



## Under the Radar, Over the Top — Qualstar Builds a Better Library

Analyst: David Reine

### Management Summary

Car rental companies have proliferated across the country especially at major transportation centers such as airports, train stations, and the like. They all provide the same basic service – *transportation* – although some provide a wider offering than others. Everyone knows Hertz, Avis (*We're #2*), and even National. They are everywhere, and they can provide you with any size vehicle that you need. However, there a host of other, smaller companies out there, such as Alamo, Budget, Enterprise, Thrifty, and more, that can provide the same service, transportation, but, perhaps, without as many options or maybe with a special customer in mind. Some of these other companies might have a different kind of service available, for example, Enterprise will pick you up. The biggest car rental agencies all have contracts with major enterprises, which rent thousands of cars per year at special contracted prices. However, do all companies need the same options? You might not need the big profile sports car, or a fancy *Escalade*, to chauffeur around your best clients. You might only need a basic sedan, say three or four times a year. You do want to be sure, however, that the car you rent is of equal quality to that same sedan from the Big 3, is well maintained, and is clean. Oh, did I mention that it doesn't hurt to be economical.

The CIO of every data center, enterprise or departmental, is faced with a similar problem every day. There are several major computer companies, such as HP, IBM, Oracle, and others, that can satisfy just about any kind of I.T. requirement you may have. Some can even offer you an entire menu of offerings from servers to disk arrays, to tape libraries, and they are eager to provide you with all of them. You, however, may not be in the market for everything; you may be looking just for a tape library to handle the long-term preservation of your enterprise's most valuable asset – *its data*. Your mission- and business-critical data has been growing at an historic rate, unchecked, possibly doubling in size every 12 to 18 months. Preserving that data on continuously spinning media for a long time might be a very expensive proposition.

Some of the major players in the tape industry, most notably IBM, Oracle, and Quantum, have product lines spanning every tape requirement from autoloader to vast automatic tape libraries (ATLs). ATLs often play a major role in the long-term preservation of data within the enterprise, for both archive and backup. Many small companies that previously developed ATLs have disappeared from the landscape due to mergers, acquisitions, and in some cases, poor business decisions, especially on tape format. Some of the smaller companies that concentrate on just a few products, specializing in providing superior quality and performance, have flourished. One such company is Qualstar, of Simi Valley, CA. Qualstar has dedicated itself to the development of simple, reliable libraries that offer the combination of higher performance and value that is sought by many enterprises. To learn more about how Qualstar provides an inexpensive to protect and secure your data, please read on.

### Long-Term Preservation of Data

Every enterprise, every department – large, mid-sized, or small – has been undergoing a decade

### IN THIS ISSUE

➤ Long-Term Preservation of Data .....	1
➤ Who is Qualstar? .....	3
➤ Qualstar Libraries .....	3
➤ Conclusion .....	6

of rapid, and often uncontrolled, data storage growth, especially in the past few years. Many-to-most are doubling their mission- and business-critical storage capacity every 12 to 18 months, while some see even greater demands. This growth is stretching the limits of every IT budget, especially for the smaller business, as it attempts to gain control of the total cost of ownership (TCO) of its IT assets. The IT staff not only has to acquire additional primary storage, but they also must ensure the protection and long-term preservation of important business information, whether via backup or archiving.

Some businesses have adopted a D2D (disk-to-disk) backup solution, instead of tape-based data protection, primarily to facilitate the recovery process, as the urgency for retrieval is critical when a recovery is required. The TCO and data protection challenges of a D2D environment, however, can create an unacceptable burden on the IT budget or the long-term preservation of data.<sup>1</sup> In addition to acquisition costs, the additional costs for the electricity required to drive and cool the environment and the additional floor space required, and the additional technology needed to protect the data, places a further strain on the budget.

For these reasons, many IT personnel are looking for an efficient, low-cost backup and archive capability, and thus are deploying tape to reduce the TCO and energy consumption for long-term storage, as well as to enable manageable data protection strategies. In fact, with the improved throughput performance of the newest tape architectures, some IT departments are returning to the tried and true value of tape. In addition to the improved performance of today's automated tape solutions, tape provides the enterprise with:

- Affordability
- Reliability
- Scalability
- High capacity in a compact format
- Energy efficiency
- Portability and
- Ease of use

The enterprise, or a business unit or department thereof, must be able to cope with all of the components of the information infrastructure.

