

Microsoft  
**SQL Server™ 2005**

Microsoft  
**Windows Server System**

## **Running Oracle Applications on Microsoft SQL Server™ 2005**

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Applies To: Microsoft SQL Server 2005

### **Summary:**

Microsoft Corporation and Oracle are committed to delivering superior solutions deployed on the Microsoft® platform that are cost-effective, reliable, and scalable to customers worldwide. This paper discusses the support for Oracle applications on the Microsoft platform, which includes Microsoft Windows®, Microsoft Office applications, and Microsoft SQL Server™ 2005, the last of which is the primary focus of this white paper.

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## Introduction

With Oracle's announcement of its upcoming new releases of the PeopleSoft, Siebel, and JD Edwards product lines, many customers have begun planning their future technology investment strategies. Due to concern over the roadmap of Oracle's Fusion applications, some customers have raised important questions regarding Oracle's future strategy, many of which focus on Oracle's commitment to the Microsoft platform and their other business offerings.

As part of its "[Applications Unlimited](#)" commitment, Oracle is committed to delivering their PeopleSoft, Siebel, and JD Edwards offerings to customers, a commitment that includes having these applications certified and fully supported on the Microsoft platform. In fact, according to the [Microsoft|Oracle Customer Information Center](#) Web site, Siebel Release 8.0, PeopleSoft Enterprise 9.0, and JD Edwards Enterprise One 8.12 are now certified and shipping on Microsoft SQL Server 2005 SP2 and Windows Server 2003 R2 on a variety of platform choices (e.g. 32- and 64-bit). In addition, Microsoft is working closely with Oracle to ensure that the companies' mutual customers get the most out of their Oracle applications running on the Microsoft platform.

In this paper, we will focus on how the advancements in Microsoft SQL Server 2005 are designed to provide a strong, economical platform for the deployment of three of Oracle's business application platforms: PeopleSoft, Siebel, and JD Edwards.

## The Microsoft and Oracle Partnership

Microsoft and Oracle have a partnership that spans from business development to technical collaboration and even co-marketing. As leaders in the software industry, the two companies collaborate and integrate in the best interests of their mutual customers. To meet these customers' requirements, needs, and demands, Oracle is committed to delivering databases and applications that run on the Microsoft platform and that can be supported by Microsoft's development and integration tools. Microsoft and Oracle also work together to ensure their mutual customers are successful on their integrated platform, including routing service calls to each other on a case-by-case basis. In addition, Microsoft and Oracle have even provided each other with key support as sponsors of each other's conference and trade events (e.g., Oracle has served as a sponsor for the Microsoft Professional Developers Conference, TechEd, and other conferences).

## Microsoft SQL Server 2005 is Designed for the Enterprise

Microsoft SQL Server 2005 is designed to provide comprehensive, integrated data management and analysis software that enables organizations to reliably manage mission-critical information and to confidently run today's increasingly complex business applications. SQL Server 2005 enables companies to gain greater insight from their business information and to achieve faster results for a competitive advantage. There are a set of new and enhanced features that make SQL Server 2005 ideal for the enterprise environment.

## Enterprise Data Management

### High Availability

[Microsoft SQL Server Always On Technologies](#) are designed to support mission critical applications with the highest level of availability. These technologies are engineered to provide a full range of options to help customers minimize system downtime and maintain appropriate levels of application availability. Features include database mirroring, failover clustering, database snapshots, snapshot isolation, peer-to-peer replication, log shipping, and online operations. Used separately or in combination, these features can help minimize downtime and keep critical enterprise systems available.

## Scalability

There are plenty of scalability advancements in SQL Server 2005. These features include table partitioning, snapshot isolation, and 64-bit support, which enables enterprises to build and deploy some of their most demanding applications using SQL Server 2005. These table and index partitioning features are designed to ease the management of large databases by facilitating the management of the database in smaller, more manageable chunks.

In earlier versions of SQL Server, users sometimes experienced blocking and deadlocking problems that could require extensive analysis and index tuning to resolve. However, SQL Server 2005 introduces a new isolation level called Read Committed Snapshot Isolation (RCSI), which is designed to help reduce the possibility of blocking and to help increase concurrency and performance. RCSI is designed to automatically maintain required versions of data.

Customers such as [AIM Healthcare Services](#) can attest to the performance and scalability of SQL Server. The company decided to migrate its 9-terabyte database, which supports about 200 internal users, from Oracle to SQL Server 2000 Enterprise Edition hosted on Windows Server 2003, Enterprise Edition, and running on an Intel-based computer. The decision mapped well with the fact that in recent years the company had been progressively moving more of its operations away from the UNIX operating systems to Microsoft Windows operating system, and had been moving its Oracle databases to SQL Server.

