FalconStor®

File-interface Deduplication System (FDS)

High-performance network-attached data deduplication

FalconStor® File-interface Deduplication System (FDS) is a NAS deduplication solution that offers high performance, Symantec OpenStorage (OST) integration, enterprise-level functionality, disk-to-disk (D2D) data protection, integrated replication, and global block-level data deduplication in a fully integrated, easy-to-deploy appliance. This solution helps reduce disk capacity and network bandwidth usage by 95% or more — allowing companies to retain more data on disk, improve restore performance, reclaim floor space in the data center, and experience power and cooling cost savings.

Highlights

Scalable architecture
> Virtual appliances from 1TB to 5TB of usable storage capacity, protecting up to 100TB of original data
> Storage appliances from 1TB to 68TB of usable storage capacity, protecting up to 1.36 PB of logical data
> Gateway appliances for managing up to 68TB of user and SAN storage

High performance
> Flexible post-process or concurrent deduplication, user configurable for maximum flexibility and performance
> High-performance data ingest rates up to 600 MB/s (2.2 TB/hr) for CIFS/NFS connectivity, and up to 1.5 GB/s (5.4TB/hr) for 10GbE and Symantec OST connectivity

Seamless implementation
> Easy-to-deploy, easy-to-manage LAN-based deduplication reduces storage capacity by as much as 95% or more
> Certified with all leading backup and archiving applications *(see certification matrix on www.falconstor.com/matrix)*

Cost-effective DR
> 150:1 multi-site data replication with real-time monitoring, folder-level policy management, and statistical analysis
> WAN-optimized replication reduces network bandwidth requirements by as much as 99%

More than ever, companies are pressured to protect and retain data for longer time periods due to ongoing demands to reduce downtime, recover data faster, and meet government compliance regulations, combined with the adoption of e-discovery, real-time business analytics, and server virtualization. Organizations must now find ways to reduce secondary storage demands, speed recovery time, provide offsite copies of data for disaster recovery (DR), and eliminate the physical security risk of removable media. Although traditional data protection and retention methods such as D2D backup and archiving applications can solve the time to recovery, they also generate duplicate data, which requires five to ten times more secondary storage capacity than the primary storage being protected.

