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Product Brief

Quantum DXi7500

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Contents

Executive Summary	1
DXi7500 Features and Benefits	1
De-Duplication that Suits Your Specific Environment	1
<i>What Kind of De-duplication Methodology Should I Use?.....</i>	<i>1</i>
<i>For Fastest Backup & Restore for Retained, De-duplication Data: Deferred Processing</i>	<i>1</i>
<i>For Minimal disk usage for De-duplicated Data: Adaptive In-line.....</i>	<i>2</i>
<i>For Fastest backup & restore for specialized data sets: No De-duplication.....</i>	<i>2</i>
Automating Site Loss Protection: Replication	2
Adapting to your Environment.....	3
<i>NAS Presentation.....</i>	<i>3</i>
<i>VTL Presentation</i>	<i>4</i>
Matching System Growth to your Growing Data Needs	4
High Availability	4
Integrated Tape Creation: Long Term Data Protection	5
<i>Application Specific Path to Tape.....</i>	<i>5</i>
Security	5
Product Family Overview	6
Quantum and Disk-Based Backup.....	6
Certifications	7

Executive Summary

The DXi7500 is designed to serve as the core of a comprehensive, multi-site data protection environment.

The DXi7500 is the disk backup and remote replication system that brings the benefits of data de-duplication from the small appliances where the technology has been proven to data centers where a premium is placed on scalability, performance, high availability, and flexibility. Now you can reduce floor space, power and cooling requirements and their associated costs at the center of your organization.

DXi7500 offers full Enterprise features: scaling to 240 TB, performance up to 8 TB/hr, active-active high-availability architecture, direct tape creation, and the ability to mix adaptive in-line de-duplication, deferred processing de-duplication and conventional disk backup in the same system. This brief will introduce you to the rich feature set in detail.

The DXi7500 can be linked via replication to DXi3500 and DXi5500 sites to create a comprehensive backup and retention system that works with all major backup software. This allows you to consolidate your backups from remote or branch offices and eliminate the need for IT skills at those offices and the cost, complexity and risk of remote tape creation and transport.

Now, at last, the technology exists to intelligently manage your backups system-wide, to achieve improved service level requirements, to monitor everything from anywhere and to save operational costs at the same time.

DXi7500 Features and Benefits

De-Duplication that Suits Your Specific Environment

What Kind of De-duplication Methodology Should I Use?

When people ask about de-duplication methodologies they are really asking about what end-user backup problem needs to be solved. Some end users need to shorten their backup window as much as possible while others are more concerned about using the absolute minimum disk capacity. All other disk backup providers force users to make a choice of approaches up front that limits their options.

Quantum's DXi family of disk backup solutions is unique in that it gives users a choice of approaches to let them solve a wide range of backup problems optimally for different data sets and backup jobs. We call it Policy-Based Data De-duplication.

For Fastest Backup & Restore for Retained, De-duplication Data: Deferred Processing

For users who want the absolute fastest backup time for data that will be de-duplicated, the DXi lets them move all de-duplication outside the backup window. All the data is written first to disk, and as soon as the backup job is finished, all the data is de-duplicated in a post process. With no data de-duplication overhead during the backup window, jobs finish in the shortest possible amount of time. Replication, which leverages de-duplication technology to reduce bandwidth requirements, also takes place completely outside the backup window. For faster reads, users can retain native copies of the backup jobs on disk.

When to use it? This approach makes sense when users can dedicate disk usage to temporary caching of data sets and when the performance of the media servers and backup infrastructure is capable of reaching high backup speeds. *Deferred processing de-duplication is available on the DXi7500.*

For Minimal disk usage for De-duplicated Data: Adaptive In-line

For users who are concerned about minimizing disk usage, we offer an adaptive, in-line approach. This method de-duplicates data during the backup process, writing data in segments to a disk buffer and then de-duplicating the segments immediately. For slower backup streams, ingest and de-duplication rates match to provide the same kind of disk usage as conventional in-line methods. But at higher backup rates, where other in-line methods throttle the backup speed, the DXi adapts by ingesting data faster and allowing the buffer to expand. Replication of unique blocks occurs in the background during the backups. In the adaptive mode, users have the option of allowing cached backup jobs to be retained in native format for faster read performance.

