

Tech Brief: Object Storage

In the traditional world of storage, applications are tied to dedicated storage, and infrastructure resources are isolated for each workload to prevent other applications from consuming and creating contention for the same resources (see Figure 1). However, this model breaks down as the proliferation of mobile devices have raised expectations on how, when, and where data is accessed by globally distributed workforces, while the volume data that needs to be stored grows at astronomical rates. This puts more demands on managing and scaling storage while IT budgets and resources are increasingly constrained.

More specifically, in traditional filesystem based storage, as multiple volumes are created to add capacity for applications, data needs to be broken up and sent to different storage locations creating multiple storage silos and increasing complexity and confusion for both storage administrators and application developers.

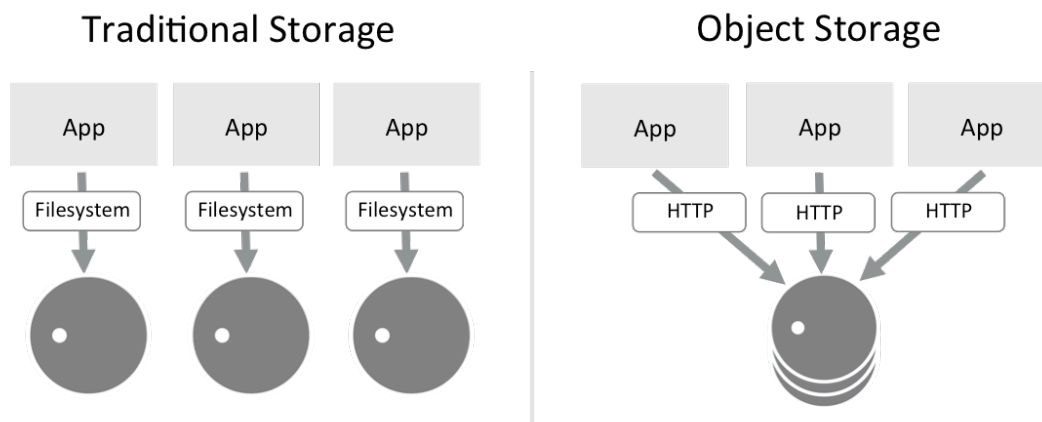


Figure 1 - Traditional and Object Storage Models

Conversely, with an object storage system, applications simply consume storage services from a single namespace as the system scales. This eliminates the complexity of managing multiple storage silos and provides applications with storage-as-a-service.

This architectural approach makes it easier to scale, manage and operate than traditional file-based storage systems, ultimately enabling more data to be stored, served or archived with fewer resources. By leveraging an open source based object storage platform, storage systems can be built using industry standard hardware, enabling IT to lower costs.

USE CASE: Object Storage for Backups

With the SwiftStack Object Storage System, IT can meet RPO and RTO objectives while decreasing TCO. Backup windows are drastically reduced as the system evenly splits the backup streams across all nodes in the system, driving high parallel I/O. SwiftStack's single unified namespace, means that multiple silos (backup targets) are no longer needed. All nodes can both ingest and egest data and performance scales linearly uninterrupted with the addition of new nodes. SwiftStack reduces backup costs because the solution is built on industry standard hardware.



Object Storage 101:

OBJECT = FILE + METADATA

What are Objects? Objects are the actual data stored. Examples include photos, videos, documents, log files, database backups, and filesystem snapshots. When objects are stored on disk, any associated metadata is stored with the data.

What is Metadata? Metadata contains system and user-defined information for an object. System metadata includes information such as creation date, object size, and MD5 checksum. User defined metadata can be any information the user associates with the object.

How is data accessed? Instead of accessing the raw blocks of data or file-based access, storage is accessed using HTTP RESTful APIs and data is stored as whole objects or blobs of data making object storage ideal for unstructured data.

Method	Description
GET	Downloads an object (including the metadata that was stored with it).
PUT	Creates a new object consisting of the specified data content and any metadata.
COPY	Replicates an object, creating an identical copy.
DELETE	Deletes an object.
HEAD	Retrieves object metadata.
POST	Creates or updates an object's metadata.

Table 1 - Common API Operations for Objects

Summary

According to a report published by IDC¹, “as businesses move toward petabyte-scale data storage, [object storage] solutions are turning out to be the right choice for balancing scale, complexity, and costs.” Object storage is clearly the winner when it comes to storing the vast amounts of unstructured data because it has been architected for high throughput, massive scalability, global namespace across multiple datacenters, and lower cost when combined with commodity-based hardware.

Learn more about Object Storage!

SwiftStack is an industry leading software-defined storage company. With OpenStack Swift at its core, SwiftStack offers a flexible and powerful software platform that allows operators to deploy, integrate and scale on standard hardware. Visit us at swiftstack.com or email us at contact@swiftstack.com to learn more about object storage.

References:

¹ “IDC Marketscape: Worldwide Object-Based Storage 2014 Vendor Assessment.” December 2014, IDC #253055.