

White Paper

The Value of Tape in, and to, the Cloud

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The Cloud Matters

One can't have an IT transformation conversation today without considering "the cloud" in some way. ESG has tracked the increased adoption and usage of cloud computing over the last several years, as well as the simultaneous ascent of these services as a cost mitigation strategy over that same period (see Figure 1).¹ In the seven years that ESG has conducted the annual research, not only has cloud use appeared among the top ten IT priorities each year, but its upward trajectory also shows no signs of slowing down.

Figure 1. Relative Ranking of Cloud Computing Services as an IT Cost Containment Measure, 2009 to 2015

	2009	2010	2011	2012	2013	2014	2015
1.							
2.							2/9
3.						3/9	
4.							
5.				5/9	5/9		
6.							
7.			7/9				
8.							
9.	9/9	9/9					

Source: Enterprise Strategy Group, 2015.

According to the latest survey, for the fourth year in a row, more organizations said they would increase spending on cloud computing services than on any other area of technology. Specifically, 66% of respondents said their 2015 cloud spending would increase, 24% said it would remain flat, and only 10% expected their cloud spending to decrease.²

Why Is the Cloud So Popular?

Fundamentally, a cloud service doesn't offer anything that a large enterprise with discretionary budget and significant in-house expertise couldn't achieve on its own.

With that said, the fact is that organizations of all sizes struggle to balance competing priorities within their IT teams and across their business units. Such struggles diminish their ability to provide the levels of reliability and agility that cloud services can deliver.

Additionally, the cloud offers an appealing pricing model—organizations pay using a consumption-based OpEx payment plan, not an asset-centric, CapEx-heavy plan. Thus, cloud services enjoy the perception of being both highly reliable and economically attractive. (And, when considering cloud as yet another IT transformational platform, it should come as no surprise that [IBM](#), which has led so many platform revolutions before, is now a leader in cloud-based IT delivery.)

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¹ Source: ESG Research Report, [2015 IT Spending Intentions Survey](#), February 2015.

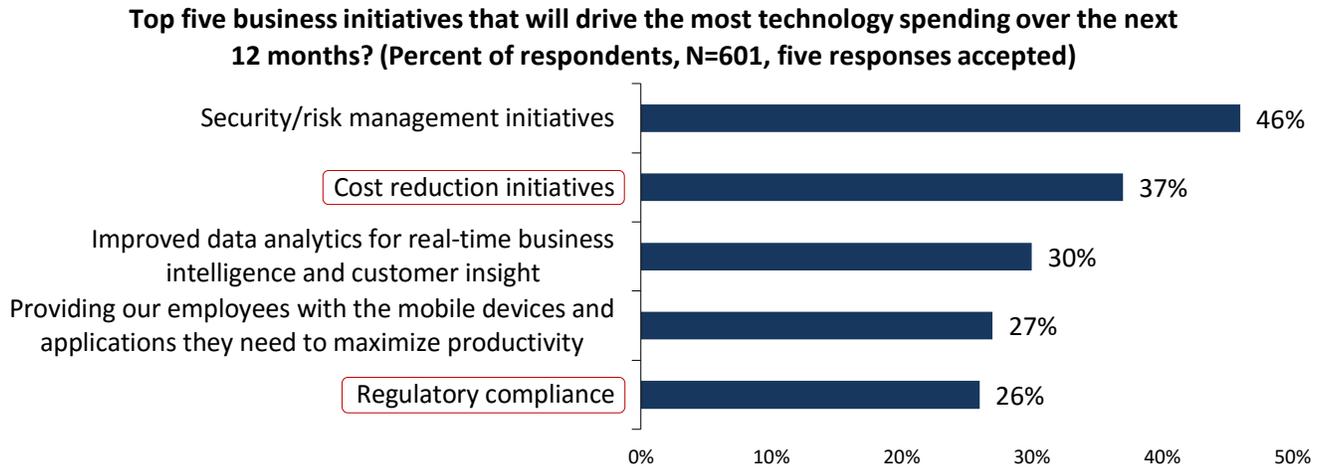
² *ibid.*

Tape Matters

Just as they are doing with cloud services, smart organizations also are incorporating tape into their storage strategies to support production and protection efforts.