---

<sup>1</sup> See the issue of *Clipper Notes* dated December 20, 2010, entitled *In Search of the Long-Term Archiving Solution – Tape Delivers Significant TCO Advantages over Disk*, and available at <http://www.clipper.com/research/TCG2010054.pdf>.

Of course, because of the differences in enterprise storage requirements, each solution must be tailored, in terms of scalability, to the needs of each specific data center. *One size almost always does not fit all.* The data center needs a scalable and cost-effective long-term storage solution that makes storage a reliable and easy-to-use reality for every enterprise regardless of size.

While the largest data center may have the resources and budget to retain and secure the information infrastructure with high-end disk arrays, Tier-2 disk as a D2D backup target, automated tape libraries, and data deduplication and encryption appliances, the more modest, but not necessarily small, mid-sized enterprise does not. Most need an entirely different kind of solution. Smaller (or remote) offices with a limited budget also need simple, affordable data protection. They require a lower-cost, open, turnkey solution to manage backups and archives. They may need a solution supporting the latest *LTO*<sup>2</sup> tape technology, to protect their investment in existing data. Implementing an *LTO-6*<sup>3</sup> tape solution, for example, can replace older, unreliable standalone devices and facilitate data preservation within the existing IT budget, even enabling the data center to protect previous investments with the capability to write to prior-generation *LTO-5* cartridges and read from the prior two generations *LTO-5* and *LTO-4* cartridges.<sup>4</sup>

The enterprise often needs a flexible IT infrastructure that includes an ATL scaled to its needs for backup/recovery and archiving. It needs an affordable, yet easy-to-use, solution to remain within the limitations of its budget, space and available power. The IT staff may need a compact configuration with high density to make up for a lack of floor space in their data centers. Portability of media often is mandatory for the offsite storage for data protection purposes, for archiving of data over the long term, and/or for disaster recovery. Portability, however, also carries additional responsibilities for data protection. Every IT staff needs the ability to encrypt its data before it leaves its premises to ensure the increased security of offsite data. The IT staff

---

<sup>2</sup> *Linear Tape Open*, also called *Ultrium*.

<sup>3</sup> See *The Clipper Group Navigator* entitled *Magnetic Tape Turns 60 – The IT Industry Receives Another Gift*, dated July 12, 2012, and available at <http://www.clipper.com/research/TCG2012015.pdf>.

<sup>4</sup> Similarly, *LTO-5* drives have the ability to write to *LTO-4* cartridges and read from *LTO-4* and *LTO-3* cartridges.

also may need to prove that retained data has not been altered, requiring support for WORM<sup>5</sup> media to ensure compliance with all industry and government required norms.

Flexibility, management, and administration are other considerations for the information infrastructure, not to mention dedicated support. The data center requires a web-based management capability to enable the remote management and administration of library functionality for remote offices. **Your enterprise needs a solution that can be relied upon to preserve and protect all of the enterprise's mission- and business-critical data.**

*Where can you get the correct infrastructure for your data center?* Well, you can certainly get an ATL from any of the largest vendors, as well as servers, disk arrays, networking, and support services. However, tape libraries may not be of prime importance to them. In fact, some library vendors have dropped support for their ATLs completely. What you may need is a vendor whose sole *raison d'être* is tape; one that dedicates all of its resources to the development of new libraries to meet specific customer needs and improving the performance and reliability of their products. One such vendor flying slightly under the radar is Qualstar.

### Who is Qualstar?

Qualstar is a small, but stable, Nasdaq-listed design and manufacturing company based in Simi Valley, CA and dedicated to the idea of building the world's finest magnetic tape storage products. Founded in 1984 as a manufacturer of 9-track tape drives, Qualstar has fewer than 100 employees, all in the U.S., and is committed to the development of high-quality engineered-to-last innovative tape libraries for the enterprise. Qualstar uses the LTO Ultrium technology and distributes exclusively through a worldwide network of partners. Its products are backed by a three-year warranty and no-charge customer support. Its tech support team always takes first call and provides 24x7x365 maintenance support. All customers are provided with lifetime free access to tech support, with no limitations or restrictions.

