



# Technical Case Study: GTSI Standardizes on Network Appliance™ IP SAN for Microsoft® Exchange and SharePoint

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## TECHNICAL CASE STUDY

Network Appliance, a pioneer and industry leader in data storage technology, helps organizations understand and meet complex technical challenges with advanced storage solutions and global data management strategies.



## Introduction

Network Appliance and its dedicated team of channel partners deliver solutions that help enterprise customers increase efficiency and improve overall profitability.

This case study describes how GTSI ([www.gtsi.com](http://www.gtsi.com)), a recognized IT solutions leader, leverages NetApp technology within the GTSI infrastructure. For more than 20 years, GTSI has served as a trusted provider of IT products, solutions, and services to federal, state, and local government customers worldwide. As a solutions aggregator, GTSI designs tailored systems built on a broad portfolio of products from leading industry suppliers. The company is headquartered in northern Virginia and employs a workforce of more than 800 people at offices throughout the United States, Germany, the Middle East, and Korea.

## Background

In three years, GTSI expects business revenues to double, reaching more than \$2 billion annually. Staggering as that number sounds, revenue growth tells only a part of the GTSI story for business development. Craig Ballam, chief information officer at GTSI, explains, "Achieving aggressive earnings growth requires deeper market penetration, an expanded breadth of solutions, and productivity improvements. We will not meet our goals for profitability if doubling revenues means also doubling the size of our infrastructure and support staff."

The GTSI corporate growth strategy has upped the stakes of storage decisions. "In an aggressive business environment, every decision must be scrutinized to ensure it contributes to the larger vision," continues Ballam. "Supporting our company's expansion requires cutting-edge technology that positions us for the future. We cannot afford to rearchitect storage solutions along the way."

Ted Kilgore, Network Operations team lead and manager of the company's Microsoft Exchange environment, explains that strengthening the GTSI e-mail system was a key driver for change. "E-mail is a core application that GTSI simply cannot live without. Nearly every one of our sales transactions, for example, depends on e-mail communications at some point in the process. With the organization's increasing reliance on e-mail, we had to take steps to protect the availability of the 800 mailboxes on our Exchange system.

The first decision was to move from Exchange 2000 to a clustered Exchange 2003 environment for better resiliency. Explains Kilgore, "Upgrading would allow us to take advantage of enhanced disaster recovery features and management tools, leverage improved caching, and stay on top of the curve for the latest Microsoft technologies. We knew, however, that such a transition would necessitate major changes in our existing direct-attached storage infrastructure."

## Customer Environment Prior to NetApp SAN

The existing Exchange 2000 structure was built on four servers configured with internal storage. Ballam says that the decision to move to the high-availability Microsoft Exchange Server cluster environment dictated transition to an external storage solution. The plan was to move both Exchange 2003 and Microsoft SharePoint data to a SAN supported by Microsoft. The new SAN would support the clustered structure with much-needed performance and reliability improvements and would ultimately evolve into the storage foundation for the entire company.

### *Customer Challenges*

- Prepare for revenues to double to \$2B
- Incrementally expand storage
- Eliminate e-mail performance issues
- Ensure Exchange reliability
- Improve data recoverability
- Reduce administrative costs

### *NetApp Value Proposition*

- Flexible, unified storage
- Proven reliability
- Data protection
- Rapid data and disaster recovery
- Reduced TCO

### *Solution Components*

- NetApp iSCSI SAN
- NetApp FAS systems
- NetApp SnapRestore software, SnapManager for Exchange, and Single Mailbox Recovery for Exchange software

### *Business Benefits*

- Cost and productivity savings
- "Blow them away" Exchange performance
- Fast information recovery
- Scalability for 450+ business entities
- One-person, application-independent administration

“Our DAS structure was severely overburdened,” recalls Dave Jensen, GTSI director of Infrastructure, Networking, and Storage. “Users had to wait for attachments to open or calendaring services to respond. From the IT side, data protection and recovery were increasingly difficult. The process of backing up four separate instances of Exchange was cumbersome and time-consuming. Improving on the problematic e-mail infrastructure accelerated the company’s overall plan for storage architecture standardization.”

