STORAGE SWITZERLAND

SOLVING THE MID-RANGE STORAGE CHALLENGE

Storage Switzerland, LLC

George Crump, Senior Analyst

Data centers in medium sized businesses face a unique challenge. They have the same storage problems that the large enterprises face yet must solve the problems within a thinner, multi-function IT organization. This is compounded by tight budgets that become even tighter in tough economies.

Medium-sized data centers also face challenges like maintaining I/O performance under increased application demand, rapid capacity growth caused by increased data retention regulations and hard requirements for quality of service from the customers they serve. High availability is expected, since most of today's business assets remain in the digital domain throughout their lifecycle. In short storage has to scale, be cost effective and easy to use.

While the consolidation/virtualization trend can render unnecessary some of the data service features found embedded in many storage systems. Solving the mid-range storage challenge is going to require addressing these problems with cost effective, high performance storage systems, such as PROMISE's VTrak x30 series RAID subsystem and VTrak S3000 SAN appliance.

Performance

Just like the large data center, most medium-sized data centers have a few individual applications that require extremely high performance; = almost all have implemented server virtualization. This means, as hosts become laden with virtual machines, each may become increasingly storage-I/O bound as they grow, potentially impacting performance across all VMs.

Storage Consolidation

For the medium-sized data center consolidation is often the primary goal when selecting a storage platform. The problem is that medium sized data centers grow, and in some cases, very quickly. This leads to situations where a business exceeds the capabilities of its initial storage systems in terms of performance, capacity or number of connected hosts. The only option is often to engage in very expensive upgrades or more commonly, deploy multiple mid-range storage solutions, the inverse of the consolidation problem they were trying to solve caused by the lack of upgradeability and scalability of mid-range storage systems.

Reliability

Data loss is just as critical to the medium-sized data center as it is to the large enterprise, maybe even more so. While it is true that all businesses are dependent on their storage systems, in many cases medium sized businesses are the most dependent on their storage systems. These businesses typically were founded and then grew with modern server and application technology readily available. They also are creating new data at a fast rate, fast enough that it can't cost effectively be manually recreated. In fact in some cases there is less likely to be an audit log of missing transactions. In short if the storage system is down so is the business there is no work around.

The staff at the medium-sized organization is typically stretched thinner and each IT team member has more than one responsibility. For example, there is seldom a storage manager whose exclusive responsibility is to manage storage. The multi-hat IT person often handles the server virtualization environment, financial application environment and the e-mail environment all of which are higher profile and tend to warrant more attention. As a result an errant drive or even a drive failure might not be noticed as quickly as in the large enterprise. Mid range storage has an obligation to be able to better detect and notify the IT administrator of a situation that places data at risk. Even still the situation may not be addressed as quickly as in the lager enterprise with storage focused personnel. This leaves the organization open to exposure for a longer period of time and means that rapid rebuilds of RAID groups is even more critical.

Serviceability

Similar to reliability, serviceability can again be more important in the mid-range data center. As part of cost containment the medium sized business will often opt for a "self-service model." This means that drive replacements and potentially other components are the responsibility of the customer and as a result, components that are simple to access, remove and replace become increasingly critical.

The reliability and serviceability requirements that a medium-sized data center has also mean that storage system management and alerting are more critical to these organizations. These systems need to provide advanced self-analysis to make sure that when it's having issues the problem can be quickly brought to the attention of the IT team.

Solutions For The Mid-Ranged Storage Problem

Typically, when a data center moves into the "medium sized" category they often need to look for a new storage system that better addresses the needs of the business. Because of the lack of scale that traditional entry level systems have, the medium-sized business will typically have several storage arrays, each purchased to support point projects as the organization matured. It may have been an Exchange cluster on one system, a NAS on another and more than likely server virtualization on a third. The goal is to consolidate all these disparate storage platforms on to a single system that improves performance, is flexible/easy to use and provides scalability, reliability and serviceability. The crux of the problem is that medium- sized organizations keep growing and keep running into the same storage challenges that have driven their ad hoc infrastructure purchases all along. They need a storage system that can offer a longer-term, consolidated solution to their data growth needs and allow them to break out of the cycle of just buying short-term solutions.

