TECH CHOICES

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Choosing A Virtual Tape Library

by Stephanie Balaouras

FORRESTER® Helping Business Thrive On Technology Change

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Choosing A Virtual Tape Library

Selection Criteria For Mission-Critical Environments

by Stephanie Balaouras
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EXECUTIVE SUMMARY

As enterprises shift their backup and data protection strategy from tape to disk, IT operations professionals can choose from continuous data protection, rotating point-in-time snapshots, and backup to a disk target solutions. Most enterprises want to introduce disk in order to meet backup windows and improve restore capabilities, but they don't want to rip out and replace their existing backup software and tape systems or manage yet another point data protection offering. Instead, enterprises want to optimize their existing environment and the simplest way to do so is to simply introduce a disk target. Now, the question is which disk target? Should enterprises select a conventional disk target (perhaps use available capacity on an existing storage array) or select a purpose-built disk appliance such as a virtual tape library (VTL). For enterprises that want to use disk and tape in a tiered backup strategy, a VTL is the best option. However, the VTL market is very crowded and there are significant differences in vendor offerings, so enterprises must choose carefully.

TABLE OF CONTENTS

NOTES & RESOURCES

Forrester interviewed 13 vendor and user companies, including: Diligent Technologies, EMC, FalconStor Software, Fujitsu Siemens Computers, Hewlett-Packard, Hitachi Data Systems, IBM, Network Appliance, Quantum, SEPATON, Sun Microsystems.

Related Research Documents

"Disk-Based Data Protection Forecast: 2006 To 2011"
November 17, 2006, Trends

"Enterprises Ask Tape: What Have You Done For Me Lately?"
March 8, 2006, Trends

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TARGET AUDIENCE

IT infrastructure and operations professional

VTL ADOPTION TRENDS ACROSS ENTERPRISES AND MIDSIZE BUSINESSES

Many firms are seeking to introduce disk into their data protection strategies. Disk provides faster backup and significantly faster restores than tape. While there are several disk-based data protection offerings on the market today, most firms are simply trying to improve their current backup environment without introducing a new technology. One way to improve current backups is to introduce disk as a backup target. Today, there are two types of disk targets:

- **Backup to conventional disk.** Most backup applications today support backup to disk. In this solution, backups are streamed to a conventional disk array — usually filled with low-cost serial attached technology advancement (SATA) drives. The key benefit with this setup is that it can provide faster backups and restores than tape, though the disk array itself has no further special capabilities, such as tape emulation or data de-duplication. In addition, the storage administrator is still responsible for storage configuration and management tasks such as RAID group definition, logical unit number (LUN) creation, and performance tuning for hotspots. Backup to disk typically requires the purchase of an additional software module from the backup application.

- **Backup to a VTL.** While VTL is common in mainframe computing environments, its introduction into open systems environments is relatively new. VTLs emulate popular tape libraries and appear as physical libraries to the backup application. As a result, they integrate more easily with existing backup (it uses the standard backup application software — not the add-on disk software module), backup processes, and procedures. They facilitate vaulting the data from the VTL to physical tape to accommodate off-site tape vaulting for disaster recovery purposes or long-term backup history archiving. In addition, VTLs offer compression to reduce the amount of physical capacity actually required to store data — something conventional disk arrays do not offer.

Large Enterprises Are Moving Toward VTLs Faster Than Smaller Firms

In May 2006, Forrester interviewed 667 storage decision-makers at North American and European enterprises (companies with 1,000 or more employees) and 578 storage decision-makers at North American and European midsize businesses (companies with 6 to 999 employees) about their current and future plans for using and deploying VTLs (see Figure 1 and see Figure 2).[1] Overall, we found that:

- **More than 20% use VTLs, with enterprises leading the way.** One-quarter of enterprises and 16% of midsize businesses currently use VTLs. Enterprises are ahead of midsize businesses in deploying VTLs because they generally have the most significant investment in tape. Forrester

