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WHITE PAPER

Addressing Operational Challenges in Microsoft SharePoint and Exchange Deployments

Sponsored by: NetApp

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EXECUTIVE SUMMARY

Sharing important electronic information — in the form of documents, emails, and instant messages and in real-time collaboration sessions — has become perhaps the fundamental means of creating, refining, and advancing business in today's corporate world. Employees have come to rely on messaging tools such as email and collaborative content management systems to work on projects that require input from other employees or business partners or on projects intersecting other corporate initiatives. These projects are based on documents that need to be shared, edited, and cooperatively authored. They contain nontraditional as well as classic, structured data sources and must be created, edited, and stored based upon mutually agreed-upon schedules. They must also be classified and archived as part of sound corporate governance, risk management, and regulatory compliance programs.

Email-based integrated collaborative environments (ICEs), aka "groupware" systems such as Microsoft Exchange Server, have become a mainstay of business collaboration, allowing firms to process work and information faster. It's well-known that ongoing and proactive communication with customers, suppliers, employees, and project teams improves productivity. In corporate settings, email is increasingly used to convey information and conduct business between internal and external parties. Greater reliance on email in the corporate environment has resulted in the increased volume of messages sent and received, and firms cite email as one of the top three factors driving annual data growth of 52% or more, according to IDC annual research studies.

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Another critical tool that millions of teams in thousands of organizations use to effectively collaborate is Microsoft Office SharePoint Server (MOSS or SharePoint). An overarching motivator for firms to deploy collaborative technology, such as SharePoint, is to increase worker productivity and accelerate their business growth. According to IDC, SharePoint is Microsoft's fastest-growing business software product of all time, even during the severe global economic downturn, and as SharePoint implementations expand in site numbers, object volume, and active users, storage capacity demands increase. IT organizations must deploy a storage infrastructure that enables reliable and cost-effective expansion in SharePoint environments. It must also enhance IT organizations' ability to meet higher standards for availability, reliability, compliance, and legal requirements.

Given today's economic climate, firms are looking to increase efficiencies, reduce costs, and increase both knowledge worker and IT productivity. The data storage solutions deployed in support of Exchange and SharePoint implementations must also include optimization and management capabilities that reduce storage and storage management costs and the impact of document and message information growth on stressed IT budgets.

This white paper looks at the factors driving Exchange and SharePoint growth and the operational challenges organizations face in scaling these applications for enterprise-ready deployment. It assesses the portfolio of NetApp storage solutions for delivering scalable, flexible, and efficient storage solutions in the enterprise. This white paper further examines how NetApp storage solutions — which leverage storage technologies such as thin provisioning, deduplication, and thin cloning — help customers achieve efficiency, cost, and productivity gains. And as firms consolidate their Windows server and storage sprawl on virtualized servers, leveraging NetApp networked storage solutions in Microsoft Exchange Server and SharePoint Server environments makes it possible for IT organizations to guarantee their messaging and collaboration environments are enterprise ready. The combination of consolidated storage and server infrastructure and the use of virtualization enables firms to do increasingly more with less.

SITUATION OVERVIEW

With the availability of Microsoft Exchange Server 2007 and the release of Microsoft Exchange Server 2010, firms are dealing with ongoing growth while also planning for upgrades and migrations. Microsoft continues to develop functionality, increasing the necessity for this application. In addition, rapid adoption of Microsoft Office SharePoint Server 2007 as a collaboration platform is occurring within organizations of all sizes. Many of these deployments begin with business users taking advantage of the collaborative workspaces within SharePoint. These workspaces enable business users to manage documents and data associated with their projects and share this information with colleagues as they collaborate. Initial deployments are frequently spearheaded by individual departments, and business workers easily adapt to SharePoint as an application because it provides an intuitive interface and tight integration with Microsoft Office applications to enable easy incorporation and organization of content types into a shared workspace. And as firms consolidate their IT infrastructure with an eye toward cost savings, the use of virtualization continues to proliferate in production environments.