Crippled Enterprise Solutions

One of the classic attempts to address the mid market has come from enterprise storage vendors. To enter this market without cannibalizing their primary market, those systems aimed at large enterprises, they have offered ‘crippled’ solutions that are often not upgradable to their enterprise-class systems. While they do address much of the performance and reliability concerns, they don’t address serviceability or scalability. Most of these “enterprise jr.” systems still have the service requirements of the larger counterparts, meaning that most issues with the system or even upgrades will require a professional services engagement and the associated fees from the vendor.

As mentioned earlier most of these systems are downgraded versions of their enterprise products, causing an almost a planned obsolescence as the organization grows. Being forced into an expensive and inconvenient upgrade is not what the medium-sized data center needs.

Over Extended Small Data Center Solutions

At the opposite end of the spectrum is the over-extended small business system. These are systems that have worked well for the organization when it first needed shared storage and as it began to grow, but have reached their limit. What often happened was that many of these smaller systems existed in the medium-sized data center, but they couldn’t easily be consolidated into a larger system.

Scale Out / Clustered Storage Systems

Scale out storage or "pay as you grow" systems are often considered by the medium-sized data center. These are systems where expansion of the system is done via storage nodes, often 1U server class hardware with internal disk drives. These nodes are clustered together and combine the processing power and storage into a single addressable entity. While these have gained acceptance for specific applications, their overall use is not very common. One challenge with scale out systems is that each growth step is a repeat buy of storage, processing power, and network I/O, all of which may not be needed. As these systems continue to grow some of these resources tend to go essentially unused. As a result there is almost always an excess in either storage processing power, network I/O or capacity. For example nodes may have been added to address performance but additional capacity may not have been needed but since capacity comes with the nodes the customer ends up paying for a resource they may never use. This is more than just changing an upfront cost but also ongoing costs since that unused capacity uses power and takes up valuable rack space in the data center.

Scale-In Storage Systems For The Mid-Range

A growing alternative is to use storage systems like those from PROMISE Technology. Powered by the latest Intel Jasper Forest processor and advanced storage components these systems can scale in a single, but highly available, configuration to almost 200 drives and maintain constant performance to a near total build out. This represents a new class of system designed to “scale-in,” meaning that all the capability to support the growth that the typical medium-sized data center is going to experience is already built in. The only thing that has to be added is additional storage capacity. As a result these systems address performance, consolidation and scalability allowing a single system to be fast enough to serve most of the storage needs of a typical medium sized data center as it continues to grow.

Service and reliability of scale-in systems can be handled by intelligent autonomous healing technology like that found in the PROMISE Technology Ex30 storage system. It has the ability to detect disk errors and perform a silent migration of data from a failing drive. Essentially drives can be rebuilt without the performance drain and data exposure the traditional RAID rebuilds require. This alleviates the problem of the undermanned and distracted mid-range data center IT staff that may not notice a failure. In fact, the system can even scan disks for media errors during times of low utilization to catch problems before they impact production. What this means to the administrator is those high profile applications like server virtualization, financial applications and e-mail remain operational at full performance levels yet data is constantly being protected in the background and a drive failure will not slow down production operations.

Another challenge with mid-range storage consolidation is that the data center can truly reduce storage to a single system which handles all storage responsibilities. This means that the system needs to be maintained without downtime, like the PROMISE Technology Ex30 system, which can update firmware on the fly without requiring a reboot.

Cost containment is delivered by building systems that are both reliable and easily serviced, something important to companies leveraging a leaner business model. Companies like PROMISE have grown up with price performance driven products and don't have the overhead associated with maintaining monolithic storage solutions that the legacy enterprise storage systems manufacturers do.

Scale-In storage like the PROMISE x30 series may be an ideal solution for the mid-sized data center. It allows for consolidation onto a single platform. By centralizing storage operations on a single high available platform organizations can improve data manageability and reduce the chances of data loss through user error. Most importantly the platform is scale-ready. The only component that needs to be added is capacity, making upgrades cost effective and easy to perform.