Small Wonders

BY ALAN RADDING

Universal Distributed Storage brings enterprise-class storage benefits to the SMB.

For years large organizations have had access to storage technology that was beyond the reach of small and midsize businesses (SMBs). But with recent developments in distributed storage solutions, led by Microsoft and an "ecosystem" of storage partners, this situation is changing.

Consider the case of the University of Portland in Portland, Ore., a successful midsize organization. Until last January its managers were scrambling to keep up with growth. And like most midsize organizations, the managers lacked the kind of resources available to large organizations. This was particularly the case when it came to storage and information management.

Even getting simple management information proved difficult. "It was hard to know how much storage capacity we were using. We couldn't answer basic questions about the use of our systems," recalled Bryon Fessler, the school's vice president for information services. How could the school manage its IT infrastructure following the best practices of large, successful organizations if its managers couldn't even get the most basic information?

The backup situation was even worse. "It was difficult to do backups. We had to back up to multiple tapes. We had to back up the servers in groups. Sometimes a group was overlooked," Fessler said. It was a catastrophe just waiting to happen, but luckily the school never had an emergency that required it to recover all of its backed up data fast.
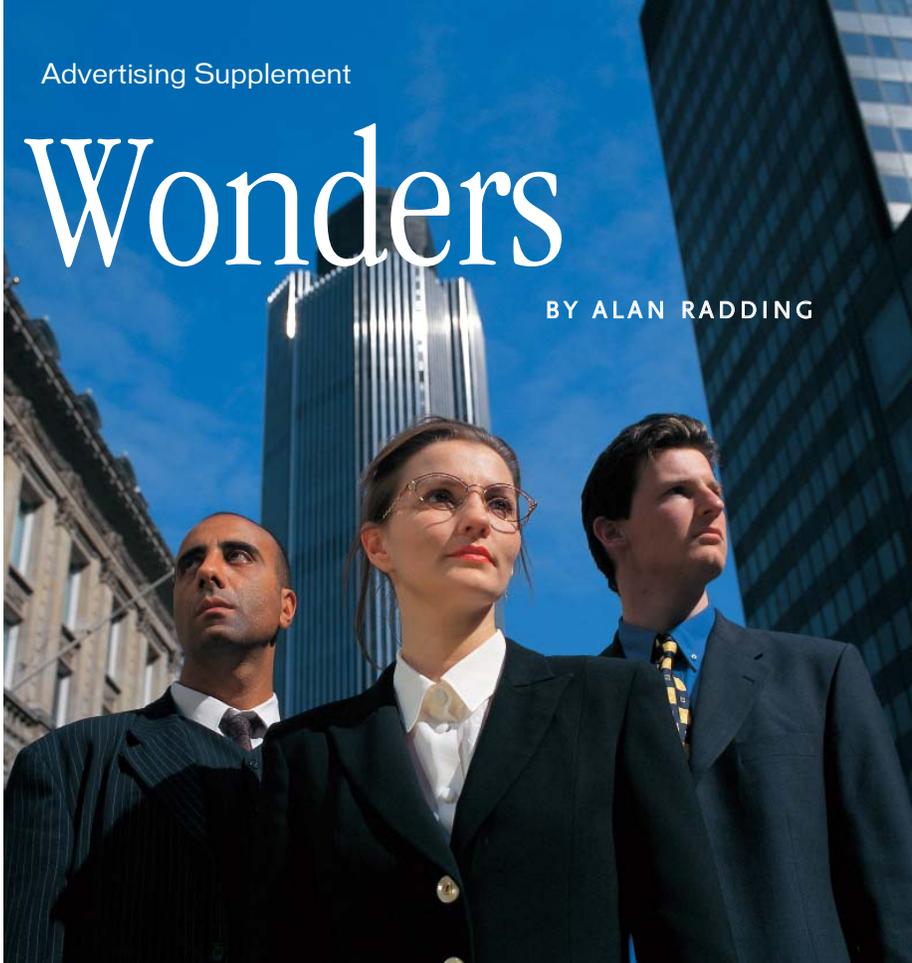
Storage with a pedigree

HP offers ease of use and a clear path to Exchange 2003 migration.