Growth of Messaging Volume and Collaborative Workloads

ICE products such as Microsoft Exchange and IBM Lotus Notes/Domino have long dominated the market for email, calendaring and scheduling, and directory-based application development among midmarket and enterprise buyers. Increasingly, security, unified messaging, mobile device support, and archiving features have been integrated with the ICE platforms themselves, thus making the systems even more pervasive and increasing message volume. Today, 92% of business workers have access to email and contribute to a message volume of nearly 61 billion business and

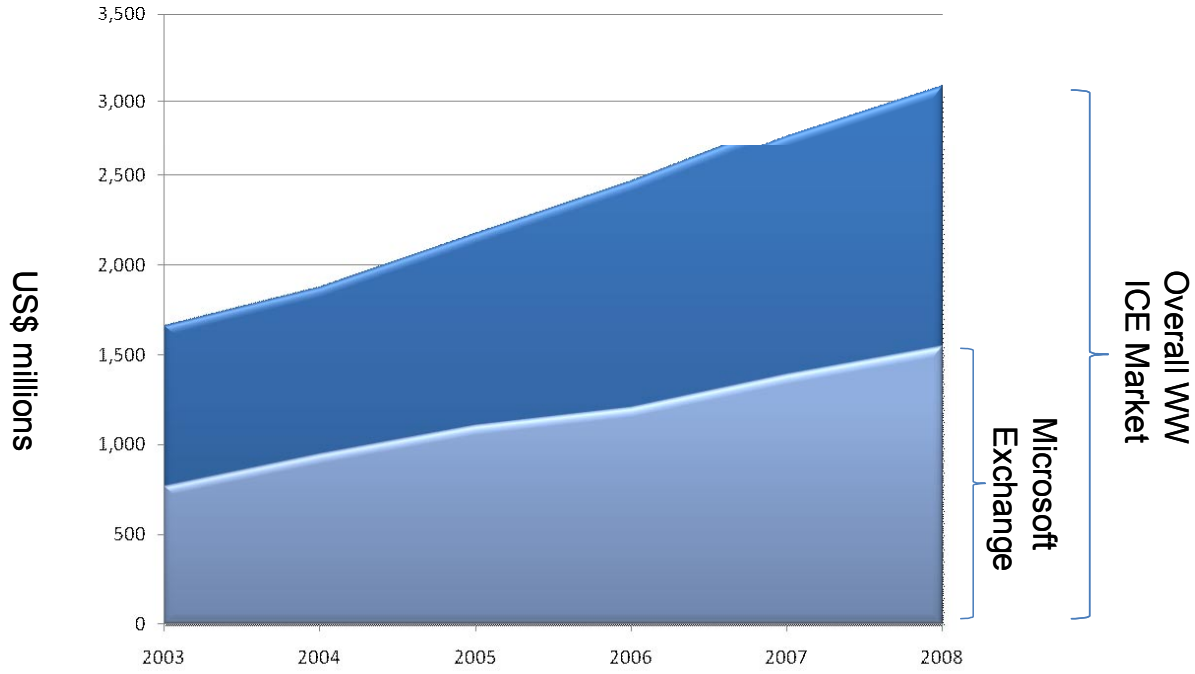
consumer email messages that IDC estimates are sent on an average day in 2009. Clearly, email has shown tremendous staying power. This is in part due to greater employee familiarity with the inbox paradigm and the use of the inbox as a virtual file storage system. But it is also due to vendor strategies to provide more functionality that used to require third-party products, integration, and management.

For example, Microsoft made an extension of its Active Directory schema the foundation for Microsoft Office Communications Server for enterprise instant messaging. And at the same time, Microsoft has tied identity management for related products to Active Directory, thus requiring that one Exchange server be installed. This strategy furthered customer reliance on buying Exchange servers, a trend which is reflected in the strong year-over-year growth enjoyed by Exchange today (see Figure 1). Further, and central to our premise in this paper, with Exchange 2003, Microsoft began a policy of turning to trusted technology partners for complex tasks such as automating many necessary but manual processes related to availability, redundancy, backup, and recovery of Exchange Server databases across multiple server roles (e.g., mail server, UM, antispam), multiple locations, and multiple server versions, deepening the opportunity for third-party vendors with Microsoft certification and expertise in managing active Exchange environments and artifacts.

