

SANs Need Storage Virtualization — And Unisys Has The Answer

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Management Summary

The word “virtualization” has been thrown around in the recent past as though it were a new concept, an idea of the late 20th and early 21st century. If one puts one’s mind to the word, it becomes evident that virtualization has been around for a long time. Take the modern automobile, for example; it is a good model of virtualization, i.e., a form of abstraction from the physical model. Most of you may be too young to remember, but there was a time when starting a car was an arduous task: you had to get gasoline into the engine by depressing the gas pedal a couple of times, advance the choke and throttle, and hand crank the engine.¹ Then the Bendix starter was invented and drivers could start the car from their seat. The driver still had to pump the gas pedal, advance the spark and throttle, but virtualization had begun and it became simpler to drive a car. **Continued advances were made so that today, most of what it takes to drive a car has been virtualized, leaving the driver with only the critical management responsibilities.**

Computer users have also experienced virtualization before the current buzz about storage virtualization. One can easily argue that programming languages, from COBOL to Java, are the virtualization of software development; they freed the programmer from concerns about the inner structure of the host computer by abstracting the basic mechanics. In the same way, the operating system, where hardware meets software, first virtualized memory management and, now, almost the entire computer systems. All of this happened long before the introduction of the virtualization of storage. Upon reflection, it is easy to see that, with storage virtualization, we are not embarking on a new journey, but taking on further enhancements as part of a continuous process that responds to today’s needs for highly-productive enterprise computing. The widespread implementation of storage area networks (SANs) at larger enterprises solved many problems (mostly relating to connectivity and scaling), but introduced serious new challenges (mostly administrative). **Enterprises cannot keep up with the growth of storage without further administrative assistance; this is the driving force for storage virtualization.**

Unisys recognizes this need and has announced its own SAN virtualization product called the *Unisys Storage Sentinel* that will provide these benefits not only for heterogeneous SAN-attached disk arrays, but will do the same for tapes. Enterprises will be able to achieve greater utilization of storage resources, easier manageability, with no increase in personnel – delivering real business value. Read on to find out more about this new product that has the potential for additional benefits to the enterprise.

¹ Maybe the familiar equivalent is the pull-start on an outboard motor or the lawnmower.

IN THIS ISSUE

- **SANs Need Storage Virtualization ... 2**
- **Unisys Storage Sentinel 2**
- **Conclusion 4**

SANs Need Storage Virtualization

SANs deliver many benefits:

- Centralized support of heterogeneous servers by fewer, larger arrays;
- Access to storage management software for snapshots and remote copies;
- Improved backup and recovery strategies; and
- Optimization of storage resources, to name a few.

This is not without costs, however. SANs are not cheap, either in terms of the hardware and software that is required or in terms of the people costs for implementation and administration. For many enterprises, the benefits have outweighed the costs, at least as first calculated.

Along the way, it became clear that the cost of managing SANs and administering the storage behind them was largely linear. If storage doubled, so did the cost of administration, which is now many times more costly than the hardware and software. So the search was on for meaningful ways to lessen the administrative workload, because there just aren't enough qualified storage administrators to keep up with the growth of storage, not to mention that IT operational funds are stagnant at best. **The push is on to reduce storage costs by more efficient use and administration, which leads us to the next thing – storage virtualization for SANs.**

Storage virtualization removes the physicality from the storage equation, as seen by the server and by the storage administrator. The server no longer knows (or needs to know) where its storage resides (within an array, or even in which array). The administrator no longer has to worry about assigning, estimating, and monitoring the physical aspects of storage. Through policy management², the storage is allocated by the virtualization device, and the server does not see any difference. If the capacity needs to be increased, the server does not need to stop to reset its parameters.

Similar virtualization concepts can be applied to tape. Servers may “think” that they have a tape drive unit at their disposal, but it

² The road to sophisticated policy-based management will come in stages. This journey has just begun.

too may have been virtualized to another location.

With storage virtualization, disk-based storage and tape systems can be managed more easily and transparently than before. In addition, with good policy management capabilities, the right kind of hardware assets can be deployed to meet the specific applications ‘or users’ needs.

Unisys Storage Sentinel

Unisys’ virtualization-based storage management solution is delivered via a storage management server – called the Unisys Storage Sentinel – attached to a Fiber Channel SAN. (See Exhibit 1 on the next page.) In turn, the SAN is connected to a virtual storage pool on the accessing (back) side, and is attached to servers on the front side.