One impressive element of the project was that the database was growing rapidly during the migration. In less than one year the company was able to migrate a well-established application from Oracle to SQL Server while at the same size tripling the size of the database, the company reported. In addition, it increased the capacity of its claims processing system and simultaneously lowered its operational costs.

Following the project, Solesby was also [publicly cited](#) as an early adopter and advocate of SQL Server 2005, which was publicly reported as achieving the company's goals to create a database that scales well and provides its users with the real-time data and business analytics they need to make better decisions. In particular, Solesby cited the new snapshot isolation feature in SQL Server 2005 that makes it easier to mine large quantities of data, keeping it easier to track without giving up high performance.

(Extensive evidence of SQL Server's high performance according to standard industry metrics is provided in the [Benchmarks](#) section below.)

## Manageability

As an enterprise data management platform, SQL Server 2005 provides an integrated management console that is designed to enable database administrators (DBAs) anywhere in the organization to monitor, manage, and tune all of the databases and associated instances of all servers across the enterprise. SQL Server 2005 is also engineered to provide strong security "out-of-the-box" when installed because all but the most essential features are either disabled or not installed by default, thereby limiting the exposed surface area of the server. The SQL Server Surface Area Configuration tool empowers the DBA to control which features are enabled, which helps ensure that potentially unused features are not enabled and left in an unprotected state. SQL Server 2005 is also designed to provide deep visibility into the performance and operations of the systems for end-to-end service monitoring, and to enable administrators to quickly isolate problems as well as proactively manage multiple services. Last but not least, SQL Server 2005 is also designed to expose all the management functionality of the database so that administrators can extend these objects to automate routine administrative tasks, allowing user to focus on high-value tasks and lower the cost of ongoing maintenance.

## Security

Security, privacy, reliability, and business practices are the driving forces of the [Microsoft Trustworthy Computing initiative](#). Security is a key feature of SQL Server 2005, which provides confidentiality, integrity, and availability of mission-critical data. As part of this focus on technology investments, Microsoft takes a "defense-in-depth" approach

to protect and align three core elements: fundamentals, threat and vulnerability mitigation, and identity and access control. Microsoft commits significant resources toward enhancing privacy protection, from the software itself to the services and products it offers to customers to help them manage the privacy of their information.

SQL Server 2005 provides rich security features to protect data and network resources. Its clustering supports Kerberos authentication on a virtual server, and it also supports Microsoft Windows-style policies on standard logins so that a consistent policy can be applied across all accounts in the domain. SQL Server 2005 also supports encryption capabilities within the database itself, fully integrated with a key management infrastructure. By default, client-server communications are encrypted.

## Business Intelligence

SQL Server 2005 furthers Microsoft leadership in the area of business intelligence (BI) through innovations in scalability, data integration, development tools, and rich analytics. SQL Server 2005 is designed to enable scalable BI by putting critical, timely information in the hands of employees across the company through interoperability with Microsoft's familiar and highly popular Microsoft Office system business productivity tools. From the CEO to the information worker, SQL Server 2005 enables employees to quickly and easily harness data to make better decisions faster. The comprehensive integration, analysis, and reporting capabilities of SQL Server 2005 enable companies to extend the value of their existing applications, regardless of the underlying platform.

## Microsoft SQL Server 2005 Compared to Oracle Database

Microsoft SQL Server 2005 running on Microsoft Windows Server® provides a platform for enterprise-class relational database and analysis solutions. SQL Server is designed to provide specific strength in the areas of security, availability, integration with Microsoft Visual Studio®, scalability—from the smallest businesses to the largest—as well as low total cost of ownership (TCO).

Microsoft SQL Server offers reportedly astonishing savings over Oracle solutions in terms of administrative cost and other factors that contribute to total cost of ownership. For example, an [independent study](#) of the total cost of administration (TCA) for surveyed database administrators (DBAs) using Microsoft SQL Server and Oracle databases found that the Microsoft SQL Server cost-per-DBA yielded an \$7,360 lower average TCA per database—over a 350% difference.

## Security

Microsoft believes that advanced security is functionality that should be standard in all enterprise database infrastructures. That's why SQL Server includes all of its standard security features in each and every SQL Server edition, "out-of-the-box". Customers that acquire SQL Server 2005 Enterprise, Workgroup, Standard, and Express editions receive the same standard security features and functionality and do not have to purchase them separately as add-ons at an additional cost.

