



Improving the Backup Scenario — Nexsan and FalconStor Hit a Home Run

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Management Summary

We all have heard of the expression that *the whole is greater than the sum of its parts*. Have we ever stopped to consider what that really means? In the world of entertainment, for example, was the comedy team of Abbott and Costello funnier together than either would have been flying solo? In the field of medicine, the synergy of two drugs, such as Tylenol and Codeine, working together, are far more effective than either would be by themselves. They enhance the effect of each other in improving the pain relief for the patient. Even more striking is the value of the house that each of us lives in. If you added up the cost of all of the wood, nails, and piping that goes into the construction of a house, you would not come close to the actual value of the completed property. Why? One reason would be the added value of the labor that went into putting all of those components together.

We also have experienced the synergy of partnerships impacting the data center, where we have seen the physical or logical joining of any number of companies resulting in a stronger enterprise IT environment. With the complexities that are running rampant throughout the data center, anything that can be done to simplify and lower the total cost of ownership (TCO) of the IT infrastructure is welcome. In the past few years, we have seen data centers striving to gain control of an IT budget under attack from the uncontrolled deployment of underutilized servers. With 80 to 90% of server resources being wasted, the data center was paying for this glut of servers with unused CPU cycles, wasted energy, inefficient use of administrative personnel, and disappearing floor space. The availability of multi-core processors from companies like AMD and Intel, along with multi-socketed servers from Tier-1 server providers such as Dell, HP, IBM, and others, combined with virtualization hypervisors like *VMware*, *XenServer*, and *Hyper-V*, together have enabled the enterprise data center to consolidate and virtualize their mission- and business-critical application at a ratio of 10:1 or higher. However, what is being done to reduce the TCO of the storage infrastructure? Well, for those of you not paying close attention, storage synergy is in full bloom, also, with the recent announcements of the acquisition of Diligent by IBM, Data Domain by EMC, and a new partnership between Nexsan and FalconStor to reduce the costs of enterprise storage.

In August, FalconStor and Nexsan announced a joint venture to take advantage of the synergy that these storage innovators bring to the table. FalconStor and Nexsan have combined to deliver a new high-performance, energy-efficient storage system that will take advantage of Nexsan's *AutoMAID* technology to improve the energy- and space-efficiency of the enterprise data center and the data deduplication software from FalconStor to reduce the amount of data that needs to be backed up. The resulting platform, the Nexsan *DeDupe SG* is now available to lower the TCO of your data center. To learn more about the Nexsan *De-Dupe SG*, please read on.

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Uncontrolled Growth of Storage

The data center of any mid-sized enterprise faces the same issues as those of the largest enterprise, simply on a different scale. Where the largest enterprise is supporting thousands or tens of thousands of users with hundreds of terabytes of data, and growing, the mid-sized enterprise may *only* be supporting 500 to 1000 users, on possibly more than 100 servers, with between 25 to 50 TBs of data, *and growing*. The proliferation of open systems servers throughout the data center, and the enterprise, has resulted in uncontrolled server sprawl, adding complexity to the IT infrastructure. Unfortunately, these mono- and dual-processor systems are usually running at less than 20% efficiency, with 80% of the system resources, and electrical energy, wasted. This complexity and waste cannot help but contribute to an increase in the TCO of the data center due to excess costs for maintenance, systems management, floor space, and energy. The IT staff had to change the architectural infrastructure of the data center. They had to change the IT paradigm by removing complexity from the data center through the consolidation and virtualization of enterprise servers and the deployment of scalable, virtualized storage.

Through consolidation, the IT staff has simplified the physical management of existing enterprise compute resources throughout the data center, replacing under-utilized, under-performing servers with new, multi-core processors in multi-socket systems. This has enabled the data center to reduce the server count by a factor of up to 10:1, lowering the TCO of the data center. The flexibility of these servers enables the improvement of server utilization through the virtualization of the server environment with virtualizers such as *Hyper-V*, *VMware*, or *XenServer*. **By virtualizing multiple mission-critical, and business-critical, applications within a single physical server, the data center not only improves server utilization but also increases the demand for efficient backup technology from the virtualized environment to the storage network.** This results in the need for an affordable storage array with higher throughput, higher capacity, and the energy efficiency necessary to meet today's unique scalability demands of a growing enterprise, but keeping in mind the higher performance requirements of tomorrow. Spe-

cifically, in order to reduce the TCO of storage, most data centers will need to implement some form of information lifecycle management (ILM) program to control the cost of storage.

