

ReliaStar Brings IT All Together

by Philip E. Courtney

A wide array of new operating systems and applications at ReliaStar Financial Corp. (Minneapolis, Minn.) resulted in the distribution of data to the far reaches of the enterprise. Coinciding with this distribution were the requirements for constant, reliable application access to all business-critical information. Another requirement was the demand for centralized management of backups for data residing on a diverse collection of UNIX, MS-Windows NT (Microsoft Corporation, Redmond, Wash.) and Novell (Provo, Utah) servers as well as EMC Symmetrix (EMC Corporation, Hopkinton, Mass.) storage devices.

By taking an assessment of existing technologies, and by applying the long-standing disciplines inherent with its mainframe heritage, the IT organization at the company implemented a cross-platform management solution fully exploiting the capabilities of its mainframe-based automation technologies.

"Our operations group has a strong mainframe background," explains Tom Becchetti, senior capacity planning analyst, ReliaStar Life. "We felt it was important to leverage our existing knowledge base as well as our existing technologies."

While some of the mainframe technologies leveraged by the company include its RACF security system (IBM Corporation), its JOBTRAC job scheduling system and its CA-1 tape management system (both from Computer Associates International, Islandia, NY), the bulk of its successful solution for cross-platform data access and management came from making the most of the capabilities of its enterprise-wide backup and restore product. FDR/UPSTREAM along with FDRSOS with its UPSTREAM/SOS companion product (all from Innovation Data Processing, Little Falls, NJ) met the criteria required.

FDR/UPSTREAM is a network-based, storage management tool for centralized, automated and unattended backup/restore and archival from PC/LAN/UNIX systems to OS/390 MVS mainframe server tape and DASD. The product provides full, incremental and differential backup and supports PC servers running NT,

Novell, OS/2 as well as UNIX servers and client workstations.

ReliaStar complemented FDR/UPSTREAM with FDRSOS and UPSTREAM/SOS for the open systems data that resides on their EMC Symmetrix Array. FDRSOS works only with open systems data and performs a physical image backup of the SCSI or Fiber connected open systems volumes that are on Symmetrix devices. These backups realize the greatest amount of speed because they are performed across the ESCON channel to mainframe tape. UPSTREAM/SOS can determine if a file has changed and back it up through specially formatted disk volumes shared by ESCON and SCSI channels. According to Becchetti, FDR/UPSTREAM recognizes file systems, performs incremental backup and provides file level granularity for recovery. UPSTREAM/SOS provides greater backup speed by avoiding the network—a crucial factor for ensuring continued cross-platform application availability and maintaining good response times. "FDRSOS and UPSTREAM/SOS technologies let us reserve the network for our applications and not just the backups," says Becchetti.

Yet, for ReliaStar, expanding the use of FDR/UPSTREAM and FDRSOS products enabled the company to meet not only the goals of centralized storage management, but also helped deliver centralized, cross-platform access, control and management of multi-platform tasks and jobs, as well as expanding support for their existing firewall security features.

"We've leveraged many of the features in the products," explains Becchetti. "They've proven they are flexible enough and strong enough to handle requirements well beyond just cross-platform backup and recovery."

Growing and Evolving

ReliaStar Financial Corp. is the eighth largest publicly held life insurance holding company in the United States on the basis of revenues (Fortune magazine, April 1999). ReliaStar's subsidiaries and sales offices throughout the United States, as well as its European and Latin



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American reinsurance sales operations, have over four million worldwide customers. As a comprehensive financial services company, ReliaStar provides a wide range of value-added investment, insurance, banking and other products and services to its customers. The company explains the complexities of insurance and investments using straightforward language that consumers can clearly understand.

Although IBM MVS mainframes have long provided the company's processing horsepower, ReliaStar has recently seen the implementation of many new cross-platform business systems beginning with simple client/server applications to complex, N-tier, web-based, e-commerce systems. Its distributed environment has grown from a small collection of eight Novell servers to an environment that now includes a 1/2 terabyte of storage on nearly 70 MS-Windows NT servers, 1.5 terabytes on approximately 60 UNIX servers supporting a mix of Sun Solaris, IBM AIX and HP-UX operating systems, and 3/4 of terabyte on an EMC 5430 Symmetrix device shared between MVS and UNIX operating systems.

"Like many companies, we've evolved from a mainframe-only environment

where we once had the luxury of downtime to an environment supporting the 24x7 needs of our business,” says Becchetti. “We’ve installed a number of different platforms and many different types of storage devices and we must ensure that applications can access all of their data.”

Still, several years ago, back when a web still belonged to a spider and e-commerce was a misspelling, ReliaStar found it challenging to support growing requirements for cross-platform application access. In many situations, the driving reason for the challenge was a distinct lack of sophistication in the backup and restore process.

