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Microsoft SQL Server 2008

EMC Documentum 6.5 with SQL Server 2008 Reaches New Heights in Scalability and Performance, Driving Lower Customer TCO

White Paper

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Introduction: This white paper describes how Microsoft® SQL Server® 2008 provides an optimal, enterprise-ready, highly scalable data platform for EMC Documentum Enterprise Content Management (ECM) 6.5, as demonstrated in a recent large scale benchmarking study performed jointly by EMC, Microsoft, and Hewlett-Packard (HP). This paper also describes how SQL Server 2008 enables businesses to deploy reliable, manageable, and secure implementations, while delivering the advanced features and capabilities needed to support the most demanding workloads. It is assumed that the reader has a working knowledge of enterprise content management and EMC Documentum software, in addition to Microsoft SQL Server concepts and features.

For the latest information, see:
http://www.microsoft.com/sqlserver/2008/en/us/default.aspx

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Executive Summary

IDC research estimates that the size of the digital universe, that is, information created, captured, or replicated in digital form, was 281 exabytes[1] in 2007. Through 2011, this compound growth rate for the digital universe is expected to increase by 60 percent.[2]

For this reason, many businesses are challenged to find the best way to manage escalating volumes of information competently over the long term, including managing the growth of compliance and regulatory data. Moreover, due to tough economic times, businesses also have to determine how to meet this challenge with fewer resources.

For this reason, the EMC Corporation and Microsoft formed an alliance to assist companies in finding and testing a cost effective means for managing critical business information proficiently. This effort includes joint integration and interoperability testing such as benchmarking studies.

In July 2008, EMC® Documentum® Enterprise Content Management version 6.5 was released to help organizations manage and retain information efficiently, derive maximum value from their data assets, and meet business and government guidelines for good information governance. Documentum ECM 6.5 incorporates Web 2.0 technologies and delivers true enterprise performance and scalability, federated records management, and support for accelerated transactional business processes.

Early in 2009, EMC, jointly with Microsoft Corporation and Hewlett-Packard (HP), completed a benchmarking study to demonstrate the market leading scalability, performance, and cost efficiency of Documentum ECM 6.5 running on the Microsoft® platform. The study was conducted through Microsoft's Enterprise Engineering Center (EEC). It used Microsoft® SQL Server® 2008 as the data platform, HP's latest server technology running Microsoft® Windows Server® 2008, and an EMC storage subsystem.

The benchmark results prove that Documentum ECM 6.5 offers the best performance and scalability. They suggest that customers can achieve a 50 percent or greater reduction in Total Cost of Ownership (TCO), as compared to earlier ECM benchmarks:

EMC Documentum ECM 6.5 benchmark results summary

- 100,000 users
- 748,800 transactions per hour
- 0.86 seconds average response time
- 878 application server hits per second

The results underscore the dramatic savings in time and money that can be obtained by using Microsoft Application Platform technologies.[3] SQL Server 2008 provides an enterprise-ready, highly scalable data platform that is reliable, secure, manageable, economical, and well integrated with Documentum ECM 6.5. It supports the most demanding ECM workloads by delivering advanced features and capabilities including:

- Ease of use and self-tuning features
- Advanced database features

[1] An exabyte is equal to 2 to the 60th power or 1,152,921,504,606,846,976 bytes.
[2] The Diverse and Exploding Digital Universe, and IDC White Paper (March, 2008)
[3] http://www.microsoft.com/sqlserver/2008/en/us/application-platform.aspx

- High availability features
- Optimal, native integration with the Windows platform
- Excellent value and a lower TCO

Enterprise Content Management

Enterprise Content Management or ECM software helps customers manage all of the unstructured information, also called content, in the enterprise. Content exists in many forms such as text documents, engineering drawings, video files, and many others.

With ECM, customers are able to:

- **Create content**. Content can be produced many ways. For example, by using productivity applications such as Microsoft Word, by aggregating existing information from a variety of sources such as Enterprise Resource Planning (ERP) applications, and by converting paper documents into scanned images.
- **Add intelligence to content**. Create categorization schema, metadata, and tags that make search and retrieval fast and efficient.
- **Manage content**. Perform reviews, revisions, and approvals according to pre-defined business rules that include workflow and lifecycle management.
- **Repurpose information**. Reuse or convert content into another format or product by managing the relationships between content items.
- **Publish content**. Issue content to one or more channels. For example, a single piece of content might be published simultaneously to a Web site, printed as a text document, and sent to a mobile device.
- **Retain, archive, and find content**. Save, store, or search for content in compliance with business rules, regulatory requirements, and/or to meet litigation demands.

