



SQL Server 2008: Spotlight on Cost

Twelve Ways to Reduce Costs with Microsoft® SQL Server® 2008

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Summary: Many organizations are finding themselves having to deal with difficult challenges in a tough economic climate. A key factor in addressing these challenges is to reduce costs and drive efficiencies, and Information Technology departments are under increasing pressure to maximize the return on IT investment and get the best possible value from new and existing systems. This white paper describes ways in which organizations can use Microsoft SQL Server 2008 to save time and money.

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Contents

Introduction	4
Challenges Facing Today's Businesses	5
Reducing Costs with SQL Server 2008	6
1. Experience Immediate Benefits while Maximizing Long Term ROI	6
2. Ensure Always-On Reliability and Reduce Downtime	7
3. Reduce Data Vulnerabilities and Protect Data	8
4. Consolidate data systems and Reduce Energy Requirements.....	8
5. Maximize Hardware Resources with Resource Governor	8
6. Save Money on Hardware and Boost Performance with Compression and FILESTREAM	8
7. Centralize System Monitoring and Compliance Logging	9
8. Reduce Administrative Overhead with Automated Maintenance, Powershell, and Policy-Based Management	9
9. Consolidate Data and Provide Access to Key Business Information throughout the Enterprise.....	10
10. Provide Improved Business Insight.....	11
11. Increase Developer Productivity	11
12. Rely on a Database Engine that Can Scale as your Application Grows	11
Conclusion	12
More Information.....	12

Introduction

In today's challenging economy, companies confronting tighter credit, reduced business activity, and slower consumer spending are looking for ways to quickly cut costs. Across virtually all industries, organizations both large and small seek opportunities to lower their costs, while simultaneously seizing any opportunity to drive revenue.

While the instinct in many corporate boardrooms may be to slash spending—including IT budgets—in order to shore up profits, there is a tremendous opportunity now to better leverage existing IT resources and to invest in new technology that will save money and drive value.

Business leaders who maintain a long-term perspective even as they take short-term steps to adjust to current economic realities have the opportunity to sharpen their organization's focus on the right priorities and to ensure that they have the right resources working to achieve the right business objectives. Many of the trends that have made this an era of dynamic business expansion haven't changed. Technology continues to advance. Productivity continues to rise. New innovations continue to create new business opportunities.

Microsoft® SQL Server® 2008 represents a high-value enterprise data platform that delivers mission-critical functionality at a fraction of the cost of competing solutions. SQL Server 2008 enables companies to build dynamic new solutions and to extend existing systems in ways that helps them take immediate advantage of new business opportunities, while simultaneously reducing costs and maximizing efficiencies across the organization.

This white paper describes 12 ways in which SQL Server 2008 can immediately help your business meet the challenges of today's economic environment and prepare for tomorrow's opportunities.

Challenges Facing Today's Businesses

The current economic downturn and its more competitive business environment have inevitably led businesses to think about reducing costs in order to improve efficiency. However, indiscriminate cost cutting as a short-term measure can have damaging long-term consequences, and must be balanced against the need for continued growth if businesses are to not only survive, but thrive in the future. How should an organization go about this process? This paper suggests a two-pronged approach:

- Maximize existing investments by making the most of what you already have.
- Make strategic new investments that will bring tangible returns and save you money.

When deciding how to achieve savings, companies need to focus on areas of technology that will yield the greatest benefits within the context of the business challenges that they face. These include:

