TECHNOLOGY WHITE PAPER

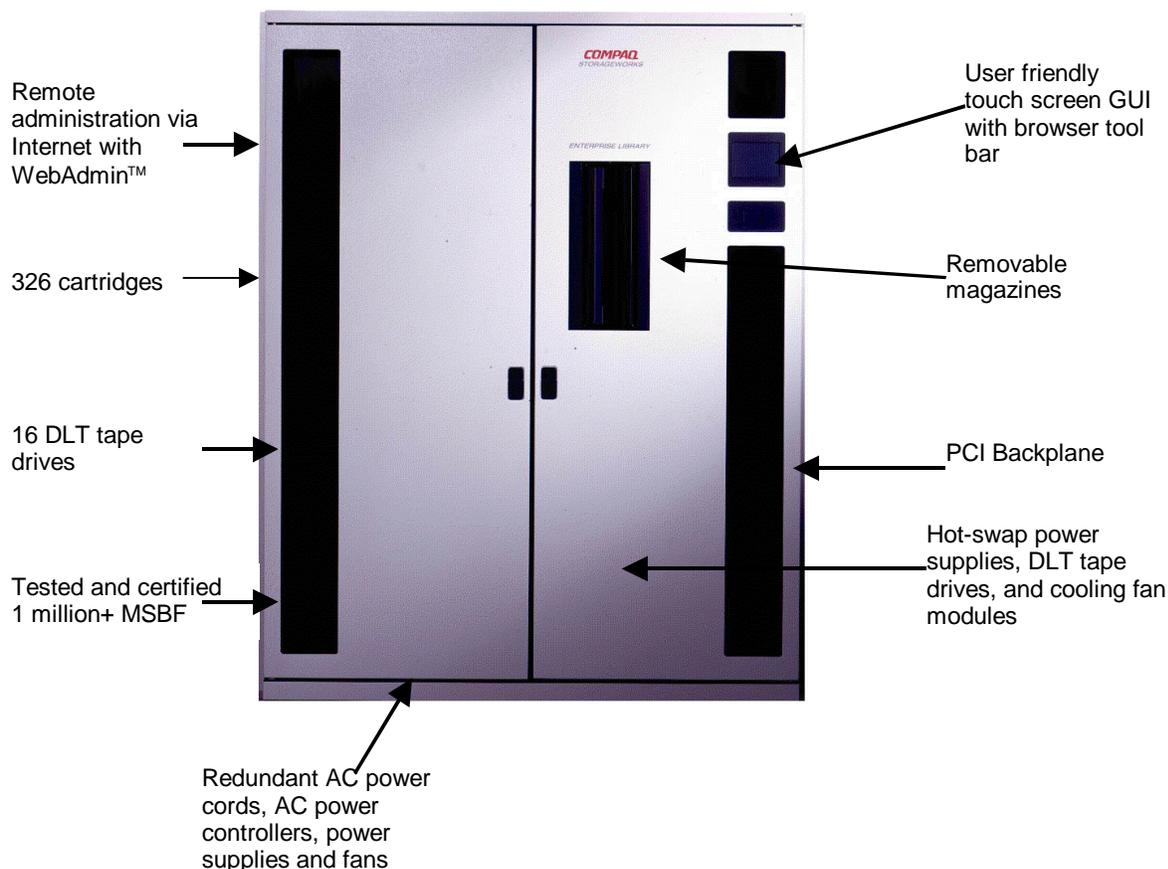## StorageWorks ESL9000 Enterprise Storage Library

Introduction

The Compaq StorageWorks ESL9326D is the first product in the new Compaq StorageWorks ESL9000 Enterprise Library series. The Compaq StorageWorks ESL9326D is a modular, enterprise-class DLT automation devices for ProLiant and Alpha platforms using Window NT, NetWare, Tru64 Unix, and Open VMS operating systems. It can be operated using industry standard application software as either a direct attached device or as part of a multi-host solution. It offers high availability and scalability features commonly found in primary storage disk sub-systems, and with an architecture which incorporates a PCI backplane, the ESL9326D library can easily accept future product enhancements. It is the only "true enterprise-class" DLT tape library with a high availability design, superior performance, Compaq Insight Manager administration, a modular upgrade path, and a low total cost of ownership.