EMC Documentum Enterprise Content Management 6.5

In July 2008, EMC released EMC Documentum ECM 6.5, which enables organizations to manage and retain information efficiently, derive maximum value from data assets, and meet business and government guidelines for good information governance. It raises the bar on scalability, performance, and TCO for ECM solutions and introduces innovations that:

- Strike a balance between business agility and IT control.
- Enable users to embrace social media and dynamic collaboration at work.
- Provide IT managers with the control they require for security, compliance, archiving, and scalability.
- Incorporate Web 2.0 technologies used to enable social software and services such as social networking sites, wikis, and blogs.[4]

[4] http://www.emc.com/about/news/press/2008/documentum-delivers-d65.htm

- Deliver enhanced XML capabilities required to support social media tools and technologies.
- Provide increased performance for managing growing volumes of content being created and distributed in a Web 2.0 environment.

Documentum ECM and SQL Server 2008

EMC and Microsoft work together closely to ensure that Microsoft enabling technologies including SQL Server are well integrated with Documentum ECM products. As a result, EMC and Microsoft are uniquely positioned to provide increased business value to companies that use Documentum ECM on the Microsoft platform.

Since 2006, EMC and Microsoft have conducted benchmarking studies to demonstrate Documentum ECM performance characteristics within a range of processing volumes for a specific configuration. These studies enable EMC customers and prospects to match the best software, hardware, and network configuration to their processing volumes.

In November 2006, EMC and Microsoft completed their first joint benchmarking study. This study evaluated the transaction performance of Documentum ECM version 5.3 using Microsoft SQL Server 2000 Enterprise Edition and Microsoft SQL Server 2005 Enterprise Edition as the enabling technologies.[5]

The Documentum ECM 6.5 Benchmark

Early in 2009, EMC, jointly with Microsoft, and HP, completed the largest ever ECM industry benchmark using Documentum ECM 6.5 with SQL Server 2008 Enterprise Edition and Microsoft Windows Server 2008:

- **Goal**. To simulate 100,000 users of Documentum Webtop 6.5, with each user engaging in a variety of content management related transactions, and sustain this load over an entire work day.
- **Results**. Proved that Documentum ECM 6.5 running on the Microsoft platform offers the best performance, market leading scalability, and it is cost efficient. These benchmark results suggest that customers can achieve a 50 percent or greater reduction in TCO, as compared to earlier ECM benchmarks.

EMC Documentum ECM 6.5 benchmark results summary

- 100,000 users
- 748,800 transactions per hour
- 0.86 seconds average response time
- 878 applications server hits per second

[5] http://www.emc.com/collateral/software/white-papers/h3361_documentum_sql_server_2000_wp.pdf
http://www.emc.com/collateral/software/white-papers/h3362_documentum_sql_server_2005_wp.pdf

EMC Documentum ECM 6.5 12 hour workday highlights

- 100,000 users
- 9 million transactions
- 38 million application server hits
- Average response time less than one second

This benchmarking study was performed through the Microsoft Enterprise Engineering Center (EEC). As part of the Server and Tools business, the EEC is a data center and lab facility located in Redmond, Washington, U.S.A. It provides partners with the tools, hardware, and technical expertise needed to test Microsoft product deployments in real world, enterprise production environments under controlled conditions, often using recently released software. The experience the EEC and partners gain through these efforts help to improve Microsoft and partner products and increase customer satisfaction.

Figure 1 illustrates the multi-tiered benchmark environment used for testing.