**Table: Standard Security Features Common to SQL Server 2005 Editions**

<i>Features</i>	<i>Express</i>	<i>Workgroup</i>	<i>Standard</i>	<i>Enterprise</i>
<b>Advanced Auditing, Authentication, and Authorization</b>	✓	✓	✓	✓
<b>Data Encryption and Key Management</b>	✓	✓	✓	✓
<b>Integration with Microsoft Baseline Security Analyzer</b>	✓	✓	✓	✓
<b>Integration with Microsoft Update</b>	✓	✓	✓	✓

Table Source: [Microsoft SQL Server 2005 Security Feature Comparison](#).

In contrast, Oracle typically provides only basic security features across of all of its various product editions; additional advanced security features that many customers may consider essential may be available only as options at additional cost.

Moreover, these important and more advanced options are available only with the Enterprise Edition of the database, leaving small- and medium-sized businesses potentially vulnerable. The bottom line is that for equivalent security functionality, SQL Server can cost less than Oracle and be easier to manage.

### **Analyst Reports on Microsoft and Oracle Security**

[“What database is more secure? Oracle vs. Microsoft,”](#) a November 2006 independent security study by Next Generation Security Software Ltd. analyst David Litchfield, compared the respective security postures of Microsoft SQL Server and Oracle RDBMS (relational database management system) based on multiple sources for the period between December 2000 and November 2006. Litchfield reported that not only did SQL Server possess a stronger security posture than Oracle RDBMS (i.e., Oracle 10g Release 2), but that Microsoft SQL Server demonstrated a lower incidence of total security flaws reported by external researchers as well as that fewer security vulnerabilities were detected in SQL Server than in Oracle RDBMS over the same period of time.

In addition, Litchfield concluded that Microsoft also addressed vulnerabilities more quickly than Oracle due to its strong Security Development LifeCycle (SDL) as well as stated that he believed SQL Server code was “just more secure than Oracle code.” Altogether, the report suggested that customer days-of-exposure-to-risk may be demonstrably lower with SQL Server than with Oracle (at the time of publication, no security flaws had yet been announced for SQL Server 2005).

[“Microsoft Runs the Security Table,”](#) a second November 2006 study by independent analyst Eric Ogren of ESG, reported that rate of security vulnerabilities documented in the National Vulnerability Database for the major database vendors is noteworthy for the stark contrast between Microsoft, MySQL and Oracle. ESG believes that Microsoft’s investments in secure development processes are responsible for the impressive results in SQL Server quality. ESG considers Microsoft, with proper execution, to be years ahead of Oracle and MySQL in producing secure and reliable database products.

## **High Availability**

High availability does not have to mean high cost. Both SQL Server 2005 and Oracle can help provide very high levels of availability. However, SQL Server 2005 is specifically designed to deliver enterprise-level high-availability features to customers as well as provide them with a lower total cost of ownership (TCO), high flexibility, and reduced complexity compared to competing solutions such as those offered by Oracle.

## **Performance and Scalability**

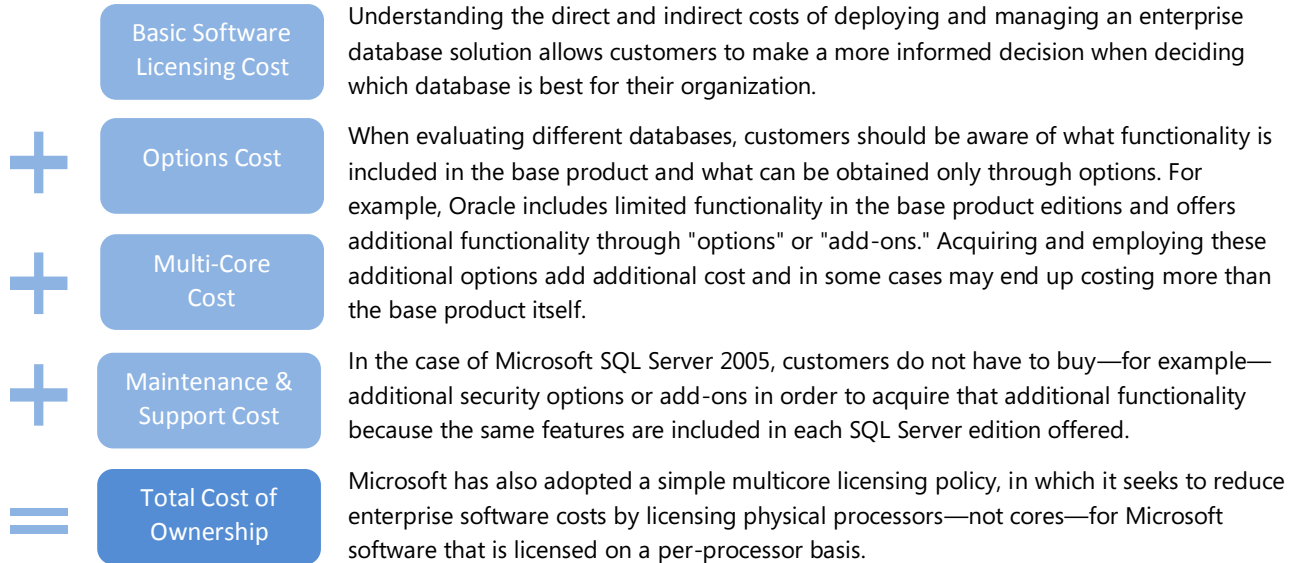
SQL Server comes in several editions designed to meet the needs of businesses of all sizes, from small- and medium-sized companies to the largest enterprises. The strong performance of SQL Server 2005 is supported by industry standard benchmarks that speak for themselves (please see the below [Benchmarks](#) section below for specific details).

