

Evaluating EVault Software Backup and Recovery Technology

A Guide for Credit Union Technical Decision Makers

Since 1997, EVault® Data Protection Solutions have served the disk-based backup and recovery needs of hundreds of credit unions. Today, its 35,000 customer roster boasts everything from leading financial institutions to healthcare organizations and hospitals. EVault has learned what it takes to make a disk-based backup and recovery platform easy to use, efficient, and highly scalable and flexible.

In this white paper, you will learn how EVault Software technology can keep your credit union's data secure and compliant. You'll also learn why EVault is recognized for its leadership in the area of disk-based backup and recovery.

Specific topics covered include

- Unique EVault differentiators
- How EVault Software technology compares to other tape emulation and deduplication solutions
- How EVault balances fast backup, single-pass restores and data deduplication to offer dramatic reductions in your overall backup data footprint
- How EVault performs end-to-end data deduplication
- Unique EVault features that ensure the security and integrity of your data

If you're a technical decision-maker for a credit union, you'll gain deeper knowledge of EVault Software technology and its overall architecture. You'll also gain insights about why credit unions like yours choose EVault to guard their critical data.

Common Factors Driving the Popularity of Disk-Based Backup with EVault

The face of data protection in credit unions has changed dramatically in recent years. This is due to a number of emerging internal and external factors that most corporations must take into account as part of their efforts to effectively evaluate the merits of any disk-based backup and recovery platform. Table 1 on the following page summarizes how such factors contribute to the increasing popularity of EVault.

Table 1.
Factors Influencing the Adoption of EVault Disk-Based Backup and Unified Recovery.
Traditional tape backup or even local disk-to-disk data protection is no match for these daunting challenges.

Factor	How this Drives the Popularity of EVault Software Technology
Explosive growth in applications and their underlying data	<p>Increased business reliance on critical, growing applications now requires:</p> <ul style="list-style-type: none"> • Rapid backup of applications and data—with minimal disruption to systems or users • Fast local and remote restores to bring data “back online” after disruption • A cost-effective backup/recovery platform flexible enough to scale up, scale out, be managed in-house or outsourced, as company needs grow and change.
Growth in distributed work environments and an emphasis on 24/7 system availability	<p>When credit unions expand to include new branch offices, new data protection needs emerge:</p> <ul style="list-style-type: none"> • Short nightly backup windows require quick completion of backup processes without bringing production systems offline • As branch offices emerge with limited access to IT expertise, centralized IT staffs seek technology alternatives to help them simplify protection of remote office data • Credit unions must provide backup for employees in widely dispersed offices, from cross-country to international.
Emphasis on disaster recovery	<p>Recent acts of nature and terrorism have prompted credit unions to quantify the risk of extended downtime and take proactive steps to mitigate that risk in the form of faster, more immediate, local and off-site recovery.</p>
IT efforts to contain operational and capital costs, consolidate resources and standardize processes	<p>IT organizations are progressing toward a flexible, economical infrastructure that adapts quickly to business changes. For data protection and recovery, this trend has included:</p> <ul style="list-style-type: none"> • A move away from the use of separate or dispersed point solutions and IT silos. Companies are moving towards a unified backup and recovery platforms that support wide ranges of operating systems and application environments. • The need to quickly manage and report on data protection/recovery “readiness” from a central console or Web interface • The need to free up IT staff resources for more critical functions— replacing inefficient, largely manual tape-based backup/recovery efforts with more efficient, automated backup/recovery from disk.
Increased emphasis on regulatory compliance and data security	<p>NCUA regulations and IT governance initiatives are fueling the following moves:</p> <ul style="list-style-type: none"> • Replacing less secure tape backup/tape transport with local/remote disk-based backup that includes end-to-end encryption over LAN or WAN connections • Encryption of electronic information while in transit or in storage on networks • Establishing records preservation program and corresponding record retention policies • Use of a central backup/recovery console with role-based security and backup job status information, and quick access to backup/recovery success and failure reports. • Rapid, point-and-click recovery of data sets for internal and external audits.
Shifts in Technology	<p>A combination of technology factors make EVault disk-based backup more attractive:</p> <ul style="list-style-type: none"> • Many companies have already invested in wide area network (WAN) infrastructure that now makes highly compressed, disk-based backup “over the wire” very viable • The emergence of lower-cost disk drives and the dropping overall cost of disk media now make online, disk-based backup an economical alternative to tape.