FalconStor Software offers FalconStor FDS, a block-level deduplication and replication solution that minimizes storage capacity for the widest variety of business data, including databases, user-shared data, backups, archives, and virtual machine data. FalconStor FDS improves capacity optimization by analyzing new data against existing repository deduplicated data to identify redundant data, reducing the original data set by as much as 20 times. WAN-optimized replication fosters cost-effective DR by transmitting only unique, globally deduplicated data. FalconStor FDS significantly changes the economics of secondary storage, dramatically reducing costs and improving data recovery times while making WAN replication an operational reality.
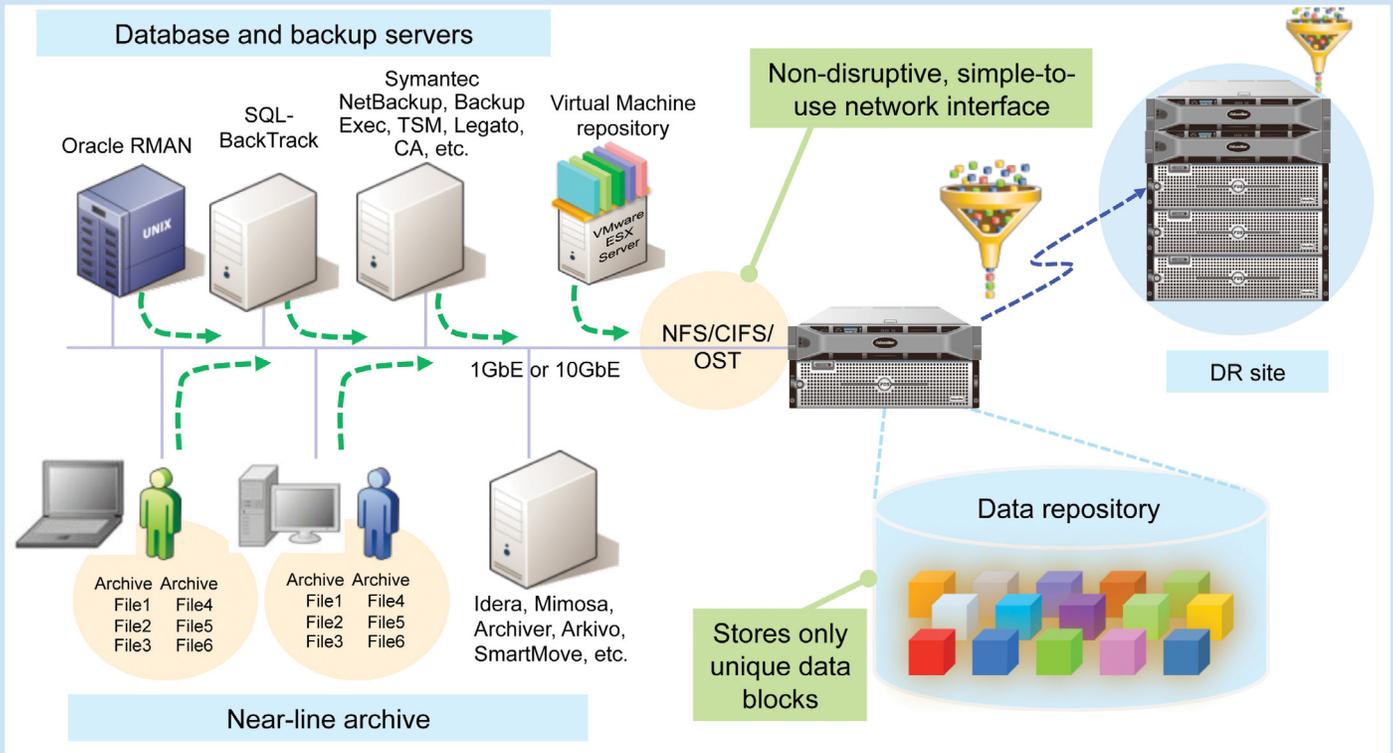
Easy to deploy

FalconStor FDS offers non-disruptive integration using a LAN-based file interface (CIFS or NFS network share) or Symantec OST protocol over IP for Symantec NetBackup and Backup Exec Media Servers. Using 10GbE and Symantec OST, up to 5.4 TB/hr of aggregated throughput can be transferred to a FalconStor FDS appliance for deduplication and replication to a centralized DR site. An easy-to-use file interface maximizes compatibility with source data through seamless integration with all major backup software, database utilities, archiving applications, virtual machine data, and even manual file copies, with little or no changes to existing D2D backup applications or file and data archiving processes.

High performance

Offering both post-processing and concurrent block-level deduplication, FalconStor FDS is optimized for high-performance data ingest of up to 1500 MB/sec or 5.4 TB/hr, which can be used for backup and recovery, archive, protection of enterprise applications (Oracle, Microsoft Exchange, Microsoft SharePoint, and others), virtual data, and file copy data.

FalconStor FDS architectural overview

FalconStor FDS architectural overview diagram showing Database and backup servers (Oracle RMAN, SQL-BackTrack, Symantec NetBackup, Backup Exec, TSM, Legato, CA, etc., Virtual Machine repository with VMware ESX Server), 1GbE or 10GbE connection, NFS/CIFS/OST interface, Non-disruptive, simple-to-use network interface, DR site, Data repository (Stores only unique data blocks), and Near-line archive (Archive File1–File6, Idera, Mimosa, Archiver, Arkivo, SmartMove, etc.)

All data is written to a common data repository, so that redundant data segments are eliminated across all data sets regardless of the original source, optimizing storage resources. Concurrent deduplication (simultaneous data ingest and deduplication) can be applied on a job-by-job or file-by-file basis, enabling the deduplication process to take place in the background without affecting the backup window.

For the fastest possible restore, FalconStor FDS is optimized to enable high-performance data access for both deduplicated and non-deduplicated data. Data blocks are striped across the deduplication repository to optimize the performance of read operations. The data deduplication repository uses direct block-level access during read operations with no file system overhead. Furthermore, FalconStor FDS includes advanced data verification and user-defined, customizable data integrity checks to ensure data resiliency, long-term data retention, availability, and recoverability.

