Leveraging the Cloud for Your Storage Needs

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Bret Piatt – Speaker Profile

- Director, Corporate Strategy
- 10+ years experience at major service providers
- Member of the team behind the creation of OpenStack
- Led the technical team for Rackspace Cloud Tools
- Product managed security and compliance offerings at Rackspace and AT&T
- Led networking and security engineering teams for both R&D and production deployments at SBC/AT&T
CLOUD STORAGE

WHY IT MATTERS
HOW BIG IS A..
GIGABYTE

500,000 pages of text
15 minutes of HD Video
TERABYTE

10,000 hours of high quality audio
35 Blu-ray discs
PETABYTE

All of the data for World of Warcraft™
62,400 hours of HD video
EXabyte

The amount of data sent on the global wireless networks per month
ZETTABYTE

All of the data on Earth today
150GB of data per person
2% of the data on Earth in 2020
State of the art density..

..3TB drives..

..15 disks per RU..

is 529,101 42U cabinets for one zettabyte. That is 8,465,616 ft² of data center*.

*16 square foot work cell per cabinet
If we stored all of the global data.. as “an average” enterprise.. it would take.. 38.5% of the World GDP!

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MONTHLY FIGURES</th>
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<tbody>
<tr>
<td>ENTERPRISE AVERAGE STORAGE COST</td>
<td>$1.98 PER GIGABYTE</td>
</tr>
<tr>
<td>MONTHLY WORLD GDP</td>
<td>$5.13 TRILLION</td>
</tr>
<tr>
<td>COST TO STORE A ZETTABYTE</td>
<td>$1.98 TRILLION</td>
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CLOUD STORAGE OPPORTUNITY

MOST DATA IS AT REST
STORAGE I/O IS EXPENSIVE
ADVANCED FEATURES ARE EXPENSIVE
USE HYBRID DATA STORAGE
MAXIMIZE BENEFITS
KEY ATTRIBUTES OF OBJECT STORAGE

ACCESS VIA API
STANDARD HARDWARE
OBJECTS, NOT FILES OR BLOCKS
CONFIGURABLE REPLICAION
AUTOMATIC DATA DISTRIBUTION
PETABYTES, BILLIONS OF OBJECTS
EXAMPLE SMALL SCALE OBJECT STORAGE

- 2 Proxies
- 5 Storage nodes
- 120TB raw
- 40TB usable
- 14 RU
- Linux OS
- Standard SATA
- Standard Ethernet

Out to network backbone

Proxy Nodes
(ReST API using HTTPS)

Switches
(1GigE, Private VLAN for storage network)

Storage Nodes
(1 Zone = 1 Node)

This leads to a $0.09/GB monthly TCO!
CLOUD STORAGE

ENTERPRISE USE CASES
Hybrid Storage Management (HSM) is a new category of tools

Integrate with applications that are major consumers of storage

Focus on unstructured as it is growing much faster than the more difficult to hybrid structured data
EXAMPLE

SHAREPOINT

- Optimize by putting larger infrequently accessed documents on cloud storage
- BLOB Store allows customized rules for data location
- SQL Server keeps small and frequently accessed files
UPDATE AND OVERVIEW OF

OPENSTACK
"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."
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OPENSTACK ARCHITECTURE

Mobile Apps

Web Client

Enterprise Software

ECOSYSTEM

OpenStack Compute

OpenStack Object Storage

OpenStack Imaging Service

CORE PIECES
OPENSTACK OBJECT STORAGE ARCHITECTURE

REST-based API

Data distributed evenly throughout system

Scalable to multiple petabytes, billions of objects

Account/Container/Object structure (not file system, no nesting) plus Replication (N copies of accounts, containers, objects)

No central database

Hardware agnostic: commodity hardware, RAID not required
OPENSTACK COMMUNITY GROWTH

- Participating Organizations: 100+ organizations now backing OpenStack; ~300 developers contributing code

Project Participants

- Global Developers & User Groups: 17 countries represented at our Spring 2011 Design Summit
Public, private, and hybrid..
..including both on and off premise.
OPENSTACK OBJECT STORAGE AND CDMI

- CDMI – Cloud Data Management Interface
  - http://www.snia.org/tech_activities/standards/curr_standards/cdmi

- OpenStack blueprint proposal filed
  - https://blueprints.launchpad.net/swift/+spec/swift-cdmi

- Developers needed to implement

- APIs expose capabilities of a platform
  - CDMI specifies features not present in Swift
  - Swift has features not defined in CDMI
THANKS / Q&A

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