CA ARCserve r16.5 vs. Veeam Backup & Replication v7.0

Product Review

We test backup/restore, disaster recovery, replication and business continuity products to help you choose the one that's best for your organization. This review looks at the latest versions of CA ARCserve (r16.5) and Veeam Backup & Replication (v7.0).

Executive Summary

The following chart shows, at a glance, the significant differences between CA ARCserve and Veeam Backup & Replication.

	Veeam Backup & Replication v7.0	CA ARCserve r16.5
Performs well	✔	✔
Uses resources frugally		✔
Costs less		✔
Backs up virtual and physical servers		✔
Has both image- and file-based backup		✔
High Availability (with true CDP)		✔
Supports several Hypervisors		✔
Relies completely on Hypervisor	✔	
Restores Microsoft Exchange elements	✔	✔
Restores SQL Server elements	✔	
Bare Metal Restore (BMR)		✔
Deduplication (image-based)	✔	
Ease of administration		✔

If you want to back up both virtual and physical servers, if you want to perform file-based backups or backup directly to tape, if you want the quickest possible failover to secondary servers, if your virtual computing environment uses other than VMware or Microsoft Hypervisors or if you want a Bare Metal Restore (BMR) capability, your choice is easy and simple – CA ARCserve.

On the other hand, if you want none of these features and functions, Veeam Backup & Replication may be worth looking at. Do you need to extract individual SQL Server tables from a backup? Do you need deduplication of image-based backups? CA ARCserve lacks these functions.

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In a virtual-only environment, CA ARCserve and Veeam Backup & Replication each have strengths. However, in contrast to Veeam Backup & Replication, CA ARCserve works equally well in both virtual and non-virtual environments.

We found additional differences between the products. CA ARCserve was more mature, it gave us both file- and image-based backup, it had better SRM reporting, it exhibited far greater uptime and availability and, finally, CA ARCserve cost less to operate.

CA ARCserve r16.5 is the better answer for those organizations needing quality backup/restore, replication for offsite disaster recovery and maximum high availability for business continuity.

CA ARCserve r16.5 has again earned the Network Testing Labs World Class Award for best data protection and business continuity.

Review Details

The ideal data recovery system is fast, 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 inevitable disasters, failed hardware and user mistakes. The perfect data recovery system comprehensively manages data backups' retention periods. It works equally well with virtual environments, physical environments and clouds.

Above all, the ideal system can back up data as it's being recorded, can back up data at specific times of the day and can back up data to virtually any storage medium. A truly useful data recovery system can even automatically fail over to a secondary server (or set of servers) if a primary server stops working.

CA and Veeam contend that the latest versions of their data protection products, CA ARCserve r16.5 and Veeam Backup & Replication v7.0, meet these requirements. To find out the truth, we again put the vendors' claims to the test in our network lab.

We look closely and in detail at the abilities and shortcomings of both CA ARCserve r16.5 and Veeam Backup & Replication v7.0. In this report, we compare and contrast the two products, feature by feature.

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> **NOTE**
> *Veeam Backup & Replication is only intended for and only works within virtualized environments. CA ARCserve supports both physical and virtual environments. Accordingly, to be fair to Veeam, we've divided this review into two major sections. The first review section explains how well the products work in a virtual environment, while the second discusses physical and hybrid environments.*

CA ARCserve's components are CA ARCserve Backup (file-based backup), CA ARCserve D2D (image-based backup), CA ARCserve Replication (for continuous data protection and disaster recovery) and CA ARCserve High Availability (for continuous data protection and system, application and data availability).

Veeam Backup & Replication's components include the core Veeam Backup & Replication tool, Veeam ONE (reports), Veeam Management Pack (Microsoft monitoring helper module) and Veeam Smart Plug-in (SPI) (HP monitoring helper module). Veeam also offers some no-charge, limited-function, promotional versions: Veeam Backup Free Edition, Veeam ONE Free Edition, Veeam Extended GRL and Veeam Stencils (for Visio).

Veeam offers its backup/recovery tool in three editions: Standard, Enterprise and Enterprise Plus. These editions vary mainly in features, user interface and how many CPU sockets each supports.

CA ARCserve r16.5's improvements include:
Windows Server 2012 Support, All Product Areas
- NTFS deduplication support
- Resilient File System (ReFS) support
- Hyper-V 3.0 support
- Distributed VSS support
- Storage Spaces support

CA ARCserve's image- and file-based backup also support Windows 8.

Image-based Backup Enhancements
- Red Hat and SUSE Linux server support, with Bare Metal Restore (BMR)
- Remote Virtual Standby
- vSphere 5.1
- Catalog-less backups for reducing overhead and shortening the backup window
- BMR of systems with BIOS to uEFI & vice-versa
- Support for Eucalyptus 3.x
- Support for additional Microsoft Azure regions

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- **Host-based VM Backup Enhancements**
  - Support for Exchange 2013
  - Catalog-less backups
  - Bare Metal Restore (BMR) for uEFI-to-or-from- BIOS
  - Host-based VM backup recovery point replication
  - BMR or file recovery from replication recovery points
  - Replication recovery points can be Virtual Standby basis
  - Support for Eucalyptus 3.x
  - Support for additional Microsoft Azure regions

File-Based Backup Enhancements
- Improved NTFS volume backup performance (more than 40% faster)
- Improved Hyper-V VHD volume backup performance (nearly 4 times faster)
- Support for LTO 6 tape and Logical Block Protection
- Support for VHDX virtual volumes (Up to 64TB on Hyper-V 3.0)
- Support for Fujitsu Cloud & Eucalyptus 3.x
- Support for backup of SQL 2012 AAG clusters
- Support for a variety NAS port configurations
- Improved D2D light integration
- Improved deduplication management
- Improved management of pending, failed & held migration jobs
- Usability fine tuning

