



## Enterprise Storage – Have It Your Way

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### It's Time to Think Differently

I hate to admit it, but times have changed. It used to be that you would buy best-in-class storage products (both software and hardware) and assemble them into an enterprise-class solution – on the assumption that the sum of the parts would be better than any one vendor could offer and, importantly, you could get the benefit of a pricing “shoot-out” for each of the competing category vendors. This was the presumed best practice. However, today, “not so much” – on both factors.

No doubt, in the past we were focused more on storage hardware; in particular, we wanted to find the right storage hardware for the intended use and server connectivity. Today, our thinking has become “clouded”. While “storage in the cloud” now has a noticeable presence, even as a concept within enterprise data centers, it is “clouded thinking” that has had a greater impact. By clouded thinking, I mean that we don’t see as clearly the storage that sits in (or on the other side of) the virtualization that separates what is being stored from where and how it is actually stored. This is a good thing and has been a long time coming.

Thus, instead of focusing on the devices on which things are stored, we now can leave that physical reality and focus on satisfying the business and legal requirements for what is being stored. In an era of hardware commodization<sup>1</sup>, the focus moves to software – and rightly so. While we still might choose to have storage hardware in our enterprise data centers (for a long list of reasons), what we really now want is the ability to envision and use storage as we see fit, which of course will be an evolving and moving target and may incorporate storing some data in a distant, private or public cloud. While I sit here humming the old Burger King jingle “Have It Your Way”, I think that is exactly what we want. *Being able to have it your way* is the new mantra of enterprise storage.

This, of course, is more about finding the right storage architecture and software solution that can deliver the desired availability and protection at the best unit cost of storage, at every tier, than it is about the infrastructure being deployed at each tier. Nonetheless, the components of that infrastructure are critical parts of the equation. It just is a reversal of which is more important – now the cart goes before the horse.

Finding the right storage architecture requires that you either know exactly what you need and want today (and for the next few years) or that you will find a world-class technology-integrating framework that is capable of giving what you need now and will be able to handle or evolve into whatever you might need in the future. This clearly is more about finding the right integrative storage software solution than it is about choosing today’s best-in-class underlying storage hardware.

This change has happened for many reasons, but these two may be the most significant:

- Given a preference, enterprise data centers no longer want software that only works on one-of-a-kind hardware (i.e., on a platform solution that can be provided by a single vendor).

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<sup>1</sup> This commodization is driven by many factors, but most important is the fact that almost all of what is being delivered as storage solutions is built on competitively-similar hardware from a handful of vendors. This is true of hard disks, RAM, flash memory, and tape. While there are exceptions and while there always will be components that have leapfrogged over the competition, the components world is one where falling behind means being left behind. This, of course, almost always results in there being fewer suppliers, as most IT suppliers don’t set out to be a commodity supplier.

- Assuming that one buys the most cost-efficient and use-effective storage hardware at each tier, the TCO optimization focus moves to the per terabyte software costs and per terabyte administrative costs (and away from per terabyte hardware costs).

There might be a third, albeit softer, factor – compared to decades past, most of us now are willing to buy more from a single vendor and make a commitment to that vendor (but only as long as there isn't infinite lock-in). In an era of open solutions, this is expected.

### Defining An Integrative Storage Architecture/Solution

What is it that we seek from an integrative solution? First, let's define what I mean by integrative.

- Integrative – serving or intending to unify separate things

In this case, integrative storage architecture means something capable of unifying separate (and likely different) storage hardware. Over the decades, this has been attempted at many levels – from standard electrical/magnetic and protocol interfaces for storage devices (like IDE, Fibre Channel, SATA and SAS for disks and LTO for tape) and networking (Ethernet) to common storage management protocols (like SNIA's Storage Management Initiative Specification (SMI-S)).

For most of the first five decades of storage history<sup>2</sup>, each storage vendor provided storage management methodologies, APIs, and administrative software that were unique to (i.e., specifically designed for) a given product line, i.e., there was no widely-applicable or universal solution. With time, this has changed. Today, many storage vendors offer administrative solutions and access methodologies that work across multiple vendors' storage hardware products. If sufficiently integrative and universally-applicable, these tend to be much more durable (in terms of their longevity of usefulness) than the underlying hardware, which may be upgraded or replaced as often as every few years. (Thus, the “cart” for “carrying” the data becomes more important than any single “horse”, because it is more durable, especially if it continues to evolve

<sup>2</sup> Depending on where (and on what product) you say is the beginning of storage as we now know it, we are in the sixth or seventh decade, based on the widespread use of magnetic tape for storing data in the 1950s and 1960s. Since I wrote my first code in 1966, my perspective spans the last five decades.

in place. One way to measure the “worthiness” of the integrative solution is to assess its universality. The more that it can integrate (in a meaningful way), the more worthy or valuable it becomes.

