OPTIMIZING MICROSOFT EXCHANGE AVAILABILITY AND RECOVERABILITY

Maximizing uptime of Microsoft Exchange environments with an advanced network-based solution

ABSTRACT

Across various configurations of standalone Exchange, Exchange with DAG, virtual or physical servers, direct attached storage or SAN based storage, IT professionals today have a wealth of solutions at their fingertips to help implement best practices for optimizing their Microsoft Exchange storage environments. The key is to make the right choice: The best selection is a comprehensive solution that delivers the gamut of data protection storage services and centralized management so that you are not left with a jumble of niche solutions, adding more work and frustration instead of alleviating it.

INTRODUCTION

At your company, people expect your Microsoft Exchange system to always be up and running. Staff must be able to dependably send and receive email and wireless messages, refer to records and attachments, use calendars, and access contact information. Continuity of service is paramount— whatever the conditions, the servers, applications, and data must always be available and reliable. Downtime is unacceptable. Even a short period of data unavailability can cause serious damage to your organization's operations and bottom line; extended loss can be fatal to its very existence, not to mention those late night phone calls from users.

Microsoft Exchange—widely popular and one of today's leading business communication tools—is specifically designed to deliver high-volume collaboration capabilities, fast transaction rates, improved management and security features, and greater cost and infrastructure savings. Yet it is precisely because Exchange is so widely used that the underlying hardware infrastructure – particularly the storage – can be especially challenging to manage effectively.

As message volumes continue to grow, and file attachments consume endless gigabytes of disk space at both local and remote sites, the Exchange administrator is often left struggling to deal with this onslaught of data. Disk resources must continually be reconfigured. Backup times increase relentlessly, compounded by the fact that for purposes of regulatory compliance, email messages must often be stored for lengthy periods of time. And since email, contact lists, and calendar services are mission-critical tools, recovery must always be fast and accurate, even after disaster.

In order to better handle this situation, IT professionals today have a wealth of solutions to help implement best practices for optimizing their Exchange environments. The key is to make the right choice. The best selection is a comprehensive solution that delivers the entire gamut of storage services so that you are not left with a jumble of niche solutions, adding more work and frustration instead of alleviating it.

While businesses count on IT to make sure this communication happens, the simple fact is that it cannot be accomplished with obsolete or inadequate tools. Therefore, to meet the current mandate for nonstop availability, companies with existing Microsoft Exchange deployments are seeking innovative solutions to ensure uptime and to further enhance the application's efficiency, availability, and recoverability.

In today's 24x7x365 business environment, it is clear that in order to maximize availability and thereby business productivity, a practical storage solution for messaging/collaboration data needs to deliver advanced storage services that protect data and improve its accessibility.

Such services include:

- Disk mirroring for data redundancy
- Multipathing for protection against network node failures
- Remote data replication for disaster recovery (DR)
- Point-in-time snapshots for rapid, granular, non-disruptive recovery of individual mailboxes and entire data stores
- Impactless backup that not only can be completed within the backup window but which doesn't burden Exchange servers.

A solution that provides a vital competitive edge is one that succeeds in extending all of these features to a messaging environment to create a more flexible and easy-to-manage storage infrastructure, while preserving the existing flow of storage and backup administration as well as day-to-day business operations.

THE SOLUTION

Simplify and centralize the storage infrastructure and its management

Exchange administrators often cite capacity management as their biggest challenge. Storage and management resources are continually pushed to the limit: A typical Exchange environment might host hundreds or thousands of active mailboxes, multiple servers, and terabytes of constantly growing email storage capacity.

Moreover, because organizations typically grow over time in a piecemeal if not abrupt fashion (think mergers and acquisitions), the result is often a disconnected and/or duplicated infrastructure (such as surplus Exchange servers and storage arrays), unnecessarily complex processes, excessive administrative overhead, out-of-space conditions due to under-provisioning, and the inverse – wasted storage capacity and capital due to the rampant over-provisioning employed in an attempt to avoid insufficient performance and disk capacity.

