WHITE PAPER

Proactive Tape Media Management:

A Guide to Crossroads ReadVerify™ Appliance's ROI

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THE PROBLEM WITH TAPE MEDIA

In today's economy, significant data growth, disaster recovery, regulations and compliance all factor into an organizations' need to successfully back up data; therefore, any failure of the data backup process can pose a significant and expensive problem. While many of the newer technologies can provide faster recovery time and recovery point objectives, tape and accompanying automation systems still provide the lowest cost, most portable and highly-scalable solution; therefore, they continue to serve as the backbone of logical data protection and long-term archival of information. Though backup is the proven method for providing logical data protection, this method has a significant failure rate, and media failure is the primary cause.

Currently, administrators solve the problem of failed backups due to tape media failure by making multiple copies of the same backup, cycling tape media and/or destroying tape media after it fails. These methods do not assure the success of a backup to tape or the ability to quickly find and replace a failed tape. Additionally, current methods of tape management do not ensure data restoration after a disaster and are often unnecessarily costly to the organization. Crossroads ReadVerify Appliance (RVA) can enable storage administrators to proactively manage their backup environments by achieving a greater return on investment of their backup storage systems and extending the effective life of tape cartridges. RVA also aggregates trends with a unique tape drive, tape media or an interaction between these devices providing for resource utilization metrics and reporting.

A "CROSS YOUR FINGERS" APPROACH TO TAPE MANAGEMENT

Tape manufacturers may tell you that tape has a great success rate that many administrators and users of tape have not experienced. Despite the potential for tape failure, many organizations continue to use a reactive approach for managing media and live with the risk for potential backup or recovery failure. Typically, corporations utilize a media rotation scheme for backups where they perform a full backup once a week followed by incremental backups throughout the work week. Each day's media is stored for a period of time before it's placed back into the rotation to be used again. Companies then follow one of two tape media management models: use until failure or utilize media for a set number of cycles.

Use Tape Until Failure: A Reactive "Shot In The Dark"

This is the least-managed approach for media management and can open a company up to unrecoverable disasters. In this model, the tape media is used until it fails. The challenges to this approach are many. It is clear there are multiple causes for backup failures, and while media is the leading factor, it is by no means the only one; therefore, reacting to a backup failure by removing media could possibly waste time and achieve nothing. If an organization doesn't know why its backup failed, the media may not be the problem at all.

The "use until failure" method creates the possibility of recovery failure. By the time a tape fails, the odds are the recovery of backups that were run near the end of a tape's effective life would not successful. The "use until failure" approach is generally driven by budgetary restraints (i.e. the cost of media is high; therefore, maximize its use) rather than business continuity requirements, and the method is not based on business best practices.

If a storage administrator does not move beyond this model, there is essentially no management of the success of backups. RVA, for a minimal cost, allows administrators who have been taking the "use until failure" approach to easily implement a true management model for the backup administrator and the company as a whole by assisting you in maximizing the effective life of your tape media.

Utilizing Media for a Predetermined Number of Uses: Limited Risk Management

Removing media after a set number of uses reduces but does not eliminate the risk of tape failure. Using this method, an administrator selects an arbitrary number of backup cycles per tape (often suggested by the media provider). There are two major problems with this method: backup failure and unnecessary media expenditures.

Additionally, it is important to understand every time the tape is read, reread, written and rewritten, the error rate grows, and the media itself causes most failed backups. Failed media and media errors mean that the tape cannot be written or read. Since tape restores are purely media-related, you cannot afford to have degraded tapes (theoretically) storing your backup data. Similarly, you do not want to destroy a tape simply because you are trying to avoid tape failure by tossing out potentially good tape media before its effective use. This method may be more proactive than using a tape until failure but is very costly and gives a false sense of security.

