FalconStor® Software

Virtual Tape Library (VTL) Enterprise Edition

High-performance backup and restore with deduplication

FalconStor® Virtual Tape Library (VTL) is the industry's market-leading virtual tape solution, unmatched in performance and scalability. With virtual tape, backups complete faster and more reliably, with little or no change needed to the backup environment. Built-in data deduplication dramatically reduces the amount of data needed to be stored on disk. Sophisticated physical tape integration and data security complete the solution.

Highlights

Performance
> High throughput backup via 2/4/8Gb FC and 1/10Gb/sec iSCSI; up to 5TB an hour per node
> Fast restore from deduplication repository

Scalability
> Scales up to 8 VTL nodes as a single logical unit
> Deduplication architecture supports N+1 cluster of up to 8 nodes

Management
> Up to 8 nodes can be configured and managed as a single group
> Tape caching, multi-tape export, and tape consolidation streamline media management

Integration
> Supports all major enterprise backup software, including Symantec NetBackup OST
> Supports backup of open systems (Windows, UNIX, Linux, NetWare, Mac) and IBM iSeries from the same platform
> Emulates over 50 tape libraries and 30 tape drive formats for transparent integration into existing backup operations

Efficiency
> Integrated deduplication and compression technology maximizes return on storage investments
> Supports one-to-one and many-to-one data replication for DR, lowering costs by slashing network traffic by over 95%

Security
> Enhanced corporate data security with tape shredding, tape encryption, and replication with network data encryption

Today's enterprise data centers manage large heterogeneous environments, often with hundreds of servers running various operating systems and applications, generating petabytes of data. This makes backup and recovery operations complex and time-consuming, to the point where many organizations struggle to complete backup in the required time.

Since 2003, FalconStor Software has been helping organizations address this business challenge with what has become the #1 virtual tape library (VTL) solution on the market, proven by major OEM partners such as EMC, IBM, Sun, Spectra Logic, and COPAN Systems, and used by thousands of customers worldwide. With FalconStor VTL, IT professionals are leveraging their original investments in backup infrastructures and processes while improving the quality of their data protection.

High-performance backup and recovery

Designed from the start as an enterprise-class application, FalconStor VTL technology can achieve single node aggregate backup speeds of 1.5GB per second, or over 5TB per hour, allowing users to solve the single biggest issue in backup: meeting the backup window. Up to eight nodes can combine into a single logical unit, scaling performance to a remarkable 12GB per second, or 43TB per hour across the backup environment. Supporting the latest high-speed protocols, including 8Gb Fibre Channel (FC) and 10Gb Ethernet, FalconStor VTL technology takes full advantage of the latest advances in server, storage, and networking equipment.

Because the FalconStor VTL solution can store large volumes of data, it can eliminate the need to purchase additional costly enterprise tape libraries and drives in order to accommodate explosive data growth.

Equally important is the ability to restore data quickly, even from the deduplication repository. FalconStor read-ahead technology ensures that restore speeds are fast, allowing organizations to bring critical systems back online rapidly.

Comprehensive and manageable

Because FalconStor VTL Enterprise Edition emulates over 50 popular tape libraries and 30 tape drive formats, it fits easily and transparently into existing backup environments without the need to reconfigure backup jobs. Extensive certification testing has validated FalconStor VTL operationally with all major backup software packages across multiple operating systems. Various backup methods are supported, such as NDMP and Symantec NetBackup Open Storage Option (OST), as well as enterprise-ready features such as support for StorageTek ACSLS, IBM 3494 tape libraries, and IBM iSeries (AS/400) connectivity.

Manageability is critical for any enterprise-class solution, and the FalconStor VTL solution offers a host of management enhancing features, including extensive command line functionality, SNMP support, historical and real-time reporting, email alerts, and group-based policy management.

Integrated disk and tape solution

Many data centers require both disk and tape for tiered backup and archive/compliance needs, driving the need for VTL solutions that integrate virtual and physical tape operations. Without this integration, VTLs become isolated silos of backup while tape creation generates unwanted network and operational overhead.

The FalconStor VTL solution seamlessly bridges disk and tape through best-of-breed tape management capabilities. Operations are streamlined and media creation is optimized to reduce timelines and limit media consumption.

Tape caching. Moving data from virtual tape to physical tape can be automatically controlled by tape caching policies, such as adjusting the number of days that data has been on disk or the amount of used disk space. Files can be restored from either the virtual or physical tape copy. Operations are totally transparent to the backup software, so there is no impact to existing policies.