In fact, ESG asked IT decision makers about the business initiatives playing the biggest roles in driving their IT spending and found that cost reduction was the second most-cited response, with regulatory compliance fifth (see Figure 2).³ Organizations achieve regulatory compliance in part by establishing a mature approach to data protection and preservation. But how can they protect and preserve *while reducing costs*? By using modern tape.

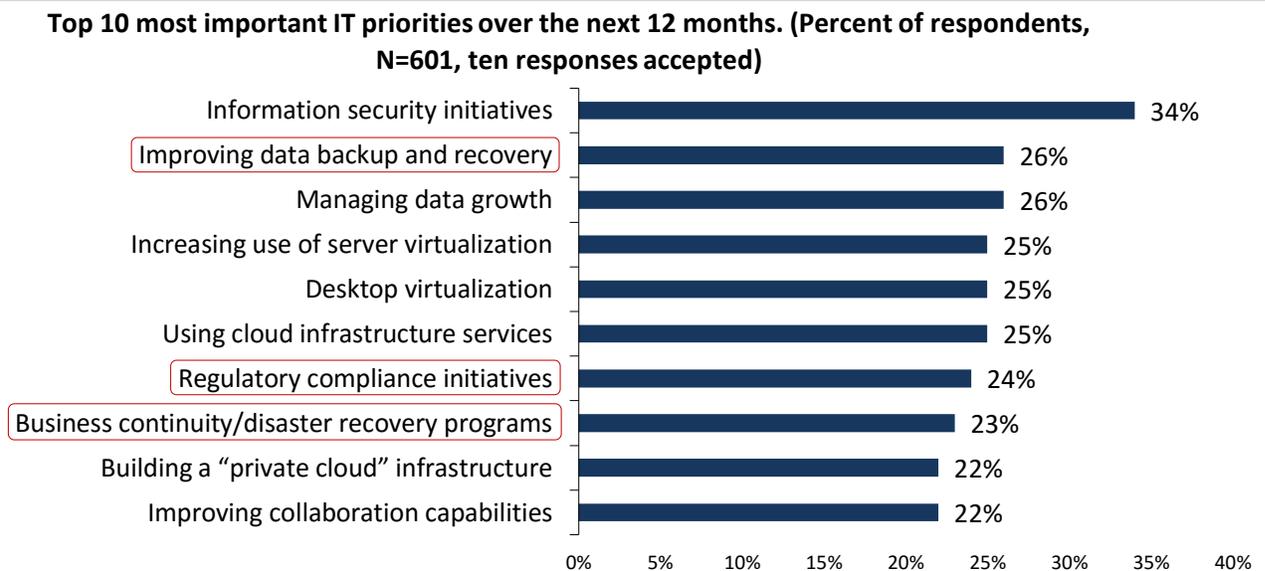
Figure 2. Top Five Business Initiatives Driving IT Spending in 2015



Source: Enterprise Strategy Group, 2015.

Similarly, as Figure 3 shows, improving data backup and recovery was the second most commonly cited IT spending priority reported by the survey respondents this year, with regulatory compliance seventh, and BC/DR eighth.⁴

Figure 3. Top Ten IT Spending Priorities in 2015



Source: Enterprise Strategy Group, 2015.

And those are just the data protection priorities. Consider also the third-listed priority (managing data growth), and it becomes clear that *how one stores data* ties directly into whether or not some major IT priorities will be achieved.

