

# Top 10 Myths About Flash Storage

The use of flash storage in data centers is gathering a lot of momentum. The solid-state array market grew from about \$240 million in 2012 to about \$670 million in 2013, according to research from Gartner.<sup>1</sup> Strong growth is expected to continue: IDC predicts that the market for all-flash arrays will grow at a compound annual rate of almost 60% a year, bringing the overall market to more than \$1.2 billion by 2015.<sup>2</sup>

There is good reason for this gathering momentum. Legacy hard disk drive (HDD) solutions have performance limitations, particularly when it comes to IOPS. These limitations can affect the performance of critical applications—particularly among I/O-intensive workloads such as online transaction processing (OLTP), virtual desktop infrastructure (VDI), high-performance computing and big data analytics.

Flash addresses some of the performance challenges of HDDs—especially when it comes to IOPS and latency—and flash prices have come down significantly during the past few years, to the point where flash is now competitive with HDDs. What's more, some of the leading flash array vendors have ensured that their solutions address the broader concerns of enterprise IT leaders, particularly around issues such as reliability, resiliency, integration with legacy architectures, durability and availability of features such as deduplication, compression, snapshots and replication.

All of the hoopla around flash has created a groundswell of activity that has been exciting on one hand, but also confusing and somewhat lacking in clarity about what flash really can and can't do for an organization. Part of the confusion has been driven by the infusion of startup companies looking

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<sup>1</sup> ["All-Flash Arrays Offer Strong Opportunity for NetApp Despite Competition,"](#) Forbes, June 26, 2014

<sup>2</sup> ["All-Flash Array Performance Testing Framework,"](#) IDC, June 2013



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to differentiate themselves from the more established vendors. Also, because flash in the enterprise is a relatively new phenomenon, IT leaders are still discovering where, when and how much flash is necessary to address their specific workload and application challenges.

As a result, there are some widely held beliefs about flash that may not be particularly accurate or true. In this article, we look at the top 10 myths about flash storage and reframe them with a heavy dose of reality.

**Myth No. 1:** It's all about IOPS.

Actually, it's not all about IOPS. IOPS are important, of course, but the reality is that all flash vendors use basically the same solid-state devices (SSDs), so the IOPS performance differential among vendors is not all that significant. Besides, most all-flash arrays deliver more IOPS than the applications or compute/network infrastructures can push to them.

The response time of those IOPS is key—so, in reality, performance is much more about latency than about IOPS. As noted by leading storage analyst George Crump of Storage Switzerland: “Server-side flash is all about performance, and the key performance differentiator is latency. Latency is the time required to complete a transaction between a host and a storage system, such as a read or write operation.”<sup>3</sup>

So when considering flash for the enterprise, make sure to understand the latency characteristics of the solution. You should typically expect latency of less than 1 millisecond and, in fact, you should require sub-1-msec latency for business-critical applications.

**Myth No. 2:** Flash is more expensive than traditional spinning disks.

While technically true, the gap between the two is much narrower than is commonly cited and is getting smaller all the time as economies of scale and increased volume continue to drive down the cost of SSDs. By utilizing data reduction technologies such as inline deduplication and compression, IT organizations can take advantage of more usable space on flash devices, making the cost of flash much closer to HDDs, if not equal altogether.

In addition, any thorough total-cost-of-ownership analysis will examine a range of other issues when comparing overall costs, and will go beyond the raw numbers. For example, flash drives consume far less energy than HDDs, enabling additional cost savings. Also, flash storage is typically more reliable and resilient than HDDs. So your applications are not only performing better, but they are also likely experiencing greater uptime as well.

Finally, some thought leaders argue that the traditional measurements of cost are not necessarily appropriate when comparing flash with HDDs, as can be seen in the next myth, which is...

