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Five Key Storage Strategies For A Down Economy

Tips To Make The Most Of A Tight Budget In The Face Of Ongoing Data Growth

by **Andrew Reichman**

with Stephanie Balaouras, Rachel A. Dines, and Rachel Batiancila

EXECUTIVE SUMMARY

It's clear that the economy is on a downward trajectory, and regardless of the duration or severity, there's no doubt that belt-tightening in IT spending will be the norm for the next year. At the same time, most IT budgets were already stagnant or slow-growing as firms have sought to cut their spending to maximize efficiency and profitability. With the sharp pace of data growth unlikely to abate any time soon, storage directors will find themselves in a very difficult position. While some application development or expansion projects might get put on hold, firms can't afford to jeopardize revenue-generating initiatives by delaying storage purchases, upgrades, or transformative initiatives, especially when the economic outlook gets bleak. This document proposes five strategies that can help to make the most of a tight budget, generate tangible savings, and meet business goals even when times are tight.

ONE: PLAY HARDBALL WITH STORAGE VENDORS

According to Forrester data, storage represents at least 11% or more of IT hardware budgets, and not surprisingly, the market size for storage is in the tens of billions of US dollars.¹ This is a tremendously competitive market, with high margins and many product options — but also high costs associated with switching to a new vendor. Vendors and channel partners know this and fight tooth and nail to acquire and retain storage customers. If you're a shop that's been loyal to a single vendor for a long time — expanding capacity without competitive bids — it's likely that your vendor has become complacent and you're not getting the highest discounts possible. As the economy softens further, storage vendors will be trying even harder to win new deals and protect their existing accounts from competitors trying to do the same thing.

Use this situation to your advantage by introducing a fresh sense of competition among the vendors you work with. Even if you don't expect to switch vendors in a request for proposal (RFP) process, you're likely to shake an incumbent out of complacency and pay less for your next purchase. What's more, you might discover a new vendor you weren't aware of previously that can satisfy your needs more effectively.

TWO: AVOID NEW PURCHASES BY RECLAIMING WHAT YOU ALREADY HAVE

Most storage directors would be amazed at how much wasted storage capacity they have tied up in their environments. Storage is wasted when it's allocated but not used. This happens for a variety of reasons; one of the most common is simple underutilization. Some applications and operating systems don't lend themselves to gradual storage expansion over time; they require a large upfront allocation that may or

may not be consumed eventually. This tendency for overallocation combined with limited ability to effectively forecast data growth in most organizations leads to a significant gap in the amount of capacity that is allocated versus actually used.

Unfortunately, this type of reclamation can be challenging. In most cases it requires application downtime to reallocated storage capacity. To do this successfully requires careful planning on the part of the storage department and buy-in from application teams that are likely to have other priorities. In a down economy though, this effort becomes more worthwhile, as the purchase avoidance savings can be significant. Coordinating this type of reclamation with a refresh cycle is one way to ease the pain; using storage virtualization to migrate nondisruptively is another.

There are also other, less disruptive types of reclamation that should be high priorities for any shop wanting to reclaim existing capacity. Looking for misconfigured or unassociated storage is one of the easiest ways to reclaim storage. With communication between storage and server teams being less than perfect in most shops, there are often servers that have been eliminated from the environment without its associated storage being returned to the free pool. Additionally, there's often storage that's "mapped but not masked," meaning it has been allocated within the storage array but not recognized by a server. This happens for a variety of reasons, such as incomplete provisioning, changed plans partway through the process, or inconsistency. It's one of the easiest ways to reclaim storage without significant effort on the storage team side or objection from the server and application communities, and it can produce significant amounts of reclaimed space to offset other required purchases.

THREE: AUDIT BACKUP AND REPLICATION CONFIGURATIONS TO CUT WASTE

Technologies for disaster recovery (DR) such as backup and replication are critical to protecting data and providing effective access to data as needed to conduct business. Unfortunately though, actual and expected recovery point objectives (RPOs) can drift significantly over time. Some applications don't have enough protection while others have too much. In a typical storage environment, there can often be as many as 10 copies of the same data — several days of full backups, a couple of snapshots, and a fully replicated copy at the alternate site. Most backup systems have inadequate reporting capabilities, so it's difficult for storage administrators to associate applications to their backup jobs and their retention schedules. Likewise, it's not always easy for storage administrators to associate applications to their RAID levels, number of snapshots, and replication protection. It's even more challenging relating all this information back to required RPOs.