## **Developer Productivity**

Integration of SQL Server 2005 with Microsoft Visual Studio, the Microsoft .NET technologies, and the common language runtime helps to provide customers with a solution that’s comprehensive, seamless, functional, and provides high performance.

SQL Server 2005 is also designed to provide exceptional ease of use and offer seamless integration for service-oriented architecture (SOA) applications. Additionally, SQL Server 2005 business intelligence (BI) features are integrated with Visual Studio.

## Total Cost of Ownership



Oracle provides a variety of licensing policies that some customers may find complex and less easy to understand, such as licensing per-core, as systems with multiple cores become increasingly more common, the difference between these licensing methods and policies may become increasingly pronounced.

In addition to databases licenses, customers typically purchase maintenance and support. Maintenance agreements frequently give customers the right to newer versions of the software without relicensing new copies. These are often priced as a percentage of list price, typically 20 to 25 percent. For this reason, because Oracle solutions tend to have higher license cost than those of Microsoft SQL Server, the maintenance costs for Oracle can be higher as well as well. For support, vendors typically offer different levels which range from support during business hours all the way up to dedicated, onsite support.

In contrast to Microsoft, Oracle typically requires a maintenance agreement for the provision of service packs and security patches. Given the longevity of databases, it's important for customers to consider the higher ongoing cost that may be required to maintain an Oracle database. Microsoft Software Assurance gives customers automatic access to new technology and provides productivity benefits, support, tools, and training to help them efficiently deploy and use software.

## Case Study: American Power Conversion (APC)

[American Power Conversion \(APC\)](#) contemplated major increases in its use of Siebel software—including consolidation of separate instances into a single, global database and expanding its use to include the real-time needs of its call center. APC selected SQL Server 2005 for many of the reasons detailed above.

The company reports that when it licensed SQL Server 2005, it received much more than just SQL Server 2005. By choosing SQL Server over Oracle, it 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. It also saved by being able to run the solution on commodity hardware rather than on expensive UNIX hardware. The company reported that this was absolutely crucial to them given the need to operate as cost-effectively as possible.

APC estimates that it achieved \$800,000 in first-year savings by moving to SQL Server 2005 instead of Oracle—about 50% of the estimated cost of an Oracle solution. That includes a 75% savings on software licensing, plus a continuing \$200,000 annual savings in reduced personnel costs, given the easier use and greater manageability of SQL Server.

With SQL Server 2005, the company felt it was getting all the mission-critical, enterprise-level performance it could want from Oracle for a fraction of the price of Oracle. When people say they should standardize on a single database platform rather than running both SQL Server and Oracle, they agree—and say that the success of our Siebel upgrade shows that SQL Server is the way to go.

## Oracle Applications are Built for Microsoft SQL Server 2005

PeopleSoft, Siebel, and JD Edwards applications have a long history of supporting the Microsoft platform. SQL Server 2005 is a certified platform for each of these Oracle applications.

The table on the following page shows the versions of the Oracle products currently supported by Microsoft SQL Server 2005.

Oracle Platform	Microsoft Supported Oracle Products
<b>SIEBEL</b>	<ul style="list-style-type: none"> <li>• Siebel 7.7, Siebel 7.8, Siebel 8.0</li> </ul>
<b>JD EDWARDS ENTERPRISEONE</b>	<ul style="list-style-type: none"> <li>• EnterpriseOne Tools 8.96_F1</li> </ul>
<b>PEOPLESOFT ENTERPRISE</b>	<ul style="list-style-type: none"> <li>• PeopleSoft Enterprise 8.9 and 9.0</li> <li>• PeopleTools 8.48 and 8.49</li> </ul>

## Microsoft SQL Server 2005 is Built for Oracle Applications

Many of the features introduced in SQL Server 2005 are designed to greatly enhance the experience customers have with their existing Oracle applications. This section examines some of these improvements in-depth some as they pertain to Oracle applications. Please note that many of these features are enjoyed by multiple—and in some case all—applications that are built on SQL Server 2005.