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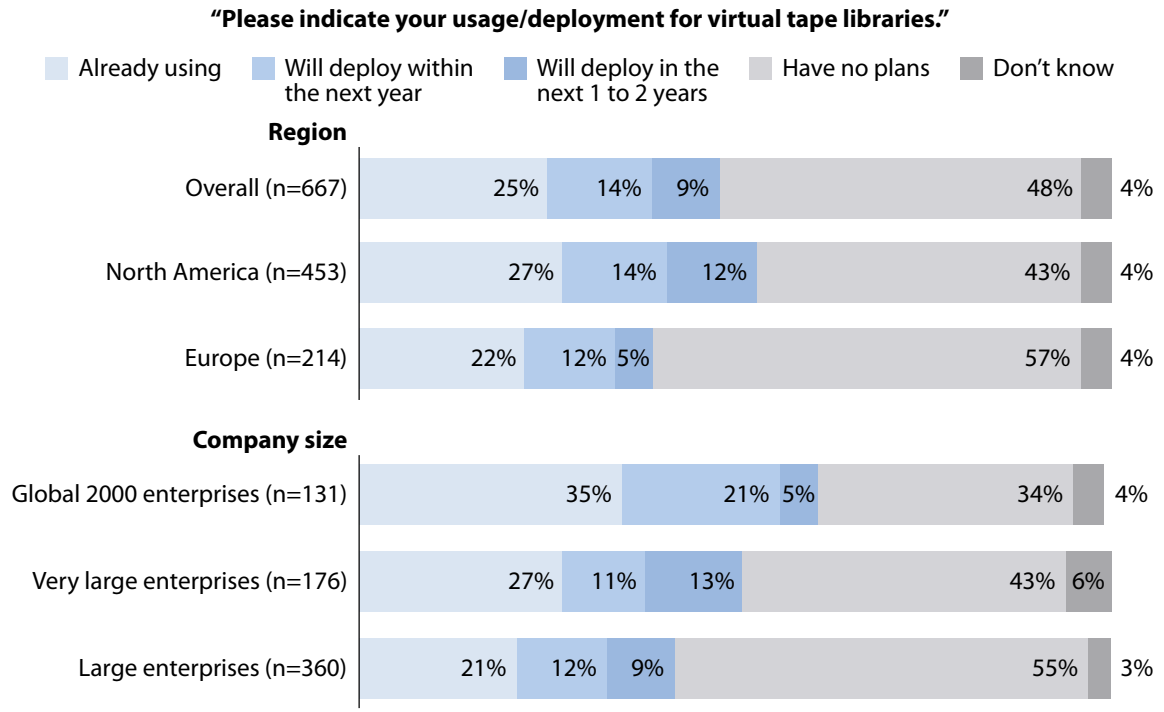
also expects a healthy increase in usage over the next year among both enterprises and midsize businesses, as another 14% of enterprises and 6% of midsize businesses plan to deploy VTLs within the next year.

- **Enterprises will more aggressively deploy VTLs than midsize businesses.** Overall, 23% of the enterprises that we interviewed are planning to deploy VTLs within the next two years, with the majority of growth planned for the first year. In a comparatively less aggressive approach, only 13% of midsize businesses are planning to deploy VTLs within the next two years, with the majority of the growth planned to occur in the second year.

- **The larger the business, the higher the VTL deployment levels.** Enterprises and midsize businesses report higher VTL deployment levels as the company size grows. This trend is evident among enterprises, as 21% of large enterprises (1,000 to 4,999 employees) already use VTLs compared with 27% of very large enterprises (5,000 to 19,999 employees) and 35% of Global 2000 enterprises (20,000 or more employees), and midsize businesses alike, as 13% of medium-small businesses (100 to 499 employees) already use VTLs compared with 20% of medium-large businesses (500 to 999 employees). The same trend also applies to enterprises and midsize businesses planning to deploy VTLs within the next two years.

Figure 1 2006 VTL Adoption Trends Across North American And European Enterprises



Base: 667 storage decision-makers at North American and European enterprises (percentages may not total 100 due to rounding)

Source: Business Technographics® May 2006 North American And European Enterprise Infrastructure And Data Center Survey