Replication and High Availability Enhancements
- Scenario Creation Wizard improvements
- Scenario wizard includes ARCserve HBBU server
- Full system "Cascade scenario" for switching over to multiple replicas
- Full system scenario failover to Hyper-V 3.0
- Hyper-V 3.0 scenario supports WAN failover
- Improved SMTP and scenario authentication support for multi-tenant, MSP mail servers
- AES-128, AES-256 (or none) encryption options
- Export replication reports as HTML-format email attachments
- Full system scenario supports uEFI, GPT boot disk & Dynamic Disks
- Full system scenario VM settings can be modified while the scenario is running
- BMR preserves destination volumes
- Support for Eucalyptus 3.x
- Support for additional Amazon regions
- Protection of multiple Oracle database instances with a single RHA scenario
- Support for SQL Server filestreams

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The new features in Veeam Backup & Replication v7.0 are:

Two "Disruptive Innovations" (*Veeam's own terminology*)

- Pre-programmed WAN acceleration, consisting of caching, variable block length data fingerprinting and TCP/IP protocol optimizations (requires the Enterprise Plus edition)
- VMware-only SAN device remote control feature for creating snapshots in 3 HP SAN environments (HP StoreVirtual VSA, HP StoreVirtual and HP StoreServ) (requires the Enterprise Plus edition)

Miscellaneous New Features

- Tape drive support (requires Enterprise or Enterprise Plus edition)
- SureReplica for verifying restore points in replicas (VMware-only, requires Enterprise or Enterprise Plus edition)
- vCloud Director enhanced visibility of backups (requires Enterprise or Enterprise Plus edition)
- vSphere Web Client plug-in for monitoring backups (requires VMware vSphere 5.1)
- SureBackup, U-AIR and On-Demand Sandbox for Hyper-V (Requires Windows Server 2012 Hyper-V plus Veeam's Enterprise or Enterprise Plus edition)
- Can delegate 1-Click Restore functions (Enterprise Manager Web interface), including the restoration of entire VMs, across multiple administrators and business users (requires Enterprise Plus edition)
- Explorer for Microsoft SharePoint has advanced search capabilities and granular recovery of SharePoint database items (requires Microsoft SharePoint 2010 and Veeam's Enterprise or Enterprise Plus)
- Support for Microsoft Exchange 2013
- Additional enhancements, such as:
  - the ability to set independent retention policies for each backup job or backup copy job
  - parallel processing of multiple VMs
  - support for larger backups
  - automatic termination of deduplication when the Veeam software sees large backup files that are not a good candidate for deduplication

The categories we used in this evaluation are:
- ❖ Image-based backup features
- ❖ File-based backup features
- ❖ Replication/high availability features

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Because Veeam Backup & Replication only functions within a purely virtual environment (and then only for virtual servers), we first evaluated it and CA ARCserve using VMware ESX and vSphere, Microsoft Hyper-V, Citrix XenServer and Redhat KVM.

Next, we tested CA ARCserve in both physical and hybrid physical/virtual environments.

We also discuss pricing and usability.

For each feature, we rank the products and we explain the rankings when they're dissimilar.

The first feature chart reveals how well CA ARCserve and Veeam Backup & Replication fare in producing – and recovering from – image-based backups in a virtual environment.

Virtual Server/VM Image-based Backup
An image-based full system backup contains everything about a computer at the moment the backup copy was made – the operating system, the system's current state and the data file disk blocks. The backed up image can later be restored (termed a Bare Metal Restore operation, or BMR) either to the same computer or to another computer of different brand and type. Additionally, image-based backup products offer granular recovery at the application and file level for faster recovery.

Virtual Server/VM Image-based Backup Features Comparison Table
(Scoring from 0 to 5, with 5 the highest)

Feature	Veeam Backup & Replication v7.0	CA ARCserve r16.5
Snapshot/image backup technology	5	5
Operating System/VM support	3	5
Device support	4	5
Server support	5	5
Client/Workstation support	0	5
Cloud capabilities and support	4	4
RTO/RPO (for disaster recovery)	4	4
Granular recovery	5	4

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Feature	Veeam Backup & Replication v7.0	CA ARCserve r16.5
Off-site replication of images	4	3
Bare Metal Recovery (BMR)	0	5
Deduplication	4	0
Virtual standby for cold-failover	3	5
Image archiving, retention and versioning	5	5
Centralized management	3	4
Centralized reporting	3	4
Image-based backup features aggregate ranking	**3.5**	**4.2**

Virtual Server/VM Image-based Backup Notes

Technology –Both CA ARCserve and Veeam Backup & Replication offer synthetic backups, in which a full backup is assembled, or synthesized, from a baseline full backup and subsequent incremental backups.

CA ARCserve's image-based backup is built on its patent-pending ***Infinite Incremental (I^2 Technology)***. With I^2, users can do a full backup initially and then only perform incremental backups from that point forward. This technology leverages Windows VSS and has been designed to intelligently manage the backup of just those blocks of data that have changed since the last backup and present a consolidated point-in-time view of the protected volume for multiple recovery types, thus reducing your recovery time. Veeam's synthetic backups use Veeam's proprietary virtual machine changed-block driver to detect data blocks needing backup.

While CA ARCserve is truly infinite – you only have to create a full backup once, at the beginning – Veeam recommends that you periodically re-create full backups about once a week.

CA ARCserve and Veeam Backup & Replication can each create snapshots as often as every 15 minutes. However, on certain HP SAN storage media (HP StoreVirtual VSA, HP StoreVirtual and HP StoreServ), Veeam Backup & Replication can create snapshots as often as the HP storage media can produce them. However, StoreVirtual has quiescence of VMs, but the other two are only crash-consistent at the filesystem level. ***Note:*** *These HP storage media products come with management software that can*

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schedule snapshots. If you have one of these HP products, you can create and manage your own snapshots. HP virtual storage customers might not need Veeam Backup & Replication at all.

Operating Systems/VM support – Both CA ARCserve and Veeam Backup & Replication support Linux as well as Windows. However, the two products vary significantly in their support for virtual machine environments.