When it comes to helping companies get the maximum value from their technology investments, the two-decade collaboration between HP and Microsoft continues to deliver what users want. As the leading systems integrator for Microsoft Exchange, HP has a legacy of architecting Exchange solutions that address some of the toughest business challenges. In fact, Microsoft chose HP StorageWorks Enterprise Virtual Arrays and HP ProLiant Servers as the platforms on which to run its own Exchange infrastructure. For small to midsize organizations with limited IT resources, HP offers a proven methodology for consolidating costly, multi-server Exchange environments on a money-saving, single-server SAN.

It is HP's highly touted ease of installation and SAN technology that attracted St. Mary and All Angels School in Aliso Viejo, Calif., to the HP StorageWorks Modular Storage Array SAN solution. Said Michael Magaldi, St. Mary's director of technology, "[The SAN] was so easy to install that it took us longer to unpack the SAN from the box than it took to actually install it."

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Reversal in fortunes

Today, the situation is completely different at the university. Working from a strategic plan the school developed late in 2004 as a catalyst, the information services group embarked on an initiative to upgrade its IT infrastructure and adopt best practices. By January 2005, it had installed clean, reliable, uninterruptible power; upgraded to Hewlett-Packard (HP) blade servers running Windows; and installed its first storage area network (SAN), which it acquired from LeftHand Networks.

In the process, the school gained many of the advanced storage management features that large organizations had been using for years to maximize their storage and systems investments and protect their valuable, critical data assets. Now the school can make frequent, fast copies (snapshots) of critical data to ensure the data can always be recovered quickly. It also can send copies of the data over the wide area network to a secure offsite location. "That lets us get out of the tape

backup business for our critical data," which is a great relief, Fessler said.

Adding to Fessler's relief, the school's lead vendors in this

effort, LeftHand Networks and HP, turned out to be partners with Microsoft. "That LeftHand Networks was partnering with Microsoft was important to us. We

The power of many

With the UDS vision, Microsoft has focused on its core strength—software—while relying on leading storage industry vendors to provide storage-specific products built on the Windows platform. Some of Microsoft's leading storage partners include Brocade, Emulex, EqualLogic, Hewlett-Packard, Hitachi Data Systems, LeftHand Networks, NSI Software, and QLogic. These partners are collaborating with Microsoft to advance SAN simplification for users of Windows Server 2003 R2 by ensuring interoperability with the storage capabilities built into the Windows platform. Microsoft is working with storage system vendors to simplify hardware setup under the UDS banner.

"Microsoft has done a great job from the operating

system standpoint by providing integration points. We can now enable features Microsoft makes available in specific products knowing they will work correctly," said Ralph Lobato, HP's Microsoft alliance manager for StorageWorks.

"UDS is a guiding vision that provides a framework for managing distributed data. It is about how Microsoft as a platform can manage all data. The SAN is just one element. Our role is to ease the management, to ease the configuration, to ease replication. We simplify the interface," according to an Emulex spokesperson.

use a lot of Microsoft technology," he said. The fact that his primary storage and server vendors were working closely with Microsoft in a strategic vision now called Universal Distributed Storage (UDS) gave him added assurance that the technology decisions they had made were correct and would continue to be the best choices going forward. And the school could do it at a price—$50,000 for 8TB of storage—that a midsize organization like the University of Portland could handle.

Advanced storage for the smaller businesses

In other words, smaller organizations can now reap the benefits from high-end storage solutions formerly reserved for enterprise-class companies. Within the enterprise, IT managers first bought advanced storage arrays and set

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—Steve Duplessie, Senior Analyst, Enterprise Strategy Group

them up as Fibre Channel (FC) SANs, which, although complicated to install and run, allowed for multiple servers to share a common pool of centrally managed storage. The high-end enterprise storage arrays they purchased were packed with sophisticated management software that allowed the companies to replicate data over the network, set up redundant paths between the servers and storage to ensure high availability, and make frequent copies of the data, which made it easy to quickly recover data that

had been inadvertently corrupted or deleted.