40530 Source: Forrester Research, Inc.

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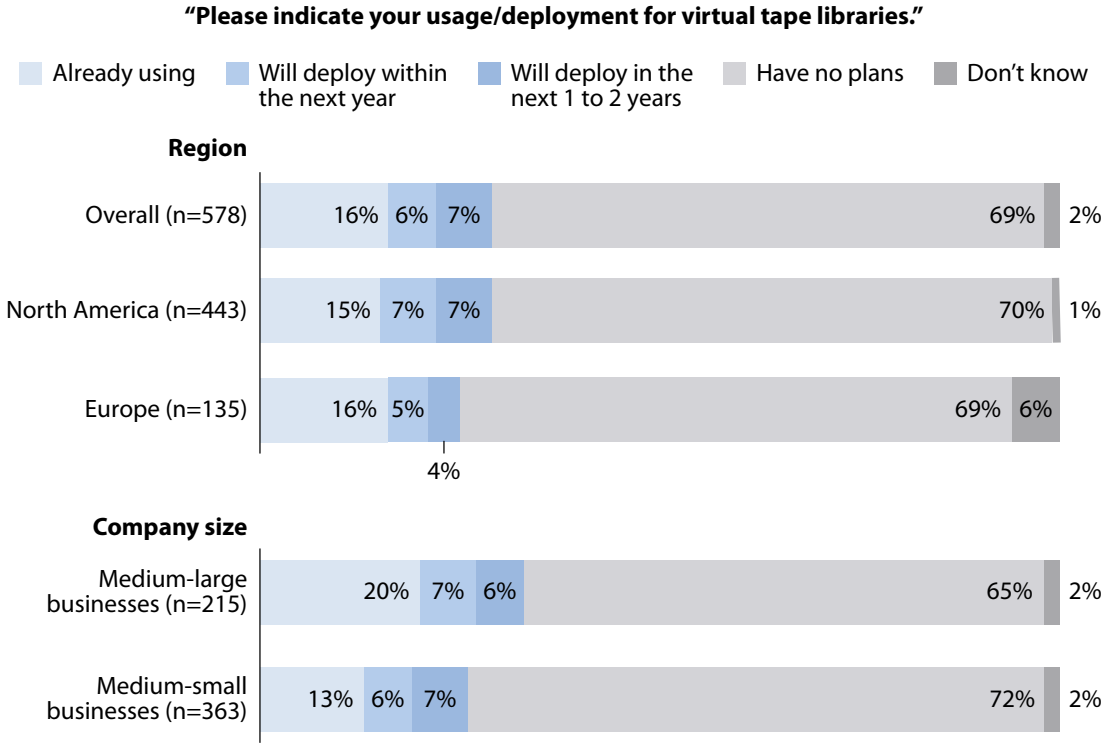
Figure 2 2006 VTL Adoption Trends Across North American And European Midsize Businesses



Base: 578 storage decision-makers at North American and European midsize businesses (percentages may not total 100 due to rounding)

Source: Business Technographics® May 2006 North American And European SMB Infrastructure And Data Center Survey

40530 Source: Forrester Research, Inc.

WHY CHOOSE VTL OVER BACKUP TO DISK?

Despite the prevalence of backup to tape and backup to disk, Forrester believes that demand for VTL technology will increase as enterprises better understand the distinctions between backup to disk and backup to VTL.[2] What makes VTL appealing? With VTL, firms can:

- **Upgrade to disk without disrupting the current backup environment.** Because VTLs appear as popular tape libraries and drives to backup software, firms can introduce the VTL into the environment and achieve the improved backup and recovery of disk without the need to replace or upgrade current backup application or radically change backup processes.

- **Protect and maximize current investment in tape.** VTL solutions like Data Domain and SEPATON seek to eliminate tape while other vendors such as Fujitsu Siemens Computers see the VTL as the virtualization of tape resources, supporting a disk-to-disk-to-tape backup

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strategy. For example, some VTLs more readily support the creation of a physical tape cartridge. The physical library is directly attached to the VTL and data is streamed from the VTL to the tape drive — not back through the backup media server and out to the physical tape directly from the VTL drive. This is the generally accepted approach for mainframe VTL offerings. The benefit of this approach is efficient tape use but the VTL stores the data in its own proprietary format and it maintains its own tape catalog. Restoring data from tape requires the presence of the VTL. Open system VTL vendors are not pursuing a proprietary tape format approach; they are either reading backup data from the VTL back through the media server or pursuing significant integration with the backup application vendor to store the data in its native tape format during direct physical tape creation.

- **Avoid storage management overhead.** Unlike backup to conventional disk target, storage configuration and management in the VTL are masked from the end user. VTL disk storage is preconfigured in integrated systems. The end user simply defines "virtual tape drives" and the VTL handles LUN provisioning and volume management transparently. Without this ability, management overhead would be burdensome in very large backup environments.

- **Get the flexibility to meet new requirements or complex environments.** With a VTL, end users can emulate multiple physical tape drives, allowing them to add additional virtual tape drives at any time to increase the number of concurrent backup streams to the VTL or to provide host or separate backup applications with their own dedicated resources — all without subdividing the underlying disk layout.

