OpenStack Fundamentals Training Part 2
Compute
Agenda

1. OpenStack Project Overview
2. OpenStack Nova Architectural Overview
3. OpenStack Nova: The Future
4. Getting Involved with OpenStack
OpenStack Project Overview
What is OpenStack?

Software to provision virtual machines on standard hardware at massive scale

OpenStack **Compute**

A community creating open source software to build public and private clouds

Software to reliably store billions of objects distributed across standard hardware

OpenStack **Object Storage**
OpenStack: The Mission

"To produce the ubiquitous Open Source cloud computing platform that will meet the needs of public and private cloud providers regardless of size, by being simple to implement and massively scalable."
OpenStack Release Schedule

- **Bexar:** February 3, 2011
  - OpenStack Compute ready for enterprise private cloud deployments and mid-size service provider deployments
  - Enhanced documentation
  - Easier to install and deploy

- **Cactus:** April 15, 2011
  - Community plans for next releases

- **Design Summit:** April 26-28

- **Diablo:** September 22
  - OpenStack Compute ready for large service provider scale deployments
  - This is the ‘Rackspace-ready’ release; need to communicate Rackspace support and plans for deployment

- **Design Summit:** October 3-5
  - See blueprints for details
Community with Broad Commercial Support
How does it work?

Nova Architectural Overview
Traditional Operating System

- Provides APIs
- Abstracts access to hardware resources
- Controls workloads across resources
Traditional Operating System

- API
- Operating System
- Processor
- Network
- Storage

(openstack logo)
Cloud Operating System

- Provides APIs
- Abstracts access to virtual resources
- Controls and distributes workloads
Cloud Operating System
What is the Difference?

- The **type** of resource controlled
  - hardware components vs whole systems
- The **scale** of resources controlled
  - one machine vs. many
- The **location** of the resources
  - local vs remote
Application Programming Interfaces (APIs)

CLIENTS

EC2 API

OpenStack API

Internal APIs

Web Dashboard
Nova Subsystems

API

Nova

Compute

Network

Volume
Queue

- Facilitates inter-machine communication
- uses RabbitMQ
- Messaging encapsulated into simple library
- RabbitMQ -> 0mq -> Burrow?
Database

- Clear abstraction layer
- Currently supports PostgreSQL/MySQL/SQLite
- Redis -> SQL -> Zookeeper?
Compute

- Manages Virtual Machines
- Controls Multiple Hypervisors
  - KVM
  - XenServer
  - ESX (VMWare)
  - Hyper-V
Future Compute Features

- Public cloud bursting
- Feature parity amongst major drivers
- Better recovery and redundancy
Network

- Controls virtual networks and IP addresses
- Supports IPv6
- Multiple networking modes
  - Flat
  - Vlan
- Supports multiple NICs per VM
Future Network Features

- High-Availability Networks
- Generalized Networking as a Service
Volume

- Manages Attachable Block Storage
- Multiple Backends
  - SAN / iSCSI
  - Linux Logical Volumes / iSCSI
  - Ceph
  - Sheepdog
Future Volume Features

- Backup and Snapshotting
- Driver for LunR (commodity hardware solution)
- Multi-zone scheduling
the future

OpenStack in the Next Year
Long Term Goals

- Provider ready cloud operating system
- Easy to integrate with existing systems
- Support for federation and bursting
- Effortless deployment
Other Additions

- Scalable Commodity Block Storage
- Integrated Pluggable Auth
- Notification System
Getting Involved with OpenStack

- Step by step guide on how to join the community: http://wiki.OpenStack.org/HowToContribute
- OpenStack uses Launchpad to track pretty much everything in the project.
  - https://launchpad.net/~OpenStack
- Subscribe to the mailing lists
- Join us on IRC
  - You can talk to us directly in IRC in the #OpenStack channel on freenode.net.
Thank You!

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Nova Questions & Answers