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EVault: Delivering the Perfect Balance of Performance and Efficiency

Several aspects of the EVault Software architecture make EVault uniquely suited to perform disk-based backup and recovery functions for credit unions. These include:

- **Perfectly Balanced Disk-based Backups.** The EVault Software backup and recovery platform strikes the ideal balance between fast backups, a reduced amount of backup data sent across LAN or WAN connections, and reductions in the overall storage “footprint” to subsequently store backup data.
- **Optimized, End-to-End Data Reduction and Deduplication.** EVault Data Protection offers one of the few solutions that combines unique data reduction features on both the front-end (agent or source) and the back-end (target or “vault” system). EVault DeltaPro™ data reduction technology on the front-end and its own post-processing, Director-side deduplication combine to offer significant reductions in required storage capacities and bandwidth.
- **Easier, Less Costly Scalability.** EVault avoids the hidden cost of scaling found in many solutions. Instead of spending inordinate extra time processing larger quantities of backup jobs or forcing the acquisition of more hardware, the EVault Software architecture easily scales up (to accommodate larger amounts of data) and scales out (to protect larger numbers of servers).
- **The Most Flexible Delivery Options on the Market.** The EVault Software backup/recovery architecture offer multiple, flexible delivery models to customers. These include:
 - > EVault SaaS (Software-as-a-Service)
 - > Licensed EVault Software (for in-house installation)
 - > Hybrid models (software may be owned by the customer, but is managed by EVault)
- **Easy, Centralized Management.** Despite its sophisticated engineering, EVault Software differentiates itself by intuitive ease of use and management. Credit unions that want to standardize data protection processes universally—even across multiple, geographically dispersed offices—can do so easily from the same, straightforward Web-based console.
- **All-in-One Architecture.** Instead of requiring third-party integration to gain necessary features, EVault Software’s unified architecture accommodates a variety of needs, from fast delta processing of changed data blocks to deduplication and end-to-end encryption.

The following table compares the benefits of EVault’s data protection technologies to other solutions.

Table 2. Comparing EVault to Other Disk-Based Data Protection Technologies.