³ *ibid.*

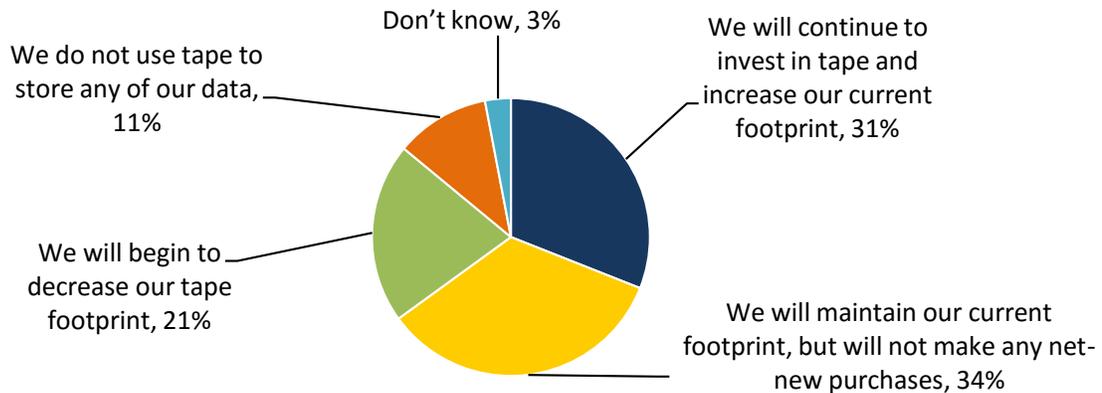
⁴ *ibid.*

Why Is Tape So Popular?

As organizations deal with ever-growing amounts of capacity that must be provisioned, managed, and maintained, the combined economic attributes and high-performance abilities of tape become quite compelling to IT decision makers. As Figure 4 shows, two-thirds of the organizations ESG surveyed report that they are either maintaining or growing their tape footprints.⁵

Figure 4. Organizations' Forward-looking Strategies for Tape Technology

What is your organization's forward looking strategy with regard to tape technology?
(Percent of respondents, N=373)



Source: Enterprise Strategy Group, 2015.

With the average annual growth rates of both primary and secondary/protection storage capacity exceeding 30%, organizations of all sizes are realizing that simply scaling their storage infrastructure linearly isn't sustainable.⁶ It's becoming equally obvious to IT architects that reassessing where data "lives" as well as how it is preserved should be of paramount importance. Using tape is a logical outcome of such assessments.

And again, as with so many waves of IT transformation that have occurred before, no one should be surprised to see innovation in this area coming from IBM. IBM plays a leadership role in the Linear Tape Open (LTO) initiative, and it sells enterprise-class tape offerings under the IBM TS1100 brand. IBM also boasts a longstanding data protection software pedigree in the form of Spectrum Protect, formerly known as Tivoli Storage Manager (TSM).

Tape Makes Sense in the Cloud

Too many IT architects and industry pundits incorrectly assume that "tape versus cloud" is a mutually exclusive decision. *Tape should be in the cloud:*

- The cloud provides an appealing alternative economic model complete with expertise and secure secondary facilities.
- Meanwhile, tape provides industry standardization, portability, and longevity.

Modern IT environments deserve the chance to leverage all of those advantages. Indeed, ESG believes that one of the next industry trends to unfold will center on the higher utilization of tape within public and private cloud providers.

It will happen for reasons that are both **operational** and **financial** in nature.

⁵ Source: ESG Research Report, *2015 Storage Market Trends*, to be published.

⁶ Source: ESG Research Report, [Backup and Archiving Convergence Trends](#), April 2014.

