ESG Economic Validation

Quantifying the Economic Benefits of the iTernity iCAS FS Archival Storage Platform

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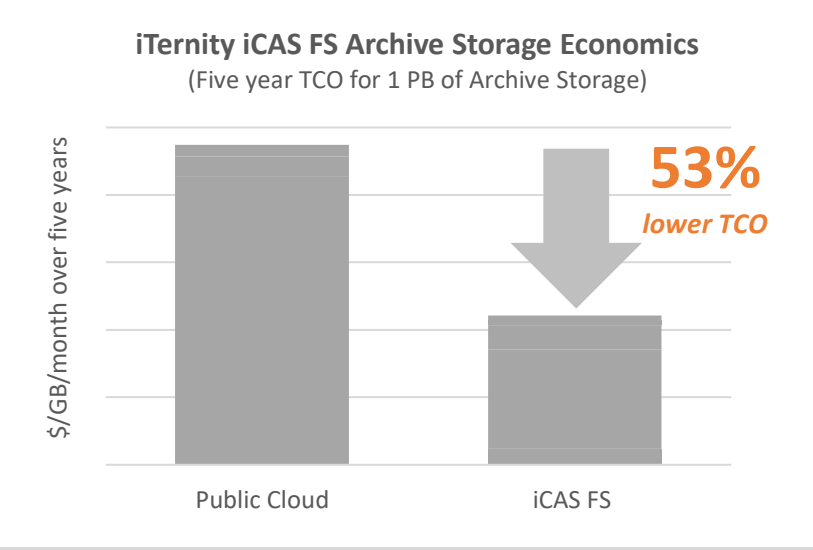
Executive Summary

iTernity iCAS FS combines the best features of on-premises and public cloud storage for compliance-driven archival workflows: low cost on-premises storage that scales without limits with a zero-touch support model and built-in compliance capabilities including WORM, retention management, and end-to-end encryption.

ESG completed a total cost of ownership analysis of iCAS FS across five categories—cost of storage capacity, maintenance and support, power and cooling, cost of capital, and storage administration—for a prototypical organization in the medical industry with a petabyte of archival storage.



ESG confirmed that the total cost of ownership for a one-petabyte iCAS FS archive ($0.0111 per GB per month) reduces the cost of delivering storage-as-a-service by 53% or more compared with the public cloud.

Introduction

This ESG Economic Validation quantifies the savings that can be expected when using iTernity iCAS FS as the cornerstone of an on-premises storage-as-a-service platform for archival and compliance compared with renting storage from a public cloud provider.

Background

According to ESG research, 94% of surveyed organizations are currently using public cloud computing services.[1] The public cloud is certainly an attractive option. The public cloud reduces the cost of owning and managing physical resources. It's quick and easy to deploy and ideally suited for temporary and unpredictable workloads. The initial entry costs are attractive—no large upfront investment is required. However, entry-level cost is only part of the story. Compliance and cost over time often matter more.

According to ESG research, 55% of organizations have moved one or more workloads from public cloud infrastructure services back to on-premises data centers. ESG survey respondents' top three most-cited drivers for this rising wave of cloud repatriation are concerns about data security, cost, and regulatory compliance.[2] These concerns are especially important for organizations with archival initiatives that are subject to strict compliance mandates (e.g., GDPR, HIPAA, GxP, GoBD). To do more, IT professionals need intelligent archival solutions that, at scale, allow them to securely archive data in a cost-effective way that fosters compliance.

iCAS FS

iTernity recently announced the availability of iCAS FS, a data storage archiving platform that's designed to securely store and manage large data volumes on-premises. Leveraging more than 15 years of experience delivering archival software solutions to more than a thousand global organizations in partnership with industry technology partners (e.g., HPE, Scality, SUSE) and a large ecosystem of software partners, iTernity has developed an on-premises scale-out archival storage platform that:

- Simplifies the deployment and maintenance of archival storage.
- Lowers the cost of archival storage with a hardware-independent, software-defined architecture.
- Enables the pay-as-you-grow simplicity of the public cloud at a fraction of the cost.

The balance of this report explores how iTernity iCAS FS provides a new choice that combines the best of both worlds: low-cost on-premises archival storage that's purpose built for compliance-driven archival workloads with a cloud on-premises support model and zero-touch operation.

[1] Source: ESG Research Report, *2020 Technology Spending Intentions Survey,* February 2020.
[2] Source: ESG Master Survey Results, *2019 Data Storage Trends,* November 2019.

ESG Economic Validation

ESG's economic validation process is a proven method for understanding, validating, and quantifying the economic value of an IT industry solution. The process leverages ESG's core competencies in market and industry analysis, forward-looking research, and technical/economic validation.

