WHITE PAPER

The Critical Need to Protect Mainframe Business-Critical Applications

Sponsored by: EMC

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EXECUTIVE SUMMARY

Backup and recovery for enterprise firms' existing data protection processes and technology are being reevaluated. New data protection architectures are being deployed in response to challenges brought on by unabated data growth, more aggressive service-level agreements (SLAs) for operational and disaster recovery (DR), and the ongoing adoption of virtual infrastructure. IDC research suggests legacy approaches to backup and recovery are frequently inadequate to protect today's volume of primary data within smaller backup windows while also meeting increasingly shorter recovery time objectives.

The mainframe customer environment brings a further set of challenges not addressed by many vendors' solutions. IDC research indicates that mainframe systems continue to remain critical to many large organizations' business processes. In fact, mainframe systems are undergoing an evolution to support increased server virtualization and cloud-based services. Mainframe systems provide customers with high-performance, reliable, and secure computing to address future scale and growth. However, mainframe customers still rely on physical tape for backup of critical applications such as billing or batch processing and oftentimes deploy multiple tape subsystems to meet these divergent needs. Relying solely on tape for operational and disaster recovery of mainframe data and systems can introduce security, reliability, and recovery problems that are at odds with an enterprise firm's need for secure, scalable, and efficient backup of mainframe data with near-instant recovery of business-critical applications.

This IDC White Paper examines the typical enterprise organization's need to protect and recover business applications running on mainframe systems. It also evaluates the EMC Disk Library for mainframe storage solution in meeting the requirements for mainframe business-critical application protection and recovery.

SITUATION OVERVIEW

Business-Critical Applications Run on Mainframe Systems

IDC research indicates that much of the world's information resides on mainframe systems. In large enterprise environments, this has been the case for some time. Despite platform migrations from z/OS to Unix, Linux, and Windows, many critical

applications and workloads are still running on mainframe systems. The established processes and legacy applications on mainframe systems in many of the world's largest corporations — and in multiple units within those organizations — have allowed the mainframe to outlive many of its rivals. In industries such as banking, transportation, finance, insurance, government, and utilities, mainframe systems continue to run critical business processes.

The mainframe as an enterprise-class server has a long life expectancy, combining its dominance in performing traditional high-value, high-volume computing workloads with newer capabilities that support "modern" workloads based on Linux, Java, and Web applications. The addition of new application-specific processors to an exceptionally high-performing and green technology platform provides users with viable, if sometimes underappreciated, alternatives for hosting applications. Business processes such as financial transactions, security trades, payroll, inventory management, and claims processing are all frequently run on mainframe MIPS. As a result, mainframe continues to be an important force in enterprise computing, even as the IT industry works out the details of server and storage virtualization at all levels and looks to cloud computing and cloud storage deployment options.

IT organizations continue to work toward overall improvement of service levels to all of their constituencies in order to meet business-critical needs. While mainframe systems provide scalable, available, and secure platforms for mission-critical applications and workloads, legacy tape processes and tape backup routines can create single points of failure within today's highly redundant, fault tolerant, and clustered datacenters.

Physical Tape Falls Short of Mainframe Business-Critical Application Recovery Objectives

Physical tape use in mainframe environments has largely been used for backup and recovery processes, particularly for batch and billing operations. Physical tape is a scalable, low-cost option for these use cases. However, a second set of physical tapes must be cloned and exported or replicated using additional tape infrastructure or high-cost, proprietary virtual tape systems to ensure an adequate disaster recovery plan. While physical tape can be used for data migration and long-term archive, it presents a number of challenges associated with availability, accessibility, and rapid recovery.

Recovery of data from physical tape can be cumbersome because data is written to tape media in a sequential manner. Recovery from physical tape requires the tape media to be mounted inside a library in order to search sequentially for the data set to be located and restored. Thus, recovery can be time consuming because the tapes must first be located, transported, mounted, and read back in a sequential process for recovery. In addition, administering tape in large-scale mainframe environments can be costly, especially if tape media management is included for offsite disaster recovery repositories. Purveyors of mainframe tape systems have introduced disk-to-disk-to-tape–based systems or virtual tape servers to address recovery challenges. However, these options are costly and proprietary.

OVERVIEW OF THE EMC MAINFRAME BACKUP APPROACH

EMC Addresses Mainframe Protection and Recovery Requirements

For the past several decades, EMC has provided mission-critical mainframe environments with high-performance, high-value storage solutions, including storage architectures as well as array-based approaches, for business continuity and disaster recovery. More recently, EMC has made significant investments in the backup and recovery market, including strategic and judicious acquisitions in the mainframe and deduplication storage markets. In late 2010, EMC acquired Bus-Tech to provide a disk-based backup and recovery solution for mainframe environments. Prior to this acquisition, EMC and Bus-Tech enjoyed a long-standing OEM and reseller relationship. With the acquisition, EMC integrated the Bus-Tech technology with the EMC Data Domain solution to offer mainframe customers a data disk–based system with data deduplication. The acquisition and tight integration have given EMC a backup and recovery portfolio that is expansive and flexible enough to meet the diverse backup and recovery customer needs of not only open systems but also mainframe environments.