Tape Makes Sense for Operational Reasons

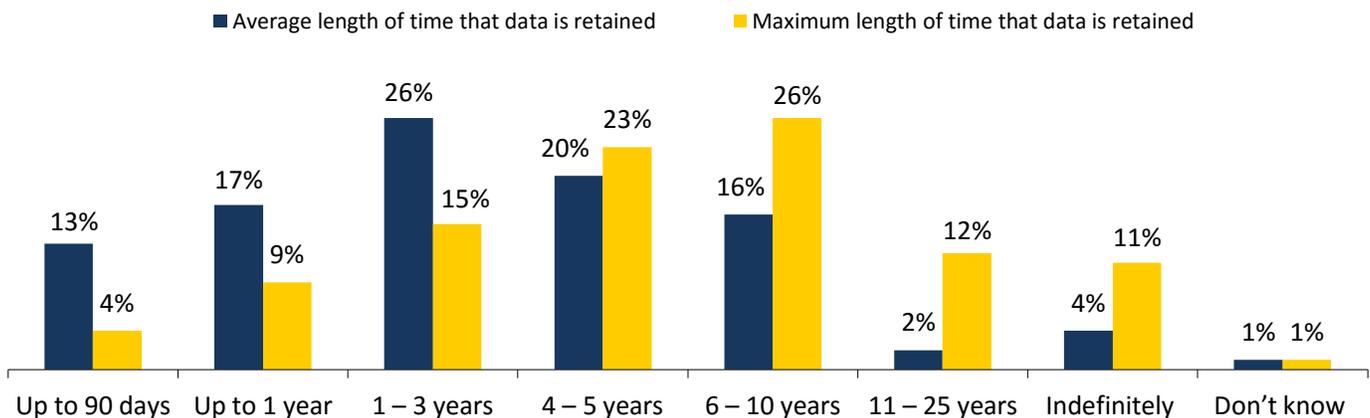
As mentioned, **cloud services** simply represent an alternate delivery/economic version of what a large enterprise with sufficient budget and skilled staff could build and run by itself. In a sort of parallel, the same drivers that make **tape** compelling to those enterprises also make tape functionally and economically desirable to managed service providers (MSPs). They deal with the same burdens of scale, the same data-longevity requirements, and the same need to reduce internal costs as much as possible before passing the costs onto subscribers.

When a cloud provider chooses to use tape, it's a choice that benefits scenarios—related to BC/DR, security, and long-term retention—that most IT organizations are very familiar with:

- **BC/DR**—As a means of protecting data to support BC/DR preparedness, tape provides long-term durability and portability. Tape-stored data ensures that cloud providers (just like large enterprises) will have the data they need when they need it, but with a much more desirable cost model than what a cloud-based *disk* farm could offer. While a percentage of servers will utilize cloud-disk for DRaaS scenarios, platforms not requiring immediate failover can benefit from the more economical protection of tape.
- **Physical and system-level security**—Cloud providers are responsible for ensuring the security of the data they keep custody of on behalf of their clients. It cannot be overstated, therefore, that as a complement to the *in-flight* security that cloud solutions often provide, encryption *at rest* can often be easily accomplished by leveraging the built-in encryption mechanisms of contemporary tape cartridges.
- **Long-term retention**—Many organizations report storing data for more than five years (see Figure 5).⁷ Most of them cannot afford to store it all in a disk-only architecture. Thus, they will continue to use self-managed tape as a long-term repository in conjunction with disk-based backups for fast restoration. Organizations choosing a cloud-based service for tertiary storage should also expect to be leveraging tape for long-term data retention: It's a way to gain the same economic and longevity benefits that self-managed tape provides.

Figure 5. Average and Maximum Data Retention Requirements

To the best of your knowledge, what would you say is the average length of time that your organization retains backup data? What would you say is the maximum length of time for which your organization retains (or is required to retain) backup data? (Percent of respondents, N=375)



Source: Enterprise Strategy Group, 2015.

Organizations are moving from a traditional disk-to-disk-to-tape (D2D2T) approach to a disk-to-disk-to-cloud (D2D2C) model for their tertiary data. If those organizations are highly regulated or audited, they should be wary of any cloud provider that *doesn't* use tape.

⁷ Source: ESG Research Report, [2015 Trends in Data Protection Modernization](#), September 2015.

Why? Because if the cloud provider only uses disk, and the subscriber later wants to move its long-term data out of that cloud and into another provider's cloud, the subscriber will lose "chain-of-custody" assurance that the reconstituted data is still authentic.

The *only* way that any cloud provider can offer a long-term alternative to self-managed tape is for the provider to use tape also. In that way, the data will remain pristine over its long preservation lifecycle.

Essentially, there is no less reason for tape to be used in the cloud than in a big, efficient data center. In fact, as the chain-of-custody example shows, there are some situations in which it is *more* important.

Tape Makes Sense for Financial Reasons

A well-managed in-house IT infrastructure and a well-managed cloud infrastructure have the same requirements related to operating at scale under the lowest possible cost model—including the aforementioned requirements for BC/DR preparedness and long-term data retention. As such, it behooves cloud providers to take advantage of the storage agility and good economics that tape provides, both for their own use and for the benefit of their subscribers.

