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ARCHIVING IN THE NOVELL NETWARE ENVIRONMENT IN THE BANKING SECTOR - A CASE STUDY

A Frost & Sullivan Case Study Sponsored by EMC and CaminoSoft

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INTRODUCTION

Information for this case study was gathered through interviews with a large bank based in the United States that has been in business for over 150 years. As is common in the financial services industry, the bank would only participate in this fact finding study by remaining anonymous. As a result, this bank is referred to in the study as *THE*bank.[1] In order to protect the anonymity of *THE*bank, the region, number of employees, names of IT executives interviewed, and any other information that might otherwise identify the institution has been withheld. The findings of the study were revealing and illuminate the business pain and challenges faced by financial services organizations around the world that continue to rely on the flexibility of a Novell NetWare environment. It is the opinion of Frost & Sullivan that the findings in this study are applicable to any bank and financial services institution operating in a Novell NetWare environment.

In the seven generations that *THE*bank has conducted business in the United States, it has had to adapt to numerous changes in the financial services business environment, ranging from government regulations to the way it manages business-critical information. One way that *THE*bank manages and controls business costs today is through the use of Novell NetWare, which continues to be deployed on approximately 2 million network servers worldwide and utilized extensively within the global financial services industry.

As a large NetWare shop with over 1,000 users, *THE*bank manages a significant number of file shares and storage on its Novell servers and uses a high-end EMC Symmetrix™ storage area network (SAN). Because EMC Symmetrix™ is intended to store large volumes of frequently accessed transaction data, its premium price and performance require *THE*bank to enforce storage limitations by business unit so that only necessary data is stored on the SAN.

Data moved off of the SAN into archive storage is retained for regulations mandated by the Federal Deposit Insurance Corporation (FDIC), Gramm-Leech-Bliley (GLB), and Sarbanes-Oxley (SOX).

STORAGE CHALLENGES FACED BY *THE*BANK

Enforcing storage limitations by business unit at a directory level made sense to the IT department at *THE*bank because it forced each area of the business to ensure that only information vital to the operation was stored on the SAN, rather than multiple copies of particular files or other unnecessary data, such as family photos.

After implementing storage policies for the SAN, a homegrown archive solution was created to allow storage administrators to relocate unreferenced files (content not accessed in 6 months) to a low-cost, off-site file server. Furthermore, this archive was considered "nonessential storage" and though its content was mirrored, it couldn't be brought back online for 2-3 days in the event of a server or drive outage due to different

> "Although we were concerned with compliance issues, we sought out CaminoSoft in the beginning for other archive storage problems. With those problems resolved, we realized that the joint CaminoSoft and EMC Centera™ solution also helped us with compliance."
>
> *- CIO, THEbank*

> "Our storage users were dropping files anywhere they could when we placed limits on the amount of storage for each business department."
>
> *- Storage Administrator, THEbank*

> "It eventually became clear that storage at THEbank wasn't being used by employees as they had been trained to use it. Whenever an archive server failed or was taken offline for maintenance the phone would start ringing with calls from employees that urgently needed data from the archive."
>
> *- Storage Administrator, THEbank*

1. *THE*bank is a name that the author created to conceal the identity of the bank interviewed for this case study. *THE*bank is not related or affiliated with any banks or financial services web sites with similar names. Any similarity between *THE*bank in this case study and a similarly named bank is entirely coincidental.

storage volume recovery rules and service level agreements (SLAs) implemented by the IT department.

Although manually relocating inactive data to a nonessential storage archive was intended to eliminate unchecked growth of data on the SAN, it resulted in additional storage challenges that *THE*bank did not anticipate.

A Cumbersome Archive, Storage Limits, and Unusual Archive Storage Use

Despite the fact that users were told that inactive files would be relocated to the archive, the solution proved to be cumbersome and unworkable. Since this solution wasn't an automated hierarchical storage management (HSM) system, users had to remember where to look for archived data that seemingly disappeared from business unit directories. When administrators or colleagues reminded users where to search for archived files, it was common to find copies of the file that had been moved back to the SAN by the user while leaving the same file on the archive.

As this pattern continued, administrators found up to 4-5 copies of identical data on the SAN. Over time, this behavior would cause some business units to bump against the established directory storage limits, which created a secondary issue: users were storing active files on "nonessential storage" archive volumes.

Policy Disconnect – Active Data on Archive Storage and User Pushback

To get around storage limitations, users were moving business-critical documents to archive storage, without realizing the implications. Because the archive was considered nonessential storage, the recovery time following a failure was protracted but consistent with the established SLAs. The obvious disconnect between the storage policy and the storage usage created a twofold challenge for *THE*bank. The non-referenced data continued to be brought back to the SAN and active data was being stored on the archive.