The proliferation of Exchange as an ICE platform will continue with the availability of Exchange 2010. Many Exchange 2010 features will have implications for a firm's storage infrastructure. For example, Exchange 2010 delivers new, integrated email archiving functionality — including granular multi-mailbox search, item-level retention policies, and instant legal hold — making it easier for businesses to address compliance and discovery issues. This may result in increased storage capacity for messaging archived content that should be archived, as well as better availability based on redundant data stores. Another implication for storage is the integration of voicemail with email. With Exchange 2010, the traditional voicemail system can be replaced with a unified solution integrated into the core communications platform. This new system potentially obviates (or at least extends the functionality of) the on-premise enterprise PBX system and acts as a unified messaging (UM) system, enabling users to receive their voicemail messages right in their inboxes and manage those voicemail messages just as they do email, with familiar tools such as Outlook and Outlook Web Access. However, storing of voicemail within email will place new demands on storage capacity and user access requirements and add a "real-time" requirement to the asynchronous mail store.

FIGURE 1

Worldwide Integrated Collaborative Environment (ICE) Revenue Versus Microsoft Exchange Revenue, 2003–2008

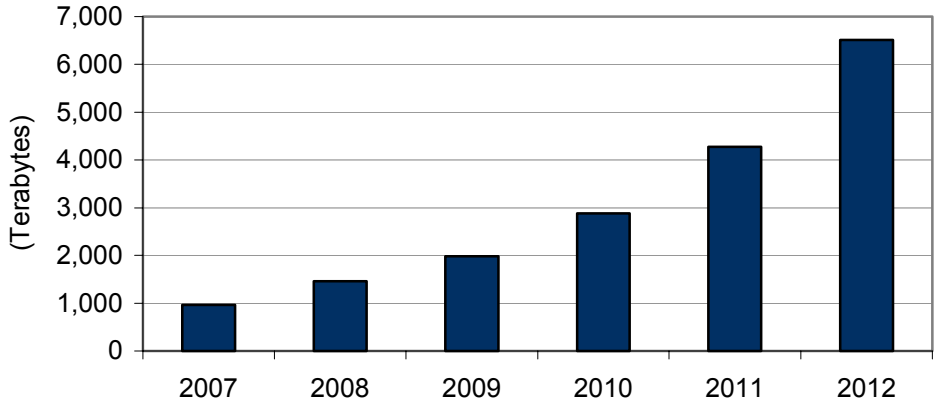


Source: IDC's Enterprise Collaboration and Social Solutions research, 2009

Recent IDC research shows that in addition to Exchange growth, enterprises are increasing the size and scope of their collaboration environments, with SharePoint emerging as a major driver of information growth (see Figure 2).

FIGURE 2

Worldwide Terabytes Shipped to Support Collaborative Workloads, 2007–2012



Source: IDC's Storage Workloads Research, January 2009

An IDC study entitled *Microsoft SharePoint Server Ecosystem and Customer Usage Trends* surveyed 300 U.S. organizations about their current and planned usage of SharePoint. SharePoint deployments play a major role in extending information access to a greater number of employees and opening access to a wider set of enterprise data assets.

This study found that respondents planned to expand their SharePoint deployments within the next 12 months to enable more employees to use the environment for collaboration. On average, respondents planned to enable 10% more of their employee population to access SharePoint so that the platform would be accessible to 60% of the organization. The largest increase was planned by organizations with 1,000 or more employees that intended to extend SharePoint usage to 19% more of their employees. Among these respondents, SharePoint was primarily used in an intranet setting, with the leading site usages being access to corporate information (66%) and project team sites (57%).

For larger firms, SharePoint sites easily encompass thousands of individual contributors and hundreds of different workspaces, often deployed in a non-uniform fashion and initially outside centralized IT architecture and planning. As SharePoint expansion occurs, enterprises must develop a centralized management strategy and standard deployment architecture to ensure data integrity, long-term scalability, and cost management.

Integration of Microsoft Exchange Server and SharePoint Server

With collaboration and communication so tightly interconnected, the integration between SharePoint and Exchange is relevant for particular use cases. SharePoint offers the capability to accept email messages and place their contents into SharePoint document libraries, discussion groups, and lists. This may be considered an alternative to Exchange public folders and for firms that want to use SharePoint as a records management system for email.

Integration with Other Content Repositories

Organizations also plan to integrate SharePoint with existing enterprise applications such as content management systems, records management systems, customer relationship management systems, and enterprise resource management systems so that SharePoint will increasingly serve as the entry point to accessing a wider set of operational data that is currently stored on enterprise-class storage systems.

While some firms may consider using SharePoint for records management, frequently larger firms already have deployed a series of content and records management repositories. The larger the firm, the greater the number of repositories in use.