When to use it? The adaptive in-line approach makes sense when disk usage must be minimized and with systems with mixed data ingest rates. *Adaptive In-line de-duplication is available on all DXi Series models—retention options are available on DXi7500.*

For Fastest backup & restore for specialized data sets: No De-duplication

For backup needs with data that does not de-duplicate well (e.g., some image files), for data with short retention policies (e.g., some database logs), or non backup usages (primary NAS shares), the DXi Series provides the option of turning off de-duplication entirely on a share by share basis. This lets users reduce costs and simplify management by conventional VTL or NAS uses with data de-duplication functionality in a single system.

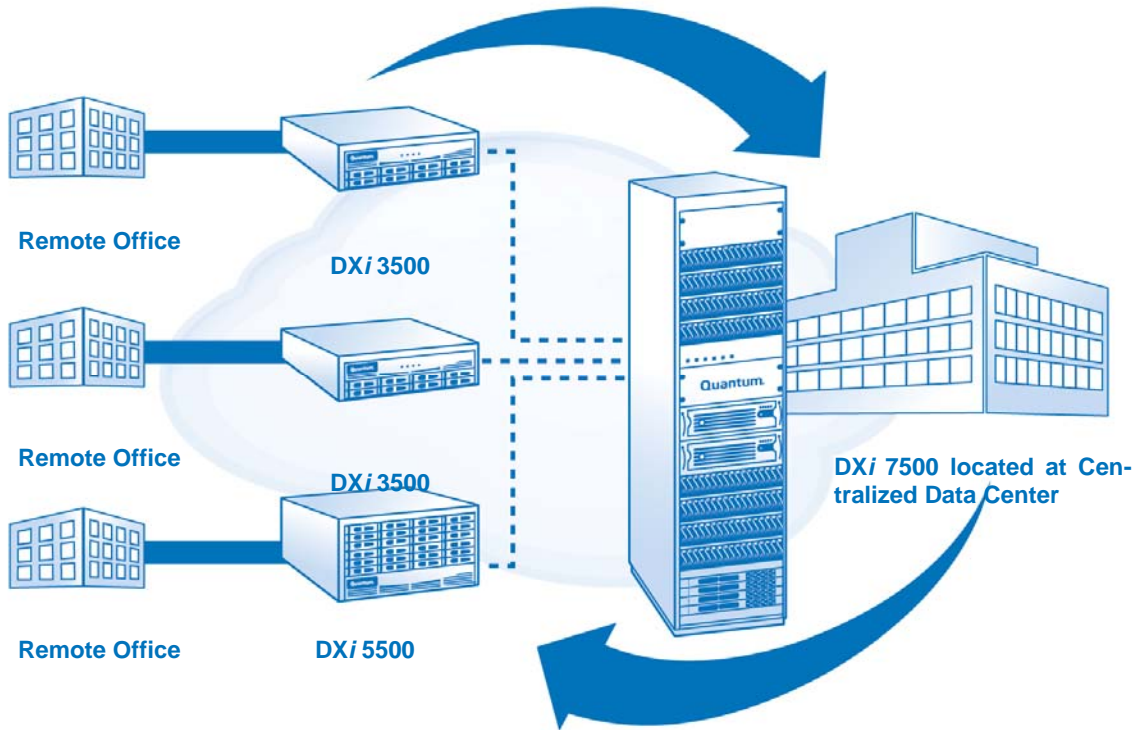
When to use it? Turning off de-duplication makes sense for data that doesn't de-duplicate, when data does not have to be retained, and in high performance server environments. *"No de-duplication" is available on the DXi7500 as a no charge option.*

Automating Site Loss Protection: Replication

Data backed up locally is an ideal source for replication as it already represents a 'point in time' copy of the data to be protected. The replication of this data does not have to be concerned with synchronizing transactions or maintaining consistency of databases because that has already been achieved as part of the backup process.

Now that only the small amount of data associated with the unique blocks of each backup have to be transferred off-site, replication over WANS becomes a feasible and cost-effective Disaster Recovery (DR) protection strategy. The DXi Series supports bi-directional replication so even the backup data created locally at a central site can be protected against disaster by replicating it back out to one of the regional offices which has been sized to accommodate this security copy.

The DXi Series has a unique approach to replication which absolutely minimizes the bandwidth required by checking which unique blocks require migration before any are moved. It is possible to replicate up to twenty remote DXi appliances into one central DXi7500 so any data which may have already been captured from one site is not sent unnecessarily from another. This also means that disk space requirements on the target are kept to an absolute minimum.



