



# CONVENTIONAL WISDOM IS WRONG – PUBLIC CLOUD STORAGE COSTS MORE

Ask any storage analyst or IT storage professional about public cloud storage costs and they will say with complete confidence that it's cheaper than on-prem storage. They are incorrect, much to their surprise. It doesn't matter whether the public cloud storage in question is block, file or object, the on-prem storage is just about always less costly. The primary exception are those rare circumstances when the storage is temporary or short term, less than 18 months, and is specifically public cloud object storage. The question becomes how often is storage consumed just temporarily or for short term? The answer is not very often.

This assertion goes against the conventional wisdom and as a result raises many additional questions among IT storage pros.

- How was this conclusion reached?
- What is being compared?
- What assumptions were made?
- Are they realistic?
- Over what period of time?
- Is the public cloud storage "on-demand" feature being taken into consideration?
- What about operating expense costs of on-prem storage?

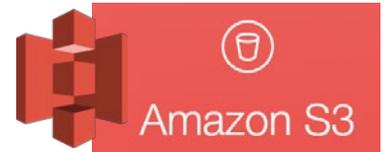
These are all sound valid questions. The best way to answer them is to take a look at a realistic comparison example. Since public cloud storage is primarily utilized by small to medium IT organizations and the mid-tier, a good comparison for on-prem would be unified storage such as the Nexsan Unity hyper-unified storage system. Nexsan Unity is production proven, easy to deploy, easy to access multi-protocol (NFS, SMB a.k.a. CIFS, iSCSI, Enterprise class file sync and share), with optional secure active archiving, significant scalability, and is in the mainstream for cost. For the public cloud storage, the choice is the definitive market leader AWS simple storage service (S3) object storage.

S3 is significantly slower than Nexsan Unity with appreciably higher latencies and would not do nearly as well in any performance test. On the other hand, S3 delivers essentially unlimited scalability and maintains a replica within the local region or out of region. AWS S3 public cloud storage is what most IT storage pros mean when referring to cloud storage. And even though AWS also provides elastic block storage (EBS) and elastic file storage (EFS) that would be more competitive on a performance basis, they are simply non-competitive from a cost basis. In other words, they cost way too much. This brief will provide a comparison between AWS S3 and Nexsan Unity, and then do a quick look at AWS EFS (which is half the cost of EBS). The key to any comparison is to start with the assumptions first.



## COMPARISON ASSUMPTIONS

BASELINE ASSUMPTIONS FOR BOTH AWS S3 AND NEXSAN UNITY
<b>5 yr comparison</b>
480TB of consumed capacity to start
Unstructured data growth rate @ ~ 15%/yr or 1.19%/mo compounded
~ 960TB consumed at the end of 5 yrs <ul style="list-style-type: none"> <li>Note: Is below analyst projections - faster growth favors Nexsan over AWS</li> <li>Works out to an average of 695TB/mo total over the 5 yrs</li> </ul>



AWS S3 SPECIFIC ASSUMPTIONS CONCERNING STORAGE COSTS & TRANSIT FEES <sup>†</sup>
Avg file (object) size is 1 MB
Avg read-out to internet/mo = ~ 15% of total capacity <ul style="list-style-type: none"> <li>15% read-out aligned with industry avg<sup>††</sup> of active data frequently accessed</li> </ul>
Avg PUT, COPY, POST, LIST requests/mo @ ~ 15% file # total
AWS prices based on lowest cost US East Region (VA)
Storage costs <ul style="list-style-type: none"> <li>\$.023/GB/mo for 1st 50TB</li> <li>\$.022/GB/mo for next 450TB</li> <li>\$.021/GB/mo for next 500TB</li> </ul>
PUT, COPY, POST, LIST request costs from S3 <ul style="list-style-type: none"> <li>\$.05/1,000 requests</li> </ul>
GET and other request costs from S3 <ul style="list-style-type: none"> <li>\$.04/10,000 requests – assume these costs are near zero so not calculated</li> </ul>
S3 Storage management inventory pricing <ul style="list-style-type: none"> <li>\$.0025/million objects listed/mo</li> </ul>
S3 Storage class analysis pricing <ul style="list-style-type: none"> <li>\$.10/million objects monitored/mo</li> </ul>
3rd party EFSS service utilizing customer's AWS S3 storage <ul style="list-style-type: none"> <li>\$3.00/user/mo not including the storage</li> <li>Averaging ~ 2TB per user</li> </ul>

<sup>†</sup>All AWS pricing publicly available from the AWS website and subject to change without notice  
<sup>††</sup>2014-2015 DS Consulting survey of 376 IT organizations: active files ranged from 5 to 20% of total



NEXSAN UNITY SPECIFIC ASSUMPTIONS	
Nexsan Unity6530 active-active system configured w/960TBs raw capacity	<ul style="list-style-type: none"> <li>• Formatting &amp; RAID consumes (conservatively) ~ 25% of raw capacity</li> </ul>
Sophisticated data reduction technology increases effective usable capacity	<ul style="list-style-type: none"> <li>• Effective usable capacity depends on data dependent data reduction ratios</li> <li>• Data deduction ratios range from 2:1 to 5:1 of usable capacity</li> <li>• Effective usable capacity then ranges from 1.44PB to 3.6PB</li> </ul>
5 yr Total Cost of Ownership (TCO) for this standard Nexsan Unity6530	<ul style="list-style-type: none"> <li>• \$420,279 – based on street prices</li> <li>• Includes 5 yr premium 7x24x365 4 hr onsite services</li> <li>• Includes power and cooling costs @ \$.11/KW hr</li> <li>• Includes annual rack cost @ \$12,000</li> </ul>
5 yr TCO for this Nexsan Unity6530 configured for high performance	<ul style="list-style-type: none"> <li>• Includes 2x DRAM and a flash SSD FASTier cache of 1.6TB per controller</li> <li>• NOTE: there is no AWS S3 comparable</li> <li>• \$477,327 based on street prices</li> </ul>

## CALCULATING THE COSTS

Running the numbers reveals some staggering numbers. AWS S3 will cost **\$1,451,799<sup>1</sup>** over 5 years versus the Nexsan Unity having a 5 yr TCO of between **\$420,279<sup>2</sup>** and **\$477,327<sup>2</sup>** depending on performance requirements. It means AWS S3 is **304%** to **345%** more costly than Nexsan Unity6530 on-prem.

