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Professional backup solutions compared

Test Run



Kamill Macniale, 123RF

Seven leading and popular backup solutions line up to face the Linux Technical Review test team, whose members have checked nearly 100 individual features in a comparative test. *By Jens-Christoph Brendel*

You might think everything to be said about backups has already been said. The backup principle scribes have used since the middle ages has hardly changed. Valuable information is duplicated and put into safekeeping to avoid loss, even if the original is mislaid or damaged. Of course, the copying process is digital and typically automated now. The volume of data created worldwide will grow 10-fold between 2006 and 2011 say the analysts at IDC [1], and the major part of this huge volume – some 1,800 exabytes – needs to be backed up on a regular basis.

As capacities grow and time slots become increasingly shorter, admins face limited bandwidth for network-based data transfer. Additionally, they need to worry about data security and protection requirements, the increasing need for automation, huge mountains of information that cloud offerings or data warehouses accumulate, the pressure of guaranteeing minimal

outages, stricter compliance regulations, and an increasingly complex storage landscape. For all of these reasons, and more, backup is a topic of concern for many admins.

New requirements automatically spawn new backup software features, and these changes are reflected in the product comparison, first performed about two years ago. Some of the buzzwords that dominate the backup scene today were of no consequence then, including the now ubiquitous “deduplication,” as well as continuous data protection, synthetic backups, or special processes for backups of virtual machines. In the new round of product comparisons, I naturally included these criteria, and they are worth examining in more detail.

Deduplication, CDP, and Synthetic Backups

Deduplication has become important to backups in the course of the past

two or three years because, in a perfect world, it combines several benefits. For one, deduplication reduces the sheer volume of data by identifying identical blocks of data and backing them up once only; all other instances of the same data block are simply referenced by pointers. Depending on the type of information and the change rate, this process can often reduce the data to a tenth of its original volume.

Source deduplication also removes the need to transfer data, which saves network bandwidth in client-server backup scenarios. Sometimes deduplication takes place at the target or on the media server (post-process target deduplication). In this case, you lose the benefit of source dedupe, and the compression rate is typically slightly lower, but you can apply the technology to older backups with, say, Tivoli Storage Manager.

Of course, deduplication has a negative side, too. The most obvious dis-

advantage is that it costs far more in terms of CPU resources, and in a worst case scenario, the benefits will not outweigh these costs. If you're deduping video or audio files, pre-compressed or encrypted files, images, and databases, the savings will not be significant.

Redundancy – which, in addition to the downside of space consumption, has the positive effect of greater failure tolerance – is removed deliberately through deduplication. If you are unable to read a block physically from a deduplicated medium, the effect might be that many different files containing the block are lost. Without deduplication, the damage would only affect exactly one file.

Continuous Data Protection (CDP) refers to the idea of backing up every change straightaway, typically in the form of byte- or block-level differences. This approach means any previous version can be restored immediately (as opposed to replication, which only stores the latest version). To offer this technology, many brand name backup software vendors have had to acquire specialists, as with deduplication.

For example, Symantec acquired Revivio, IBM acquired FilesX, and EMC acquired Kashya. Thus, CDP still is often an add-on product (Symantec

NetBackup RealTime, IBM Tivoli Storage Manager FastBack, or EMC RecoverPoint).

Of course, no backup disk can store all the changes to the original data indefinitely, and CDP is therefore able to keep its promise only for a limited period of time. Thus, the backup interval is changed to a couple of hours or days in some cases.

The technology often relies on snapshots and is then referred to as near-CDP. Continually comparing the results and the original consumes CPU cycles and I/O bandwidth. CDP is typically incapable of bridging large distances between host and storage. Synthetic backups answer the question: Why bother backing up what you've already backed up? The full backup is easy to handle and accurate but also slow and expensive. Differential or incremental backups are much smaller and faster but also far more complex to handle, and their accuracy leaves something to be desired. Deleted, renamed, or moved files can keep reappearing at their previous location or under previous names if restored from an incremental backup. In most cases, 90 percent of a full backup will be identical to the previous full backup, so the full backup does not need to be sent to the backup server again. Instead, the

backup server creates a backup of a previous full backup and the subsequent incremental backups. This synthetic backup is identical to a full backup but doesn't entail repeatedly transferring data over the wire.

