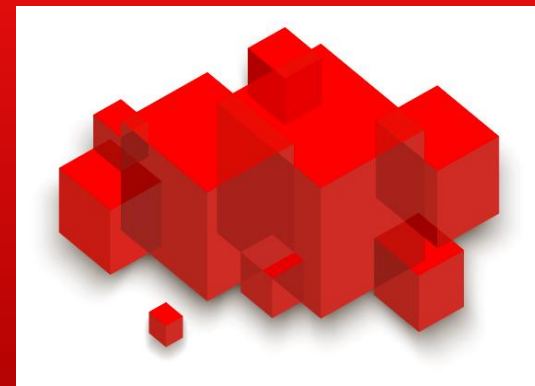# ORACLE®

Archiving On-Premise and in the Cloud
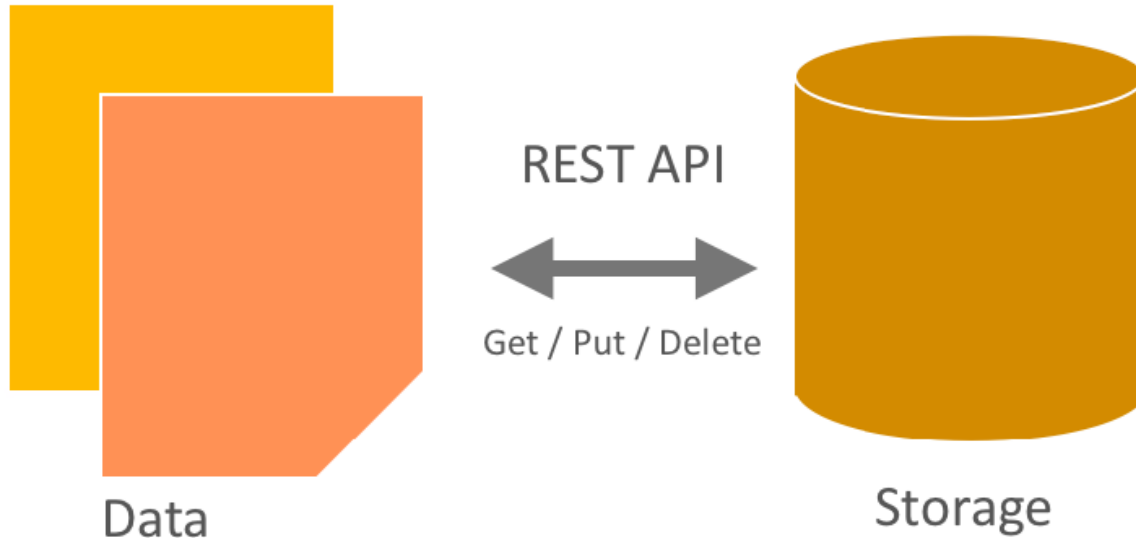
March 2015