Qualstar announced their first tape library almost two decades ago and have gone through a number of iterations using *Exabyte*, *AIT*, *SAIT*, *SDLT*, and now LTO technologies to interface

<sup>5</sup> WORM=Write Once, Read Many.

### Exhibit 1 – Qualstar RLS-8500



Source: Qualstar

with the leading tape management vendors, such as IBM Tivoli, Computer Associates, EMC Networker (Legato), Symantec, and many others. Qualstar's strength lies in their experience designing and manufacturing affordable tape automation that withstand the test of time.

Qualstar manufactures two basic product lines, each with a wide range of scale:

- the **RLS Series** of rack-mounted libraries for the mid-sized data center and
- the **XLS Enterprise Library System** for larger data centers.

### Qualstar Libraries

#### Qualstar RLS Series

All Qualstar RLS libraries are highly scalable and, as Qualstar puts it, *Simply Reliable*. (See Exhibit 1 above.) All RLS libraries come with standard functionality, consisting of the following features.

- **Encryption** enabled through the LTO tape drives. The IT staff can assign a separate encryption key to the tapes in each partition.
- **Q-Link Remote Manager** - A web browser-based library manager through which

### Exhibit 2 – Qualstar RLS Specifications

RLS-8500 SERIES SPECIFICATIONS	RLS-8560 / 85120	EXPANDABLE TO
Drive Type	LTO 5 and LTO 6	
Number of Drives	1 – 5	Up to 20
Number of Tapes	54 / 114 (See Note 1)	Up to 474
Native Capacity - LTO 5 (TB)	81 / 171	Up to 711
Native Capacity - LTO 6 (TB)	135 / 285	Over 1.1 PB
Hours of SD (25Mb) Video - LTO 5	Up to 13,110	Over 54,500
Hours of SD (25Mb) Video - LTO 6	Up to 21,800	Over 90,800
Max Compressed Capacity - LTO 5 (TB)*	162 / 342	Over 1.4 PB
Max Compressed Capacity - LTO 6 (TB)*	337 / 712	Over 2.9 PB
Max Native Data Rate - LTO 5 (TB/ hr)	2.5	10
Max Native Data Rate - LTO 6 (TB/ hr)	2.8	11.5
Max Compressed Data Rate - LTO 5 (TB/ hr)*	5	20
Max Compressed Data Rate - LTO 6 (TB/ hr)*	7.2	28.8
Library Interface	ADI	
Drive Interfaces	SAS, FC	
Field Expansion	Add 60 slots to RLS-8560 (See Note 2)	Interconnect up to 4 modules
Average Exchange Time (seconds)	7.5	
FastPass Time (seconds)		< 2
Time to Scan Barcodes (seconds)	< 149	< 149
Barcode Reader	Standard	
Rack Mount Kit	Standard	
I/O Port / Slots	1 port with 4 slots optional second port in 85120	Expansion modules may have 0, 1 or 2 ports each
Height (in /cm)	10U (17.5 / 44.5)	Up to 40U (70 / 177.8)
Width (in /cm)	16.6 / 42.2	
Depth (in /cm)	35.3 / 89.7	
Net Weight (lb /kg)	222 / 100.7	888 / 402.8
Power Consumption (watts, avg)	85	340

Note 1: 108 slots if second I/O port installed

Note 2: 54 slots with second I/O port option

Source: Qualstar

\*Using typical Compression Ratios

administrators can configure, monitor, and diagnose any RLS library from anywhere.

- **Simply Reliable intelligent robotics** with a unique, innovative design to provide precise positioning. All components, options, and tape drives are auto-discovering and each tape drive is a self-connecting assembly for easy-to-do maintenance.
- **Easy operation** is enabled through a high-resolution, color touch screen for local operation. It provides simplified installation, configuration, and operation information identical to the functions of Q-Link.

- **Support for either SAS or FC** communication protocols.

The Qualstar RLS Series comes in two models: the *Qualstar RLS-8350* and the *Qualstar RLS-8500*. (See Exhibit 2, above, for details on the larger RLS-8500.)