The good news is that you can now support your entire organization's Exchange needs while leveraging and repurposing your existing storage and know-how by implementing a comprehensive network-based storage infrastructure solution that uses virtual storage. The sooner you do it, the sooner you can transform complex Exchange management to a simple, centralized task (and the cost savings will make your CFO smile).

In an advanced network-based virtual storage model, capacity management is made infinitely easier because all disk resources are joined into a "storage pool," from which custom-sized virtual disks can be carved and provisioned to servers in the storage network.

With the right solution in place, Exchange administrators can dynamically add capacity from this storage pool on an as-needed basis with just a few mouse clicks at an easy-to-use, centralized console. The underlying disk interfaces are hidden, and only the user-friendly GUI simplifies management of storage resources, even in environments where devices from multiple vendors are used. In fact, all storage provisioning and storage services for an unlimited number of heterogeneous application and file servers can be controlled by an administrator from a single console.

Achieve high availability

Another benefit that an advanced network storage solution should provide is the ability to improve data availability. A typical Exchange environment is a breeding ground for data unavailability due to its inefficient infrastructure and business continuity tools. Even if one or more niche data protection solutions have been implemented, chances are that they are only providing a portion of the necessary protection. Inevitably the result is inadequate – or, worse, nonexistent – protection from disk-, cabinet-, and network-level failures that sabotage data availability. This scenario is more common than anyone would like to admit, and organizations of all sizes are prone to it. In the case of mergers and acquisitions, the problem is compounded because it is unlikely that all sites will have been using compatible solutions.

To protect against disk failure, an advanced network storage solution should provide synchronous and asynchronous mirroring capabilities to create redundant data sets. This way, a disk containing Exchange data can be mirrored to a second disk, which may reside on the same storage array, or even on a different storage array of a different vendor/type/interface, thereby providing a layer of cabinet redundancy over and above the RAID redundancy at the disk drive level. The disk subsystems themselves can be located in different rooms or different geographical locations altogether to protect against a localized disaster. Disks mirrored using a superior solution also deliver the added bonus of sharing the processing load, noticeably improving performance.

Network-level failures can be averted by deploying failover and multipathing services that provide your Exchange servers with multiple paths to storage. Should one path fail due to the malfunction of any element in the path, server traffic is intelligently rerouted to an available path for business continuity.

Disaster recovery that works

Without a DR plan in place, few enterprises can survive a site-level disaster. It is therefore crucial to choose a storage infrastructure solution that delivers a remote replication service that provides automated off-site data protection—across the street, across town, or across the globe. Administrators should be able to specify a variety of policies to control the replication process, giving them a very granular and flexible mechanism for keeping an extra set of data off-site for rapid recovery. In case of a catastrophic failure at the primary site, systems can be restored far more quickly from disk than traditional tape methodologies.

In an advanced storage solution, data is replicated over any existing network infrastructure without the need for Fibre Channel (FC)-to-IP protocol converters. Moreover, the solution should provide support for tiered storage on both the production and DR side so that the source storage and target storage hardware need not be the same, allowing for the use of cost-effective disk at the DR center.

A superior replication service should ensure data consistency. After all, what good is a replica if you can't recover from it? The replication process is based on a snapshot image so the data has point-in-time integrity. However, a random point-in-time image of a messaging system is not sufficient. The data must also have data consistency, meaning that all transactions are complete and in order. This ensures that the replicated data is immediately usable.

For this reason, a good replication solution should provide an integrated Microsoft VSS snapshot agent to coordinate the replication sequence with the Exchange server and with the host operating system. Just prior to replication, the snapshot agent is invoked. The agent makes use of Microsoft's VSS process, ensuring that snapshots are taken with highest possible degree of data consistency.

Ideally, the replication service should not monopolize network bandwidth. After the initial full replication, all subsequent replication transmissions should only send changed data (deltas) over the wire. Using advanced data reduction algorithms, replication should reduce bandwidth utilization at rates equivalent to deduplication technology. In addition, it should allow for a means of flexible scheduling so that replication can occur during selected times (such as off-peak hours).