CA ARCserve supports more virtualization platforms than Veeam Backup & Replication. These platforms include VMware ESX and vSphere, Microsoft Hyper-V, Citrix XenServer and Redhat KVM. Until fairly recently, Veeam Backup & Replication only supported VMware, but it now supports VMware ESX/vSphere (including V5.1) and Microsoft Hyper-V (including Windows Server 2012 Hyper-V).

Note that Veeam Backup & Replication's Hyper-V support always lags behind the vendor's VMware support. Veeam typically updates its Hyper-V product months after it adds features to its VMware product

For VMware, CA ARCserve can protect all the VMs with its host-based VM backup, but it does not protect the Hypervisor itself. For Hyper-V, CA ARCserve can protect the Hypervisor and all VMs. Veeam Backup & Replication does not protect the entire virtual host.

Device support – CA ARCserve's backup targets can be just about any device. Veeam Backup & Replication backup targets must be the following:
- Direct Attached Storage (DAS) connected to the backup repository server
- Network Attached Storage (NAS) able to present itself as CIFS (SMB) or NFS share
- Native tape drive device
- Storage Area Network (SAN), provided the backup repository server is connected directly to the SAN fabric via hardware HBA or software iSCSI initiator and the corresponding volumes are seen by Microsoft Windows Disk Management

Client/workstation support –CA ARCserve protects both virtual servers and Windows workstations (clients). Veeam Backup & Replication works only with virtual servers.

Cloud support – CA ARCserve writes its initial snapshot backup to disk. A subsequent step copies the snapshot data to the cloud. CA ARCserve's image-based backup works with Amazon Web Services as well as Microsoft Windows Azure and Eucalyptus to store secondary or tertiary image backups. After the first image copy to the cloud, CA ARCserve transmits only incremental changes (via I^2) from that point forward. This makes the best use of low-speed cloud connections.

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Veeam Backup & Replication supports Rackspace, Google Cloud Storage, Clodo, Haylix, Scality, Dunkel, Tiscali, HostEurope, DreamObjects, GreenQloud, Seeweb, Connectria, Eucalyptus and Mezeo.

Granular Recovery – Uniquely, Veeam Backup & Replication can restore nearly any object or sub-object within a virtual environment to a "sandbox" environment. While CA ARCserve can recover entire SQL Server databases or other file-level objects, its finer granularity is limited to Microsoft Exchange databases – mailboxes, e-mail notes and attachments. In contrast, Veeam Backup and Replication can even restore individual SQL Server tables.

To use Veeam Backup & Replication's granular recovery, an administrator first chooses the desired restore point and starts the target application on a special recovery VM (the "sandbox"). Once the object is recovered in the sandbox, the administrator can then copy application objects to the production VM instance. The administrator uses a Windows Explorer-like interface to retrieve specific Microsoft Exchange elements from a Veeam Backup & Replication backup set.

However, see our note, below, regarding the restoration of individual SQL Server tables.

NOTE: Restoring SQL Server Tables Can Be Risky

Suppose you add customer ABC to the SQL Server database on Monday. ABC becomes a new row in the Customer Table. On Tuesday, customer ABC places order #111, which becomes a new row in the Order Table. On Wednesday, customer ABC places order #222, which also becomes a new row in the Order Table. On Thursday, a sysadmin restores the Order Table to late Tuesday (or early Wednesday).

You then have database errors/omissions/inconsistencies.

The scenario in which you delete customer ABC and his orders but then restore the Order Table to a point in time at which ABC's orders still existed is even worse. You then have no Customer Table entry for ABC, but you have ABC's orders in the Order Table. (How would you feel if your bank were able to restore individual tables relating to your bank account balances?)

Practically speaking, you never want to be able to restore only part of a SQL Server database. It's far too risky.

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Off-site replication of images – Both CA ARCserve and Veeam Backup & Replication can replicate image-based backups to an off-site location. However, with CA ARCserve, you need two individual components, D2D image-based backup and replication.

Veeam Backup & Replication's Enterprise Plus edition is pre-programmed with three WAN acceleration features: Caching, data fingerprinting and TCP/IP optimization. We found these features less than useful and far from effective, as detailed in the Performance section of this report. The experts in WAN acceleration (e.g., Cisco, Riverbed) use an approach that dynamically responds to changing WAN link conditions to best manage WAN link throughput. Our testing showed that Veeam's pre-programmed approach does not sense WAN link traffic levels or WAN link health (such as dropped packets) and thus cannot dynamically adjust to changing WAN link conditions.

Bare Metal Restore (BMR) – Uniquely, CA ARCserve can restore Windows and Linux images onto similar or dissimilar hardware through BMR. Veeam cannot. To its credit, Veeam's Backup & Replication does have a virtual-only "Instant Recovery" feature (described below).

Deduplication – Veeam offers inline data deduplication at no extra charge. CA ARCserve's image-based component does not offer data deduplication.

Be aware that data deduplication is *extremely* CPU-time and disk-time intensive. For the sake of saving some disk space (a fairly inexpensive resource), the deduplication feature has to rummage through the backup files to determine if Veeam Backup & Replication has already made a copy of a particular data block. The problem is so severe that Veeam automatically disables deduplication when backup files exceed the maximum size recommended by Veeam. Veeam says, *"This [automatic disablement] measure is intended to increase the reliability of deployments that perhaps were not carefully planned or are not optimally configured."*

Virtual Standby – CA ARCserve offers Virtual Standby, a feature that makes up-to-date copies of backup images (recovery points) available for immediate use in case of a system outage, thus offering near-instantaneous system recovery. CA ARCserve's Virtual Standby feature automatically converts recovery points into VMDK and VHD formats and automatically registers with the hypervisor. It offers monitoring with automated and manual failover. Furthermore, CA ARCserve's virtual standby works in either physical-to-virtual (P2V) or virtual-to-virtual (V2V) failover modes and can be deployed locally and remotely (when also using ARCserve's replication component).

Veeam Backup & Replication lacks an automated virtual standby feature. It does have, however, "***vPower***," which consists of essentially two capabilities: (1) Publishing a

backup as a VMDK file and (2) running a VM directly from a backup, without having to first restore the VM (this is Veeam's "***Instant Recovery***"). Veeam Backup & Replication can perform a VM recovery from HP StoreVirtual VSA and LeftHand SAN devices.