**Myth No. 3:** It's all about cost per gigabyte.

Yes, cost per gigabyte has been the typical measuring stick for storage for many years. But we are in a new era now, with different expectations. In the very near future, it is likely

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<sup>3</sup> “Quick Guide to Storage Latency Wars,” *InformationWeek*, Oct. 29, 2013



that there will be two tiers of storage: Performance-oriented storage, i.e., flash, for Tier 1 production environments; and capacity-oriented storage, i.e., SATA, for bulk storage such as backup, archiving and recovery.

In this new era where performance is the driving force behind Tier 1 storage, does it really make sense to measure costs based on an old paradigm from a storage architecture that is more than 20 years old? In legacy HDD storage environments, excess capacity was often needed to meet the IOPS requirements for a specific application, so measuring costs on a per-gigabyte basis made sense.

With flash, however, that extra capacity is not required, so it's not about capacity; rather, it's about performance. Therefore, many savvy organizations are measuring flash by a newer and more appropriate metric: Cost per IOPs, as opposed to cost per gigabyte. When comparing flash with HDD using this metric, flash offers cost advantages that are orders of magnitude greater than HDDs.

**Myth No. 4:** Flash fixes everything.

In technology, when a bandwagon starts rolling there is often no stopping it. As flash has gained momentum it has picked up the aura of a technology that can do everything for every workload and every application. This is simply not the case and, in fact, there are many applications and scenarios where deploying flash storage is a waste of money and resources.

The obvious examples of flash overkill would be any non-performance-dependent workload, such as backup, archiving and recovery. But even within some of the more modern applications, flash can be overkill.

For instance, think of a streaming video workload. In this application, you need to stream a certain number of frames per second. There is no advantage to going any faster, so why would you need to pay for the added performance of flash? Another example would be an environment where there is a lot of data that requires access, but not on a regular basis, such as a use case where a solution is dedicated to regulatory compliance.

**Myth No. 5:** Flash drives wear out quickly.

This myth is a remnant of the earlier days of flash, before some of the leading vendors focused on building architectures for flash that were optimized for enterprise environments. True, over the course of its life span a solid-state drive will be able to perform only a finite number of writes.

But in reality, based on the design of flash solutions and the anticipated life span of the device, most flash drives will never reach the point where they have to be replaced because they have exceeded the number of allowable writes. Leading storage vendors have been able to incorporate designs that minimize the number of writes, particularly vendors that offer options for hybrid arrays that combine flash with HDDs.



One other important point about durability and resiliency: HDDs are much more susceptible to failure than SSDs. During a failure, legacy storage solutions could cause applications performance to degrade significantly or, even worse, could cause key applications to be completely unavailable. The risk of that kind of failure with flash is much less than with HDDs.

**Myth No. 6:** [Flash makes sense for only VDI.](#)

As with many myths, there is truth to this one, in the sense that flash is, indeed, a tremendous benefit to virtual desktop infrastructure environments—and probably one of the main reasons why virtual desktop infrastructure (VDI) deployments are starting to see increased growth.

Flash enables organizations to address the high I/O requirements of VDI, particularly during “I/O Storms,” when an inordinate percentage of users are logging on, logging off, shutting down or doing some other activity all at the same time. Without flash, this could be a potentially insurmountable challenge, particularly as VDI deployments get into the thousands and tens of thousands of seats.

But VDI is not the only application where flash makes sense. It’s not even close to the only application. Any application where there is a preponderance of I/O activities is a great candidate for flash. In particular, as organizations are generating more data and more activity, they are seeing a need for much greater performances in their OLTP systems and the underlying databases that support them.

This need for high IOPS and low latency is very apparent in Web environments and customer systems, as well. In addition, any application requiring high performance—such as analytics, research, computer-generated graphics, animation, e-discovery and many others—benefits significantly from the advantages enabled by flash storage.

**Myth No. 7:** [All flash solutions are created equal.](#)

This myth stems from one of the points mentioned earlier: All flash solutions basically use solid-state storage devices made by the same few vendors. While that is true, the reality is that each vendor approaches flash in a different way, using different software and architectural approaches. Some are scale out, some are scale up; some are all-flash, some are hybrid, i.e., spinning disk combined with flash; some are host-based, some are offered as flash appliances.

