



Breaking the Storage Array Lifecycle with Cloud Storage

©2011 TwinStrata, Inc.

The Storage Array Lifecycle

Anyone who purchases storage arrays is familiar with the many advantages of modular storage systems and storage area networks. However, they may also be familiar with one of the less desirable attributes of storage arrays: the typical three- to five-year lifecycle that forces decommissions and mandates upgrades on a regular basis. With many organizations expanding their need for storage by 20-60% on an annual basis¹, outgrowing capacity of existing storage arrays is a regular occurrence, effectively rendering upgrade cycles to be a fact of life.



Although decommissioning and upgrading a storage array may not appear all that daunting, the process includes a number of cumbersome aspects:

- The migration process from old to new storage arrays could last months, creating an overlap when both the old and a new storage array must be maintained. In some enterprise environments, the migration can cost thousands of dollars per Terabyte² (read “Reducing Costs and Risks for Data Migrations” by Hitachi Data Systems for more on the topic of costs)
- When purchasing a new storage array, its sizing is based on anticipated future growth, resulting in an initial capacity “over-purchase” and an underutilized storage array for most of its life cycle. Result? Pre-payment for capacity you may not need over the next 2 years
- Software and architectural changes associated with each storage array upgrade may compromise stability or, at a minimum, require staff retraining on new policies and features

The Economics of Storage Array Replacement

Why the Cycle Persists

So why decommission arrays at all? Why not simply expand storage capacity by adding new storage arrays instead of replacing them? With storage densities and capacities growing every year and cost per gigabyte dropping, the economics provide the answer.

Consider a three-year-old, 10TB storage array that cost \$50,000 to purchase and has a total annual maintenance cost (vendor maintenance fee, administration, floor space, power, cooling, etc) of \$25,000 per year. Now let’s say today you purchase a new 25TB storage array for \$50,000. Thanks to improved storage density, you may find it carries the same total annual maintenance cost of \$25K per year.

¹ [IDC: Unstructured data will become the primary task for storage](#)

² [Hitachi Data Systems: Reducing Costs and Risks for Data Migrations](#)

If you choose to keep both arrays active, you would now have data residing on the old storage array at \$2.50/GB in annual maintenance cost and data residing on the new storage array at only \$1/GB in annual maintenance cost (with plenty of capacity to spare). This economic inefficiency makes a pretty strong business case for decommissioning the old array and moving all data to the new array as quickly as possible.

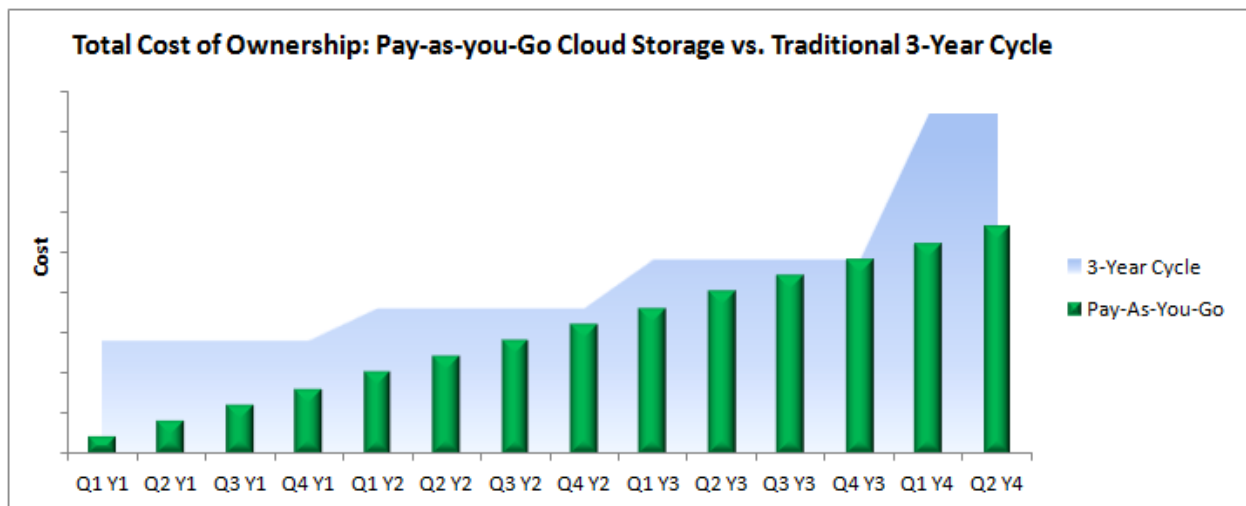
So is there any hope of breaking this storage array cycle?