### Enterprise Data Management

#### Scalability

Since Siebel is a processor-intensive application, traditionally there has been a high demand for processor cache memory, limited to 3GB memory on 32-bit machines. Scalability was limited on large symmetric multiprocessing (SMP) machines (>8 processors) due to memory access latency. In its latest release, SQL Server is engineered to handle as much as 20-30% more users on 32-bit machines under memory pressure than previous versions. It benefits from reduced cursor memory footprint and more aggressive garbage collection. There is also an estimated 15-20% performance boost over SQL Server 2000 due to SQL Server 2005 code path optimization. There is native non-uniform memory access (NUMA) support, which removes a memory access bottleneck on large SMP machines and reduces remote memory access penalty through transmission control protocol (TCP) connection affinity and soft NUMA.

#### Improved Case-Insensitive Search

Siebel databases are case-sensitive. As a result, case-insensitive searches must be performed at the application level, which can be very slow. SQL Server 2005 introduces support for computed columns, which is designed to improve performance and speed of case-insensitive searches by enabling the caching of an all uppercase or lowercase version of a column.

#### Large Row Support

Siebel database tables are very wide and support for UNICODE can effectively double the size of character columns. Previously, users typically needed to use NTEXT for 2000-character columns to fit within an 8K page and avoid implicit

FFO cursor conversion by using substring. New features for large-row support allow SQL Server 2005 to automatically overflow rows into a large object area if the size exceeds 8,060 bytes, rather than terminating. As a result, Siebel deployments no longer have the limitation of rows that exceed 8,060 bytes.

## **Simpler Data Access Model**

SQL Server 2005 has reduced the overall memory footprint for cursors and no longer performs an implicit conversion on text columns. It provides real-time cursor tracking with Dynamic Management Views. Its support for SQL Native Client (SNAC) eliminates previous Dynamic Link Library (DLL) issues. SNAC is fully compatible with MDAC ODBC (Microsoft Data Access Components open database connectivity) and is designed to support all SQL Server 2005 features and automatic client redirect.

## **Faster Enterprise Integration Manager (EIM) Load**

Previously, EIM table loading spent the majority of its cycles on non-clustered index maintenance. SQL Server 2005's enhanced non-cluster index maintenance policy bypasses the maintenance if there was no change to underlying data value. This greatly improves EIM performance. Also, the new table/index partitioning feature splits a table into multiple manageable pieces which are still treated as a single object by the relational engine, resulting in application transparency. This supports faster inserts or deletes of large quantities of data and minimizes the amount of memory required.

## **Support of Varying Size Data-Types**

In previous versions of PeopleTools, a fixed-size character data model was adopted for the entire application database. This meant that if a character field was defined as 32 bytes in length, it would consume 32 bytes regardless of whether any data was stored in it. The result was wasted space, especially in deployments having large tables with empty character columns. PeopleTools 8.48 running on SQL Server 2005 introduces variable-length character columns that use only the number of bytes actually required to store the data. Thanks to this new feature, less space is required, resulting in a smaller footprint, less network traffic, and fewer large binary objects. Due to this feature being transparent to the consuming software, it is fully backward compatible with other applications and enabled by default.

## **Snapshot Isolation**

In earlier versions of SQL Server, users sometimes experienced blocking and deadlocking problems that could require extensive analysis and index tuning to resolve. SQL Server 2005 introduces a new isolation level called Read Committed Snapshot Isolation (RCSI). RCSI is enabled at the database level and allows readers to see committed values at the beginning of a statement. This feature prevents read transactions from blocking write-transactions and vice versa, which in turn reduces the possibility of blocking and increases concurrency and performance. It automatically maintains required versions of data.

This feature is enabled by default during install or upgrade and no PeopleSoft application changes are necessary. RCSI needs to be enabled only once at the database level. It can even test run with PeopleSoft applications.

## **Data Partitioning**

Table partitioning makes it easier to deal with large databases by facilitating smaller, more manageable increments. While the concept of partitioning data across tables, databases, and servers is not new, SQL Server 2005 provides a new capability—horizontal partitioning—for the partitioning of tables across file groups, which makes it possible to divide a table into smaller groupings based on a partitioning scheme. Table partitioning is particularly useful for large databases, from hundreds of gigabytes to terabytes and beyond. Partitions can be created and dropped with virtually no loss of availability to the table. Even sliding window scenarios—those which include a large amount of data—are supported. On top of all that, this is completely transparent to the PeopleSoft application itself.

