

Continuous Data Protector (CDP)

Unified backup and disaster recovery (DR) with instant availability

FalconStor® Continuous Data Protector (CDP) software brings technical innovation and tangible business benefits for resilient IT business operations on physical and virtual servers. FalconStor CDP is a disk-based, in-network data protection solution that provides comprehensive backup, rapid disaster recovery (DR), and remote replication to enable continuous data availability for UNIX, Linux, and Microsoft Windows environments, ensuring high performance and stability for even the most demanding business environments. This solution supports application-specific data protection for most business applications including Microsoft, Oracle, SAP, and others.

Highlights

- > Instant recovery from any type of data loss, from a single block to an entire data center
- > Recovers emails or databases in 5 minutes, locally protected systems in 10 minutes, remote DR sites in 30 minutes
- > Serverless backup eliminates backup windows and reduces backup requirements from daily to weekly
- > TOTALLY Open™ architecture supports DAS, networked storage over iSCSI or Fibre Channel (FC), and virtual server environments
- > Continuous or periodic protection for any-point-in-time recovery
- > Application-aware snapshot agents ensure 100% transactional integrity
- > Integrated Microsoft Exchange and Lotus Notes message recovery
- > Integrated with Oracle RMAN, ASM
- > Host- or fabric-based deployment
- > Optimizes disk utilization while reducing storage costs and power consumption
- > Centralized management of SAN clients
- > WAN-optimized replication maximizes network efficiency and security via compression and encryption, saving bandwidth and costs
- > Enables data encryption while at rest

Unified backup and recovery

FalconStor CDP completely eliminates the disruptive nature associated with traditional agent-based backup operations. Recovery, the fundamental purpose of any type of backup operation, is near-instantaneous with FalconStor CDP disk-based and in-network recovery volumes. Centralized tape backup operations can be performed off secondary FalconStor CDP snapshot volumes. This out-of-band implementation architecture isolates all backup-related loads or 'backup windows' from production servers, physical or virtual. The in-network nature of FalconStor CDP recovery volumes, up to 255 snapshots per protection volume, provides flexible and comprehensive recovery points. Archive requirements can be addressed with HyperTrac™ Backup Accelerator, which automates the selection and mounting of FalconStor CDP snapshot volumes to backup media servers. When combined with the remote replication feature of FalconStor CDP, remote offices can replicate data to a central location for consolidated backup operations. The various costs associated with distributed tape backups can be eliminated or greatly reduced with FalconStor CDP unified backup.

Comprehensive DR

Complementing the broad data protection features of FalconStor CDP (journaling, mirroring, and snapshots), automated DR capabilities address the needs and budgets of remote DR initiatives. The ability to recover IT business operations at a failover location grows in complexity and cost as the number and type of servers and applications increase. Predominant array-based DR offerings mandate same-vendor and same-array-type deployments, which can be very costly. FalconStor CDP provides the business functionality of DR without vendor lock-in, eliminating any networking or storage constraints typical of most current DR offerings. Resumption of operations at a DR site can be fully automated with RecoverTrac™ technology. RecoverTrac maps the logical relationships between applications, servers, and associated data volumes at the primary site with corresponding applications, servers, and data volumes at the recovery site. In the event of a disaster at the primary site, associated applications can be brought online at the recovery site. A broad range of RecoverTrac technology capabilities includes dependencies, such as 'order of start,' to ensure proper resumption of business operations at the remote site. RecoverTrac has no limitations on physical or virtual servers, enabling customers to continue to leverage their existing IT investments. In addition, non-intrusive DR testing is easily accomplished with FalconStor CDP, allowing customers to identify potential DR issues before any actual disasters occur.

Heterogeneous, WAN-optimized replication

FalconStor CDP enables efficient and robust remote replication between data centers. Customers can utilize storage from any vendor at any office location, which is especially beneficial for organizations undergoing merger or acquisition activities resulting in disparate hardware and networking.