Economic Value Overview

iCAS FS is more cost effective than the public cloud for archival storage due to a variety of factors that can be classified into three major categories: cloud on-premises deployment and maintenance, future-proof software-defined storage, and pay-as-you-grow flexibility with no vendor lock-in. The combination of these economic benefits creates a foundation for a storage-as-a-service archival platform that's more cost effective than the public cloud.

Cloud On-premises Deployment and Maintenance

Nearly two-thirds (64%) of respondents to a recent ESG research survey indicate that IT environments are more complex than two years ago. The most commonly identified contributors to IT complexity were data growth, an ever-evolving cybersecurity landscape, and new data security and privacy regulations, such as General Data Protection Regulation (GDPR) in the EU.[3] The zero-touch deployment and maintenance model of iTernity iCAS FS virtually eliminates the complexity associated with supporting the compliance-driven archival needs of the business. iTernity reduces the cost and complexity of deploying and maintaining archival storage in a variety of ways:

- Factory integration of pre-staged appliances accelerates and simplifies initial deployment.
- iTernity engineers do everything associated with the on-premises deployment and installation.
- iTernity handles all of the on-premises configuration and support of an iCAS FS on-premises archive including setting up shares and permissions, monitoring automated self-healing of software errors, keeping track of redundant hardware failure alerts, and adding capacity to meet the demands of the business.

ESG analysis of the complexity associated with managing an archival storage solution (initial deployment, provisioning file shares and mount points, managing permissions, troubleshooting, maintenance, capacity planning, and capacity expansion) indicates that iCAS FS can be used to reduce the time and complexity associated with managing an archival storage platform by 61% compared with the public cloud and 76% compared with traditional on-premises archival solutions.[4]

61% less
time to manage with zero-touch operation model versus public cloud
$.00034/GB/month

iTernity's zero-touch operation model includes day-to-day management of file shares, mount points, and permissions, which delivers the majority of the time savings benefits compared with the public cloud. Those savings are magnified when compared with a traditional on-premises archive due to the fact that the zero-touch operation of iCAS FS virtually eliminates the time and complexity associated with capacity planning and growth.

[3] Source: ESG Research Report, *2020 Technology Spending Intentions Survey,* February 2020.
[4] 2 man-hours per month for 1 PB of iCAS FS archival storage versus 7 man-hours for public cloud and 17 man-hours for traditional on-premises archival storage.

Future-proof Software-defined Archival Storage

Renting storage from a public cloud provider reduces the time and expense associated with deploying and expanding storage infrastructure. This agility benefit of public cloud storage is great for transient and unpredictable workloads but can be cost-prohibitive over time for predictable workloads at scale—especially data-intensive workflows that are subject to data sovereignty restrictions and e-discovery mandates that add WAN egress fees to monthly cloud storage bills. iCAS FS reduces the cost of archival storage with a software-defined architecture that's future-proof.

- The iCAS FS software-defined archival platform leverages industry-standard x86 servers.
- Leveraging the latest advancements in industry-standard server and storage hardware, iCAS FS customers have the future-proof ability to take advantage of the latest hardware improvements and price reductions over time.

ESG compared the cost of purchasing and owning 1 PB of iCAS FS archival storage to the cost of renting object storage from industry-leading public cloud providers. A higher level total cost of ownership analysis that includes the cost of capital and data center environments will be presented later in this report, but at this point, it should be noted that ESG's analysis indicates that the cost of archival storage capacity for iCAS FS software running on HPE Apollo 4510 servers is 65% less expensive than the average price of three leading public cloud providers over five years. The iCAS FS cost advantage is primarily due to the price/performance advantages and capacity increases of the latest x86 servers and storage. With storage media capacities doubling every 18 months (and the cost per GB of capacity dropping by 50%), the cost of purchasing iCAS FS archival capacity deployed on the latest HPE servers is significantly less than the cost of renting storage from a public cloud vendor that hasn't changed the costs associated with renting a GB of object storage in the last two years.

65% less

cost of storage capacity versus public cloud

$.00736/GB/month

Pay as You Grow with no Vendor Lock-in

ESG research indicates an increasing interest in applying cloud consumption models to on-premises data center infrastructure. Specifically, 42% of IT leaders say they would prefer to buy infrastructure via a consumption-based model such as a variable monthly subscription based on resource utilization.[5] iCAS FS is well suited to meet this emerging preference with a pay-as-you-grow consumption-based licensing model with no hardware vendor lock-in.

- An iCAS FS archive starts as low as 20 terabytes of usable archive capacity and can scale to multiple petabytes with a zero-touch operation model that virtually eliminates the administrative effort associated with capacity expansion and growth.
- Additional iCAS FS archival licenses can be purchased in 1TB increments with discounts that kick in when an archive exceeds 500 TB of usable capacity.
- iCAS FS software runs on industry-standard x86 servers, which eliminates hardware vendor lock-in.