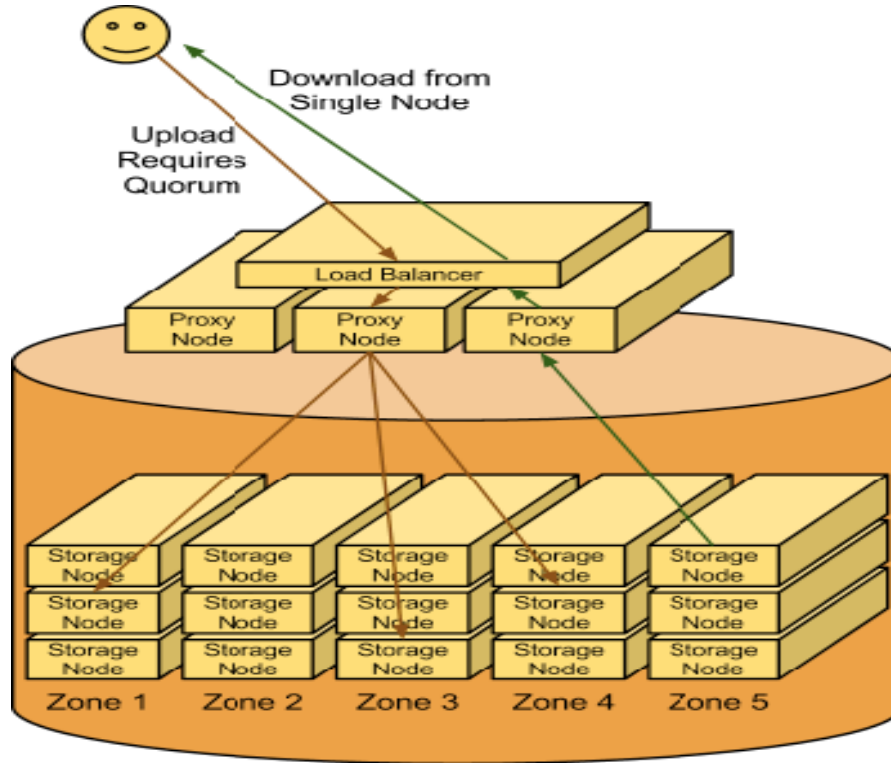# Cloud Storage

Storage accessed over a network via web services APIs.

http://swift.example.com/v1/account/container/object

REST API

Get / Put / Delete

Data

Storage

Source: http://docs.openstack.org/admin-guide-cloud/content/objectstorage_characteristics.html

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OpenStack Swift Object Storage Overview

Source: http://docs.openstack.org/admin-guide-cloud/content/section_storage-nodes.html

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Benefits of Cloud Storage

- Limitless scalability

- Custom metadata

- Single namespace

- Simplified management

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Why Are Companies Moving to the Cloud?

- Pay-as-you-go model

- Improved agility (time-to-market)

- Competitive advantage

- Stronger security

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Trade-offs between On-premise and Cloud

Business Needs Should Drive the Solution

	On-Premise	Cloud
Latency	Low due to locality	Higher due to network
Throughput	Fast Performance	Limited by bandwidth
Security	Data on-site	Third party
Investment	Up-front	Pay as you go
Infrastructure	IT staff to manage	Provider managed
Customization	More	Less
Compliance	Tailored	Standards supported?
Stability	Owned	Risk of going away

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Data Transfer

Available Internet Connection	Theoretical Min. Number of Days to Transfer 1TB at 80% Network Utilization	When to Consider AWS Import/Export?
T1 (1.544Mbps)	82 days	100GB or more
10Mbps	13 days	600GB or more
T3 (44.736Mbps)	3 days	2TB or more
100Mbps	1 to 2 days	5TB or more
1000Mbps	Less than 1 day	60TB or more

http://aws.amazon.com/importexport/details/

Public Cloud Storage Use Cases

- Backup

- Archive

- Content Storage and Distribution

  - Office productivity

  - Media sharing

- Cloud Native Application Data

Data Protection 3-2-1 Rule

3 Copies - 2 Different Medias - 1 Offsite

Backstop = Last Line of Defense

3 Total Data Copies

Copy 1
Production

Copy 2
Backup to disk or Tape

Copy 3
Offsite Copy

The 3-2-1 rule ensures logical and physical data protection

| Insert Information Protection Policy Classification from Slide 8

Preservation Considerations with Cloud Storage

| Preservation Requirement	Cloud Storage
Descriptive metadata	Cloud storage provides custom metadata
Fixity	Is check done outside of cloud storage?
System security and access control	Are they sufficient?
Auditable Event Tracking	Are there records of actions associated with an asset?
Immutability	Is there versioning so that originals are unchanged?
Transcoding	Does it require a recall and new upload?

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IDC is observing a shifting trend in cloud and Web-scale architectures to a multitier storage strategy in order to sustain growth while maintaining existing data.