Recovering accidentally deleted e-mail was a particularly onerous task. “Restoring a single mailbox was actually more time-consuming than restoring the whole system,” points out Kilgore. “First the entire mail system was restored to a development environment, and then the required mailbox was located and put back into production. We effectively had to have a mirrored server that was an exact replica of the production server and redirect the application into thinking the mirrored server held the source data. It could take days, sometimes as much as a week, to retrieve data. And, because the only time users realize important pieces of mail are lost is when they need access to them, recovery requests are always urgent. We had to find a better solution.”

### **Decision Process**

The GTSI team considered both Fibre Channel and IP SAN solutions. “We were concerned about the complexity and expense of traditional Fibre Channel SANs,” says Kilgore. “Those implementations would have meant purchasing an FC switch and would have required us to send at least one of our administrators off-site for special training.

“Alternatively, the IP SAN solution proposed by NetApp allowed us to leverage our existing IP network investment and support resources. We liked the simplicity of iSCSI and the overall simplicity of the NetApp system architecture. Additionally, the NetApp IP SAN uses iSCSI technology to enable FC-equivalent performance at a more attractive price point. NetApp was able to demonstrate that iSCSI technology could handle our application performance requirements while working better within our budget.”

GTSI had already had a positive experience with NetApp solutions. A 5TB NetApp NAS structure supports GTSI Oracle9<sup>™</sup> business systems running on UNIX<sup>®</sup> servers. The expectation was that these systems, including PeopleSoft applications on an Oracle<sup>®</sup> Database, would eventually be integrated on the new SAN.

“We are confident in the reliability of NetApp systems,” adds Jensen. “Since installing a NetApp NAS structure for our Oracle-based financial systems, we have not experienced a single minute of storage-related downtime. Reliability, performance, expandability, simplicity, low TCO—they all pointed to NetApp.”

### **NetApp Implementation**

The NetApp IP SAN was implemented in a single day, and the entire transition of the DAS-based Exchange structure to the clustered Exchange 2003 environment was completed in a month and a half. One primary architect from GTSI managed the project, utilizing supplementary IT resources only as needed.

Today, two NetApp FAS270 storage systems running Data ONTAP<sup>™</sup> 6.5.1 r1 support Exchange 2003 and SharePoint applications on three clustered servers based on Microsoft Windows<sup>®</sup> (in an *n+1* configuration with two active, one passive) using iSCSI technology. To distribute the processing load, each server supports about 400 users. NetApp FAS270 systems provide high-speed storage for more than 800 Exchange mailboxes and 800 SharePoint accounts. GTSI utilizes NetApp Snapshot<sup>™</sup> technology to create three daily, nearly instantaneous backups of the infrastructure. The Snapshot copy run at midnight is mounted and backed up to tape. NetApp SnapRestore<sup>®</sup> software provides rapid restoration of Snapshot copies.

As part of the installation, GTSI licensed NetApp SnapManager® for Exchange software. This application simplifies data management processes—including backup and restoration of Exchange data—and ensures that backups are valid at the time of creation. GTSI also uses NetApp Single Mailbox Recovery software, a host-based application that enables the rapid restoration of single mailboxes.

## **Results**

Kilgore recalls a seamless transition to the new infrastructure. “We effectively built a new system alongside the old and then used a wizard-based tool to transparently migrate users to the clustered Exchange 2003 structure supported by the NetApp IP SAN. Installing the Microsoft iSCSI initiator took about 10 seconds; then we just mapped the LUNs to the NetApp storage. Based on the war stories recounted by experienced administrators, I suspect this relatively painless setup is in sharp contrast to what we would have encountered had we opted for a traditional Fibre Channel SAN rollout.”

Kilgore also points out that the Exchange 2003 software facilitated the deployment of a high-availability structure. “Using features specific to Exchange 2003, we were able to easily do a DR installation on a second server, bringing it online with none of the background work that would have been required using older versions.”

## **Fivefold Performance Improvements**

Jensen describes the company’s response to the new structure. “Our goal at the outset of this project was to deliver a high-performance solution that would blow people away—and that’s exactly what we got.”

GTSI estimates a five to six times performance improvement over the DAS structure. “In the past,” continues Jensen, “simple processes such as resorting a mailbox could take five to six seconds—what seems like 20 minutes to a user. Also, because there were four separate instances of Exchange, some servers ran better than others. As a result, the end user experience was not consistent and it was difficult to identify the source of problems. Since implementing the NetApp SAN for our clustered environment, the changes have been dramatic. Now users have almost instantaneous response when accessing large attachments, calendaring, sorting, and performing most other Exchange tasks.”