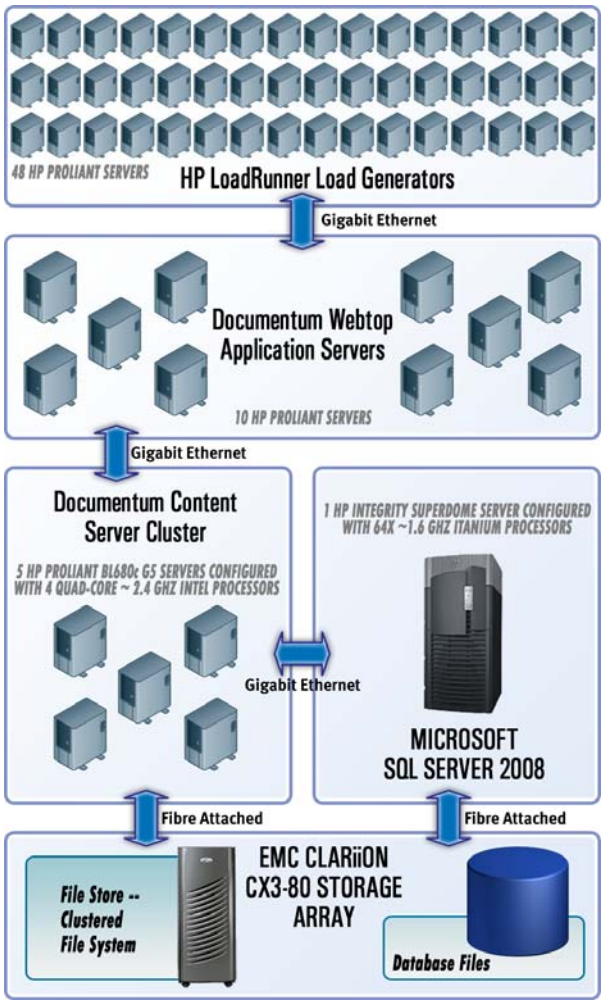

Figure 1 EMC Documentum ECM 6.5 Testing Environment

The Documentum ECM 6.5 test scenarios tested content driven business processes or a series of user operations against structured and unstructured data. In these processes the simulated user engages through multiple transactions that incrementally bring the business process to completion. Eight different types of content-driven business processes were exercised including log on, checkin, checkout, import, inbox, navigation, subscriptions, and log off.

HP LoadRunner 9.1 acted as the load driver to simulate the presence of 100,000 users on the system, submitting 878 application server hits per second. The test scenarios used were exercised by LoadRunner using Documentum ECM 6.5 benchmark kit scripts and data expansion tools. The data composition was built using the LoadRunner kit that is available on the EMC Developer Network Web site (http://developer.emc.com).

Multiple tests were conducted and used to collect the metrics reported in this summary. Transaction processing times and system utilization were measured for all tests.

In addition, HP supplied all of the server technology for the Documentum ECM 6.5 benchmarking configuration with the exception of the EMC storage subsystem:

- The Documentum ECM 6.5 database server tier was installed on an HP Integrity SuperDome running Microsoft Windows Server 2008 64-bit for Itanium based systems and SQL Server 2008 64-bit Enterprise Edition. By using the SQL Server 2008 64-bit edition, the average transaction response time was less than one second for overall query performance. The SQL Server 2008 32-bit edition was not used in this benchmark.
- LoadRunner was used to simulate the workload of 100,000 users using 48 HP ProLiant multi-processor servers running Microsoft Windows Server 2008 Enterprise Edition as the load generators.
- Documentum ECM 6.5 software was installed on 5 HP ProLiant Blade servers running Microsoft Windows Server 2008 Enterprise Edition.
- An EMC CLARiiON storage subsystem connected using Fibre Channel stored the unstructured content and associated metadata managed by Documentum ECM 6.5 and the associated SQL Server database.

These benchmarking tests were conducted in EEC in a controlled environment with no other applications running. The test scenario was sustained for more than 12 hours, simulating the loads for a full business workday.

Measurements were recorded on all of the servers when the user load was achieved and the environment reached a steady state.

Figure 2 summarizes the CPU utilization for all tiers.

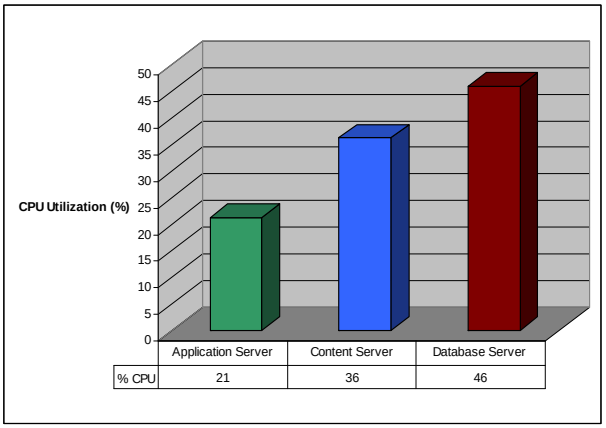

Figure 2 Average CPU utilization

In summary, the benchmark testing results clearly show that Documentum ECM 6.5 can enable businesses to do more with their servers to lower the TCO. Both in comparison to previous benchmarks and in side-by-side comparisons, Documentum ECM 6.5 demonstrates a significant reduction in the hardware resources required per transaction, as compared to earlier Documentum ECM releases. This analysis indicated that there is at least a 50 percent reduction in the TCO running Documentum ECM 6.5 Service Pack 1 (SP1).