The severity of the problem was discovered by chance when a drive on the archive server went off-line. The IT department treated the situation casually since the storage in question was "nonessential" and made plans to bring the archive back up over the weekend. However, *THE*bank's storage administrators quickly discovered that users across all business units desperately needed access to data on the archive. More study of the problem revealed that employees were not using storage as the IT department had intended and documented. Instead, they were storing files wherever they could find space, including creative solutions such as moving files to GroupWise email volumes.

An Option Considered

Because *THE*bank is NetWare-based enterprise, senior IT executives felt that commercially available archiving options were limited. Although the homegrown solution it had in place would manually move inactive files off of the SAN to less costly archival storage, it wasn't transparent to *THE*bank's users who had to know where to find their archived content.

Ideally, *THE*bank wanted a true HSM environment where users wouldn't have to know that files had been moved to an archive, other than perhaps a slightly slower response time in opening a file. *THE*bank also wanted a system that would be transparent to users and would automatically manage files and storage based on a set of predetermined administrative policies, specifically addressing what types of files, folders, and volumes to manage and the criteria for migration, demigration, and remigration.

The Option Chosen

*THE*bank had tentatively decided on a workaround solution that would have to be built internally, but recognized that its storage problems would continue to get worse until a true HSM solution was implemented. When *THE*bank began discussing the purchase of an EMC Centera™ for data archiving, senior IT executives were told by EMC about CaminoSoft's HSM solutions. As it turned out, CaminoSoft's Managed Server HSM™ product line supported the NetWare, Windows 2000/2003, and EMC Centera™ platforms. In conjunction with EMC's Centera™, CaminoSoft's Centera Proven™ Edition provided the desired tight integration of HSM and fixed-content archiving needed for *THE*bank's NetWare-based environment.

CAMINOSOFT MANAGED SERVER HSM – CENTERA PROVEN™ EDITION

CaminoSoft's Centera Proven™ Edition is a policy-based, automated solution for migrating, demigrating, and remigrating files in NetWare (or Windows 2000/2003) server environments. The solution supports multi-server clusters and file migration across an unlimited number of storage tiers, covering the EMC storage hierarchy from EMC Symmetrix™ to EMC Centera™. The Managed Server HSM policy-driven engine provides for lights-out operation, automatically reclaims premium SAN space for active files, and reduces the time required for backup (and recovery of a server or storage following an outage). The process is transparent to users, who continue to access files, regardless of the storage tier on which they reside, through their existing business unit directories. Furthermore, by providing the capability to set retention and deletion dates on migrated files, Managed Server HSM facilitates compliance with internal governance requirements and relevant industry regulations.