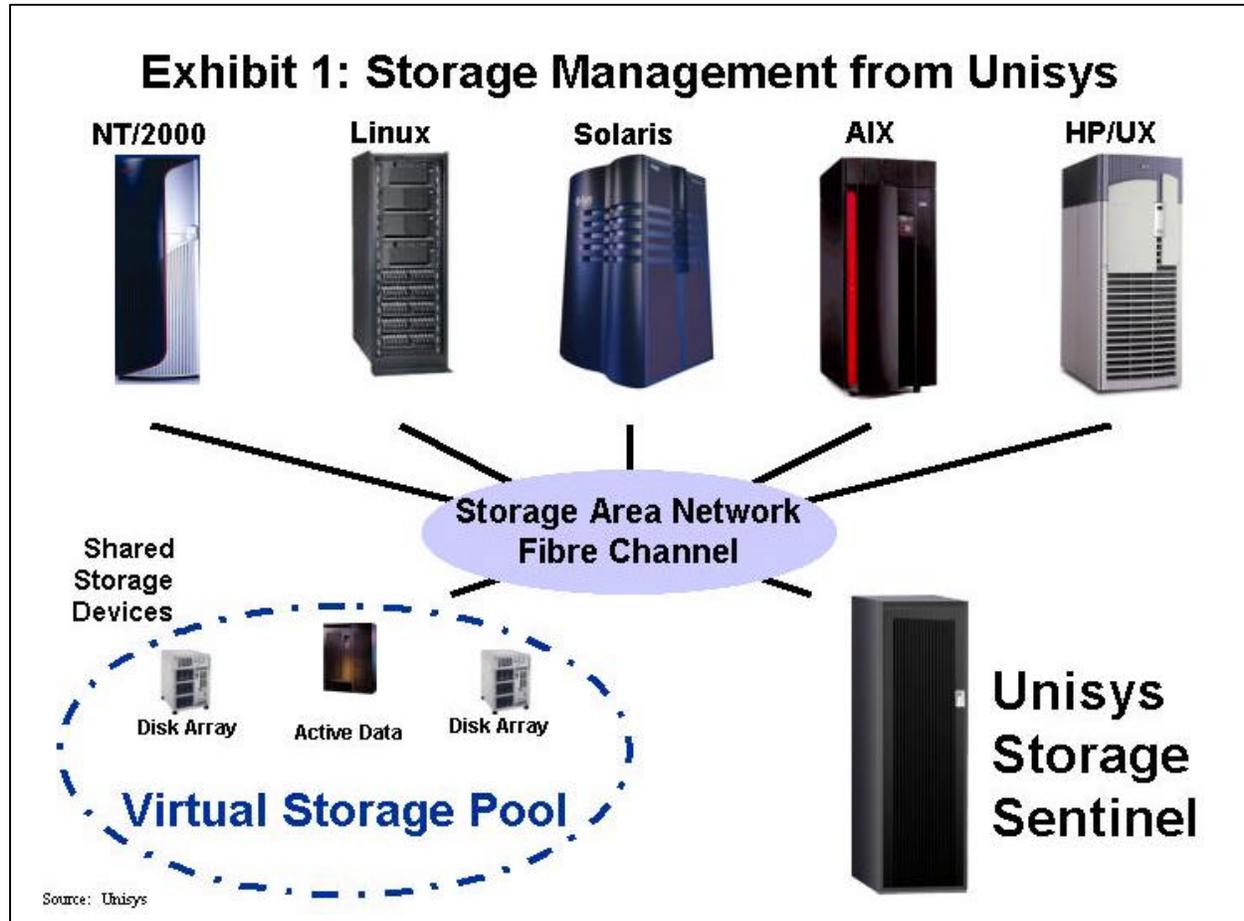
Unisys Storage Sentinel can also be acquired as a standalone solution, with 1.8 TBs of disk and a pair of switches in the same rack. The servers currently supported are Windows NT/2000, Linux, Solaris, AIX and HP/UX.

Technology is great, but the measurement of its usefulness is determined by the value it brings to the enterprise. Here are some of the major benefits of the Unisys approach to storage management.

Storage Consolidation

As a virtualization methodology, the Unisys Storage Sentinel insulates the user from being concerned about which storage device is being used. Because of this, **storage administrators can consolidate physical storage into virtual storage, thus making use of the over-allocated but otherwise unused storage that is so commonplace³, and also by providing access to storage that may have been previously inaccessible because it was in a different array.** Storage Sentinel is able to handle and virtualize all types of storage whether they are RAID, JBODs or tape devices. The ability to now utilize previously allocated but unused free space can delay procurement of additional

³ The standard practice has been to be safer rather than sorry, especially when a server may have to reboot to have its storage increased. This has led to over allocation of mammoth proportions.



storage. In addition, storage can be acquired and assigned using a more global enterprise perspective than when storage was assigned directly to a particular server.

Business Continuity and Disaster Recovery

Unisys' ability to eliminate planned or unplanned storage downtime adds IT resiliency to the enterprise. Unisys Storage Sentinel can provision storage automatically and provide backup facility without needing to bring the system down, thereby providing non-stop service to users. A snapshot facility enhances business continuity by providing a point in time remote copy of data, enhancing back up facilities through snapshot copy. This may be less expensive than using array-based snapshot software.