The amount of in-house storage acquired by an enterprise, plus the amount of labor to manage that storage, is roughly equivalent to what an MSP would pay to acquire the same amount of disk storage and pay for labor, power, and cooling. In other words, a cloud provider that uses a disk-only architecture cannot offer its subscribers fundamentally lower long-term costs versus what those subscribers could achieve on their own. In fact, a disk-only MSP's charged prices might actually be higher in the long term: After all, they do need to make a profit.

For an MSP to offer a long-term, economically desirable offering to its subscribers, it has to operate according to a cost model that internally costs less than what an enterprise's would.

In this case, it means the MSP has to use something that costs less than disk—i.e., tape.

In many ways, MSPs do resemble large enterprise IT organizations. However, many MSP subscribers are notably smaller than an enterprise of 1,000 employees or more. Just as large enterprises can run efficiently at much larger scales than mid-sized companies can, MSPs can run under an economically appealing model, even at great scales. In fact, larger MSPs can operate in an even more optimized manner, with costs reducing even further.

Tape, Cloud—and IBM

As mentioned earlier, based on IBM's pedigrees in data protection and data management in the form of a software portfolio, a tape hardware portfolio, and a cloud services offering portfolio, the vendor is in a unique position to provide high-value tape/cloud solutions. Those solutions can come not only through its own platforms, but also through its broad global network of partners. IBM has longstanding leadership in software-defined storage for tape, including:

- **High Performance Storage System (HPSS)**.
- **IBM Spectrum Protect**, formerly known as Tivoli Storage Manager (TSM), for backup and recovery.
- **IBM Spectrum Archive**, utilizing IBM's introduction of the open-format Linear Tape File System (LTFS).

Between IBM's solution offerings, its long pedigree of delivering IT systems at large scale (which is what all cloud providers fundamentally deliver), and its vast ecosystem of business partners, it would be reasonable to watch for IBM's presence in helping to combine the better aspects of cloud services and tape solutions moving forward.

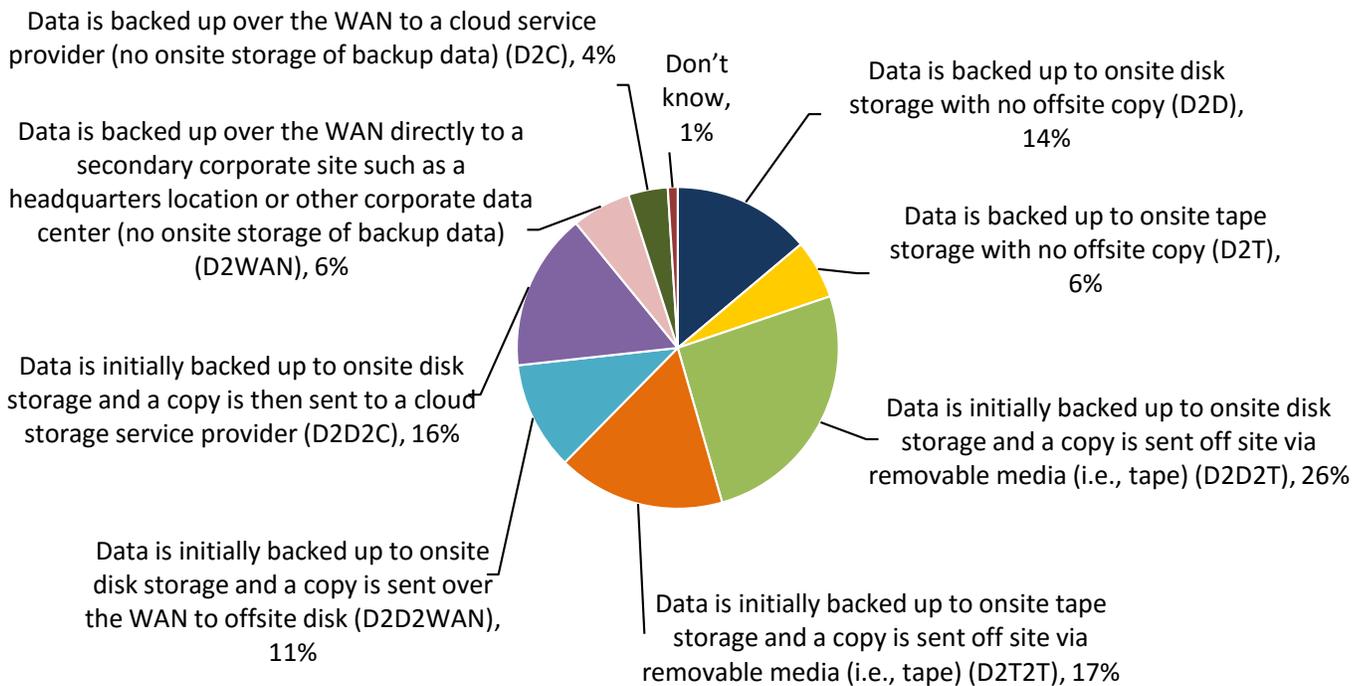
The **ONLY** way that a cloud provider can offer a long-term alternative to self-managed tape is for the MSP to use tape also. In that way, the data will remain pristine over its long preservation lifecycle.