Going back after the fact and auditing backup policies and storage configurations can eliminate unnecessary backup jobs, snapshots, clones, and replication and can return unused disk or tape media to the free pool to reduce future expenditure. Reviewing the replication levels to make sure that applications are right-sized can also help to make sure that storage is not being wasted. While it might seem like a good idea to overprovision applications for the best possible RPO, the costs

add up fast, and money overspent on DR capabilities for applications that aren't cost-justified take money away from other efforts. In a tight cost environment, savings such as this can be critical. While the effort to go through all of the jobs and replication configurations might seem tedious, this is work that can be done internally without too much expenditure, and the results can be significant.

FOUR: RETHINK STORAGE NETWORK DECISIONS

For years, storage networking dogma has revolved around Fibre Channel (FC) as the only solution that is good enough for robust applications. These days, however, alternatives are presenting better cost profiles while still meeting needs for high performance and availability:

- **iSCSI uses Ethernet for low-cost block storage.** iSCSI, like FC, is a block storage protocol but uses standard Ethernet as a transport. In addition to soft benefits like staff familiarity with the ubiquitous networking protocol, parts sparing, and ease of troubleshooting, there are significant component acquisition cost benefits as well.² Most applications don't even come close to pushing the bandwidth envelope of 4 Gb links, yet they still use FC exclusively because it's what they're most familiar with. Smart firms looking to cut costs will give serious consideration to adding iSCSI as a lower cost tier for storage networking. What's more, the future of storage networking is likely to be some sort of Ethernet-based network, so starting to move there now is a good investment for the future.³
- **NFS is a file protocol that's used to support not only files, but also applications.** The traditional use case for file-based protocols is to provide user access to files across the network, but more applications are supporting NFS as a way to connect servers to storage. Most notably, Oracle, VMware, and a variety of content and digital asset management systems have thrown their hat into the NFS ring. NFS relies on Ethernet as the physical transport protocol, so it has the same component cost structure, and in many cases offers even more ease of use and staff familiarity benefits, because server and application administrators are generally more comfortable with file protocols than with block storage protocols. Additionally, using a file protocol means that data is saved as a file, with accompanying metadata and discrete handling capabilities that can allow for greater archiving control and less lock-in to applications.
- **Direct attached storage (DAS) can be the simplest path to shared storage.** The traditional storage vendor dogma indicates that an intelligent networked storage back end allows for cost savings through a shared resource pool, improved performance through higher aggregate spindle count, and better resiliency through advanced, centralized data protection. But these assumptions are predicated on two things: 1) that workloads are actually shared on the centralized storage system, and 2) that the application can't do effective data replication. On the workload sharing front, firms are often hesitant to put data from multiple key applications on the same storage system for fear that there won't be enough resources to go around or that a spike in resource consumption or a configuration issue on one application might compromise

the performance and availability of the rest. If you're working with a one application to one storage device approach, then the benefits of centralized networked storage are limited and the costs may not be justified.

On the replication front, key application vendors such as Oracle and Microsoft have been improving their native replication capabilities significantly, and they're getting to the point where they can present a reasonable alternative to array-based capabilities. Microsoft in particular has been making a big push to promote Exchange 2007 on DAS, especially with a recent white paper that describes in clear and exhaustive detail its own internal IT experience.⁴

While these options might not make sense for every application or every environment, cost-conscious firms should take a good, hard look at their storage network decisions and give some consideration to the approaches above. Doing this with a willingness to challenge preconceived notions and time-honored best practice is the best way to find some places where significant cost savings can be uncovered.

FIVE: USE A TIERING METHODOLOGY THAT DELIVERS RESULTS SIMPLY

Tiering is a thorny subject with many storage directors: Vendors have promised the world, but users have generally had minimal success implementing tiered storage, and the complexity has often outweighed any cost savings. If tiering means buying a wholly separate platform in addition to the tier one infrastructure, it can take years to realize any benefit. By shifting investments you would already have made to lower tiers instead, you can realize cost avoidance. In addition to the build-out problem, firms struggle with knowing what to put onto lower tiers and with gaining acceptance for this from their line-of-business customers. Without effective performance analytics to identify what data would be well served by a lower horsepower solution, and lacking chargeback to incent users to select lower cost solutions, there's little success in placing data on the middle tiers.