VM backups could involve grabbing a snapshot of the virtualization host, thus supporting backups of the running machine without a maintenance time slot.

In other cases, the backup can be created directly in storage, without needing to access the LAN, or it could use a backup server running on one of the other virtual machines, which avoids accessing the physical network.

Cloning is a way to back up VMs and access them without using their operating systems. By cloning the core image file of a disconnected VM, you could duplicate its virtual hard disk without having to start the VM.

Old Friends

The other criteria for the comparison tables (Tables 1 through 4) are mainly old friends. Besides basic details of the products (Table 1), I was also interested in standard features (Table 2) that any administrator would expect to find. Acronis Backup & Recovery stands out here, because it doesn't use a centralized backup server and many clients; rather, it backs up a dedicated server directly. All of the programs can handle full backups and differential and incremental backups, but beyond these, you start to see the differences: Synthetic backups are not as frequent, and you can rarely schedule a backup for the first Monday in the month; several copies at a single pass are also rare, and the filtering options for file and directory exclusion are also very different. Equally apparent differences exist with special backup technologies (Table 3), and support for applications such as databases or groupware in the form of special modules reveal the discrepancies between the vendors (Table 4).

At this point, you can see that despite our efforts to look at the details, some

Test Procedure

To test the various backup programs, I used a virtual machine on a VMware ESX server. The physical underpinnings were a ProServ II server by ExuS Data with two Xeon quad-core processors and 16GB of RAM (Figure 1, top).

All of the virtual machines ran on SLES 11 SP1. They typically had 1GB of RAM and an additional 50GB hard disk to back up, as well as the system disk.

All the backups were created on disk. To handle this setup, I had a 6100 SATA Premium RAID by transtec (Figure 1, bottom) with 12 Serial ATA disks, a 320 UW SCSI controller for the host connection, and 512MB cache.

I configured various disk groups and logical volumes on this powerful hardware and exported them to the backup server. The RAID system's controller supports RAID 0, 1, 5, 10, or JBOD.



Figure 1: The hardware used for the backup tests, with the ExuS Data server at the top and the transtec RAID at the bottom.

Table 1: Product Overview

	Acronis	Arkeia	EMC
	Backup & Recovery v10	Network Backup v8.2.6.1	NetWorker v7.6
Product Details			
Operating Systems (Server)			
Linux	Asianux, CentOS, Debian, Fedora, openSUSE, RHEL, SLES 10, Ubuntu	Fedora, generic, Mandrake, Mandriva, Novell OES/SLES/SUSE, RHEL, Slackware, Ubuntu, United Linux, Yellow Dog	RHEL and SLES
BSD	No		No
Unix variants	No	AIX, HP-UX, Irix, SCO UnixWare, Solaris	AIX, Dynix, HP-UX, Irix, Solaris, Tru64
Other	No	No	
Mac OS X	No	No	No
Windows versions	No	No	2000/2003
Operating Systems (Client)			
Linux	-	Fedora, generic, Mandrake, Mandriva, Novell OES/SLES/SUSE, RHEL, Slackware, Ubuntu, United Linux, Yellow Dog	x86/64
BSD	-	FreeBSD, NetBSD, OpenBSD	No
Unix variants	-	AIX, HP-UX, Irix, SCO UnixWare, Solaris, Tru64	AIX, HP-UX, Solaris, Tru64, Irix
Other	-	NetWare	NetWare, OpenVMS
Mac OS X	-	Yes	Yes
Windows versions	-	2000/2003/2008/98/XP/Vista/7	2000/2003/98/NT/XP/Vista
Interfaces and Support			
GUI	Yes	No	No
Web interface	No	Yes	Yes
CLI	Yes	Yes	Yes
License	Commercial	Commercial	Commercial
24/7 support	Yes	Yes	Yes
Price	US\$ 1,219	One server, one drive, 1TB VTL: US\$ 1,300	Client/server/Storage Node >US\$ 4,000 depending on size of environment
URL	[http://www.acronis.com/]	[http://www.arkeia.com/en/products/arkeia-network-backup]	[http://www.emc.com/products/detail/software/networker.htm]
System Architecture			
Client-server architecture	No	Yes	Yes
Optional media server	Yes, storage node	Yes	Yes
Backup Media			
Disks	Yes	Yes, via VTLs	Yes
Tapes	Various SCSI and USB drives	3590, 9840/9940, AIT, DAT, DLT, DTF, LTO, Magstar, Mammoth, SAIT, SDLT, SLR, Travan, VXA	4mm, 8mm, 9840/9490, AIT, Atmos, DAT, DLT, LTO, QIC, SAIT, SDLT, Travan
Autoloader	Yes	Yes	Yes
Virtual tape libraries	No	Yes	Yes
NAS via NDMP	No	Yes	Yes