Technology	Drawbacks	How EVault compares
Virtual Tape Library or Disk-based Tape Emulation	<p>Longer backup times due to on-going need for daily incrementals, full backups.</p> <p>Increased cost of data storage due to reliance on file-level backup (as opposed to block-level) and the need to store more data. Usually requires periodic off-load to tape.</p> <p>Feature-limited. Features like deduplication may need products from more than one manufacturer, prompting more complexity in restores, implementation or support.</p> <p>Bandwidth-intensive. Especially for remote locations, many solutions require periodic full backups, consuming too much bandwidth.</p>	<p>Shorter backup windows due to use of delta, block-level change processing (EVault DeltaPro™) and adaptive compression. No need for on-going incrementals and full backups.</p> <p>Reduced cost of data storage due to use of block-level backup change practices and deduplication/optimization. Smaller storage footprint enables longer term storage on disk, versus a required off-load to tape.</p> <p>Feature-rich. Features from deduplication to end-to-end encryption are native to EVault Software technology.</p> <p>Bandwidth-optimized. Many features, from EVault DeltaPro to adaptive compression significantly reduce the amount of data transmitted over the wire.</p>
Tape Emulation Software and Hardware and/or Data Deduplication Software	<p>More up-front backup processing often required for source-based deduplication that occurs at the most granular, bit-level.</p> <p>Increased hardware costs due to added processing required or the need to scale the system in order to protect more data or more servers.</p> <p>Software-and bandwidth-constrained. Many tape emulation solutions need to still perform periodic full backups can cause backup slowdowns and bandwidth congestion.</p> <p>Hardware-constrained. Many solutions require costly up-front capital investment in specific hardware. This reliance on specialized hardware can adversely impact:</p> <ul style="list-style-type: none"> • Scalability • Performance <p>Accountability. Hardware-based deduplication solutions are often add-ons to an existing backup solution. When problems occur, which vendor does the customer need to call for resolution in a combined hardware/software architecture?</p>	<p>Less up-front backup processing, achieving the perfect balance of quick file reads, less granular, delta (block-level) processing for data reduction, advanced compression, and further deduplication on the target.</p> <p>Minimal hardware cost. EVault uses existing, “white box,” industry-standard systems and EVault agents that can be added quickly to protect any new or existing server or device—without modifications to the existing customer architecture.</p> <p>Fully optimized software architecture. EVault Software is optimized at multiple levels to speed backups, send only changed data without the need for more periodic full backups, and to minimize bandwidth consumption.</p> <p>Minimal hardware requirements. EVault is designed to run efficiently and scale accordingly on non-proprietary white box servers. The system is also designed to scale quickly with minimal investment in additional hardware.</p> <p>Full accountability and support. With EVault, there’s never a worry about who to call in the event questions arise. EVault fully supports all facets of its EVault Software solution and is dedicated to resolving every customer issue or question.</p>

An Overview: How EVault Software Works

EVault Software offers true disk-to-disk data protection, with no tapes to manage or shuttle off-site. This means the same, automated data protection for your corporate headquarters and branch offices—without the need to rely on non-IT staff to change out tapes, slow backups and restores, tape-related mechanical and reliability issues, or the need to use less secure, external couriers to move sensitive business data to another location. Three key software modules are involved in every EVault Software backup and recovery solution:

Web CentralControl: An easy-to-use, Web-based console that enables centralized administration, role-based security assignments, job scheduling, retention policy creation and management of operations for multiple EVault Software Agents and their backup jobs. Fast, point-and-click restores are also performed from Web CentralControl.

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The EVault Software Agent: This software agent is installed on each server or device needing data protection. It requires no changes to underlying server hardware. The agent installs directly onto multiple operating system environments with minimal overhead. Communicating closely with the other two modules, the agent initiates ongoing, delta (or block-level change) processing of backup data. It also works to perform adaptive compression for more compact data transmission over LANs or WANs. The agent also can encrypt data prior to its being sent.

The EVault Director: The director authenticates and accepts data received from the agent(s), then stores and manages the backup data in separate storage pools on its electronic “vault.” The Director typically resides on a storage subsystem—either housed at the customer site or within a managed EVault provider data center. Customers may opt to have another Director and vault off-site.

Reporting with EVault Reports

The EVault Reports module is an intuitive Web-based interface with an in-depth view into the backup jobs stored within the Director “vault.” With the ability to schedule automated e-mail delivery of select backup data set reports to a group of users, EVault Reports includes 19 total reports to indicate everything from which backup jobs succeeded or failed (the Backup Status Report) to graphical depictions showing how much data storage has been used on the vault for all or some of a customer’s backup jobs (the Storage Totals Report). Many compliance and auditing needs are easily addressed through EVault Reports. Likewise, storage resource planning or future acquisitions are easier to estimate based on trend-based report data.