As data ages, the urgency to access it decreases. *Mission-critical* applications typically have a requirement for instantaneous access to storage. Therefore, the IT staff tends to store this information on the fastest, most reliable media available, typically 15K RPM Fibre Channel (F.C.) drives. As you might suspect, this is also the most expensive media available in open systems storage arrays. The data for *business-critical* applications, such as email and data warehouse, does not necessarily have to be on Tier 1 drives. This secondary data can be on Tier 2 drives, such as F.C. drives running at 10K RPM. Tier 3 data, such as backups, can clearly utilize the high capacity, low-cost characteristics of SATA drives. However, due to the long-term nature of this data, there is an overwhelming need to control the amount of duplicate data being replicated and the energy required to maintain a responsive backup architecture. Furthermore, there is an absolute necessity to deploy storage with the reliability, availability, and serviceability (RAS) features demanded by the SLA policies of the enterprise.

In order to satisfy these demands, FalconStor and Nexsan have formed a partnership to deliver the Nexsan *DeDupe SG*, a high performance solution that combines Nexsan's ultimate energy efficient storage architecture available with FalconStor's File Deduplication System.

A Synergistic Collaboration

For those of you who do not know who Nexsan is, they are a pioneer of next generation disk-based storage systems designed for the long-term storage of digital information. Their storage systems are ideal for storing and archiving information commonly referred to as *fixed content*, since it rarely changes over time. These solutions enable organizations to store and access growing amounts of fixed content data over longer periods of time, while meeting evolving business and compliance requirements in a "green" environment. These systems are ideally suited for the mid-sized enterprise, but are also attractive for all storage users. Nexsan is a leader in the development of energy-effici-

ent and space-efficient storage systems that help a wide-range of enterprises attain superior operating efficiency.

A decade old, Nexsan, based in California, has deployed over 21,000 systems to more than 60 countries. They have installed systems in small and medium-sized enterprises as well as large global enterprises around the world. Their systems are the first to offer *AutoMAID* (Automatic Massive Array of Idle Disks), a policy-based intelligent "green" energy-saving technology. AutoMAID epitomizes the MAID 2.0 concept in which power consumption is dramatically reduced without sacrificing performance.

FalconStor was founded in 2000, in New York, by a team of experts with decades of experience in storage networking. The spirit of innovation is pervasive throughout FalconStor, as it strives to develop better, more flexible, and ever more efficient technological solutions to address real-world customer needs. They are the premier provider of *TOTALLY Open* data protection solutions with over 4,000 enterprise clients and 30,000 SMB customers around the world. They develop best-of-breed software solutions for backup optimization, data deduplication, continuous data protection, and storage virtualization.

Nexsan and FalconStor have now partnered to deliver a high performance, high efficiency data deduplication solution with outstanding price/performance. That solution, the Nexsan DeDupe SG, is a co-branded data deduplication system built around FalconStor's high performance, field-proven data deduplication engine, integrated with Nexsan's reliable, performant, and especially energy efficient storage.

The Nexsan DeDupe SG

The Nexsan DeDupe SG platforms can be characterized by two words: speed and energy efficiency (okay, make that three words). The DeDupe SG is a high performance, energy efficient data deduplication system that leverages the "green" efficiencies inherent in its industry-leading components: data reduction through high-speed deduplication, footprint reduction through space-efficient storage arrays utilizing high capacity disk drives, and energy savings, through Nexsan's AutoMAID technology. A DeDupe SG system is primarily a backup target

used during the backup window, with not degradation in performance with an increase in the number of files. The typical backup window is less than eight hours a day, while other solutions require the data center to continue to spin drives and burn energy for another 16 hours. **Not only will the DeDupe SG enable the IT staff to achieve higher capacity and better performance during the backup, but it will also enable the data center to save energy and reduce costs for every hour that the DeDupe SG is not in use.**