Current Problems with Determining Tape Management Models

Simply put, using reactive tape management models results in either risk or waste or both. The longer you use tape media, the risk of a backup failure greatly increases. Using tape media for a shorter time decreases risk of a backup failure, but results in the possibility of wasted tape expenditures. Many companies feel their choices are limited: you can set tape usage to a safe, but wasteful, level, or you could increase your use of each tape and incur more risk.

STOP THROWING MONEY AWAY: MAXIMIZE YOUR MEDIA INVESTMENT

Based on the current methods of managing tape media, it is likely that many organizations are throwing away good media. Neither of the above reactive management models allows the administrator any indication of whether or not good tape is being thrown out (literally throwing away money); therefore, neither method provides a proactive method for dealing with media errors. RVA predicts when media begins to go bad so that the suspect media can be removed before the media, and therefore the backup, fails.

RVA EXTENDS THE EFFECTIVE LIFE OF TAPE MEDIA

Crossroads RVA is a 1U rack-mount easy-to-implement, out-of-band appliance that proactively validates the integrity of individual tape media and provides a method for monitoring, validating and reporting on the status, performance and utilization of tape media over its effective life. RVA enables companies to be more responsive to tape media errors and failures, resulting in increased data integrity and significant cost savings.

At the core of RVA is the data sampling engine that collects read performance statistics from individual tape media for every use. Sampling is accomplished without causing any degradation to the backup process, and statistical information is stored into RVA's database where media and drive diagnostics are carried out on each piece of media and drives within the user's library. Reports are presented to the user through an intuitive Web-based graphical user interface (GUI) or through emailed alerts and/or reports based on the organization's individual configuration. Armed with this information, storage administrators can extend the life of tape media by using it throughout the useful life of the media, rather than some arbitrary number of uses.

Crossroads RVA actively predicts when tapes start to become unreliable and prompts the storage administrator to consider replacing the media before it goes bad— proactively, not reactively. Tape vendors often state there are too many variables to determine the effective life of tape media. However, through advanced media management, as well as the monitoring and reporting capabilities of RVA, the tape media is sampled and monitored for errors and failures. By analyzing media statistics, the administrator can use RVA to determine that a tape is starting to degrade and media should be replaced before the next backup and potentially minimize downtime.

Crossroads RVA tracks the user when error rate thresholds are exceeded and trends hard and soft error rates. Each individual tape can be managed based on its capability to be read in a proactive manner giving maximum use of the media over its effective life. RVA makes lower administrative and operational costs possible based on monitoring, automated alerting and reporting and an increase in the efficient use of tape devices. These capabilities will provide an effective method to the management of backup systems, minimizing reactive, sometimes damaging "quick-fix" actions.

RVA'S ROI IN A HIGH-WASTE/LOW-RISK SCENARIO

In the following scenario, Crossroads was able to show a corporation approximately how much money it was losing annually due to wasted tape media (See Figure 1). The following company uses a Sun StreamLine SL500 library with 494 slots. The company uses approximately 1800 tapes a year, and each tape is used 100 times before it is retired from rotation. In this scenario, the risk of backup failure is low since the tapes are retired frequently; however, the waste of media and money is high.

By using RVA, the company can begin to proactively address the problem of unrealized tape usage. After the installation of RVA, the company can still remove tape media before its effective end of life; however, administrators will no longer need to retire tape media long before its effective end of life. This change from reactive to proactive management of tape media using RVA could potentially pay for itself in just over two months and save the company $117,873 annually.

SMART PURCHASE JUSTIFICATION AND VENDOR NEGOTIATION

Once a company has deployed RVA, the appliance begins storing statistical data for historical reporting. An administrator can use reports for purchase validation and vendor negotiation. Using RVA's report functionality, storage administrators can analyze the performance of their tape media over time. When working with backup venders and value-added resellers (VARs), the customer is empowered with actual data showing the performance of tape media; therefore, the purchaser can use this data to negotiate with VARS and/or vendors.

