An integrated approach to optimizing SharePoint infrastructures

By Dave Jaffe, Dave Zenz, and Dan Holme

Through integrated data management, the Dell™ SharePoint Infrastructure Optimization solution helps enterprises achieve their capacity planning, service-level agreement, governance, and performance objectives for the Microsoft® SharePoint® platform.

Organizations are increasingly adopting Microsoft SharePoint Server collaboration software as the standard mechanism to manage and gain value from enterprise content. This reliance on SharePoint, as well as the rapidly rising volume of business-critical content, is challenging IT to adequately architect the underlying infrastructure to match and grow with organizational usage.

Bringing storage and data management into their main SharePoint environment enables organizations to unify SharePoint operations, which helps reduce capital costs, operating expenses, and outage risk. This unification requires a comprehensive approach to SharePoint infrastructure that is designed to seamlessly grow with the organization—supporting tier 1 applications and their service-level agreements (SLAs), improving end-user performance, enhancing manageability, and consolidating SharePoint unstructured content and backup and archive data sets.

The Dell SharePoint Infrastructure Optimization solution is designed to interoperate with and optimize existing SharePoint deployments with no disruption to the applications. The solution addresses three main use cases:

- Proactive capacity planning and management that help drive improved capacity utilization and performance
- Business continuity to help ensure organizations achieve their backup windows, the SharePoint infrastructure is backed up, and time to restore is as fast as possible
- Flexible and scalable governance through automated archiving with data-in-place capacity optimization

Facilitating SharePoint management and migration

Dell SharePoint Infrastructure Optimization combines the scalability of the Dell DX Object Storage Platform and the management capabilities of the AvePoint® DocAve® Software Platform to enable comprehensive,
fully integrated life cycle management and migration for SharePoint enterprise content.

**Simple, scalable fixed-content storage**

The DX Object Storage Platform is an innovative storage platform that combines ease of management with scalability and resilience. It stores data—whether SharePoint content, a backup data set, or an archived SharePoint site—as an object instead of a collection of bytes.

The DX Object Storage Platform is designed to scale with ease. It creates one storage pool with a global address space to consolidate SharePoint binary large objects (BLOBs) and backup and archive data sets. The platform enables organizations to scale SharePoint to multiple petabytes with no service disruption. Moreover, SharePoint capacity is virtualized, and data is automatically thin-provisioned.

The DX Object Storage Platform includes several powerful data and storage management capabilities. It is self-managing, which allows SharePoint access to be inherently and automatically load balanced. The platform’s self-healing capability is designed to enable automatic verification of SharePoint content for consistency and make repairs if necessary. In addition, policy-based transactional replication for SharePoint BLOBs avoids the need for recovery point objective (RPO) scheduling.

**Enterprise-class management for SharePoint governance**

The AvePoint DocAve suite is a fully integrated software platform for SharePoint management, protection, and storage optimization. The distributed architecture of DocAve enables exceptional scalability of the SharePoint architecture, as well as unified storage management of global SharePoint content on the Dell DX Object Storage Platform. It provides the tools necessary to streamline and automate common yet time-consuming tasks that burden IT administrators, such as daily permissions management.

DocAve provides insight into how SharePoint is being leveraged by end users, so IT managers can make informed decisions on how to structure, manage, and grow SharePoint environments. It also enables IT managers to quickly recover accidentally deleted or corrupted SharePoint content to help IT comply with stringent corporate SLAs and minimize business disruption. Using DocAve, architects can expand SharePoint storage and server architectures, leading to high quality of service for global users while keeping costs in check.

**Integration for optimized, automated SharePoint management**

The DX Object Storage Platform and DocAve work together to deliver comprehensive, integrated SharePoint management that can be tailored for an enterprise’s needs. DocAve uses DocAve Manager and DocAve Agent components that provide various features and services for SharePoint management. For example, the DocAve Migration function, combined with the DX Object Storage Platform, helps organizations simplify the migration of existing enterprise content, Microsoft Exchange public folders, file systems, and previous versions of SharePoint into SharePoint 2010.

The DocAve Extender function and the DX Object Storage Platform help improve SQL performance and reduce SQL capacity requirements, effectively minimizing backup and restoration challenges. Offloading BLOB data from Microsoft SQL Server® databases to the DX Object Storage Platform enables improved SQL performance as well as seamless end-user access and interaction.1

Working with the DX Object Storage Platform, the DocAve Archiver function is designed to automate SharePoint archiving through business-driven rules to apply content life cycle management. This capability allows administrators to automate the process of offloading fixed or stale SharePoint content consuming valuable SharePoint resources to easily manageable, peer-scaling DX Object Storage.

The DocAve Backup and Restore function and the DX Object Storage Platform enable administrators to quickly restore lost or corrupt assets, including content externalized with the DX Object Storage Platform and DocAve storage.

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1 For more information about the potential benefits and considerations of incorporating BLOB externalization into SharePoint content storage strategies, see “Optimize SharePoint storage with BLOB externalization,” by Dan Holme, Randy Williams, and Jeremy Thake, 2011, qrs.ly/j81p6yp.
management software. Metadata and dependencies remain intact to help ensure minimal business disruption.

Understanding the data flow and architecture
Deployment of Dell SharePoint Infrastructure Optimization enhances the resultant data flow by offloading the BLOB, backup, and archive flows from the main SharePoint environment (see Figure 1). This augmented data flow serves to provide a parallelism of access to SharePoint, both for the end user as well as IT services, and also optimizes the operation of the underlying SQL Server database server. A user request for an item stored in SharePoint or an IT service request will be directed to the SQL Server database or to the Dell DX Object Storage Platform, depending on where that particular object is stored.

