

## Quantum Goes Beyond Deduplication

March 2010



In an industry built from flashy startups that might chase an appealing and easy to digest technology, delivering the underpinning sets of technology that today's very confidence in digital storage depends upon takes an unusual pedigree. Looking back at history, it is clear that data protection systems have always involved considerable complexity. Data protection is the very foundation on top of which we have confidence in digital data, and protecting data takes no less than one of the most complex sets of features found in any storage solution. But the challenges haven't discouraged innovation, and in fact a major innovation – data deduplication – has brought a whole new generation of storage vendors into the field of data protection.

We believe Quantum, a long-standing data protection provider, is an oft-overlooked force in this market. In this Taneja Group Company Profile on Quantum, we'll take a look at what is going on inside of Quantum, including both the company and the technology, and how Quantum – while building solutions on innovative technology – is about far more than just deduplication. On the technology front, this “more than deduplication” focus on next generation data protection – solutions providing integrated data management for the capacity optimized enterprise – may well be positioning Quantum solutions as the ones to beat. On the business front, the “more than deduplication” story is about the expertise and business capabilities behind the solutions that make Quantum a strong competitive force, even amongst industry juggernauts.

### The Next Generation Quantum

For Quantum, data protection has never been about quickly spinning up a technology. Quantum has for the past few years been quietly executing a transformation – a substantial extension of their core business of data protection. For Quantum, metamorphosing in such a way is a pattern of methodically leveraging expertise and key technology to build higher value storage offerings. Such higher value has been rooted in integrating and evolving key technologies into systems and software. The resultant higher value storage offerings have been leaders in their product classes.

Quantum has executed a change by substantially extending their solution capabilities in what they refer to as an “edge-to-core” strategy of preserving, protecting and managing data across sites, storage tiers and time. This strategy has mostly been centered around a unified, deduplicating disk architecture and tight integration with tape. However, it will increasingly focus on leveraging Quantum's file system and data management software as part of a single, scalable, distributed software platform that provides ubiquitous, seamless, end-to-end data management and protection.

## C O M P A N Y P R O F I L E

While it has taken awhile, today Quantum stands poised with a combination of technologies that appears built with all of the right underpinnings for next generation data protection.

We believe the data protection market is on the cusp of a new set of capabilities – an evolutionary change to make deduplication about more than optimizing storage within single boxes. The areas where these solutions will innovate include:

- Making deduplicated data more portable, so that it can be efficiently moved between systems and still used with the same versatility as regular data.
- Turning the act of deduplication into a distributable and scalable process so that it is possible to deduplicate data in more places, and in more ways, across the enterprise.
- Wrapping deduplication with storage management that better meets the

needs of enterprise data protection and archiving.

After focusing on algorithms and performance in the first generation, some vendors will have trouble when it comes to innovating beyond the boundaries of the single appliance. When it comes to next generation data protection, it will be about providing *solutions* focused on managing optimized data within, across, and beyond the enterprise. Such solutions will require more than fancy algorithms.

In our eyes, to deliver on these complex promises it takes a business that has the right technology platform, expertise to shape that technology platform, and the operational strength to bring it into the marketplace. Quantum has long held our attention as they've extended their business into the disk-based storage market. Let's take a deeper look at the full story.

---

### Quantum Technology

In just the last few years, Quantum has spread their wings and launched from their perch as the market leader in automated tape systems to stand at the forefront of the deduplicating, disk-based data protection market. Today, they offer one of the broadest and most full-featured selections of products available from any one vendor – the DXi-Series, which scales from less than 2 TB to more than 200 TB of usable capacity. The DXi-Series includes the remote office / branch office (ROBO) DXi2500-D appliance, the SMB optimized DXi3500, the 5 model NAS-based DXi6500

family, and the enterprise-class DXi7500 system. The range of features varies, but each DXi-Series product can work with others, shuffling deduplicated data back and forth, in orchestration with enterprise backup and data management systems, and even to the point of moving data from disk to tape.