Cloud Storage Breaks the Cycle

There is indeed hope with on-demand cloud storage. Cloud storage substantially changes the economics and deployment of data storage and makes some of the aspects of the storage array life cycle start to disappear entirely.

- The pay-as you-go cloud model eliminates the need to pre-purchase or over-purchase capacity
- Cost per GB drops over time as cloud providers continue to lower costs every 6-12 months
- Storage capacity is virtually limitless, so there is never a need to decommission or upgrade any hardware

The area chart below illustrates some of the economic inefficiencies of this deployment model. While most organizations consume storage at a near linear rate over time, the required initial pre-purchase of capacity results in a relatively disproportionate up-front investment. The blue area on the chart shows how total cost of ownership (TCO) increases over time with traditional storage deployment – note the spikes at every purchase cycle (Q1 Y1 & Q1 Y4). The green bars on the chart illustrate how TCO increases with a pay-as-you-go cloud storage model. Even in this simplistic case where the TCO of both models is identical after 3 years, you can easily spot the inefficiencies of traditional storage which requires pre-payment for unused capacity.



This is a very basic analysis. In practice, there are many additional costs that factor into traditional storage deployments including:

- administrative costs of the migrations from old arrays to a new arrays
- potential overlap where both arrays must be maintained simultaneously
- potential downtime and productivity loss during the migration process

Furthermore, the analysis does not capture some of the additional cost savings of cloud storage that include:

- economies of scale in pricing and administration as a result of leveraging large multi-tenant cloud environments
- price per GB erosion over time

Factoring these additional costs of traditional storage and additional savings of cloud storage may convince you that it is time to introduce cloud storage into your existing IT infrastructure. But where do you begin?

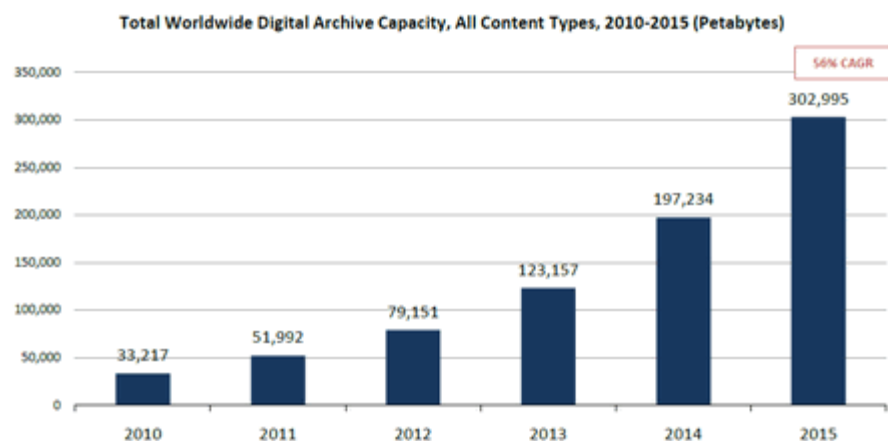
Introducing Cloud Storage into the Organization

Best Practice: Take a Hybrid Approach

While replacing traditional storage with cloud storage will break the traditional storage array life cycle, a complete “forklift” replacement may seem a bit of a stretch.

While cloud storage may not necessarily meet all on-premise storage needs, it can still augment existing storage infrastructure. A hybrid local-cloud storage environment can streamline storage operations and can even extend the life cycle of traditional storage through selective data offload.