#### Qualstar RLS 8350

The Qualstar RLS-8350 is a rack-mounted library that scales from 50 cartridge slots and from 1-3 drives up to 170 slots and up to 8 drives in 16U of rack space, including a four-slot I/O port for efficient media import and export. Any RLS-8350 Library can be expanded by adding

### Exhibit 3 – Qualstar XLS Scaled Out



Source: Qualstar

an RLS-8500 expansion module, tripling capacity and performance, passing tapes internally between modules through Qualstar's innovative, easy to install *FastPass* tape mover. With LTO-6 deployed, the RLS-8350 can hold up to 425TB native and more than 1PB when compressed. With LTO-5 drives installed, the RLS-8350 can support up to 255TB native and up to 510TB compressed.

The Qualstar 8500 is a high-capacity, expandable rack-mounted library that scales from 54 cartridge slots and from 1-5 drives up to 474 slots and up to 20 drives in from 10U to 40U of rack space, including one or two four-slot I/O ports for efficient media import and export. Every RLS-8500 library can be expanded by adding up to three RLS-8500 expansion modules, tripling capacity and performance, and passing tapes internally between modules through Qualstar's innovative, easy to install *FastPass* tape mover. With LTO-6 deployed, the RLS 8500 can hold over 1.1PB native and more than 2.9PB when compressed. With LTO-5 drives installed, the RLS 8500 can support up to 711TB native and up to 1.4PB compressed.

#### Qualstar XLS Series

Qualstar's XLS is a highly modular enterprise library delivering reliability, intelligence, density, flexibility, scalability, and ease of use. (See Exhibit 3, above.) Like the Qualstar RLS-Series, all Qualstar XLS libraries are highly scalable and, in their words, *Simply Reliable*. They come with standard functionality, consisting of the following.

- **Advanced Modular Design** – Starting with 350 cartridge slots, the XLS can grow to over 11,700 tapes and up to 159 drives to match your storage needs. The XLS consists of two

distinct modules to provide high-density, cost-effective, and flexible library systems: a *Library Resource Module (LRM)* and a *Memory Expansion Module (MEM)*. The LRM is a complete, self-contained library and is the base unit for larger XLS libraries. The MEM contains 1,075 slots in a compact footprint. Each of three LRMs can house up to 32 drives and 1056 slots, enabling the IT staff to optimize resources. A bay holding up to four tape drives can be mixed with an optional 30 cartridge slots to meet changing requirements.

- **Compass Architecture** with an advanced, innovative robotics design that yields lower power consumption, superior reliability, and high storage density. One reliable robot travels an average of just 21 inches to select over 3200 tapes. Robotics in each LRM can reach into adjacent MEMs to access cartridges housed there. XLS has *N+1* power management, redundant cooling, and hot-swap components for high reliability. XLS also comes with *Data-Guard UPS Inventory Sentry* standard for built-in power failure protection, independent of any external power protection hardware.
- **Logical Library Partitions** – An XLS library can be deployed with up to eight logical library partitions, each with dedicated tape drives, cartridge slots, and library control interface.
- **Encryption** is enabled through the LTO tape drives. Encryption key management is built-in to protect data on tape in transit outside of the library.
- **X-Link Remote Manager** provides a single-view, worldwide management interface with powerful tools and comprehensive

### Exhibit 4 – Qualstar XLS Configuration Examples

Configuration	Tape Drive Slots	Cartridge Slots†	Native Capacity LTO 5	Native Capacity LTO 6	Native 5 Data Rate LTO 5	Native 5 Data Rate LTO 6	TB per Square Foot LTO 6	Cartridges per Square Foot
<b>XLS-820500</b>	4	465	698 TB	1.1 PB	2.0 TB/Hr	2.3 TB/Hr	137	55
<b>XLS-820500 + 1 MEM2</b>	6	970	1.5 PB	2.4 PB	3.0 TB/Hr	3.4 TB/Hr	175	70
<b>XLS-820500 + 1 MEM1</b>	8	1,510	2.3 PB	3.7 PB	4.0 TB/Hr	4.6 TB/Hr	222	89
<b>XLS-832700</b>	8	655	983 PB	1.6 PB	4.0 TB/Hr	4.6 TB/Hr	153	61
<b>XLS-832700 + 1 MEM1</b>	12	1,700	2.6 PB	4.2 PB	6.0 TB/Hr	6.9 TB/Hr	225	88
<b>3 XLS-832700 + 4 MEM1</b>	36	6,175	9.3 PB	15.4 PB	18.1 TB/Hr	20.7 TB/Hr	233	93
<b>XLS-8161100</b>	4	1,056	1.6 PB	2.6 PB	2.0 TB/Hr	8.3 TB/Hr	248	99
<b>XLS-8161100 + 1 MEM1</b>	4	2,131	3.2 PB	5.3 PB	2.0 TB/Hr	2.3 TB/Hr	278	111
<b>2 XLS-8161100 + 3 MEM1</b>	8	5,337	8.0 PB	13.4 PB	4.0 TB/Hr	4.6 TB/Hr	285	114
<b>5 XLS-8161100 + 6 MEM1</b>	20	11,730	17.6 PB	28.4 PB	10.1 TB/Hr	11.5 TB/Hr	282	113

