Protecting the

Microsoft Exchange Production and Development Environment

with CommVault Software

Six years ago, Microsoft was looking for powerful, reliable restore capabilities for its internal Microsoft® Exchange test lab. By implementing CommVault® data management software—which is based on the Microsoft Windows® OS platform—the Microsoft team was able to perform seamless restores and enhanced data management in the lab. This article explores the challenges the Microsoft team faced and how implementing CommVault software helped address those challenges while providing significant technical and business benefits.

BY RANDY DE MENO

To protect critical Microsoft Exchange environments, enterprise IT organizations need reliable software tools such as CommVault Galaxy™ and QiNetix™ software. This article describes how CommVault data management software has been successfully used in the Exchange test lab at Microsoft Corporation—and thus, how IT organizations can implement CommVault software in their own Exchange environments.

Introducing the Microsoft Exchange lab

In the late 1990s, Microsoft coined the term *DogFood* to refer to code that was still being developed. In an effort to help improve the quality of Exchange code, the Exchange development team was challenged to use its own code in production before anyone else used it—a practice known as "eating their own dog food." Since then, the concept has crystallized and Microsoft Exchange undergoes extensive production testing long before a new Exchange version becomes a release candidate, which in turn benefits all Exchange users.

Hardware and software components in the lab

The Microsoft Exchange lab uses a mix of servers, network attached storage (NAS), and a storage area network (SAN) that includes Dell, HP, EMC, and Xiotech hardware. The Microsoft software used in the lab includes the Microsoft Windows OS as well as SharePoint®, SQL Server™, Microsoft Operations Manager (MOM), and Live Communications Server (LCS) software.

Before implementing CommVault software in the Exchange lab, the Microsoft team had to manually transport the NTBackup, EMC® Legato®, and VERITAS® Backup Exec™

tapes back to the test lab and manually load them each morning when the new, up-to-date data was required. This process resulted in questionable reliability and unacceptable work hours for test engineers dedicated to this task. It also reduced the time other team members could work with the software in production. In addition, administrators in the Exchange lab typically perform 5 to 30 full database restores per week, and before implementing CommVault software, the lab experienced a high failure rate for these restores.

Users and test environments in the lab

The Microsoft Exchange Products Team, the Microsoft Office Products Team (which has thousands of production mailboxes), and various Microsoft employees and executives store their live production data and e-mail in the DogFood lab on the Microsoft campus in Redmond, Washington. Microsoft simulates numerous customer environments for implementing Exchange and conducts in-depth testing in these environments. The DogFood lab is a combination of the following environments:

- Systems running mixed releases of the Windows OS and Exchange
- Servers with numerous mailboxes (some greater than 10 GB) and a large amount of data
- Servers with numerous mailboxes and a small amount of data
- Servers with a few mailboxes and a large amount of data
- Servers with a few mailboxes and a small amount of data
- Remote management (from the Redmond campus) of servers that reside in Europe and other locations throughout the world

Examining Microsoft's goals for improving the lab

In 1999, Microsoft invited CommVault to test its Windows-centric data management software in the Exchange lab. CommVault had recently made a strategic decision to base its software on a Windows platform because CommVault software was designed to provide the performance and reliability required to manage large data centers. The challenges that Microsoft invited CommVault to address were as follows:

- Create a robust storage environment
- Enable reliable backups and restores
- Use software that is flexible enough to leverage new hardware and software technologies
- Enable extensive reporting capabilities
- Provide global access to the Exchange environment from anywhere in the world

In addition, CommVault faced the challenge of managing Exchange in an environment that serves key Microsoft executives

as well as the engineers that develop the Exchange software. The following sections explain how CommVault addressed Microsoft's challenges.

Requirement 1: Remote management

The Microsoft administration team needed a robust enterprise data management solution designed to provide world-class remote management capability and the flexibility to support Microsoft's frequent Windows OS and Exchange builds. New, cutting-edge Microsoft technologies are tested so often that they may include versions of operating systems and applications that are 6 to 18 months ahead of when they are expected to be available as release candidates to customers. Over the years, these products have included:

- New versions of the Microsoft Windows Server™ 2003 and Windows 2000 Server operating systems
- New versions of Windows Server and Windows Storage Server
- Exchange Server 2003 databases with support for Virtual Shadow Copy Service (VSS) snapshot software
- The upcoming version of Exchange (code-named "E12"), SQL Server 2003, and SQL Server 2005
- Microsoft Active Directory® information
- SharePoint data
- MOM servers
- LCS data
- Windows File System data

Requirement 2: Replication

Based on the performance of the CommVault software during its initial 12 months of deployment in the DogFood lab, Microsoft requested that CommVault replicate the production data to Microsoft's DogFood simulation testing lab—known as the SIMULATED lab. This replication was designed to help the Exchange team's testing efforts by making live production data available to the various Microsoft engineers who test Exchange software. The SIMULATED test lab helps accelerate the overall build process for Exchange.