Market Analysis: Tape Is the Future of Cloud

As stated, all the reasons why today’s *modern* tape is so sensible for enterprise IT infrastructures also apply to modern MSPs. An obvious realm in which tape is (and should be) getting mindshare is in the area of data protection/data preservation.

Figure 6. Organizations’ Primary Data Backup Process

Thinking about your organization’s environment today, which of the following best describes how the data backup process is generally managed? (Percent of respondents, N=375)



Source: Enterprise Strategy Group, 2015.

Figure 6 paints a picture of tape’s prevalent usage today:⁸

- A combined **49%** of the organizations surveyed by ESG rely on tape as part of their primary data protection architecture.
- A combined **23%** of the surveyed organizations rely *solely* on tape.
- In contrast, only **16%** of the surveyed organizations leverage D2D2C solely.
- Similarly, only **4%** of the surveyed organizations send data directly to the cloud for protection.

Of course, it is reasonable that some organizations will decrease their use of tape based mainly on a desire to avoid managing the cartridges themselves (from a space or operational perspective), even though they covet the economic and long-term durability aspects of tape as a format—which brings us back to the argument for tape in the cloud.

Those organizations might reflect the main use case in which cloud service providers are retained to provide a tertiary container for long-term data protection. But, again, the only way for cloud service providers to

⁸ Source: ESG Research Report, [2015 Trends in Data Protection Modernization](#), September 2015.

economically, functionally, and reliably offer truly long-term data preservation is to, ironically enough, *use tape themselves*.

To put it another way, if an IT organization of meaningful size chooses to leverage the cloud instead of tape for its longer-term retention and BC/DR scenarios, but the cloud service provider it selects does not use tape, then the organization is almost guaranteed to (1) experience a higher-than-necessary long-term cost outlay, and (2) be putting its oldest and most compliance-sensitive data at risk, thanks to that disk-only-based MSP model.

The Bigger Truth

One of the most exciting transformations in IT over the last decade has been the mainstream evaluation and adoption of cloud-based services to enhance and bolster almost every aspect of IT.

It's an exciting transformation not only because of the fresh, appealing alternative economic model that the cloud offers, but also because the cloud gives organizations an effective way to leverage outside experts who have a laser-like focus on delivering reliable service, thereby allowing the organization's IT professionals to spend their own energy focusing on strategic business initiatives and IT management.

All indications are that the cloud-usage transformational trend will continue in 2016 and beyond. But it's important not to recklessly discard all of the "old ways" during this transformation.

Like the cloud, tape has made great strides—evolving independently in capacity, durability, and data-access capability while maintaining its economic benefits. As a result, today's tape is just as well suited to cloud service providers as it is to the enterprises and mid-sized organizations that rely on it to support their production and protection strategies.



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