IBM	Open Source	SEP	Symantec
Tivoli Storage Manager v6.2	Bacula v5.0.3	SEP sesam v4.0	NetBackup v7.0
Linux x86/64, Linux on Power, Linux on System z	CentOS, Debian, Fedora, Gentoo, Mandriva, openSUSE, Red Hat, SUSE, Ubuntu	CentOS, Debian, Red Hat, SUSE, Ubuntu, UCS	Asianux/Red Flag, Novell OES/SLES, Oracle, Red Hat
No	FreeBSD, OpenBSD, NetBSD	FreeBSD	No
AIX, HP-UX, Solaris	Solaris, OpenSolaris	Solaris	AIX, HP-UX, Solaris
No	Novell OES	NetWare, VMS, PowerMAX OS	No
No	No	No	No
2003/2008	2000./2003/2008/Vista/XP/7	2003/2008/2003R2/2008R2	2003/2003 R2/2008/2008 R2
x86/64, Linux on Power, Linux on System z	As of kernel 2.4.x	As of kernel 2.2.x	Asianux/Red Flag, CentOS, Debian, Novell OES, Red Hat, SUSE, Ubuntu
No	FreeBSD, OpenBSD, NetBSD	Open BSD	FreeBSD
AIX, HP-UX, Solaris, IBM z/OS	AIX, HP-UX, OpenSolaris, Solaris	AIX, HP-UX, Sinix, SCO Unix, Solaris, Tru64	AIX, HP-UX, Solaris
Novell NetWare 6.5 and OES	Novell OES	VMS, OS/2, NetWare	HP OpenVMS, NetWare
Yes	Yes	No	Yes
7/Vista/XP/2003/2008	2000/2003/2008/Vista/XP/7	NT/2000/2003/2008/Vista/7	2003/2003 R2/2008/2008 R2/Vista/XP/7, Storage Server 2003/2008
Yes	Yes, Qt	Yes, Java	Yes, Java
Yes	Yes, BWEB	No	No
Yes	Yes	Yes	Yes, CLI + text menus
Commercial, by processor core or backup volume	AGPLv3	Commercial, multiplex stream server under GPLv2	Commercial
Yes	Yes, Enterprise Edition	Yes	Yes
Enterprise Edition from ~US\$ 5,000 (one platform, unlimited number of support calls, clients, volumes, etc.)	From EUR 150 (one server/stream)	From US\$ 8,000 for a server and five clients	
[http://www-01.ibm.com/software/tivoli/products/storage-mgr/]	[http://www.bacula.org], [http://www.baculasystems.com]	[http://www.sep.de]	[http://www.symantec.com/business/index.jsp]
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes, via VTLs	Yes
3592, 4mm, 8mm, AIT, DLT, LTO, SAIT, SDLT, T10000	AIT, DAT, DLT, LTO, SDLT, VXA	AIT, DAT, DLT, LTO, SDLT, VXA	AIT, DAT, DLT, LTO, SDLT, VXA
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes and NetApp SnapMirror to Tape	No	Yes	Yes

criteria are not easily compared. For example, specialist modules can't offer more than the applications that they support. Thus, they're not responsible for certain deficits – or, at least, not if they leverage the capabilities of the supported applications, which is not always the case.

