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Quantum's New Sage in the Enterprise

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The Backup Reliability Problem

Protecting sensitive data and data resources continues to be a primary concern of CIOs. For many, data protection is more important than using IT as a competitive differentiator. This is because data loss or lost access to data puts the enterprise at risk—risk that can be defined in many ways, including lost revenue, and business opportunities.

A consolidated and tightly integrated combination of storage hardware, software, and networking services can be used to secure and protect data from risk of loss caused by anything from unforeseen catastrophic events, to the most often cited reason for data loss: human error. Consequently, storage platforms can now be thought of as places to manage and mitigate corporate risk.

Backup and restoration technologies provide the ability to restore data corrupted or deleted—whether by software, or human error, or by malice—to its last uncorrupted state. While local mirroring and remote replication limit the risk of an outage, both technologies are capable of propagating both good data and corrupt data. To mitigate the risk of data loss due to deletion or corrupted data, it is essential that IT administrators follow sound backup and recovery procedures.

Backups are an essential part of the daily activities in the data center. Database corruption, viruses attacks, inadvertent deletion of important files by users are a constant threat. Backups ensure that IT administrators can restore corrupted or deleted data at specific points in time.

However, backups do not always complete successfully. Overworked operators can fail to notice an error message when a backup fails, or they can ignore the message altogether and assume the backup will run successfully next time. Many times IT administrators only discover failures when it's too late—i.e. when attempting to restore data to a critical server for example and the restart fails.

Vague error messages that are often part of the instrumentation of backup applications make it difficult, if not impossible, to determine why backups fail. Was it a tape media failure, or tape drive failure, or a backup software problem? Administrators can't fix unidentifiable problems. There is a lowered level of confidence in the backup. The problem is not with the backup. It's the inability to determine if and why a backup did not complete successfully.

As anyone responsible for the smooth operation of a data center will attest, ensuring confidence of a successful backup is critical. When a failure occurs, determining the cause is never an easy task. Backup software packages can only report on problems within their realm, and tape hardware vendors are restricted to reporting on their drive or library failures.

Enter DLTSage

Quantum has addressed these issues for its DLTtape product users with a suite of maintenance tools that not only report on problems that have occurred in the past, but can predict when problems could occur in the future. DLTSage works with existing Quantum SDLT drives and other backup and restore applications from independent software vendors (ISVs) to reduce the guesswork required to determine how and why a backup failed.

DLTSage xTalk automatically discovers Quantum tape drives attached to a storage network and tracks information by device type, SCSI ID, firmware version, and unit serial number. It captures usage statistics on all drives and cartridges, and monitors environmental conditions such as temperature of the tape path or the number of power-on hours. xTalk can determine if the backups are being run at the pre-determined interval, and can highlight drives that are under utilized.

Like more traditional maintenance programs, DLTSage reports on tape drive and media failures. But DLTSage takes the process further by:

1. Monitoring tape drive and media usage to predict when tapes are nearing the end of their reliable life.
2. Predicting when a tape drive or media cartridge may fail.
3. Determining if the potential problem is with a drive or media, or possibly both.
4. Recommending that an older cartridge be retired from active service, or recommending that maintenance is scheduled for a particular drive.

DLTSage marries both hardware and ISV software reporting schemes into a single administrative interface—heretofore the missing link. Now when a backup error occurs, DLTSage, working in conjunction with backup applications, can help determine whether the problem is software- or hardware-related. It can then recommend a course of action, and communicate the recommendation to the appropriate personnel for resolution.

How Does It Work?

Today, DLTSage delivers two access tools—xTalk and iTalk. These components use different conduits to access information about drives and media (see Figure 1).

DLTSage xTalk is a host agent that currently runs on Windows, HP-UX, Solaris, or Linux servers, with support for more platforms scheduled in the future. The agent, through a series of menus, allows administrators to run diagnostics or access tape and drive information via commands that are sent over SCSI or Fibre Channel paths to Quantum tape drives.

The second component, DLTSage iTalk, runs on a Pocket PC or laptop equipped with an infrared port. A hardware engineer equipped with a Pocket PC can stroll through a computer room and point the device at a Quantum SDLT tape drive. The device communicates to the

drive through its infrared links and retrieves drive statistics quickly. As a result, there is no need to run reports on the server or queue them for printing—for storage administrators, it doesn't get any easier than that. In a future release, a web-based management component, DLTSage eTalk, will also be available for customers requiring remote access.

