Intelligent Data Management: Storage Optimization for Virtual Desktops
Creating Cost-Saving Order Out of Virtualized Data

Organizations are looking to cut costs and improve operations further by expanding their use of virtualization technology, adding virtualized desktops and the storage solutions necessary to store, access, and manage data securely.

Virtualization delivers both operational (OpEx) and capital (CapEx) savings, allowing organizations to cut spending on hardware and software for CapEx of between 20 percent and 50 percent, according to research firm Gartner. The technology generates even more far-reaching, long-lasting OpEx savings.

Virtual desktop infrastructure (VDI) saves businesses OpEx, in part through organizations' use of the technology to support displaced workers if they are unable to travel into the office because of bad weather or another crisis that disrupts normal business operations. Sometimes forced by regulations, often times encouraged by savvy management, businesses across a spectrum of industries are considering additional ways in which they can leverage their existing IT infrastructure to resolve their need for DR and continuity solutions, frequently determining virtualization is a cost-effective solution for both daily data and computing needs, and worst-case scenarios. VDI also reduces operating expenses by eliminating unexpected downtime, and costs, associated with malfunctioning workstations, upgrades, and product refreshes, and allows authorized users to securely access data from any networked device.

Whether they are in the public- or private-sector, organizations are comfortable with virtualization, which is now a well-proven technology. In fact, the Federal government is widely adopting the technology as part of its cost-cutting mandate.

Much of this data requires securing. By 2020, the percent of digital information requiring security beyond baseline levels will grow to 50 percent from 30 percent, according to IDC. Organizations not only must safeguard data; they must have procedures in place to streamline how they determine which information needs security, which level and type of security to use, and how long to archive data.

Users access this information using desktops, smartphones, and tablets, from home and branch offices, hotel rooms and airports, as well as from the sanctity of the corporate network. Each of these devices and locations has its own security and accessibility challenges, especially in highly regulated industries such as healthcare and finance.

Medical professionals, for example, must abide by the Health Insurance Portability and Accountability Act (HIPAA). The Health Information Technology for Economic and Clinical Health (HITECH) Act, which includes requirements promoting medical providers’ use of storage-hungry electronic medical records (EMRs), also requires that patient data be secured.

Data storage may, in fact, be viewed as the Achilles’ heel of the successful deployment of a virtual desktop infrastructure. Balancing virtualization with security and management tools may create a mish-mash of different vendors’ products, which are difficult to integrate into a cohesive solution. They may also be inadequate for the task of integrating with virtualized storage.

Rather than piece together disparate software and hardware from different vendors, savvy organizations invest in storage virtualization technology from a proven provider, a reliable solution designed to resolve the storage difficulties of today and tomorrow by cutting costs and administrative challenges, streamlining archiving processes, and addressing security concerns.

1 http://www.gartner.com/it/initiatives/pdf/KeyInitiativeOverview_Virtualization.pdf
2 http://www.abiresearch.com/press/3388-Business%20Continuity/Disaster%20Data%20Recovery%20Market%20to%20Reach%20$39%20Billion%20by%202015
Driving Adoption of Storage Virtualization

With so many virtualized machines, organizations must pay careful attention to their stored data, which research firm IDC projects is growing at a rate of 60 percent annually. Since most organizations use only about one-third of their storage devices’ capacity, they are spending much more than they need, according to TechNavio Insights. Storage virtualization allows organizations to use up to 70 percent of their available capacity, while simultaneously cutting spending on support and maintenance, according to TechNavio.

Without virtualizing, organizations are forced to invest in additional storage devices to retain, protect, access, and manage data. After all, 35 percent more digital information is created today than the capacity exists to store it, according to IDC. This number will surge to more than 60 percent over the next several years, the research firm predicts.

Dell EqualLogic™ (EQL), for example, is an all-inclusive solution built on a virtualized, peer-storage architecture. The integrated hardware and software solution simplifies the deployment and administration of consolidated storage environments, providing organizations with perpetual self-optimization and automated load-balancing across disks, RAID sets, connections, cache, and controllers. Compellent Technologies, acquired by Dell in 2010, created Compellent Fluid Data enterprise storage technology that consistently places data in the right place, at the right time, for the right cost. Fluid Data establishes a grid of virtualized storage as the foundation of a cloud infrastructure, ensuring business continuity through integrated snapshots, replication and data migration.