Flexible deduplication processes

FalconStor FDS is the only scheduled, flexible, policy-based NFS/CIFS data deduplication solution available today. Through a centralized management GUI, users can define policies such as concurrent or schedule deduplication and exclusion of whole directories, specific file types, small files, or files based on when they were last modified or accessed. These policies can be applied to deduplication, replication, and data integrity monitoring based on application and business needs, for maximum flexibility. For example, a full backup can be staged without deduplication to ensure the fastest restore, and scheduled for immediate deduplication upon receipt of the next full backup. This maximizes resources while meeting SLA requirements, accommodating operations that may be more efficient when performed on non-deduplicated data, such as data copy, most recent backup restore, data mining, and database testing.

WAN-optimized replication for multi-site DR

Managing tape backups at remote offices is often a challenge due to a lack of appropriate resources. FalconStor FDS eliminates the need to have qualified personnel to manage tape at remote offices, eliminating costs and security concerns about tape handling, shipping, and storage. FalconStor FDS supports efficient block-level deduplication at the remote site for local capacity optimization and fast restore while supporting replication with global deduplication at the data center.

Built-in WAN-optimized replication ensures that only globally unique blocks of data are transmitted across the WAN. Integration with Symantec OST further reduces WAN bandwidth for Symantec NetBackup while maintaining a single pane of management and a consistent catalog of data regardless of the location: tape, local deduplication repository, or remote DR site.
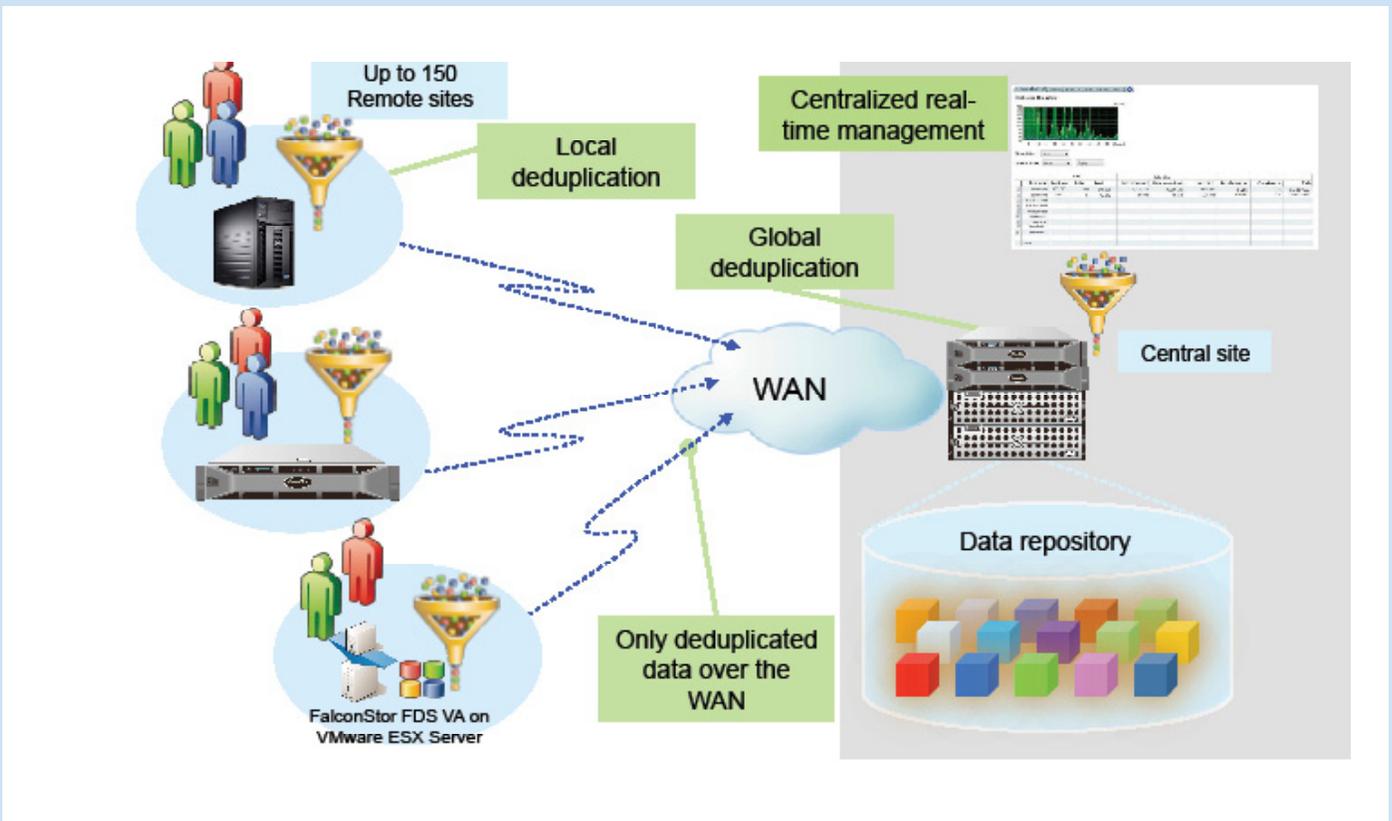
A wizard-based management console enables real time visibility, performance monitoring, and management of up to 150 remote sites at once. Various policies and schedules can be applied to replication with folder-level granularity, defining a flexible data retention model for fast restore and DR. In addition, data can be encrypted during the replication process to minimize risks and enhance security.