A more conservative approach might be to identify data suitable for cloud storage such as secondary copies, backups, off-site data and/or archives. Interestingly, archives are often stored on traditional onsite storage to make them easily accessible to meet compliance requirements. However, looking at the chart to the right, you can see that ESG’s research estimates a very rapid growth rate for archive data, approximately 56% per year.



Source: Enterprise Strategy Group, 2010.

With literally hundreds of thousands of Petabytes of archives to store over the next few years, the benefits of offloading archives or infrequently accessed data from traditional storage are numerous. In fact, transitioning this data to cloud storage can extend the traditional life cycle of storage arrays beyond the typical 3-5 year time frame. Imagine a 6-10 year storage array life cycle instead. That would result in a reduction of capital investment in storage infrastructure by half and introduce a significantly more efficient just-in-time, pay-as-you-go model.

So how do you leverage tiers of cloud storage in a manner that integrates seamlessly into your existing storage infrastructure?

Connect Your Storage Infrastructure to the Cloud with a Cloud Storage Gateway

Given most storage consumed by businesses is either block-based or NAS-based, an on-premise cloud storage appliance or gateway that converts cloud storage to a block or NAS protocol can greatly simplify deployment. When choosing a solution, keep in mind that, unlike NAS, block-based solutions have the advantage of supporting both block-based access and any file system protocol. Block-based iSCSI solutions, such as TwinStrata CloudArray, support Petabytes of storage and provide thin-provisioning, caching, encryption, compression, deduplication and snapshots, matching feature sets of sophisticated SAN storage arrays. These solutions can readily reside alongside existing SANs and are available in both software and hardware form factors.

Cloud storage appliances can grow to a virtually unlimited storage capacity without the need to ever upgrade, eliminating many administrative burdens and risks of the storage array life cycle. Since cloud storage is pay-as-you-go, cost adjustments occur automatically, eliminating the economic inefficiencies of the storage array life cycle.

In combination with a cloud storage gateway or appliance like CloudArray, you may want to consider storage tiering software. Auto-tiering software can be found in storage virtualization solutions, data classification solutions, and even in some hypervisor solutions. Once you choose an auto-tiering framework, you can immediately begin to extend the life cycle of existing storage arrays and leverage the benefits of cloud storage by selectively offloading infrequently used data.

Los Angeles Unified School District Breaks the Storage Lifecycle and Saves \$283K

The Los Angeles Unified School District (LAUSD), the largest public school system in California and second largest public school district in the U.S. was at a crossroads in their search to replace some failing hardware in the individual sites and didn't want to continue purchasing storage, tape and file servers.

LAUSD chose cloud storage to address the situation. They placed TwinStrata CloudArray cloud storage gateway virtual appliances in 15 remote locations across the district to back up 80 TB of primary storage to the Amazon Simple Storage Service (S3) cloud.

Previously, each site required either BackupExec or homegrown archiving scripts to back up a file server and then write to tape or ship the data across the WAN to a central location. Now, the CloudArray virtual appliances, take daily snapshots in the S3 cloud, for all fifteen remote locations across the district.



LAUSD was able to deploy each site in less than an hour, and within 48 hours, all data was synchronized to the cloud with full disaster recovery capabilities to any one of its other sites. Just as important as quick setup, pay-as-you-go storage and like-local access to data were the cost savings. As a result of deploying TwinStrata CloudArray, LAUSD estimates it will save \$283,000 over five years by eliminating tape and using lower-cost commodity servers.

"After a fairly lengthy evaluation process, we chose TwinStrata over competing solutions because the combination of performance, ease of use, and storage array feature set provided everything we were looking for from traditional storage arrays and backup software for far less cost without the added maintenance overhead," said Steve Saitman, senior systems specialist for LAUSD. "Moving to the cloud has not only reduced the cost and burden of maintaining the multi-site infrastructure, it has eliminated the need for future data migrations and costly upgrades. Our upgrade plans now are to simply purchase new servers every three years."

Try CloudArray for Free

You can download a free copy of CloudArray today to start enjoying all the benefits of cloud storage and discover how easy it is to break the traditional storage array life cycle.

For more information, please visit www.twinstrata.com.