

WHITE PAPER

Reducing Costs and Creating a More Secure IT Environment with a Holistic Approach to Data Protection: An ROI Analysis of FalconStor Storage Management Solutions

Sponsored by: FalconStor

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EXECUTIVE SUMMARY

IDC interviewed eight FalconStor customers that had deployed at least one or a combination of the following FalconStor storage management solutions: Virtual Tape Library (VTL), Network Storage Server (NSS), and Continuous Data Protector (CDP). All customers reported high levels of satisfaction with and enjoyed considerable benefits from the FalconStor solutions, including cost reductions, greater system availability, and increased staff productivity. Highlights of the return on investment (ROI) analysis are as follows:

- ☑ Customers reduced tape drive costs by an average of \$162,000 annually.
- ☑ Storage hardware savings average \$81,000 annually.
- ☑ Staff productivity increase is equal to one full-time equivalent (FTE).
- ☑ The average number of critical system failures was reduced from 17 to 1 annually after deployment.
- ☑ FalconStor ROI is 448% with a payback period of 5.5 months.

SITUATION OVERVIEW

Changing Technologies for Protection and Recovery

Data protection and disaster recovery continue to be overarching challenges for most firms. To remedy a myriad of problems with data protection as well as operational and disaster recovery, companies are replacing legacy backup methods with new approaches. Replication and copy services, in concert with disk storage, are being used for recovery in the event of a logical or physical failure. As a result, replication capabilities are taking on more data management functions and policies to control the frequency, expiration, scheduling, retention, and methods of creating copies. Increasingly, the scope of data protection includes replication and copy services capabilities.

As more firms rely on disk-based data protection approaches, the role of tape in the backup process has changed. With the use of virtual tape libraries, disk is being placed in the data protection path to improve backup performance, improve recovery times, and increase reliability. Despite the declines in cost per GB of disk storage, the volume of backup data often runs at odds with storage capacity and budgets. The use of deduplication technology, along with disk-based backup, affords storage capacity and cost savings by eliminating the storing of redundant backup data. With new forms of data protection available, use cases for tape have evolved. Firms are now using tape (once the default media used for backup and recovery) for deep archive, long-term retention, or secure tape vaulting; they are relying on disk for recovery and resorting to tape only as a tertiary option.

Economic Climate Driving Changes in Storage Investments

Low storage and server utilization rates, physical server sprawl, and the IT overhead with the reallocation of storage capacity to servers have been a reality in most datacenters. The lack of proper data retention and destruction, together with perpetual new content creation, has resulted in average storage growth of 60% annually. The more recent economic climate, in concert with this storage growth, is driving firms to evaluate optimization technologies such as thin provisioning, virtualization, deduplication, space-efficient snapshots, and the like. As firms seek to increase utilization in their server environment and improve availability and disaster recovery, they are consolidating physical servers and implementing server virtualization.

The use of virtualization dramatically improves the lead time to stand up a new application or server and has driven increased investment in shared SAN storage to leverage advanced high-availability and disaster recovery capabilities that virtualization enables. Hand in hand with server virtualization, storage virtualization improves capacity utilization and availability and minimizes downtime by pooling LUNs from different storage architectures. With the aggregation of dissimilar storage comes the need for a set of copy, protection, and disaster recovery services operable across different storage platforms. These software functions, once provided by the storage array itself, are now provided by the storage virtualization layer, mitigating storage lock-in and allowing firms to choose hardware that makes the best sense for their budgets, staffing, and purchasing processes.

Common Infrastructure Challenges

IDC spoke with eight midsize and large firms about challenges within their storage, data protection, and disaster recovery environments.

Storage Management Challenges

The following storage management challenges and trends surfaced:

- ☒ **Storage utilization.** "If you were in a traditional [storage] model, you would carve up your LUNs and try to figure out how much space you're going to need for the next three years. So you might set up a 2TB LUN and give it to a server. And if you put only 200 Gigs of data on it, you will have all of this useless space for years on end." (Manufacturing)