In addition, the advanced storage management software made it easy for an administrator to monitor and manage all the storage in the environment from a single location. An administrator could perform consolidated backups, add and configure new storage capacity quickly and easily, allocate and re-allocate storage capacity as needed, and generate reports detailing all aspects of storage usage.

These capabilities didn't come cheaply. However, large enterprises could justify the big expense on the basis of increased efficiency, improved performance, higher availability, greater storage utilization, and substantial reductions in administrative costs, especially when it came to backup. For example, instead of making multiple backups as the University of Portland faced, the large enterprise initiated a single backup process. And the administrators immediately knew not only whether the data was correctly backed up but, unlike Fessler, they knew all the details of storage usage.

SMBs, meanwhile, struggled with storage directly attached to each server. Directly attached storage certainly was low-cost, and it was easy to set up and configure initially. However, as soon as the organization needed more than a handful of servers, each with its own attached storage, administration and management became a costly headache. In addition, utilization of the storage capacity was poor.

Networked storage will allow [SMBs] to reduce the amount of time and resources they expend trying to manage multiple servers with directly attached storage.

While some servers desperately needed more storage, other servers sat underutilized with storage to spare, and there was no practical way to make the excess, idle capacity on one server available to another server that needed it.

Enterprise-class storage requirements

The storage capabilities enjoyed by large enterprises looked mighty tempting to SMBs. In fact, "the needs for networked storage are probably more necessary in the SMB space," said Steve Duplessie, a senior analyst at Enterprise Strategy Group, Milford, Mass. This is particularly true given the nature of SMBs' storage usage. "SMBs are the fastest growing in terms of the percent of storage capacity growth," Duplessie said. As importantly, the data an SMB stores is as critical to that organization as, say, a large brokerage's data is to the brokerage firm. Neither can survive for long without its data.

"SMBs undoubtedly need networked storage for data protection and for efficiency. Their needs are no different in this regard than large enterprises. They also face the same compliance requirements for data protection," said Rob Higby, director of product marketing at EqualLogic Inc., Nashua, N.H.

The data backup issue alone is driving SMBs to networked storage. "From a data protection perspective, SMBs need this. They

can't risk losing data. They have to track it, and it is growing exponentially," said Bob Roudebush, product manager at NSI Software, in the Southborough, Mass., office. Regulatory compliance and litigation concerns affect every organization, large and small. Even the smallest SMBs are under the gun to store and protect personal information, financial data, and even email, which increasingly plays a role in litigation.

High needs, modest budgets

Although their storage needs parallel those of large enterprises, SMBs are different in a number of ways. "SMBs have similar needs in terms of data retention, security, legal and compliance issues, and reporting, but there is a difference in scale," said Peter Smails, senior director of product marketing at Hitachi Data Systems Corp., headquartered in Santa Clara, Calif. "The difference in scale shows up in how SMBs handle the challenges of management and complexity. They can't just throw money into the building of a complex SAN." Said Enterprise Strategy Group's Duplessie, "SMBs need to be able to grow their storage at a moment's notice, and without causing application downtime. Networked stor-

age enables SMBs to have all the benefits large enterprises get."

SMBs may need the kind of storage large enterprises enjoy, but acquiring networked storage has been difficult. "They need to do it without it costing a fortune and without their needing a Ph.D. to plug the stuff in," Duplessie continued. In other words, high cost and complexity have prevented SMBs from implementing networked storage. They don't have the fat storage budget or the cadre of highly skilled storage experts to make it all work as large enterprises do.

Technical skills may be as big a challenge as the cost of networked storage. "SMBs don't have the staff that can do this. They need a turnkey solution they can take out of the box, turn on, and configure in minutes," said Ralph Lobato, HP's Microsoft alliance manager

The business value of simpler SAN

SANs deliver attractive benefits to SMBs, but for too long those benefits have been beyond their reach because of the difficulty of implementing a SAN. With iSCSI, the storage industry made strides in easing SAN implementation by using the IP networking protocol, which is familiar to SMBs. However, FC remains the dominant SAN networking protocol due to its high performance and high reliability. Unfortunately, traditional FC implementation requires specialized skills, which are lacking at most SMBs.