But the story of Quantum today is about how the integration of technologies both within the heart of the DXi-Series and beyond not only delivers much more than single repository deduplication now but

**C O M P A N Y P R O F I L E**

also provides a tremendous foundation for the future.

### **Three Key Technology Assets**

Within its technology core, Quantum has executed a transformation. That transformation has involved the methodical integration of three key technology assets into a single scalable, distributed software platform for holistic data protection and management. This platform combines: 1) Quantum's deduplication technology, 2) their StorNext file system technology, and 3) data management technology from across their product portfolio.

#### ***Quantum deduplication technology***

As a result of its acquisition of ADIC in August 2006, Quantum holds a foundational patent in variable-length deduplication and has leveraged this core intellectual property to create a powerful and flexible deduplication engine within its DXi-Series products. Variable-length deduplication is more effective and flexible than other deduplication approaches – e.g., providing more granular deduplication than single instance storage and, unlike fixed block deduplication, the ability to adjust to changes in block size. Although it depends on the type of data being deduplicated, this technology typically delivers deduplication ratios between 15:1 and 25:1, and when protecting virtualized environments, often more than 40:1. Quantum also offers policy-based deduplication in its DXi7500 enterprise systems, providing customers with a choice of deduplicating data as it is backed up, or waiting until the entire backup is completed, thereby enabling customers to select their preferred approach by individual backup job. In

addition to offering deduplication in their backup appliances, Quantum also has made it an integral part of the StorNext file system.

#### ***Quantum file system technology***

Also acquired with the purchase of ADIC, StorNext is one of the long-standing leaders within the high performance file system market and is today used behind 50,000 licenses as clustered SAN storage, scale-out NAS, or tiered archival storage.

StorNext enables users to share files easily and preserve investments by giving applications running on UNIX, Linux, Windows and/or Macintosh operating systems concurrent access to a common file store. Its open architecture makes StorNext highly scalable and allows data sharing by both SAN- and LAN-based clients. Moreover, StorNext is storage vendor agnostic, enabling users to leverage any mix of disk and tape hardware with it.

In addition to being sold as standalone software, StorNext is also the underlying file system within Quantum's DXi-Series, which provides the ability to scale performance and capacity through easy file system expansion.

#### ***Data management technology***

In the area of data management technology, one of Quantum's key assets is StorNext Storage Manager. It provides automated movement of data between different storage tiers based on user-defined policies and file access requirements. Because it integrates with the virtualization capabilities of the StorNext File System, Storage Manager can present file information to applications

**C O M P A N Y P R O F I L E**

regardless of whether they are stored onsite or offsite.

All of this has established StorNext as a solution that data-centric enterprises use to move data between general purpose storage systems, with the intelligence that comes from a file virtualizing, data tiering, HSM solution with a rich, distributed metadata layer. For high throughput tiering requirements, StorNext's new "Distributed Data Mover" (DDM) acts as a conduit for passing data and dramatically scales performance for archives that become more active.

Quantum has also developed flexible replication engines for managing (as well as protecting) data in both StorNext and the DXi-Series. In addition to providing a range of replication options, the integration with Quantum's deduplication technology means replication can be configured to intelligently replicate only unique data and, thereby, significantly reduce network bandwidth requirements.

While most discussions of Quantum's data management capabilities focus on StorNext, two other Quantum assets should not be overlooked. The first is a comprehensive approach for evaluating the integrity of library drives and media: the iLayer management software in Quantum's Scalar tape automation systems. Embedded in the more than 30,000 Scalar libraries Quantum has shipped, it provides proactive diagnostics and specific recommendations for corrective actions directly to users and can reduce library and media management time by more than half.

Also often overlooked in Quantum's portfolio is its Vision backup management software, which provides centralized management, monitoring, and reporting for Quantum DXi-Series disk and tape systems through a single console. Multi-tiered storage environments in particular can benefit from detailed analyses that can be used to reduce inefficiencies and lower an organization's total cost of ownership.