- **Get better performance than conventional disk.** Backup applications were designed to generate multiple data streams to multiple tape drives to maximize transfer rates. Because VTLs present virtual tape drives to the application, they preserve this capability and to increase the number of concurrent backup streams to the VTL, simply define additional virtual tape drives.

- **Use VTLs for replication for disaster recovery.** Most firms are seeking ways to upgrade disaster recovery capabilities from off-site tape vaulting to a technology or combined offering that improves their recovery time and recovery point objectives. Instead of deploying an array-based replication solution that requires "like-to-like" disk arrays at both the primary and secondary sites, firms can deploy VTL-based replication. The VTLs themselves are less expensive than high-end or mid-tier arrays, replication is easier to set up and configure, the data is compressed before it's replicated, and the replication is typically over lower-cost bandwidth options such as IP.

Do You Really Need A VTL?

To answer the question of whether or not they need a VTL, firms must first answer "yes" to these two questions:

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1. **Are you looking to introduce disk-based data protection into your current environment?** Disk has some important advantages over tape. Disk is a random access storage technology, which means the device can immediately access data anywhere on its media. Its key advantages are faster backups, even faster restores, reliability and advanced functionality such as snapshots, replication, and data deduplication.[3] And, due to the declining cost of disk overall, the availability of low-cost drive options such as SATA and advanced features that improve disk capacity use, the cost difference between disk and tape has narrowed significantly.

2. **Do you currently have a significant investment in tape and your existing backup environment?** For decades, tape has been the de facto storage medium for backup. In fact, most mainstream backup applications were written specifically to stream backups to tape and to manage tape media rotation schedules. Given the significant enterprise investment, the chance that tape will completely disappear from enterprise data protection strategies within the next five years is low. In fact, Forrester believes that firms will continue to invest in tape at the same time they invest in disk-based data protection technologies. Tape still has some advantages — low acquisition cost and media portability, as tapes can be removed and stored off-site for disaster recovery purposes or for long-term archiving. In addition, tape capacities are increasing dramatically. For example, LTO Gen 4 tapes will have a compressed capacity of 1.6 terabytes (TBs) and new tape options such as drive-level encryption and write-once read-many (WORM) tape media continue to make tape a cost-effective and appealing option for backup.

Are VTLs A Stop-Gap Solution?

As long as enterprises continue to use tape, VTLs will have strong appeal. Forrester's surveys and client interactions indicate that most enterprises will continue to invest in tape while they also invest in disk.

For enterprises that want to completely eliminate tape in the next several years, VTLs would appear to be a good stop-gap solution. However, enterprises will have to seek alternative offerings to support functionality such as data deduplication and replication. This functionality will be available in at least three different IT offerings — purpose-built disk backup appliances like Data Domain's DDX array series and appliance series, as functions available in primary disk arrays, or as functions of the backup/data protection software itself such as Veritas NetBackup PureDisk edition. There is a tug of war in the storage market as a whole about where intelligence should reside — embedded in the disk array or in software at the host level.

Also, VTL vendors can easily turn themselves into disk-only solutions. The tape emulation is just software layered on an intelligent disk storage subsystem. So, while they are going to market as VTL vendors today, they could easily reposition themselves and add new functionality in the future to become more of a disk-only data protection appliance.

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IT'S RAINING VTLs

The VTL landscape includes large storage system vendors, traditional tape system vendors, and emerging players. The traditional storage and tape system vendors have several important advantages in terms of their customer service and professional services for the design and integration and obviously long-term financial viability. The emerging vendors often offer advanced functionality and low cost and can overcome service and viability concerns with partnerships. In today's VTL market:

- **CA is a pure software VTL provider.** Designed for z/OS environments, BrightStor CA-Vtape takes advantage of existing z/OS tape and disk hardware capacity for a virtual tape implementation. CA is unique in this approach relative to other VTL vendors that are focused on delivering integrated VTL appliances. With CA's approach, firms are paying only for the VTL software license and using their existing hardware. This eliminates the need to purchase additional proprietary storage hardware. The offering has been available since 1998.