A Fortune 100 international full-service banking institution has deployed over 200 different content and records management products. The challenge this firm and others of its size face is providing adequate levels of integration across these disparate content silos, which increasingly include SharePoint workspaces. While SharePoint contains some records and content management features, it is used more prevalently as a collaboration platform.

Information Management of SharePoint and Exchange Content

SharePoint sites are being used by more people, both as a focal point for information access and aggregation and as a project collaboration point where documents are created, revised, and shared. The volume and the importance of the information contained on SharePoint sites also heighten concerns about governance and data retention practices.

As SharePoint deployments grow to encompass a larger number of employees, the technology's role within the enterprise to facilitate collaborative processes and serve as a system of record for multiple types of enterprise information becomes strategic. It is now a business-critical application because much of the content it stores has regulatory, legal, or business implications. For example, an aviation provider stores its aircraft manuals and maintenance records in a SharePoint repository for regulatory review as necessary. In another example, an entertainment company stores its core product, its digital assets, in a SharePoint repository and makes it available to its creative teams via intranet portals.

Business worker users want the assurance that their files will be accessible and recoverable at will. Information management stakeholders such as legal, compliance, risk, and records officers must ensure that information contained within SharePoint sites is retained according to regulatory mandates; properly preserved pursuant to a legal hold order; or effectively searched as business, legal discovery, or audit demands dictate.

Additionally, information within Exchange messages (either sent or received), calendar items, or notes may be relevant to a records management program or responsive in an electronic discovery request. Absent a legal or regulatory preservation, discovery, retention, or disposition requirement, the message content may be important for business purposes such as finalizing the terms of a contract, establishing customer requirements, and the like. Firms are also increasingly cognizant of intellectual property protection and preventing either intentional or unintentional data leakage to external entities.

IT organizations require tools to ensure that the information in Exchange mailboxes or SharePoint sites is protected, managed, and maintained in a cost-effective manner that will support their internal and external policies for information management.

Implications of Exchange and SharePoint Adoption for IT Professionals

The high penetration rate of Exchange and SharePoint and the correspondingly high utilization rate of these products by employees have meant that IT professions are now maintaining these environments, planning and building new projects around SharePoint and Exchange, and thinking strategically about IT management objectives for these bedrock products, which will be a central focus for their companies in years to come. Managing Exchange provides IT professionals with ongoing challenges related to common tasks such as running backups of Exchange mailboxes and databases in service, providing quick access to backup images for user access and common compliance tasks such as nonrepudiation and legal discovery, and restoring individual mailboxes with a wide degree of choice around keyword, user, and group and by database. All of these tasks are common roles for Exchange administrators and other IT professionals, and some are partially automated by Exchange, but to do them well and at a granular level that provides choice and flexibility in serving their "customers," IT professionals typically look to more sophisticated messaging maintenance and storage automation products. IT managers of some organizations are even considering reducing IT costs by outsourcing the management of their messaging and collaboration platforms to hosted service providers.

Proliferation of Virtualization

Consolidation, improved disaster recovery, and greater resource utilization have fueled the adoption of server virtualization in the datacenter. The workloads that firms have placed on virtual machines have gone well beyond test and development to production applications. IDC research shows that the next wave of virtualization is occurring in the remote branch as firms go through hyperconsolidation of infrastructure in regional offices and branch locations.

With the growth in SharePoint and the increasing reliance on Exchange Server, firms are moving these workloads to virtual machines running on networked storage infrastructure. The use of networked storage enables firms to benefit from improved service levels around availability, workload balancing, recovery, and the like. As firms place more important workloads on a virtual machine, applications and virtual machines must be given the resources they need while virtual machine and storage administrators have visibility into the storage infrastructure. Lack of resources and visibility into the infrastructure can impact performance, availability, and utilization levels for Exchange and SharePoint workloads.

Enterprise Deployment Considerations

As firms downsize and IT organizations face budgetary pressures, cutting infrastructure costs through Windows storage consolidation becomes a common focus area while ensuring the underlying storage platforms meet the business objectives, including

performance and security. With Exchange 2007, Microsoft began providing data replication capabilities, such as LCR (local continuous replication), CCR (cluster-based continuous replication), and SCR (standby continuous replication). These continuous replication mechanisms have been consolidated and improved in a new mechanism called Database Availability Groups (DAG) available in the forthcoming Exchange release, Exchange Server 2010. These deployment choices not only mean a great deal more flexibility in how IT professionals treat local and network replication but also require insight and careful planning into system design, tied to an understanding of current and potential future site installation architecture. Further, replication choices have an impact on broader long-term backup initiatives such as compliance and continuity.

