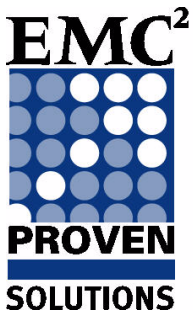




# EMC Scalable Architecture for Microsoft SharePoint Server 2007

Enabled by EMC Symmetrix DMX-4

Reference Architecture



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EMC Scalable Architecture for Microsoft SharePoint Server 2007 Enabled by EMC Symmetrix DMX-4 Reference Architecture

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# About this Solution

This document describes the reference architecture of the EMC Scalable Architecture for Microsoft SharePoint Server 2007 Enabled by EMC Symmetrix DMX-4 solution, tested and validated by EMC® Global Solutions Operations.

The validated solution demonstrates a well-performing design for a Microsoft Office SharePoint Server 2007 server farm utilizing EMC Symmetrix® DMX-4 Series storage with large, active databases.

## The business challenge

In today's fast-paced business organizations, huge volumes of unstructured content are created on a daily basis. This unstructured content includes documents, e-mail, video files, and web pages. It is often in an unmanaged state and prevents organizations from using the content for information sharing and increased efficiency.

## The technology solution

Portal sites connect people within an organization to business-critical information, expertise, and applications. Microsoft Office SharePoint Server is a world-class enterprise portal platform that makes it easy to build and maintain portal sites for every aspect of a business. By using portals, organizations can streamline processes and transactions, increase employee productivity, and strengthen relationships with customers and partners.

This solution demonstrates how organizations can:

- Manage diverse content and streamline business processes
- Provide enterprise scalability and document collaboration
- Enable affordable, uniform high availability across an environment

- Ensure a more effective, streamlined method of handling growing volumes of data
- Limit impact on server resources and networks

## Key solution components

This section briefly describes the key solution components. For details about all of the components that make up the solution, see [“Hardware resources” on page 8](#) and [“Software resources” on page 8](#).

### Microsoft Office SharePoint Server 2007

Microsoft Office SharePoint Server 2007 is an integrated suite of server capabilities that can help improve organizational effectiveness by providing comprehensive content management and enterprise search, accelerating shared business processes, and facilitating information-sharing across boundaries for better business insight.