In the event of a recovery being required at the central site or a failback to the remote site it is possible to choose from ten different point-in-time views of the backup data.

This whole replication model has the ability to eliminate any tape creation requirements at the remote site. In turn this can mean a reduction in the requirements of I.T. skilled staff in remote offices, less media management and cost plus an improvement in security by eliminating any chance of tape loss in transit. Note that all replication data is encrypted in transit.

Adapting to your Environment

The DXi7500 provides great flexibility in configuration and can provide a target for your backup software via your SAN or over your LAN or WAN and will look like a Network Attached File Share or it can emulate a tape library. The choice is up to you and your preference may vary for different parts of your organization. In areas where your servers are connected via a LAN or WAN interface to the backup server it may be simple to install a file based NAS style backup environment and one or more partitions can be created to support this.

In another part of your organization you may want to take advantage of a high speed SAN network for the fastest movement of data or you may have an existing tape library which is most easily replaced or repurposed by using a VTL implementation. This can be configured in a separate partition.

NAS Presentation

Network Attached Storage (NAS) uses shares rather than fixed drive capacities and is accessed in file format. Shares are not bounded by size. They are free to use all available space. A NAS share can be set up for access via NFS protocols as typically used by UNIX and LINUX based systems or via CIFS protocols as used by Microsoft Windows systems.

VTL and NAS are not mutually exclusive within a single Appliance or system. The DXi7500 supports up to 64 partitions, each of which can be configured as a VTL or NAS share. NAS storage is accessible via the Ethernet interface only.

VTL Presentation

A VTL represents the simplest way to implement high performance disk backup into an existing tape environment. It can utilize existing backup software and corporate processes and so it will minimize the need for restructure or retraining.

The DXi3500, DXi5500 and DXi7500 support a full-featured virtual tape library presentation, including

- Comprehensive device emulation – for media changers, tape drives and media.
- Multiple, integrated options for path-to-tape.
- Sophisticated SAN or iSCSI connectivity.

Backup packages which service tape or VTLs are designed to move data serially in large blocks which is very efficient and results in the highest performing solutions.

Matching System Growth to your Growing Data Needs

Your Quantum representative has access to experts and tools with which to estimate your current capacity requirements allowing for the benefits of de-duplication and can work with your resources to estimate growth requirements into the future. The DXi7500 is designed to be able to match your growth both in capacity and performance without disruption.

The storage capacity is virtualized so that the addition of capacity is a fairly simple process of installing extra racks of disk and configuring the new space. The required connectivity is already in place due to the use of fibre channel and GbE switches with enough ports to support a full 240TB of raw capacity. The new capacity is seen by the application as extra shares or extra virtual tape cartridges depending on the presentations chosen.

As the physical capacity grows from a minimum of one disk shelf through to the maximum of twenty shelves in two full rack cabinets, extra pairs of RAID controllers in active/active pairs are added at appropriate stages to add performance to match. Previously stored data is always protected.

If your initial configuration was a single node system, it is possible to upgrade to a dual node system adding both performance and availability. This upgrade includes the extra fibre channel and GbE switches for connectivity and has no impact on existing data. The process can be completed within four hours.

High Availability

Large installations require enterprise class reliability and the DXi7500 has been engineered from the ground up to have a no single point of failure option. When a system is providing high speed backup for your critical applications and concurrently serving as a target for up to twenty remote branch operations, the last thing you want is a hardware failure to bring your operations to a halt.

The internal disk storage is protected by RAID technology preventing any vulnerability to a disk failure and incorporates multiple 'hot spare' disk drives which allow any failed spindle to have its data rebuilt on a spare immediately. These arrays are serviced by pairs of RAID controllers in an active/active layout which shares the workload in normal operations but which will continue without interruption on the failure of either controller.

All the disk arrays are connected via multiple fiber and Ethernet management networks to pairs of Fibre Channel and Ethernet switches then back to the server nodes. This allows continued operations after the failure of any fiber, cable or switch.

All the system components are powered by multiple redundant power supplies which receive feeds from multiple AC supplies effectively isolating the system from any internal power or cabling failure or even an external power source failure. All the cooling is provided by a surfeit of cooling fans allowing any failure to be monitored but not cause an interruption.

Finally, all these hardware modules are hot swappable so that not only does a failure not cause an interruption but the repair of that failure can also be completed without interruption.