In addition:

- Improvements in performance were made at all server tiers of Documentum ECM 6.5.
- Enhancements made in Documentum ECM 6.5 allow for a significant reduction in the number of application servers needed when scaling, dramatically lowering overall hardware costs.
- SQL Server 2008 features and enhancements can provide additional savings as described later in this paper.
- The kit used with the LoadRunner scripts is available to enable customers to perform load testing on their own. EMC provided scripts can be downloaded from the EMC Developer Network (https://community.emc.com/docs/DOC-1551), which enables customers to run the benchmark scenarios against their own environment.

SQL Server 2008: Enterprise-Ready and Scalable

SQL Server 2008 provides the highest performance, scalability, reliability, and security for Documentum ECM 6.5.[6] SQL Server 2008 delivers enhanced performance as compared to competitor platforms. It scales to some of the world's largest workloads, as evidenced by strong industry standard benchmark results.[7]

SQL Server 2008 builds on the advancements in SQL Server 2005. It contains many new features and enhanced functionality that fully optimizes the power of the underlying database for large scale workloads while keeping the code independent.

In addition, SQL Server 2008 security features meet stringent Documentum ECM security requirements for protecting data and network resources. Its customizable security architecture provides full event handling, secure storage, transparent data encryption, consolidated enterprise encryption, and security key management.[8]

In addition, the SQL Server 2008 Enterprise Edition 64-bit platforms (x64 and IA64) are available for large scale Documentum ECM solutions. SQL Server 2008 can take full advantage of the newest hardware and software architectures.

New SQL Server 2008 Features

SQL Server 2008 contains many new and enhanced easy to use, self-tuning features that simplify data management, advanced database features that optimize performance, and high availability features that improve availability and reliability as described below.

Easy to Use, Self-Tuning Features

These SQL Server 2008 features have successfully simplified the management of SQL Server instances across the enterprise, dramatically reducing administration efforts. By separating the installation of the hardware from the installation, setup, and

[6] http://www.microsoft.com/sqlserver/2008/en/us/default.aspx
[7] http://www.microsoft.com/sqlserver/2008/en/us/benchmarks.aspx
[8] http://www.microsoft.com/sqlserver/2008/en/us/security.aspx

configuration of the SQL Server software, customers can enable specific installation configurations for Documentum ECM 6.5 that makes it easier to deploy and manage.

The easy to use, self-tuning features include:

- **Management data warehouse (new)**. This centralized repository simplifies the management of performance data uploaded through the data collector including disk usage, query statistics, and server activity data. For this study, the data management warehouse was useful in monitoring the results and in tuning Documentum ECM 6.5.
- **Dynamic Management Views (DMVs) (enhanced)**. New DMVs and extensions of existing views expose additional information about SQL Server internals including database mirroring sessions. For this study, the DMVs were useful in setting up the testing and monitoring of Documentum ECM 6.5 benchmark results.
- **Policy-based management (new)**. Monitors system activity and enforces policy compliance consistently across the enterprise, which might include hundreds of servers. For example, Documentum ECM 6.5 customers can use SQL Server 2008 policy-based management to develop best practices or configuration guidelines for specific EMC Documentum products to assist in managing their deployment.

Advanced Database Features

The SQL Server 2008 advanced database features can enable Documentum ECM 6.5 customers to achieve better performance and a lower TCO through:

- **Data compression (new)**. Reduces storage requirements, which significantly reduces costs and improves performance for large I/O bound workloads. Enables millions of documents in Documentum ECM 6.5 databases to be stored with a smaller on-disk footprint at a significantly lower cost.
- **Backup compression (new)**. This new feature accelerates the backup procedure and significantly reduces the storage required to keep backups online. Backups run significantly faster since disk I/O is reduced. For Documentum ECM 6.5, backup compression can reduce the amount of storage required to backup the vast amount of information stored in its SQL Server databases at a significantly lower cost.
- **Resource governor (new)**. Manages workload resource utilization and performance for database applications by differentiating concurrent workloads. For example, this feature can manage peak workloads where there are a large number of online users accessing a Documentum ECM 6.5 database.
- **Auditing**. Enables Documentum ECM 6.5 customers to monitor and log system events including logons, password changes, data access and modification, and so on.

High Availability Features

These features increase data protection in the event of a backup media failure, improve performance, and provide enhanced support in high availability environments.

The high availability features include:

- **Database mirroring (enhanced)**. Contains additional database mirroring features, such as functionality that compresses the outgoing log stream to the

mirror server to use network bandwidth more efficiently, in addition to other enhancements such as new DMVs and extensions of existing views.

- **Failover clustering (enhanced)**. SQL Server 2008, in conjunction with Windows Server 2008, enables failover clustering for high availability in the event of an application, hardware, or operating system failure.