- The explosion of data experienced by businesses in recent years, together with increasing dependencies on Web-based markets and business solutions, have made it vital for businesses to be able to store and effectively manage large volumes of data in multiple formats. This is increasingly important when a difficult economic climate makes your market even more competitive. SQL Server 2008 offers a data platform that can scale to accommodate very large amounts of data, and goes beyond relational storage by supporting XML, spatial, and unstructured data. With SQL Server, you will not need to invest in additional technologies if you need to handle these kinds of data.
- History teaches us that the businesses that survive in tough times are the ones that can be most agile in responding to volatile market conditions. Good business decisions can only be made if you have fast, reliable access to all of the information needed to make those decisions. SQL Server's built-in enterprise-class business intelligence capabilities provide you with the tools you need to make these decisions—at no extra cost.
- The drive to lower energy consumption makes sense from a pure cost cutting perspective, as well as from an ecological perspective. By consolidating business services on fewer servers and replacing out-of-date equipment with new and more efficient hardware, companies can significantly reduce energy costs and system maintenance overhead. To successfully do this, you need software that is flexible enough to support consolidation through virtualization and shared server hardware without compromising application performance, reliability, scalability, and security. SQL Server and the Windows Server[®] operating system provide the ideal platform to achieve these goals.
- Harsh economic conditions generally increase merger and acquisition activities. When this happens, the ability to quickly and easily integrate data systems can be a key factor in success. SQL Server Integration Services is a class-leading, high-performance extract, transform, and load (ETL) tool that can efficiently handle complex integration scenarios.

Reducing Costs with SQL Server 2008

So, how exactly can SQL Server help? This section lists 12 ways in which you can use SQL Server to start saving time and money now.

1. Experience Immediate Benefits while Maximizing Long-term ROI

From the free SQL Server Express with Advanced Services Edition (which includes management tools, full-text search, and reporting services) to the comprehensive SQL Server Enterprise Edition—which includes a full Business Intelligence and integration platform, as well as an enterprise-scale database engine—offers the best value database platform available. Compare SQL Server Enterprise Edition with Oracle® Database 11g:

Key Features	SQL Server 2008 (included)	Oracle 11g (extra cost)
Scalability and performance	Partitioned Tables and Indexes Partitioned Object Parallel Query Processing 16-node Failover Clustering Database Mirroring with Failover	Partitioning
High availability	Online Backup and Restore Resource Governor Backup Compression Hot-add Memory and CPU Support Database Snapshots	Real Application Clusters Total Recall Active Data Guard
Enterprise security	Advanced 3 rd -Party Key Management Transparent Data Encryption Security Auditing Scalable Data Marts and Reporting	Audit Vault Advanced Security Label Security
Data warehousing	Data Compression Query Optimizations Change Data Capture Partition Aligned Index Views Advanced Analytic Functions Advanced Data Mining Algorithms	Advanced Compression Partitioning
Advanced business intelligence	SQL Server Integration Services SQL Server Analysis Services SQL Server Reporting Services	OLAP Warehouse Builder Data Mining
Non-relational data	Spatial Performance Data Collection Policy-Based Management SQL PowerShell	Spatial
Enterprise manageability	Database Tuning Advisor Database Upgrade Testing Tool Replay Markup Language Utilities Automatic Patching Standardized Development Environment	Management Packs Diagnostic Packs Real Application Testing

Table 1: Feature comparison

SQL Server provides a huge amount of key functionality that you would have to pay extra for with Oracle. Furthermore, the initial investment costs for SQL Server are lower than for

Oracle, as shown in these price comparisons for typical scenarios with equivalent functionality, performance, and scale:

Scenario	SQL Server Price	Oracle Price
OLTP	\$50K	\$264K
Data Warehousing	\$100K	\$494K
Business Intelligence	\$1,084K	\$3,180K

Table 2: Cost comparison for common scenarios

Overall, SQL Server 2008 provides a very compelling return on investment and delivers immediate cost savings and productivity improvements. A recent independent study of large healthcare customer deployments by Forrester Consulting¹ found a 162 percent ROI (risk-adjusted) for SQL Server 2008. Brent Eckhout, SAP® Technical Systems Manager at the Missiles and Fire Control division of Lockheed Martin Corporation, realized the cost benefits of switching from Oracle to SQL Server:

“SQL Server had become a more powerful, enterprise-ready solution since we first adopted Oracle, and we thought the combination of Windows Server and SQL Server on open, standards-based hardware, could lead to significantly lower costs.”

Missiles and Fire Control’s detailed projections show that the Microsoft software and Intel® processor solution will reduce its costs by 41 percent over the next five years, compared to the cost of continuing on the UNIX® and Oracle platform. The savings are all “hard dollar” savings for hardware, software, and maintenance.

