Why Use Multiple Clouds?

Live Webcast

January 11, 2022
10:00 am PT / 1:00 pm ET
Today’s Presenters

**Moderator:**
Alex McDonald  
SNIA CSTI Chair  
Independent Consultant

**Presenter:**
Mark Carlson  
Co-chair SNIA Technical Council  
KIOXIA

**Presenter:**
Gregory Touretsky  
Principal Product Manager  
Seagate Technology
SNIA-at-a-Glance

180 industry leading organizations

2,500 active contributing members

50,000 IT end users & storage pros worldwide

Learn more: snia.org/technical  @SNIA
What We Do

Educate vendors and users on cloud storage, data services and orchestration

Support & promote business models and architectures: OpenStack, Software Defined Storage, Kubernetes, Object Storage

Understand Hyperscaler requirements. Incorporate them into standards and programs

Collaborate with other industry associations
The material contained in this presentation is copyrighted by the SNIA unless otherwise noted. Member companies and individual members may use this material in presentations and literature under the following conditions:

- Any slide or slides used must be reproduced in their entirety without modification.
- The SNIA must be acknowledged as the source of any material used in the body of any document containing material from these presentations.

This presentation is a project of the SNIA.

Neither the author nor the presenter is an attorney and nothing in this presentation is intended to be, or should be construed as legal advice or an opinion of counsel. If you need legal advice or a legal opinion please contact your attorney.

The information presented herein represents the author's personal opinion and current understanding of the relevant issues involved. The author, the presenter, and the SNIA do not assume any responsibility or liability for damages arising out of any reliance on or use of this information.

NO WARRANTIES, EXPRESS OR IMPLIED. USE AT YOUR OWN RISK.
Agenda

- Risk Reduction
  - Avoid lock-in
  - Avoid single points of failure
  - Political, regulatory and compliance restrictions

- Cost Reduction
  - Operational cost reduction
  - Exit cost reduction
  - Running work in parallel across clouds
  - Hybrid cloud / Burst to cloud enablement

- Access to Features/Performance
  - Access to cloud-specific features
  - Latency reduction
  - Throughput increase (parallelism)
  - Egress cost reduction

- Multi-cloud challenges

- Examples
Justifications & Benefits of Multiple Clouds

Mark Carlson
Avoid Lock-In

- Applications built on technology from a single cloud are tightly coupled to that one cloud provider
- Moving to another cloud requires development work
  - Potentially expensive
  - Takes a long time to complete
- Missing technology may need to be re-implemented or removed before moving to another cloud
Storage Abstraction Layer

- Insulates the application from the underlying cloud provider's interfaces
- Allows an application to store and access data across multiple clouds
  - Placement of data can be transparently changed without having to modify the application
- Reduces or eliminates the cost to exit any given cloud
- Ensures that applications are not tightly coupled to cloud-specific technologies
Avoid Single Points of Failure

- Applications built on a single cloud are dependent on the reliability and availability of that cloud.
- Spanning more than one cloud increases reliability, availability and performance.
- Enables greater control over the cost vs. reliability, availability, and performance tradeoffs.
Political, Regulatory and Compliance Restrictions

- Regulatory, compliance and political constraints change over time
- Storage abstraction layer allows data to be evacuated or moved from cloud to cloud transparently
- Example: Data governed by different regulations can be placed in different clouds that are compliant with those regulations
- When cloud storage is not acceptable can be stored on-premises
Operational Cost Reduction

- Opportunity to take advantage of lower cost service offerings on a different cloud
- Minimizes paying for SLO levels that are not required
- Data can be transparently moved from cloud service to cloud service
  - When egress costs are less than the potential savings
Exit Cost Reduction

- Applications that are built on a single cloud are unable to stop using that cloud

- Supporting multiple clouds, an application can choose:
  - Migrate services to an alternate cloud
  - Stop using services on a given cloud without disrupting application operation

- Container orchestration solutions, such as Kubernetes, enable workload packaging and mobility between clouds
  - And Multicloud storage makes it easier
Applications built on a single cloud must process data in the cloud where the data is stored.