**Integrating Key Technologies from  
Edge to Core**

Over the last few years, Quantum has made enhancements in its deduplication, file system and data management technologies, but they have also focused on integrating them more closely into a single, scalable, distributed software platform. The goal is to provide ubiquitous, seamless, end-to-end data management and protection across sites, storage tiers and time – which, as mentioned above, Quantum refers to as their "edge-to-core" strategy – while leveraging deduplication to dramatically lower costs. To date, much of this strategy has centered around backup and archive provided by the company's broad-based DXi-Series portfolio and its tight integration with tape as the main medium for compliance, disaster recovery and long-term retention. Looking toward the future, however, StorNext is likely to play an increasing role in the integrated technology platform, enabling Quantum to expand its reach beyond both an appliance-based deduplication and replication model and beyond backup and archive. Of course to be successful, Quantum must be able to integrate well with other applications, and here, too, the company has a strong foundation on which to build.

**C O M P A N Y P R O F I L E**

**Integration with other applications**

As a device or subsystem supplier for most of its history, Quantum has always understood the critical importance of being able to integrate easily with other parts of the storage and networking infrastructure, and perhaps nowhere is this more evident than with StorNext. One of the keys to StorNext's success has been the ability to integrate its data management capabilities with third-party applications through a rich set of robust interfaces, allowing data to be managed across an enterprise. For example, customers such as television broadcast networks, movie studios, human genome sequencing centers, oil and gas companies and government intelligence agencies have been able to manage large numbers of massive files so that the value of the data contained therein can be fully leveraged. In addition, the tight application integration and other key StorNext attributes – e.g., tremendous scalability, high performance file sharing, and OS platform independence – provide Quantum with opportunities to play a role in cloud implementations.

Another important example of Quantum's integration with other applications can be seen in their focus on integrating the DXi-Series products with Symantec OpenStorage Technology. By integrating with OpenStorage, Quantum makes it easier for customers to utilize deduplication

technology with Symantec's backup applications. Quantum's DXi7500 was the industry's first deduplication solution to be qualified with OpenStorage direct-to-tape capability for NetBackup; several DXi-Series products are certified to provide application-aware replication through OpenStorage in NetBackup environments; and Quantum recently announced certification of Symantec Backup Exec 2010 with OpenStorage for DXi-Series models. Moreover, Quantum claims a lead over all other deduplication providers in the number of supported applications for direct tape creation.

**A next generation platform**

The relative ease with which StorNext has been leveraged in conjunction with capacity optimized disk storage as the foundation for Quantum's emerging new integrated software platform suggests that the market only has the narrowest glimpse of how pivotal StorNext extensibility may be in shaping next generation deduplication expectations.

We have little doubt that this new platform will play out as a pivotal piece of intellectual property within Quantum, with significant potential to enable future solutions. However, the story of Quantum's transformation and opportunity goes beyond just its technology.

---

**Quantum – Leveraged Expertise**

As much as expertise at Quantum is about innovation with technology, it is also about making sure that technology addresses important customer needs. Quantum has

more than a decade of experience working with customers to solve their backup, recovery and archive challenges, and this is one of the key factors that has enabled the

**C O M P A N Y P R O F I L E**

company to adapt successfully as disk has assumed a central role in backup.

Adding disk systems to a tape vendor's portfolio is a tremendous shift. We have seen many businesses attempt to execute these types of shifts, and seldom have they been graceful. For Quantum, we believe the case is different. Their methodically executed shift to disk hasn't been about disruption, but rather about integration made possible by their focus on solutions, the portable IP, and their long-standing data protection experience.

In our view, this is an application of Quantum's expertise in delivering relevant and innovative solutions to market. And the addition of disk solutions is by no means the single demonstration of Quantum's expertise, but rather it is a repeated pattern. In operating their core business, Quantum has repeatedly applied this same expertise to "leverage" technologies up the value food chain – making key acquisitions, innovating and integrating, focusing on the most important dimensions of their solution business, and carving away unnecessary overhead.