- ☒ **Storage management.** "We needed a way to aggregate it and present mid- or lower-tier storage to servers without going through the hassle of having to have multiple array GUIs or SAN management software." (Professional Services)
- ☒ **Regulatory compliance.** "Being a broker-dealer, we're required to have certain data moved offsite into two different locations. Certain data that couldn't be sent offsite electronically had to be put on external hard drives and physically taken offsite." (Financial Institution)
- ☒ **Storage provisioning.** "Say we have one array and you created so many drives off of this array to present to this server. And we are basically at the capacity of that array...If we wanted to expand a LUN, and we were already at the capacity of an array, we'd have to move that LUN to a different array. That takes effort." (Software)
- ☒ **Time to provisioning.** "To bring SAN-dependent resources online, you're dependent on the fact that you have an inventory of resources." It could be hours, and we do this probably five times a day." (Professional Services)
- ☒ **High availability.** "If the primary array went down or had a hiccup...we'd probably get maybe four of those a year that would be customer impacting. These could be 45 minutes to an hour in length." (Software)

Data Protection and Recovery Challenges

The following data protection and recovery challenges and trends surfaced:

- ☒ **Meeting backup windows.** "I couldn't do [the backups] in a 24-hour period. There was too much data...that's when we started running into problems. Some things couldn't be backed up in time. But I had an Excel spreadsheet that I used to keep track that this server is backing up...I staggered them, this day and that day. It became a big formula." (Financial Institution)
- ☒ **Reliability.** "Occasionally, you might have a machine that might get missed in the backup process. That would happen before probably one to two machines per month minimum." (Insurance)
- ☒ **Granularity of recovery.** "I could only recover certain data. I couldn't recover all of the data — meaning if I did once-a-week backups on certain data, I could only give them what was there a week ago. I couldn't give them something that was there four hours ago." (Financial Institution)
- ☒ **Tape costs.** "Also, financially, it was very expensive to keep up with the amount of storage that we needed for keeping the old tapes, in full. We were spending at least \$100,000 a year just to keep the tapes and replace them." (Communications)
- ☒ **Tape vaulting.** "We had been taking physical backup tapes offsite...to people's homes — our employees' homes. The auditor was saying that we should really be entrusting the tapes to a formal tape delivery. But our tapes weren't encrypted. So if someone steals the tapes...We actually felt safer having our employees taking the tapes home because these are people that have been working with us for a long time." (Insurance)

- ☒ **Bandwidth constraints.** "Trying to get that data offsite, 700 Gigs was pretty much impossible through our transmission line. We have a 10 meg line between offices. And if we were to try to get all of that data offsite, I think we'd need five times that amount of bandwidth." (Financial Institution)
- ☒ **Replication is the new backup.** "We're thinking about allocation and backup in new terms. For the critical stuff, our plan is to replicate snapshots to the DR [disaster recovery] site every hour, whereas before we were just doing a nightly backup. So, now, for the really critical stuff, we're going to replicate data every hour. And then for the stuff that's sort of critical...but important, we'll replicate that every 12 hours. And the stuff that's even less important, maybe we'll replicate that every 24 hours. So now we're starting to think in terms of replication schedules." (Insurance)
- ☒ **Database backups.** "So if there were a hundred files, but only 50 of them changed, it would back only those that changed. But it would back up the full file size. And that became a problem with files that were huge...like SQL databases." (Financial Institution)
- ☒ **Shorter recovery times.** "Probably 1998, we started a formal business continuity process...our smallest RTO [recovery time objective] was five days. [In the] early part of 2008, the Risk Management Committee here told the Business Continuity planners...here's the list of the critical systems that need to be up in four hours if there's a disaster." (Insurance)

IMPORTANCE OF ENABLING A HOLISTIC VIEW

Most firms, even smaller or medium-sized ones, have in place a breadth of different data protection, storage management, and disaster recovery solutions and approaches. Small and midsize firms have an average of three or four, and larger firms have far more. This reality is the result of a number of factors, including mergers and acquisitions, software available for homogeneous storage arrays, legacy systems and data, lack of functionality parity between software suites, and disproportionate costs for different application tiers. The breadth of dissimilar solutions spans not only software capabilities but also hardware architectures as firms put in place different archive, backup, and disaster recovery systems.

The consolidation of different data protection, virtualization, and storage management functions within a common software framework provides economies of scale in terms of skills and knowledge building, commonality of operations, and purchasing leverage. Also mitigated is the risk of lack of interoperability between a range of different data protection solutions. However, as the use of disk for data protection and archiving continues to proliferate, a holistic approach from a physical storage perspective will minimize infrastructure silos and dedicated application sets specific to particular storage architectures. A holistic approach to data and storage management across a common software framework reduces operating and capital costs and improves ROI.