The compatibility issue also applies to pricing. Licensing models can be by number of clients, the backup volume, number of server CPUs, number of platforms to back up, or just a lump sum.

Additionally, you'll see a variety of surcharges for add-on modules, which in turn are priced by some kind of volume criterion. The costs are only comparable if you get the vendor's sales people to work out an offer for a tangible scenario. Wherever possible, I listed the entry-level price for a server without any optional extras (Table 1), which at least gives you some idea of the scale. Besides these criteria, identical factors also made it hard to choose in some cases. For example, any of the programs looked at can easily back up a Linux server. With the exception of Acronis, which uses a different paradigm, all of the programs will work well on heterogeneous networks with many backup clients.

For this reason, you first have to decide what you want to back up and how. If you need a feature that is a unique selling point with one of the candidates, your choice is obvious. For example, an environment with many open source components would not be supported as well by many of the commercial backup solutions as it is by SEP sesam.

The same thing applies if you have deployed some other components by, say, Tivoli. In this case, you probably want to purchase the matching backup solution.

If you have not made a decision yet, your budget will be another major factor. The heavyweights in this test in particular require a considerable investment up front. If you still have two candidates neck and neck, a subjective appraisal of their usability is your last option. Because backup soft-

ware is generally quite complex, and use concepts will tend to differ, this consideration is a matter of personal preference.

Acronis

The Linux backup software Acronis [2] doesn't keep to the popular architecture of a backup server and possibly a media server plus clients. Instead, Acronis supports precisely one server on which it is installed. It creates normal file-based backups or images on the server, with combinations also supported.

Because a disk image lets you restore the operating system with all its settings, the boot records, and so on in one fell swoop, this approach can drastically reduce the time it takes you to recover.

Acronis Secure Zone is a feature that lets you set up an extra rescue partition from which you can boot the server in an emergency. This capability means that you can fully automate any backup and allow events, such as the free space on a disk rather than just a schedule, to trigger backups – this feature is a rare ability. The GUI is clear-cut and easy to use. You can encrypt archives if needed.

After successfully completing all of the tests in the virtual environment, I encountered a problem with Acronis when backing up physical machines. The backup software froze, damaged its own installation, and reported totally nonsensical statistics. As we discovered in cooperation with the friendly and competent support people, this behavior was caused by the ext4 filesystem I had used in this case.

Acronis will not support ext4 until the next release, if then. Considering that ext4 has been around in the mainstream kernel for more than two years, it's high time Acronis started to support it.

Arkeia

Just looking at the architecture quickly reveals that Arkeia [3] aims to do battle with any size IT land-

scape. At the highest level, there is the Central Management Server, which manages multiple backup servers one level below.

These servers in turn communicate with Backup Agents, which reside on most platforms. In this way, Arkeia's model is similar to that of major-league players like Symantec, IBM, or EMC.

A software designed to handle any task has its charm because it will scale with your needs, can be modified to change as your requirements do, and offers the feature richness that you would expect from a state-of-art backup solution.

However, the downside is that such a system can become very complex; thus, it can be more difficult to manage and often expensive. If you accept these restrictions, you'll be able to do just about anything with Arkeia NetBackup.

For example, Arkeia has many features that you would only expect in the major leagues, such as direct management of storage hardware by brand name vendors to create snapshots or default definitions for throttling, or replication of backup sets on geographically distributed servers. On the other hand, the clear void between Arkeia and open source is apparent: Arkeia doesn't support even the most popular free databases or groupware suites compared with its commercial competitors.