Not to be overlooked in this equation of continual refinement is how Quantum has applied their expertise to business just as often as they have applied it to solutions. In this regard, they have a long track record that will undoubtedly continue to build in both branded channels and OEMs.

### **Optimizing the Channel**

When it comes to business execution, there may be no dimension as important as channels to market. Looking back on the

storage industry, Quantum can be viewed as one of the early leaders in developing and nurturing a channel. Their channel programs have historically been recognized as one of the best in leveraging VAR and partner efforts with accessible deal registration tools, sales process assistance (such as RFP support), early conversion to incentives fixed on MSRP, and more. The channel expertise within Quantum isn't a one-trick pony, and has been applied to different technologies, across decades, and through many acquisitions and mergers. Quantum's innovation and leadership in developing its channel is today responsible for their enormous tape automation customer base – consisting of more than 70,000 customers with Quantum-branded systems, ranging from large enterprises to SMEs.

While Quantum's channel efforts with disk-based systems may have lost some focus over the last few years as attention was drawn to bigger platforms and OEM efforts, that channel was originally built on tape, and it has a footprint and strength that remains. Since acquiring ADIC, Quantum reports that non-royalty, branded revenue has grown significantly as a percentage of overall revenue (approximately 52% to 76%) even while overall revenue was tossed about by market changes. Today, approximately 90% of Quantum's branded business flows through their channel.

With 100+ key partners in the top echelons, Quantum's partner program will undoubtedly be key in driving ever more accessible deduplication technology to market – this has in fact been an area of focus with Quantum's new DXi6500 family

**C O M P A N Y P R O F I L E**

and its special purpose packaging for easy channel partner sales, implementation, and support.

### **Optimizing OEMs**

Not to be overlooked, Quantum has a pedigree in working with OEMs that few others in the industry can claim. While the market's gesticulations around a recent OEM relationship – providing deduplication software to EMC – may be a temporary thorn in Quantum's side, Quantum in fact has substantial expertise in mustering OEM partnerships. A roster from Quantum's history includes the biggest names in the storage industry: HP, IBM, Sun, Dell and EMC (some multiple times over). While many device manufacturers might claim similar breadth, few solution-oriented companies can claim that pedigree without being exponentially larger than Quantum.

Over the past few years, Quantum has continued to drive business through OEM partnerships, taking a very strategic approach. In the area of tape, Quantum has been more selective in the opportunities they have pursued, focusing on partnerships where they can generate solid profit margins. In the area of deduplication, we suspect that Quantum's OEM partnership with EMC will be viewed as an ideal testing ground for Quantum's deduplication technology in the large enterprise customer segment. Following EMC's opportunistic acquisition of Data Domain, we see Quantum as being set free with a thoroughly tested solution in a competitive landscape that is only beginning to unfold, and where many other OEM partnerships remain open for discussion.

---

## **The Quantum Business**

Finally, a dimension of Quantum that shouldn't be overlooked is its business strength. While Quantum's technology and expertise stand to be tremendous competitive weapons, it takes business strength to sustain technology innovation, and bring the resulting solutions to market. Many pundits in the market have held poorly grounded assumptions about Quantum's business strength. While a tumultuous transition has faced many tape vendors as the backup market has shifted to disk, Quantum has managed this transition quite well.

It is no surprise to anyone that the tape

market continues to decline, and because the majority of Quantum's revenue still comes from tape, the company's revenue has fallen over the last several years. However, the decline in its revenue also reflects Quantum's decision to stop pursuing low-margin sales as it focused on building a higher value, more profitable storage systems business. The results of this strategic shift can be seen in the company's financial results over the past year.

In Calendar Year 2009 (CY09), Quantum reported some of its best results in ten years. For the last two quarters, its GAAP

**C O M P A N Y P R O F I L E**

gross margins have exceeded 40%, significantly higher than the sub-30% margins it had prior to acquiring ADIC. Quantum has also generated GAAP profits for the last three quarters, a significant achievement given the challenge of trying to transform a company during the worst economic environment since the Great Depression. In fact, when non-cash charges for amortization of intangibles and stock-based compensation, along with other non-recurring losses and gains, are excluded (consistent with the way most financial analysts evaluate a company's earnings results and future prospects), Quantum's profits in CY09 were up 35% over the prior year. In short, while the company is smaller than it was a few years ago in terms of annual revenues, Quantum is much more profitable.