As firms look to reduce infrastructure costs, disparate Windows servers with dedicated disk can be consolidated onto networked storage, cutting cost while minimizing Windows sprawl. The combination of server virtualization and networked storage improves both computing and storage capacity utilization. And networking of Windows application storage also provides efficiency and manageability as shared storage can simultaneously replace Windows file servers, directly serving files to client desktops.

OPERATIONAL CHALLENGES WITH EXCHANGE AND SHAREPOINT DEPLOYMENTS

Historically, storage was deployed as direct-attached storage (DAS) connected to a server by connects such as parallel SCSI cables. However, storage was accessible only from that server. Today, networked storage allows for sharing storage to a group of servers over interconnects such as Fibre Channel storage area networks (SANs) and Fibre Channel over Ethernet (FCoE), Internet Small Computer System Interface (iSCSI) or network-attached storage (NAS) using CIFS/SMB, Lightweight Directory Access Protocol (LDAP), and the Kerberos authentication protocols. Exchange implementations often start out as or are quickly migrated to shared Fibre Channel SAN or iSCSI storage configurations due to the inherent manageability, availability, and recovery benefits. However, SharePoint deployments frequently start as a "one-to-one" deployment, a single server with DAS. In isolated workgroup and departmental implementations, this approach is a quick way of deploying a new application. Although, for SharePoint implementations across a broader number of employees or sites, installation of the Microsoft Office SharePoint Server, SQL Server, IIS Web servers, and media server components must be spread across a growing pool of servers, each of which must be separately serviced, provisioned as needed, and backed up.

Firms deploying Microsoft SharePoint and upgrading their environments to Microsoft Exchange 2010 can benefit from improved manageability, recovery, and availability by consolidating separate DAS storage into a networked storage configuration. Moreover, firms can also increase utilization rates for the storage infrastructure. A shared storage configuration enables simplified storage administration and added flexibility because cables and storage devices do not have to be physically moved to shift storage from one server to another. Other benefits include improved availability by offering redundant paths from the server to the storage and shorter recovery times by using disk-based snapshots, replicas, or clones for restores. Utilization of storage capacity can also be increased by moving to networked storage.

Moving from a direct-attached storage to a networked storage infrastructure can also address other operational and administrative challenges specific to Microsoft Exchange and SharePoint deployments. The tiered architecture of SharePoint, the growth in Exchange message volume, the use of SharePoint by broader numbers of employees, and the pervasive uses of these applications in today's business processes raise several practical IT challenges. Table 1 lists some of these challenges.

TABLE 1

Common IT Administration Challenges Associated with Extensive Exchange and SharePoint Deployments

Escalating storage costs	With increasing storage consumption, eliminating the need to store redundant data within or across Exchange servers and SharePoint sites is essential in curbing storage costs and optimizing performance and backup processes. Other storage optimization features such as thin provisioning and space-efficient snapshots should also be considered, driving power, cooling, and footprint savings
Capacity planning	End-user teams and IT administrators need to guess how much storage they might need for each instance over the next two years and then preprovision that capacity, much of which is wasted.
Storage provisioning	Server site, object volume, and user growth frequently drive a spike in storage consumption. To avoid downtime and loss of availability, firms must meet storage demands and storage administrators must provision capacity quickly, at the right performance level and in a capacity-efficient manner, to eliminate overprovisioning.
Regulatory and legal compliance	Firms need to manage risk associated with information in Exchange mailboxes and SharePoint sites. Mitigating this risk means that content within Exchange and SharePoint is retained for prescribed periods of time according to regulatory mandates, able to be disposed of in a secure manner once an object has expired, and preserved pursuant to a legal hold order or preservation order. Moreover, fuzzy, Boolean, and concept search capabilities across Exchange and SharePoint content are increasingly becoming mandatory during electronic discovery.
Consistent recovery	Snapshots or backups of each component or tier must be done in concert with the other tiers to ensure consistent and valid recovery. This requires full fidelity backups, from an individual content item to an entire SharePoint environment and all of its farm-level components, maintaining all metadata, securities, and version histories. For Exchange environments, this means the ability to recover not only a server but also discrete mailboxes or messages.
Granular recovery	Most backup approaches for SharePoint (or Exchange) offer backup and recovery capability that ensures recovery from corruption or component failures. However, if files (or messages) are accidentally deleted, file recovery requires the restoration of a site (or mailbox), either in place or to a different server.
Indexing impacts	SharePoint performs a full content index of the content it maintains. The time it takes to create this index depends on the amount and type of data being indexed. An 8TB storage system can take as long as three days to index. The duration of the index process is I/O intensive and can impact processes such as backup windows.
Disaster recovery	Businesses need to recover not only from operational errors, logical corruption, or hardware failures but also from site-level failures or regional disasters. A tiered architecture in concert with a DAS storage configuration makes recovery from a disaster in a consistent fashion problematic. Exchange and SharePoint configurations that rely upon a virtualized SAN configuration can make use of a more streamlined shared storage recovery process.
Manageability	The tiered SharePoint architecture (SharePoint, IIS, SQL, and media server) components deployed on separate physical machines can increase cost and management overhead. They can also mean increased complexity and time in performing storage provisioning, health checks, and performance and availability monitoring tasks.
Asset visibility	As Exchange or SharePoint data grows, the number of servers grows. This growth makes tracking resources difficult. Part of the effective management of an Exchange or a SharePoint environment includes visibility and autodiscovery of servers with adequate mapping of the component relationships.

