

# Recover Data Safely, Quickly

*ARCserve Disk-to-Disk data recovery tool is the clear choice for quick, reliable and easy to use data security. ARCserve is full-featured, more technologically advanced and yet less expensive – a winner in all categories.*

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## EXECUTIVE SUMMARY

CA's ARCserve Disk-to-Disk (D2D) is clearly the tool of choice for protecting data essential to your organization's day-to-day operations.

ARCserve D2D is faster, more reliable, more efficient and less expensive than Symantec's Backup Exec System Recovery. ARCserve D2D is more scalable, much easier to use, more technologically advanced and offers more features. In particular, D2D's use of "Infinite Incrementals" to implement its *Synthetic Full Backup* technology is nothing short of brilliant.

ARCserve D2D easily performs bare metal restores to dissimilar hardware, uses only a fraction of the computing resources consumed by Backup Exec System Recovery and provides a unique Web 2.0-based interface that's intuitive and responsive.

ARCserve D2D gives you instantly-available and well-labeled clone versions of your data that you can quickly restore in case of a data emergency. Retrieving data is as simple as pointing at the data and clicking on where you want it to go. Server migrations are a snap.

ARCserve D2D is painless and effective insurance against lost or damaged data.

ARCserve D2D wins the Network Testing Labs World Class Award for best data recovery product.

TRUE STORY: The first users to phone in trouble reports to the help desk had complaints ranging from “I can’t get my work done” to “I think the error message on my screen said a network error had occurred.” The troubleshooter/administrator – we’ll call him Tim – who began looking at the problem started first checking network connections and routers. Network errors were Tim’s specialty ... something he knew how to locate and fix.

Tim spent some minutes with pings and traceroutes. The network was fine. It was clean as a whistle, behaving normally.

Tim then called a user who’d reported a problem, asking the user to try using the application. The cryptic error message the user relayed to Tim said, “No Database Connection; Giving Up.”

So Tim went to the server room. A glance at the application’s database server told Tim all he needed to know – not one but two of the database server’s hard disks had failed.

Thank goodness the server has hot-swappable disks and I’ve got spares, Tim thought to himself. Tim pulled the old hard disks and inserted new ones. Tim assumed the RAID Level 5 disks would repair their contents automatically and get back to work.

They didn’t.

Instead, Tim found himself having to wade back through the sheaf of database backups that he had on hand to find out which ones to apply. Tim reverted to the last full backup of the server and then applied each of the incremental backups created since that full backup. As he worked, people kept asking Tim how much longer the application would be down. Each time, Tim would answer, “About ten minutes. Maybe a half hour.”

When Tim finished the restorations, he checked the database to make sure it was as up-to-date as he could make it. He then looked up. It was 10 o’clock in the evening. Everyone else had gone home.

HOW LONG could you afford to wait for a fix to a critical database server in your organization? (This is not a rhetorical question: You actually need to know the answer for each of your data repositories.)

The ideal data recovery system is quick, reliable, intelligent and easy to use. It scales well, uses computer resources sparingly, offers many levels of granularity and is secure. The ideal data recovery system can restore data to bare metal computers of dissimilar characteristics and operating systems. It gives you an intuitive picture of your data, supports all the operating systems your organization uses, comes with excellent customer support and is affordable. The ideal data recovery system protects you from

disasters, failed hardware and user mistakes. The perfect data recovery system comprehensively manages data backups' retention periods.

Above all, the ideal data recovery system saves copies of data on disk (termed "disk-to-disk," or D2D) for fast access.

The ideal D2D system can be an excellent choice as a first commercial data preservation strategy in an organization. It's also a perfect add-on for environments that need to implement a better Recovery Point Objective (RPO) and Recovery Time Objective (RTO), that need "bare metal recovery" to dissimilar hardware or that need to offer end-user-initiated file recovery.

Both CA and Symantec offer D2D packages. (We'll look at Acronis' offering in a later report.) In this review, we evaluate CA's and Symantec's D2D products in the lab to determine which one you should include in your computing environment. We pitted ARCserve D2D against Backup Exec System Recovery in tests that measured performance, features, reliability, scalability, ease of use and cost.