Before using CommVault software, the Microsoft Exchange team was unable to restore production data to the SIMULATED test lab without manual intervention. The SIMULATED lab is connected to the DogFood lab via a private network, and the test machines in the SIMULATED lab have the same Domain Name System (DNS) names, Microsoft Active Directory forests, and Exchange Server names as their cloned cousins in production. Before CommVault software was implemented, the client names in the two labs could not be differentiated. Microsoft administrators tested numerous backup solutions, but none could address this problem. The only solution at the time was to manually bring tapes into the SIMULATED lab for restores—which required a team of dedicated

administrators working excessive hours, including staying late to change tapes. Time-consuming backups and restores made it hard for administrators to perform their primary responsibilities—maintaining the production environment and finding bugs in Exchange. Consequently, Microsoft needed to find a way to reduce the time required to create the shadowed SIMULATED lab while enhancing the performance and reliability of the restores.

CommVault addressed these challenges with its CommVault QiNetix software, which differentiates the two sets of servers by giving a unique name to the servers in the SIMULATED lab. The dual-homed CommVault CommServe system connects the two large networks. By leveraging these capabilities, the CommVault software enabled administrators to spend less time on backups and restores and more time on their core competencies as test engineers. Furthermore, CommVault software supports VSS without requiring manual intervention by administrators.

Requirement 3: Migration

In late 2004, after five years of successful deployment, the entire DogFood production environment moved to the internal Microsoft IT production network. Today, Microsoft moves production data to the SIMULATED lab using the CommVault CommCell™ migration capability. The CommCell migration capability enables administrators to restore data from one CommServe-based system to another.

Implementing the CommVault solution

Microsoft enables anytime, anywhere management of its DogFood lab by using one Windows-based server (the CommServe system) with five CommVault MediaAgents. The MediaAgents are a mix of high-performance SAN storage and DLT7000 (digital linear tape) storage. Figure 1 shows the CommVault system's role within the Microsoft lab.

For more than six years, the Microsoft team has been using CommVault Galaxy software to back up data in the lab. Each night over 1 TB of full and incremental backup data—including Exchange Server 2003 databases, Windows Server 2003 data, SQL Server 2000 data, SharePoint data, MOM data, and domain controller data (such as system state and Active Directory service data)—is backed up. Disk-to-disk-to-tape (D2D2T) management is used: backups are stored to a SAN and then migrated to tape. The implementation of D2D2T backups has significantly enhanced the performance and reliability of the lab. Since Galaxy has been deployed, the Microsoft team has not reported experiencing a single instance in which administrators were unable to restore data from a backup. Although initial software and hardware releases have experienced occasional problems, the Microsoft team works with vendors to troubleshoot and resolve any flaws before allowing products to be deployed to joint customers.

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In addition, CommVault QiNetix enables administrators to hot swap a cloned server to production within minutes if a system fails. This capability is designed to save time and help make data highly available.

CommVault software relies on a fully-unified, modern code base that is powerful yet cost-effective and easy to use. This code base leverages the features and power of the Windows Server OS. Supported by Dell and Microsoft, CommVault software is built on a Common Technology Engine that moves, manages, and catalogs data.

CommVault's policy-based data management software is designed to provide the Microsoft Exchange environment with anywhere, anytime management. This includes support for Microsoft's cutting-edge products and technologies as well as
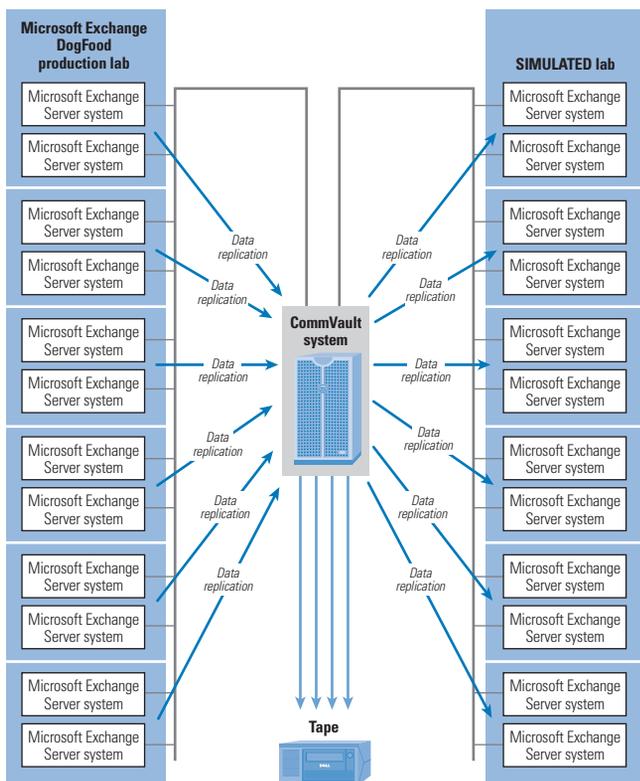