Tape consolidation. Because backup jobs rarely match the exact size of the target tape, space often gets wasted. Tape consolidation writes multiple virtual tapes to a single physical tape of the same or greater capacity. This maximizes the utilization of physical media, significantly reducing the amount of cartridges used, shipped, and stored, lowering overall costs. Newer, larger capacity physical tape formats can easily be deployed into the backup infrastructure. There is no need to reconfigure backup jobs, which can continue to run to virtual tapes based on a smaller tape format. The cost savings that can result from tape consolidation alone are often enough to cover the price of the FalconStor VTL solution.

Multi-tape export. Organizations often need to create multiple copies of physical tapes to meet offsite disaster recovery (DR) service level agreements (SLAs) and/or regulatory requirements. FalconStor VTL technology can create multiple physical copies of virtual tapes (up to five) as part of automated tape caching or an auto archive policy; or it can occur during manual export of a single tape. Multi-tape export increases IT productivity, eliminating the need for manual tape duplication or scripting.

FalconStor VTL provides high-speed backup and direct tape integration
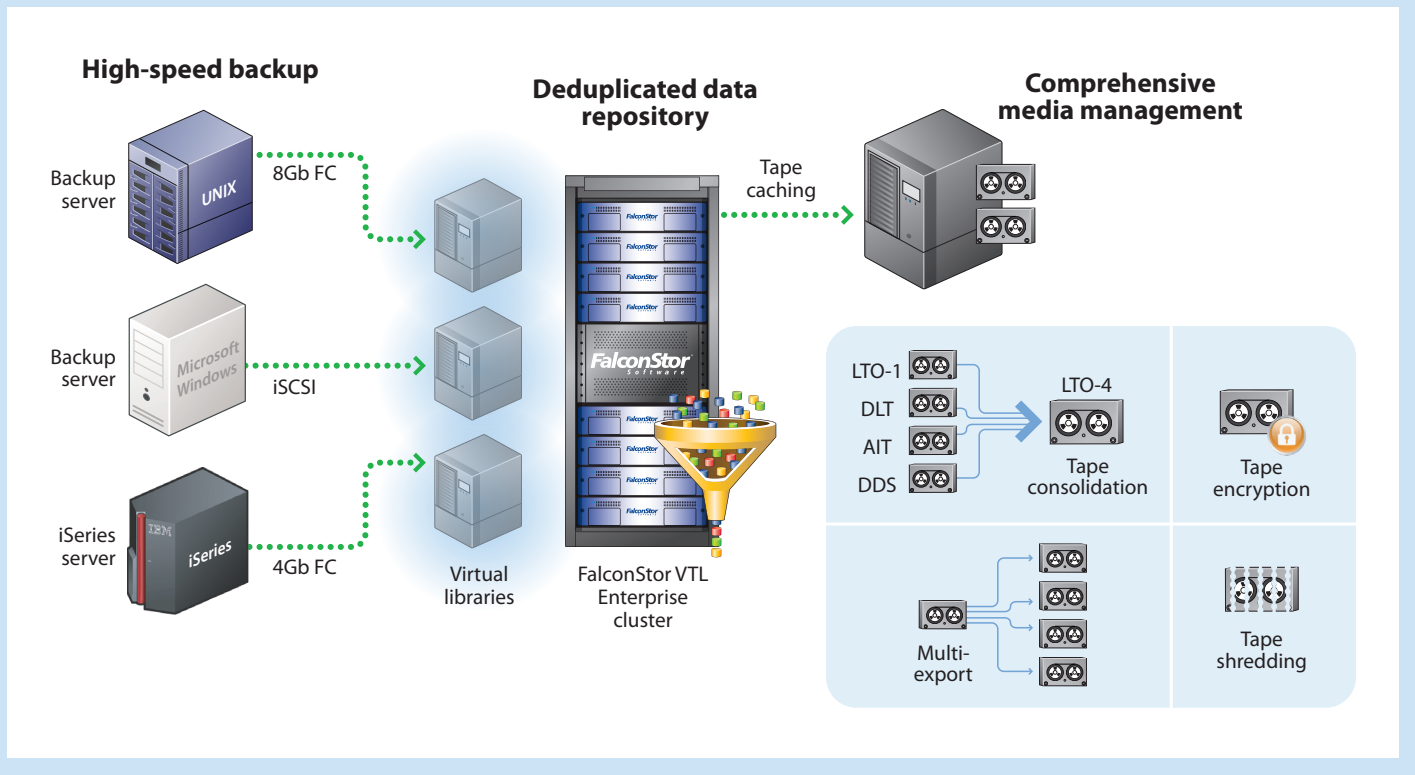
Clustered, global data deduplication

By its nature, the backup process generates multiple copies of the same data over time, consuming valuable disk space. To eliminate this unneeded duplicate information, Falconstor VTL Enterprise Edition provides integrated data deduplication.