And Joe Stell, Director of Information Systems at Naturally Fresh®, a major U.S. manufacturer of dressings, sauces, and dips, identified other ways that choosing SQL Server saved time and money:

“We had our SQL Server 2005 data warehouse and business intelligence solution up and running in just two months; with Oracle, we would have been looking at six to nine months, or more.”

Not only that, but Naturally Fresh realized an 84 percent saving in the cost of software licenses by choosing SQL Server over Oracle.

If you’re already running SQL Server 2000 or 2005, you can benefit by upgrading to SQL Server 2008. The range of new and improved features offered in SQL Server 2008, many of which are outlined in this paper, will bring significant time and cost savings. The upgrade process is quick, so you can start saving money in the short term as well as over the longer term.

2. Ensure Always-On Reliability, Reduce Downtime, and Protect Revenue

Avoid lost revenue and reduced productivity caused by planned and unplanned downtime. SQL Server 2008 offers a range of technologies that can minimize downtime, including 16-node clustering, database mirroring, peer-to-peer replication, and log shipping. These features, together with hot-add hardware support, online backup and restore capabilities, make SQL Server an excellent choice for mission-critical applications. For example,

¹ Forrester Consulting: *Total Economic Impact of SQL Server 2008 Upgrade.*

migrating an SAP ERP environment to SQL Server can reduce unplanned downtime by more than 20 percent, according to a Wipro Technologies study².

3. Reduce Data Vulnerabilities and Help to Protect Data

Because data is one of your company's most valuable assets, security represents a key consideration in any application infrastructure. SQL Server 2008 has been designed from the ground up as a security-enhanced database platform. By default, SQL Server operates with minimal surface area, reducing opportunities for attack and accidental data loss. This in turn reduces the risk of revenue loss caused by sensitive data being compromised or by unplanned downtime required to recover lost data. SQL Server's enterprise-level security model, together with built-in support for transparent data encryption, helps to effectively protect your data assets without the additional cost of custom client application development to handle encryption, authentication, and authorization.

4. Consolidate Data Systems and Reduce Energy Requirements

The hardware consolidation support built into SQL Server 2008 can help you to reduce your hardware, energy, cooling, real-estate, licensing, and administrative costs. Because consolidation involves making more efficient use of less hardware, the benefits are both financial and environmental. SQL Server 2008 offers a number of consolidation approaches that allow you to mix and match options to create the ideal solution for your data services:

- Where all of your databases have similar security, manageability, and compatibility requirements, you can use multi-database support to consolidate databases into a single SQL Server instance and use Resource Governor to minimize contention.
- Where your databases have different security, manageability, or compatibility requirements, you can use multi-instance support to consolidate up to 50 instances of SQL Server onto a single physical server. You need just one SQL Server license per physical processor, regardless of how many instances are installed.
- Where you require the highest level of isolation between database solutions with different workloads or with different security, manageability, or compatibility requirements, you can use server virtualization. You need only one Windows® license and one SQL Server license per physical processor, regardless of how many virtual machines you install on the physical server.

5. Maximize Hardware Resources with Resource Governor

Contention between applications for CPU and memory resources can lead to inefficient and unpredictable query execution performance, which can cause serious problems for users throughout an organization. The new Resource Governor in SQL Server helps to maximize the efficiency of resource usage among applications, helps to prevent runaway queries, and lets you prioritize high-importance workloads so that business-critical operations complete quickly and reliably before less-important operations.

Maximize even more resources by using Resource Governor in database consolidation scenarios. Allocate appropriate resources across multiple databases in a single SQL Server instance to ensure that any increased contention for resources is managed effectively and does not degrade performance.

² Wipro Technologies: *Microsoft SQL Server Migration Pays Big Dividends for SAP/ERP Customers.*

6. Save Money on Hardware and Boost Performance with Compression and FILESTREAM

Use SQL Server 2008 data compression to compress tables, indexes, and partitions, and use SQL Server 2008 backup compression to compress database and log backups on disk or tape. Compression reduces disk capacity requirements for data and backup storage, which reduces up-front costs for disk hardware and lets you repurpose existing disk capacity. Sven Otromke, SAP System Manager at TÜV® NORD Group, one of Germany's largest technical service providers, comments:

“SAN storage is very expensive compared to other forms of storage. So far, our average compression ratio with SQL Server 2008 has been 63 percent, so we expect that we will be able to reduce the size of our databases by almost two-thirds. This means what normally costs us about \$100,000 per year in storage will cost us only \$35,000. By compressing our databases, we can also reduce I/O, energy costs, and data center space requirements. And we'll be able to realize more efficient backup and disaster recovery strategies.”