Application-Centered Backup/Recovery via Application Agents

EVault Software integrates with today’s most popular applications via application-specific agents. Supporting more applications than most solutions, agents perform “hot” application backups and recover critical data within individual databases, mailboxes, portals or cluster nodes. Available agents support **Microsoft Exchange, Microsoft SQL Server, Microsoft SharePoint Portal Server, Microsoft Cluster Services, Oracle, and VMware.**

In addition, EVault Software offers integration with industry-leading Open File Manager (OFM) and Open Transaction Manager (OTM) to back up open files and applications such as **Microsoft Outlook, Microsoft Office, IBM Lotus Notes, IBM Lotus Domino, and Novell GroupWise.** With this integration, customers can perform “hot” backups on such environments without needing to shut down their applications or close files.

Integration with Major Platforms

EVault Software supports all major operating systems, including **Microsoft Windows, VMware, Novell NetWare, Linux, Sun Solaris, HP-UX, IBM AIX, and IBM i.**

Support for Virtual Server Environments

EVault Software integrates with virtual server environments such as those running VMware. Using a fully functional VMware application agent, EVault Software offers disaster recovery protection of the entire virtual environment, including all guest systems and applications. The VMware agent backs up the virtual machines while they are online. Flexible, single-pass restores allow the virtual machines and critical applications to be recovered to either the original or alternate location. When teamed with ESX Server Agent, file-level restores also become an easy reality. EVault Software’s Web CentralControl management console is then used to protect both physical and virtual environments.

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Proven Recovery with Single-Pass Restores

EVault Software performs a number of data integrity checks throughout to ensure backup data sets are always sound and readily available to be restored, when needed. Although only changed backup data is sent to the vault, EVault Software operates quite differently from a typical incremental, tape-based backup. Building virtual “full” backups dynamically when the jobs arrive at the vault, EVault Software makes data immediately available for recovery with a simple point-and-click, one-step restore process that EVault calls a single-pass restore. The Web CentralControl management interface lets end users restore their own data, if the customer prefers. The EVault Software vault recovery architecture also allows customers to implement and use more than one vault to accommodate varied needs of off-site recovery or backup/restore situations involving multiple offices. EVault “Dual Vault” configurations are also common.

“We decided if we were going to change our backup process, let’s make the whole process better instead of just putting a Band-Aid on it. Our relationship with EVault has since solved every single one of our pain points. We moved completely off tapes the day we turned EVault on.”¹

Nancy Bourdon,
Chief information Officer
City County Credit Union

Main Features of EVault Software

EVault Software is a highly comprehensive backup and recovery platform that provides credit unions with the building blocks for successful data protection—from high performance and efficiency to ease of use, flexibility and scalability. EVault Software also offers high levels of reliability and availability of backup data when you need it. Supporting a wide range of operating systems and applications, EVault Software protects both physical and virtual environments simultaneously. Able to handle data at both corporate headquarters and branch offices, EVault Software is known for fast performance, dramatic backup reductions and rapid restore capabilities.

EVault Software: Optimized at Every Level for Fast Performance and Efficient Storage

The EVault Software backup and recovery platform is inherently fast and efficient in its backup and restore processes due to several features that optimize performance. Offering end-to-end deduplication, minimized traffic and reduced data footprints, EVault Software is a sleek engine for driving rapid, reliable disk-based backup and recovery.

¹ Excerpt from the EVault case study on City County Credit Union located at <http://www.evault.com/case-studies/>.

Table 3. Optimization Levels within the EVault Software platform architecture.