## Dynamic Management Views

SQL Server 2005 introduces a set of Dynamic Management Views, or DMVs, that surface the internal counters of the database engine, enabling users to get a quick read on server operation and present dramatically increased information with minimal overhead on the database server. This feature enables monitoring and tuning of the database, tasks that have been greatly simplified since earlier versions of SQL Server. There are over 80 DMVs available.

## 64-bit Platform Support

SQL 2005 x64 provides native support for x64 platforms (from AMD and Intel) and runs on Microsoft Windows 2003 x64. It provides nearly unlimited virtual address space while helping provide a price point comparable to that of 32-bit machines.

## Index Enhancements

In the past, unused indexes created performance and on-disk storage overhead because JD Edwards shipped one schema for all verticals/components and not all of the shipped indexes were used. The SQL Server 2005 Disable Index feature is designed to remove the need for maintaining unused indexes while preserving the index definition. The online index rebuild, reorganize, and drop allow index access during maintenance.

## Plan Stability

As JD Edwards queries are dynamically generated by application, DBAs typically need more control of optimization than merely creating/dropping indexes or updating statistics. Plan Guide in SQL Server 2005 is designed to allow them to control optimization with query hints when the application cannot be changed.

## Database Mirroring

Database Mirroring maintains two copies of a single database that must reside on different instances of SQL Server Database Engine. Database mirroring is designed to provide complete or nearly complete redundancy of the data. In the event of a disaster, in high-safety mode with automatic failover, failover can quickly bring the standby copy of the database online. This helps improve the availability of the production database during upgrades as well. This feature is part of the SQL Server Always On Technologies and is designed to provide high availability for mission critical applications.

## Other New Features

There are quite a few other new features introduced in SQL Server 2005 that are designed to benefit existing Oracle application customers. For example:

- **Forced parameterization** is a database-level option that forces parameterization of all queries automatically without application code changes.
- **Online index rebuild** reorganizes and drops to ensure no long-term table lock is held for the duration of the operation, increases concurrency.
- **Dedicated administrator connections (DAC)** help ensure that the database administrator has access to the server regardless of the workload. Also, the ability to disable and enable indexes can selectively deactivate index maintenance and use, while preserving index definition (metadata).
- **Implied predicates optimization** enables the optimizer to automatically optimize queries with implied predicates for equalities and inequalities.

Note: This paper has only covered the major features introduced and advanced with SQL Server 2005. For more information and details, please consult the Additional Information and References resources below.

## ***American Power Conversion (APC) Case Study Revisited***

In a previous section we outlined the reasons that APC upgraded their call center application to SQL Server 2005 Enterprise Edition (64-bit). Now, we will review the results.

Since the migration, Siebel transaction response times are 100% faster, cutting the response time for database searches in half. In the call center, the faster database queries with SQL Server 2005 enable faster, more effective, and more cost-effective customer service. The solution also scales to support a 300% increase of the current 3,000-user base.

The availability is “rock-solid” according to the company.

The company reports that use of SQL Server 2005 Reporting Services to monitor Siebel and SQL Server performance opens an entirely new world to them and that it dramatically increased the amount and type of information they have on how their system performs. APC also reports that they have visibility into Siebel performance that they never had before. That was another big reason for upgrading and it’s turned out to be extremely successful for them.

APC uses the performance data to proactively identify potential problems and to address them before they affect system performance. They’re seeing absolutely rock-solid availability with SQL Server 2005, despite consolidating on a single global instance, and increasing the size of the database, the number of users, and the number of application modules accessing the data. The company reports that SQL Server 2005 just works—so their users can, too.

The availability of thorough performance data leads to better insight and business decisions.

APC says that with SQL Server 2005, they not only have a better understanding of the ‘snapshot’ of their performance, but that they also have a better understanding of performance trends, where they’re going with transaction volumes, response times, and other measures. For APC, that means they’re better able to do capacity planning and scalability planning than they ever could before.

## **Business Intelligence**

SQL Server 2005 is designed to provide a complete enterprise-ready and scalable BI/data warehouse platform. SQL Server Integration Services (SSIS) provides “out-of-the-box” enterprise-class scalability options with its advanced data-integration pipeline architecture, high-performance processing, and native support for 64-bit platforms. It is an effective tool set for both the traditional demands of enterprise data extraction, transformation, and loading (ETL) operations, as well as for the evolving needs of general purpose data integration.

All SQL Server 2005 services share common metadata, resulting in broad metadata-based visibility from data sources, through ETL, and into reporting and analytic processes. Developers can link an SSIS package to a report. This enables downstream impact analysis, so IT can see how a change in a source system will affect not only ETL, but also reports. It also enables the reverse, namely upstream data lineage, where a report consumer can drill all the way back to the source of a report’s data.