CA's ARCserve D2D proved itself the superior data recovery tool in our tests. ARCserve D2D was considerably more responsive, consumed far fewer computing resources and gave us rock-solid reliability. ARCserve D2D's *Synthetic Full Backup* technology (which is based on the concept of infinite incrementals) was particularly impressive. CA's Web 2.0 interface is light-years ahead of Symantec's GUI, and ARCserve D2D excelled when we asked it to do bare metal restores to dissimilar hardware.

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## **Performance and Technology**

ARCserve D2D's *Synthetic Full Backup* technology is the next best thing to sliced bread. It may be better, in fact, because this innovation can put the whole loaf of bread back together again, as fresh as you want.

*Synthetic Full Backup* technology creates full backups from incremental (differential) backups (also known as "Infinite Incrementals"). With D2D, the base recovery point moves forward in time and incorporates the changes from each successive incremental recovery point. D2D manages these recovery points automatically. In contrast to the way an administrator must work with Backup Exec System Recovery, a D2D administrator doesn't spend (potentially data-risky) time cleaning up old recovery points or use conversion utilities to deal with left-behind recovery points.

A Backup Exec System Recovery data administrator has to schedule periodic full backups (say, weekly) interleaved with incremental backups (perhaps daily or hourly). The Backup Exec System Recovery administrator had to be constantly aware of this

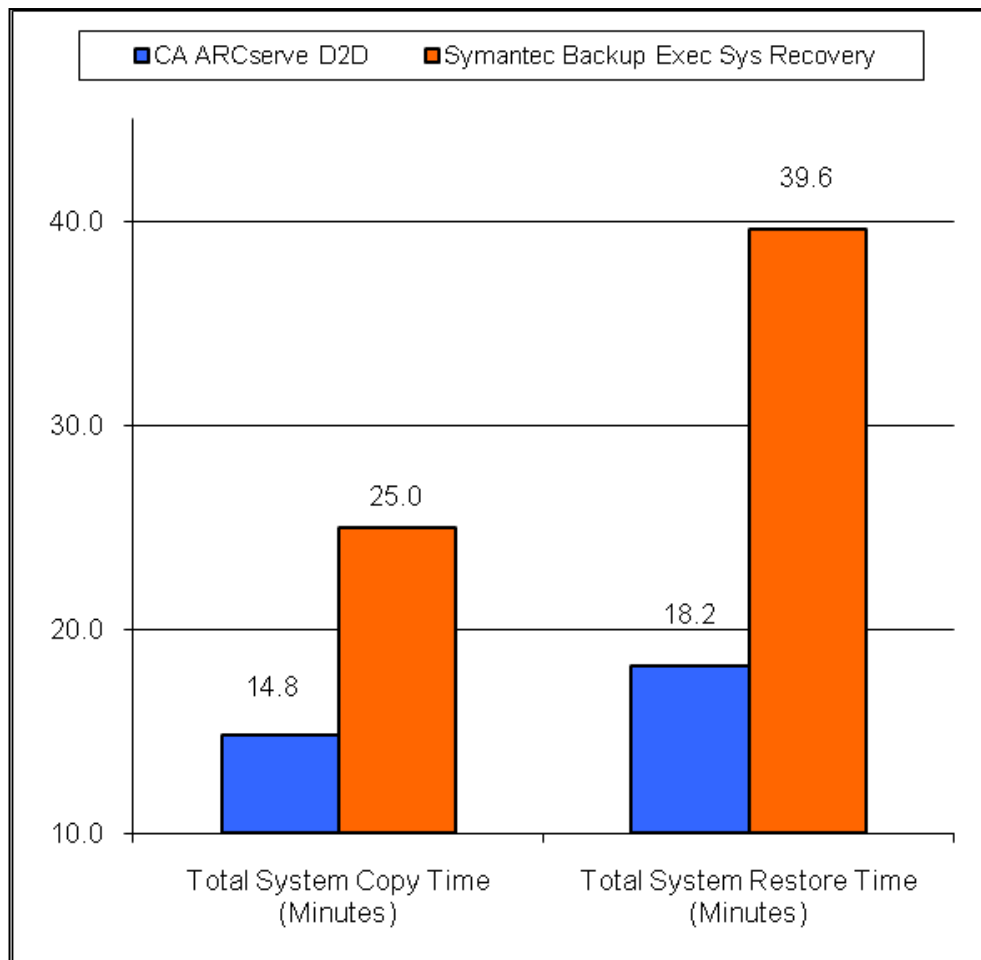
cycle ... deleting old backups, managing volume capacities to hold multiple full backups, etc.