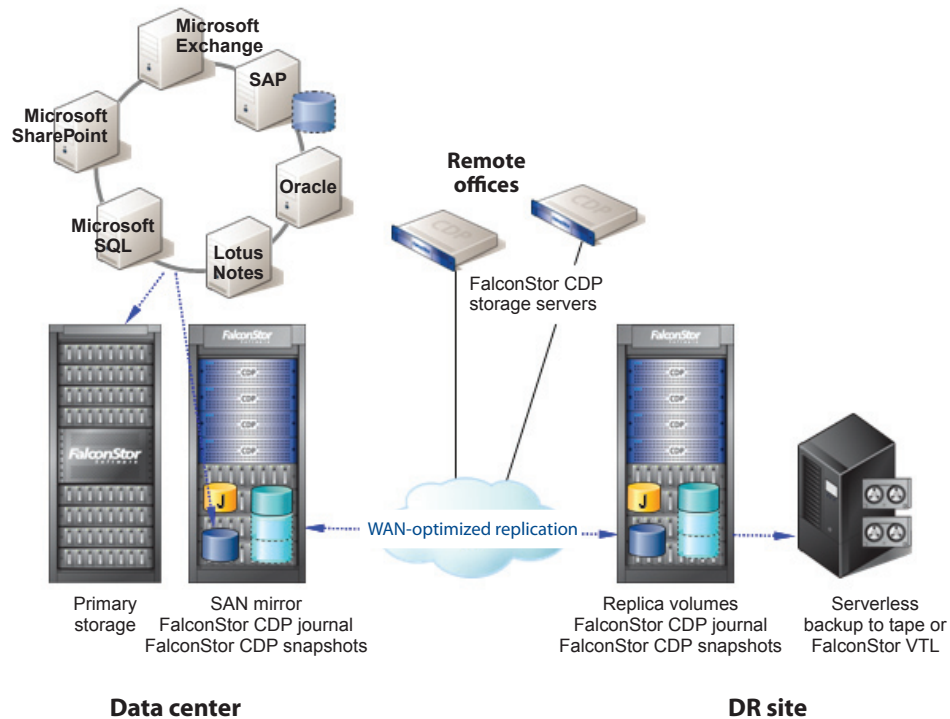
In addition, bandwidth costs increase with the number of remote locations requiring DR protection. To minimize these costs, FalconStor CDP provides WAN-optimized replication, which includes four primary features: encryption, compression, link awareness (adaptive replication), and MicroScan™ technology. Encryption and compression are standard features of all FalconStor solutions; data encryption is available for both data at rest or in flight. Adaptive replication automatically switches between continuous and periodic data transmission in the event of temporary bandwidth link outage or throughput degradation. Periodic replication queues data for subsequent transmission, while preserving write-order-fidelity. MicroScan is a patented FalconStor technology that minimizes the amount of data transmitted during remote replication. It eliminates redundant inefficiencies at the application and file system layers. Rather than arbitrarily transmitting entire blocks or pages (as is typical of other replication solutions), MicroScan technology maps, identifies, and transmits only unique disk drive sectors (512 bytes), reducing network traffic by as much as 95%.

Application-aware, space-efficient snapshots

FalconStor CDP provides application-aware snapshot agents for most popular business applications. FalconStor snapshots can be instantly mounted, in an application-consistent state, for recovery of individual files and database objects, or as entire volumes for bare metal recovery. Two often overlooked, yet critical, aspects of snapshot recovery are the number of snapshots supported, and the disk capacity resource volume necessary to store those snapshots. FalconStor CDP offers up to 255 snapshots per protection volume, enabling true disk-based backup. Snapshot scheduling can provide tape backup functionality for weeks, months, or years. Larger environments can simplify multiple snapshot operations by leveraging the consistency group feature of FalconStor snapshots, which allows multiple data protection operations to be performed simultaneously.

Snapshot technology also enables efficient disk capacity utilization. MicroScan technology eliminates duplicate data from subsequent snapshot images. This, along with 'copy-on-first-write' technology, minimizes disk capacity requirements and maximizes capacity utilization. The resulting recovery granularity enables fast, functional, and efficient recovery for businesses of all sizes. By default, FalconStor CDP mirror volumes are defined with thinly provisioned volumes: that is, with logical disk capacity equal to that

FalconStor CDP for the enterprise



which is on the primary storage. Thin Provisioning simplifies storage resource provisioning and capacity management by allocating physical disk capacity on an as-needed basis. This maximizes disk utilization while reducing storage costs and power consumption.

Near-instant application or server recovery

Recovery of email, files, database objects, or entire servers is the essential objective of any data protection solution. The time required to recover data or servers – recovery time objectives (RTO) – often has an inverse relationship with the cost of the solution. That is, low-cost solutions typically have very high RTO values. Conversely, costly solutions, with very low RTO values, often deliver on their promise of data availability, but with cumbersome access methods. FalconStor CDP delivers comprehensive local and remote data protection, with fast and straightforward access to recovery data. The innovative architecture of FalconStor CDP results in local recovery in as little as five minutes for file/object recovery, to as little as ten minutes for bare-metal server recovery. Remote recovery of data or servers is equally fast and intuitive, with complete remote server recovery in as little as 30 minutes.