In addition to saving money on disk hardware, data compression delivers improved performance because it uses disks and memory more efficiently. Compression is particularly beneficial for large databases and in scenarios where the same data is stored in multiple locations, such as with replication and mirroring. Compressed backups run more quickly because fewer disk writes are needed and because you can use backup compression on data that is already compressed in the database to achieve even greater savings in time, disk capacity, and electrical demand.

The new FILESTREAM support in SQL Server 2008 enables companies to store files and binary large object (BLOB) data more efficiently using the Windows NTFS file system, while continuing to provide all the benefits of SQL Server security and transaction support—as if the data were stored in the database. Files and BLOB data stored in the file system can be accessed more efficiently because Windows NTFS is more highly optimized to manage files. Also, since FILESTREAM data is not loaded into SQL Server's memory buffers until it's needed, these buffers are available for other data-related operations. Defragmentation of FILESTREAM data can be handled in the operating system, which makes it easier to manage.

7. Centralize System Monitoring and Compliance Logging

Centralize performance and diagnostic data collection with the Data Collector feature in SQL Server. Data Collector enables organizations to collect, store, and analyze diagnostic information from servers throughout the enterprise in a central management data warehouse, making it easier to find, diagnose, and resolve issues before they adversely affect business performance. Additionally, you can take advantage of All Action Audit capabilities to reduce IT development costs in achieving compliance. There is no need to develop or maintain custom solutions to achieve compliance.

8. Reduce Administrative Overhead with Automated Maintenance, PowerShell, and Policy-Based Management

SQL Server provides unparalleled support for automating database maintenance tasks across the enterprise, including backups and index management. Using the SQL Server

Agent to manage jobs, operators, and alerts significantly reduces the burden on IT departments, while ensuring that the day-to-day operation of your data systems is managed effectively. Additionally, support for PowerShell makes it easy to create custom management scripts through a single shell to automate key tasks for multiple database servers. This saves time by giving administrators a common scripting language that they can use across different servers.

Implementing and maintaining policy compliance for databases and servers across an enterprise can be a challenging and time-consuming task. SQL Server's new Policy-Based Management dramatically simplifies this process and enables you to take a proactive approach to administration. You can create policies that control security, database options, object naming conventions, and a host of other settings across one or multiple servers. Policy-Based Management is a much more efficient way to manage data services because it eliminates the time required to make systems compliant, and can prevent non-compliant changes from being implemented. This enables administrators to focus on higher-value tasks and results in a more secure and more predictable environment that ultimately saves money. You can use Policy-Based Management to manage instances of SQL Server 2005 and SQL Server 2000, as well as SQL Server 2008. Built-in policy templates make it easy to create policies for common scenarios, so you see a return on your investment very quickly.

9. Consolidate Data and Provide Access to Key Business Information throughout the Enterprise

In addition to an enterprise database management system, SQL Server provides a highly productive, class-leading Business Intelligence platform that enables end-users to safely create powerful BI solutions without taxing valuable IT resources.

SQL Server's BI tools can help you make the business decisions that will drive success and give you the edge in a challenging economic climate. SQL Server includes comprehensive BI services for ETL and integration operations, data warehousing, multi-dimensional (OLAP) analysis, data mining, and reporting. Unlike data platforms from other vendors that require you to pay extra for these features, SQL Server builds them in at no additional cost. Arindam Sen, Lead Database Administrator at American Power Conversion, a leading manufacturer of uninterruptible power supplies and surge protection products, comments:

“By choosing SQL Server over Oracle, we saved on the cost of a data integration solution, a reporting solution, and a notification solution, all of which would have cost extra with Oracle ... we're getting all the mission-critical, enterprise-level performance we could want from Oracle for a fraction of the price of Oracle.”