IDC

Technology Assessment: Cold Storage is Hot Again

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90% of an Organization's Data is Passive

Facebook Photo Access Patterns
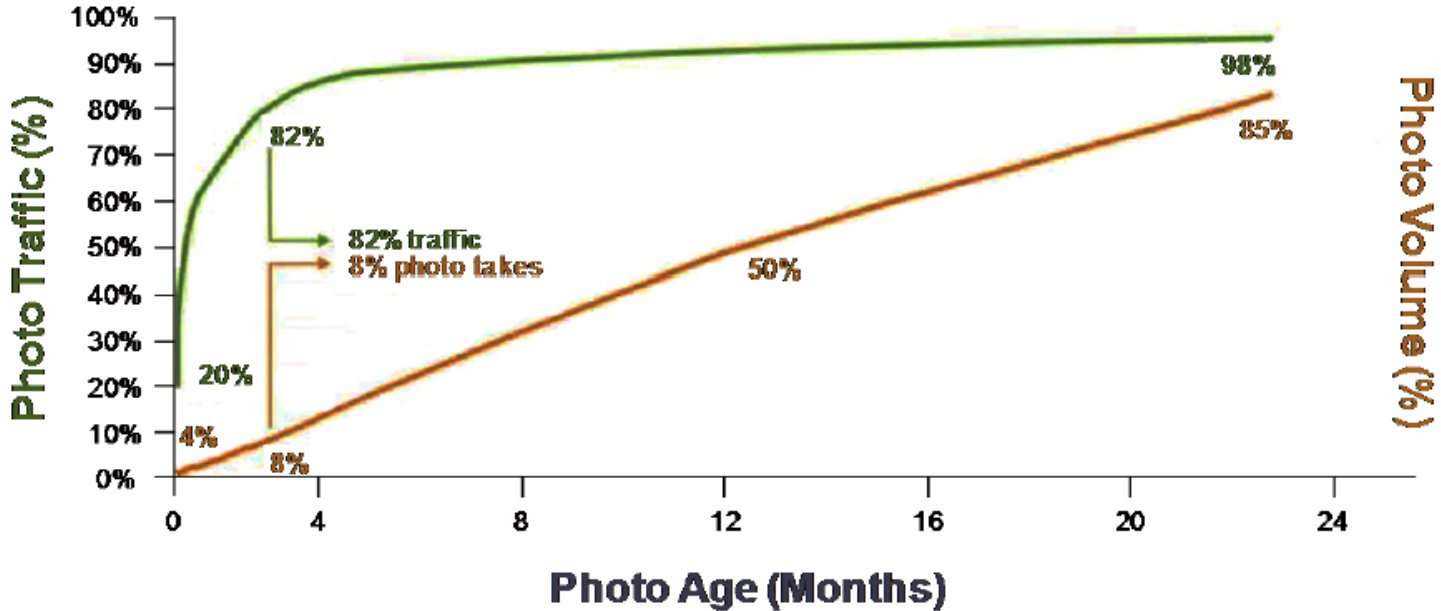
Note: Data is from the Open Compute Summit IV, January 2013, Santa Clara, California.

Source: Facebook, 2013

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10PB, 5 Year TCO Comparison
On Premise Tape vs Public Cloud Storage

- Amazon Glacier Pricing
  - $.01 per GB/month
  - Upload and retrieval Requests = $0.05 per 1,000
  - Data Transfer IN To Amazon Glacier = $.00
  - Data Transfer OUT From Amazon Glacier To Internet = $.05 to $.09 per GB
- The cost to store 10PB for 5 years is $6 million
  - Does not include costs for upload, transferring data out, or bandwidth
  - 10gigE link would take 92+ days to transfer 10PB
  - Reading all 10PB would cost $500,000.

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10PB, 5 Year TCO Comparison

On Premise Tape vs Public Cloud Storage

- Tape Pricing
  - $296,279.80   4,000 slot library including installation
  - $160,000.00   4,000 LTO6 tapes
  - $96,969.60   8 LTO6 tape drives
  - $232,547.65   5 years of Premier Support
  - $3,997.19   Power: 702 watts at $.13/kilowatt-hour
  - $63,750.00   Floor space: 51 sqft at $250 per sqft/year
- Total Cost $853,544.24
  - Glacier is 7x the cost over 5 years

"Glacier is almost 10 times as expensive as an on-premise tape system with support."