In a down economy though, when cost cutting is not an option but a requirement, firms are taking a new approach to this problem. Instead of asking lines of business where they want their data, and instead of using tier one as the default, more storage departments are putting more data on tier two storage from the start, and only promoting to tier one if the performance is unacceptable. Keep in mind that a tier could be differentiated by a combination platform type, drive type, RAID configuration, and replication level, so think outside the box. Buying cheaper, denser disks in the systems you already own makes sense for tiering without the added cost of a separate platform. Remember to keep it simple and consistent — having too many tiers and options makes it hard to manage the environment, which can negatively impact cost structure.

- **Focus on tangible hard costs savings.** A down economy is not the time to aim for speculative benefits such as “faster time to market” or “improved customer service” that take years to realize and are hard to quantify. Now is the time to look for clear savings that result from specific actions. Also avoid efficiency gains and productivity improvements, as they’re notoriously hard to quantify. Instead focus on purchase cost avoidance and other measurable benefits.

ENDNOTES

- ¹ Forrester surveyed 1,001 IT decision-makers — 206 of whom focused on storage and storage-related technologies across North American and European enterprises via our Enterprise And SMB Hardware Survey, North America And Europe, Q3 2007. When asked to pick their top priority, 24% of storage decision-makers pointed to expanding storage capacity and 22% told us that data retention and archiving were the top priority. See the November 19, 2007, “[The State Of Enterprise Hardware Adoption: 2007](#)” report.
- ² Although a great deal of energy is expended discussing the performance differences of IP-based and Fibre Channel (FC)-based storage area networks (SAN), it is generally accepted that it is cheaper to deploy an iSCSI SAN. This report dissects the components of an IP-based SAN and compares the up-front and ongoing costs versus a FC SAN. The cost advantage of iSCSI is so significant in terms of server side and switch network costs that you owe it to your budget to determine which applications would be a good fit for this technology. Some implementations of IP-based storage networking can struggle with high intensity application workloads, others have matured significantly and are more capable of handling enterprise-class applications. Given the hardware acquisition cost benefits as well as synergies in network staff and infrastructure, significant benefits can be gained from the use of iSCSI-based SAN architectures. See the February 7, 2008, “[Cost Comparison Of iSCSI Versus Fibre Channel SAN Components](#)” report.
- ³ Ten gigabit per second Ethernet (10 GbE) represents the next level of enterprise network bandwidth, with vendors hyping it as the next great capability. But as an IT infrastructure and operations professional, you must strike a balance between constant operational improvement and sound financial decision-making. So far, 10 GbE has been a high-end luxury for firms that want maximum performance regardless of cost, but that’s changing fast. The per-port pricing gap between 10 GbE and alternate network options is narrowing rapidly as more vendors increase the competitive pressure on pricing for related components. So where will this technology truly matter, and when? This report looks at the impact of 10 GbE on infrastructure applications and provides guidance for the most effective transformation of your network. See the May 16, 2008, “[10 GbE: Its Time Is Coming](#)” report.
- ⁴ The following white paper describes how Microsoft IT exceeds high-availability targets with large mailboxes at low costs based on new storage designs. Source: Microsoft TechNet (<http://technet.microsoft.com/en-us/library/cc500980.aspx>).
- ⁵ Consolidation can help to optimize cost structure for IT organizations with limited resources. Technology enablers like virtualization and remote computing eliminate requirements for dedicated physical assets for each application and for physical proximity of users to those resources. Although many potential initiatives

can have a positive impact on operations, firms are unable to do everything at once. Instead, build business cases that prioritize and select the initiatives that offer the greatest impact with the least risk. Consistent application of cost analysis can enable firms to compare investments across a portfolio of options, communicate the risks and benefits to technologists and business decision-makers, and, ultimately, make good decisions. With the cost and impact of technology investments constantly growing, smart businesses will mandate economic justification for all major investments in order to more closely connect business goals with technology initiatives. See the November 12, 2007, "[Measuring The Cost Of IT Consolidation](#)" report.