Taking the Open Cloud to 11 with CloudStack!

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What This Talk is About
(Aside from kittens, unicorns, and rainbows.)
Cloud, blah, blah, blah

• When thinking about “cloud” we mean:
  – On Demand, Self-Service
  – Broad Network Access
  – Resource Pooling
  – Rapid Elasticity
  – Measured Service
  – API
In Other Words: Solving Real Problems

- Eliminating Virtual Sprawl
- Programmatic Access to Infrastructure
- Self-Provisioning for Customers via GUI or API
- Maximizing Resources
- Hosting Dual Workloads (Legacy and Cloud)
- Robust, Scalable, Fashionable*

* That last one, maybe not so much.
So... What is CloudStack?
CloudStack History (so far)

- VMOps (2008)
- GPI’ed (May 2010)
- Cloud.com Acquired (July 2011)
- Entirely GPI’ed (August 2011)
- Relicensed & Proposed to Apache (April 2012)
- Accepted into Incubator (April 16, 2012)
- First Apache Release (November 6, 2012)
- First Point Release (February 12, 2013)
CloudStack Design Goals

- Multi-tenancy
- Broad Hardware/Hypervisor Support
- Orchestrate Hardware Resources that may be behind a firewall
- Horizontally scalable management layer
- Beautiful and Functional UI
High-Level Features

A set of applications that:
• Provide separation between tenants
• Handle allocating compute resources (inc. custom allocators)
• Let users provision compute resources
• Manage High Availability
• Massively scalable (thousands of nodes)
• Resource usage accounting
• And more…
Management Server

- UI/API bits are stateless (state is stored in a MySQL database)
- All UI functionality is available as an API call
- Restful API
  - Unauthenticated API on 8096 for localhost (disabled by default)
  - Authenticated on port 8080
  - Responses in XML or JSON
Domains, Projects, and Users

- CloudStack has a top-level domain called ROOT
- You can create sub-domains
- You can create 3 types of accounts, admins, domain-admins, or users
- Projects can be used to hold resources for time-limited projects
Hypervisor Support

- KVM
- XenServer
- Xen Cloud Platform
- VMware via vCenter
- Bare Metal via IPMI
CloudStack Primary Storage

- Where the VMs volumes reside.
- Supports NFS, iSCSI, Clustered Logical Volume Manager, and others. (Depends on hypervisor)
- Hypervisor communicates with primary storage – mgmt server only communicates with host hypervisor.
- You can use local storage, but lose some features.
CloudStack Secondary Storage

• Stores templates, ISOs, and snapshots
• Historically NFS – added the option of object storage recently
  – Includes Swift, GlusterFS, Ceph and others (in various states of production readiness)
• Managed by Secondary Storage VM –
  – Manages moving templates and snapshots from/to primary storage, aging out snapshots, etc.
CloudStack Allocation

• How are VMs placed, storage allocated, etc.?
• CloudStack has several defaults
  – First fit
  – Fill first
  – Disperse
• Don’t like those? Create your own!
• Allows over-provisioning
• OS Preference
RFMTTR (High Availability)

- RFMTTR – “really fast mean time to recovery.”
- CloudStack is not (alone) a magical HA solution.
- Watches HA-enabled VMs to ensure they’re up, and that the hypervisor it’s on is up. Will restart on another if the hypervisor goes down.
- Redundant router.
CloudStack Networking

- **CloudStack manages**
  - DHCP
  - VLAN allocation
  - Firewall
  - NAT/Port forwarding
  - Routing
  - VPN
  - Load Balancing
- **CloudStack can manage physical network hardware (F5-Big IP, NetScaler, Juniper SRX)**
Misc. Features

• Usage Accounting
• UI is Easily Re-Themed / Replaced
• Over-Provisioning
• LDAP Integration
• Notification and Capacity Thresholds
• CloudMonkey CLI
• Much more!
Getting Started

• Visit CloudStack.org
• Start with RPMs or Debian Packages (CentOS/RHEL 6.3 and Ubuntu LTS 12.04 supported)
• Sign up for cloudstack-users@incubator.apache.org
• Talk to us! #cloudstack on Freenode
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Demo Time?
That’s All! Thanks!

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