At a time when energy conservation and thinking *green* have become staples of any enterprise's social policy, Nexsan has delivered its innovative AutoMAID technology to promote energy efficiency without a significant performance penalty. **Supported in both SAS and SATA environments, AutoMAID is a multi-level energy-saving technology that enables the IT staff to conserve 20%, 40% (SATA only), or 60% of the energy that would otherwise be consumed. Alternatively, the data center can achieve maximum performance and the lowest latency with AutoMAID turned off.** AutoMAID differs from traditional MAID architectures, which usually have an *on* or *off* approach, and only is supported on SATA drives. When *off*, MAID¹ takes minutes to wake up, limiting its use to

Exhibit 1 – Levels of AutoMAID

- **Level 1** – Unloads the read/write heads, saving up to 20% of the energy, yet still providing sub-second response time for the first I/O only; all other I/Os are at full speed.
- **Level 2** – Unloads the heads and slows disk rotation to 4000 RPM, saving up to 40% of the energy, with a 15-second recovery time for the first I/O only; all other I/Os are at full speed.
- **Level 3** – Puts the drives in sleep mode with power on resulting in a 60% (or higher) savings, with a 30-45 second recovery time for the first I/O only; all other I/Os are at full speed.

Source: Nexsan

¹ MAID, or Massive Array of Idle Disks, was designed for Write Once, Read Occasionally persistent data and typically has only 25% of its drives powered on and spinning at any given moment.

Exhibit 2 — Nexsan DeDupe SG Family Specifications

DeDupe SG Model	Usable Capacity (TB)	Logical Capacity (TB)	Backup Performance (MB/Second)
DDSG-4	4	80	150
DDSG-7	7	140	270
DDSG-12	12	240	350
DDSG-18	18	360	390
DDSG-26	26	520	450
DDSG-52	52	1040	750

archiving and similar applications. AutoMAID's faster response from its reduced state enables a broader set of application use, in fact, enabling the IT staff to create a multi-tiered storage architecture for SME data as it ages. See Exhibit 1, on the previous page, for a description of the levels of AutoMAID that can be assigned by drive.

To this energy efficient storage array, Nexsan has integrated FalconStor's high performance, block-level deduplication software engine for backup and archiving applications. With an easy to deploy CIFS/NFS interface, FalconStor provides a policy-based engine for both concurrent and post-processing data deduplication, enabling the IT staff to select which files to dedupe. It also enables WAN-optimized replication for bandwidth savings. The DeDupe SG delivers this performance and efficiency with full compatibility with the leading backup software packages and many-to-one replication for remote and branch offices. The DeDupe SG also comes with a hosted backup option with the data center's backup software of choice being installed directly onto the DeDupe SG appliance. This will enable the data center to move backup traffic across the server bus, eliminating LAN traffic and increasing backup speed and eliminating backup server hardware.

Nexsan has created a set of turnkey DeDupe SG models (see Exhibit 2, above) to satisfy the backup requirements of any mid-sized enterprise dipping their collective toes into the data deduplication waters for the first time. The entry-level DDSG-4 supports a usable capacity of 4TBs and a logical data capacity of 80TBs, assuming a data deduplication rate of 20:1, along with a backup performance of up to 150MB/s. At the high end, the DDSG-52 supports 52TBs of usable capacity and a logical data capacity of over one Petabyte with a 20:1 data deduplication rate, with a backup performance of up to 750MB/s. These perfor-

mance numbers compare quite favorably with the performance levels established by Data Domain, 120MB/s with the entry-level 3TB DD510, up to 450MB/s with the 48TB DD690.

Conclusion

With the Nexsan DeDupe SG, the data center can not only increase the performance of backup and archive processes, but it can also decrease the amount of energy being consumed by storage for data protection. With AutoMAID, the IT environment can contribute to meeting corporate environmental goals, protect natural resources, and reduce the amount of electricity required to drive and cool the data center without impacting performance. This will enable the enterprise to extend the life of the data center, perhaps eliminating the potential of having to build a new one!

This partnership between Nexsan and FalconStor combines the innovation of two of the leading lights in backup storage technology, removing data deduplication as a niche technology and placing it squarely in the mainstream of any mid-sized enterprise architecture. If your data center needs to increase backup performance and reduce energy consumption, the Nexsan DeDupe SG may be the solution that you seeking.



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