Central Management – Working with disk images is easy and painless with CA ARCserve's Web 2.0-based management console, but replication of image backups is managed separately using the replication component's user interface. Veeam's user interface spans both backup and replication and, although less responsive and intuitive than CA's, is also a point-and-click affair.

Central Reporting –CA ARCserve's Central Reporting produces much more useful and informative reports regarding disk image recovery points than does Veeam Backup & Replication, but reporting for replication jobs is managed separately using the replication component user interface. Veeam reporting covers both backup and replication. Both products integrate with Windows Explorer to show the contents of an image file as a mountable drive letter. Veeam Backup & Replication, like CA ARCserve, displays a useful dashboard of backup job status information. Both Veeam Backup & Replication and CA ARCserve offer reports for backup job monitoring and capacity planning.

CA ARCserve's image-based backup component offers far better management and reporting than Veeam Backup & Replication, but Veeam Backup & Replication does offer a single user interface through which to manage both backup and replication. CA ARCserve's image backup and replication components are separately managed.

Performance and Media Usage – We found CA ARCserve's I^2 slightly faster than Veeam Backup & Replication's synthetic full backup process during backup operations, but Veeam Backup & Replication was somewhat faster during restore operations. For a single-server system comprising 300 GB, Figure 1 shows the average relative performance of CA ARCserve D2D Host-based backup r16.5 and Veeam Backup & Replication v7.0. We obtained these averages in testing with a wide mix of applications, data and virtual machines.
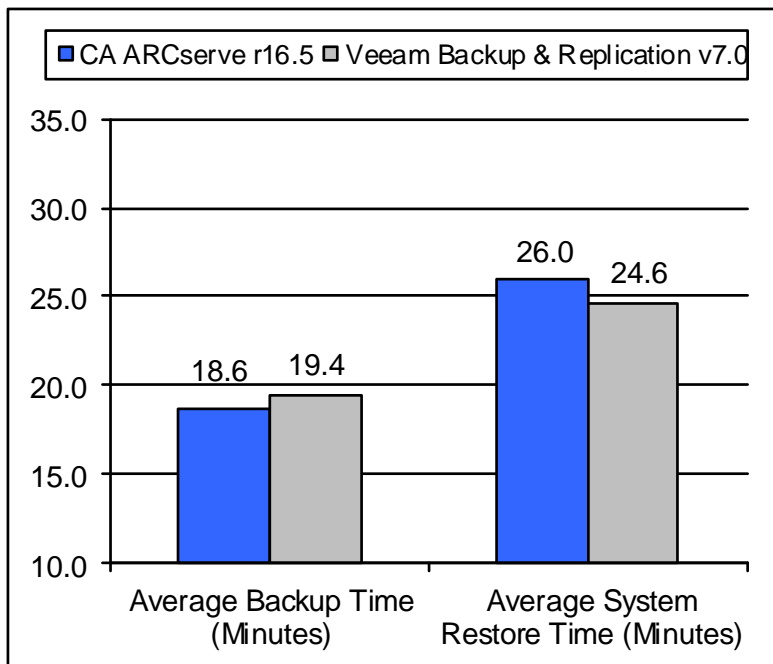
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Figure 1.

CA ARCserve I^2 vs. Veeam Backup & Replication image-based backup/restore performance (no deduplication)

Chart legend: CA ARCserve r16.5, Veeam Backup & Replication v7.0

	CA ARCserve r16.5	Veeam Backup & Replication v7.0
Average Backup Time (Minutes)	18.6	19.4
Average System Restore Time (Minutes)	26.0	24.6

Across a typical T1 frame relay WAN link with varying traffic levels and occasional (inevitable) spates of dropped packets, Veeam Backup & Replication's WAN acceleration feature fared poorly. Figure 2 graphically illustrates the difference between CA ARCserve and Veeam Backup & Replication when we used a T1 WAN link for off-site replication of image-based backup files.
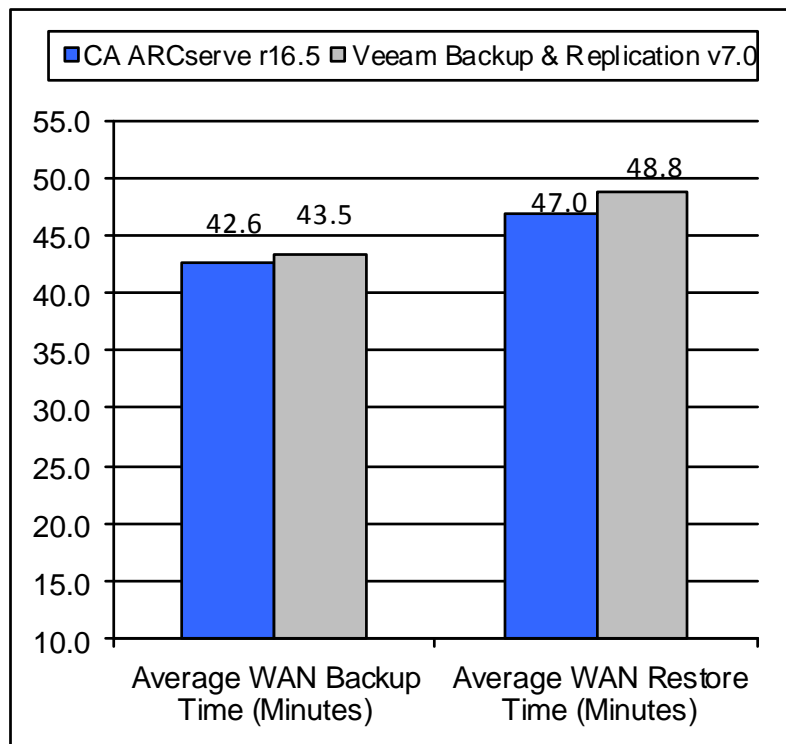
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Figure 2.