- **EMC is the early leader in open systems VTL.** Since introducing the CLARiiON Disk Library several years ago, EMC has installed more 70 petabytes of VTL disk storage.[4] Renamed the EMC Disk Library, the technology is based on jointly developed EMC and FalconStor software and special enhancements to its CLARiiON array. In November 2006, the company announced the third generation of the EMC Disk Library with end-to-end 4 GB Fibre Channel and consolidated media management with Symantec's Veritas NetBackup and its own Legato NetWorker. EMC also offers solutions in the mainframe space. It goes to market with Bus-Tech to offer the Mainframe Appliance for Storage and resells the Fujitsu Siemens CentricStor through its EMC Select program. The company also quietly acquired the assets of failed startup Neartek which had significant mainframe VTL intellectual property.

- **Fujitsu Siemens offers the only integrated mainframe and open system VTL.** If Fujitsu Siemens had more extensive routes to market in North America, it could easily become a major player in the region with its CentricStor solution. What distinguishes the CentricStor from any other platform is that it supports both mainframe and open systems and it has a grid-like architecture. The architecture is modular and can scale performance and capacity independently. When a large enterprise deploys CentricStor modular components across multiple data centers, the components form one VTL system across the enterprise. Another distinguishing characteristic is that the CentricStor was also designed to send data to tape, demonstrating that Fujitsu-Siemens does not believe in completely replacing tape in the customer's environment. In Europe, the company enjoys widespread success with more than 450 installations — mostly large installations at major banks and insurance companies.

- **HDS partners with Diligent to offer mainframe and open systems VTLs.** In a nod to the importance of VTL solutions, Hitachi Data Systems (HDS) has partnered with Diligent

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Technologies to offer an integrated VTL solution based on its storage array offerings and Diligent's VTL software. Diligent was selected because the company has a mainframe and open system versions of its software. HDS is specifically targeting mainframe customers who want to completely eliminate tape rather than use the VTL as cache or staging area before vaulting data to tape.

- **Hewlett-Packard (HP) offers open systems VTLs for SMBs and enterprises.** Where many vendors focus only on enterprise requirements, HP offers entry-level solutions for small and medium-size businesses (SMBs) or remote offices starting at only $6,000 for the integrated solution (iSCSI VLS1000i) as well as the enterprise segment (VLS6000 Family). Like many of the storage vendors, HP's VTL software is based technology from a smaller vendor, SEPATON, an arrangement that allows HP to focus on developing a range of integrated VTL offerings for any market segment based on its server and storage hardware technologies while SEPATON stays focused on the advanced software functionality.

- **IBM continues its focus on the mainframe VTL market.** IBM and StorageTek have dominated the mainframe VTL market for years and both continue to focus on this market while expanding into the open systems market. IBM was early to market with its Virtual Tape System in 1997 and has shipped nearly 5,000 units to date. One of the system's key advantages is its peer-to-peer synchronous replication capability. In August 2006, IBM announced the next generation of its mainframe VTL, the Virtualization Engine TS7700. The new TS7700 is based on more modular architecture and introduces IP-based replication for less expensive VTL to VTL clustering. For its open systems VTL, IBM offers the Virtualization Engine TS7510 — based on FalconStor Software's VTL software.

- **Network Appliance (NetApp) is the new open systems market challenger.** Since acquiring Alacritus in April 2005, NetApp has moved quickly to integrate VTL software with its successful nearline disk array to offer the integrated NearStore VTL. The company has entry-level to enterprise offerings and boasts advanced hardware-based compression as well as automated performance tuning feature and the to create tapes directly in a nonproprietary format. The NearStore VTL gives the company an opportunity to go after non-NetApp storage customers with a different NetApp offering. A major advantage for NetApp is the ability to combine its Decru storage encryption appliance with the NearStore VTL for those firms that have security concerns.

- **Sun StorageTek is ready to branch beyond mainframe VTLs.** Sun StorageTek remains a market leader in the mainframe VTL alongside IBM with its Virtual Storage Manager (VSM) system. Since VSM2 was released in 1998, the company has gained more than 4,000 installations. It continues to expand its offerings with the release of VSM5 — double the capacity and performance of its current offering — and VS4e — a midrange mainframe offering. While opportunities continue to exist in legacy StorageTek mainframe tape customers.

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Sun is leveraging its VTL expertise from the mainframe side to provide an upgradeable family of VTL offerings for Open systems. Beyond the current VTL 2.0 product, Sun is launching VTL Plus in December 2006, and VTL Enterprise and VTL Remote (using the SunFire X4500 server and storage offering) next year. Sun will build on its significant VTL background to generate Sun-only intellectual property, building distinct features around areas such as tape integration and disaster recovery on top of the FalconStor code base.