Implementation of hardware components
The architecture of Dell SharePoint Infrastructure Optimization with the AvePoint DocAve Software Platform is based on a medium SharePoint farm that supports up to 5,000 users, as defined by Dell. In this example architecture, SharePoint is implemented on four servers: two SharePoint Web front-end servers for high availability, a SharePoint application server, and a SQL Server database server for SharePoint (see Figure 2). The SharePoint infrastructure includes a highly available Dell DX Object Storage cluster comprising primary and secondary DX6000 cluster services nodes and two DX6012 storage nodes, each with twelve 1 TB disks.

Configuration of SharePoint
In the Dell SharePoint Infrastructure Optimization architecture, SharePoint roles are assigned to the various servers to help maximize performance and availability. The administration and crawl components are assigned to the application server while the search index is spread across both Web front-end servers, with each Web front-end server’s index portion mirrored on the other Web front-end server. This configuration enables high performance by spreading the work across multiple servers as well as high availability. The two Web front-end servers are load balanced using Microsoft Network Load Balancing.

Evaluating the performance of DocAve features
In July 2011, Dell engineers in the Dell Solution Centers tested the functionality of AvePoint DocAve Extender, Archiver, and Backup and Restore in the Dell SharePoint Infrastructure Optimization architecture. Two large, 200 GB site collections were built for testing the Remote BLOB Storage (RBS) feature of SQL Server as implemented by DocAve Extender. Two smaller 10 GB collections were built for testing DocAve Archiver and Backup and Restore. The content databases holding the large site collections were stored on their own 400 GB volumes on the Dell EqualLogic™ PS6010XV storage area network (SAN) array. The smaller site collections’ content databases were stored on a third volume.

2 For more information about deploying a medium SharePoint farm, see “Microsoft SharePoint Server 2010: Designing and implementing a medium farm,” by Ravikanth Chaganti and Kevin Quinn, May 2010, qtn.ly/6pZQa.
DocAve Extender for improving SQL performance

The RBS feature of SQL Server 2008 helps improve SharePoint functionality by removing the BLOBs, such as large PDF files, from the SQL Server database, replacing them with stubs, and storing them on external storage. DocAve software contains an RBS provider through its Extender feature.

To test the Extender functionality through BLOB removal from an existing SharePoint site, one of the large 200 GB site collections, SC2, had all BLOBs larger than 1 MB externalized to the Dell DX Object Storage cluster, and then its content database was compacted using the SQL Server shrink function. In just more than seven hours, 4,800 BLOBs (24 per site) were moved from SQL Server to the DX Object Storage cluster. Upon completion, the content database was compacted to 6.5 GB from its original 206 GB, a reduction of 97 percent.

To quantify the effect of BLOB externalization on SQL Server database performance, SQL Server backups and restores were performed on the content databases of the two 200 GB site collections. Dell engineers found that backing up the extended site collection was 29 times faster than backing up the nonextended site collection, and restoring it was 32 times faster.

To further evaluate the effect of DocAve Extender on SharePoint end-user performance, Dell engineers built a load test to simulate typical SharePoint use and ran it against both the site collection with BLOBs still in the SQL Server database (SC1) and the site collection with BLOBs externalized to the DX Object Storage cluster with DocAve Extender (SC2). Four typical use cases—browse, download file, upload file, and search—were modeled. Browses represented end users visiting various site home pages as well as certain list pages. Downloads and uploads involved the same set of files of varying sizes that were used to build each site. Search used a common set of technical search terms relevant to the file set. All tests were run against all 200 sites of each site collection.

The four use cases were run in a proportion that modeled the SharePoint Capacity Planner (SCP) heavy collaboration usage profile. In each test, 1,000 simulated users were run for 60 minutes, with a 60-second think time inserted between operations so that each user would issue roughly one request per minute, in accordance with the SCP.

Using DocAve Extender to move BLOBs from SQL Server to the DX Object Storage Platform, Dell engineers observed performance improvements of 17 percent to 40 percent for the four use cases.

DocAve Archiver for offloading content

DocAve Archiver moves objects meeting certain criteria—when last accessed, size, and so forth—from SharePoint to the DX Object Storage Platform and maintains them there according to a specified retention policy. To test this functionality, all objects greater than 1 MB from the 10 GB site collection SC3 were archived. The operation took 24 minutes to archive 240 files, and the content database ended up less than 1 GB in size after the shrink operation.

DocAve Backup and Restore for robust data protection

DocAve Backup and Restore provides full or incremental backup of specified sites, site collections, or content databases to the DX Object Storage Platform. To test this feature, Dell engineers created a full backup of a 10 GB site collection, SC4, and then restored the collection from the backup. Backup took almost 23 minutes to back up 2,642 items; it took roughly 17 minutes to restore these items.

Unifying operations for high performance, manageability

Dell SharePoint Infrastructure Optimization consolidates SharePoint unstructured content, backup, and archive data sets on the Dell DX Object Storage Platform. The solution stack includes components of the AvePoint DocAve Software Platform and Dell hardware. In functional and performance tests conducted by Dell engineers, Dell SharePoint Infrastructure Optimization demonstrated exceptional SQL performance and fast offloading, backup, and restore of SharePoint content. The results of this study indicate that Dell SharePoint Infrastructure Optimization, when deployed in existing SharePoint environments, helps organizations improve SharePoint manageability and end-user performance, reduce capital and operational expenditures, and increase SharePoint service quality.

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