OBS work to setup a Cloud
  - Some improvements for ease of use needed
    - (this work is almost done)
- Need to link required packages from other projects into Eucalyptus project
- Kiwi example needs to be updated
  - Still references version 1.6.2 and does not use OBS packages
- Need wiki write up on how to setup the cloud using the OBS packages
- Long standing issue with openssl compatibility was recently resolved
- Needs a Testing subproject



OpenNebula



# OpenNebula

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- Project born from a research project
  - [opennebula.org](http://opennebula.org) and v1.0 in 2008
- Current release 2.2.1
- Next release 3.0
  - Currently in beta
- Completely open source
- Active upstream community
  - Also appears to have very active user community
- Easy to contribute
- Implementation in C, C++ and Ruby



# OpenNebula

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- Has relatively few dependencies
- Has plugins to manage Vmware based cloud nodes
- Can handle KVM or Xen based infrastructure
- Uses libvirt to manage Vms
- Supports Open Cloud Computing Interface
- Supports EC2 API
- Next version makes changes to DB schema
  - Upgrade mechanism will need investigation



# OpenNebula

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- openSUSE packages available for 2.2.1
  - Setup uses KVM virtualization infrastructure
- Project home `Virtualization:/Cloud:/OpenNebula`
- Kiwi example shows
  - Build head node image
  - Build cloud node image
  - Automates cloud node setup and registration
  - Build VM to run in Cloud
- Wiki write up on how to setup an OpenNebula cloud just using the available packages
- Needs testing subproject

OpenStack



# OpenStack

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- Newest entry into Cloud infrastructure software arena
- Current release 2011.2 Cactus
- Next release Diabolo
- Appears to have grabbed the momentum
- Powers the Rackspace public cloud
  - Major contributors Rackspace and NASA
- Designed for multitenant
- Completely open source
- Active upstream community
- Implementation primarily in Python



# OpenStack

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- Lots of moving parts and dependencies
  - Controller, storage, and image service implemented as 3 different and visible parts
  - Setup can be a bit more challenging than other options
- Targeted as large scale setups



# OpenStack

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- openSUSE packages available for 2011.2 (Cactus)
- openSUSE packages available for Diabolo (Testing)
- Project home
  - Virtualization:/Cloud:/OpenStack
  - Virtualization:/Cloud:/OpenStack:/Testing
- Need wiki write up on how to set up cloud using the OBS packages
- Possibly create KIWI example and or SUSE Gallery images
- Small cloud running at SUSE using these packages (Cactus)



# Resources



# Resources

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- External
  - Eucalyptus
    - <http://open.eucalyptus.com/>
  - OpenNebula
    - <http://opennebula.org/>
  - OpenStack
    - <http://www.openstack.org/>
- openSUSE
  - Wiki
    - <http://en.opensuse.org/Portal:Cloud>
  - Mailing list
    - [opensuse-cloud@opensuse.org](mailto:opensuse-cloud@opensuse.org)
  - OBS