- **Quantum appeals to enterprises that want a vendor that understands tape.** With its acquisition of rival ADIC in August 2006, Quantum is poised to become a significant alternative to the major storage incumbents. With the ADIC acquisition, Quantum now has two open system VTL platforms for the enterprise, a disk-based appliance family for the midrange, as well as the data deduplication technology of Rocksoft (which ADIC acquired in March 2006) in which the company has near-term plans to integrate into its disk-based product portfolio. The combined company has a significant install base of existing tape customers, plus deep relationships with all the major backup application vendors and major value-added resellers (VARs). It has strong expertise in VTLs: Quantum has offered its own VTL since 2002.

- **COPAN Systems offers scalability and its disruptive "MAID" disk technology.** COPAN targets extremely large backup environments with Revolution 220TX, a VTL that can scale to 448 TBs. COPAN is the prime advocate of massive array of idle drives (MAID) technology, which is also licensed by a handful of smaller storage vendors. Storage systems based on MAID technology — which may, in fact, use SATA drives — can get close to the $3/GB cost of automated tape solutions, but are purpose-built for long-term archiving.

- **Data Domain wants to eliminate tape from your environment.** If you are the enterprise that wants to ultimately eliminate tape, then Data Domain is the vendor for you. The company does offer VTL software for its purpose-built disk backup appliances but excels in its advanced data deduplication and compression technologies. Founded in 2001, the company was an early pioneer of deduplication technology and has a long list of reference customers that take advantage of the technology. To date, the company has shipped more than 1,500 systems to 600 firms and is protecting approximately 90 petabytes of data.

- **Diligent Technologies offers mainframe and open system VTL software for its partners.** Launched in 2002, Diligent was created when investors purchased EMC's research and development labs in Tel Aviv, Israel, the unit responsible for the development of EMC's CopyCross technology. The company now offers two open systems VTL software products and one mainframe software product. The company is 100% indirect and recruits partners to integrate the software and disk hardware into a preconfigured solution. While HDS is a major reseller, Diligent also has 20 other VARs across North America, Europe, and Japan. In 2005, the company began shipping its ProtecTIER VTL with data deduplication technology.

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- **FalconStor Software is the leading VTL market enabler.** FalconStor sells its software through major OEMs (including COPAN, EMC, IBM, Huawei-3COM, Sun Microsystems) and VARs that combine the software with disk storage into an integrated solution. Its VTL offering is built on its IPStor platform, which enables not only VTL, but also disk-only image-based protection including continuous data protection and business continuity with replication. Most recently, it announced its deduplication software for its VTL, which is done after the backup.

- **SEPATON succeeds as a standalone vendor and enabler.** SEPATON offers its own integrated VTL solutions but it also licenses its technology to HP which integrates with its hardware technology such as its ProLiant servers and selects the tape emulation. SEPATON has focused its efforts on offering a VTL than can, ultimately, help enterprises eliminate tape with compression and its data deduplication technology (launched in the spring 2006). It puts special emphasis on the company's architecture stack including its own I/O subsystem, file system, and VTL software on which it can build future "content aware" applications. SEPATON's approach to data deduplication differs from other VTL vendors — rather than deduplicate the data during the backup, it conducts the deduplication post-backup. It also offers VTL-specific replication and is also pursuing the mainframe market with a recently announced partnership with Luminex.

WHAT ARE THE SELECTION CRITERIA FOR CHOOSING A VTL?

Firms that are considering a vendor evaluation for VTL should keep the following requirements in mind before the evaluation process begins.

- **What are the support and interoperability requirements?** First, firms must evaluate the vendor's ability to support hardware and software requirements. Specifically, firms should determine whether or not the vendor supports mainframes, open systems, or both, and the firm's specific operating systems, backup software applications, tape emulations, and networks (FICON, FC, iSCSI). Even the combination of these items with infrastructure components such as host bus adapters (HBAs) and switches is an important consideration.

- **Do you plan to buy software or an integrated appliance?** Firms have the option to buy software-only solutions, such as those offered by Diligent and FalconStor, or an integrated appliance that bundles VTL-ready hardware and software from a VAR or major partner. Firms that have the development and integration skills in-house can buy VTL software with storage hardware and do the work to integrate internally, but can easily underestimate the work involved in the integration of the VTL software and the disk array. An integrated appliance is shipped preconfigured, is much easier to install and receives the full customer service support of the VAR or vendor.