“We planned to do performance testing but didn’t because the improvement was so immediate and striking,” adds Ballam. “We had users sending e-mail to the IT department to voice their approval. That’s almost unheard of.”

## **Streamlined Management**

GTSI has experienced measurable benefits in storage management. Even though the GTSI user base has grown since the NetApp deployment, no additions have been made to the two-person administrative staff.

“Single mailbox restoration is one of the major benefits of the NetApp software,” emphasizes Kilgore. “Whether it’s information needed in human resources, or for legal requirements, or to support a sale, critical data can be back in a user’s mailbox within minutes. Even in the worst case, when the needed data is not on an active Snapshot copy, it still takes only a couple of hours to restore from tape.”

“Of course it was costly to tie up administrators for days or weeks doing nothing but handling requests to retrieve mailboxes,” adds Ballam. “But, frankly, in many cases, those single mailbox restores were simply not successful. It’s impossible to measure the cost of that lost information.”

NetApp Snapshot technology makes it practical to create frequent backups of all critical GTSI data. Rapid, unattended backup of consolidated storage eliminates lengthy overnight tape backup

processes. In the new structure, only incremental backups are copied to tape each night, with full tape backups run solely on weekends. SnapManager provides the benefit of backup verification. Kilgore adds. "If we need to restore an Exchange backup, we can count on it being a valid copy."

Snapshot and SnapRestore technologies provide rapid recovery from data corruption on the Oracle side of the house as well, enabling immediate rollback to a known good copy of database information. "With more than 10 UNIX servers accessing our data, it's critical to maintain high availability," says Jensen. "All of our financial test and production systems run on NetApp."

Moving SharePoint files off a shared network drive to the NetApp IP SAN has produced additional time savings and benefits. The entire corporate user base now has more convenient access to needed documents, and the IT team can more easily track document ownership, search for content, and manage dated materials.

### **Reduced TCO**

GTSI attributes a range of cost savings to the NetApp solution. From fewer software licenses to reduced hardware costs, the NetApp solution contributes to the bottom line. In addition to eliminating several servers and substantially reducing the administrative time requirement for managing Exchange, GTSI has been able to considerably improve productivity by speeding Exchange access and limiting downtime.

### **Foundation for Growth**

Since the initial deployment, the Exchange and NetApp structure has already been expanded to support the company's growth. "The NetApp system enabled us to add a drive to one of our volumes—with no downtime or noticeable performance hit during the addition. NetApp FilerView® software makes it easy to take a drive from a pool and assign it to a volume. The system actually handles most of the expansion process on its own."

GTSI expects to leverage NetApp architecture throughout the organization. "Our plans are to continue to consolidate servers, moving all of our data to NetApp systems," concludes Jensen. "For example, we expect to connect our SQL Server-based online ordering system. Plans also include establishing a 'warm' disaster recovery site. The single operating system across the entire NetApp product line simplifies the process of expanding to multiple sites for DR or growth."

"Obviously, because GTSI itself is an integrator, we have many storage options," summarizes Ballam. "That's why we know we've made the right decision for the long term. In all our expansion activities, NetApp will serve as a scalable foundation architecture and critical enabling technology to support GTSI storage needs on our way to becoming a two-billion-dollar company."

### **Additional Resources**

- "Total Economic Impact™ of Microsoft Exchange Storage Consolidation Using Network Appliance," Forrester Research, March 2004: [www.netapp.com/tech\\_library/ftp/analyst/ar1022.pdf](http://www.netapp.com/tech_library/ftp/analyst/ar1022.pdf)
- "SnapManager for Microsoft Exchange Best Practices," NetApp technical report, August 2003: [www.netapp.com/tech\\_library/ftp/3233.pdf](http://www.netapp.com/tech_library/ftp/3233.pdf)
- "iSCSI SAN Validation Study," ESG Labs Report, April 2004: [www.netapp.com/solutions/iscsi/esg-labs-summary.html](http://www.netapp.com/solutions/iscsi/esg-labs-summary.html)
- Network Appliance iSCSI Technology Center: [www.netapp.com/solutions/iscsi](http://www.netapp.com/solutions/iscsi)



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