TABLE 1

Common IT Administration Challenges Associated with Extensive Exchange and SharePoint Deployments

Meeting service levels	Business dependency on Exchange requires meeting service-level requirements for availability, reliability, and recovery across server roles, locations, and server versions while reducing costs and freeing up IT resources.
Automation	Automating manual IT processes relating to availability, redundancy, backup, and recovery of Exchange databases.
Maintenance	A tiered architecture not only adds more physical server hardware but also increases the complexity of and time for routine tasks such as software patches, security updates, and health and performance monitoring.
DAS versus SAN for Exchange	The deployment of Exchange in a DAS storage configuration can stymie availability, provisioning, and performance, and most DAS Exchange implementations face low utilization rates. SAN (Fibre Channel or iSCSI) implementations offer thin provisioning to avoid downtime as well as high availability and improved backup and recovery.
Exchange migrations	Exchange 2003 and Exchange 2007 sites will need to plan for migration to Exchange 2010, which, although offering some compelling features and cost reductions, will not be trivial. Networked storage can support migrations in a nondisruptive manner without compromising service levels or recovery capabilities.
Development and testing	Exchange and SharePoint deployments in the context of records management or for intranet portals often bring about requirements for custom development work to align out-of-the-box functionality with a particular business unit's set of requirements. This means another application for IT to maintain and the need for test and development sites for upgrades and refreshes while minimizing storage capacity required for test and development and ease of recovery to a particular application point in time during testing.

Source: IDC, 2009

NETAPP: SCALABILITY, FLEXIBILITY, AND STORAGE EFFICIENCY FOR THE ENTERPRISE

NetApp is a leading worldwide supplier of storage and information management solutions for enterprises. It delivers a broad portfolio of systems, software, and support services designed to provide organizations with a scalable, flexible, and efficient foundation for storing, accessing, and protecting valuable information assets.

At the core of NetApp's solutions is a family of unified networked storage systems that scale from compact solutions designed to meet the storage requirements of small and medium-sized businesses (SMBs) or remote offices to large, high-performance systems designed to meet the intense storage workloads of the largest enterprises. NetApp solutions support multiple connection options (e.g., Fibre Channel, iSCSI, NFS, FCoE, and CIFS) so that companies can leverage a common storage asset while having flexibility in selecting the optimal connection option for different applications.

The unifying force underlying all NetApp storage systems is a common set of storage services based on a single software architecture (Data ONTAP). From the largest systems to the smallest systems, IT organizations need to learn and use only one set of tools for storage provisioning/management, data protection, remote data replication, and data retention. Table 2 provides a list of important storage use cases and a

partial list of NetApp capabilities that enhance enterprises' storage processes in support of applications such as Exchange and SharePoint and that address many of the challenges outlined in Table 1.

NetApp's portfolio of solutions are tightly integrated with a range of virtualization offerings, including those from VMware, Microsoft, and Xen. NetApp is extending its history of application-level integration to combine storage infrastructure and server virtualization to deliver datacenter management efficiencies, cost savings, and data protection for customers.