To specifically address the SAN challenge, Microsoft initiated the Simple SAN for Windows Server Program under the Universal Distributed Storage vision. "With Simple SAN Microsoft has identified over 100 com-

plex items that make implementing a SAN difficult. We've incorporated these items in a GUI that makes the SAN easy to install," said Tim Lustig, senior business alliance manager at QLogic Corp., Aliso Viejo, Calif.

In an effort to further simplify SAN implementation, Microsoft built support for SANs directly into the Windows platform. Storage vendors take advantage of this built-in support so SMBs don't have to bother with the internal details. Microsoft also has worked directly with core SAN component vendors like Emulex Corp., Costa Mesa, Calif., to reduce SAN setup complexity. Finally, it steers customers to those products that have proven to be simple to implement through its Simple SAN for Windows Server Program.

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for StorageWorks. And after they have installed the storage in minutes rather than days, SMBs need to be able to maintain it easily, without the involvement of storage experts.

Taming networking concerns

If storage itself weren't difficult enough for SMBs, networked storage adds another complication—the network. Although most SMBs have simple local area networks, storage often requires a separate network based on the FC protocol, which requires specialized skills. Switches, too, present a challenge. "SMBs need relief from having to manage switches. They want something they can turn on and forget," said Brian Hoke, liaison with Microsoft for storage technologies for Brocade Communications Systems, Inc., San Jose, Calif.

The SMBs' lack of awareness of networked storage and the benefits it could bring may hold them back. "Many SMB managers simply are not aware of how much networked storage can help them," Hoke continued. Networked storage will allow them to reduce the amount of time and resources they expend trying to manage multiple servers with directly attached storage. They will experience higher storage utilization and reduce the amount of storage capacity that never gets used. Similarly, they will experience streamlined, more reliable backups and higher availability of their data. They also can be confident that their sys-

tems will be able to comply with regulatory mandates to save and protect data as well as respond efficiently to requests by regulators and courts for stored data.

As the organization grows, it will be able to easily increase its storage. "Adding on to network storage can be very easy, which eliminates down time and frees the staff to do other things," Duplessie said. If networked storage is good for large enterprises, it certainly can be good for SMBs, too. To get there, all SMBs need is

to find a storage solution that addresses the challenges of cost and difficulty.

UDS—enabling networked storage for SMBs

"Until recently, it wasn't feasible to bring networked storage into the SMB space due to the problems of cost, complexity, and skills," Duplessie said. Now, however, it is feasible.

Storage technology has steadily evolved, getting less costly and easier to use every year. But even then, few SMBs on their own are likely to pull together the disparate pieces to make a complete networked storage solution. It requires a catalyst, and that turned out to be Microsoft. "It is because of Microsoft that SMBs will be able to do networked storage. Microsoft makes things cheap and

easy as compared to the expensive, complicated status quo. And Microsoft, because of its market muscle, can also get the other vendors to play nice. SMBs really benefit when Microsoft pulls out the stick," Duplessie explained.

Behind the stick is Microsoft's Universal Distributed Storage vision. UDS is intended to mainstream high-end functionality for the purpose of delivering storage solutions built on industry-standard hardware offered through multiple independent partners. One resulting goal is to lower the total cost of storage ownership. To do this, Microsoft has enhanced Windows itself to ensure that it manages distributed data storage more cost-effectively than any other platform, irrespective of whether the data sits on a server or a remote worker's desktop; whether the data is centralized or spread across branch offices; or whether the data is stored on a SAN or network-attached storage (NAS).

There are two keys to understanding how Microsoft envisions UDS: universal and distributed. "To us, universal means making sure the storage is universally available to any organization, large or small, using similar technology differentiated only by the nature of the organization," said David Golds, product unit manager for Microsoft's Windows Core File and Storage Systems.