Windows Platform Support

One major advantage for customers implementing Documentum ECM 6.5 solutions on SQL Server 2008 is its optimal, native integration with the Windows Server platform.[9] This native integration significantly reduces the administrative effort and provides more consistent data that can be shared from a common platform. In contrast, competitors tie up a large amount of resources to maintain and port functionality to different operating system platforms.

By using the Windows operating system together with SQL Server 2008, Documentum ECM 6.5 customers can scale up as their application requirements increase and receive the benefits of tightly integrated security.

Since Windows Server is widely supported by hardware companies, customers have the flexibility to choose hardware from a wide range of vendors that support Windows.

By using the Windows platform, Documentum ECM 6.5 software hardening and patch management security measures are fully addressed, thereby enhancing security within the Windows Server-based Documentum ECM 6.5 environment.

Total Cost of Ownership

SQL Server 2008 offers a lower TCO to Documentum ECM 6.5 customers. It dramatically reduces administration efforts and it reduces the costs associated with database administration and services. SQL Server 2008 automates, streamlines, or eliminates many routine database management tasks, and provides time saving administration tools and wizard driven features.

In addition, SQL Server 2008 is provided at a lower cost than competitor platforms. Many of the features that are simply included within SQL Server 2008 must be purchased as separate products or add-ins in competitor platforms.

SQL Server 2008 licensing fees are lower. For more information, see:
http://www.microsoft.com/sqlserver/2008/en/us/licensing-faq.aspx

It offers better pricing. For more information, see:

http://www.microsoft.com/sqlserver/2008/en/us/pricing.aspx

SQL Server 2008 delivers the best price to performance ratio in the initial phase of the investment. It contains a comprehensive suite of tools, which reduce acquisition costs and immediately improves the productivity of technical resources. It has both the lowest investment costs and the lowest costs associated with maintaining the configuration.

[9] http://www.microsoft.com/windowsserver2008/en/us/default.aspx

Conclusion

Many businesses are challenged to find the best way to manage escalating volumes of information competently long term, including managing the growth of compliance and regulatory data. Moreover, due to tough economic times, businesses also have to determine how to meet this challenge with fewer resources.

For this reason, the EMC Corporation and Microsoft formed an alliance to assist companies in finding and testing a cost-effective means for managing critical business information proficiently. The close working relationship of Microsoft and EMC enables the Microsoft platform and Documentum solutions to be fully integrated.

In July 2008, EMC Documentum ECM 6.5 was released to help organizations manage and retain information efficiently, derive maximum value from their data assets, and meet business and government guidelines including incorporating Web 2.0 technologies.

Early in 2009, EMC, jointly with Microsoft and HP, completed the largest ECM industry benchmark using Documentum ECM 6.5 with SQL Server 2008 and Microsoft Windows Server 2008. The goal was to simulate 100,000 users of Documentum Webtop 6.5, with each user engaging in a variety of content management-related transactions. The test scenario was sustained for more than 12 hours, simulating the loads for a full business workday.

The results prove that Documentum ECM 6.5 running on the Microsoft platform provides the best performance, market leading scalability, and it is cost efficient. These benchmark results suggest that customers can achieve a 50 percent or greater reduction in TCO, as compared to earlier ECM benchmarks.

In particular, SQL Server 2008 is a highly scalable, enterprise-ready database. It offers an optimal solution for deploying reliable, highly available, high performance, and secure Documentum ECM 6.5 implementations.

These implementations can take full advantage the new and enhanced features of SQL Server 2008. It delivers easy to use, self-tuning features that make it easier to manage Documentum ECM 6.5 solutions. SQL Server 2008 provides enterprise-class advanced features including data compression and backup compression, and high availability features such as database mirroring, all at a lower cost.

Windows Server combined with SQL Server 2008 gives Documentum ECM 6.5 customers optimal integration that can scale to the largest applications in the market. By using the Windows platform, Documentum ECM 6.5 hardening and patch management security measures are fully addressed.

In addition, the TCO of Documentum ECM 6.5 with SQL Server 2008 is lower. SQL Server 2008 delivers the best price to performance ratio in the initial phase of the investment and the lowest costs associated with maintaining the configuration.

About EMC

EMC Corporation (NYSE: EMC) is the world's leading developer and provider of information infrastructure technology and solutions that enable organizations of all sizes to transform the way they compete and create value from their information. Information about EMC's products and services can be found at http://www.emc.com/.

For more information, see:

- SQL Server Web site
- SQL Server TechCenter
- SQL Server DevCenter

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