FALCONSTOR'S SOLUTIONS ADDRESS COMMON CHALLENGES

FalconStor Overview

FalconStor Software Inc., a publicly traded company (NASDAQ: FALC), is a provider of disk-based data protection solutions that facilitate continuous availability of business-critical data with speed, integrity, and simplicity. The company offers a series of data protection solutions, including Virtual Tape Library, Continuous Data Protector, Network Storage Server, and File-interface Deduplication System, all of which are built upon the FalconStor IPStor storage platform. The company distributes its offerings through OEM and solution provider partners. FalconStor customers from Fortune 1000 firms to small and medium-sized businesses have implemented FalconStor solutions to meet their recovery time objectives (RTOs) and recovery point objectives (RPOs) as well as to manage their storage infrastructures with minimal total cost of ownership (TCO) and with optimal ROI.

FalconStor Solutions

FalconStor Software provides a suite of enterprise-class storage solutions that enable continuous availability of business-critical data. The company offers a series of data protection and storage management solutions that share a common model of being integrated, optimized, and highly available, leveraging the FalconStor IPStor platform. FalconStor solutions are sold as four key product families:

- ☒ **Virtual Tape Library (VTL).** FalconStor Virtual Tape Library (VTL) is a high-performance, scalable, disk-based tape emulation system that optimizes backup. Integrated data deduplication provides valuable reductions in disk utilization and bandwidth during tape replication. Physical tape support extends functionality to the creation and management of physical media.
- ☒ **Continuous Data Protector (CDP).** FalconStor Continuous Data Protector (CDP) technology provides high-speed local and remote disk-based data protection with instant recovery. By keeping a complete mirrored copy of data in its native format, as well as a series of point-in-time snapshots, the FalconStor CDP solution offers rapid and granular recovery in all disaster scenarios, including accidental data loss, system corruption, server or storage failures, and site-level loss.
- ☒ **Network Storage Server (NSS).** FalconStor Network Storage Server (NSS) integrates storage virtualization and provisioning across multiple disk arrays and connection protocols for an easy-to-use, scalable SAN solution. FalconStor NSS lets customers pool and tier disk assets, simplifying provisioning, reducing allocation errors, and maximizing resource utilization. It also incorporates a full set of application-aware data protection services.
- ☒ **File-interface Deduplication System (FDS).** FalconStor File-interface Deduplication System (FDS) offers an easy-to-deploy, easy-to-manage, scalable data repository with deduplication to minimize online storage capacity needs for backup and archiving applications. Integrated data replication is included for disaster recovery.

REDUCING COSTS AND CREATING A MORE SECURE IT ENVIRONMENT WITH FALCONSTOR SOLUTIONS

IDC interviewed eight customers that had deployed at least one or a combination of the following FalconStor storage management solutions: VTL, NSS, and CDP. Table 1 describes the customer deployments.

TABLE 1

Customer Deployments

One product	4
Two products	2
Three products	2
NSS	6
VTL	4
CDP	4

Source: IDC, July 2009

All of the companies in this study are based in North America and range in size from 300 employees to 5,000 employees. IT staff size varies from 4 employees to over 25 employees. Table 2 shows the demographics of the customers in the study.

TABLE 2

Customer Demographics

Average number of employees	1,475
Average number of IT staff	17
Average terabytes of storage	138
Geography	North America

Source: IDC, July 2009

A common goal for customers prior to deploying FalconStor was preventing disk failures and avoiding lost data. As one manager said, "We were absolutely horrified by the failure of a SAN. We would lose all kinds of data when tapes would fail us."

Avoiding manually changing tapes, especially during a large backup, was an important benefit for customers. With FalconStor software deployed, the backup process was seamless, saving the IT staff significant amounts of time. The FalconStor solution reduced the customers' need for data duplication, reporting features, and the toolsets they required to make the transition from full legacy tape systems to VTL.

Benefits of FalconStor Storage Solutions

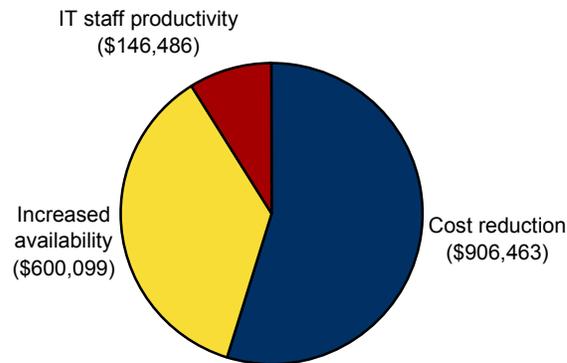
Key FalconStor storage solution benefits include backup and recovery, integration with the actual physical tape library (as some customers could not completely remove tapes), and the ability to work with a company that monitors the initial storage environment.