EMC

NetWorker by EMC [4] (formerly Legato) is one of the long-standing heavyweights in this class. Development of the software started in the 1990s, and the product is correspondingly mature and complete on various platforms.

A wide range of backup agents will take care of applications with open files that need special treatment, including open source products such as MySQL or Open-Xchange, which other competitors from the commercial camp traditionally avoid. Deduplication and continuous data protection are implemented as add-on

products for NetWorker (Avamar and RecoverPoint), but their controls are at least integrated with the NetWorker console.

As another special feature, EMC also draws on its own resources as a hardware vendor and offers preconfigured bundles with NetWorker software and matching storage hardware. For example, the software includes the EMC Data Domain Global Deduplication Array with its centralized inline deduplication storage pool.

I noticed a small issue when I installed the test software – a dependency for Open Motif, which is no longer included in the standard repositories for SLES 11.

This dependency is easily resolved by downloading and integrating Medium 1 from the SUSE Linux Enterprise 11 SDK [5], which provides the required software. You can't install the HomeBase Agent, which stores the server configuration and hardware information in profiles, at all on SLES 11; it is

only available for RHEL 4/5, Solaris, and AIX.

IBM

The best thing about the Tivoli Storage Manager (TSM) product [6] is that it integrates with Tivoli, IBM's all-encompassing system management solution, which manages the entire life cycle of your full crop of services under one roof. Tivoli integrates modules for asset management, security,

Table 2: Classical Backup Technologies

	Acronis	Arkeia	EMC	IBM	Open Source	SEP	Symantec
Backup Strategies							
Full backup	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Differential	Yes	Yes	Yes	Yes (only for NDMP and databases)	Yes	Yes	Yes
Incremental	Yes	Yes	Yes		Yes	Yes	Yes
Synthetic backups from incremental backups	No	No	No	Yes, incremental forever, except databases	Yes	No	Yes
Exclude Filter							
Directories	Yes	Yes, using special block files	Yes	Yes	Yes	Yes	Yes
Regex for file names	No, but wildcards	No	No	Yes	Yes	Yes	No, but wildcards
File size	No	No	No	No	No	No	No
File extension	No	No	No	Yes	Yes	Yes	Yes, with wildcards
Date	No	No	No	No	No	No	No
Owner	No	No	No	Yes	No	No	No
Scheduling							
Frequency: cyclical, fixed cycle	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar: fixed or relative date	No	Yes	No	Yes	Yes	No	Yes
Pre/Post Scripts							
Pre-backup scripts	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-backup scripts	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extra Options							
Multiple copies at one pass	No	No	Yes	Yes	Yes	No	Yes
Data classification	No	No	No	Yes	No	No	Yes
Media pools	No	Yes	Yes	Primary and copy pools on disk and tape	Yes	Yes	Yes
Retention policies	Yes, related to archive	Yes by Savepack/Drivepack	Yes, by SaveSet	Yes, client-based, arbitrary granular	Yes, by file, volume, and job	By Media pool in days	By policy
Restore to other location	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monitoring active processes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated log viewer	Yes	Yes, two variants	Yes	Yes	Yes	Yes	Yes

monitoring, or storage management, including backup and archiving. Besides this, Tivoli Storage Manager, with all of its modules and add-on products, is one of the most powerful backup suites, period. Like other commercial competitors, however, it pays little heed to popular open source products like MySQL or PostgreSQL. The only backup methods are offline and file-based; special modules are not provided. Tivoli Storage Manager is well equipped for any other field of application, at least if you have the budget to afford it. In this case, you can benefit from the flexible, hierarchical organization of the program structure that supports granular control of, say, retention periods or versioning in many layers. It also integrates a descendent of HSM (Hierarchical Storage Management), which lets you migrate data to cheaper media with longer access times as the data becomes less important.