EMC has continued to make investments in its backup and recovery portfolio to provide its customers a broad product portfolio that spans a comprehensive list of applications and use cases. In 2010, EMC formed its Backup and Recovery Systems (BRS) group. The formation of the BRS division provides EMC a singular focus on backup and recovery without a single set of point solutions. Organizations can work with EMC to completely refresh their backup and recovery applications and infrastructure, or they could take a targeted approach in order to focus limited time and resources on the backup and recovery use cases with the highest need of attention. The company's approach of addressing different backup and recovery use cases through multiple yet interoperable offerings affords customers considerable flexibility when deploying EMC backup and recovery solutions.

EMC Disk Library for Mainframe Solution

The EMC Disk Library for mainframe is a tape replacement solution that provides customers an integrated disk-based system with a high-availability (HA) architecture, rapid recovery, and faster time to disaster recovery, as well as the ability to dramatically reduce CPU cycles by directing hierarchical storage management (HSM) workloads to the Disk Library for mainframe. Customers replacing their physical tape infrastructure with the EMC Disk Library for mainframe solution can eliminate single points of failure associated with doing batch processing or billing on tape. The Disk Library for mainframe solution can continuously replicate to a secondary hot site to significantly improve DR testing and readiness. In addition, the Disk Library for mainframe provides customers the ability to combine primary and deduplication storage in one system. The Disk Library for mainframe can be used as a conduit for migration of production data to next-generation hardware or a secondary site — without downtime. Another added benefit of the Disk Library for mainframe is the sizable reduction in customers' floor space requirements for physical tape.

Deploying a Disk Library for mainframe solution also allows customers to mitigate risks, financial and public disclosure, from lost or stolen tape media.

The base components of the Disk Library for mainframe (virtual tape engines [VTEs], internal switches, and access control points) all reside within a single cabinet. Additional cabinets may be configured depending on storage capacity requirements. EMC incorporates virtual tape emulation software called EMC Virtuent in all of the Disk Library for mainframe models. Virtuent is a tape-on-disk software package that runs on a base hardware controller that provides two FICON connections to the mainframe. The Virtuent software provides the controller emulation supporting IBM 3480, 3490, or 3590 tape drives. Data that is written to or read from these tape drives by the mainframe is stored and retrieved from either primary or deduplication storage that is configured in the Disk Library for mainframe.

In summary, EMC Disk Library for mainframe provides customers:

☑ Support for all mainframe tape use cases

☑ Concurrent mixed use of primary and deduplication storage

☑ Optimized deduplication

☑ Disk snapshot disaster recovery options

☑ Simple configurations

☑ The ability to mix encrypted and nonencrypted data in the same disk library

EMC's primary value proposition of the Disk Library for mainframe is that it supports all mainframe tape use cases in a single all-disk system. Competing vendors would need to deploy multiple tape and/or disk-based systems to meet the functionality of the Disk Library for mainframe. More importantly, the EMC Disk Library for mainframe can integrate with its primary storage array, the VNX, allowing customers greater scale and the ability to have primary and deduplication storage in a single solution. This capability is exclusive to the EMC Disk Library for mainframe environments. Furthermore, the Disk Library for mainframe provides customers near-instantaneous availability for recall or migration of critical data. This significantly changes the value of the data that might otherwise be housed in physical tape repositories.

Reclamation or migration of data using EMC Disk Library for mainframe environments takes seconds rather than minutes when compared with other prevailing mainframe disk-based or virtual tape systems that need to process recovery from physical tape repositories in some instances. Customers benefit from significant savings from reductions in CPU cycles and primary storage costs. EMC Disk Library for mainframe is ideally suited for retrieving fixed content such as check images or payroll information on an optimized, lower-cost disk-based system.

The EMC Disk Library for mainframe consists of the following models:

- ☑ Mainframe Data Library-1000 for Data Domain

- ☑ Mainframe Data Library-2000 for Data Domain

- ☑ DLm2000 supporting up to 142TB of primary storage

- ☑ DLm6000 supporting primary and/or deduplication storage

CHALLENGES

While EMC has been providing mainframe customers with primary storage for over 25 years, these same mainframe environments have relied on tape as the medium of choice for protection and recovery. Thus, other storage suppliers' offerings are well established and entrenched as the means of protecting today's business-critical mainframe data. EMC can leverage its relationships with the world's largest firms in order to promote the value of the Disk Library for mainframe solution, although it will take time to displace well-entrenched vendors as well as long-standing mechanisms for protecting mainframe data. In a similar vein, tape is a valued commodity in the mainframe protection market, and customer movement off tape has been historically slow. EMC would be well served in providing mainframe tape environments with a clear and transparent migration path to the Disk Library solution and a compelling ROI to aid in business justification.

CONCLUSION

Mainframe systems remain critical to large organizations' business processes, providing high-performance, reliable, and secure computing for mission-critical workloads. However, mainframe customers still rely on physical tape for backup of critical applications such as billing or batch processing. Relying solely on tape for operational and disaster recovery of mainframe data and systems can introduce security, reliability, and recovery problems that are at odds with an enterprise firm's requirements. Existing mainframe customers seeking a secure, scalable, and efficient backup solution for mainframe data, which can provide fast operational and disaster recovery of their business-critical applications, must short-list the EMC Disk Library for mainframe solution.