Multiple clouds take advantage of:
- Lower computing costs
- Available computing resources, including running processing in multiple clouds in parallel

Approach does not work well for large datasets where the cloud-resident application must access the full dataset.

Storage abstraction layer allows collections of data to be stored together on the same cloud.
Computing performed on that cloud can be performed against locally stored data.
Provides transparent access to remotely stored data for computing in any given cloud.
Enables transparent migration of data when computing moves from cloud to cloud.
Hybrid Cloud / Burst to Cloud Enablement

- Supporting a storage abstraction layer allows:
  - Uniformed data access on-premises and in the cloud
  - May ease burst to cloud when on-premises capacity is exhausted
  - Remote batch execution using cloud resources
Access to Cloud-Specific Features

- Features that are present only on a given cloud can still be taken advantage of without having to use that cloud exclusively

- Allows storage features specific to a cloud to be:
  - Exposed in a standardized manner
  - Allows data to be transparently accessed and migrated
  - Removes the application being aware of the underlying mechanics
Latency Reduction

- When storing the same file in multiple clouds, a simultaneous request can be made for the file from each of those clouds.
- The first response can be used to satisfy the request.
- Other requests can be aborted to save egress charges.
- Can be hidden behind a proxy CDMI™ (Cloud Data Management Interface) server so applications need not do anything different.
Throughput Increase (Parallelism)

- Storage objects on-prem are accessible to multiple clouds
- Hard-limits can be exceeded and increase the aggregate total throughput
- Storage objects can be sharded and erasure coded
- Parallel requests to each cloud return the shards
  - Sufficient number of shards are returned, the object can be reconstituted
  - Workaround for individual cloud provider's bandwidth limits
- Sharding also increases the security since no one cloud has all the data
Egress Cost Reduction

- Cloud providers have varying charges for egress
- Some may not charge at all for egress
- Using multiple clouds to store the data, the cloud with the lowest egress charges can be used to fetch the object
Multi-cloud Challenges and Usage Examples

Gregory Touretsky
Multi-cloud Challenges

- **Manageability**
  - API
  - Functionality

- **Security**
  - Reliable, error-prune cross-cloud security model
  - Multicloud audits

- **Interoperability**
  - 3rd party apps
  - Managed services

- **Costs**
  - Track and control across clouds
  - Egress

- **Talent**
  - And keeping up with the changes

These challenges must be analyzed when planning a multicloud architecture.
Example 1: Shared Multi-cloud Storage

- **Use case:** rendering at the lowest cost
- **Solution:** leverage lowest cost “spot” instances in any of the clouds
  - Access data on a shared storage from multiple clouds
  - Mostly-read access
  - All objects are in the same storage cloud
Example 2: Distributed Multi-cloud Storage

- **Use case:** scientific research using data sources from multiple clouds
- **Solution:**
  - Build an abstraction level for cloud-agnostic data access
  - Implement global authentication mechanism
  - Read anywhere, write (preferably) in the same cloud
  - Every object is stored within a specific cloud
Example 3: Dispersed Multi-cloud Storage

- Use case: secure archive storage
- Solution:
  - Build an abstraction level for cloud-agnostic data access
  - Stripe data across multiple clouds
  - No single cloud stores all parts of an object
  - An application must read from multiple clouds to gain access to the entire object
Summary and Q&A

- Multi-cloud infrastructure is a reality for many companies
  - Hybrid cloud = multi-cloud
- Multi-cloud strategy is important to address potential challenges
- Multi-cloud adoption can be simplified with a common abstraction layer
  - Especially for storage
Thanks for Viewing this Webcast

- Please rate the webcast and provide us with feedback
- This webcast and a copy of the slides will be available at the SNIA Educational Library https://www.snia.org/educational-library
- A Q&A from this webcast will be posted to the SNIA Cloud blog: www.sniacloud.com/
- Follow us on Twitter @SNIACloud
SNIA Quick Poll Questions

- What Storage Cloud(s) do you use today?
- What platform or solution do you use to abstract multiple clouds?
  - Take the quick anonymous survey at https://www.surveymonkey.com/r/SNIACloud
Thank You