Additionally, IBM obviously leverages the benefit of being able to supply matching storage hardware in the form of disk arrays or tape libraries from a single source.

Open Source

Bacula [7] is the only professional and network-based backup that is totally free. It offers the classical open source advantages: completely (at least theoretically) extensible code, no licensing costs at all, and an active community. If needed, Bacula Systems and various system integrators will offer support, including 24/7 support with short response times. Of course, this service will cost you money.

Additionally, Bacula offers more or less everything you need for centralized backup on larger networks, including sophisticated job control, comprehensive support for popular storage hardware, useful scalability, and powerful volume management.

Creating your own rescue CD adds bare-metal recovery to your options. However, you will have to do without other things – particularly custom support for backing up databases, groupware, directory services, or similar applications. Add-on modules for these purposes, which are typical of other products, are almost completely missing.

The generic Bpipe plugin fills some of the gaps by picking up data of any kind that you need to back up – via Stdout, for example – and passing it on to Bacula. Thus, you can integrate a MySQL dump that other backup solutions that support the database can access internally.

SEP

SEP's *sesam* software [8] has cleverly found a niche market where the crowd is not as tightly packed. This tool goes beyond simple backup solutions designed to handle only a couple of computers but flies below the

Table 3: Special Backup Technologies

	Acronis	Arkela	EMC
Snapshots			
Based on backup software	Yes	No	
Based on Windows VSS	No	Yes, own agent	Yes
Based on storage hardware	No	No	Yes, via PowerSnap module
Data Handling			
Deduplication	No	Not integrated yet, but available separately	Integrated separate product: EMC Avamar
CDP	No	No	Integrated separate product: EMC RecoverPoint
Backup clones	Yes, "dual destination"	Yes, by means of replication	Yes
Staging (e.g., D2D2T)	No	Yes, optional, D2T separate license	Yes
Compression	Yes	Yes, two variants	Yes
Encryption	Yes, AES 128/196/256	Yes, DES or Blowfish	Yes (256-bit AES)
Multiplex streaming	No	Yes, multiplex and multistream; hundreds of streams	Yes, based on clients, savegroups, and devices
Load balancing/Failover between drives	No	Yes, within Drivepacks	Yes
Backup verification	Yes	Yes	Yes
Disaster recovery	Yes	Yes, optional	Optional via EMC HomeBase Server
Bandwidth controls/Throttling	Yes	Yes, two methods	Yes

altitude of those functional monsters with their panacea claims. SEP sesam is thus useful for larger environments but also easy to keep track of and affordable.

SEP sesam impresses in open source environments: No other backup solution provides modules for important free applications. Additionally, SEP releases its own Sesam Multiplex Stream Server under the GPL, which includes the recording format. Users could thus theoretically access data stored with SEP, without actually purchasing the software; this feature provides additional peace of mind and cuts the cords tying an enterprise to a vendor.

Recently, the brand-new version 4 of SEP sesam was released, along with a new GUI. This latest version is even more suitable for large-scale IT environments.

For example, you can group clients and hide or show them in the view behind the group name for a clearer overview. Additionally, you can con-

figure and store your own custom views.

Filtering options have also been extended. All told, many improvements to details based on feedback from users have considerably boosted usability.

One small downside with respect to usability relates to the still fairly complex configuration of disk backups using a virtual tape library and virtual media.

However, I have heard that the developers will be tackling this problem in one of the next versions. Then, you will simply be able to define a target directory for disk backups in SEP sesam.