CA ARCserve I^2 vs. Veeam Backup & Replication image-based backup/restore performance through a frame relay T1 WAN link

Testing both CA ARCserve and Veeam Backup & Replication infinite incrementals (one full backup at the outset and incremental backups thereafter), we saw that CA ARCserve's I^2 needed about 10% less storage space than Veeam Backup & Replication with deduplication turned off (180 GB vs. 201 GB) when we tested the creation of daily, weekly and monthly backups over a three-month time span. Figure 3 depicts the resulting storage requirements both with and without Veeam's deduplication.
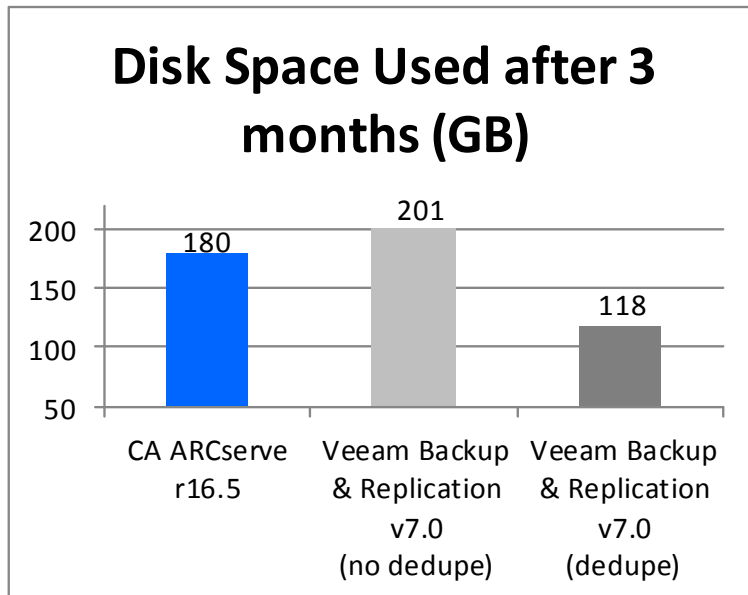
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Disk Space Used after 3 months (GB)

Figure 3.

CA ARCserve I² vs. Veeam Backup & Replication image-based disk storage utilization

In an effort to reduce Veeam Backup & Replication's storage space consumption, we enabled the product's data deduplication feature. Unfortunately, because Veeam's data deduplication is extremely CPU-intensive, backup and recovery times unacceptably nearly doubled with the option turned on. Nonetheless, Veeam's deduplication feature saved an additional 83 GB of storage space. Figure 4 shows the relative performance of CA ARCserve and Veeam Backup & Replication with Veeam's deduplication enabled.
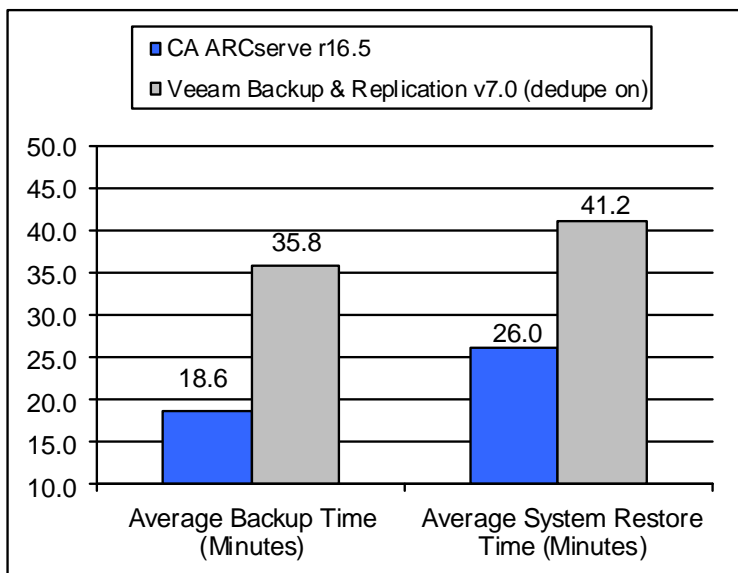
Figure 4.

CA ARCserve I² vs. Veeam Backup & Replication with deduplication enabled

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RTO/RPO Performance Testing – To measure CA ARCserve's and Veeam Backup & Replication's Recovery Time Objective (RTO) and Recovery Point Objective (RPO) performance, we simulated the destruction of four Windows Server VMware ESX virtual machines containing a total of 860 GB on two physical computers in a small data center. One of these VMs ran SQL Server 2005, one ran Internet Information Server (IIS), one ran an OLTP business application and the fourth was the backup server.

Both CA ARCserve and Veeam Backup & Replication took snapshots every fifteen minutes and transferred backups to a remote location. Four VMs at the remote location stood by, waiting to go to work in case of a disaster. We measured the minutes needed to recover data and resume operations.

Using CA ARCserve image-based backup in one test and Veeam Backup & Replication in another test, an administrator at the remote location restored the transferred data onto the waiting secondary servers. The test concluded when the administrator had restored all servers and had brought the OLTP application back online.

The CA ARCserve administrator needed just 50 minutes to restore data to the VM servers and resume the OLTP application. The Veeam Backup & Replication administrator needed about the same time (51 minutes) to restart the systems.

Note that the testing depicted earlier in Figures 1 through 4 occurred on a single computer running different numbers of VMs, while our RTP/RPO testing used four VMs on two physical primary servers and two physical secondary servers. Also, the earlier charts show only the time to complete a backup job. They do not include times for such other disaster recovery tasks as restarting applications.

Not all IT organizations use image-based backup technology and many still rely on file-based backup, especially if they want to use a direct-to-tape backup strategy. In the next section, we had planned to compare CA ARCserve r16.5 and Veeam Backup & Replication v7.0 file-based backup and restore capabilities in a virtual environment, but Veeam does not offer file-based backup, only image-based backup. Therefore Veeam did not achieve any scores in the following section.

