GETTING STARTED WITH OPENSTACK

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Presenters

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The OpenStack Story
The E-mail That Started It All

From: Jim Curry
Date: Fri, Jun 4, 2010 at 11:02 AM
Subject: Rackspace
To: Chris.C.Kemp@nasa.gov <Chris.C.Kemp@nasa.gov>

Chris,

I run corporate development at Rackspace, and am very interested in talking with your team about Nebula. Confidentially, we are in the process of open sourcing our cloud stack and I am interested in seeing if there might be some synergies / opportunities for the two projects to work together. Would it be possible to setup some time to discuss with your team?

Thanks in advance!
Jim

Jim Curry
VP Corporate Development, Rackspace
The Birth Of OPENSTACK
The Open Source Project

38,902 people
178 countries
585 supporting companies
20M+ lines of code

One of the fastest growing open source communities in the world.

The OpenStack project is a global collaboration of developers and cloud computing technologists producing the open standard cloud computing platform for both public and private clouds. Backed by a vibrant community of developers and some of the biggest names in the industry.

Get Involved
Recent User Adoption Trends

Enterprise Private Cloud
- eBay
- SAP
- Walmart
- TD Bank

Public Cloud
- Deutsche Telekom
- Internap

Telecom & NFV
- AT&T
- SK Telecom
- Swisscom

Research & Big Data
- Chameleon
- Nectar
- MIT Institute of Technology
What Is OpenStack?
Automation and Orchestration Of IT Resources

Solution: OpenStack, The Cloud Operating System
A new management layer that adds automation and control

- Connects to apps via APIs
- Self-service Portals for users

CLOUD OPERATING SYSTEM

Creates Pools of Resources
Automates The Network
In A Loosely Coupled Architecture
To Deliver Self-Service IT Rapidly At Scale
OpenStack Reference Architecture
## Consumption Models

<table>
<thead>
<tr>
<th>Public</th>
<th>Private Cloud Distro</th>
<th>Private Cloud as a Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Premises</td>
<td>On-Premises</td>
<td>On or Off Premises</td>
</tr>
<tr>
<td>Shared Infrastructure</td>
<td>Dedicated Infrastructure</td>
<td>Dedicated Infrastructure</td>
</tr>
<tr>
<td>No deployment required/ Upgrades by vendor</td>
<td>Deployments and upgrades by customer or vendor</td>
<td>Deployment and upgrades by vendor</td>
</tr>
<tr>
<td>Operated by vendor</td>
<td>Operated by customer</td>
<td>Operated by vendor</td>
</tr>
</tbody>
</table>
## OpenStack Vendors (Sample)

<table>
<thead>
<tr>
<th>Public</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Dreamhost</td>
<td>Mirantis</td>
<td>Cisco</td>
</tr>
<tr>
<td>GoDaddy</td>
<td>Red Hat</td>
<td>IBM Blue Box</td>
</tr>
<tr>
<td>Internap</td>
<td>SUSE</td>
<td>Platform9</td>
</tr>
<tr>
<td>Rackspace</td>
<td>Ubuntu</td>
<td>Rackspace Rackspace with Red Hat</td>
</tr>
</tbody>
</table>
Rackspace OpenStack Private Cloud Options

RACKSPACE PRIVATE CLOUD
POWERED BY OPENSTACK

Upstream OpenStack delivered as-a-service.

RACKSPACE PRIVATE CLOUD
POWERED BY RED HAT

Red Hat Enterprise Linux OpenStack Platform delivered as-a-service.
Red Hat OpenStack Options

RACKSPACE PRIVATE CLOUD
POWERED BY RED HAT

Red Hat Enterprise Linux OpenStack Platform delivered as-a-service.
Learning OpenStack
Resources To Get You Started

The OpenStack Foundation
http://www.openstack.org/

Official OpenStack Documentation
http://docs.openstack.org/

The OpenStack Cloud Computing Cookbook (Third Edition)

OpenStack Essentials
https://www.packtpub.com/virtualization-and-cloud/openstack-essentials
Join The OpenStack Community

http://www.openstack.org/community/
Let's Get Going!
REDHAT'S COMMUNITY DISTRIBUTION

http://www.rdoproject.org
OVERVIEW
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DASHBOARD: WEB INTERFACE
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- Web based interface for managing OpenStack
- Modular design
DASHBOARD: WEB INTERFACE

$ vagrant up
$ vagrant ssh
$ sudo -i
$ cat keystonerc_admin

http://192.168.37.2/dashboard/
CONNECT TO THE DASHBOARD
COMMAND LINE INTERFACE

• Converged CLI
• Component CLI

$ openstack help
$ keystone help
$ keystone help user-create
$ glance help
KEYSTONE: IDENTITY MANAGEMENT
KEYSTONE: IDENTITY MANAGEMENT

- Centralized identity service
- Central catalog of services

Multiple authentication options
- Username / Password / Token
- OAuth
- Apache REMOTE_USER
CREATE A USER
GLANCE: IMAGE MANAGEMENT
GLANCE: IMAGE MANAGEMENT

- Registry for virtual disk images
- Images used as base for new instances
- Many pre-built images available
NEUTRON: NETWORK MANAGEMENT

- Networking as a service
- Modular architecture

Design Features
- Central or distributed arch
- Network subnet, and port abstractions
- Plugin arch supports many technologies
ADD A NETWORK
NOVA: INSTANCE MANAGEMENT
NOVA: INSTANCE MANAGEMENT

- Manages virtual machines on hypervisors
- Provides virtual servers on demand

Design Features
- Designed to scale horizontally
- Designed for standard hardware
BOOT AN INSTANCE
NEUTRON: PROVIDER NETWORKS

- Provides non-project network access to instances

Technical Design
- Project network
- Project router
- “External” Network
NEUTRON: PROVIDER NETWORKS

- CIDR: 172.24.4.224/28
- Tenant: service
- Gateway: 172.24.4.225

- Disable DHCP
- Allocation pool: 172.24.4.227, 172.24.4.238
CONFIGURE PROVIDER NETWORK
CINDER: BLOCK STORAGE
CINDER: BLOCK STORAGE

- Manages virtual persistent block storage volumes
- Snapshot capability
CREATE, ATTACH AND MOUNT A VOLUME
SWIFT: OBJECT STORAGE
SWIFT: OBJECT STORAGE

- Simple file storage and retrieval
- Multiple backing store options
CREATE A CONTAINER AND UPLOAD AN OBJECT
INSTALLATION METHODS

RDO
- Packstack
- Triple-O

RH OPENSTACK PLATFORM
- OSP Director
REVIEW
RESOURCES

- Rackspace: www.rackspace.com
- Red Hat: www.redhat.com
- RDO: www.rdoproject.com
- OpenStack: www.openstack.org
- TryStack www.trystack.org

- https://radez.fedorapeople.org/
  - Vagrantfile
  - OpenStackSummitAustin2016.pdf