By using SSIS, companies can directly extract data from the databases used by Oracle applications and perform business intelligence activities on it. For example, Microsoft’s Information Technology department, a cross-IT group, uses SSIS to perform metric calculations on data extracted from the Siebel Call Center database. This system replaces a former reporting application with a new scalable and flexible reporting application that improves reporting throughout the organization. For more information, please read “[Using SQL Server 2005 Integration Services in a Scalable Business Intelligence Solution](#)” (available online in both Microsoft Office Word and Microsoft Office PowerPoint® versions).

## ***Case Study: AIM Healthcare Services***

[AIM Healthcare Services](#) decided to migrate its 9-terabyte database, which supports about 200 internal users, from Oracle to SQL Server 2000 Enterprise Edition hosted on Windows Server 2003, Enterprise Edition, and running on an Intel-based computer. The decision mapped well with the fact that in recent years the company had been

progressively moving more of its operations away from the UNIX operating systems to the Microsoft Windows operating system, and had been moving its Oracle databases to SQL Server.

Although the company considered Linux as an option for the operating system, it decided that it wanted to take advantage of its growing knowledge of the Windows operating system, and not introduce a new operating system and the administrative complexities that would come with it. AIM, which creates most of its applications in-house, also wanted to use Microsoft development tools.

Data mining is at the heart of AIM operations, as the company on a weekly or monthly basis—depending upon the customer—imports billing data and launches algorithms against the data, searching for inappropriately paid claims, duplicate payments, contractual issues such as subrogation, and a range of other factors including abnormalities that might indicate mistakes or fraud. The data mining is performed using the company's own searching algorithms and through incorporating business rules for specific customers. The company created its own data mining application using Visual Studio .NET and the .NET Framework, and executes much of the code through SQL Server stored procedures. The company also used the Microsoft Visual C#® development tool.

## Benchmarks That Speak For Themselves

SQL Server 2005 has demonstrated outstanding performance, scalability, and price/performance results with industry benchmarks that speak for themselves. [Transaction Processing Performance Council \(TPC\)](#) benchmarks confirm that:

[SQL Server 2005 Exceeded the 1 Million Transactions-Per-Minute Mark in the TPC-C Benchmark.](#)

TPC benchmarks demonstrate that SQL Server 2005 has successfully scaled past the barrier of 1 million transactions per minute, type "C" (tpmC), becoming the first to ever do so on Windows. Microsoft SQL Server 2005 has also demonstrated the highest ranking performance on Windows.

[SQL Server 2005 currently holds various performance and price/performance records on the TPC type "H" benchmark:](#)

- In the 100-GB non-clustered category, SQL Server 2005 established a world record performance on of 19,323 QphH (queries per hour/H) at 100GB and price/performance of 10.67 \$/QphH at 100GB.
- In the 300GB category, SQL Server 2005 has demonstrated the best performance on Windows with 46,034 QphH and price/QphH of \$8.31 (and remains ranked second overall).
- In the 1-terabyte category, SQL Server 2005 has also demonstrated the best performance on Windows.
- In the 3-terabyte category, SQL Server 2005 demonstrated the best performance on Windows; in one 3-terabyte case, SQL Server reached a performance of 60,359 QphH (queries per hour) with a price/performance of \$32.60.
- SQL Server 2005 also currently holds a higher ranking than either Oracle and IBM databases in both the 300-gigabyte TPC-H non-clustered category as well as the 1-terabyte TPC-H non-clustered category.

SQL Server 2005 performance is ranked highest in a number of TPC of industry standard benchmarks, as shown in the following table:

**Table: [TPC Performance Benchmarks for Microsoft SQL Server 2005](#)**

TPC Benchmark Category	Result	Highest Ranking on:
TPC-C Non-Clustered	1,231,433 tpmC	Windows
TPC-H (100 gigabytes) Non-Clustered	19,323 QphH	All platforms
TPC-H (300 gigabytes) Non-Clustered	46,034 QphH	All platforms
TPC-H (1 terabyte) Non-Clustered	69,999 QphH	All platforms
TPC-H (3 terabytes) Non-Clustered	60,359 QphH	Windows

Table source: [Transaction Processing Performance Council \(TPC\)](#) Note: The above results represent current, standing performance benchmarks that were achieved on multiple dates via multiple tests of varying configurations. Please see the TPC results for full details, methodologies, and test conditions.