Jack Clark, ZDNet

AWS Glacier's dazzling price benefits melt next to the cost of tape
http://www.zdnet.com/aws-glaciers-dazzling-price-benefits-melt-next-to-the-cost-of-tape-7000003068/
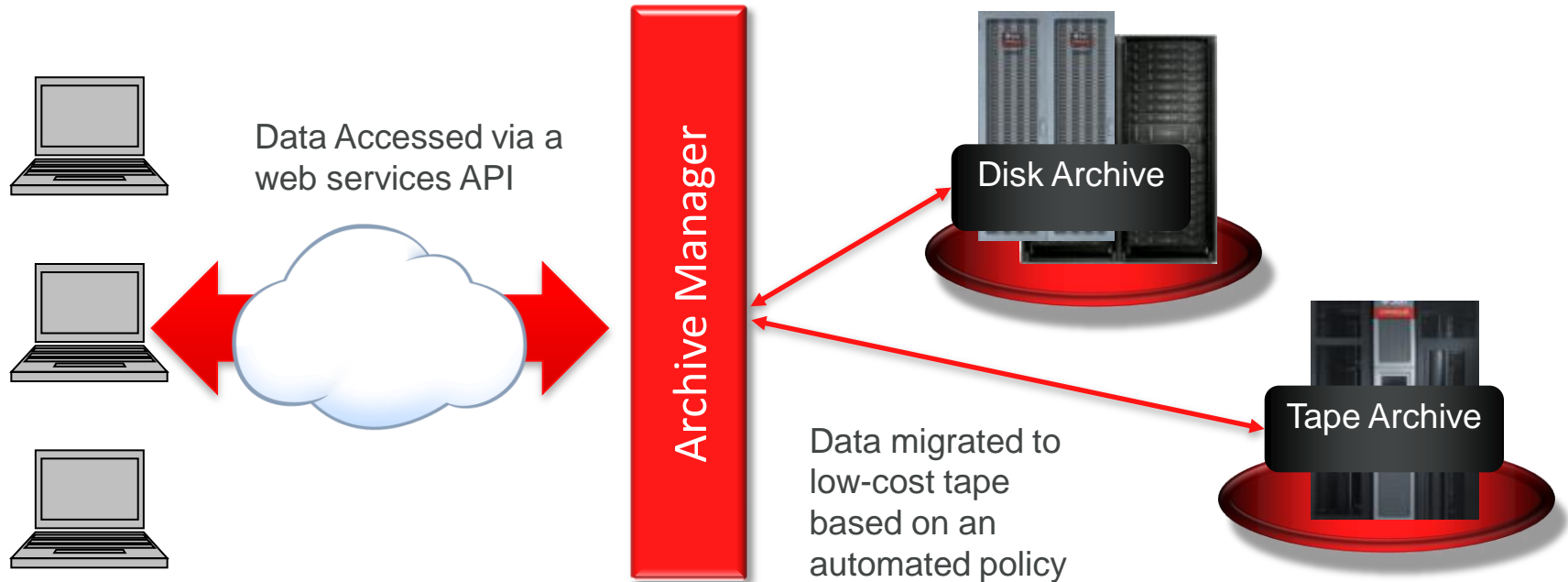
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Oracle Sponsors OpenStack Foundation