Virtual Access To Physical Disks Or Tapes

Users and their applications have access to virtual disks or virtual tapes without being concerned about the physical disk, disk space, or tape devices that have been assigned. Unisys Storage Sentinel provides

all of the means for provisioning, assigning and communication between the user and the virtual storage device.

Backup

Unisys claims that backup windows can be minimized, and in many cases be eliminated, with Unisys Storage Sentinel. This is achieved via the snapshot feature where views of the data in virtual volumes are created. The copied volume(s) can then be sent to a journal on a virtual disk. In this manner, the administrator can perform the backup and restore functions off-line, adding to enterprise business continuity requirements.

Non-Disruptive Addition or Deletion of Physical Disk

In the pre-virtualization period, system interruption occurred whenever disks were added or deleted from the environment. This may have been fine if there was odd shift time available to perform these tasks but with the more prevalent 24x7 operation, business processing had to be interrupted. **With**

Unisys Storage Sentinel, disks (arrays) may be added deleted or modified without disrupting service to the users. Availability is improved, users are satisfied and business continuity is maintained.

Policy Based Management

Quality of Service (QOS) objectives are more easily attained and maintained using Unisys Storage Sentinel. The flexibility of assigning virtual disks in a prioritized manner, giving the most important applications or departments the optimum use of virtual disk volumes, will ensure that the utilization goals will be met.

Ease of Management

Through a centralized administrative console, all aspects of assigning and managing virtual disks are maintained. Storage pools can be created or modified. Created pools can be organized by the similar qualities required. Those requiring mirrored or striped sets or those disks that need not be protected can be collected into individual pools and virtual disks. Pooling may be accomplished by two methods: symmetrical or asymmetrical pooling. In the symmetrical paradigm, both data and control are collocated between the host servers and storage. When asymmetrical pooling is used, the data and control are separated.

In live operation, volumes may be created, expanded, or deleted without interruption to the users. Volumes deleted can be immediately reassigned or held in reserve. When new disks are added to the system, their incorporation is performed through the administrative console.

Additional Features

Unisys Storage Sentinel contains or will contain additional features that can assist the user to obtain even higher levels of performance from their virtual storage systems. A future **charge back feature** will permit the IT department to report on the usage and cost of usage. These should map into the policy-based terms and conditions, where those with the highest priority could pay a higher unit cost for their storage and access. As an adjunct of the utilization data collection used for charge back, **performance monitoring and resource management** will be available. An important additional feature

will be the ability to perform **predictive capacity planning**, minimizing the effect of growth in storage utilization by being able to add storage capacity on a shorter lead time than could otherwise be done.

Conclusion

With the earlier introduction of Storage Area Networks, new improvements in the utilization of storage were made. **Unisys has entered the storage virtualization field, bringing its customers facilities that can demonstrably improve performance, reduce costs and bring measurable gains in business value to the enterprise.** This comes at a time when IT executives are clamoring for ways to gain more control while reducing costs. **Unisys Storage Sentinel will bring greater reliability, availability, and security while, at the same time, a reducing the total cost of ownership.** Storage virtualization seems to be an obvious decision, just like the electric starter on the automobile. In a few years, you won't be able to imagine how you could have ever managed your storage environment without this capability. **Leave the driving to the Unisys Storage Sentinel and just tell it where you want to go!**



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About the Author

Joseph S. De Natale is Director of Enterprise Systems Planning with The Clipper Group. He brings more than forty years of experience in the data processing field with particular emphasis on systems management and application development on large-scale mainframes. Prior to joining The Clipper Group shortly after its founding, Mr. De Natale was an independent consultant, first with Ropes and Gray, Attorneys at Law, where he provided expert opinion on data center management for civil cases. He later joined International Data Corporation (IDC), as a senior consultant and analyst, where he covered banking systems, data center management software, and large systems computers and storage. Formerly, Mr. De Natale spent eleven years at Citicorp Information Resources (CIR) as CIO of the Boston Data Center, where he managed the support of over 200 outsourcing contracts for thrift institutions. Earlier, he was MIS Director for the Lahey Clinic, and prior to that was a Project Manager for Computer Sciences Corporation, where he was involved with NASA and FAA outsourcing and applications contracts. Previously he was Director of AVCO Computer Services for fourteen years. At AVCO, in addition to being responsible for all internal data processing, he initiated the marketing and sales of computer services to commercial clients. Mr. De Natale began his career with Pratt and Whitney Aircraft as a programmer of nuclear physics and business applications. During his career, Mr. De Natale was involved in the evaluation, installation and operation of large-scale mainframe systems and for the development of commercial, scientific and engineering application systems. He has also had successful experience in the marketing and operation of outsourcing contracts. Mr. De Natale earned a Bachelor's and Master's degree in Mathematics from Boston College. During his period at AVCO, he was selected by AVCO to attend the Northeastern University Management Development program, a co-op program covering an MBA curriculum.

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