Tandberg Data AccuVault™ RDX

Binary Testing conducts an independent evaluation and performance test of Tandberg Data's latest small business backup appliance.

Data backup is essential to their survival and yet many

small businesses still do not have a coherent plan to protect their digital assets. Reasons for failing to backup critical systems and application data are manifold with the most common including limited IT budgets, complexity, hardware and software costs and a lack of resources for managing backup strategies.

Successful backup strategies for small businesses must be affordable, easily managed and be able to provide swift access to data in the event of a loss or disaster. With the launch of its AccuVault™ RDX data protection solution, Tandberg Data aims to address all these requirements in an easily deployed, cost-effective desktop system which provides a number of valuable features not normally found at this price point.

Designed to secure up to five servers or workstations, the AccuVault™ RDX is preloaded with Tandberg's Data's AccuGuard™ Enterprise data protection software. Along with automated backup tasks, off-site storage and archiving for file, Exchange and SQL servers, it includes integrated source-based data deduplication technology

Data deduplication eliminates redundant copies of data and can significantly reduce costs for backup storage requirements. It's gaining rapidly in popularity but is aimed primarily at larger businesses so it's rare to see a really affordable option for small businesses.

Binary Testing was commissioned by Tandberg Data to evaluate the AccuVault™ RDX appliance in its UK network testing lab. Its engineers deployed it in a dedicated Windows-based test network and looked at ease of use, manageability, features and performance.

Using the Binary Testing data deduplication test suite, the engineers ascertained data reduction ratios and storage savings for long term file server and Exchange Server backups. A VMware ESX Server system was also introduced to the appliance to test performance of multiple server backups.

KEY FINDINGS

1 All Windows backup and offsite storage features seamlessly integrated into a single appliance

2 Delivered high data reduction ratios in lab tests of 34:1 for file servers and 60:1 for Exchange Server

3 Performance of up to 143GB/hour recorded for backups from multiple Windows servers

4 Swift deployment and simplified management highly suited to SMBs with limited IT experience

5 Integral RDX® drive provides an ideal solution for offsite data retention and media rotation

Introducing the AccuVault™ RDX

Tandberg Data has aimed the AccuVault™ RDX data protection solution very firmly at the SMB and ROBO markets. It's designed to provide an affordable plug-and-play backup solution for protecting physical or virtual Windows servers and workstations.

The AccuVault™ RDX offers a complete data backup and recovery solution in a low-profile desktop appliance. Its compact design allows it to fit into any small office and it's extremely quiet.

The Binary Testing engineers confirmed it has a very low power consumption when compared to a combination of a standard x86 server with an LTO-4 tape drive.

The AccuVault™ RDX is one member of a family of AccuVault™ appliances

Power Ratings		
System	**Idle (Watts)**	**Peak (Watts)**
Tandberg AccuVault RDX	**29W**	**35W**
Dual Xeon 5500 server with LTO-4 tape drive	**165W**	**320W**

The appliance's low power draw is due to the use of a dual-core Intel Atom CPU. These processors are now commonly used in many SMB network storage appliances as they deliver a good combination of processing power, low heat output and minimal power requirements.

Internal storage is provided by a 1TB SATA hard disk which is used as a repository for the operating system and a destination for primary backups. The network connection is handled by a high-speed Gigabit port and additional USB ports provide options to add further external storage devices. The appliance also ships as standard with a 1TB RDX® cartridge.

A useful feature is the small LCD touch screen on the front of the appliance which provides readouts on system status and internal temperatures. A menu is provided for running system maintenance and diagnostics tasks, viewing used and free disk space on the appliance and configuring the network interface.

The appliance is designed to be mounted flat on a desktop or vertically using the supplied stands. The LCD display can sense the position and will rotate itself to remain vertical in either orientation.

Tandberg Data's RDX® QuikStor™ technology

The AccuVault appliance includes an internal RDX® QuikStor™ dock which is used for essential data archiving and off-site storage. Tandberg Data's RDX® technology uses sturdy removable cartridges with compact 2.5in. SATA hard disks mounted inside.

These pocket sized cartridges are easily portable and very robust making them a solid alternative to tape for off-site storage. As they are essentially removable hard disks they perform faster than SMB level tape drives and are more easily integrated into Windows operating systems.