In one example, Boston Medical Center virtualized its data center, desktops, and storage with Dell, a move that cut its data center’s power bill in half and saved the healthcare provider up to $3.2 million. More important, the facility is now more responsive to patient needs, according to Brad Blake, chief technology officer.

“In just a few weeks, Dell delivered an easy-to-understand and comprehensive snapshot of where we stood from a storage perspective—what was being used, what was not being used—and the report showed that our expensive fibre channel SAN was only 20-40 percent utilized,” said Blake. “In desktop virtualization, all the data sits on the centralized storage, so performance is critical. EqualLogic was head and shoulders above the rest.”

Compellent performed well above par for the Professional Golf Association (PGA), which uses the Compellent® Storage Center™ SAN, housing 6 TB of fibre Channel and Fibre ATA, to support its 10 PGA TOUR Superstores. With Compellent’s virtualized storage, PGA Tour Superstore employees can access data from any desktop or thin client and has halved its three-

IOPS: Seeing Through the Boot Storm

One concern about storage and desktop virtualization is the capability of the storage array to deliver required I/O when demand is at its highest such as first thing in the morning, when a group of users accesses and loads a group of applications at the same time.

Companies could ignore the temporary I/O demands these boot storms create—but these noticeable, productivity-reducing lags can last for hours, depending on the size and scope of an organization’s employee base. Whenever a company updates security software or conducts a security scan, patches desktop applications, or users log-off at night, another boot storm occurs, meaning employees could suffer through compromised productivity and a sub-par user experience multiple times each day.

Most businesses will not accept this environment—nor do they need to. But companies also do not want to pay for over-provisioning when, during the bulk of the work-day, they already have adequate I/O.

Measuring IOPS—including factors such as caching, which can increase IOPS, and RAID overhead and latency, which can decrease IOPS—and including peak times, as well as average loads, lets IT determine how much storage users need. In turn, knowing the necessary amount of storage plus the available budget enables IT professionals to determine which storage solutions are best-suited to meet their virtualized storage requirements.
year total cost of ownership, said Gentry Ganote, CIO of PGA TOUR Superstore’s parent company, Golf & Tennis Pro Shop.

“When I began assessing SANs, Compellent stood out from the crowd. Increasing utilization was a primary goal, and I quickly saw how Compellent’s Thin Provisioning and Automated Tiered Storage features could get us where we needed to be,” Ganote said. “Our systems only use the storage they really need—nothing is wasted. By improving utilization this way, we’re also increasing available capacity and system performance.”

From Endpoint to Data Center
The move to virtualization means a reconsideration of how organizations structure storage. Since it’s no longer necessary to focus on the individual storage needs of each workstation, individual, or department, IT professionals can review the bigger picture and tap storage devices’ full capabilities.

Virtualized storage is easily expandable based on the needs of individual users. With the technology’s centralized management and archiving tools, IT professionals no longer need to expend energy and resources scrambling to keep up with changes in individual workers’ storage needs. Nor must they depend on users for security or backup. Instead, virtualized storage solutions’ integrated software incorporates these capabilities, providing an all-inclusive toolset that eliminates inefficiencies, reduces management issues, helps assure regulatory compliance, and boosts productivity.

Within the organization’s data center, that same integrated approach allows IT to shift storage resources as needed quickly, without requiring new storage devices. Virtualized storage management, security, and archiving tools address the entire operation’s needs, allowing management to feel assured that company data is secure and searchable.

Hybrids Deliver the Best of Both Worlds
Integrating hybrid technologies under the roof of one solution empowers customers to tap the strengths of each different storage system, while mitigating any weakness—such as cost—that may occur when IT professionals select and design the storage infrastructures necessary to support their virtual desktop infrastructure (VDI) solutions.

Recognizing this added-value, the Dell EqualLogic hybrid SANs melds together solid state drives (SSD) and Serial Attached SCSI (SAS) drives within a single chassis. The EqualLogic firmware’s on-board intelligence provides automatic tiering and balancing of stored data between the SSD and SAS tiers. This device tiering within the array creates a flexible and powerful balance between performance and responsiveness provided by the low latency SSD tier and capacity provided by the SAS tier.8

By combining the low latency of SSD with the high capacity of SAS, the EqualLogic PS6000XVS provides the foundation for optimizing the performance of multi-tiered workloads within an array. The EqualLogic PS6000XVS’ intelligent software automatically places the linked clone parent replica image on the low-latency, high-performance SSD tier to ensure the most throughput, while temporary data and users’ unique application data is placed on lower cost, capacity-optimized SAS drives.9

Compellent, acquired by Dell in 2010 in a move widely lauded by analysts and industry experts, designed a hybrid solution that uses SSDs as both cache and tier 0, a creative approach resulting in more features, enhanced scalability, and faster performance with fewer SSDs. Although storage administrators can select where to house files, the hybrid solution’s default setting automatically places the most-used data to cache, while less frequently accessed information is moved to slower drives.