With ARCserve D2D's *Synthetic Full Backup*, the data administrator need only perform a full backup once. Thereafter, ARCserve D2D stores incremental backups that, on demand, it automatically turns into a full backup for whatever date and time you specify.

Unfortunately, Backup Exec System Recovery is cumbersome and error-prone. It uses "Recovery Point Sets," each of which consists of a full backup (base) plus a set of incremental children for that defined backup period. Backup Exec System Recovery requires administrators perform a full backup once each backup period, and it also requires that administrators manually manage disk space by deleting older Recovery Point Sets to make room for new ones.

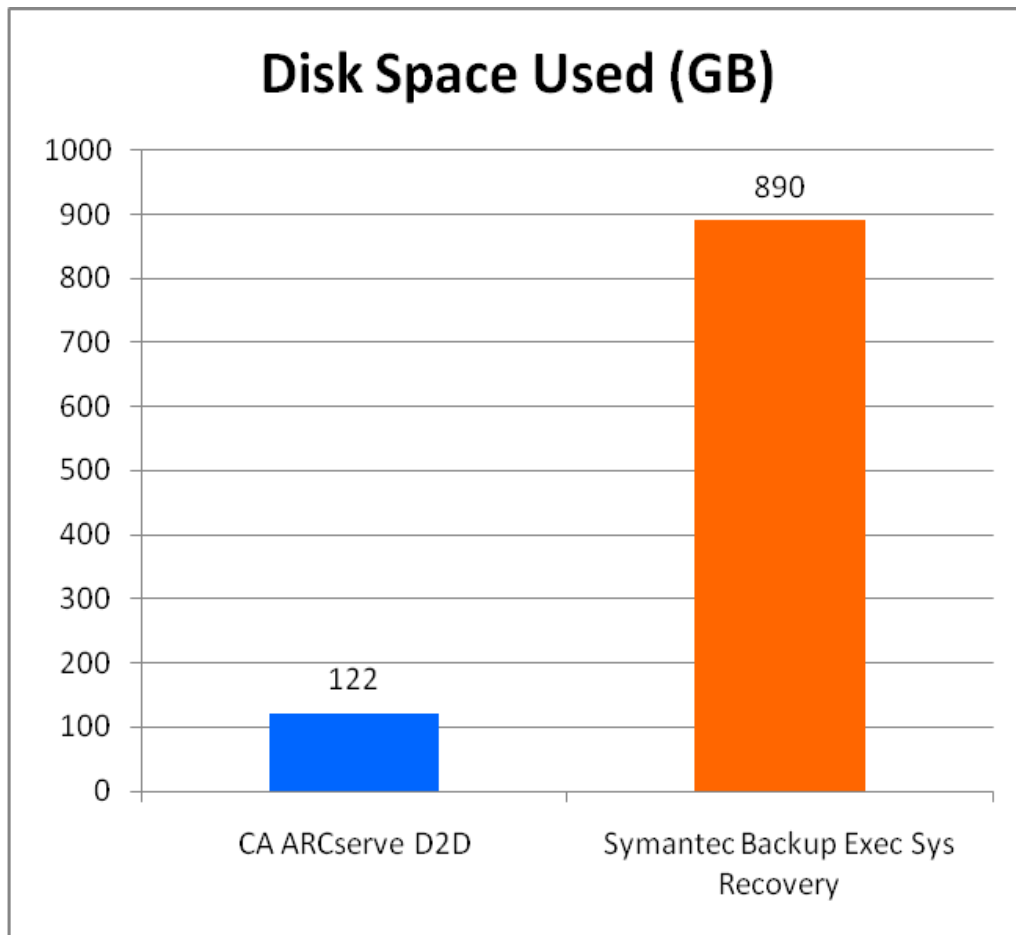
Chart 1 contrasts the time that ARCserve D2D and Backup Exec System Recovery each took, on average, to do system copy/restore operations over a simulated one month time period. You can see that *Synthetic Full Backup* made ARCserve D2D much quicker, with ARCserve D2D needing only 14.8 minutes for a system copy but Backup Exec System Recovery requiring a full 25 minutes. Similarly, an ARCserve D2D restore operation took only 18.2 minutes, compared to Backup Exec System Recovery's sluggish 39.6 minutes.