Implementation

Implementation of the CaminoSoft/EMC solution was straightforward and occurred after normal operating hours, one business unit at a time. The first step involved removing storage limitations for the business unit's files about to be migrated by Managed Server HSM to EMC Centera™. Then all archived volumes were moved back to EMC Symmetrix™ before turning on the CaminoSoft policies that *THE*bank had configured to meet its needs. After Managed Server HSM was started on the NetWare source servers, the software began to automatically examine the directories, identify candidate inactive files that met policy criteria, and perform the migration from EMC Symmetrix™ to EMC Centera™. This process was repeated until each business unit's files were migrated. The above diagram depicts a typical configuration.
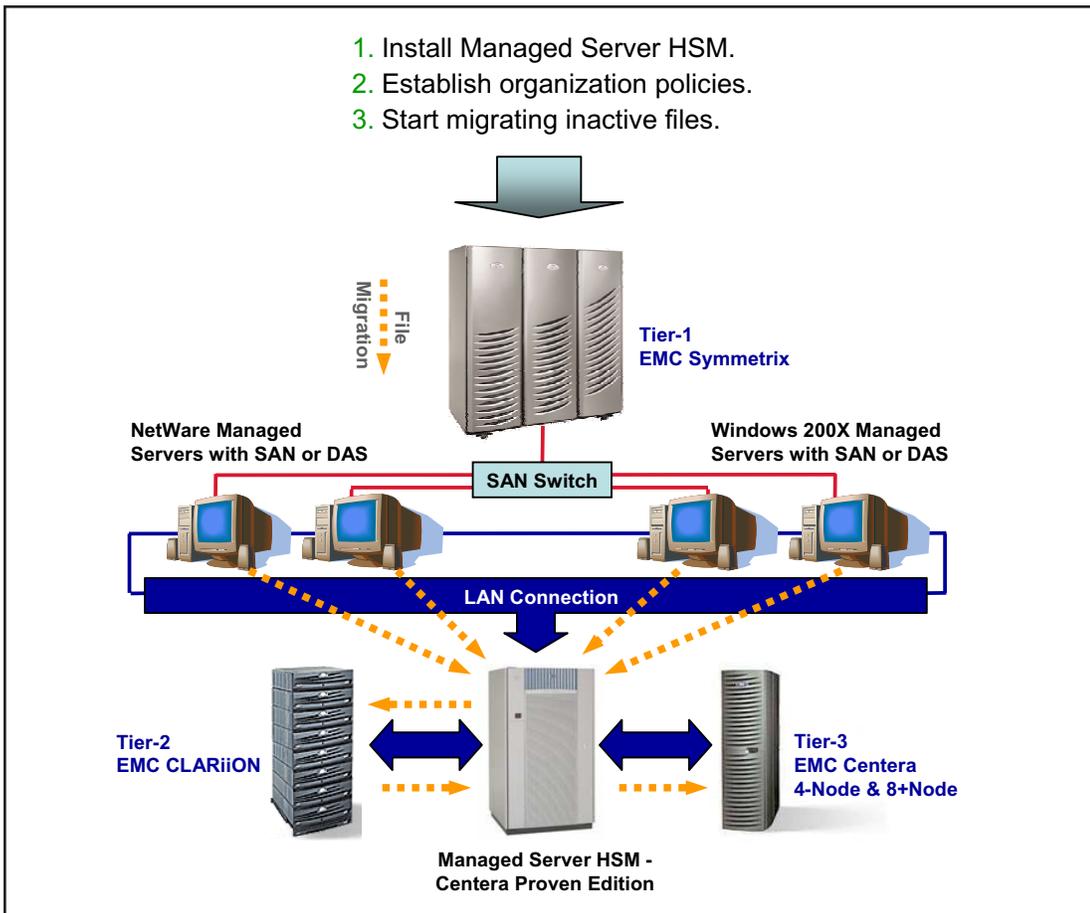
"Because so few companies were investing in R&D for the Novell environment, we weren't aware of any solutions that could resolve our storage challenges."

- CIO, THEbank

1. Install Managed Server HSM.
2. Establish organization policies.
3. Start migrating inactive files.

File Migration

Tier-1
EMC Symmetrix

NetWare Managed
Servers with SAN or DAS

Windows 200X Managed
Servers with SAN or DAS

SAN Switch

LAN Connection

Tier-2
EMC CLARiiON

Tier-3
EMC Centera
4-Node & 8+Node

Managed Server HSM -
Centera Proven Edition

Archive Storage with EMC Centera™

EMC Centera™ with its Content Addressed Storage system (CAS) is an advanced online storage infrastructure that can be used to archive files for any type of application. EMC Centera™'s CAS technology stores and indexes data via a Content Address (CA) rather than the information's physical or logical placement in the storage array.

Using the industry's first global implementation of CAS technology, EMC Centera™ stores information based on a globally unique CA derived from the object being stored. The CA serves as a digital fingerprint. With a CA derived from the content itself, EMC Centera™ is able to eliminate multiple copies of identical information, regardless of the number of requests to store a piece of content. In the event that fixed content is altered and stored again, EMC Centera™ computes a different Content Address and stores it in the system. This results in a dramatic reduction in system management and ensures that original content is never overwritten.

For business continuity, EMC Centera™ stores the content and protects it using content mirroring or content parity protection within the same EMC Centera™. Because the addressing and encryption functions are similar to a public key infrastructure (PKI), security and authenticity of the stored information is guaranteed. Furthermore, to maintain data

integrity and audit trails in the event of a hardware failure, EMC Centera™ detects the fault and self-heals by generating a new copy of the content objects. As this process takes place, the affected storage node is isolated from the rest of the system until it can be replaced.