December 10, 2013

"Oracle also plans to integrate OpenStack Object Storage into its
storage portfolio, providing customers with access via OpenStack APIs
to Oracle ZFS Storage Appliance and Pillar Axiom storage systems for
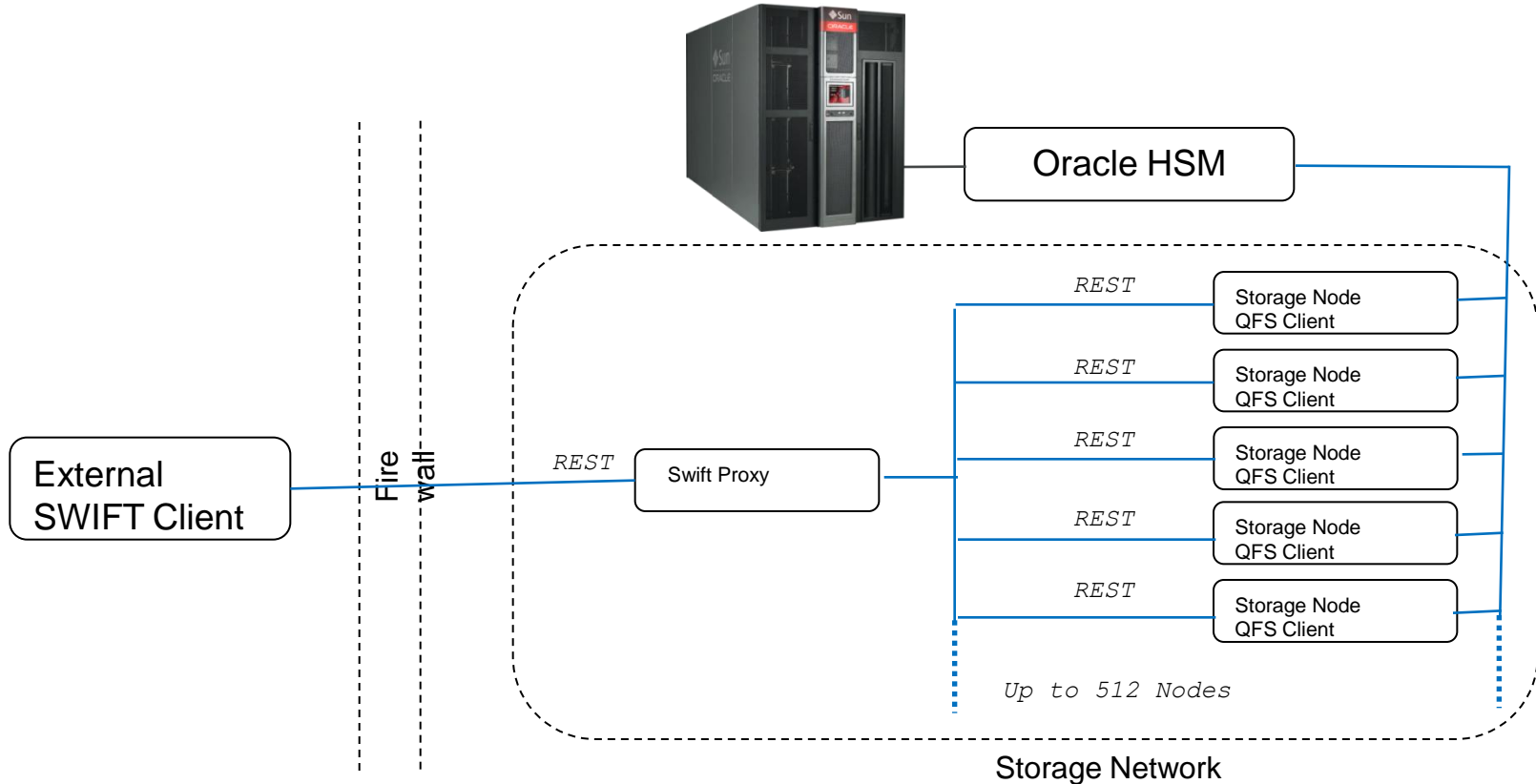object storage and StorageTek tape solutions for deep archiving and
data protection."

http://www.oracle.com/us/corporate/press/2079843

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Tape Web Interface for Cold Storage / Archive

Simplify the use of Tape

Data Accessed via a web services API

Archive Manager

Disk Archive

Tape Archive

Data migrated to low-cost tape based on an automated policy

Swift Tape Deployment Diagram (Logical)

Oracle HSM

REST — Storage Node QFS Client

REST — Storage Node QFS Client

REST — Storage Node QFS Client

REST — Storage Node QFS Client

REST — Storage Node QFS Client

Up to 512 Nodes

External SWIFT Client

Fire wall

REST — Swift Proxy

Storage Network

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Summary

- Understand the trade-offs between on-premise vs cloud
  - Business needs drive the technology decision
- Remember the 3-2-1 Rule (3 copies, 2 mediums, 1 offsite)
- There is a trend towards multiple tiers of cloud storage
  - Tape behind a web interface can provide a low-cost, lower SLA tier

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