Comprehensive data protection for physical and virtual servers

FalconStor CDP provides data protection for physical and virtual servers including virtualization infrastructures from VMware, Microsoft, Oracle, and Citrix Zen. As more businesses realize the productivity gains associated with server virtualization, the importance of protecting those servers, and their associated applications and data, greatly increases. Just as traditional agent-based backup operations impose severe CPU and system loads on individual servers, multiple virtual servers residing on a single physical machine greatly amplify this load and often cripple CPU and I/O performance. FalconStor CDP does not impact virtual or physical server resources for data protection; rather it protects, replicates, and backs up virtual and physical server data directly from FalconStor CDP secondary protection volumes.

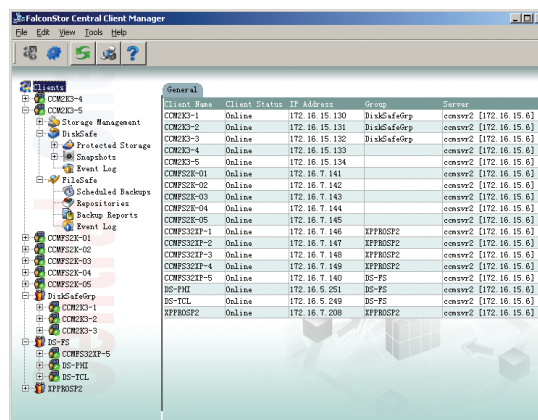
VMware vCenter Site Recovery Manager integration

FalconStor CDP is fully certified with VMware Site Recovery Manager, offering both failover and failback operations. Failback ensures data consistency at the primary data center prior to restoration of IT operations after the failure cause has been resolved.

Eliminate backup window; zero-impact tape backup

FalconStor CDP completely eliminates backup windows or any lost productivity due to backup job server impact. Any required tape backup jobs are performed off secondary, out-of-band FalconStor CDP volumes. True 'serverless backup' is enabled by FalconStor CDP and HyperTractechnology, which automatically selects and mounts FalconStor CDP snapshot volumes for backup jobs, supporting any

FalconStor Central Client Manager (CCM)



Client Name	Client Status	IP Address	Group	Server
CONEX-1	Online	172.16.15.130	DiskSafeGrp	consv2 [172.16.15.6]
CONEX-2	Online	172.16.15.131	DiskSafeGrp	consv2 [172.16.15.6]
CONEX-3	Online	172.16.15.132	DiskSafeGrp	consv2 [172.16.15.6]
CONEX-4	Online	172.16.15.133		consv2 [172.16.15.6]
CONEX-5	Online	172.16.15.134		consv2 [172.16.15.6]
COMPSER-01	Online	172.16.7.141		consv2 [172.16.15.6]
COMPSER-02	Online	172.16.7.142		consv2 [172.16.15.6]
COMPSER-03	Online	172.16.7.143		consv2 [172.16.15.6]
COMPSER-04	Online	172.16.7.144		consv2 [172.16.15.6]
COMPSER-05	Online	172.16.7.145		consv2 [172.16.15.6]
COMPS32P-1	Online	172.16.7.146	IFFRSGP2	consv2 [172.16.15.6]
COMPS32P-2	Online	172.16.7.147	IFFRSGP2	consv2 [172.16.15.6]
COMPS32P-3	Online	172.16.7.148	IFFRSGP2	consv2 [172.16.15.6]
COMPS32P-4	Online	172.16.7.149	IFFRSGP2	consv2 [172.16.15.6]
COMPS32P-5	Online	172.16.7.140	IS-FE	consv2 [172.16.15.6]
IS-FM1	Online	172.16.5.251	IS-FE	consv2 [172.16.15.6]
IS-TCL	Online	172.16.5.249	IS-FE	consv2 [172.16.15.6]
IFFRSGP2	Online	172.16.7.208	IFFRSGP2	consv2 [172.16.15.6]

backup software or tape drive. FalconStor CDP offers multiple recovery points from snapshots, reducing the requirement for backup frequency from 365 daily backups, to 52 weekly backups or 12 monthly backups, enabling tape backup to be repurposed for long-term corporate compliance and governance data retention.