NetApp's virtualization support allows for reduced datacenter costs and improved application availability and disaster recovery. Integrating NetApp storage and server virtualization improves scalability. Standing up a virtual machine means allocating storage and provisioning a server in minutes, and utilization is improved while using up to 50% less storage. Lastly, a firm can improve upon its disaster recovery and application availability by cutting out backup windows and recovering virtual machine–critical data with application-consistent backups.

TABLE 2

NetApp Architectural Components and Their Usage

Use Case	NetApp Component(s)	Customer Benefit(s)
Consolidation of information on shared storage	Replace isolated DAS pools with consolidated SAN-attached storage systems; using Snapshot copies for space-efficient replicas in backup	Larger aggregate capacity including support for multiple tiers; simplified data management; increased data availability with RAID-DP technology; highly scalable with modular expansion; unified architecture with support for multivendor storage (Additional consolidation of information on shared storage drives increases storage efficiency.)
Fast, efficient backup and recovery	Multiple NetApp Snapshots for many point-in-time (PIT) replicas with little impact on performance; multiples allow frequent checkpoints; integration between SnapManager for Exchange, SnapManager for SharePoint Server, and SnapManager for SQL Server (NetApp Snapshots and Snapshot management provide tight integration with Microsoft technologies such as Volume Shadow Copy Service [VSS] for consistently capturing the state of the application.)	Choice of points in time upon which to perform additional data manipulation; minimal data loss; any size database; Snapshot copies verified for integrity and then stored; instantaneous access to backup copies
Granular recovery	SnapManager for Exchange, NetApp Single Mailbox Recovery for Microsoft Exchange, and SnapManager for Microsoft Office SharePoint Server	Enables administrators to execute granular retrievals in minutes versus hours of manual effort, establish and verify email evidence for compliance or legal requests, and find individual emails or SharePoint elements across mailboxes and sites
Simplified storage provisioning	Data ONTAP operating environment and FlexVol space-efficient provisioning	On-demand storage provisioning; shared storage resource; built-in storage growth for easy nondisruptive expansion; high performance; quick time to value; tight integration with Microsoft Microsoft Management Console (MMC) and VSS

TABLE 2

NetApp Architectural Components and Their Usage

Use Case	NetApp Component(s)	Customer Benefit(s)
Storage and data management	SnapManager for Microsoft Office SharePoint Server, SnapManager for Exchange	Autodiscovery of Exchange databases or SharePoint components and data sets across the enterprise that enables automated backup to ensure protection
Data deduplication	Data ONTAP operating environment	Deduplication integral, not an add-on feature; eliminates duplicate data and reduces space consumption accordingly; as high as 20:1 reductions; application transparent for primary (production), secondary (backup), and archival storage; low overhead; no complex hashing tables; addresses space, power, and energy costs
Full datacenter backup and recovery	Replicated copies using SnapVault; SnapManager for Microsoft Office SharePoint Server; SnapManager for SQL Server, SnapManager for Exchange	Offsite separation to protect from regional disasters, fires, floods, and other weather incidents; improved storage efficiency; optional backup to tape; rapid recovery of data; backup verification can be done on replicas created at a separate site
Archiving and compliance	Data ONTAP, SnapLock	Long-term or active archives, used in concert with regulatory retention and legal requirements; cost savings in use of high-capacity SATA drives and SEC-compliant WORM disk storage
Disaster recovery	Data ONTAP, SnapMirror, SnapDrive for Windows, SnapManager for Microsoft Office SharePoint Server, SnapManager for Exchange	Fast recovery to a consistent point, enabling business to restart operations
Development and testing	NetApp FlexClone technology	FlexClone volumes use space very efficiently, storing only data that changes between the parents and clone and bringing savings in dollars, space, and energy without sacrificing performance; clones are created within seconds and become accessible immediately

Source: IDC, 2009

One of the common design points across this portfolio of integrated features is boosting efficiency in terms of asset utilization and operations (e.g., NetApp's on-demand storage provisioning and data deduplication functions). This focus is especially critical for highly redundant messaging environments such as Exchange as well as collaborative applications such as SharePoint where information creation and reuse is both rapid and unpredictable. Without this focus on efficiency, the storage growth and management challenges associated with applications such as Exchange and SharePoint can be highly disruptive to storage operations in the datacenter.