That time difference is money in your pocket (budget) each time you have to wait for a data recovery operation to finish before you can get your organization back to work.



## Chart 1. System Copy/Restore Performance.

Chart 2 graphically shows ARCserve D2D's advantage in conserving disk space after just four weeks of simulated backup copies of multiple servers and clients. ARCserve D2D needed just 122 GB to store a full backup plus a series of incremental backups, while Backup Exec System Recovery required 890 GB.

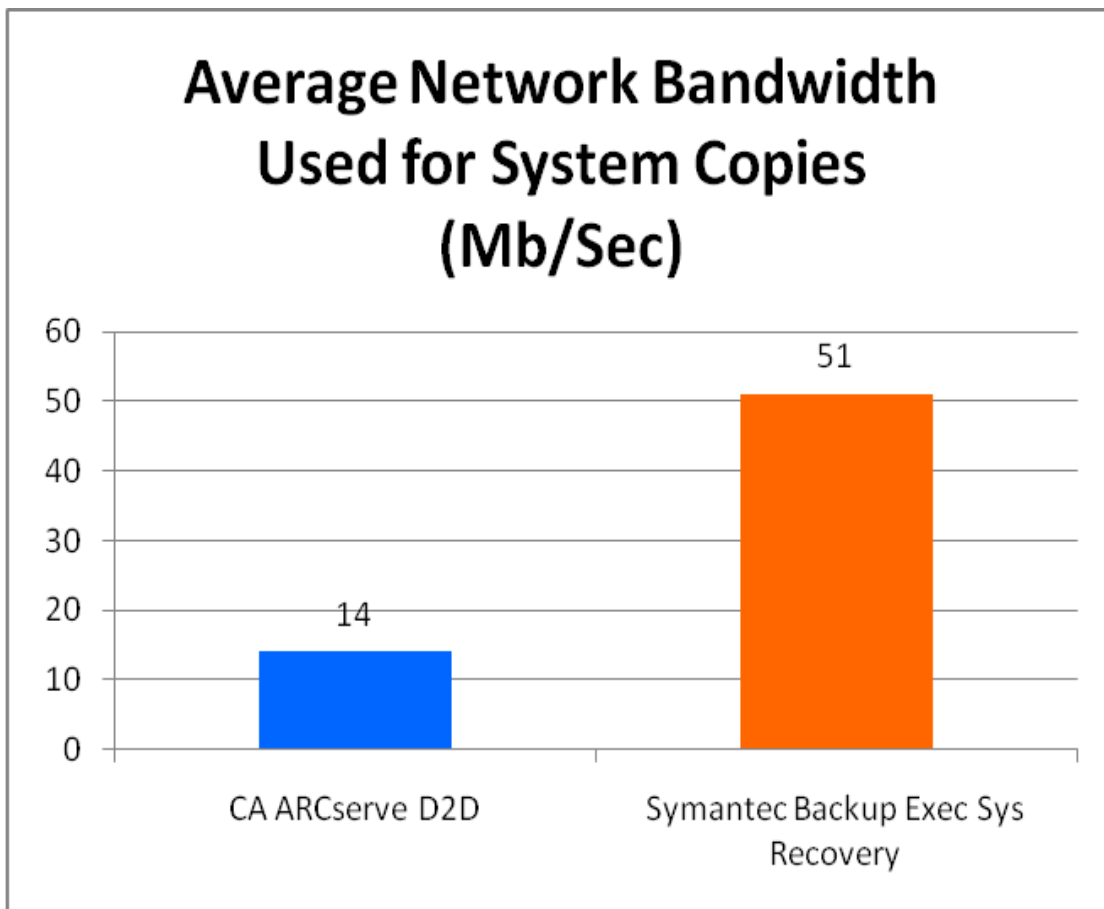


## Chart 2. Disk Space Used for System Copies

ARCserve D2D's *Synthetic Full Backup* technology gave us another significant advantage – because it didn't have to copy gigabytes and gigabytes of data to make its periodic full backups, ARCserve D2D used far less network bandwidth. ARCserve D2D recreated the full backups from its store of incremental backups.

