

Quantum®

WHITE PAPER

QUANTUM'S TIERED ARCHITECTURE

And Approach to Data Protection

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THE NEED TO KEEP MORE DATA, LONGER

Data growth continues to be a significant challenge for IT departments; and with flat or declining budgets, being able to store more data while minimizing storage cost is as crucial as ever.

According to ESG's *Trends In Data Protection Modernization Report* from August 2012: "More than half of midmarket respondents now report total data volumes exceeding 10TB, and nearly half of enterprise organizations report more than 100TB under management. Overall, the majority of organizations report annual growth of between 11% and 30%."

In addition, there is an increased focus these days on the economic value of data—companies are storing more data for longer periods of time and finding new ways to analyze and reuse it for new revenue streams or new technological breakthroughs.

Many companies prescribe a single technology to solve this problem (it usually happens to be the technology they are selling), but since data value changes and tends to decrease over time, it doesn't make sense to keep data on the same technology (and pay the same expensive price) as your data ages.

QUANTUM'S TIERED ARCHITECTURE

Here at Quantum we take a different approach to designing and architecting data protection solutions. We can help you keep more data longer by using the right combination of technologies to match your data value over time to the value of the storage that data resides on.

But it's not just our technology—it's our approach to helping you size and design the right solution to meet your needs, regardless of a specific technology and regardless of whether you need to retain data for months, years, or forever.

Quantum's combination of technologies and our specialized expertise in data protection and big data management means that you can be certain you are maximizing the value you are getting out of your data over its entire lifecycle.

THE TECHNOLOGY BEHIND QUANTUM'S TIERED ARCHITECTURE

Quantum's tiered architecture for data protection is built on some of our core technologies:

- **Patented variable-length deduplication** to reduce disk requirements by 90% or more, and reduces network bandwidth usage when replicating
- **Scalable disk and tape solutions** to protect from one terabyte up to multiple petabytes of data
- **Best-in-class performance** for backup and restore—at a lower price
- **The industry's best management features** to reduce operating expenses and reduce administrative time spent managing backups, including:
 - **iLayer™ Proactive Monitoring and Diagnostics** to reduce service calls and shorten resolution time
 - Ability to manage your backup environment directly from your iPhone or Droid smartphone with our **Quantum Vision®** app
 - **Intuitive, graphical scheduling policies** to manage your deduplication and replication tasks, including replication bandwidth scheduling for enhanced network control
 - **Advanced Reporting** on your deduplication rates and capacity utilization to reduce downtime and provide a more in-depth view into your deduplication environment
 - **Management** of your multi-site, multi-device environment from a single console using an intuitive topographical view
- **Integrated path-to-tape** for long-term retention of backup data

QUANTIFYING THE BENEFITS OF A TIERED APPROACH TO DATA PROTECTION

In order to quantify the benefits of Quantum's tiered approach, let's compare the total solution cost over 3 years of some different solutions when sizing those solutions for four different retention periods: 6 months, 1 year, 2 years, and 3 years.

The general scenario we are comparing here is a company considering deploying deduplication, and using deduplication and replication for their near-term data protection, disaster recovery and backup retention. The specific scenario on which we chose to base our comparison is as follows:

- A company with 100TB of data to protect, and 30% annual data growth
- We looked at a time horizon of three years—in other words, what is the solution cost to this company over 3 years for the investment they are making?
- For this scenario, we will compare three different solutions, each sized for the four different retention periods noted above. The three solutions we compared are using EMC Data Domain deduplication appliances (all disk), using Quantum DXi® deduplication appliances (all disk), or using a combination of Quantum's DXi deduplication appliances and Quantum Scalar® tape for long-term retention (tiered).

See Appendix 1 at the end of this document for much more detailed information on the specific scenario and assumptions we made, including rates of change, backup window and backup scheme assumptions, and exactly how long and how much data was kept on disk and tape for the retention periods.



Figure 1: Tiered Architecture Cost Savings Across Different Retention Periods

Per Figure 1, even when sizing a solution for a 6-month or 1-year retention period, Quantum’s DXi-Series provides cost advantages over the competition. However, the financial benefits of the tiered architecture really start to show up when retaining data for 2 or 3 years. For companies with a need to retain data longer than 1 year, this is where the much lower cost of tape starts to provide significant TCO savings.

When retaining data for 3 years, Quantum’s approach will save you 60% over the competition’s approach, and can save up to \$8M over 3 years versus the competitive approach.

SUMMARY

Quantum’s tiered architecture and approach to data protection is all about matching data value to storage costs over time—enabling our customers to maximize the value they get from their data over its entire lifecycle, while minimizing total cost of ownership.

By using Quantum deduplication appliances for near-term data protection, and tape for long-term retention, customers can realize significant total cost of ownership savings.

APPENDIX 1 – DETAILED ASSUMPTIONS

When performing this analysis we made a number of assumptions to make these scenarios as realistic as possible. These assumptions are listed in Table 1 below.

Assumptions Used to Create Model		
Data to Protect	100	TB (1024 bytes per kilobyte)
Annual Growth	30%	
Size of Full Backup	100	TB (backup applications report in units of 1024 bytes per KB)
Size of Full Backup	110.0	TB (disk and tape report in units of 1000 bytes per KB)
Size of Incremental Backup	10%	Size of the Incremental Backup as portion of the Full
Average Rate of Change	10%	of each incremental, per backup
Weekly Rate of Change ("RoC")	6%	Weekly Full-to-Full Backup RoC without Incrementals in between
Monthly Rate of Change ("RoC")	25%	Month-to-Month RoC without other Backups in between; =26x weekly RoC / 6
Average Compression	2	-to-1
Full Backup Window	48	hours (Fri-Sat)
Incremental Backup Window	12	hours (Sun-Thu)
DXi Buffer Reserve	10%	
DXi Interface	VTL	
Replication	Yes	source to target, one direction only
Backup Schedule		
Weekly Full	1	backup per week (Fri-Sat)
Daily Incremental	5	backup per week (Sun-Thu)
Retention		
DXi Incrementals	20	events (4 weeks)
DXi Weekly Fulls	26	events (6 months, considering 52 weeks/yr)
Tape Creation	Yes	Monthly Full Backup only (read back to server)
Time to Create Tape	48	hours
LTO-5 Cartridge Capacity	1.5	TB uncompressed
LTO-5 Drive Throughput	504	GB/hour uncompressed
Use DXi Max Read Rate	360	GB/hour per drive stream
Assume	360	GB/hour with 2-to-1 compression
Avg Cartridge Capacity Utilization	90%	

ABOUT QUANTUM

Quantum is a proven global expert in Data Protection and Big Data management, providing specialized storage solutions for physical, virtual and cloud environments. From small businesses to major enterprises, more than 100,000 customers have trusted Quantum to help maximize the value of their data by protecting and preserving it over its entire lifecycle. With Quantum, customers can Be Certain they're able to adapt in a changing world – keeping more data longer, bridging from today to tomorrow, and reducing costs. See how at www.quantum.com.

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