### Microsoft SQL Server 2005

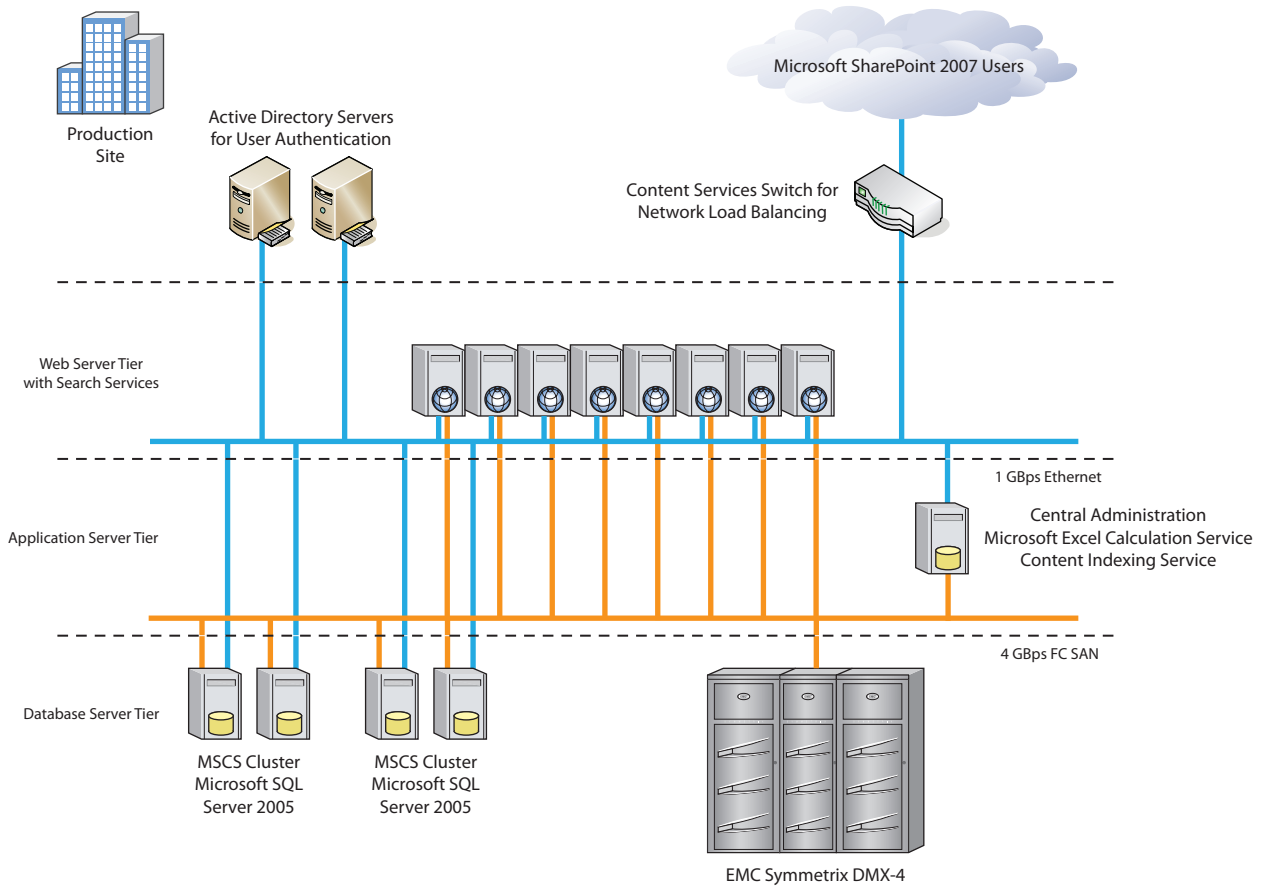
Microsoft SQL Server 2005 is a comprehensive, integrated data management and analysis software that enables organizations to reliably manage mission-critical information and confidently run today’s increasingly complex business applications. Microsoft SQL Server 2005 allows companies to gain greater insight from their business information and achieve faster results for a competitive advantage.

### EMC Symmetrix DMX-4 Series

EMC Symmetrix DMX-4 enables you to manage and protect all of your data—more than 1 petabyte of storage—and keep it available at all times. Symmetrix DMX-4 provides customized Flash drives that break the performance barriers of traditional disk technology because they are optimized to meet high-end storage requirements. DMX-4 also delivers built-in RSA security technology to keep your critical data safe, as well as high availability to ensure constant data access. Best of all, the DMX-4 is energy efficient and easy to manage.

## Physical architecture

Figure 1 illustrates the overall architecture of the solution.



**Figure 1 Physical architecture**

## Solution design

This solution demonstrates a Microsoft Office SharePoint Server 2007 server farm designed for document collaboration. The solution is scaled at an enterprise level and uses a three-tier web application architecture.

### Web server tier

The first tier handles connections to the web portal and consists of several web servers, or web front ends. The web front ends serve the web pages that constitute the portal. These pages provide access to documents and collaboration features. The web front ends are presented to users through a content services switch or another method of network load balancing. The web server tier also provides query services that generate results for searches initiated by the web front ends. Each web server has a local copy of the search index maintained by the indexing service. If a web server were to fail, search services would still be available from the other web servers.

In the solution as validated, activity on the web front ends is load balanced by a network load balancer. The load balancer allocates users across eight web servers using a round-robin policy.

### Application server tier

The second tier is an application server tier that consists of one application server. This server hosts central administration, Microsoft Excel calculation services, and a content indexing service. The indexing service parses new content and updates the query database on the web front ends.

### Database tier

The third tier is a database tier. Microsoft SQL Server 2005 databases store both content and Microsoft Office SharePoint Server 2007 server farm management databases such as the configuration database and the metadata database supporting the search capabilities.

The servers in this tier are configured as two Microsoft Cluster Services (MSCS) physical clusters. Each cluster is a two-node active/passive cluster, which offers the greatest level of high availability.