Highly flexible deployment

FalconStor CDP enterprise software enables customers to leverage preferred server and storage platforms. Hardware can be homogenous or heterogeneous; there are no vendor or networking constraints. Similar hardware consolidation benefits of server virtualization, such as with VMware, are realized by the comprehensive data protection and storage abstraction enabled by FalconStor CDP. All of the features and functionality provided by FalconStor CDP enterprise software are also available in the form of FalconStor CDP appliances.

Comprehensive centralized management

FalconStor CDP clients, such as hosts or application servers, integrate with FalconStor Central Client Manager (CCM), which enables customers to monitor and manage their activity from a centralized console. FalconStor CCM works with FalconStor CDP host agents to manage protection policies, either on an individual basis or by groups (consistency groups), ensuring accuracy and consistency of data protection policies across the entire organization. Group management is flexible and can be configured by host or application; for example, Microsoft Exchange or Microsoft SharePoint groups. FalconStor CCM displays application server status and resource statistics, creates groups for efficient administration, and monitors storage use for all associated protection volumes.

Key features

Storage services

Email alerts. Monitors the operation of the FalconStor CDP server. This feature provides email notification so that a technician or maintenance provider can carry out system maintenance and eliminate problems.

FC support option. Supports FC protocols over 2Gb, 4Gb, or 8Gb ports. Supports FC booting using certified HBA. Integrates with Disk Manager to securely allocate storage.

iSCSI support. Supports iSCSI protocol over built-in Gigabit Ethernet ports. Load balancing and path failover are supported via standard Microsoft iSCSI Initiator driver. Supports iSCSI booting using certified iSCSI HBA. Integrates with Disk Manager to securely allocate storage without the usual complexity associated with iSCSI authentication.

WAN-optimized replication. Efficient, block-level delta replication to a DR site. A built-in UDP or TCP protocol can be used without the need for additional FC/IP routers. Patented MicroScan technology analyzes each replication block on-the-fly during replication and transmits only the changed sections. Encryption options are available.

Synchronous mirroring/zero downtime migration. Protects against hardware failures and enables data migration from one storage array to another with zero downtime for servers, applications, and/or users.

TimeMark® snapshots. Space-efficient snapshots can be enabled for all iSCSI and FC disks or disks protected by DiskSafe™ technology. Database agents are available for popular databases to ensure 100% transactional integrity.

TimeView® images. TimeMark technology includes the TimeView feature, which creates an accessible, mountable delta snapshot image that enables administrators to freely create multiple and instantaneous virtual copies of an active data set. The data set and/or replica copies can then be assigned to multiple application servers with read/write access for concurrent, independent processing, all while the original data set is actively being accessed/updated by the primary application server.

Client agents

FalconStor Central Client Manager (CCM). FalconStor CCM provides central management of client-side DiskSafe agents and monitors the client storage. It allows an administrator to monitor and manage the activity of SAN clients for one or more FalconStor CDP servers at once.

DiskSafe agent. DiskSafe is a host-based replication software agent that delivers block-level data protection for a broad range of software and hardware platforms. DiskSafe agents support any storage networking protocol with minimal overhead, while providing continuous or periodic data protection.

FalconStor Message Recovery for Microsoft Exchange.

FalconStor CDP integrates with Microsoft Exchange Recovery Storage Group technology. The snapshot disk responds directly to Microsoft Exchange databases and rapidly recovers information in single inboxes. A wizard lets you load information into databases without having to restore and recover databases or consume server disk space.

RecoverTrac. Disaster recovery and testing tool. This wizard-driven feature allows administrators to map the relationship and configuration information of servers and applications with their associated data volumes as well as primary and recovery sites. This automates the remote failover of servers, applications, and replicated storage in the event of a disaster. RecoverTrac supports physical servers, virtual servers, and mixed server environments, running any network protocol.

HyperTrac Backup Accelerator option. Supports serverless file backup, enabling the backup server to connect to a FalconStor CDP server and assisting with backup by automatically connecting to the snapshot disk. This option completely backs up server files to tape or to a virtual tape library (VTL) such as the FalconStor® Virtual Tape Library (VTL) solution.

Snapshot agent suite. Application-aware snapshot agents ensure full protection for active databases such as Microsoft SQL Server, Oracle, Sybase, and DB2; messaging applications such as Microsoft Exchange and Lotus Notes; and file servers. Complete data and transactional integrity is attained through a robust and automated process that safely and reliably takes snapshots of databases for point-in-time copy purposes and DR.

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