Binary Testing engineers exclusively reviewed RDX® QuikStor™ for PC Pro magazine, the UK's leading IT publication, when it was first launched and were impressed with its feature and capabilities. It received a PC Pro Recommended award and in its review, Binary Testing concluded that Tandberg had delivered "an innovative hard disk-based alternative to tape for small-business backup operations".

What is data deduplication?

Data deduplication is the process of eliminating multiple copies of data to reduce backup storage requirements. There are a wide range of deduplication technologies available on the market today but Tandberg Data's source-based deduplication offers a number of significant advantages over competing solutions.

Embedded on the AccuVault™ RDX appliance, the AccuGuard™ Enterprise software removes all redundant data on the source backup system first before sending anything over the network to the destination appliance resulting in significantly reduced backup windows. AccuGuard™ Enterprise uses three data deduplication techniques to identify and remove redundant data. First, the data is compressed using advanced compression algorithms.

Next, its unique global single instance storage (G-SIS) technology is used to remove redundant data at the file level regardless of file name, path or host server. Active files are then analyzed at the sub-file level to further remove any redundancy which overcomes problems with PSTs, Exchange EDBs and SQL Server databases.
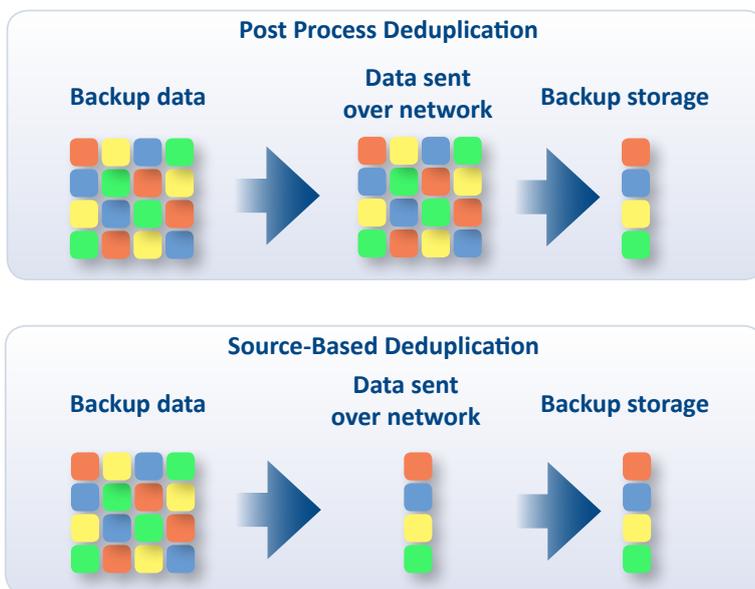
" Tandberg Data's source-based deduplication offers a number of significant advantages over competing solutions. "

Traditional 'post-processing' deduplication solutions only process the data and remove redundant blocks as it arrives at the appliance. A major disadvantage of this method is it generates higher network traffic during the backup as all data must be sent to the appliance for processing. To avoid impacting on general business operations, backups must be run at quiet times such as overnight.

Tandberg Data's source-based deduplication does not require an agent installed on the systems selected for backup. When a backup begins, it simply runs a scheduled task on the source server which is remotely executed from the appliance. This approach reduces deployment time as no additional software has to be installed on each server. Furthermore, when upgrades are made available for the AccuGuard™ Enterprise software they only need to be applied at the core appliance.

Backup strategies are simplified as there is no need to run a combination of weekly full backups plus daily incremental or differentials. AccuGuard™ Enterprise uses Protection Plans which define what data is to be secured, where it should be stored and what schedule is to be applied. Deduplicated data and associated cataloguing information are kept in Stores which can be located on disk drives, network drives, removable disks and file folders.

For the AccuVault™ RDX appliance, Stores will be created on its internal disk drive and also on the RDX® cartridges for removal to secure off-site storage. The data stored on the RDX® cartridge is a complete mirror of the local Store thus providing an exact copy.

As a Store holds all information about the deduplication processes, the more systems that are backed up to it, the better it performs when reducing redundant data. Only unique items are retained in a Store, so the information from all associated systems will be used in the deduplication process.

As the processors on each system are being used to perform local data analysis and deduplication, there are no significant overheads on the backup appliance when securing data simultaneously from multiple systems. The appliance supports multiple Stores and as AccuGuard™ Enterprise supports backup from file servers, Exchange Server and SQL Server, multiple stores can be used to separate data from different applications.