In the solution as validated, the document content resides in 25 content databases distributed across the two clusters. Collectively, the clusters host 5 TB of document content (the equivalent of more than 22 million documents) of the following document types: DOC, DOCX, GIF, JPG, MPP, PPT, PPTX, VSD, XLS, and XLSX.

## Hardware resources

The hardware resources used to validate the solution are listed in [Table 1](#).

**Table 1**      **Hardware**

Equipment	Quantity	Configuration
Web front-end server	8	Dell 1950, 2 dual-core CPUs, 3.0 GHz, 4 GB RAM
Application server	1	Dell 6850, 4 dual-core CPUs, 3.0 GHz, 32 GB RAM
Database server	4	Two MSCS clusters Active nodes: Dell 6850, 4 dual-core CPUs, 3.0 GHz, 32 GB RAM Passive nodes: Dell 6850, 4 CPUs, 2.4 GHz, 8 GB RAM
Network switch	1	Cisco Catalyst 6509
Content services switch	1	Cisco CSS-11503
Fibre Channel switch (SAN)	1	Cisco MDS 9500 4 GB
Storage array	1	EMC DMX-4 4500 Series array with Enginuity® (version 5772.83.75)

## Software resources

The software resources used to validate the solution are listed in [Table 2](#).

**Table 2**      **Software**

Software	Version	Configuration
Microsoft Windows Server 2003 Enterprise Edition R2	SP2 64-bit	Installed on web front-end servers, application servers, and database servers
Microsoft SQL Server 2005 Enterprise Edition	SP2 64-bit	Installed on database servers
Microsoft SharePoint Server 2007	SP1	Installed on web front-end servers and application servers
EMC Solutions Enabler	6.3.2.0	Installed on application servers and database servers
EMC PowerPath®	5.1.1	Installed on application servers and database servers

## User load profiles

During validation, a Microsoft “Heavy” user load profile was used to determine the maximum user count that the Microsoft SharePoint 2007 server farm could sustain while ensuring that average response times remained within acceptable limits. Microsoft standards state that a heavy user performs 60 requests per hour; that is, a request every 60 seconds. [Table 3](#) lists the acceptable limits for Microsoft SharePoint 2007 user operations.

**Table 3** Acceptable user response times

Type of operation	Example	Acceptable user response time
Common	Browse	< 3 seconds
Common	Search	< 3 seconds
Uncommon	Modify	< 5 seconds

Three user profiles were tested to help determine scalability. [Table 4](#) lists the user profiles and corresponding response times.

**Table 4** User profiles

User activity as percentages (browse / search / modify)	User load profile	Requests per second	Concurrency	Maximum user capacity	Average user response time in seconds (browse / search / modify)
80 / 10 / 10	Heavy	22	1	132,000	< 3 / < 3 / < 3
70 / 5 / 25	Heavy	31	1	186,000	< 3 / < 3 / < 3
50 / 20 / 30	Heavy	30	1	180,000	< 3 / < 3 / < 3

## Content load profile

Table 5 presents the content load profile used during solution validation.

**Table 5** Content load profile

Content Type	% of Documents	Number of Documents
.doc	20	4,399,458
.docx	20	4,399,459
.xlsx	20	4,399,459
.pptx	20	4,399,458
.mpp	5	1,099,865
.jpg	5	1,099,865
.gif	5	1,099,864
.vsd	5	1,099,864
<b>Total</b>	<b>100</b>	<b>21,997,292</b>

## Conclusion

Sizing and configuring a Microsoft Office SharePoint Server 2007 server farm can be a complex activity. Many requirements must be considered and fully understood during the planning phase.

Time and attention must be invested to gather current and future requirements. The way in which the infrastructure is to be used, along with the nature of business operations, should determine where resources are allocated to reduce the potential for environment bottlenecks in the future.

EMC can help accelerate assessment, design, implementation, and management while lowering the implementation risks and cost of creating a Microsoft Office SharePoint Server 2007 server farm.

To learn more about this and other solutions, contact an EMC representative or visit [www.EMC.com/solutions/microsoft](http://www.EMC.com/solutions/microsoft).