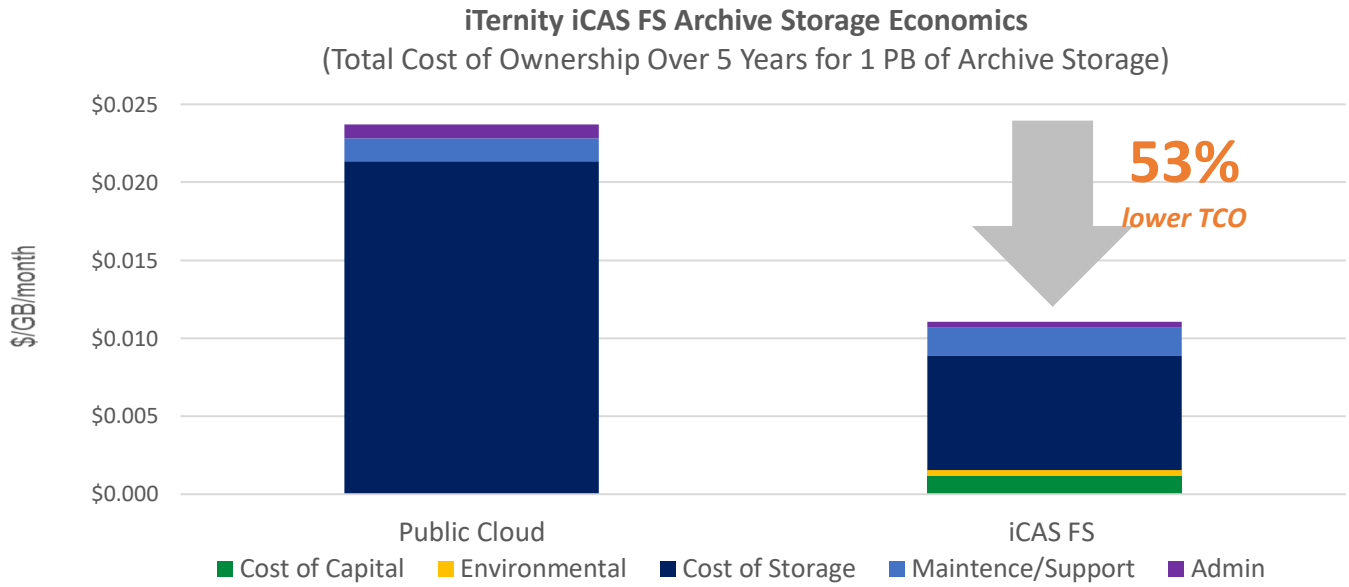
[5] Source: ESG Research Report, *2020 Technology Spending Intentions Survey,* February 2020.

ESG Economic Analysis

ESG created a five-year TCO model and applied pricing associated with each component—cost of capital, storage capacity, maintenance and support, power and cooling, and storage administration—for a prototypical organization in the medical industry that's shopping for 1 PB of usable archival capacity. Pricing was based on publicly available data and industry knowledge, and all costs were based on street pricing, which factor in typical discounts.

The average of the publicly available pricing for three industry-leading public cloud vendors was used to determine the cost of storage for the public cloud option shown in Figure 1. The cost of a four-hour service level agreement from a public cloud vendor, which is comparable to the iCAS FS support SLAs that were used for analysis, was included for support. The administrative costs associated with deploying, provisioning, and managing an archival storage solution were included.[6] Like public cloud storage, the iCAS FS analysis included the costs of storage, maintenance, support, and administration. Since the hardware stack resides on-premises, the costs of power, cooling, and capital were included as well.[7] The results are summarized in Figure 1 and Table 1.

Figure 1. Archive Storage TCO: iTernity iCAS FS versus Public Cloud



Source: Enterprise Strategy Group

Table 1. Archive Storage TCO: iTernity iCAS FS versus Public Cloud

$/GB/month	Public Cloud	iCAS FS
Cost of storage	$0.02133	$0.00736
Maintence/support	$0.00149	$0.00181
Cost of capital	$0.00000	$0.00118
Environmental	$0.00000	$0.00037
Admin	$0.00088	$0.00034
Total ($/GB/month)	**$0.0237**	**$0.01106**

Source: Enterprise Strategy Group

[6] Business-class support (24x7 electronic access to cloud support engineers and one- to 24-hour telephone response time guarantees, depending on severity), and the analysis assumed a fully burdened full-time engineer (FTE) with an annual cost of $100,000.

[7] The average US cost of electricity as of December 2019 ($0.1027 per KwH) and a typical co-location fee for data center floor space ($9/month/40U) were used to calculate the cost of power, cooling, and space. An annual percentage rate (APR) of 6% was used to calculate the cost of capital.

