

Midrange tape automation is taking a quantum leap

BY ALEX CHAN

Today's IT professionals face an ever-increasing multitude of problems and issues pertaining to storage management, including logarithmic growth of data storage needs, facility and space constraints, expandability of storage systems, ability to manage systems offsite, ease of use, initial investment cost, investment protection, reliability and serviceability. Recent economic conditions have exacerbated these issues, driving requirements for extreme efficiency and laser-focused effectiveness.

New paradigms in midrange tape automation will take advantage of the opportunity to vastly improve data protection by exploiting consolidated, shared and networked storage technologies. These technologies are enabled by the following features: space consolidation through low-form-factor, rackmount configurations, remote device management, flexible, easily-upgraded systems; and networked configurations.

Offering these benefits in a modern platform for midrange data protection will result in cost saving, cost avoidance and increased revenue potential. The next step for these platforms is advancing features found in autoloader units, which is defined as an automated, multi-cartridge (independently addressed), single tape drive system.

High cartridge density in a low form factor enables unprecedented savings on the amount of space required to store data.

A form factor measures the physical, external size of a device, as opposed to the storage capacity. The form factor of rackmounted devices describes the height of devices. (One unit (U) is equal to 1.75 inches.) Rackmounted devices have been systematically downsized from 4U to 3U to 2U; today, some vendors have an entire device in 1U. By constantly reducing the height of rackmounted devices, vendors allow data centers to fit more devices into a rack and to maximize the use of floor space.

The autoloaders currently on the market use the traditional X-Y-Z robotics that consumes valuable space. This traditional approach also increases the form factor because it requires the cartridges to be in an upright position. New technologies for tape automation will use innovative technologies to orient and access cartridges more efficiently.

Rackmount configurations for autoloaders allow quick and easy integration in a data center environment.

With the exponential growth of data storage needs, data intensive businesses such as ISPs, ASPs, SSPs and data centers are grappling with facility and space constraints. In an effort to reduce facility costs, these businesses maximize space utilization by mounting their storage peripherals in standard 19-inch racks and cabinets.

The movement from standalone to rackmount will reduce the cost of ownership for drives and autoloaders as well as for servers. New midrange automated tape

systems will be designed to be rackmounted, although they will have the flexibility to be configured for tabletop use, as well.

New automated tape systems avoid large portions of management cost through a built-in, advanced, Web-based software. This type of software will be built into each system and exploit commonly used Ethernet technologies to allow remote administration of the automated unit.

Users will be able to perform many of the functions available directly from the physical unit through a front panel and diagnostics remotely during off-hours. Remote management of multiple systems through Web-based software enables administrators to do more with less, more conveniently. The software will also allow users to download firmware updates using FTP protocol, resulting in time and cost savings.

New automated systems will offer high data capacity in single drive systems, avoiding the overhead and software license fees associated with more complex systems.

The new autoloaders will be fully supported by the existing data protection software. These new systems will conform to existing data protection software standards so as to maximize functionality and ease of operation.

This conformance reduces the effort needed to integrate the new solutions into existing environments, and still be able to take advantage of new features.

The new autoloaders will minimize upgrade cost by enabling customers to upgrade drive technology and cartridge count at their site through the modular architecture of the autoloader. So end users can scale their autoloader to their data protection needs.

Increased performance is enabled through optimum autoloader functionality and reliability features, which lower data protection risks.

Optimized autoloader functionality

Using the latest tape drive technologies the new autoloaders will optimize the time needed for backup windows.

A new autoloader system protocol will allow duplex communication between the tape drive and autoloader in the previously proven scsi logical unit number environment. Using a newly developed packetized serial protocol, these new systems will execute robotic processes at a significantly increased speed compared to previous scsi LUN approaches.

A mail-slot will be a standard feature in these new autoloaders, allowing the quick insertion or extraction of cartridges without interrupting the operation of the tape drive and autoloader. The design of the mailslot will ensure that the cartridge is presented to the end-user without exceeding the profile of the autoloader and will prevent damage to the tape cartridge or autoloader if the door of the rack cabinet is closed.

Reliability features that will be available in these new autoloaders will lower the risk associated with storage devices and IT environments. Such features will include:

- A soft power down switch on the front panel allows the tape drive to complete any robotic movement in progress before the power turns off.
- Redundant flash memory buffers firmware upgrades, so that until the autoloader system confirms a successful firmware download, the existing firmware remains in the primary flash memory.
- Password-protection for key functions: security at the operator level to allow the user to perform all routine commands and view status information and the administrator level; and administrator-level password to access all operator-level functions, plus all the configuration and diagnostic functions.

Network integration

Storage network technologies increase efficiency and lower the total cost of ownership. All authorized servers on the fiber channel network can share the tape system.

Because these new autoloaders will hold capacities in the terabyte range, and average servers require between 200GB and 600GB of backup capacity, this sharing allows multiple servers to optimally share the density advantages of the autoloader. All authorized servers on the Gigabit Ethernet-based storage network can share the autoloader using the iscsi protocol.

In both instances, efficiencies are available through server-less backup technologies.

Conclusion

The advanced features offered by the new autoloader technologies will intersect the pending needs of the IT user by reducing the total cost of ownership through the ease of management, reducing the physical space required, ability to upgrade tape drive technology, and improving serviceability.

The new autoloaders will provide a platform for new technologies in networked configurations to cross into modern paradigms of sharing and direct data movement. The new autoloaders will provide a solid basis upon which complementary software and hardware vendors can add value, offering the perfect solution for IT professionals to meet the increasing data demands of their customers while optimizing IT resources.

For more information on storage networks and server-less backup technologies, see the Internet Engineering Task Force (IETF) Web site (www.ietf.org) or the Storage Network Industry Association (SNIA) Web site (www.snia.org). For more information on NDMP, see www.ndmp.org or www.snia.org.

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