Virtual Server/VM File-based Backup

A file-based backup contains copies of applications and data files you designate, file by file and directory by directory. The backup process automatically and regularly creates the latest backup copy onto whatever media you specify – tape, disk, USB memory or other device. You can archive older backup copies offsite, for safekeeping. Restoring the data copies it back to the source machine or other computer that typically already

has an operating system installed on it. However, most file-based backup products also offer some type of bare metal restore (BMR) for system recovery.

Virtual Server/VM File-based Backup Features Comparison Table
(Scoring from 0 to 5, with 5 the highest)

Feature	Veeam Backup & Replication V7.0	CA ARCserve r16.5
Tape device support	0	5
Application support	0	5
Tape integration	0	5
Tape archiving, retention and versioning	0	5
Virtual machine protection	0	5
Application-specific granular recovery	0	5
SRM reporting	0	5
Basic backup reporting	0	5
Infrastructure visualization	0	5
Central management	0	4
Deduplication	0	4
Public and private cloud support	0	4
File archiving	0	5
Integration with image-based backups	0	5
Synthetic full backups	0	5
File-based backup features aggregate ranking	**0.0**	**4.8**

Virtual Server/VM File-based Backup Notes
CA ARCserve r16.5 has a wealth of file-based backup features. Moreover, it's fast, reliable and frugal in its use of storage space, offering built-in data deduplication at no additional cost. Because it's integrated with CA ARCserve's image-based

backup/recovery component, you can migrate image-based backups to tape for archive and compliance purposes.

CA ARCserve supports a myriad of operating systems, applications and backup devices, including tape and Virtual Tape Library (VTL). CA ARCserve has superior reporting, its infrastructure visualization feature is unequalled and its central management console is responsive and intuitive.

CA ARCserve Central Reporting provides global views, administration and reporting on all devices, settings and policies (running on-premise and off-premise) protected by CA ARCserve. It gives both detailed reports and a summary Dashboard report view that clearly show the overall status as well as individual details for any and all backup operations.

CA ARCserve's topology map clearly and intuitively displays a customer's infrastructure. By node, virtual machine or device, CA ARCserve graphically presents a hierarchical picture of data backup sets. CA ARCserve's SRM reporting is revealing, comprehensive and helpful. A person can monitor the status of any and all backup operations, identify long-running backup operations, locate backed up data, discover whether data is encrypted, know the company's disaster recovery status and track volume, disk and memory usage on each server.

In the last features table, let's examine the huge differences between CA ARCserve and Veeam Backup & Replication in the areas of replication and high availability.

Virtual Server/VM Replication and High Availability
The Replication process continuously copies changes made to one (master) computer's files to a secondary (replica) computer. The replica computer is always an exact copy of the master (provided that all byte-level changes made on the master computer are successfully transmitted across the LAN or WAN to the replica).

High Availability manages the relationship between the master and replica computers in a way that makes the replica computer almost instantly assume the role of master if the master computer suffers a problem. Users are automatically redirected to the replica as part of the failover process. The result is a file, application or database server that's virtually always available.

Multiple master and replica computers are possible, and Replication can be configured for one-to-one, many-to-one and one-to-many scenarios.

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Virtual Server/VM Replication and High Availability Features Comparison Table

(Scoring from 0 to 5, with 5 the highest)

Feature	Veeam Backup & Replication V7.0	CA ARCserve r16.5
Replication	3	5
True high availability (hot failover)	1	5
Server support	5	5
Operating System and application support	5	5
RTO/RPO (for disaster recovery)	2	5
Cloud Integration	2	3
Continuous Data Protection (CDP)	2	4
Offline synchronization	5	5
Replication and HA recovery testing	2	5
Network optimization	5	5
Replication and backup integration	5	4
Assessment mode utility	2	5
Application aware replication	5	5
Replication and high availability features aggregate ranking	**3.4**	**4.7**

Virtual Server/VM Replication and High Availability Notes

CA ARCserve's replication component may be used in a scheduled manner to migrate backups offsite and in a real-time, continuous manner. CA ARCserve provides true continuous data protection to complement periodic backups of critical data.

For companies needing maximum system uptime and availability, CA ARCserve has a High Availability (HA) component. Veeam has a replication feature but does not offer high availability.

Both CA ARCserve's and Veeam Backup & Replication's replication components perform asynchronous replication and support Windows, Linux and UNIX environments. They may be deployed onsite, offsite and/or linked to a cloud. Basically, CA ARCserve's replication feature clones each I/O operation and sends the cloned copy to a secondary destination of your choice. Veeam Backup & Replication uses its proprietary VSS writer to send snapshot data to the secondary destination.

Uniquely, CA ARCserve can replicate between physical and virtual servers (P2P, P2V and even V2P). CA ARCserve can also replicate between virtual server platforms (V2V).

Veeam Backup & Replication can replicate only between virtual servers (V2V).

CA ARCserve's HA component includes all the functions of the replication component and adds the ability to monitor one or more background services running on a server. If a service fails, CA ARCserve will attempt to restart it. If the restart fails, the system can be set to automatically fail over to the replica (or failover) server. Alternately, the administrator can set the system to not automatically failover, thus allowing the administrator to investigate the problem. The administrator can then choose to use push-button failover if he or she deems it necessary. Veeam Backup & Replication lacks all these features.

Veeam Backup & Replication's replication feature lacks true high availability and delivers only "Near CDP:"
- Veeam's Instant Recovery technology is slower because it requires manual intervention on the part of an administrator when a data disaster occurs
- Instant Recovery is an incomplete, poor substitute for high availability – it doesn't have the system monitoring, service-level restart and automated failover capabilities of CA ARCserve's HA component

Veeam's Instant Recovery, which is somewhat similar to CA ARCserve image-based backup's Virtual Standby, is used to manually start a VM at a remote location.

With Veeam Backup & Replication, you still run the risk of data loss, significant outages and costly stoppages in the operation of your business when you need to recover data and start up replacement servers.