Performance Test Results

To ascertain the AccuVault™ data reduction rates and potential storage savings, we used the Binary Testing deduplication test suite for file server and Exchange Server backup operations. For the file server test, we used a 10GB data set consisting of 1,320 files and for Exchange Server we created 1,000 users each with their own set of email attachments totaling 10GB.

The Binary Testing suite allows controlled changes to be applied to a desired percentage of files or emails. We used the AccuGuard™ Enterprise console to manage a daily backup strategy and after the first backup had completed, used the suite to modify the data sample prior to each subsequent backup.

To represent a typical rate of change for file server activity within an SMB office environment, the suite was used to modify 2 percent of data within 40 percent of files prior to each backup. For Exchange Server activity, the suite was used make the same rate of changes to emails.

" For the Exchange Server test, a data reduction ratio of nearly 60:1 was achieved. "

The simulated backup period for each test was two months. The data reduction rates and storage savings were calculated by comparing the results from the two tests with the amount of data that would have been backed up without deduplication.

The file server results were compared with a standard backup strategy consisting of daily incrementals and weekly full backups. The Exchange Server results were compared with a standard strategy of daily backups combined with flushing committed logs.

Data reduction ratios over a two month backup period
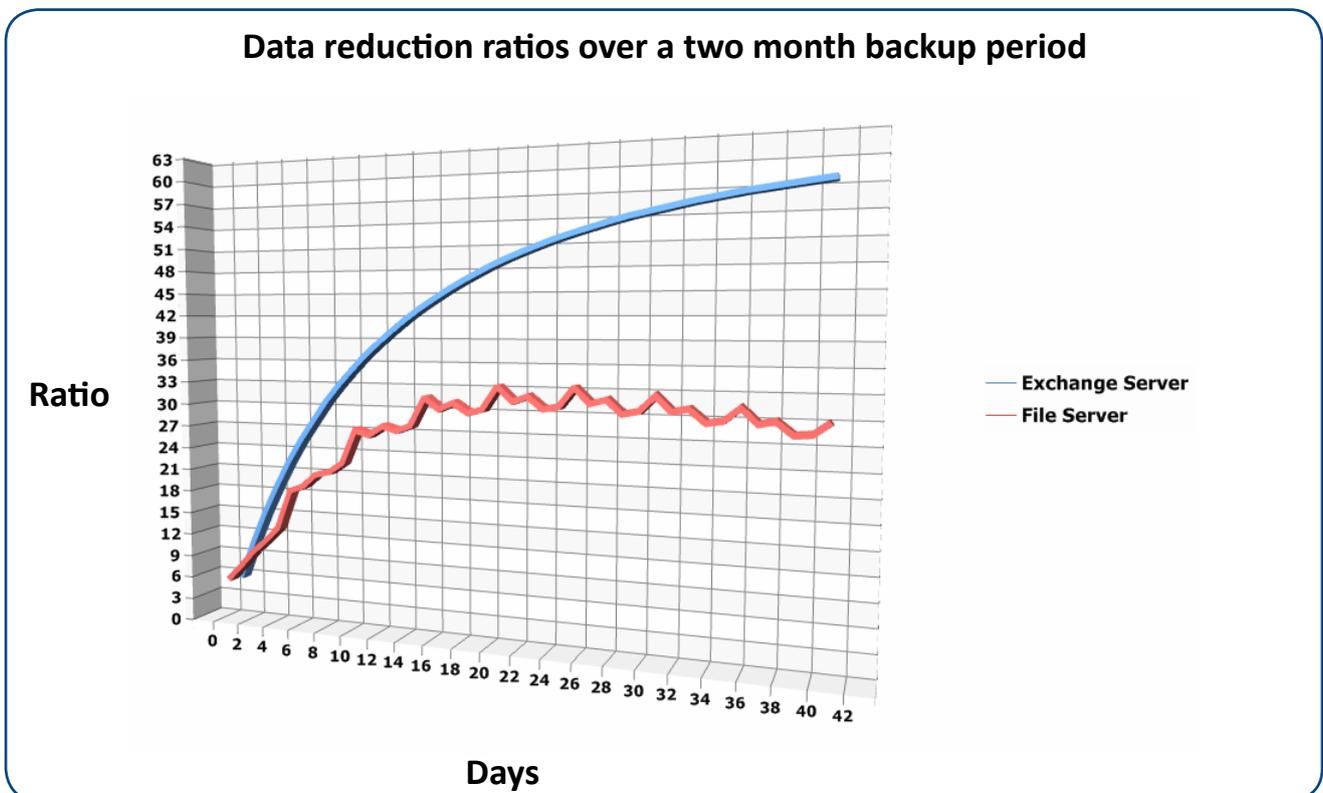
The AccuVault™ was found to deliver very good data reduction rates during both tests. For file server backup operations the Binary Testing engineers recorded a reduction ratio of close to 34:1 during the simulated two month backup period. For the Exchange server test, a data reduction ratio of nearly 60:1 was achieved. Binary Testing engineers have conducted data reduction tests on many other deduplication appliances and find that these ratios compare very well with many mid-range and enterprise level solutions.