The deduplication process starts as FalconStor VTL technology reads virtual tape cartridges and determines the backup format, which varies based on the backup software used. A unique data identifier is calculated for each piece of data and a single copy of each unique piece is stored. Typical deduplication rates of 20 to 1 reduce the storage footprint by 95% or more. This allows you to keep weeks or even months worth of data on disk for fast, dependable restore, without any of the reliability concerns of tape-based restore. Unique FalconStor technology ensures restores are rapid, without the often severe performance impact imposed by other deduplication solutions. Deduplication can be performed concurrently with backup or after backup completes, to optimize storage efficiency without affecting the backup window.

The FalconStor VTL solution supports both one-to-one and many-to-one replication configurations to enable tape infrastructure consolidation at a centralized data site. With standalone FalconStor VTL servers deployed at each site, virtual tapes in remote locations can be replicated via WAN to the data center, where FalconStor VTL Enterprise Edition aggregates the data into a clustered repository of globally unique data. Data from remote sites can be exported to physical tape at the central site as needed, allowing tape to be entirely eliminated at remote sites.

Clustered architecture. For scalability and increased design flexibility, deduplication processing can be physically separated from virtual tape backup processing by running it on separate servers. The FalconStor data deduplication engine offers 8-node clustering with an N+1 failover architecture. Multiple deduplication appliances run a single logical repository, providing linearly scalable throughput as units are added. If one unit fails, the standby system (+1) automatically takes over its workload to ensure continuity. The cluster maintains a single hash table, so it does not compromise deduplication ratios.
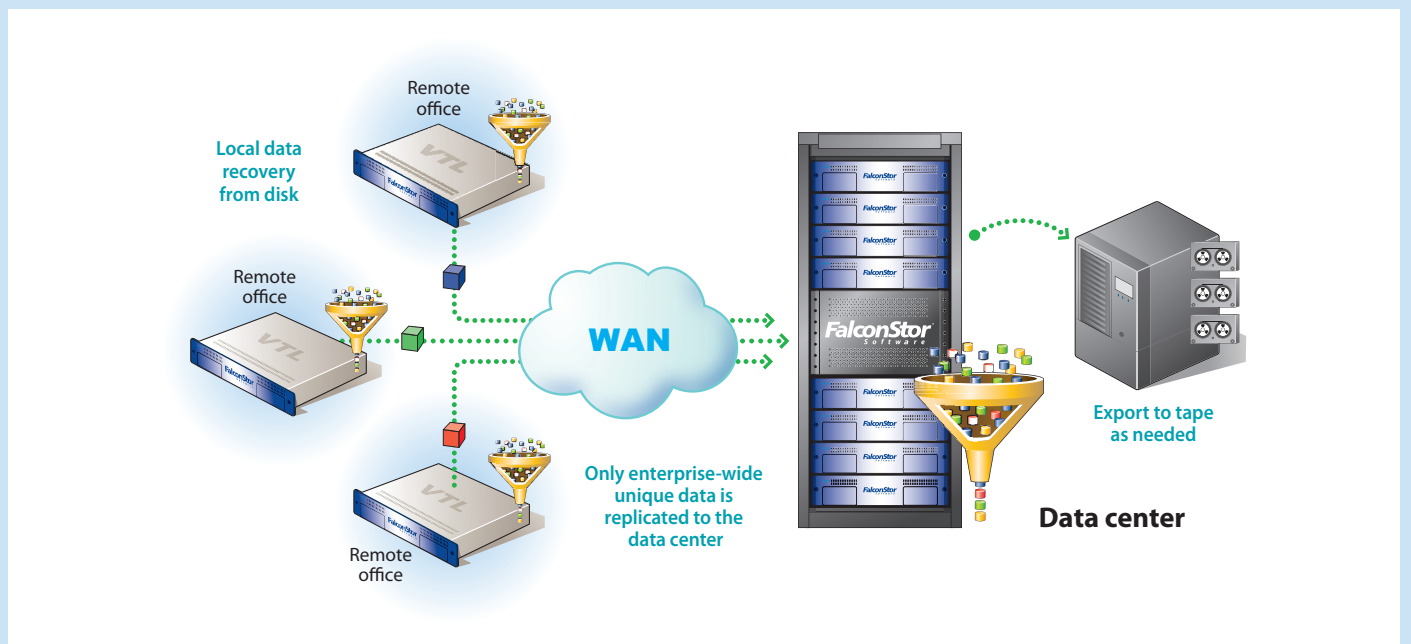
Secure by design

Since data security is only as good as its weakest link, securing data both on backup media and during any replication process is critical to the integrity of corporate information. FalconStor VTL Enterprise Edition delivers unique features that provide comprehensive data integrity for securing data storage and migration.

Secure tape export. To prevent unauthorized access to data on physical tapes, the FalconStor VTL solution can write to tape in an encrypted format based on the Advanced Encryption Standard. Because encryption is handled by the VTL, it does not require any specific backup software or tape drive encryption licensing, and it can be applied to any tape format, maximizing your existing media investment.