Chart 3 graphically illustrates the bandwidth requirements of ARCserve D2D and Backup Exec System Recovery. Backup Exec System Recovery consumed 51 Mb/Sec

of bandwidth to do the same work that ARCserve D2D used only 14 Mb/Sec to accomplish.



**Chart 3. Network Bandwidth Used During System Copies**

CA's ARCserve D2D outperformed Symantec's Backup Exec System Recovery in every category. We attributed ARCserve D2D's faster performance to its greater maturity, the CA developers' greater attention to detail and, of course, CA's *Synthetic Full Backup* technology.

We also noted that ARCserve D2D employs industry-standard Microsoft VSS to create snapshot backups, while Backup Exec System Recovery, unfortunately, defaults to using a proprietary snapshot mechanism. ARCserve D2D's adherence to the Microsoft VSS standard ensures that ARCserve D2D's backups are always in a consistent state.

### **Ease of Use**

ARCserve D2D's user interface was not only more responsive than Backup Exec's, it was far easier to understand and navigate. Configuring Backup Exec System Recovery to use Microsoft VSS to create snapshot backups (rather than the proprietary default) is

a perfect example – the option is buried several levels deep in the Backup Exec System Recovery user interface. As implied by the configuration option's location in the user interface, VSS is an afterthought tacked onto Backup Exec System Recovery. Impressively, VSS is native to ARCserve D2D.

ARCserve D2D exposes a Web 2.0 interface somewhat like that of HP's Data Protector Notebook product. However, ARCserve D2D's Web 2.0 interface is cleaner and simpler than even Data Protector Notebook's. It provides real-time access to the latest documentation updates, invaluable technical data, helpful tips and online user communities. To our delight and surprise, ARCserve D2D's Web 2.0 interface even gives customers virtually direct access to ARCserve's developers – and they actually listen to customer suggestions and ideas. Software companies traditionally go to great lengths to shield developers from customers. CA is thankfully reversing this trend.

ARCserve D2D's Web 2.0 interface gave us the ability to remotely access all our protected servers, change configuration settings, check the status of our backups and restores, initiate backup jobs and launch remote recoveries – all via the Internet.

Server migrations are a snap with ARCserve D2D's bare metal recovery (BMR) technology. To test BMR onto dissimilar hardware, we migrated a SQL Server 2005 installation running on an HP Proliant server to a high-end Dell PowerEdge server. The migration was flawless and amazingly quick. While Backup Exec System Recovery also offers BMR, we noted that it was slower than ARCserve D2D and much more difficult to use. For instance, Backup Exec System Recovery requires that you use its "bmrsetupmaster" command-line interface.

ARCserve D2D automatically manages data backups according to retention periods you set. In contrast, Backup Exec System Recovery requires that you overtly delete older Recovery Point Sets (i.e., a full backup plus incrementals) to make room for new data backups – a potentially risky operation for your data.

We noted another flaw in Backup Exec System Recovery's approach to file (or volume) recovery. Backup Exec System Recovery must create links in computer memory for all the recovery points in the backup set ... all the way back to the base (i.e., full backup). Backup Exec System Recovery slows down significantly when it tries to link a great number of recovery points, and, in some cases, Backup Exec System Recovery will actually exhaust available memory and crash in the middle of a recovery operation. (Aware of this limitation, Symantec recommends users refrain from defining/extending Recovery Point Sets too far out in the future before creating a new full backup.)

Our Remote Recovery tests were child's play via ARCserve D2D's Web-based interface, and they always worked exactly as we expected. We easily recovered data to the original source machine or to another computer that we specified.

In contrast, Backup Exec System Recovery's thick client architecture gave us some unpleasant surprises and disappointing results when we attempted Remote Recovery.