Certain vendors, such as NetApp, offer several different approaches to flash, so that customers have a broader range of options, depending on their workloads and applications. In addition, many organizations want to protect their legacy investments, so they are seeking flash solutions that build on existing architectures and infrastructures, rather than requiring ripping them out and replacing them with new all-flash silos. And this leads to...



**Myth No. 8:** Only a startup company can deliver a flash solution.

This is a myth propagated by—you guessed it—startup companies. Their main argument is that they can deliver flash solutions designed for flash because they don't have a legacy architecture to protect. And, while that is true, there are significant downsides to the argument.

By building a new architectural approach from scratch, the startup companies may be asking companies to give up significant investments—not just in equipment, but also in the time, training and knowledge that has gone into building the existing infrastructure.

Also, the startup companies typically don't have experience in building enterprise-class storage solutions. In addition, as we've already seen in the market, many of these startup companies have had challenges scaling their solutions and delivering on the reliability required for the enterprise.

**Myth No. 9:** Flash is not enterprise ready.

Because some startup companies have had issues scaling their all-flash solutions, there is a myth that flash is not yet enterprise ready. As with anything in technology, so much depends on the vendor. If you choose a vendor that understands the challenges of the enterprise and has a proven architecture, you can be assured that your flash solution will deliver all of the characteristics that define enterprise-class storage.

What are some of those characteristics? Here's a start: Reliability, resiliency, high availability, simple manageability, scalability and integration with existing infrastructure. In addition, an enterprise-ready solution will support all of the major advances that have made HDD storage more efficient and affordable, including intelligent tiering, deduplication, compression, snapshots and thin provisioning. In a market where there are many vendors that may not make the enterprise grade, there are also established leaders with impeccable enterprise credentials.

**Myth No. 10:** All flash solutions are equal, so it doesn't matter which vendor we choose.

This compounds the error of Myth No. 7 and transmutes it into a whole new myth of even greater impact and proportion. Of course it matters which vendor you choose—it matters greatly. As noted, there are a wide range of ways to approach flash, and you want to make sure you choose a vendor that gives you the most flexibility.

The solutions from the newer companies don't offer any major benefits over solutions from some of the established vendors, such as NetApp, which has taken its proven technology and rewritten firmware to update it for the new flash era. This gives customers the reliability of an established vendor, coupled with the cutting-edge technology needed for many of their critical applications.



There are other important advantages in going with an established vendor. As noted, an established vendor will have much more experience in knowing what it takes to build and support enterprise solutions. The established vendor will have a much more extensive support team and will be able to deploy experts where and when you need them.

In addition, a market leader such as NetApp will have a broad and established partner ecosystem, with experienced and skilled integrators that are among the best in the world. A prime example of this is NetApp's partnership with World Wide Technology.

World Wide Technology is an award-winning systems integrator with 25 years' experience in building solutions for a broad range of applications, including extensive expertise in supply chain solutions. The company has more than \$6 billion in revenue and more than 2,700 employees around the world.

One of the advantages of working with a partner such as World Wide Technology is access to its Advanced Technology Center, which is a collaborative ecosystem to design, build, educate, demonstrate and deploy innovative technology products and integrated architectural solutions. Using the latest data center, collaboration, security, storage and networking technologies, WWT engineers design and integrate systems to solve business and technical challenges facing large public and private organizations.

## **Conclusion**

Flash storage is just scratching the surface of its potential in terms of what it can deliver to organizations in this new compute era, increasingly defined by cloud, big data, mobility and social media. For many IT leaders, the question is not whether to use flash, but where to use it, and how to use it most effectively.

Making decisions about flash means making the right choices about which vendor's solution to use, and which systems integrator to help facilitate the deployment. Making the right decisions also means working from facts, not myths. Now that we've helped separate the myths from the reality, perhaps your organization is ready to take the next step in flash.

**[Here's where to get started.](#)**