Figure 1. Microsoft Exchange DogFood lab managed with CommVault software

simple data management using disk as the primary media target. In addition, the CommVault software helps manage the Microsoft DogFood and SIMULATED environments from a single Windows-based server.

Technical benefits of CommVault software

CommVault software enables Microsoft and other environments to benefit from numerous features and capabilities:

- **Simplicity and ease of use:** CommVault software helps make installation, configuration, and management easy for novice administrators to learn.
- **Web browser–based management:** Administrators can perform complete management and maintenance tasks from virtually any location—whether the office, a hotel, or home—that has Web access to the CommServe-based system. This capability is designed to save administrators time and help ensure that data is managed properly.
- **Reliable restores:** CommVault software has a track record of high reliability—the Microsoft lab has not reported experiencing a failed restore in over six years.
- **Cutting-edge hardware and software technology:** CommVault software has continually supported Microsoft operating systems and applications early in the development and beta cycles and throughout production, including tests of many diverse customer environments. CommVault engineers and developers have worked closely with the Microsoft team to provide continuous data management support for all versions—early-build, alpha, beta, release to manufacturing (RTM), and production—of Microsoft's next-generation operating systems and applications, while CommVault software runs in a production environment at Microsoft.
- **Support of combined releases:** Microsoft customers often have mixed revisions in their networks, and Microsoft often runs mixed versions and revisions of Exchange and Windows.

Business benefits of CommVault software

Microsoft administrators can benefit from the reporting capabilities of CommVault software, which enables them to manage the environment from the lab, the office, home, or a text-messaging device. Recent enhancements to the CommVault software also enable administrators to use MOM to monitor the overall enterprise. These reporting capabilities help the Microsoft lab save time and money. Figure 2 explains additional business benefits and key performance indicators for these benefits.

Backing up Exchange in a demanding IT environment

Six years ago, Microsoft was looking for a solution that would provide world-class restore capabilities and a fully integrated user

Key benefits	Key performance indicators
Reliable protection	The Microsoft team has not reported experiencing a restore failure during the six years it has been running CommVault software.
Minimized cost	A single Windows-centric CommVault system is designed to manage multiple servers and applications, two disparate networks, and multiple terabytes of data.
Seamless business continuity	Service-level agreements (SLAs) for CommVault software have been met ahead of time for the past six years. Before CommVault software was implemented, replicating the environment was a challenge.
Cross-application support	Exchange, SharePoint, SQL Server, Active Directory, Windows Storage Server, MOM, and other Microsoft applications are used in production.
Ease of use	Web browser management from across the building or from home is possible—with easy-to-read reporting that can be sent to a Windows Mobile phone or a BlackBerry device.
Fast Exchange database restores	Complete, reliable restores can be performed in minutes.
Support for next-generation builds of Windows and Exchange	CommVault supports releases of Windows and Exchange that are often 6 to 12 months away from becoming release candidates.
Assistance in rebuilding and adding Windows-based servers	CommVault software offers the 1-Touch System Recovery option, which leverages Windows Preinstallation Environment—allowing administrators to recover an entire system quickly and easily by inserting a CD that links system information from the CommVault database.

Figure 2. Business benefits of CommVault software

interface. CommVault now serves as the software vendor providing data protection for the Microsoft Exchange DogFood lab and for the Microsoft IT organization. The integration of CommVault software with the Windows platform and CommVault's experience working closely with Microsoft has enabled powerful, reliable data management and restore capabilities in the Exchange environment.

After a six-year record of seamless restores in the Microsoft Exchange DogFood lab, CommVault's cutting-edge data management software has incorporated global management and high-quality reporting features, further enhancing enterprise data management capabilities.

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FOR MORE INFORMATION

CommVault case study for the Microsoft Exchange DogFood lab:
www.commvault.com/microsoft/case_study.asp