This clearly is much more about the capabilities of the integrative software than the underlying server infrastructure on which it runs. While there are many server platforms that might be used to handle the storage placement and delivery, administration, and management, the server is much less of a differentiator, as long as it doesn't mandate vendor lock-in. Thus, what we seek is a utilitarian approach to storage management and optimization that is integrative and universal and, of course, affordable. Stated differently, the ability to be widely connectible is only the baseline requirement; it's the “ante” or stake to play in the integrative storage game, but not sufficient to be the winner. It also has to be:

- **Utilitarian** (fully-functional, i.e., useful),
- **Easy to use** (if not largely automatic, i.e., driven by policies), and
- **Self-optimizing** (in terms of tier placement, read and write performance, and cost).

These summarize the integrative requirements for what now is being called “Software-Defined Storage”.<sup>3</sup>

### You Probably Still Need Multiple Tiers of Storage Hardware

Like those annoying TV commercials that say “but there is more”, I need to remind you that more than a Software-Defined Storage solution is required. You need minimally-performant (able to meet the minimal performance and protection requirements) and cost-efficient (lowest cost per terabyte of data) storage hardware at every tier that you deem to be necessary. These range from all-flash (and other all-electronic) storage platforms, to rotating disks, to tape, and others. Whether you are buying scale-up or scale-out storage platforms, you need to have storage hardware platforms, which are the “horses” that allows the “cart” to deliver the universal solution that you require.

While you might say that you already have a

<sup>3</sup> See the February 25, 2015, issue of *Clipper Notes*, entitled Simplifying Storage Management with Software-Defined Storage, which is available at <http://www.clipper.com/research/TCG2015003.pdf>.

lot of storage platforms at a lot of tiers, the reality is that you will need to buy more, sooner or later – and most likely sooner. While compression and deduplication (common methods that some software-defined storage solutions provide) may allow you to store more on the storage that you already have, you no doubt will need more and, ultimately, will replace all that you have.

### To Double Down – or Not?

This brings up a very important question – do you buy both hardware and software from one vendor, or many? The answer to that contentious question might be summed up in a single question – do you want to be the integrator of solutions from many storage vendors ... or not? The old-timer in me says “be the integrator”, because that might provide the best and/or most cost-optimized solution. But now I am going to say “don’t be the integrator” unless that’s the only way to get to where you need to be. You want to let the lead vendor do as much of the hardware qualification and optimization as you can. If you start with a lot of existing hardware, this might be your strategy for meeting future data growth. Thus, you need to explore the integrative software and future storage possibilities long and hard before deciding that no one storage vendor can do and deliver what you need and want to do.

What you seek is a provider that can give you whatever you want (a cost-efficient, performant and effective solution for managing data stored at many tiers). By definition, few vendors are capable of delivering what you want – the way that you want it (I’m still humming “Have It Your Way”), because that vendor needs to be delivering world-class solutions across a broad spectrum of hardware platforms, in addition to having a robust, multi-faceted storage software solution.<sup>4</sup> While there are hybrid storage platforms that might span several-to-many of your tier requirements, at the end of the day, if your storage requirements are large and the demands are great, you probably will be better off going with focused platforms at each tier and letting your storage software solution manage and optimize each tier and, when appropriate, move data between the tiers.

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<sup>4</sup> And, if this is important to you, you would have just “one throat to choke” rather than many.

### Recommendations – Have It Your Way

First and foremost, you need a universally-applicable software-defined storage solution and very good storage platforms, and every tier of your storage architecture. These days, this just makes good sense.

Second, you should seek to engage with as few storage vendors as is possible, as long as you can do so without feeling trapped in your relationship with that vendor or with those vendors. If you can see doing this with one vendor, don’t rule that out before exploring the possibilities.

Regardless, continue to hum “Have It Your Way” (in your head, unless you want to start a chorus), because that is what you want and deserve.



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