Backup Exec System Recovery's remote access feature showed us the recovery points, calendar and configuration settings on the remote computer. However, Backup Exec System Recovery restored files and folders to the computer we were operating, not the original source machine. Backup Exec System Recovery's remote access feature can be quite disconcerting and downright problematic to use.

D2D is so easy to use that – if your corporate policies permit – end users can perform their own file restorations, thus saving administrators considerable time. Administrators can focus on more critical, more global problem solving and management.

## **Conclusion**

CA's ARCserve D2D is the clear winner in our head-to-head data recovery competition. ARCserve D2D is the tool of choice for protecting the data that's essential to your organization's day-to-day operations. ARCserve D2D bested Backup Exec System Recovery in every category. ARCserve D2D stood out most particularly for its faster performance, its use of *Synthetic Full Backup* technology and its Web 2.0 interface. Technologically, ARCserve D2D stands head and shoulders above Backup Exec Recovery System.

D2D is a perfect choice as the first data backup system an organization acquires. As an add-on to an existing backup scheme, D2D shortens both RPO and RTO. It saves considerable time when used to migrate server environments, and it offers end-user-initiated file recovery.

We found ARCserve D2D to be effective, reliable insurance against lost or damaged data.

## ***Vendor Contacts***

CA	800-225-5224	<a href="http://www.ca.com">www.ca.com</a>
Symantec	800-721-3934	<a href="http://www.symantec.com">www.symantec.com</a>

## Testbed and Methodology

Virtually all our testing took place across 512 kb/s frame relay, T1 and T3 WAN links. The testbed network consisted of six Fast Ethernet subnet domains routed by Cisco routers. Our lab's 150 clients consisted of computing platforms that included Windows 2000/2003/XP/Vista/Win7 and Red Hat Linux (both server and workstation editions).

The relational databases on the network were Oracle 8i, IBM DB2 Universal Database, Sybase Adaptive Server 12.5 and Microsoft SQL Server 2005. The network also contained three Web servers (Microsoft IIS, Netscape Enterprise Server and Apache), three e-mail servers (Exchange, Notes and Sendmail) and several file servers (Windows 2003 Server).

Our virtual computing environments consisted of VMware and Microsoft Hyper-V.

A Compaq Proliant ML570 computer with four 900 Mhz CPUs, 2G bytes RAM and 1.3 T bytes hard disks, running Windows 2000 Advanced Server, Windows 2003 Advanced Server and, at other times, Red Hat Enterprise Linux, was our test platform for all the products' server components. We also used a Dell PowerEdge R810 in our server migration tests.

## Report Card

Grade scale is A through F, with F = Failing and A = Perfect

Category and weight (%)	CA ARCserve D2D	Symantec Backup Exec System Recovery
Backup and Restore ( 30%)	A	B
Performance (30%)	A	C
Ease of Use (10%)	A	C
Reports (10%)	A	A –
Deployment (10%)	A –	B +
Documentation (10%)	A	C
Overall Score	A	C

## **About the Author**

Barry Nance is a networking expert, magazine columnist, book author and application architect. He has more than 29 years experience with IT technologies, methodologies and products. Over the past dozen years, working on behalf of Network Testing Labs, he has evaluated thousands of hardware and software products for ComputerWorld, BYTE Magazine, Government Computer News, PC Magazine, Network Computing, Network World and many other publications. He's authored thousands of magazine articles as well as popular books such as *Introduction to Networking (4th Edition)*, *Network Programming in C* and *Client/Server LAN Programming*.

He's also designed successful e-commerce Web-based applications, created database and network benchmark tools, written a variety of network diagnostic software utilities and developed a number of special-purpose networking protocols.

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## **About Network Testing Labs**

Network Testing Labs performs independent technology research and product evaluations. Its network laboratory connects myriads of types of computers and virtually every kind of network device in an ever-changing variety of ways. Its authors are networking experts who write clearly and plainly about complex technologies and products.

Network Testing Labs' experts have written hardware and software product reviews, state-of-the-art analyses, feature articles, in-depth technology workshops, cover stories, buyer's guides and in-depth technology outlooks. Our experts have spoken on a number of topics at Comdex, PC Expo and other venues. In addition, they've created industry standard network benchmark software, database benchmark software and network diagnostic utilities.