Compaq's ESL9326D Enterprise Library is the perfect solution for customers who want to take DLT backup into the high-end enterprise.

Features

The ESL9326D offers many features that distinguish it from products offered by our competitors.

Remote administration via Internet with WebAdmin™

326 cartridges

16 DLT tape drives

Tested and certified 1 million+ MSBF

User friendly touch screen GUI with browser tool bar

Removable magazines

PCI Backplane

Hot-swap power supplies, DLT tape drives, and cooling fan modules

Redundant AC power cords, AC power controllers, power supplies and fans

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Target Environments

The Compaq ESL9326D Enterprise Library is targeted toward customers who:

+   are operating traditional Compaq ProLiant or Alpha based solutions
+   manage large, enterprise-wide data base applications with terabytes of consolidated server storage
+   require an enterprise class DLT automation platform
+   are no longer comfortable with de-centralized automation solutions, where data management is difficult
+   require high drive counts for maximum throughput and high slot counts for maximum capacity
+   manage back up and restore applications for large database servers running mission-critical, consolidated databases
+   require frequent, consolidated, automated backups
+   require 24x7 availability
+   require a solution which offers future scalability
+   require a solution whose feature set can be easily upgraded as future automation technologies become available

Benefits to Customer

High Availability – Continuous Operation

Redundant fail-over components, which are on-line hot swappable, provide a level of high availability that is essential for customers with mission-critical backup applications.

+   The ESL9326D comes standard with redundant AC power, AC power distribution, power supplies, and cooling fans.
+   Drives, power supplies, and fans can be hot swapped to replace failed components without disrupting the reading and writing of data.
+   The load port allows the user to swap up to 12 tapes in 2 removable magazines without interrupting library operations.

Upgradability – Future Proof

For IT departments concerned with maintaining an up-to-date storage library, only the ESL9326D was designed to take full advantage of next century technological advancements in automated storage. This is accomplished by using:

+   hot swap drive modules that permit a simple plug-in upgrade to incorporate new drive technologies
+   a modular, passive PCI backplane upgrade path that provides a 'plug and play' method for adding future PCI card based functionality

Both of these features provide greater upgrade flexibility at reduced cost for true investment protection. Adding or replacing PCI cards and hot swap modules allows the library to easily accept product enhancements and provide compatibility with upcoming features.
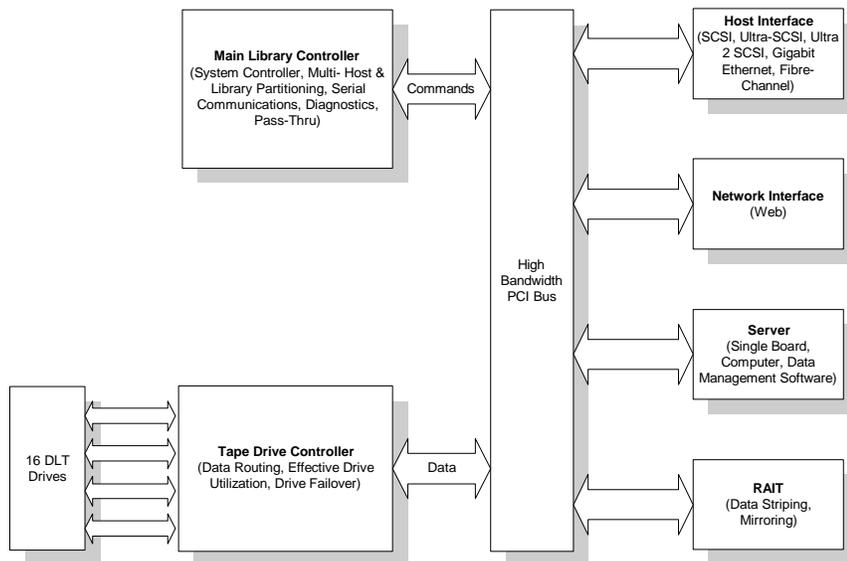
The following table provides examples of product enhancements that can be made available in the future.