Source: Qualstar

information to monitor and manage library operations. It includes an easy-to-use GUI with sophisticated control and management tools.

- **Easy operation** is enabled through a high-resolution, color touch screen for local operation, via an Ethernet port built into the XLS, or remotely via an intranet or the Internet. It provides simplified installation, configuration, and operation information identical to the functions of X-Link.
- **FC communication protocols** are supported.

The Qualstar XLS comes in a wide variety of configurations in order to satisfy the specific requirements of almost every data center. See Exhibit 4, above.

### Conclusion

With a continuing explosion of primary mission- and business-critical data, every enterprise must be careful as to how they protect that data for long-term retrieval access. Costs for storing all data on disk can become prohibitive very quickly. The arguments for automated tape libraries can be very convincing on a total cost of ownership basis.

Where the enterprise goes to obtain that ATL resource could be the second most important issue after ensuring data availability and protection. The data center could look to one of the larger, multi-line vendors, which often realize more revenue from their server and disk array products which, accordingly, may get the lion's share of attention. On the other hand, you could

look to one of the small players, such as Qualstar, where ATLs command the complete attention of its executives, engineers, sales, and support teams.

The quality of Qualstar's product set and their long track record should alleviate any concerns that enterprise executives might foster. If your data center is looking for an ATL solution to preserve and protect mission- and business-critical data for the long run, Qualstar may have the library that best fits your needs.



### ***About The Clipper Group, Inc.***

**The Clipper Group, Inc.**, now in its twentieth year, is an independent publishing and consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

- ***The Clipper Group can be reached at 781-235-0085 and found on the web at [www.clipper.com](http://www.clipper.com).***

### ***About the Author***

**David Reine is a Senior Contributing Analyst for The Clipper Group.** Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. In 2002, he joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and an MBA from Northeastern University.

- ***Reach David Reine via e-mail at [dave.reine@clipper.com](mailto:dave.reine@clipper.com) or at 781-235-0085 Ext. 123. (Please dial “123” when you hear the automated attendant.)***

### ***Regarding Trademarks and Service Marks***

**The Clipper Group Navigator, The Clipper Group Explorer, The Clipper Group Observer, The Clipper Group Captain's Log, The Clipper Group Voyager, Clipper Notes,** and “*clipper.com*” are trademarks of The Clipper Group, Inc., and the clipper ship drawings, “*Navigating Information Technology Horizons*”, and “*teraproductivity*” are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

### ***Disclosures***

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.

After publication of a bulletin on *clipper.com*, The Clipper Group offers all vendors and users the opportunity to license its publications for a fee, since linking to Clipper's web pages, posting of Clipper documents on other's websites, and printing of hard-copy reprints is not allowed without payment of related fee(s). Less than half of our publications are licensed in this way. In addition, analysts regularly receive briefings from many vendors. Occasionally, Clipper analysts' travel and/or lodging expenses and/or conference fees have been subsidized by a vendor, in order to participate in briefings. The Clipper Group does not charge any professional fees to participate in these information-gathering events. In addition, some vendors sometime provide binders, USB drives containing presentations, and other conference-related paraphernalia to Clipper's analysts.

### ***Regarding the Information in this Issue***

The Clipper Group believes the information included in this report to be accurate. Data has been received from a variety of sources, which we believe to be reliable, including manufacturers, distributors, or users of the products discussed herein. The Clipper Group, Inc., cannot be held responsible for any consequential damages resulting from the application of information or opinions contained in this report.