It is also worth noting that despite the annual revenue declines, Quantum has delivered sequential revenue growth for two consecutive quarters, the first time in two years that it has done so. This suggests that Quantum's overall revenue trajectory is beginning to run contrary to the trend over the last few years.

Although Quantum has stated that it does not expect to replace all of its lost tape revenue – much of which was low margin – with revenue from disk systems and software, we believe Quantum is poised to deliver good financials going forward in terms of both revenue and profit. The company is in the midst of a significant new product introduction cycle begun last year that includes new disk and tape platforms and major software enhancements. In

addition, while licensing revenue from its deduplication partnership with EMC will mostly go away over the next few quarters, Quantum has demonstrated that it can continue to deliver strong growth in branded DXi and StorNext revenue, and it recently announced that it had secured a new OEM for its deduplication software.

As for Quantum's debt – a subject that has received significant public attention – last year the company overcame the challenge of an extremely tight credit market and refinanced a key component of its debt in a hands-off financial transaction with EMC that imposed no restrictions or limitations on Quantum's business. This, combined with the company's continued strength in generating cash, should lay to rest any doubts about Quantum's ability to manage their debt.

To sum up, in a market growing at a year over year CAGR of 75% (see the Taneja Group 2008 Data Protection Market Forecast), and where the integration of Quantum's key technology assets give it significant advantages, we think Quantum's time to both sustainable revenue growth alongside tremendous profit growth is not far away. In the interim, well-managed debt and increased profitability have positioned Quantum to capitalize on market opportunities.

## Taneja Group Opinion

As we've turned our eye toward a deeper examination of Quantum, we've been surprised with what we've found. The legacy of tape that has undone some competitors seems to have created opportunity for Quantum. Quantum's tape experience opens doors in a network of established customer accounts, makes an in-place partner network fully accessible, and carries the benefit of years spent honing expertise and developing key intellectual property. Meanwhile, Quantum's adeptness at business execution appears to have positioned them to carry an innovative solution set to market on top of already strong business fundamentals.

Today, data protection and archiving have been optimized and re-optimized as technologies that are used to drive data into a single massive silo. But the infrastructure is changing, and so will user requirements around how they execute data protection and archiving. Moreover, the very act of optimization – deduplication – is changing how we think about protecting, archiving, and moving data. Those forces surrounding data deduplication create a rich

environment where innovators may well deliver tremendous value that changes how the storage infrastructure operates. There will be many more vendors than Quantum innovating in this market, and many already have a leg up. That's not unfamiliar territory to Quantum.

The Quantum story is about deeply integrated data management and protection – across highly optimized platforms, extending anywhere data is stored. That is a vision broader than most we see from deduplication vendors. In our assessment, that vision is generating real products that are in turn creating real business for Quantum.

The industry remains challenged to understand a Quantum that isn't easily categorized as solely hardware or software, and simultaneously is equal parts the expertise and business foundation developed over 30 years. We're of the opinion that the whole of Quantum is greater than the sum of these parts, and will be a dominant influence in this deduplication market well into the future.

---

***NOTICE:** The information and product recommendations made by the TANEJA GROUP are based upon public information and sources and may also include personal opinions both of the TANEJA GROUP and others, all of which we believe to be accurate and reliable. However, as market conditions change and not within our control, the information and recommendations are made without warranty of any kind. All product names used and mentioned herein are the trademarks of their respective owners. The TANEJA GROUP, Inc. assumes no responsibility or liability for any damages whatsoever (including incidental, consequential or otherwise), caused by your use of, or reliance upon, the information and recommendations presented herein, nor for any inadvertent errors which may appear in this document.*