ESG economic modelling indicates that the total cost of ownership for a one-petabyte iCAS FS archive ($0.0111 per GB per month including the cost of capital, power, space, and cooling that's associated with on-premises storage) is 53% less than the cost of public cloud storage ($.0237/GB/month) over five years.[8]

Other Considerations

A variety of factors that influence the choice between iCAS FS and public cloud storage were not included in the ESG TCO analysis, but should be considered:

Public cloud storage surcharges. The cost of a public cloud storage solution typically includes network egress fees (fees for network bandwidth to retrieve archive data from the public cloud) and IOPS fees (fees based on performance: more archive I/O operations per second costs more). These fees can vary significantly depending on the amount of archive data that is read by e-discovery, compliance, and data analytics applications. These archive egress fees for organizations that typically experience read rates of 20-30% of the size of the archive per year were not included in this TCO analysis. Including these surcharges would increase the cost of a public cloud archival solution and magnify the TCO benefits of iCAS FS.

Business continuity. ESG modelled a two-site iCAS FS deployment for redundancy and recoverability. iTernity iCAS FS supports streched clusters by switching smartly between synchronous and asynchronous replication, depending on the current latency between two data centers. The public cloud scenario that was modelled in this TCO analysis was deployed in one region and does not include the storage and networking costs associated with replication between cloud regions. Including such costs would more than double the cost of the public cloud solution and the TCO advantages of the iCAS FS solution.

Hardware cost reduction over time. The iCAS FS is a software-defined solution that runs on industry-standard x86 servers with industry-standard storage devices. As hardware prices erode over time, those savings can be realized as organizations grow to meet their storage archiving needs of the future.

RAID-6 versus Erasure Coding. The iTernity iCAS FS architecture uses a distributed file system with RAID-6 and replication instead of erasure coding with a goal of providing cost effective recoverability after a disk or site failure. Erasure coding requires less disk capacity for recoverability, which reduces the cost of extra storage media for protection, but those savings don't necessarily lead to a total cost of ownership benefit for an on-premises archiving deployment. Erasure coding algorithms are CPU- and memory-intensive, which increases hardware costs—especially for smaller archives that can't justify the cost of more than two servers and three sites for erasure coding. In ESG's opinion, an iCAS FS configuration with a minimal requirement of two data centers with at least one server in each data center will typically be more cost effective than an archiving solution with erasure coding.

Compliance readiness. Leveraging iTernity's heritage of developing archival software solutions for compliance-driven applications and industries, the iCAS FS platform supports a variety of optional features that are available at no additional cost:

- Encryption of archive data in transit, at rest, and between iCAS FS nodes for intercluster communication.
- Write once, read many (WORM) support ensures that archival data has not changed since it was archived.
- Retention management enables the definition and enforcement of policies that dictate the length of time that iCAS FS archival data is retained and what to do with that archival data after the retention policy has expired (for example, secure delete).

[8] The cost of iCAS FS storage per month over five years was compared to the average of the publicly available on-demand price for "standard" object storage from three leading public cloud vendors.

- **Ransomware protection.** WORM files stored in iCAS FS cannot be modified or deleted. There is no customer administrator with direct access to a closed iCAS FS solution with a hardened Linux operating system. The "IT attack surface" is minimized in iCAS FS, so it is very difficult for malware to impact archive integrity and availability.
- **GDPR Compliance:** A KPMG audit has confirmed that iCAS FS is GDPR compliant.[9] The KPMG audit includes confirmation that the iCAS FS "Special Delete" feature meets the GDPR "right to be forgotten" compliance mandate.

The level of savings that your organization will achieve depends on a variety of factors, including the specific public cloud provider you're considering, your capacity requirements, and the cost of capital for your organization. That said, if your organization plans on delivering archiving services that need a petabyte or more of storage, then ESG is confident that the economic benefits of iTernity iCAS FS will hold true.

The Bigger Truth

A growing number of organizations are struggling with the choice between public cloud and on-premises storage to meet the archival needs of the business. iTernity provides a new choice that combines the best of both alternatives—low-cost on-premises archival storage hardware with a cloud on-premises deployment and maintenance model. ESG completed a five-year total cost of ownership analysis for a typical archival application in the medical industry. We found that the total cost of ownership for a one-petabyte iCAS FS archive ($0.0111/GB/month) can yield a total savings of up 53%, or more, compared with public cloud.

If your organization is looking for a storage solution that can provide the foundation for a cloud on-premises archival-as-a-service offering for your organization, then ESG believes that you should consider the economic advantages of iTernity iCAS FS.

[9] https://www.kpmg.de/bescheinigungen/RequestReport.aspx?4930D964A0CC4A63A78978DC58AC5494