NetApp Solutions for Exchange and SharePoint: Automation and Optimization

The final element in NetApp storage solutions is a recognition that advanced services must be optimized to address the unique requirement of critical business applications. NetApp delivers targeted solutions that simplify and/or automate configuration and

storage management tasks associated with specific applications. Critical applications addressed directly by NetApp products include:

- Microsoft Exchange, SharePoint, and SQL Servers
- Virtual Infrastructure (VMware, Citrix, and Microsoft)

NetApp's Exchange solutions enable cost reduction, simplified data management, and improved availability for messaging and unified communications systems. Standing up Exchange 2007 or 2010 on NetApp storage allows for storage cost reduction through deduplication, thin provisioning, and space-efficient snapshots. Exchange Server data is protected and recovered quickly. As messaging volume grows, storage capacity can be added nondisruptively and service levels for availability can be met. In the event of a site-level disaster, the messaging environment can quickly be failed over to an alternate site for continuity of business. Lastly, regulatory and legal requirements can be achieved by data retention, discovery, and search capabilities.

In the case of SharePoint, the focus is on reducing administrative overhead and improving application availability as SharePoint instances and information sets expand. The integrated capabilities include autodiscovery of data sets and configurations, integration with application-specific data management facilities, and coordination of data protection and disaster recovery processes. This integration also makes it possible for IT administrators in charge of SharePoint environments to transparently take advantage of NetApp's storage efficiency capabilities, reducing downtime associated with upgrades and expenditures of new storage capacity.

Challenges

A general challenge that all storage suppliers face is the need for greater content awareness of the data their storage systems house. Delivering the right levels of performance, reliability, and availability to an application is no longer enough.

Block-based storage lacks any awareness of the content within the data it stores. It deals at the byte level. File storage deals at the file system level, which provides more granular information but is still limited to rudimentary characteristics (file type, date created, etc.). Neither approach, on its own, understands the value of this data to the organization, be that based on the intrinsic value of the intellectual property or the intrinsic risk associated with its loss or misuse. In the future, enterprise storage solutions will increasingly need to be more knowledgeable about the content of the data. Being more cognizant about the data resident inside a storage system affords greater levels of data management by the storage system itself; for example, supporting things such as content-triggered migrations between tiers of storage or supporting up-front classification and optimal data placement.

Exchange 2010 has some compelling improvements, focused on lowering costs, information protection, meeting compliance requirements, built-in archiving, and improved performance with lower-cost storage configurations. Some of these capabilities may impact user perceptions or adoption of other infrastructure technology. Storage suppliers such as NetApp must offer clear value demarcation between what Exchange 2010 will provide and what value is provided by storage

systems and storage software infrastructure. Doing so will be critical until such time as the user community fully understands the extent of the current 2010 feature set. Moreover, as Exchange 2010 becomes available, firms will need to plan for Exchange 2003 or Exchange 2007 upgrades to Exchange 2010.

As a growing portion of this enterprise content is stored or organized within SharePoint, an even greater awareness of SharePoint data sets among storage systems is critical. Such awareness can inform more intelligent content–centric policies for migration, search, preservation, retention, and disposition. Storage solutions need to leverage services such as indexing, classification, and search for policy-based management, data migration, and intelligent tiering based on content-triggered rules.

CONCLUSION

As Exchange volume continues to scale and SharePoint usage reaches critical mass for a firm, the need for management, scalability, reliability, compliance/legal, and cost containment capabilities becomes critical. Making the right architectural storage decision can have a profound effect on addressing these requirements and enable Exchange and SharePoint to scale to enterprise-ready deployments.

NetApp, with its broad portfolio of shared storage systems and sophisticated (but easy-to-use) storage and information software solutions such as SnapManager for Microsoft Office SharePoint Server, provides an enterprise-class foundation for scaling, managing, and protecting SharePoint applications and information. It enables storage optimization, data protection and recovery, manageability, and risk mitigation capabilities. NetApp's comprehensive set of features and options is also essential for reliably and cost-effectively growing Exchange and SharePoint environments in the current budget-constrained economic climate.

Infrastructure costs can be reduced by consolidating disparate Windows servers with dedicated disk onto networked storage. Server virtualization in concert with networked storage for Exchange and SharePoint workloads improves both computing and storage capacity utilization, offering increased efficiency and improved manageability.

The bottom line for enterprises is that the combination of NetApp storage solutions and Microsoft's Exchange Server and SharePoint Server environments makes it possible for IT organizations to guarantee that their collaboration environment is enterprise ready.