For example, a company purchases half of its tape media from "Vender A," who recommended 200 uses and the rest of the media from "Vendor B" because the tape media was cheaper. The company plans to run all tape media for 200 uses. After deploying RVA, the organization notices that the more expensive tapes are beginning to have hard write errors much faster than the less expensive tapes, of which many have surpassed their 200 uses with no hard write errors. In this case, the company may decide to purchase the cheaper tape media in the future as its effective life is longer.

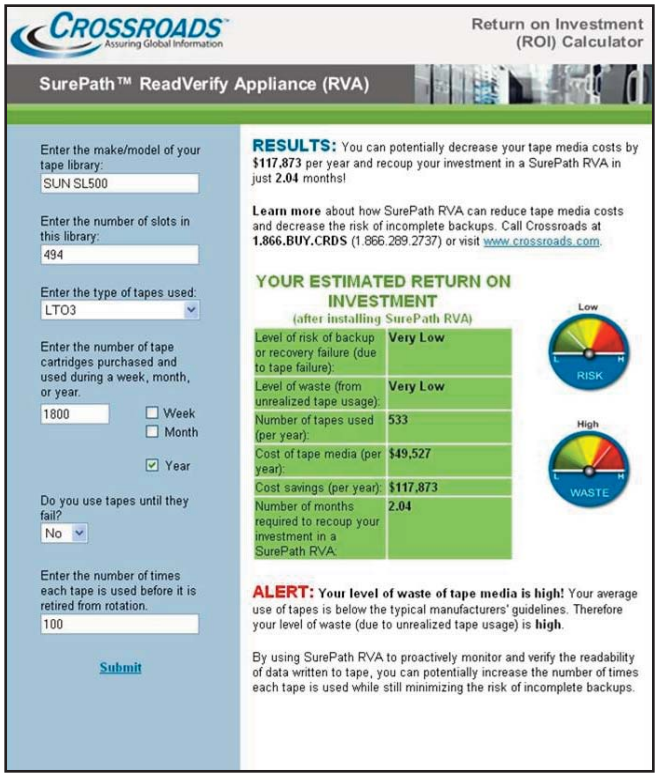

Figure 1: Crossroads RVA ROI Calculator

SUMMARY

RVA enhances the value of tape media by enabling organizations to better monitor the true effective life of their tape media, reducing unnecessary tape media expenditures as well as offering:

Tape Media Integrity — RVA proactively assesses tape media validity over its effective life. The appliance tracks the capability of the backup system to read the media and analyzes the results over time. These results are compared against a user-defined set of policies, and the user is alerted concerning suspect media. RVA allows the user to determine when media has degraded and provides a vehicle to remove error-prone or defective media.

Utilization and Performance — RVA measures the utilization of each unique drive in the overall backup system. The system reports on drives that are over- and under-utilized when analyzed against prior performance. Measuring the performance of each drive, these results, as compared against the theoretical average performance of the drive type, provide a method to tune and increase utilization. RVA's data analysis and reporting tools alert the user to a potential system imbalance, system configuration issues or problems with individual drives.

Monitoring and Reporting — RVA monitors and reports on user-definable policies and thresholds related to tape media and drives. More than 35 different parameters are monitored, and alerts are sent out via email when user- or system-defined thresholds have been crossed. Through an intuitive Web-based console, RVA provides the user with a simple mechanism for displaying library systems (both physical and logical), tape drives and media reports; therefore, all aspects of the backup system are displayed for quick analysis.

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ABOUT CROSSROADS

Headquartered in Austin, Texas, Crossroads Systems delivers flexible solutions to protect, secure and restore business-critical "data-at-rest." Crossroads (symbol:CRDS) is currently traded on Pink Sheets and also posts its financial disclosure reports, press releases and other related documentation on the OTCIQ webservice of the Pink Sheets website. For more information, please visit www.crossroads.com.

Crossroads promotes institutional and personal environmental responsibility within the company, with our partners and with the users of our products. We are committed to providing the best products and services while encouraging practices consistent with sustainable living and resource conservation.

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