OpenStack and Storage Foundation Evolution
Dr. Udo Seidel
Linux Strategy and Server Automation Lead @ amadeus
Gene Mullis
Sr. Principal Technical Product Manager
Introduction
Introductions

About Udo Seidel

• Teacher for mathematics & physics
• PhD in experimental physics
• Started with Linux in 1996
• Linux/UNIX trainer
• Solution engineer in HPC and CAx environment
• Head of the
  – Linux Strategy
  – Server Automation
• Publishing articles and presenting on conferences
About OpenStack
About OpenStack

Background

• Project started in 2010
• Provides Infrastructure as Service (IaaS)
• New versions every 6 months
  – Austin, Bexar, Cactus, ... , Folsom, Grizzly
  – Previous (2013.2) was called Havana
  – Current (2014.1) is called Icehouse
  – Next (2014.2) will be Juno
• Managed by OpenStack Foundation
About OpenStack
Core Components

- Keystone – identity
- Glance – *image store*
- Nova - compute
- Cinder – *block storage*
- Swift – *object storage*
- Neutron- network
- Horizon - dashboard
- Heat – orchestration
About OpenStack
Emerging Components with flavour of storage

- Manila
  - File-System as a Service (FaaS)
- Savana
  - Hadoop as a Service (HaaS)
- Trove
  - Database as a Service (DaaS)
About OpenStack
Impact and side effects

• Service vs. Server
  – Shift of view point

• Software Defined Networking
  – Network Virtualization
  – Automation opportunity

• Software Defined Storage
  – Paradigm change
  – Another opportunity to automate
  – Who owns storage management?

• DevOps

• Continuous Improvement & Deployment
### About OpenStack

**Characteristics of Emerging Cloud Applications**

<table>
<thead>
<tr>
<th>Resiliency</th>
<th>Scaling</th>
<th>Data managed Externally</th>
</tr>
</thead>
</table>
| - Ability to run workload a more than one location  
- Ability to detect app and end-to-end faults and remediate  
- Performance and SLA management are key | - Application nodes auto-configure and require no human interaction  
- Ability to adjust number and location of nodes based upon load, latency, and resource optimization | - Each individual application node is stateless  
- Data source can be traditional database, non-relational data source, or Object Storage  
- Individual nodes might have sub-transaction level state |

### Who Runs this type of Application?

- Finance  
- Telecommunications  
- Retail

Anyone who can leverage a scale-out application
Amadeus and OpenStack
Erding Data Centre

- No single point of failure
- Follow The Sun’ operational concept: global support and local knowledge
- Central Data Centre in Erding, Germany
- Security drives everything we do

Aim: 100% service availability

- 1+ billion transactions processed per day
- 850 million billable transactions processed in 2010
- 0.3 seconds system response time
- 95% of the world’s scheduled network airline seats
- 5000+ servers
About Amadeus
Relation to/with Symantec

- Symantec customer for ages
- First HP-UX .. Now Linux
- Mainly storage and high availability
  - Storage Foundation HA
  - Command Central Storage
Amadeus’ IT challenges
Normal Evolution

- Complexity
- Server
- Admin

2009 2011 2013 2015 2017

1280 – OpenStack and Storage Foundation Evolution

SYMANTEC VISION 2014
Amadeus’ IT challenges
Unknowns, Unexpected, Unpredicted

• World has changed
  – Faster
  – Better
  – Cheaper
• New technologies
• New competitors
  – Known
  – Unknown
• Bazar and cathedral
About Amadeus
In OpenStack context

• Just a traditional data centre
  – Not special
  – Not unique

• Familiar with Opensource
  – Linux
  – Apache, JBOSS, ...

• Mainframe and Unix
Using OpenStack

Process Changes

- Big picture
- Faster
- ‘Power’ shift
Using OpenStack

Organization Changes

- Joined instead of next-to-next
- Overlap instead of interfaces
- Legacy vs. New
- Internal chargeback
Using OpenStack
Mindset Changes

• No walls
• New responsibilities
• New view points
  – Technology just a vehicle
  – Business for technicians
Using OpenStack
Adaption and Actions

• Change
  – Mindset
  – Organization/Management
  – Processes
  ➔ All at the same time

• Fast
  – Moving target
  – New sub projects

• Drink your own champagne
Symantec and OpenStack
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Symantec and OpenStack
Learning and Contributing

Offerings

- SNAS: Scale out NAS
- DRaaS
- Object Storage Offering

New Platform
SW & Appliances

Contribute
- Cinder Drivers for CFS
- Security Improvements
- Corporate Sponsorship
- Replication and Data Mobility
- Enabling Disaster Recovery

Add Value to Ecosystem

Services
- Development & Testing
  - CPE- IaaS
  - Data Analytics
- Internal and External Services; Partner Clouds

1280 – OpenStack and Storage Foundation Evolution
Symantec and OpenStack
Where are we going?