Level	EVault Optimization Features Used at this Level
1. Optimized at the Source (EVault Agent)	<ul style="list-style-type: none"> • EVault DeltaPro block-level delta processing technology optimizes processing of backup data and dramatically reduces the data stored at all backup phases. • Reliance on existing resources. EVault agents can be added to existing servers or hardware, with the EVault Director (vault) able to reside on new or existing basic “white box” hardware. With EVault Software, a single Microsoft Windows server with SATA or Fibre Channel drives can easily protect a multiterabyte environment. • Initial Seed Options (the first full backups) may need to be performed to move backup data off-site. In these cases, EVault Software offers several options for “seeding” the data to minimize disruption. 1) Deferred Backup: Customers specify certain times of day for initial backup “seed” data transmission; 2) QuickShip Vault: EVault ships a mini-vault/Director unit for local, initial seed backups, then customers ship the unit back to EVault or to an off-site/central headquarters location for faster backup.
2. Optimized in Transit	<ul style="list-style-type: none"> • Adaptive Compression—Reduces data blocks transmitted by 50% to 90%. • Dynamic Bandwidth Throttling—Lets customers control the amount of network bandwidth to be used for backup jobs. Especially useful for more frequent backups of more critical data or environments with limited bandwidth available. • Backup/Restore Transfer Protocol (BRTP)—EVault’s custom-developed, secure protocol runs transparently on top of TCP/IP. BRTP offers many levels of error-checking, error-recovery and connection recovery for assured data integrity, continuation or resumption of backup sessions after a network outage. If a backup can’t be completed, data backed up that far is valid. BRTP also ensures data encryption in transit.
3. Optimized at the Target (EVault Director or Vault)	<ul style="list-style-type: none"> • Deduplication at the Director Level—further reduces the amount of backup data stored by typically 20%. By removing duplicate files or data blocks, deduplication achieves even greater reductions in the amount of backup data stored. • Storage Pool Optimization—enables longer data retention in smaller footprints. Optimization features include: <ul style="list-style-type: none"> • Automatic Removal/Reclamation of Expired Blocks—Per the customer’s retention policy, the oldest backup blocks no longer required are deleted or moved to a different storage tier, with related storage space reclaimed. • Defragmentation of the Vault’s Data. This further tunes the storage pool. • Verification of Safeset (Backup Data) Integrity • Migration to Secondary Storage Pools—The Director allows data to be automatically migrated or copied to less expensive, secondary storage pools. EVault Software also enables agents to recover data directly from a secondary pool—without the use of a Director. Some organizations may choose to store longer-term archival backups on a less costly system that can even be detached and turned off when not in use, to save on power and utility costs.

How They Work: EVault DeltaPro, Compression and Data Deduplication

The keys to fast backups and reduced storage space in the EVault Software are its EVault DeltaPro, compression and data deduplication technologies. During the backup process, EVault converts backup data into a common, system independent data format that is highly compatible with future systems or upgrades. This format also allows data to be easily restored from any other compatible system on the network.

Understanding EVault DeltaPro Technology with Adaptive Compression

EVault DeltaPro is the main method used by EVault Software to dramatically reduce the amount of backup data transmitted to the Director. Over the years, EVault DeltaPro technology has been updated, enhanced and field-proven to provide the best balance between storage optimization and optimal backup performance.

“We knew we needed something better than tape, especially with the push for encryption. EVault came along and it was a good solution for us. It looked promising when we first saw it and it’s done everything it claimed it would do.”²

EVault DeltaPro is a delta-block processing technology that searches, finds and transmits only those new or changed data blocks in files since the last backup. This up-front functionality offers customers storage capacity savings of upwards of 50:1 over traditional file-based backup methods. Some solutions may claim to process block-level changes, but their definition of a block is more inline with the size of traditional files. In contrast, DeltaPro identifies each 32KB of data as a block. Instead of processing file-level changes or changes to blocks smaller than 32KB, EVault found 32KB to be the most efficient block size to reduce the amount of data transferred while speeding block-level processing.

EVault DeltaPro incorporates a number of optimized processes to ensure rapid, front-end processing and reductions in data footprints. Common EVault DeltaPro processes include:

- **Patented Quick File Scan (QFS).** Performs a rapid scan of files on every system or server containing an EVault agent to identify any data blocks added or changed since the prior backup. Up-front processing time is extremely low while this process runs, ensuring optimal backup windows.
- **Adaptive Compression.** Reduces data blocks transmitted by an average of 50–90%. EVault DeltaPro selects the best compression algorithm based on available CPU and network bandwidth.
- **Enhanced CPU Utilization.** Automatically splits backup jobs across multiple CPUs.
- **Self-Healing EVault DeltaPro.** Automatically recreates the delta index file if it is corrupted or missing. This way, EVault DeltaPro continues to function and identify only new or changed blocks.