Microsoft SQL Server is also designed to excel on Oracle line of business (LOB) applications such as those of Siebel and PeopleSoft:

**Table: SQL Server Siebel and PeopleSoft Benchmarks**

Workload/Application	Segment	Result	Best on:
Siebel eBusiness Application Suite	CRM	30,000 concurrent users	See <a href="#">Siebel</a> Web site for details.
PeopleSoft Enterprise Applications	CRM Financials HCM	25,200 concurrent users, 8,955,224 journal lines/hour, 82,743 payees/hour	See <a href="#">Microsoft SQL Server</a> <a href="#">PeopleSoft</a> Web site for details.

**Siebel:** On October 17, 2005, Siebel certified the Siebel 7.7 benchmark with 30,000 concurrent users. SQL Server 2005 (64-bit edition) and Windows Server 2003 offer world-class performance for Siebel customers at a very compelling total cost of ownership (TCO). The throughput, scalability, and reliability delivered by SQL Server 2005 can power the largest and most complex Siebel business applications. SQL Server 2005 enhancements, in particular non-uniform memory access (NUMA) support in the SQL Server Database Engine, allowed for almost linear scalability. To view the complete results for the benchmarks listed above, please visit the [Siebel Customer Relationship Management Applications](#) Web site.

**PeopleSoft:** PeopleSoft Enterprise Applications running on SQL Server deliver strong benchmark results in human resources, financial, and Customer Relationship Management (CRM) segments, and are fully covered under the Oracle support policy. To view the complete results for the benchmarks listed above, please visit the [Microsoft SQL Server: Oracle PeopleSoft Enterprise Applications](#) Web site.

## Summary

Due to the company's "Applications Unlimited" commitment, Oracle customers can expect continued company investment in the PeopleSoft, Siebel, and JD Edwards platforms. In addition to these investments, Oracle customers can also expect to benefit from the ongoing enhancement of the Microsoft platform for Oracle applications, especially with solutions such as Microsoft SQL Server 2005.

## Additional Information

**For more information on Microsoft and Oracle partnership:**

[www.microsoft-oracle.com](http://www.microsoft-oracle.com)

**For more information on SQL Server 2005:**

<http://www.microsoft.com/sql/default.mspx>

**For more information on SQL Server and Oracle comparison:**

<http://www.microsoft.com/sql/prodinfo/compare/oracle/default.mspx>

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<http://www.oracle.com/applications/applications-unlimited.html>

**Microsoft | Oracle Customer Information Center: "Oracle Applications certified and shipping on Microsoft Platform" (Web site)**

<http://www.microsoft-oracle.com/Pages/default.aspx>

**Oracle: "[Microsoft] Office Interoperability Center" (Web site; last updated 10/20/07)**

<http://www.oracle.com/technology/tech/office/index.html>

**Microsoft: "Microsoft SQL Server 2005 Service Pack 2" (Web site)**

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<http://www.microsoft.com/windowsserver2003/default.mspx>

**Microsoft: "Microsoft SQL Server: Home – High Availability - Always On Technologies" (Web site)**

<http://www.microsoft.com/sql/technologies/highavailability/default.mspx>

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**Microsoft "Trustworthy Computing" (Web site)**

<http://www.microsoft.com/mscorp/twc/default.mspx>

**Microsoft: "Security in SQL Server 2005" (Web site)**

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**Microsoft: American Power Conversion (APC): "American Power Conversion runs Siebel on SQL Server: Saves \$800,000 over Oracle" (April 2007)**

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**Next Generation Security Software Ltd: "Which database is more secure? Oracle vs. Microsoft" by David Litchfield (11/21/06)**

<http://www.databasesecurity.com/dbsec/comparison.pdf>

**Microsoft: "Using SQL Server 2005 Integration Services in a Scalable Business Intelligence Solution" (Web site)**

<http://www.microsoft.com/downloads/details.aspx?FamilyID=4BDF5838-C8F2-4071-86A9-832B61309A5A&displaylang=en>

**Transaction Processing Performance Council (TPC) (Web site)**

<http://www.tpc.org/>

**AIM Healthcare: "9-Terabyte Database Moved to Microsoft SQL Server for Performance, Lower TCO" (4/5/06)**

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**Computerworld: "SQL Server scalability, BI features succeed: Early-access customers of Microsoft SQL Server 2005 give the new database high marks for scalability and business intelligence features." (7/11/05)**

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**Microsoft Third-Party Study: "Microsoft SQL Server and Oracle Database: A Comparative Study on Total Cost of Administration (TCA)" (May 2006)**

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<http://www.oracle.com/applications/crm/siebel/index.html?URI=2509>

**Microsoft: "SQL Server: PeopleSoft Enterprise Applications" (Web site)**

<http://www.microsoft.com/sql/prodinfo/compare/oracle/peoplesoft.msp#EBAA>