• Consolidated cloud platform for products and services
  – A “greenfield” opportunity to re-invent our cloud
  – Global team in the US, Europe, and Asia of top-notch, open source
    minded engineers in the areas of cloud and big data

• Open source components as building blocks
  – Identify capability gaps and contribute back to the community

• OpenStack as the underlying infrastructure

• Distribution Agnostic

• Scale to thousands of nodes across multiple data centers

• Leverage our knowledge to develop solutions in this space
CFS OpenStack Integration

• IceHouse Cinder API Functionality
  – Volume Create/Delete
  – Volume Attach/Detach
  – Snapshot Create/Delete
  – Create Volume from Snapshot
  – Get Volume Stats
  – Copy Image to Volume
  – Copy Volume to Image
  – Clone Volume

• Future?
  – Support Manila File Service
  – Enhance Cinder to support additional Volume functionality (extend by pre-allocation of extents)
  – Replication pool management
  – Secure Erase
  – Policy and SLA enforcements
Symantec Emerging Offerings
Scalable NAS Appliance

1. Business continuity
   • Expanded On-line operations
   • Improved cluster fault detection
   • Enhanced Disaster Recovery
   • Rolling Upgrade functionality
   • Enhanced File System Recovery tools

2. Data center transformation
   • Adapt to new scale of unstructured data usage
   • Accelerate performance by leveraged SSD as cache
   • Leverage DAS as an option to SAN

3. Support for Virtual Environments
   • Support hosting in virtual / cloud environment
   • Integrate with OpenStack to support Cinder NFS, iSCSI and Manila volumes
   • Continued VMware support with vStorage APIs for Array Integration (VAAI)
Symantec Emerging Services
Cloud Platform Vision

Symantec Cloud Offerings
App 1, App 2, App 3...

PLATFORM AS A SERVICE

FUNCTIONAL SERVICES
- Network Redirection & Content Inspection
- Cloud Based Device Management
- Cloud Based Data Collection
- Content Distribution from the Cloud
- Data Warehousing and Analytics
- Web Service Enablement
- Cloud Based Object Store
- Entitlement Management
- Identity Management

OPERATIONAL SERVICES
- High Availability & Load Balancing
- BC/DR (Backup & Failover)
- Storage Management
- Consumption Management
- Incident Management
- Deployment and Provisioning
- Security Audits & Compliance
Symantec Emerging Offerings
Next Generation Object Storage

Key Features
• Multi-Protocol Access
• Policy based Management
• Content Inspection
• Data Classification
• Multi-Tenant Design
Symantec Emerging Services
One Target Type: Provider Clouds based on OpenStack

Disaster Recovery-as-a-Service powered by Symantec

Customer: On-Premise Protected Compute/Apps

Provider’s Cloud (IaaS): Based upon OpenStack

Optimized Recovery Resource Utilization via OpenStack Integration: Just-in-time DR Failover, Failback, Fire Drill

Example: Provision Recovery Resources at DR Failover (Cost efficient just-in-time DR failover model)

<table>
<thead>
<tr>
<th>What</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detach Replicated Data From Replication Controller</td>
<td>Compute API: delete v2/{tenant_id}/servers/{server_id}/os-volume_attachments/{attachment_id}</td>
</tr>
<tr>
<td>Provision VM (replicated data + network assignment + any personalization)</td>
<td>Compute API: post v2/{tenant_id}/servers/{imageRef, flavorRef, name, metadata, personality, networks} post v2/{tenant_id}/servers/{server_id}/os-volume_attachments</td>
</tr>
</tbody>
</table>

Secure
Replication
Automated recovery
Multi-tenant management
Subscription based billing
Summary
Summary
Key take away items

The OpenStack Ecosystem provides:

• Both an opportunity and challenge
• A powerful and evolving eco-system
• An opportunity for Automation
• A platform for a new generation of cloud applications
Questions?

Thoughts?

Comments?
Thank you!

Please take a few minutes to fill out the short session survey available on the mobile app—the survey will be available in the mobile app shortly after the session ends. And then watch for and complete the more extensive post-event survey that will arrive via email a few days after the conference.

To download the app, go to https://vision2014.quickmobile.com or search for Vision 2014 in the iTunes or Android stores.
Thank you!

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Side-effects of introducing/using OpenStack
About OpenStack
Architecture

Diagram showing the architecture of OpenStack with nodes labeled: Network, Block Storage, Compute, Image, Object Storage, Dashboard, and Identity. Connections and relationships are depicted with arrows and text labels indicating functionality and interactions between the components.
Introducing OpenStack – Side-effects

- Demand management
  - Ahead
  - Buffers and/or alternatives

- Server vs. Service
  - Shift of view point

- Stack visibility

- Stack responsibility
Introducing OpenStack – More side-effects

• Software Defined Networking & Network Functions Virtualization
  – Automation opportunity
  – Many projects/products
  – No golden rule

• Software Defined Storage
  – Paradigm change
  – Organizational changes almost mandatory

• DevOps

• Continues Improvement & Continues Deployment
About OpenStack

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Contributing to Opensource

• Legal foundation
• License?
• When ROI?
• Impact/influence by contributing
Partners and Competitors

• Co-petition
• Stats for
  – Contributions
  – Solved issues (closed tickets)
Beyond OpenStack

- Triple O
- Challenges almost independent of IaaS solution
- Opensource vs. closed source mentality
- APIs: standard/open vs. proprietary
- Legal and tax implications