“Simple things like missed tape mounts or bad tapes would cause a backup to fail,” says Becchetti. “The failure of a backup can result in an inoperable application if the data cannot be restored.” He also notes that a distributed, manually operated, server-based solution lacked the intuitiveness and automation needed to perform restores. “Not only did we have to figure out which tape held the file,” Becchetti contends, “we also had to manually mount tapes to perform the restores. That made for some long days when you had to perform 30-40 restores each week.”

However, as an organization with strong mainframe roots seeking to extend the benefits of automation and centralized

storage management, the implementation of FDR/UPSTREAM provided the ability to harness the resources already in place on the mainframe.

“All of our mainframe tools and procedures were already in place,” says Becchetti. “We felt it was far better to take advantage of our scheduling system, tape management system, tape silos and mainframe storage management system.”

Exploiting Existing Technologies

The implementation of FDR/UPSTREAM enabled the company to better secure the data used by cross-platform applications. Additionally, it allowed ReliaStar to increase its return on its investments made in scheduling and tape management systems as well as its FDR/ABR (Innovation Data Processing) storage management system.

“Our concerns about providing backup and recovery support for cross-platform applications were virtually eliminated with FDR/UPSTREAM,” says Becchetti.

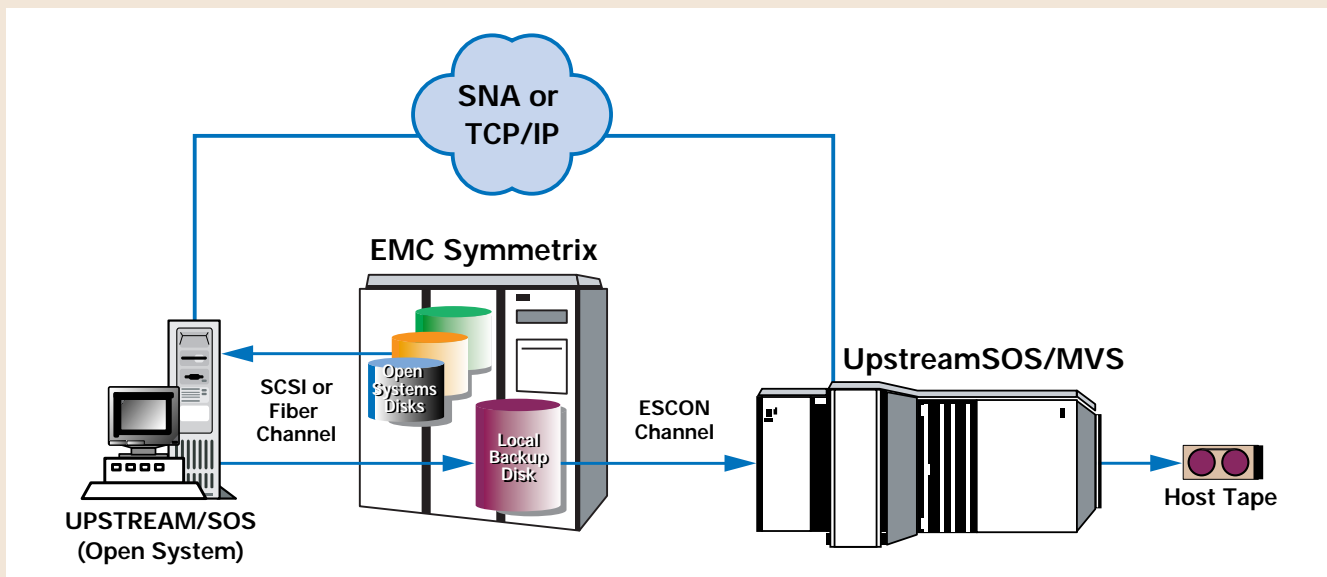
Initial backup activities with FDR/UPSTREAM began with the retrieval of server data from traditional hard drives. Data is backed up across the ReliaStar network—a 100 mbit Ethernet connection using either the company’s CISCO router and CIP card or through an OSA adapter, based upon the company’s differing application configurations. FDR/UPSTREAM first required

Reliastar to create a baseline set of jobs used for backup. These were full-volume backups designed to capture all of the files on each of the distributed servers—including user data as well as a mix of Sybase databases. The distributed backup process is launched when mainframe-based JOBTRAC submits an FDR/UPSTREAM batch job that uses a TCP/IP or LU6.2 connection to the server environment to perform the backup task. During each process, FDR/UPSTREAM tracks every file name and other related information such as file creation date, last modification date, backup date/time, and server name. It also provides immediate notification in the event of failure such as an abend, or if the backup task was unable to retrieve specific files.

“FDR/UPSTREAM is integrated with our mainframe automation tools and manages our distributed data regardless of the type of server or type of file or database,” says Becchetti. “Centralization means that we only need to monitor tasks from one location.”