Tape shredding. Tape shredding enables users to "destroy" a virtual tape image so that it cannot be accessed, even when using disk forensics. Shredding performs a three-pass wipe of the selected virtual tapes using an algorithm specified by the U.S. Department of Defense (Standard 5220.22-M), helping IT managers meet security and regulatory compliance requirements.

FalconStor VTL enterprise global deduplication architecture

Remote office

Local data recovery from disk

Remote office

WAN

Remote office

Only enterprise-wide unique data is replicated to the data center

FalconStor Software

Export to tape as needed

Data center

Specifications

Host interfaces	Support 2/4/8Gb/sec FC, 1/10Gb/sec iSCSI connections
Performance	Throughput maximum 1,500MB/sec (or 1.5Gb/sec) per node or 5TB/hour
High availability (HA)	VTL HA up to 4 pairs (8 nodes), deduplication cluster up to 8 nodes plus 1 (+1)
Virtual devices	Up to 128 virtual libraries, 1,024 virtual drives, 65,536 virtual tapes per FalconStor VTL node
Tape library emulation	ADIC Scalar 10K/100/1000/i500/i2000, ATL P1000/P3000/P4000/P7000/P7100/M1500/M1800, HP ESL9000 series/EML E-series/MSL2024/MSL4048/MSL5052/MSL8096, IBM 3494/3584L22/3584L32/3590E11/3590B11/3583TL, Overland Neo 2000/Neo 4100/Neo 8000, Qualstar TLS4222i, Quantum PX510/PX720, Sony CSM-200, Sun StorageTek L20/L40/L80/L180/L700e/L1400M/9710/9714/9730/SL500, Spectra Logic 12K/20K/64K/T50/T120/T200/T380/T950
Tape drive emulation	HP Ultrium-1/2/3/4, IBM ULTRIUM-TD1/2/3/4, IBM 3590E1A/B1A/E11/B11, IBM TS1120, Quantum DLT7000/DLT8000/SDLT1/SDLT320/SDLT600/DLT-S4, Seagate ULTRIUM 6242, StorageTek 9840/T9840B/9840C/9840D/9940A/9940B/T10000A/T10000B, SONY AIT-1/AIT-2/AIT-3/SDX-500C/SDX-700C/SDZ-100/SDZ-130
Backup software support	Atempo TimeNavigator, BakBone NetVault, CA ARCserve Backup,CA BrightStor Enterprise, CommVault Galaxy/Simpana, EMC Data Manager, EMC Legato Networker, EMC Retrospect, HP DataProtector, IBM BRMS, IBM TSM, Innovation FDR, LXI MMS, Microsoft DPM 2007, Oracle Secure Backup, Symantec NetBackup and Backup Exec, Syncsort Backup Express, Yosemite TapeWare

Optional advanced features	
Hardware compression	Compresses data with add-in hardware card so that more data can be stored on a virtual tape cartridge, saving disk space without adversely impacting VTL performance. Uses high-speed PCI-Express technology.
Hosted backup support	Allows certified backup applications to be installed directly onto the VTL server, increasing performance and eliminating the need for a separate backup server.
NDMP v4 backup support	Allows certified backup applications and industry-standard NAS appliances to perform backup to, and restore from the VTL using NDMP v4 protocol over an IP network for both command and data flow.
Replication with encryption	Protects against theft of data traveling from one location to another through digital space, encrypts the data stream so that it cannot be deciphered and read by unauthorized persons.
Symantec NetBackup OST option	Provides integration with Symantec NetBackup OST option for disk-based backup.
ACSLS shared library support	Enables the FalconStor VTL solution to work with ACSLS-managed tape libraries, allowing the system to share ACSLS-managed libraries between the FalconStor VTL server and backup servers for physical tape operations.
IBM 3494 library support	Enables a FalconStor VTL server to connect to and manage IBM 3494 tape libraries for export and import of virtual tapes to and from physical tapes.
IBM iSeries support (AS/400)	Allows IBM iSeries and AS/400 systems to connect to a FalconStor VTL server for backup, restore, and IPL.
Tape duplication (multi-tape export)	Allows administrators to make multiple physical copies (up to 5) of virtual tapes simultaneously for offsite storage. This can be part of an automated tape caching, auto-archive policy, or a manual export.
Tape consolidation	Allows multiple virtual tapes to be exported to a single physical tape in a physical tape library, minimizing tape usage and enabling the conversion of virtual media with a smaller capacity to physical media with a higher capacity (i.e. DLT to LTO).
Secure Tape option	Encrypts data exported to tape using Advanced Encryption Standard.

For more information, visit www.falconstor.com or contact your local FalconStor representative.

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