Sheffield Hallam University in the United Kingdom cut costs by up to 80 percent, in part because of Compellent Fluid Data Technology.10 The architecture automatically puts files on the appropriate tier to maximize both cost and performance.

“Sheffield Hallam tourism staff can now base their IT needs on the actual number of users, rather than having to be concerned with the individual, or department, IT professionals can review the bigger picture and tap storage devices’ full capabilities.

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8 http://searchstorage.techtarget.com/magazineContent/Managing-storage-for-virtual-desktops?pageNo=5

Benefits of Combining Intelligent Storage and Desktop Virtualization

PCs with hard drives pose concerns about management, archiving, or security. Organizations must rely on users to maintain data integrity, safeguard information, and comply with regulations. All too often, businesses discover a problem after the fact.

Upgrading individual workstations with different storage devices based on the user’s needs is time-consuming and expensive. This is one of the reasons virtual desktops are more effective; they leverage a virtualized environment whereby data is funneled to the appropriate device securely.

Virtualized storage environments boost the efficiency of virtual desktops by removing redundant data. All users may include an e-mail from human resources on their desktop hard drives, but virtualized and optimized storage needs to retain only one copy, plus confirmation it was sent to all employees. Storage optimization also compresses unnecessarily stored documents, which quickly can eat up valuable storage resources when multiplied across hundreds or thousands of users.

Virtualized environments are also easier to access anywhere/anytime. Whether they are on the road or finishing work from home, employees are more productive when they can log-in securely and access up-to-date information anywhere they can connect to the Internet.

There are, of course, costs associated with these benefits. Organizations may need to boost their network capabilities or find their existing network strained. Scrutinizing the anticipated return on investment against the expected improvements can determine whether the investment is appropriate.

All told, an optimized and virtualized storage system improves utilization, lowers costs, and provides the foundation for a solid backup/recovery strategy. Virtual desktops take these efficiencies further by taking error-prone and insecure endpoint PCs out of the equation.

A Partner in Dell

With its expertise in intelligent data management solutions, Dell is a recognized leader in designing, delivering, and supporting virtualized storage solutions to many organizations. Dell takes the complexity and high cost out of storage technology using an Intelligent Data Management (IDM) model.

IDM encompasses growth planning and analysis, data protection, archiving, discovery and compliance, and optimization of server and storage resources in the data center. This strategy includes integrated TierDisk systems—including Dell™ PowerVault™ DL2000 disk-based deduplication and backup solutions based on CommVault®, Simpana®, and Symantec™ Backup Exec™ software—along with tiered Dell EqualLogic™, Dell PowerVault, and Dell/EMC storage, Compellent solutions, plus Dell consulting services.

With its sophisticated, integrated array of products and services, Dell works across industries, providing expertise to customers in many fields, including healthcare, higher education, and government, for example.

“Our relationship with Dell is one of those partnerships where we know they’re always going to be there for us. With Dell, there’s almost an end-to-end assistance from the data center all the way to the bedside,” said Dr. Todd Rothenhaus, CIO, Caritas Christi Health Care.13

Dell also offers comprehensive tools, such as Advanced Infrastructure Manager, that help businesses improve operations. The infrastructure management and provisioning software solution helps IT professionals simplify the administration of heterogeneous hypervisors, servers, storage devices, and networks.

In the data center, Dell Virtual Integrated Systems (VIS) architecture improves efficiency by responding to selected business requests quickly. Dell VIS automates and streamlines repetitive tasks, and IT departments can leverage these automation tools to get more from their existing infrastructure and staff.

Storage Virtualization Reality

Organizations now have a cost-effective, proven method to make the most out of their vast repositories of information. Through virtualized storage, businesses can securely and affordably leverage the most appropriate technology for all their storage needs, no matter how and where users need to access this irreplaceable, invaluable data.

To learn more about Dell storage solutions, visit: [[URL TK]]