Despite placing distributed backups under a single management umbrella, continued growth in the distributed environment soon posed a new problem: a dramatic increase in tape utilization. “We have a hodge-podge of systems and applications and a diversity of specific servers for applications, databases and

Continued



networks," says Becchetti. "An increasing number of new applications required their own servers and we could no longer get by with using one tape per server."

Combined with the rise in tape utilization came an escalation in network traffic as well as an increase in the amount of time needed to perform the backups—a challenge that grew increasingly unacceptable as application availability demands grew larger and cross-platform data access grew more prevalent.

Responding to this challenge, ReliaStar implemented the FDR/UPSTREAM Automatic Duplicate File Support and Forward Merge Backup facilities. Automatic Duplicate File Support reduces backup time and storage usage by automatically identifying duplicate files and updating just a pointer to the common copy, thereby eliminating the overhead of transmitting duplicate files. The Forward Merge Backup reduces network traffic by building upon the baseline created by full volume backups and retrieving from the server only the files that have been changed. FDR/UPSTREAM reduces tape utilization and network traffic by constructing a new, synthesized image of each server without sending or transmitting unchanged files. The completion of the Forward Merge Backup results in a single tape set that is representative of the server from the point in time of that backup. "This functionality provides us quick access to any files that need to be restored," says Becchetti.

Still seeking to further exploit existing technologies and improve backup efficiency, ReliaStar also implemented another FDR/UPSTREAM feature, its MVS Backup Data Set Migration. Launched via a JOBTRAC request, the Backup Dataset Migration is a disk pooling technique that places backup data directly from the multiple servers onto a mainframe DASD device where they are subsequently consolidated onto a single tape set managed by CA-1. "Not only does the Migration help us reduce tape utilization," Becchetti contends, "it also allows us to improve the efficiency of the restores. With all data from a variety of servers on a single tape set, it's easy to group files by application."

Additionally, Becchetti emphasizes, the Backup Data Set Migration helps speed the restore process by allowing files to be placed directly onto the correct open systems target disk from tape without having to use an intermediate restore or pool volume.

New Technologies Bring New Solutions

Demands for 24x7 application availability presented ReliaStar with the dual challenges of maintaining cross-platform data protection while ensuring adequate application response time.

One of the methods implemented by ReliaStar to ensure application availability was the installation of the EMC Symmetrix devices and the creation of independently addressable Business Continuance Volumes (BCVs) to store data for applications running on its mainframe, UNIX or MS-Windows NT platforms. The BCVs are mirrored copies of production volumes which can be separated for non-disruptive backup.

According to Becchetti, because the EMC devices work with such a broad range of operating systems, the company simplified its ability to select the storage mechanisms for its many diverse platforms. "We were spending too much time figuring out which volumes were needed for which machines," he says. "We're not in the hardware business and the EMC Symmetrix devices allow us to store data from MVS and our distributed systems on the same device."

The company also took advantage of the EMC Symmetrix Remote Data Facility (SRDF) software that provides an online, host independent, mirrored data storage solution to duplicate production data. Duplicated data can reside on another Symmetrix in any location. This proved to be the key for successful disaster recovery testing for ReliaStar.

ReliaStar implemented FDRSOS to support its EMC volumes and further extend centralized storage management capabilities. By making the EMC devices connected to the MVS operating system visible as pseudo-MVS DASD volumes, FDRSOS performs a physical disk backup of open systems data at the Symmetrix logical level that bypasses the network and writes data directly to MVS tape.

For incremental backup and file level granularity ReliaStar also uses UPSTREAM/SOS. After determining that a file has changed, UPSTREAM/SOS performs a backup through a specially formatted disk volume (local backup) that is shared by both ESCON and SCSI channels. However, to ensure speed and to eliminate impact on application processing, the backup data goes across the ESCON channel and avoids the network. Furthermore, the "local backup" volume can be used either simply as a "pass through" data transmission medium, with no data remaining resident on it, or can be configured for data to remain on the local backup volume for later immediate retrieval. "The system can also manage the space on an ongoing basis to retain as much data as possible locally," says Becchetti.

Equally important, for the HP/UX based Sybase databases, ReliaStar has implemented the SQL Backtrack interface of UPSTREAM/SOS that provides throughput of eight gigabytes per hour per occurrence, or server. This enables the backup process to avoid the network, keeping traffic at a minimum while still providing outstanding performance.

"Using a combination of FDR/UPSTREAM across the network for some servers and FDRSOS and UPSTREAM/SOS backups for others, we're easily backing up 90 servers each night with plenty of room for scalability," says Becchetti.

And, in addition to supporting cross-platform application data requirements, the high throughput rate assisted in speeding the daily copy of several production Sybase databases to the test environment. "Copies of these production databases are needed in the test environments for several different applications running on several different platforms," says Becchetti. "Availability requirements for the test databases are almost the same as the requirements for production."