The graph below shows the amount storage capacity saved by the AccuVault's™ deduplication during the tests over the simulated two month period. For the file server test, a total of 218GB of data was secured to the appliance but this was reduced to 7.2GB. For the Exchange Server test, a total of 440GB of data was backed up and this was reduced to only 7.6GB.

AccuVault™ storage savings

GB

Days

Exchange Server
File Server
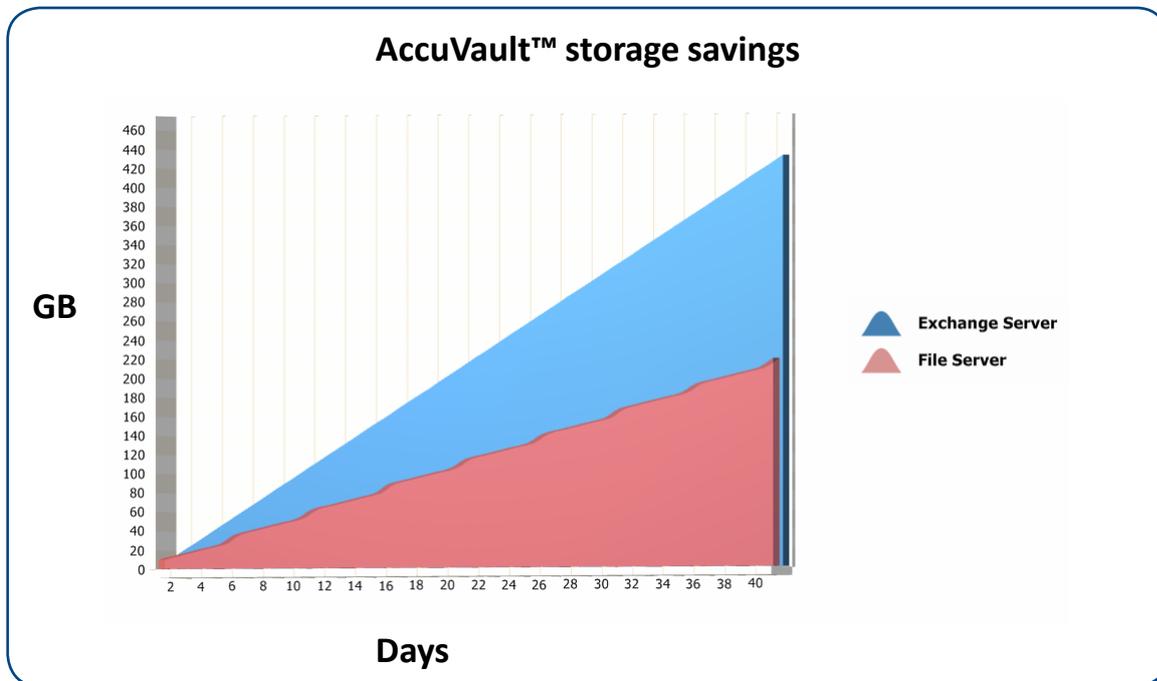
Backup from multiple servers

The AccuVault™ RDX 1TB is designed to protect up to five servers and/or workstations. The Binary Testing engineers conducted further file server tests to see what the limits of the appliance were when backing up from multiple systems.

A series of backup tests from ten servers were run to determine the number of streams the appliance could comfortably handle. A VMware ESX Server system was used to present ten virtual machines all running Windows Server 2008 R2 and linked to the test network via a high-speed 10-Gigabit connection.