CA ARCserve can monitor a single server, group of servers, entire server farm or specific applications, such as Microsoft Exchange, SQL Server, SharePoint, IIS and

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Dynamics CRM, thus ensuring maximum availability. When a hardware or application failure occurs, CA ARCserve automatically activates the replica server(s). It gives the replica servers IP addresses and host names during activation to make failover transparent to end users, many of whom will never even know an outage occurred. Again, Veeam Backup & Replication lacks these abilities.

CA ARCserve's HA component is perfect for distributed applications like Microsoft SharePoint and Dynamics CRM, which typically have a multi-tier architecture consisting of separate Web, application and database servers. CA ARCserve replicates, monitors and fails over all the servers, not just the database server. And with group management, all component servers can be failed over even if only one fails. This is especially useful when the replica servers are kept at a distant remote location. CA ARCserve offers sophisticated push-button failover and failback for the highest possible level of automated availability. Veeam Backup & Replication's replication feature requires that an administrator manually start the application(s) that will access the replicated data.

CA ARCserve comes with many pre-built replication and high availability scenarios. Furthermore, it provides application-aware replication and failover for Exchange, SQL Server, SharePoint, and IIS, as well as Oracle and Blackberry. In other words, CA ARCserve already knows what specific directories and files to replicate and when – you just indicate which applications to protect. Furthermore, the CA ARCserve high availability component supports virtually all third party or in-house-developed Windows-based applications – administrators can easily create custom scenarios that specify which application services to monitor.

While both CA ARCserve and Veeam Backup & Replication support virtual computing environments, CA ARCserve's Replication and HA components go much further than Veeam Backup & Replication. CA ARCserve offers replication and high availability for VMware vSphere, Microsoft Hyper-V and Citrix XenServer. Veeam Backup & Replication can perform only replication in a VMware or Hyper-V environment. It does not have replication for Citrix nor does it have high availability support for any of these virtual platforms.

CA ARCserve also has high availability support for Windows server clusters. Veeam Backup & Replication can replicate data onto clustered Windows servers, but an administrator must manually activate the secondary servers within the cluster to complete/finish a failover operation.

CA ARCserve's Replication and High Availability components include an easy-to-use assessment mode tool for performing "what if" dry runs to assure you have adequate bandwidth for replication. CA ARCserve also offers an Assured Recovery testing feature you can use to perform scheduled or ad-hoc recovery testing at the hardware, application and data levels on the replica server, without affecting the production server

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or impacting the continuous data protection and monitoring. Veeam Backup & Replication's SureBackup feature can verify the integrity of recovery points.

Simply put, Veeam Backup & Replication lacks CA ARCserve's feature-rich ability to replicate, monitor and automatically fail over critical virtual and physical servers.

When we measured RTO/RPO by performing the same disaster recovery test with CA ARCserve's High Availability component that we'd done with CA ARCserve's image-based feature (see the RTO/RPO topic above in the Image-based Backup report section), **CA ARCserve needed just six seconds to automatically restart the OLTP application** at the remote backup site. **Veeam Backup & Replication's replication feature required the same 51 minutes** as in the previous (image-based) test to recover from the simulated disaster. Veeam Backup & Replication's slower RTO/RPO was primarily a result of the administrator having to perform many manual tasks in order to make the application available from the remote site.

Physical Server Image Backup, File Backup and Replication and High Availability

If you have a hybrid physical/virtual environment, Veeam Backup & Replication forces you to license two different vendor's backup and recovery products – one physical, the other virtual. The two-vendor approach doesn't make sense because it's more expensive and less productive. Veeam Backup & Replication's "Total Cost of Ownership" (TCO) is always going to be higher than if you'd licensed your backup/recovery from a single vendor.

CA ARCserve is a single answer for IT organizations that need both physical server and virtual server backup and recovery. It offers image- and file-based backup, replication and true high availability for both physical and virtual environments. And CA ARCserve can also backup Windows-based clients (workstations).

Veeam Backup & Replication only supports virtual servers (and then only VMware and Hyper-V). Moreover, Veeam Backup & Replication is purely image-based.

Notably, CA ARCserve's Virtual Standby feature can convert backups from both physical and virtual servers to VMs for near instantaneous recovery. Veeam Backup & Replication's server-to-server data exchanges, even for its *Instant Recovery* feature, must occur strictly within a virtual environment.

CA ARCserve's BMR can easily recover an entire Linux or Windows machine (server or client), including hidden Registry files and system status information, thus putting a computer quickly back to work even after a hard drive failure. Furthermore, CA ARCserve's BMR can restore data from physical and virtual servers onto dissimilar

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hardware (P2P, P2V, V2P and V2V). Veeam Backup & Replication operates only in the virtual world and cannot perform BMR.

Because it spans physical and virtual environments, CA ARCserve offers both physical-to-virtual and virtual-to-physical replication and high availability. Veeam Backup & Replication lacks this capability. Impressively, CA ARCserve's image-based backup and high availability components can also be used to quickly and easily perform physical-to-virtual migrations. Veeam Backup & Replication lacks this capability, too.

CA ARCserve's support for both physical and virtual environments extends into the cloud – including physical-to-cloud backup migration, replication and high availability. Again, Veeam Backup & Replication lacks these features.

Ease of Use and Pricing

CA ARCserve's well-formatted and configurable dashboard reveals, at a glance, the current status of your backups. Veeam Backup & Replication also shows a configurable dashboard display of backup/restore status information. However, with Veeam Backup & Replication, visualizing backup status requires several more navigations steps. If you have multiple site backups, both CA ARCserve and Veeam Backup & Replication consolidate and centralize backup status information from all sites.

Data visibility is crucial to data backup reliability. With a single click, CA ARCserve displays a clear and highly descriptive graphical view of backup sets and backed up data. Veeam Backup & Recovery uses Microsoft design standards and Microsoft user interface guidelines to present a tree view of backup sets and objects.

Navigating Veeam Backup & Replication's backup job reports, we found, is time-consuming and tedious.

CA ARCserve's image-based backup component has a Web 2.0 interface that provides real-time access to the latest documentation updates, invaluable technical data, helpful tips and online user communities. Impressively, CA ARCserve's Web 2.0 interface even gives customers virtually direct access to the CA ARCserve development staff – and they actually listen to customer suggestions and ideas. Veeam Backup & Replication's user interface, which is not intuitive and which requires much more user input to accomplish the same tasks, pales in comparison.