FalconStor customers experienced benefits in three areas: cost reduction, greater system availability, and staff productivity improvement.

Figure 1 shows the proportion of these benefit areas.

FIGURE 1

Annual Benefits of FalconStor VTL, NSS, and CDP



Total = \$1,653,048

Source: IDC, July 2009

Cost Reduction

In the past, it was difficult and very expensive for customers to keep pace with growing storage demand by simply using tapes. One company estimated that it was spending over \$100,000 per year on backup tapes alone. Because data is now replicated, customers no longer need to back up to tape on a daily basis.

In addition to tapes, FalconStor customers continually added new tape drives to support business growth. On average, customers in this study avoided \$161,605 in tape drive expenses annually.

FalconStor customers have been able to reduce the total amount of space the IT organization needs for its operations. One customer said, "We have been able to manage our storage expectations a lot better. We have 16 terabytes [TB] now — we would need at least 50TB without FalconStor software."

In addition to requiring less storage, because of FalconStor software's flexibility, customers can now purchase less expensive disk arrays. In the past, customers were tied to particular manufacturers, but now they have a variety from which to choose. Leveraging FalconStor software's heterogeneous storage capabilities, one company estimated that it was saving as much as \$600,000 per year because it could purchase arrays at lower prices.

Customers are avoiding purchasing new servers. On average, the companies IDC interviewed avoided purchasing over eight servers. One manager mentioned, "We run multiple servers now and have them protected with FalconStor software. If I didn't have the FalconStor appliance, I would not be able to do this and I'd be buying multiple servers. So far, we saved at least eight to 10 physical servers."

Greater System Availability

Reducing the number of system errors and data migration errors has been a key benefit for FalconStor customers.

On average, customers in this study reduced the number of critical system events from 17 per year to just 1. In addition, IT organizations are able to restore data faster than they could before the FalconStor solution implementation — customers require just over one hour to restore now compared with over eight hours to restore before the deployment.

One customer said, "Before FalconStor software, we were able to get the backups done, but it just required a lot of support, a lot of labor, a lot of time on the phone. Each time was all hands on and manual."

Customers protect their data by mirroring their primary datacenters. If any issue occurs, the FalconStor solution automatically switches to the backup array. One customer said, "Our FalconStor solution has really helped us because it sits in the middle of the process. The servers are all talking to FalconStor appliances, which have two copies of the data on two different storage arrays. So if the primary storage array goes down, the FalconStor appliance would just switch to the secondary storage array." A key point is that in the past, the server would see a system error and be prevented from accessing the storage array. But because the FalconStor solution can automatically switch to a backup data set, the server does not recognize that anything is wrong and continues to process the task.

Staff Productivity Improvement

FalconStor customers are saving IT staff time because of the reduction in manual labor required for tape backups. As one customer said, "We went from probably 20 to 30 hours per month sorting out quirks with the tape component of the backups. Now, I haven't even looked at my tape robot in about two months."

Data recovery speed has been improved since the FalconStor solution deployment. As one customer mentioned, "Before, we were trying to recover 1TB worth of data, and it took us two weeks. And now, we recover it literally in one day. I can go recover a terabyte right now on this phone call, and in two minutes we'd be done."

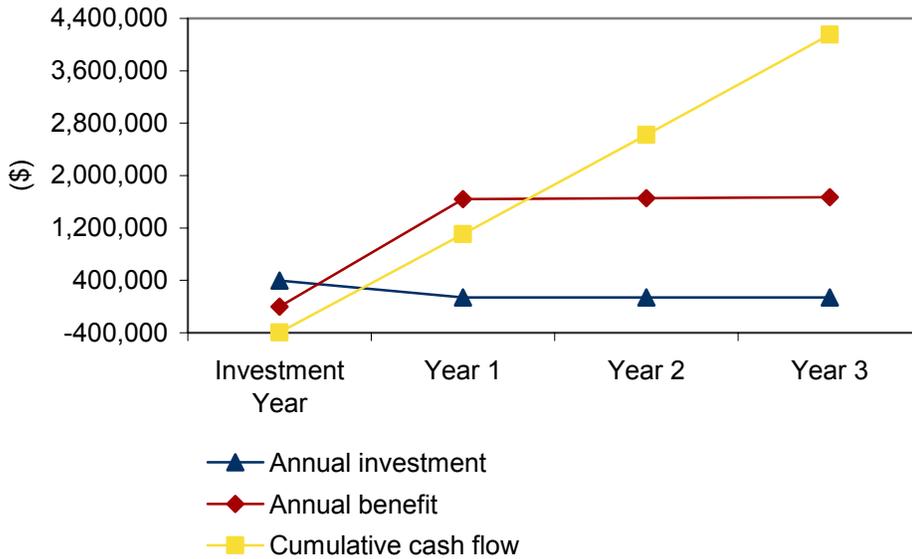
FalconStor customers mentioned saving as much as eight hours when completing a full system backup. Regarding this task, one manager said, "Before, we couldn't do it in a 24-hour period. It was just too much data."