ReliaStar business-critical applications depend upon Sybase databases. So critical is this data that, according to Becchetti, it must always remain accessible. "The data must remain available no matter what happens," he says. "We've built in the mechanisms so that the application can run from the EMC BCVs, if necessary."

Unexpected Benefits

Just as ReliaStar sought to further exploit the functionality of its existing mainframe-based tools, the time had come to expand usage of FDR/UPSTREAM. In some cases, this expanded usage put the product through a number of paces that provided unanticipated benefits. For one, the additional functionality has helped the company overcome a layer of isolation for e-commerce applications and file transfer mechanisms. According to Becchetti, many of these systems are designed to have data from business partners and customers delivered to several pre-established points outside the ReliaStar corporate firewall. "Customer data is 'dropped-off' outside the firewall where it can be analyzed prior to introduction into the system," he explains.

One of the original challenges experienced by the company was that of continued data protection; while outside the firewall, the data remained exposed to unauthorized access. Investigating methods for continued data protection, the company discovered that it could use FDR/UPSTREAM's File Transfer capabilities to migrate these files from the unprotected area outside of the firewall to a secure RACF protected location.

FDR/UPSTREAM by providing integration with its RACF host security system, operates within the confines of pre-established security rules. "We pretty much set the access authority to allow UPSTREAM's File Transfer capability, with its ASCII to EBCDIC translation ability, to transfer data through the firewalls," says Becchetti. "After the data hits the mainframe, it's protected by RACF security. And can be deleted from the outside environment."

The tradition of leveraging existing technologies continued when the company sought a method for automating and managing enterprise-wide tasks—tasks that resided outside of the realm of just backups and restores. While a couple of methods were explored, ReliaStar instead opted to again look to the functionality of FDR/UPSTREAM for an answer. "UPSTREAM provides two-way communications between MVS and other platforms in our environment with its pre- and post-processing capability," Becchetti explains. "Combining that com-

munications functionality with MVS JCL controls on the mainframe, we felt we could effectively launch, manage and monitor multi-platform tasks."

Starting with its MVS scheduling system, FDR/UPSTREAM jobs are submitted into the MVS environment. Contained within those jobs are a series of platform specific scripts that launch the tasks on the target platforms. "The scripts direct what tasks need to be performed and the UPSTREAM communications also provide a way to send status, error and completion messages to the data center operations console," says Becchetti.

Also contained within these ReliaStar constructed jobs are straight-forward MVS JCL condition code checking and operational control mechanisms. These

functionality 'CONV=WAIT' to control the tasks," Becchetti says. "Each JCL step waits for UNIX or NT to return the appropriate message before moving onto the next step and issues the return code to FDR/UPSTREAM MVS."

Continuing Growth

As ReliaStar continues to grow, new applications will surely be added to support new business requirements. This growth will also see the implementation of new servers to support cross-platform applications. According to Becchetti, growth will drive the demand for increased access to the file information contained within FDR/UPSTREAM from a variety of users throughout the organization. "More and more users today want to perform their own restores," he says. "And we'll want to provide them with that ability."

Providing users with the ability to perform their own restores can be realized through the implementation of the new JAVA interface of FDR/UPSTREAM. "It's a JAVA interface that shows users all of their files regardless of where they came from or where they are stored," says Becchetti. "They can perform their own restores based on file names. To them, it's magic."

Still, Becchetti feels confident that the organization is prepared to further leverage its existing technologies. Besides the JAVA feature, he also intends on taking advantage of FDR/UPSTREAM's NT SQL Server support, and will suggest its Oracle support to the database group. Most important, he notes, is the fact that, as an early user of the product, FDR/UPSTREAM continued to meet the scalability challenges faced by the company during its continued growth. "Rapid growth can sometimes be difficult but UPSTREAM easily grew with us as we added new configurations and hardware, and I fully expect it to scale in the future."

For more information on FDR/Upstream and the complete family of FDR storage management products, contact Innovation Data Processing at (973) 890-7300, or visit us at <http://www.innovationdp.fdr.com>

As seen in Enterprise Systems Journal 1999

RELIASTAR'S OPEN SYSTEMS BACKUPS ARE EFFECTIVE DUE TO:

- ✓ Centralized Solutions
- ✓ Leveraging Existing Systems and MVS Experience
 - Automated MVS JOB Scheduler
 - Tape Management System
 - Tape Silo
- ✓ Using High Speed ESCON Connection
- ✓ Data Reduction Methods
 - Forward Merge Backup
 - Duplicate File Support
 - Database Support

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functions are used to guide the FDR/UPSTREAM jobs through the various tasks, moving between job steps based on the task return codes and messages delivered from the distributed environment. "We're using plain old condition code checking, 'IF-THEN-ELSE', and using the UPSTREAM MVS batch