One solution, multiple uses

FalconStor FDS can be used for a number of purposes, including as a D2D target for backup operations with any industry-standard backup software, supporting database-specific tools such as Oracle RMAN and SQL-BackTrack. In addition, it is ideal for virtual machine (VM) backup, enabling the creation of a VMware NFS data store (for VMware EXS v3.5 and vSphere v4) as a deduplication repository for VMware templates, and supporting virtual desktop infrasturcture (VDI), significantly reducing the problem of "VM sprawl". The FalconStor FDS solution can also be used with archiving applications (such as Idera, Mimosa, Messaging Solutions, and Quest) and for migration of data from primary data storage.

150:1 Multi-site replication

Up to 150 Remote sites

Local deduplication

Global deduplication

Centralized real-time management

Central site

WAN

FalconStor FDS VA on VMware ESX Server

Only deduplicated data over the WAN

Data repository

Flexible, scalable architecture

FalconStor offers various deployment models and configuration options to meet the end-to-end needs of companies of all sizes. FalconStor FDS scales from small-footprint, cost-effective ROBO deployments up to rack solutions that support multiple petabytes of logical storage capacity for enterprise and data center installations. All models offer the same enterprise-level functionality and support for NFS/CIFS, Symantec OST, and replication. Physical managed capacity ranges from 1TB to 68TB in a single node corresponding to 20TB to 1.36 PB of logical repository, using an average 20:1 deduplication ratio.

Flexible deployment options include:

> **Virtual appliance:** Ideal for remote offices, the FalconStor FDS Virtual Appliance for VMware Infrastructure runs as a virtual machine (VM) on VMware ESX 3.x, 4.x, and vSphere.

> **Physical appliance:** This fully configured, easy-to-deploy, easy-to-manage deduplication appliance scales from 1TB (tower or rack) to 68TB of physical RAID 6 protected usable repository storage.

> **Gateway appliance:** Gateway appliances integrate with existing storage infrastructures to provide storage capacity optimization for any certified vendor disk resource. (*For more information, refer to the certification matrix at* **www.falconstor.com**)

About FalconStor

FalconStor Software, Inc. (NASDAQ: FALC), the provider of TOTALLY Open™ Data Protection solutions, delivers the most comprehensive suite of products for data protection and storage virtualization. Based on the award-winning IPStor® platform, products include the industry-leading Virtual Tape Library (VTL) with deduplication, Continuous Data Protector (CDP), File-interface Deduplication System (FDS), and Network Storage Server (NSS), each enabled with WAN-optimized replication for disaster recovery and remote office protection, and the HyperFS® file system. Our solutions are available from major OEMs and solution providers and are deployed by thousands of customers worldwide, from small businesses to Fortune 1000 enterprises.

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

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