Benefit over Time

The FalconStor solution offers a significant benefit of \$1,638,614 in just the first year after deployment. Investment is highest in the first year, and annual maintenance costs decline and level off over time. The total cumulative benefit over three years equals \$4,152,974. Figure 2 shows the investment, benefit, and cumulative cash flow over three years.

FIGURE 2

Investment, Benefit, and Cash Flow over Time



Source: IDC, July 2009

Business Benefit

Implementing FalconStor solutions has allowed customers to better align the IT organization with their overall business strategy. One manager said, "We were able to now go to projects that would be more business and solution oriented. And our knowledge base about the technology has been improved, which the company really needed. We've been freed up to spend more time coming up with business solutions."

Customers reported being able to pursue "green" initiatives. FalconStor software users are saving space and power, and they are able to reduce the costs of both as well. One manager said, "We're able to stay ahead of technology, and we implement projects that are really going to help our users understand how important it is to be cost-efficient."

For acquisition-based customers, FalconStor software has dramatically improved the time to set up a new location. One customer said, "We're now able to react very quickly, and it's easier for us to get new businesses up and running. From an infrastructure perspective, it used to take us months. Now we're doing it within a week, and we're using two fewer people to do the work."

FalconStor solutions have allowed companies to grow their business faster. Because the storage is virtualized, servers operate faster without incurring any downtime. One customer said, "It's more graceful growth. If we needed to expand the amount of storage that we have presented to a server, it's much easier to do it with FalconStor software in the middle than it would be otherwise."

Return on Investment

FalconStor has provided its customers with an average three-year benefit of \$3.97 million (discounted). The ROI over three years is 448%, and the payback period is 5.5 months. Table 3 shows the IDC ROI analysis.

TABLE 3

Three-Year ROI	
Benefit (discounted)	\$3,967,725
Investment (discounted)	\$724,087
NPV	\$3,243,638
ROI	448%
Payback	5.5 months
Discount rate	12%

Source: IDC, July 2009

CHALLENGES AND OPPORTUNITIES FACING FALCONSTOR

FalconStor is in a unique market position as a provider of software that is the functional equivalent of tools provided by storage array providers. However, its software works across a range of heterogeneous storage architectures. This position presents challenges and opportunities as noted in the following sections.

Challenges

- ☒ Competing with access to customers during storage systems purchase
- ☒ Qualification costs associated with a range of heterogeneous environments
- ☒ Market penetration from larger suppliers, pushing out entrenched incumbents

Opportunities

- ☒ Well positioned in the shift from backup to replication technology adoption
- ☒ Well positioned in capacity optimization (deduplication) technology
- ☒ Enabling copy services across dissimilar systems
- ☒ Extension of its indirect distribution to a broader range of VARs and OEMs
- ☒ Storage virtualization and heterogeneous replication that fit well with cloud computing and IT as a service opportunities
- ☒ Integrated set of storage and data protection functions compared with competitors that achieve functionality through acquisitions

CONCLUSION

Given the evolution of technology, economic and budgetary pressures, and storage infrastructure challenges, firms must provide stronger ROI and shorter payback periods on technology investments. The research conducted in support of this paper illustrates that FalconStor customers have realized significant cost reductions, greater system availability, and increased staff productivity as a result of deploying FalconStor solutions. Through the use of FalconStor technology, the firms interviewed were able to achieve an ROI of 448% and a payback period of 5.5 months. Other firms seeking to reduce storage infrastructure costs, improve staff productivity, and increase uptime and availability can use these results as a benchmark in their environments.

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