These numbers do not reflect the additional cost of adding Enterprise File Sync and Share (EFSS) to the AWS S3 that comes standard with the Nexsan Unity. That adds approximately **\$62,534<sup>3</sup>** to the AWS S3 total over the 5 years for a total of **\$1,514,314<sup>4</sup>**. Using the average monthly total storage consumption of 695TB<sup>5</sup>, the average AWS S3 monthly cost/GB = **\$0.0363**. Using that same average monthly total storage consumption, the average Nexsan Unity6530 on-prem monthly cost/GB ranges from **\$0.0101** to **\$0.0115**. Breakeven for the Nexsan Unity6530 versus the AWS S3 typically occurs in less than 2 years or 24 months. Every month thereafter with the Nexsan Unity is money in the bank.

It's always possible that the AWS transit fees assumptions may be estimated a bit too high. Rather than debate the point it is a simple matter to eliminate them for the sake of argument. In doing so, the 5 yr TCO for AWS drops down to **\$908,436<sup>6</sup>**. Of course the EFSS doesn't change but again for the sake of argument it will not be included this time. In this grossly underestimated TCO scenario the AWS S3 is still more than twice as costly as the standard Nexsan Unity 6530 and almost twice as costly as the performance configuration. The average AWS S3 monthly cost/GB drops down to **\$0.0218**. Granted this is an unrealistically low estimate of the S3 costs. However, it's still a worthwhile exercise to demonstrate the point that public cloud storage is not less expensive than on-prem storage and is in fact substantially more costly.

<sup>1</sup>AWS S3 TCO calculations are based on the assumptions listed in the tables above and this equation: 60 month SUM total of AWS S3 storage costs + PUT, COPY, POST, and LIST S3 transit fees + S3 storage management inventory fees + S3 data storage analysis fees.

<sup>2</sup>Nexsan Unity TCO is based on the typical street price for these configurations and OpEx assumptions in the tables above.

<sup>3</sup>3rd party EFSS calculated based on assumptions in tables above summed total for all 60 months. User # calculated by dividing total consumed capacity per month by 2TB. Cost per month is calculated by multiplying the number of users by \$3.

<sup>4</sup>Adds the private EFSS service TCO to the AWS S3 TCO.

<sup>5</sup>Calculated by summing the storage capacity consumed each month during the 5 years and then dividing by 60.

<sup>6</sup>AWS S3 TCO calculation only based on the 60-month sum total of the S3 storage costs based on assumptions in tables above.



### Yeah but...

Then why do so many people believe that public cloud storage such as AWS S3 is less costly? Perception and reality do not always align. And as previously pointed out, public cloud storage costs are less if the timespan for that storage is 18 months or less. Other rationale includes:

- The business or organization does not currently have an IT data center.
- Or they want to get rid of the data center or data centers they have.
- Building or maintaining a data center and its infrastructure to house storage is a sizeable cost.

If the organization decides it does not want to have their own data center, then they do not want to have their own on-prem storage. Lower storage costs will not change that decision.

There are also several erroneously perceived public cloud storage technical advantages such as:

- Better data resilience because of data being stored in more than one data center and potentially out of region. Storing the data in multiple data centers only protects it in the event of the rare site disaster. It does not protect against human errors, human maliciousness, ransomware, malware of all kinds, or software corruption that needs some form of data protection such as zero capacity snapshots such as those provided with Nexsan Unity.
- Better data resilience because of erasure coding. Erasure coding only protects against disk or object storage node hardware failures. Similar, albeit a bit more robust than parity RAID, it adds significant latency affecting application performance or response time.

In the end, on-prem storage systems such as Nexsan Unity, offer more functionality (zero capacity snapshots, data reduction, higher performance, local control, and more) for a much lower total cost of ownership than public cloud object storage such as AWS S3.

And what about AWS Elastic File Services (EFS)? How does that compare? EFS is more than an order of magnitude (10x) more expensive than AWS S3 for storage at \$.30/GB/month plus EC2 costs. Meaning the same storage costs alone would be more than **\$12.5M** (does not include any EC2 costs). It is a non-starter and simply not a competitive public cloud storage alternative.

Solution Brief sponsored by Nexsan. About the author: Marc Staimer, as President of the 19-year-old Dragon Slayer Consulting in Beaverton, OR, is well known for his in-depth and keen understanding of user problems, especially with storage, networking, applications, and virtualization. Marc has published thousands of technology articles and tips from the user perspective for internationally renowned online trades including many of TechTarget's Searchxxx.com websites as well as Network Computing. Marc can be reached at marcstaimer@me.com, (503)-579-3763, in Beaverton OR, 97007.

### For more information on Nexsan Unity Storage

Web: [www.nexsan.com](http://www.nexsan.com)

Email USA: [sales@nexsan.com](mailto:sales@nexsan.com)

Email EMEA: [emeasales@nexsan.com](mailto:emeasales@nexsan.com)