You can use SQL Server Integration Services, SQL Server Analysis Services, and the SQL Server database engine to create a data warehouse solution that centralizes key business data into a single unified dimension model for analysis. The enterprise-class connectivity and record-breaking performance³ provided by SQL Server Integration Services makes it faster and easier to consolidate data from multiple sources, including SQL Server, Oracle, SAP,

³ See <http://blogs.msdn.com/sqlperf/archive/2008/02/27/etl-world-record.aspx>.

Teradata®, and IBM® DB2®, into a central data warehouse for analysis and reporting purposes.

Your employees can use SQL Server Reporting Services to safely access information whenever and wherever they need it. SQL Server helps to reduce low-priority requests to IT departments and developers by empowering business users to create their own reports by using SQL Server's Report Builder tools. The ability to easily access reports through a central Report Manager application or from a Microsoft SharePoint® site, combined with native support for rendering reports in Microsoft Office Word and Excel® formats, gives you the power and reach to enable informed decision making throughout the enterprise.

10. Improve Business Insight

Before individuals can make decisions, they need to accurately understand information. SQL Server 2008 empowers information workers to safely dive into data without requiring IT support. Executives and information workers can use ubiquitous Microsoft Office applications to perform PivotTable analysis of Analysis Services cubes and to create predictive models that inform the business decision-making process. With built-in support for key performance indicators (KPIs) and perspectives, and integration with Microsoft Office SharePoint Server and Office PerformancePoint Server, critical business information can be easily accessed through dashboards—making business performance monitoring an ongoing part of daily activities.

11. Increase Developer Productivity

Support for an extensive range of Microsoft .NET Framework-based data application interfaces, including Language-Integrated Query (LINQ), Entity Framework, Sync Services, and ADO.NET Data services, plus deep integration with Microsoft Visual Studio®, make SQL Server a productive data application development platform. This reduces the time and cost required to develop new data solutions. Built-in support for data types that go beyond traditional relational data, including native XML functionality and spatial data types, makes SQL Server a suitable platform for almost any kind of data solution. Comprehensive security features, including transparent data encryption, provide a more secure environment for your company's critical data without requiring any special considerations from application developers.

12. Rely on a Database Engine that Can Scale as Your Application Grows

SQL Server 2008 features several enhancements that enable it to scale to support very large volumes of data. This means that you can be sure that as your application grows, SQL Server 2008 can accommodate it while still delivering great performance. These enhancements include:

- Partitioned table parallelism, which enables SQL Server 2008 to make more efficient use of multi-processor systems when processing queries against partitioned tables. This allows applications to efficiently support very large tables that have billions of rows of data, and eliminates the cost of developing custom technology to support large datasets. Partition management has also been made more efficient through partition-aligned indexed views.
- Filtered indexes, which are built upon only a subset of the rows in a table so that they provide faster performance and consume less disk space.

- Data and backup compression, which enable you to save on disk storage space and also to improve performance.
- Resource Governor, which enables you to manage contention between applications and to prioritize workloads.
- Star join optimizations, which enable the query processor to more quickly return results from dimensionally modeled data warehouses.

Conclusion

In a challenging economic climate, SQL Server can help you to save money, gain business insights, and drive revenue so that your organization can maintain the competitive edge that it needs right now, and be better positioned to take advantage as the economy recovers.

More Information

You can find out more about saving costs and driving efficiencies with SQL Server 2008 in the following resources:

- **ETL World Record:** <http://blogs.msdn.com/sqlperf/archive/2008/02/27/etl-world-record.aspx>.
- **Total Economic Impact of SQL Server 2008 Upgrade:** <http://download.microsoft.com/download/d/1/1/d11349b8-af33-45c4-a89c-f0dc64bbd431/TEI%20of%20SQL%20Server%202008%20Upgrade.pdf>.
- **Microsoft SQL Server Migration Pays Big Dividends for SAP/ERP Customers:** http://download.microsoft.com/download/2/e/5/2e5d5185-92e7-46db-aec4-74b793c82653/WIP_MSSQLSAP_WP_layout_v10.pdf.

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