FUTURE PRODUCT ENHANCEMENTS
+   direct fibre channel interface
+   network administration cards
+   hardware RAIT / data mirroring
+   EBS fibre compatibility
+   dynamic drive partitioning
+   remote web administration
+   SDLT/LTO drive technologies
+   internal NAS intelligence

PCI Backplane

The ESL9326D passive PCI backplane provides for the easy addition of new enabling-technologies. The following diagram illustrates the various options that can be made available in the future for plug-in to the PCI backplane.

The PCI backplane is:

+   *Network ready* – Can connect directly to networks with the addition of PC-Ethernet, PCI-FDDI and PCI-ATM adapter cards

+   *Fibre ready* – Can connect directly to Fibre channel backup servers and networks with the addition of PCI fiber channel adapter cards.

+   *Server ready* – Can accommodate single-card CPU's. With the addition of backup software, the ESL9326D can become a powerful, intelligent, network attached storage device.

+   *Tape array ready* – Can support fault tolerance through auto tape copy, mirroring and tape striping with parity by adding tape RAIT cards.

Scalability

For customers with shrinking backup windows, the system allows both the capacity and performance of the backup solution to grow as the quantity of data increases. The standalone cabinet will soon be scalable up to 5 modules, each with its own robot, supporting up to 80 drives and 1630 data slots.

High Capacity

With 326 slots and up to 16 Compaq 35/70 DLT drives, the ESL9326D has a native capacity of 11.4 Terabytes and a throughput of up to 288 GB/hour. Future multi-module capability will allow the end user to build a DLT backup solution with 1630 slots and up to 57 Terabytes and 1.4 TB/hour of performance. High throughput capability is especially important for customers with storage intensive applications because it enables shorter backup windows.

Advanced Robotics

The ESL9326D contains a robotic DLT tape handling system that provides an extraordinarily precise and gentle loading and unloading of cartridges. The system is self-calibrating and uses a controlled timing and force that reduces drive stresses and

increases reliability. The gripper mechanism grips the cartridges at the top and bottom and inserts or removes the cartridges without sliding them, thereby increasing cartridge life.

Ease of Use

For busy IS departments, the ESL9326D is designed to eliminate the need for highly trained system administrators.

+ System administration is easy with an onboard, user-friendly control panel (GUI touch screen) that provides operational functionality, configuration capability, fault determination, and diagnostic capabilities.
+ Operation is simplified by the incorporation of two 6-cartridge removable magazines that facilitates tape import and export and off-site data storage
+ Maintenance is also easy. Single-connector components allow quick user swaps for upgrading or replacement. The hot swap components make for easy on-line servicing.
+ Setup and installation procedures are clear and easy to follow.

High Reliability

The ESL9326D offers high robotic reliability with greater than 1 million mean swaps and 250,000 hours between failure.

Small Footprint

The unit's compact form factor offers high capacity per square meter. It does not take up valuable floor space in the customer's data center.

Worldwide Support

Compaq provides fully trained support personnel worldwide, quick availability of adequate spare parts, and a 3-year on-site rapid-response labor and parts warranty.

Low Cost

High availability design, easy system administration, a modular upgrade path, Compaq Insight Manager remote monitoring support and the industry's best warranty all add up to the lowest Total Cost of Ownership (TCO). The cost per GB is competitive with other libraries of similar size (<$10/GB). The unit is capable of being field upgraded to higher performance DLT drive technologies with little incremental investment.

Conclusion

The ESL9326D Enterprise Library is a cost effective, reliable, high-performance backup solution for customers with enterprise-wide storage needs. The PCI Backplane technology sets it apart, as a long-term solution that can be continually upgraded as technology advances. With its high availability design, scalable performance and scalable capacity, the ESL9326D offers true Enterprise-Class features and performance for reliable backup, restore and hierarchical storage management.