Using the same 10GB file server data sample on each system, backups from the ten virtual servers were run to the appliance simultaneously. After the initial full backups had completed, two changes of 2 percent in 40 percent of files were applied to each server and further incremental backups run after each change.

Ten server backup performance

Run 1
Run 2
Run 3

Gigabytes per hour
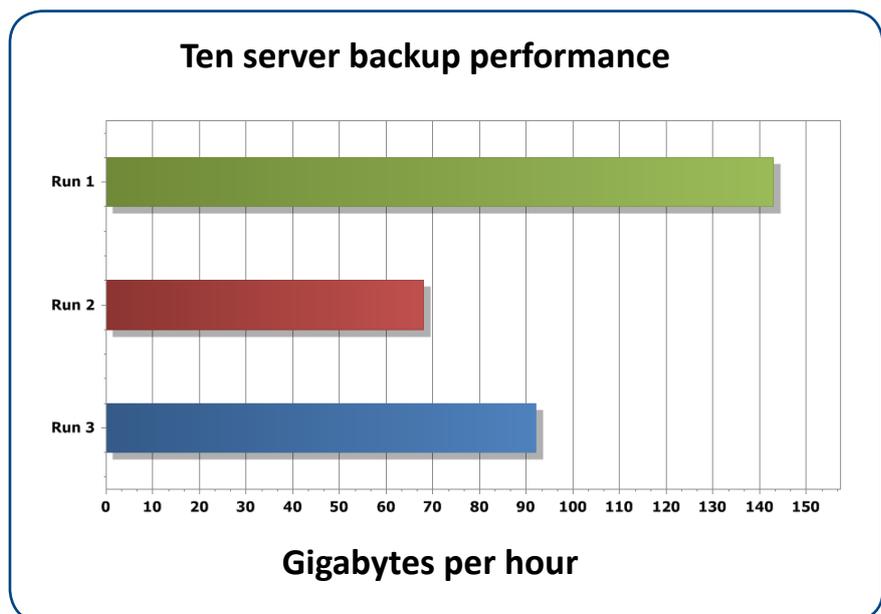
CONCLUSION

The deduplication test suite used in this report represents an experimental method which truly reflects real world scenarios and does not depend on extrapolations or projections based on limited testing. A key finding from the Binary Testing performance tests is that the AccuGuard™ Enterprise software running on the appliance delivers consistent results across a range of applications.

The results confirm that Tandberg Data's claims of a 20:1 deduplication ratio are easily achievable. The file server test returned ratios of up to 34:1 whilst the Exchange Server test delivered ever better performance with a near 60:1 ratio. In real terms, these results show that the appliance is quite capable of storing up to 30 days of full backups on its internal hard disk. Applying the highest file server ratio seen in the tests to its 1TB of physical storage effectively increases this to nearly 34TB.

The 'many-to-one' tests conducted in the Binary Testing labs also show that the appliance is quite capable of handling the demands of the target market. The tests show that the appliance can handle double the number of systems it's designed to protect and transfer rates as high as 143GB per hour were recorded.

The Binary Testing engineers were impressed with ease of deployment and ongoing management of the AccuVault™ appliance. The core OS is based on Windows Storage Server 2008 so it presents a familiar interface and the AccuGuard™ Enterprise software was found to be just as easy to use.

AccuGuard™ Enterprise significantly reduces the complexity of data integrity operations. Its deduplication technology simplifies the backup and recovery processes immensely as each individual backup is a completely recoverable set of data. Furthermore, agentless technology means no software has to be deployed to the systems being protected.

Businesses must ensure their backup strategies include off-site storage and the AccuVault's ™ internal RDX® drive provides an ideal solution for this essential task. It integrates neatly with the AccuGuard Enterprise software so off-site backups onto removable media can easily be made part of a backup and disaster recovery policy.

Traditionally, deduplication has been a technology that only enterprises could afford but the Tandberg Data AccuVault™ RDX delivers a low-cost solution to small businesses. It is ideally suited to Windows environments with additional requirements for off-site protection and media rotation, does not require any additional backup software and is particularly easy to deploy and manage.

Binary Testing Labs
AccuVault Test Setup

File Server and Exchange Server data reduction tests

Windows AD Domain and file server

Exchange 2007 Server

AccuVault RDX

Multiple Windows Server backup performance tests

VMware ESX Server 4

10GbE

AccuVault RDX

Ten VMs backed up simultaneously to AccuVault appliance