How Centera Works: Application Example
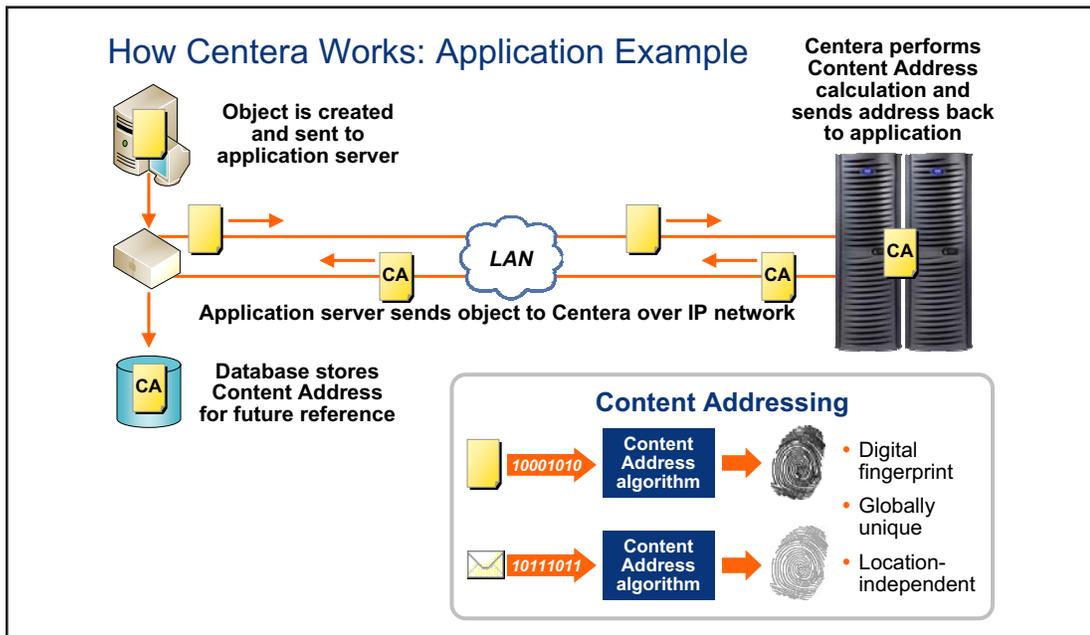
EMC Centera™ can also be configured to help meet the most stringent requirements of regulated environments by enforcing application-based retention periods within its microcode. Just as important as data retention in a regulatory environment, however, is the importance of a uniform data archive expiration policy. When data expires, EMC Centera™ uses U.S. Department of Defense 5015 data destruction standards to eliminate the ability to recapture deleted information with disk management tools. EMC Centera™'s central policy management also allows administrators to immediately extend data retention periods as needed for any eventuality. Automating these processes and allowing retention periods to be extended frees IT personnel from performing low-level maintenance tasks and helps an organization eliminate potential legal liabilities pertaining to data archive retention.

Lastly, due to the flat address space of a Content Address, applications don't have knowledge of the physical placement of fixed content within EMC Centera™, components can be replaced and EMC Centera™ software upgraded without disruption to create a solution architected to easily scale beyond a petabyte.

Post Implementation Result and Conclusion

The difference for storage users at THEbank was considerable. They no longer had to remember if a file had to be accessed on primary or archive storage, and they could find what they were searching for through their familiar directory structure. It also made the storage administrator's job easier because there were significantly fewer calls requesting

"Customers appreciate our responsive service. We connect on a personal level and don't waste their time trying to guess what kind of infrastructure they have; we already know the ins and outs of their environment and operational objectives."

- Garreth McGuinness, CaminoSoft Manager of Technical Services

additional storage. The integrated CaminoSoft Managed Server HSM and EMC Centera™ solution is precisely what THEbank had wanted, because it automatically brings files back from EMC Centera™, places them on EMC Symmetrix™ for use, and remigrates them back to EMC Centera™ after the user has closed the file.

The integrated solution also enabled *THE*bank to use their EMC Centera™ for disaster recovery preparation. As a result, they can take advantage of EMC Centera™'s guaranteed data authenticity, ridding itself of the long recovery times experienced with their homegrown archive based on cheap storage, and reining in overall storage growth through the use of EMC Centera™'s single-instance feature. And because the solution has performed well for *THE*bank, storage administrators plan to use it in the future for their Microsoft Windows environment.

In the end, *THE*bank was pleased with the work that CaminoSoft and EMC accomplished in creating a tightly integrated solution. They are also confident that they made the right choice due to the strong commitment both vendors have made to the continued support of Novell NetWare. By opting for an integrated, certified solution supporting NetWare, *THE*bank was able to solve its storage challenges as well as increase operational efficiencies and further leverage its existing investment in infrastructure.

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"Even if a particular problem isn't ours, we help our customers figure out what is going on to try to resolve their issue. We work closely with backup and antivirus companies, operating systems vendors, and storage hardware and software providers to ensure customer satisfaction."

- Garreth McGuinness

ABOUT FROST & SULLIVAN

Based in Palo Alto, California, Frost & Sullivan is a global leader in strategic growth consulting. This case study is part of Frost & Sullivan's ongoing strategic research into the Information Technology industries. Frost & Sullivan regularly publishes strategic analyses of the major markets for products that encompass storage, management, and security of data. Frost & Sullivan also provides custom growth consulting to a variety of national and international companies.

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