The distributed part of Microsoft's UDS vision revolves around storage replication. "It is about seeing storage as a distributed system," Golds said. When storage is viewed as a distributed system, Golds explained, it is treated as a file service rather than as a file server. Traditionally, storage was accessed through a file server, which meant that the user had to know on which server the data resided. As a file service, the data can reside anywhere or be replicated to multiple places. The users don't need to know or care where the data resides; the system will bring the data to them from the right place.

Windows at work

Microsoft has been steadily implementing the UDS vision in a series of products included in the Windows platform. For example, in the latest release, Windows Server 2003 R2, Microsoft included Storage Manager for SANs, which is a sophisticated storage management tool for SMBs.

Storage Manager for SANs "is intentionally not a full-featured SAN management tool. It is designed to address only those classes of problems that SMBs face," Golds said. For example, it allows organizations to provision their storage very easily, but it doesn't do SAN zoning, which is a complicated process. "The majority of SMBs don't need zoning," Golds said. Rather than make the product unnecessarily complicated, Microsoft will steer those few SMBs needing zoning to one of its partners who provide complex SAN management tools.

In addition to Storage Manager for SANs, Windows Server 2003 R2, an update release of the Windows Server 2003 operating system, takes advantage of Windows Server 2003 with Service Pack 1 (SP1) to deliver greater stability and increased security resulting from its proven code base. For example, it provides improved identity and access management across security-related boundaries through Active Directory Federation Services (ADFS), which lowers the total cost of ownership (TCO) and boosts security, espe-

cially when collaborating with partners or deploying Internet-facing Web applications.

In other areas, Microsoft and its partners deliver sophisticated capabilities comparable to the high-priced large enterprise features provided by traditional storage vendors. Microsoft's Volume Shadow Copy Service (VSS), for example, lets SMBs make snapshots of data, replicate data, and manage those copies just as buyers of the more costly products do. VSS is a powerful capability yet simple to use. "You can make shadow copies during the day. At some point you may need to go back to an older version of the data. So, you just right-click on the folder and see a list of previous versions," Golds said. In the past, this kind of capability was quite expensive. Today, it is included in Windows Server 2003.

R2 enhances Windows' replication capabilities by providing replication to multiple remote sites over the WAN, and it does so in a way that fits with the SMB's budget and resource constraints. For example, Golds said, "You can synchronize files over the network, but you are only sending the pieces that have changed, not the whole file or document." Sending only what has changed saves the organization time and bandwidth. This improved replication in R2 not only saves bandwidth but also removes the need for backup in branch offices.

Integrated and compatible

"What the UDS vision has ushered in is an order-of-magnitude improvement for SMBs from two years ago," said Karl Chen, vice president of marketing and business development at LeftHand Networks Inc., Boulder, Colo. In addition to packing advanced features like VSS, Virtual Disk Service

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(VDS), and multipathing (via the Multipath I/O technology, or MPIO) for high availability into Windows, "Microsoft has integrated storage technology right into the operating system, making it available and compatible. It eliminates any integration and compatibility issues. That allows us to build complementary technology that takes full advantage of the capabilities Microsoft has built into the operating system," he continued.

The kind of simplicity the UDS vision brings to networked storage can pay off big. St. Mary and All Angels School, Aliso Viejo, Calif., discovered the benefits of SANs when the school's students became heavily involved in storage-intensive rich media, which has become integral to the learning experience. The increased storage demands forced the school to make the transition from multiple servers with directly attached stor-

age to a multiterabyte FC SAN from HP, a transition it could not have made the old way.

"We are understaffed, and we should have at least one MCSE [Microsoft Certified Systems Engineer], but even without an MCSE, implementing a SAN is a lot easier," said Michael Magaldi, director of technology. And the SAN itself has made a big difference. "Without the SAN we couldn't provide the level of service to the students that we do. The SAN lets us do much more without taking a lot of our time," he said.

Two years ago networked storage would have been beyond the reach of an SMB like St. Mary's. Today, with Microsoft's leadership and its rich partner ecosystem, any organization can take advantage of advanced, networked storage.

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