Understanding EVault Software Deduplication Technology

Beyond EVault Software’s ability to reduce backup data footprints through its DeltaPro technology, EVault goes one step further by also performing deduplication at the target (or vault), once backup data is stored on the Director system. This post-processing deduplication functionality ensures backup jobs perform optimally, yet continues to look for any duplicate data within each backup job “pool” that may have been renamed, but was not subsequently identified as a duplicate during front-end QFS and EVault DeltaPro processing. Data deduplication at the Director level uniquely identifies matching blocks across all files in a backup job and eliminates duplicates, where needed. Unlike competing solutions, this back-end process does not adversely impact the backup window or slow performance of backup jobs. Back-end deduplication can, however, help reclaim typically 20% more storage space on the Director system.

² Excerpt from the EVault case study on University of South Florida Federal Credit Union located at <http://www.evault.com/case-studies/>.

“We didn’t want to spend a lot of money increasing our bandwidth to reach branch offices as we moved to online backup. EVault’s compression tool provided a big advantage in that respect.”³

Tim Burch,
Vice President Technology Services
NASA Federal Credit Union

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Understanding EVault Security and Encryption Technology

A key benefit for many EVault Software customers is their ability to perform easy, end-to-end encryption for all aspects of their backup data transactions—from the point of backup job creation to data transmission and data at-rest on the vault. EVault customers are often quick to attest to the benefits of encrypting their highly sensitive backup data with EVault Software.

- **Role-based security.** Role-based security options enable the customer to choose who has ultimate power to restore, encrypt and decrypt data, or perform other backup/restore related functions. With EVault Software, the customer is the only holder of the encryption key. Once a customer sets up an encryption password and specifies encryption settings during setup of a backup job, backup data will not be able to be decrypted unless the same encryption password is supplied. In the event EVault manages data at an off-site vault, no EVault personnel can ever view the encrypted data. No EVault personnel ever has access to a customer's encryption key. In information security circles, this is known as a “trust no one” security paradigm.
- **Encryption at creation, in transit, and at rest.** When configuring backup jobs, credit unions can choose from either 128-bit AES encryption or 256-bit AES encryption. Encrypted data remains on the vault or Director in its encrypted state. Since most data is transmitted as block-level changes, this offers further security for the transmission process. Credit unions transmitting data across external WAN connections can also transmit the data with 128-bit AES encryption over the wire. EVault Software can even encrypt Web CentralControl communications via Secure Sockets Layer (SSL) encryption.

Conclusion

There's a reason why EVault has taken its place as a leader in disk-based backup and recovery. Hundreds of credit unions and 35,000 total customers strong, EVault couples its field-proven EVault Software technology with some of the most flexible and scalable delivery options in the industry. Backed by top-notch support and services that its customers have come to rely on, EVault continues to evolve, refine and improve its EVault Software architecture. It offers the best balance between fast, disk-based backups and reduced backup data footprints. Recovery also becomes an easy, one-step process.

EVault uses the same technology and interface in its solutions—regardless of whether customers decide they want EVault itself to store and manage their backup data or they'd rather do it themselves. Recognized for its end-to-end encryption methods, innovative disk-based vaulting concept and EVault DeltaPro technology, EVault offers credit unions a unified platform for rapidly updating and restoring backup data.

Learn how EVault can help transform awkward backup processes into streamlined operations you truly can “set and forget.”

³ Excerpt from the EVault case study on NASA Federal Credit Union located at http://www.evault.com/customers/case_studies.php

To learn more about EVault storage solutions, call us at 1.877.901.DATA (3282), email us at concierge@evault.com, or visit us at www.evault.com.



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2011.12.0007_WP (updated 12/05/2011)