Rapid recovery for continuous data availability

Even with mirroring and replication providing a significant degree of data protection, the possibility still exists for data loss from a different kind of misfortune: "soft errors." A soft error is a case of data being destroyed, even while the hardware is still up and running. A soft error can have multiple sources: a virus can damage or delete information; a malicious attacker can delete data; human error can result in accidental deletion of email or mailbox; or a message store itself can become corrupt. If some soft errors are allowed to persist undetected, they can develop into a rolling disaster, which becomes impossible to recover from even as the data damage gets progressively worse.

The important thing to keep in mind is that hardware protection schemes like mirroring – while critical to protecting your data from device or channel failure – do not to protect against soft errors. In most cases, an inadvertent file deletion inherently means the file is gone from both sides of the mirror. However, with the right solution in place, all is not lost. Continuous data protection technology allows you to essentially go back in time to recover the data.

An advanced storage solution offers continuous disk journaling using delta-based point-in-time snapshots of a data disk that can be scheduled at specific time intervals or "high-water" marks of new data changes. When needed, the

data can be “rolled back” to an earlier point in time with only a few simple clicks in the management console. This means that if the Exchange data store is somehow corrupted or deleted, it can be recovered entirely from disk in a matter of minutes without lengthy tape restores and frustrated end users. Moreover, the data can be only minutes old, rather than days old as is often the case with tape.

Imagine a different scenario. What if only part of the data is lost, such as a single user’s mailbox? This is not a problem. With a superior solution in place, any of the delta-based snapshots can be mounted as an independent readable/writeable drive, without having to roll back the entire volume. So with the Exchange database actively mounted, the Exchange administrator can mount an earlier version to the recovery database or recovery storage group, and retrieve a deleted mailbox object. This takes mere minutes.

With delta-based snapshot functionality, it is easy for enterprises to achieve their Exchange recovery point objectives (RPO) and recovery time objectives (RTO).

Impactless backup

Shrinking backup windows coupled with larger backup requirements are making traditional methods of tape backup more challenging. Although tape provides an effective way to archive Exchange data stores over the long term, today’s organizations need a way to ease backup and archival operations by taking the workload off the Exchange servers. The ideal solution will move data to tape as quickly as possible; in fact, test results typically show data moving at full drive speeds, as much as 100 gigabytes per hour per LTO tape drive.

In impactless backup, your tape drives/libraries or virtual tape libraries continue to be connected to your existing dedicated backup server, while file-by-file or block-level backups are dramatically accelerated and can occur at any time without impacting Exchange, other applications, or end users. The backup works in conjunction with a delta-snapshot service, enabling the backup software to back up point-in-time snapshots of data directly from SAN storage, thereby offloading backup processing from application servers and the LAN. In this way, the backup window is eliminated.

Impactless backup allows the backup software to perform full, incremental, or differential, file-by-file or block-level backup/restore operations so that you do not have to perform full backups of your Exchange data store every night.

In an ideal solution, the backup process integrates fully with a Microsoft VSS snapshot agent, so backups have data consistency. No third-party backup software or agents are needed on your Exchange servers, because the Exchange servers are not involved in the backup process.

In addition, you can replicate data offsite, and deploy your new backup model at the offsite location, so that in essence your tapes or virtual tapes are already out of the building before you even begin the backup process.

CONCLUSION

Advanced network storage solutions for Microsoft Exchange

Today, collaborative applications—particularly messaging—are the critical force driving business, from the executive level down and across the enterprise. Business revolves around this electronic transmission of information. Deals are negotiated, cemented, and documented this way. Management interacts internally this way. Employees team up this way.

With an advanced network storage solution for Exchange—such as FalconStor® NSS and its unique, innovative Message Recovery for Exchange, Continuous Data Protection (CDP), and Replication features—you can optimize your Exchange investment to achieve the performance you want and deserve…today.

FalconStor Software offers data protection solutions that integrate with Exchange to solve your toughest backup/recovery challenges. These comprehensive solutions integrate with our industry-leading deduplication solutions and storage virtualization tools, allowing you to build a comprehensive, optimized Exchange backup environment that suits your organization's unique needs and facilitate the continuous availability of business-critical data with speed, integrity, and simplicity.

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