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- **Can the vendor support your preferred approach to physical tape creation?** There are two ways to create physical tapes from the VTL and choosing a vendor that can support the firm's preferred method is important. Firms can either perform a second backup from the VTL through the backup media server to the tape library or directly from the VTL without the need to read the data back through the backup media server and out to the tape library. In the first approach, the backup software retains complete control of the media catalog and media management, allowing the enterprise to restore directly from tape without the necessity of the VTL's presence. The second approach — common to mainframes — creates the tapes directly from the VTL without the backup media server and can improve tape use. Unless there is special integration with the backup application (which many VTL vendors offer with leading backup application vendors such Veritas NetBackup) the VTL writes to the tape in its own proprietary format and maintains its own tape catalog.

- **What are the tape media management requirements?** Tape media management is closely related to physical tape creation and is an important element of the decision process. If physical tapes are created by performing a second backup from the VTL through a backup media server, tape media management is not an issue because the backup application continues to maintain the catalog and media management. If, however, tapes are created directly from the VTL without the backup media server, you have to decide whether the backup application or the VTL should control the catalog. In mainframe environment, the VTL controls the catalog, but most open system VTL vendors that support direct tape creation must do extensive integration with backup application software vendors to retain control. This allows enterprises to restore data from the VTL or directly from tape and the physical tape receives the same barcode as the virtual tape.

- **How important is tape cartridge use?** Compression improves VTL disk use by storing more data on less physical disk storage; all VTLs offer some level of compression and report compression rates of anywhere from 2 to 1 to 3 to 1. However, when creating physical tape cartridges directly from the VTL, most VTLs default to a conservative compression ratio to ensure that the virtual tape cartridge fits on the physical tape cartridge to prevent piling over onto two cartridges, which can cause media management problems. However, defaulting to a conservative compression ratio won't make full use of the tape cartridge capacity. Some VTLs, such as NetApp's NearStore, can match the tape drive compression that it is emulating. NetApp often promotes its "smart sizing" capability as a competitive advantage in the open system VTL market.

- **What are the long-term scalability requirements?** When selecting a VTL solution, firms must ensure that they select a VTL than can scale to meet their current and future requirements. Some VTL vendors offer a nondisruptive upgrade path from an entry-level VTL to a larger VTL, whereas other VTL offerings have a grid-like architecture that allows

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enterprises to add nodes that become part of a single VTL configuration. Firms with large environments will find the grid-architecture appealing. Midsize businesses need to focus on a nondisruptive upgrade path.

- **What approach to replication do you use?** Enterprises are increasingly interested in VTL replication as a cost-effective way to replace off-site tape vaulting as their disaster recovery solution. There are two methods to VTL replication — VTL-specific replication that occurs at a virtual drive level or replication using the native capabilities of the integrated storage array. VTL-specific replication ensures the appropriate metadata is replicated to the VTL at the remote site. It's a little more complicated to deploy the array-based replication but it offers firms synchronous as well as asynchronous replication and even some of the advanced capabilities such as multisite replication, resynchronization after a WAN disruption, etc.

- **How can you reduce complexity and improve manageability?** Firms that have multiple VTLs at a single site or across multiple sites need to select a solution that has centralized management: Not all VTL vendors offer this today. For those vendors that do offer centralized management, firms have two manageability choices — manage these VTLs from a single console or select a VTL technology where individual VTL nodes become part of single VTL entity.

- **Do you data deduplicate before or after the backup?** Data deduplication — a new offering on most VTLs — removes redundant copies of data and stores only unique data segments. Firms must decide whether to deduplicate pre- or post-backup. This is an important feature that can potentially save a significant amount of disk space in a very large environment but does have a downside. The pre-backup process imposes a potential performance impact on the backup. Vendors should offer guidelines on the expected performance impact. Performing the data deduplication post-backup eliminates the risk of a performance hit, but forces firms to manage "deduplication windows" to ensure that deduplication processes that run on the VTL during the day complete before regular backup process kick-off in the evening.