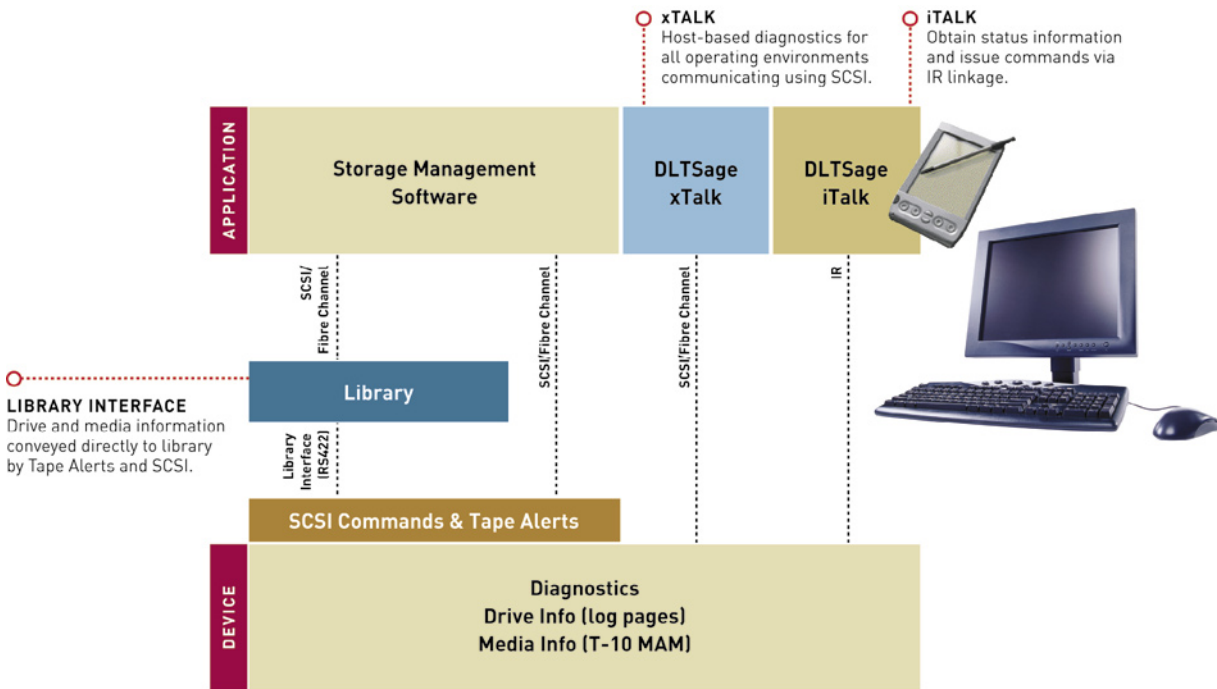


Figure 1. DLTSage xTalk and iTalk access tape and drive information. Source: Quantum pdf.

Beyond the access tools that Quantum provides, many software backup vendors, such as Arkeia Corporation, CommVault Systems, Computer Associates, Legato, and Veritas, have already agreed to support DLTSage and these vendors constitute a large part of the currently installed backup software. Negotiations are underway with other software vendors and we expect other agreements to be announced shortly. Total automated backup solutions require tape libraries in addition to drives and backup software. Tape library providers ADIC, Overland Storage, and Quantum's Storage Solutions Group have already committed to supporting DLTSage as well as Quantum's library product line.

Integration With Standards

Rather than presenting a proprietary interface to other vendors and products, DLTSage can be integrated with other backup and restore applications that support the T10-MAM and TapeAlert standards¹. The Media Auxiliary Memory (MAM) standard defines how vendors should store status information on a selected area of a tape cartridge². Quantum has expanded their implementation of the standard to include additional information, such as the serial numbers of the last 50 drives that have accessed a given tape cartridge. This allows Quantum to perform extended trend analysis and increase the accuracy of the predictions rendered by DLTSage. ISVs can also take advantage of Quantum's extensions by storing detailed information about the status of their backups.

The TapeAlert standard, also the work of the T10 committee, provides information on the status of tape drives. Unlike the MAM standard, which allows vendors freedom to define what will be stored beyond the mandatory parameters, TapeAlert consists of 64 different status flags. Such flags include the number of drive write recoverable errors, and the number of unrecoverable read errors. Library and tape drive vendors share status information using TapeAlert, and ISVs can query flag status and convert the information to understandable text messages.

Conclusion

Many IT administrators have experienced the pain of an incomplete backup, wondering if the restore will *really work this time*. However, the answer is not really with the backup operation itself, but with the processes that determine if a backup operation will complete successfully.

For Quantum customers today, DLTSage identifies and mitigates risk by monitoring the backup process, detecting and reporting failures as they happen, and predicting when specific drive or media failures could occur in the future. These capabilities are essential to reassure administrators, and to ensure that when a restore is required, it will actually be successful.

FOOTNOTES

¹ T10 is a Technical Committee of the International Committee on Information Technology Standards (INCITS). Quantum is one of about 100 members of INCITS.

² The first 4K bytes contain mandatory parameters, such as serial numbers of the last four drives that used the cartridge and application information stored by backup software vendors. The standard allows additional space to be allocated which hardware or ISVs can use to track, for example, the status of recent backup jobs, or the serial numbers of the last, say, fifty drives that read or wrote to the cartridge.



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