Symantec

Symantec's NetBackup [9], which still went by the name of Veritas in my last test, is also a mature and

Info

- [1] IDC: The Diverse and Exploding Digital Universe: [<http://www.emc.com/collateral/analyst-reports/diverse-exploding-digital-universe.pdf>]
- [2] Acronis Backup & Recovery 10 Server for Linux: [<http://www.acronis.com/backup-recovery/server-linux/>]
- [3] Arkeia: [<http://www.arkeia.com>]
- [4] EMC NetWorker: [<http://www.emc.com/products/detail/software/networker.htm>]
- [5] SLES 11 SDK: [<http://download.novell.com/protected/Summary.jsp?buildid=fQKpDcAhPVY>]
- [6] IBM Tivoli Storage Manager: [<http://www-01.ibm.com/software/tivoli/products/storage-mgr>]
- [7] Bacula: [<http://www.bacula.org/en/>]
- [8] SEP sesam: [<http://www.sep.de/us/home/nc/1/>]
- [9] Symantec NetBackup: [<http://www.symantec.com/business/products/family.jsp?familyid=netbackup>]

IBM	Open Source	SEP	Symantec
Yes	No	No	Yes
Yes	Yes	Yes	Yes
Yes	No	No	Controlled like Hitachi ShadowImage, EMC TimeFinder and SnapView, IBM FlashCopy, HP EVA Snapclone
Yes, client and server side	Yes	Not integrated, but possible with FalconStor	Yes, integrated with client and media servers
Proprietary product, TSM FastBack	No	No	Proprietary product (RealTime)
Yes	Yes, implicit on migration	Yes, implicit on migration	Yes
Yes; also between disk and tape	Yes	By migration between medial pools	Yes
Yes	Yes	Yes	Yes
Yes	Yes (256-bit AES), Blowfish, RSA	Yes (256-bit AES), Blowfish 64-bit	Yes (DES 40-bit, DES 56-bit)
Yes, source disk multiplexing for SAP backups; no tape multiplexing	Yes, unlimited	Yes, up to 64 parallel streams	Yes
Yes, when using IBM tape drives and drivers	Yes	Yes, within drive groups	Yes, within storage unit groups
No	Yes	Yes	Yes
Yes	Yes, Enterprise Edition	Proprietary product (BSR)	Proprietary product (RealTime) or features bare-metal recovery with separate license
For laptop backups with TSM FastBack for Workstations	No	No	Yes

widespread backup software that includes everything you would expect from a professional data center backup tool today: integrated source and target deduplication, options for backing up virtual environments, a plethora of monitoring and reporting functions, and disaster recovery features.

NetBackup has a wide selection of options and add-on modules: from special backup technologies for laptops and desktops and remote SAN-based tape access, to virtual tapes or tape and disk encryption. NetBackup also shows its strength on storage networks, for example, in the form of support for the Network Data

Management Protocol (NDMP) that allows serverless direct backups on any backup medium. The software also includes many modules for special applications, including databases (from Oracle to Sybase), groupware servers, directory services, and hypervisors, as well as for snapshots and fast SAN-based backups. ■

Table 4: Online Backup Modules for Special Applications

	Acronis	Arkeia	EMC	IBM	Open Source	SEP	Symantec
Databases							
Oracle	No	Yes	Yes	Yes, TSM for databases	No	Yes	Yes
DB2	No	Yes	Yes	Yes	No	Yes	Yes
Informix IDS	No	No	Yes	Yes	No	Yes	Yes
Microsoft SQL	No	Yes	Yes	Yes, TSM for databases	No	Yes	Yes
MySQL	No	Yes	No	No	No	Yes	No
Ingres	No	No	No	No	No	Yes	No
MaxDB	No	No	No	No	No	Yes	Yes
Sybase ASE	No	No	Yes	Via BMC SQL BackTrack or direct in ASE 15.5	No	No	Yes
PostgreSQL	No	Yes	No	No	No	Yes	No
Mail Servers and Groupware							
Open Xchange	No	Yes	No	No	No	Yes	No
MS Exchange	No	Yes	Yes	Yes	Yes, Enterprise Edition	Yes	Yes
Scalix	No	No	No	No	No	Yes	No
Novell GroupWise	No	Yes	No	No	No	Yes	No
Zarafa	No	Yes, script	No	No	No	Yes	No
Lotus Domino	No	Yes	Yes	Yes	No	Yes	Yes
MS SharePoint	No	Yes	Yes	Yes, TSM for MS SharePoint	Yes, Enterprise Edition	No	Yes
Directory Services							
LDAP	No	Yes	No	No	No	Yes	No
Novell eDirectory	No	Yes	No	Yes	No	Yes	No
MS Active Directory	No	Yes	Yes	Yes, NetWare with TSM B/A client, OES with eMTool	Yes, Enterprise Edition	Yes	Yes
Virtualization Solutions							
VMware ESX	No	Yes	Yes	Yes	No	Yes	Yes
Citrix XenServer	No	Yes, script	Yes	Yes	No	Yes	No
Hyper-V	No	Yes	Yes	Yes	No	Yes	Yes
HP-UX Integrity	No	No	No	Yes	No	No	Yes
Solaris Zones	No	No	Yes	Yes	No	No	No
Business Intelligence Software							
SAP R/3	No	No		Yes, TSM for ERP	No	Yes	Yes