- **What are your performance expectations?** Despite performance claims from the VTL vendors, there is no independent lab or industry group that validates performance claims. The only way to determine whether or not the performance of the VTL is acceptable is an actual demonstration in your environment. There are two important elements to understand about VTLs and performance. First, the VTL will only improve the performance of backups if it is the target that is the bottleneck. Second, even when the VTL is introduced the bottleneck is usually caused by something else in the backup ecosystem. Most enterprises cannot stream data to the VTL fast enough and it depends on the number of media servers in the environment, the performance capabilities of these servers, the connectivity from the servers to the VTL, and the configuration of the backup jobs themselves. If you have a large, complex environment, you may want to consider a vendor that can offer an assessment of your backup

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environment so that you can make the appropriate adjustments to your environment as well as configure the VTL for maximum performance.

- **Who are the vendor's major partners?** The VTL vendor's partnerships with major backup application vendors, storage vendors, and tape vendors are a good indication of its ability to integrate into an existing environment or have more in-depth integration in key areas, such as tape creation and tape media management.

- **What are the implementation and ongoing support requirements?** There are two types of services to be concerned with — customer and consultative service. Whether they buy directly from the vendor or through the VAR, firms will need to ensure that they receive implementation support, as well as reasonable support for break/fix and ongoing maintenance. For large environments, consulting and integration services are also important and there are many vendors that can assess your current backup environment to understand how to best implement the VTL for maximum results. The larger your environment, the more you'll require 24x7 customer support and will be likely to need to implementation and consulting services with your VTL purchase. Midsize businesses might need something less than 24x7 support but implementation services from a capable VAR are still important.

- **How viable is the vendor in the long term?** With emerging vendors in any technology segment, long-term financial viability is always a concern for enterprise buyers. Firms should focus on vendors that have strategic relationships, such as reseller arrangements, with the larger storage incumbents. Also, quiz these vendors on the number of VARs they have recruited, the overall number of customers, and specific reference customers.

- **How much are you planning to spend?** Prices vary widely between emerging companies and the established vendors but expect to pay for software plus disk capacity based on a per-terabyte basis. Pricing usually starts at $100,000 for entry-to-midrange-level models that support several terabytes. There are even entry-level appliances that start as low as $30,000. Because price can vary so widely, you'll need to determine what kind of service and support your require from your VTL vendor, larger vendors are more expensive but their higher price tag comes with the ability to deliver 24x7 support in most geographies.

RECOMMENDATIONS

VTLs WILL HELP TAPE USERS MIGRATE TO DISK-BASED DATA PROTECTION

If you have a significant investment in tape today, and plan to continue to invest in the technology for the foreseeable future, you can introduce disk into your backup environment with a VTL. It is, in fact, the least disruptive disk-based technology for your environment.

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- **Avoid data protection vendors with grandiose promising to eliminate tape altogether.** If you have significant investment in tape and it still plays a role in your data protection strategy, you need to select a vendor whose technology will integrate with your existing backup environment and maximize your investment in tape.
- **Pick vendors with a broad portfolio of capabilities.** Seek a vendor with a portfolio of mature disk-based data protection offerings that encompass VTLs and disk-only solutions, strong deployment expertise, and partnerships with leading backup application vendors and other independent software vendors.

SUPPLEMENTAL MATERIAL

Companies Interviewed For This Document

Diligent Technologies

EMC

FalconStor Software

Fujitsu Siemens Computers

Hewlett-Packard

Hitachi Data Systems

IBM

Network Appliance

Quantum

SEPATON

Sun Microsystems

ENDNOTES

[1] Sources: Business Technographics® March 2006 North American And European Enterprise Network And Telecommunications Survey, Business Technographics March 2006 North American And European SMB Network And Telecommunications Survey.

[2] In November 2005, Forrester conducted a directional survey of 50 storage and business continuity decision-makers at North American enterprises to assess adoption trends in storage and business continuity technology. According to the survey, the adoption of disk-based technologies for both local data protection and disaster recovery protection is growing rapidly. Based on this rapid adoption, it's clear that disk-based data protection technologies have graduated from an emerging market phase to an expanding phase. Independent software vendors, storage vendors, and traditional tape hardware vendors must be prepared to capitalize on this market phase immediately. See the March 8, 2006, Trends "Enterprises Ask Tape: What Have You Done For Me Lately?"

[3] The high reliability of disk is due to features like RAID — which provides fault tolerance against drive failures — and fewer mechanical operations, which reduces the opportunity for data errors and hardware failures.

[4] As of Q3 2006.

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