Integrated Tape Creation: Long Term Data Protection

Many large enterprises needing to comply with a growing number of legislative requirements, possible protection against litigation or just desiring to maintain long term archives of their business data turn to tape. When data needs to be kept but will be accessed rarely if ever, the benefits of tape come into focus. It requires minimal expenditure of power and cooling to store data safely for 30 years or more and the cost per gigabyte is lower than any other medium. If your business processes call for the use of real, physical tape, the DXi7500 provides the means to get your data to physical tape in an application-specific format:

Path-to-Tape utilizes one or two direct Fibre Channel links to a tape library and will move large volumes of data at high speed without impacting your protected servers, your media servers or your production networks or SAN.

Application Specific Path to Tape

DXi7500 contains the data movers and command interpreters necessary to integrate with Symantec's Direct-Copy function. (an NDMP-based path-to-tape) Released in NetBackup (NBU) Version 6.5, Direct-to-Tape allows the backup application to control the creation of actual tape cartridges as well as the virtual tape cartridges in the DXi7500. This frees the tape realization to be carried out on any available tape or format with full status being reported back to NBU which keeps multiple entries in its catalog to cover both (or more) copies of the data.

With direct to tape support, your backup application knows about both copies of the data, and can use either, depending on your needs. It also allows the virtual and real tape copies to have independent expiry dates and becomes the basis of Backup Lifecycle Management. It empowers your existing NBU operations staff and does not require them to learn or manage any extra processes.

Other major backup applications are expected to support this technique in the near future.

Direct to tape support is available on the DXi7500 at launch..

Security

The protection of your data is one of your highest priorities. This is why you back it up and why you create off-site copies. The DXi Series can play a major role in this protection in many ways. By replacing removable media in your remote offices and replicating data across the WAN the risk associated with handling and transporting tapes is avoided.

All data that is transmitted between DXi Series systems is encrypted in flight to ensure that any intercepted transmissions are useless to an outsider.

All DXi Series appliances in your organization can be managed centrally via a web interface using SSL for privacy and multi-layered access for security.

The use of StorageCare Guardian, a free product providing monitoring, diagnostic access and firmware upload/download is protected by a link using public key encryption for maximum security and it is not given access to user data.

Product Family Overview

With the DXi3500 through the DXi7500, Quantum's DXi family of backup/recovery appliances provides a spectrum of solutions for your business, whether small or large, distributed or centralized:

The DXi Series midrange disk backup appliances (DXi3500 and DXi5500) are integrated data de-duplication appliances that reduce disk and network bandwidth requirements by 90% or more at your small or remote offices. Easy to install and manage without IT, skills the smaller DXi solutions can comfortably store backup data locally for several months. This allows you to meet commitments for high speed data recovery at the site without having to revert to libraries of tapes or other off-site data. All DXi Series appliances offer flexible interface options, including NAS, VTL and mixed presentations, along with Fibre Channel and iSCSI connectivity. DXi Series appliances can be linked to DXi Enterprise models (DXi7500) to create a consolidated multi-site backup and retention environment that combines disk, tape, and replication, all with common management and unified service and support.

Quantum and Disk-Based Backup

For over 25 years, Quantum has been providing backup, recovery and archive solutions to all sizes of businesses world-wide and is currently the largest independent company in this space. With revenues of a billion dollars and operations in 127 countries Quantum is uniquely positioned to advise and provide products and services to satisfy all your data protection needs.

Up until about 2002, 99.9% of medium or larger organizations used magnetic tape for backup and long term storage of data. The introduction of SATA disk technology and lower cost arrays led to the introduction of Virtual Tape Libraries and other disk based solutions which helped reduce the cost and complication of media management and also improved reliability and the time required to recover data. Quantum introduced the DX30, the first Virtual Tape Library for Open Systems.

The latest advance has come with improvements in the algorithms used to monitor and store that data and the introduction of data reduction in the form of de-duplication which brings big steps forward in usability, business benefits and cost effectiveness.

The DXi Series, introduced in 2006 has been delivering cost effective de-duplication and replication services to the medium sized business and the addition of an enterprise class system, the DXi7500 results in the broadest family of compatible, disk-based backup appliances and systems available. DXi appliances adapt to your environment, not the other way around.

Certifications

DXi7500 is fully certified with and provides metadata filters for the following software applications:

- Symantec Backup Exec 12 and earlier
- Symantec NetBackup 6.5 and earlier
- EMC Networker
- CommVault Simpana
- CA BrightStor
- HP Data Protector (filters under development)