Backup & Disaster Recovery

Georgetown University Chooses SEP sesam Backup Solution



The Situation

Georgetown University's McDonough School of Business (MSB), one of the most renowned business schools in the United States, called SEP sesam to replace their under-performing backup software. MSB is experiencing a period of strong program growth. The MSB Technology Center has been tasked with keeping their IT systems up to date and required a state of the art backup system to ensure continuity of operations. After a brief discussion, SEP was able to analyze current problems and provide reliable backups for critical data.

During the course of using the old solution, administrators were continually asked to reconfigure and restart their backup systems even though changes were not being made to the environment or the network infrastructure.

The Challenge

MSB's new data and applications services requirements had outstripped its legacy backup software. The old solution was not flexible enough to meet new demands without continuous monitoring. The old system continually failed during overnight backup tasks. Each error and failed backup required a lengthy call to vendor tech support and often required custom code changes and hot patches. The situation finally became untenable when the software could not work with a newly purchased EMC DL3D1500 Disk Library. This final straw initiated an active search for a better and more effective backup solution.

The Solution - SEP sesam

Mike Yandrischovitz, Data Systems and Security Manager for the business school, consulted with other members of the user community and discovered SEP sesam. After contacting SEP, he downloaded and installed the software. In less than two hours, Mike, along with SEP assistance, was able to get backups for McDonough's most critical applications.

The decision to move from the old vendor was still difficult. Business school staff had invested a great deal financially and even more in time and lost productivity. Nevertheless it was decided to make a change to SEP sesam.

"James Delmonico, at SEP, had us up and running in hours. I was getting substantial 'heat' from our user community because our backup solution was unstable. We were not able to get reliable backups using the old backup software. Thanks to the SEP sesam solution we had reliable backups almost immediately and restores of critical data for our customers' everyday requirements were fast, easy and accurate. We are now a great fan of the software and the team at SEP," said Yandrischovitz.

"SEP engineers were even instrumental in using the SEP software to help diagnose a configuration problem with our new SAN. Isolating the problem, we were able to pinpoint an issue with the SAN Switch. The vendor reconfigured the switch and now, with the new software and new hardware, our backups are completed within time windows previously considered unattainable."

According to John Carpenter, McDonough Chief Technology Officer, "SEP sesam and their helpful engineers took a major worry off our plates. The new implementation has performed better than we expected. Our staff can now go home on time and I've saved the cost of acquisition of SEP sesam by returning scheduled overtime back to the operating budget. Backups that used to take a whole weekend are now complete in under eight hours."

Results

"Implementing SEP sesam has been truly instrumental in easing our workload and providing a quality backup solution for all of our customers. The implementation has allowed us to use other equipment including our hundred-slot ADIC tape library, which was not available to us when using the previous solution. The time we spend working on backup related issues has been reduced by a factor of 90%. The acquisition cost for SEP sesam was less than our annual maintenance fee for the old backup solution. Call us one satisfied customer," stated Carpenter.

SEP

Backup & Disaster Recovery

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