CA ARCserve's Web 2.0 interface has meaningful icons, a grasp-at-first-glance view of network objects and pop-up windows for object-specific tasks. It strategically uses multi-level drop-down menus and tabs to organize tasks in a way that aligns perfectly with a network administrator's workflow. Every backup and restore operation is within easy reach of just a few mouse clicks.

CA ARCserve makes extensive use of the Ajax (***Asynchronous JavaScript and XML***) multipurpose browser-based framework of tools, widgets, controls and methods. CA ARCserve's interface offers a rich set of widgets that resemble elements of native desktop applications. For example, it has built-in support for keyboard navigation, focus and tab handling and drag & drop.

CA ARCserve'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.

For virtual server environments, CA ARCserve's RPO socket-based pricing (which includes file- and image-based backup, file replication and one year of maintenance) is less expensive than Veeam's socket-based pricing for its Enterprise and Enterprise Plus editions. Similarly, CA ARCserve's virtual environment RPO-RTO socket pricing is less expensive than Veeam's Enterprise Plus edition. Uniquely, CA ARCserve adds full application and data replication along with true high availability. Note that CA ARCserve offers component-, server- and capacity-based pricing, too. Also note (again) that Veeam Backup & Replication only supports virtual server environments.

Veeam B&R is available individually, as a part of Veeam Backup Management Suite or as a part of Veeam Backup Essentials. *Pricing is per CPU socket.*
- Veeam Backup Essentials (maximum 6 CPU sockets per customer) – intended for small businesses with 2, 4 or 6 CPU sockets
- Veeam Backup Management Suite – for any size organization

Veeam Backup & Replication v7.0 Pricing

Cost per socket (includes 1 year of non-premium support)	Standard	Enterprise	Enterprise Plus
Veeam Backup & Replication	$ 750	$ 1,250	$ 1,999
Veeam Backup Essentials	$ 410	$ 750	$ 1,150
Veeam Backup Management Suite	$ 1,100	$ 1,550	$ 2,300

Two years of Veeam Backup & Replication premium support optionally costs $567.

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CA ARCserve r16.5 Pricing

	MSRP
CA ARCserve Backup for Windows	$818.40/server
CA ARCserve D2D for Windows Server Standard Edition	$732.00/server
CA ARCserve Replication for Windows Standard OS with Assured Recovery	$1,600.50/server
CA ARCserve High Availability for Windows Standard OS with Assured Recovery	$3,250.50/server
CA ARCserve Backup for Windows Essentials File Server Module with D2D and Replication	$2,005.20/server
CA ARCserve Backup for Windows Standard Database Module with D2D and Replication	$2,610.00/server
CA ARCserve Backup Advanced Email Module with D2D and Replication	$2,730.00/server
CA ARCserve Backup for Windows Enterprise Application Module with D2D and Replication	$3,228.00/server
RPO Managed Capacity: Recover your data in minutes CA ARCserve Backup + CA ARCserve D2D Advanced Server + Central Applications + file-only CA ARCserve Replication	$9,540/Terabyte
RTO Managed Capacity: Recover applications in seconds CA ARCserve Backup + CA ARCserve D2D + Central Applications + CA ARCserve Replication + CA ARCserve High Availability	$16,740/Terabyte
Virtual Environment RPO Per Socket Solution: Recover your data in minutes CA ARCserve Backup + CA ARCserve D2D Advanced Server + Central Applications + file-only CA ARCserve Replication	$795/socket (unlimited cores)
Virtual Environment RPO-RTO Per Socket Solution: Recover applications in seconds CA ARCserve Backup + CA ARCserve D2D +Central Applications + CA ARCserve Replication + CA ARCserve High Availability	$1,995/socket (unlimited cores)

* All CA ARCserve pricing includes 1 year of Enterprise support/maintenance

Rankings Summary – Virtual Server Environment

	Veeam Backup & Replication v7.0	CA ARCserve r16.5
Image-based backup	3.5	4.2
File-based backup	0.0	4.8
Replication, High Availability	3.4	4.7
Usability	4.0	4.5
Total score	**2.7**	**4.6**

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Conclusion

We've shown that even in a virtual-only environment – if such an animal exists – CA ARCserve and Veeam Backup & Replication both have strengths. However, in complete contrast to Veeam Backup & Replication, CA ARCserve is equally at home in both physical and virtual environments.

CA ARCserve is an integrated, reliable, easy-to-use and scalable answer when disaster strikes. CA ARCserve offers both comprehensive file-based and image-based backup, offers much better SRM reporting and provides far greater uptime and availability with its virtual standby and high availability capabilities. Moreover, in almost all cases, CA ARCserve r16.5 costs less than Veeam Backup & Replication v7.0.

We recommend CA ARCserve without reservation. In fact, we use it in our own shop.

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Vendor Contacts

CA 800-225-5224	www.arcserve.com
Veeam 678-353-2140	www.veeam.com

Testbed and Methodology

Virtually all our testing took place across T1 and T3 frame relay 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/Win8, Macintosh 10.x and Red Hat Linux (both server and workstation editions).

The relational databases on the network were Oracle, IBM DB2 Universal Database, Sybase Adaptive Server 12.5 and both Microsoft SQL Server 2008 and 2012. The network also contained two Web servers (Microsoft IIS and Apache), three e-mail servers (Exchange, Notes and Sendmail) and several file servers (Windows 2003, Windows 2008 and Windows 2012 servers).

Our virtual computing environments consisted of VMware, XenServer, Red Hat KVM and Microsoft Hyper-V.

A group of four Compaq Proliant ML570 computers, running Windows 2003 Server, Windows 2008 Server, Windows 2012 Server and Red Hat Enterprise Linux, was our test platform for all the products' server components. A second group of four similar computers simulated our backup site for disaster recovery.

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.

You can e-mail him at barryn@erols.com.

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.

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