Microsoft® Windows Server System™

Microsoft® SQL Server™ 2000

Understanding Database Pricing

Comparing Database and Business Intelligence Pricing and Licensing

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For the latest information, please see *http://www.microsoft.com/sql/howtobuy/default.asp*.

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Introduction

Historically, database pricing has been very hard to understand. Complex pricing and licensing models make side-by-side comparisons difficult. At first glance, some database software products may seem inexpensive, but some vendors often impose hidden costs beyond the obvious purchase price and, over time, customers are forced to pay exorbitant amounts of money for functionality that they had assumed to be part of the original product. When considering database pricing it is important to take into account not only the direct costs of deploying and using the solution but also the indirect costs.

Advancements in hardware play a major role in database pricing. The exponential growth rate of the processor speed allows for higher performance at a lower cost. Although hardware costs have been declining, they still constitute a sizable portion of the typical enterprise IT budget. As organizations continue to streamline costs, IT departments are looking for cost-effective solutions that meet their high-level expectations. They are being asked to reduce costs, yet deliver higher levels of data availability, performance, and reliability to support business needs.

The advancements in software technology also influence pricing. Technologies such as reporting, online analytical processing (OLAP), and data mining, previously available only to high-end users are now open to a broad range of information workers across an organization, allowing the typical user to conduct sophisticated business analysis. This provides organizations with the ability to transform information into better business decisions at all levels, turning what was once just a large dataset into rich business knowledge.

To better understand database pricing this paper will explain the different ways in which databases are priced and compare pricing for the three leading database vendors: Microsoft, Oracle, and IBM. For companies making the initial database decision, this paper will also explain the general pricing philosophy that each vendor employs; thereby helping organizations avoid typical pitfalls or pricing traps. These are a few of the different areas covered to better understand database pricing:

- Editions
- Options/add-ons
- Licensing models and the effect of multicore processors
- Maintenance and support
- Price comparison
- Total cost of ownership (TCO)

Editions

The first concept to consider when buying database software is that of editions. Database editions allow companies to get access to different levels of functionality at varying price points. Vendors take different approaches to their editions and typically target editions at specific market segments, making some options only available on certain editions.

Typically, database editions fall under three tiers:

- Basic: targeted at small to medium sized businesses with limited requirements. These editions have further limitations to the number of CPUs, and may also add limitations to memory, database size or number of users.

- Standard: targeted at medium-sized business or departmental solutions. Standard editions are sometimes limited to a certain number of CPUs, and lack some of the sophisticated features of enterprise editions.

- Enterprise: targeted at large companies, for applications that require large volumes of data and/or high transaction throughput. Enterprise editions include features such as high availability, clustering, and advanced management tools, and typically have no CPU or memory limitations.

The following table explains these three tiers in more detail:

Tier	Features	Sample Products	Price
Basic	Basic database functionality Simplified management tools Up to 2 CPUs Memory / database size limits	Microsoft SQL Server Desktop Engine (MSDE) Oracle Standard Edition One DB2 Express Edition	$0–$5,000 per CPU
Standard	Availability Basic management tools Basic security Up to 4 CPUs or nodes	Microsoft SQL Server Standard Edition Oracle Standard Edition DB2 Workgroup Edition	$5,000–$15,000 per CPU
Enterprise	High availability Scalability High-end management tools Enterprise security No CPU limit	Microsoft SQL Server Enterprise Edition Oracle Enterprise Edition DB2 Enterprise Server Edition	$20,000–$40,000 per CPU

Note: All prices are per processor and reflect pricing for purchases within the United States and are in United States dollars. Pricing based on information available on vendor Web sites.

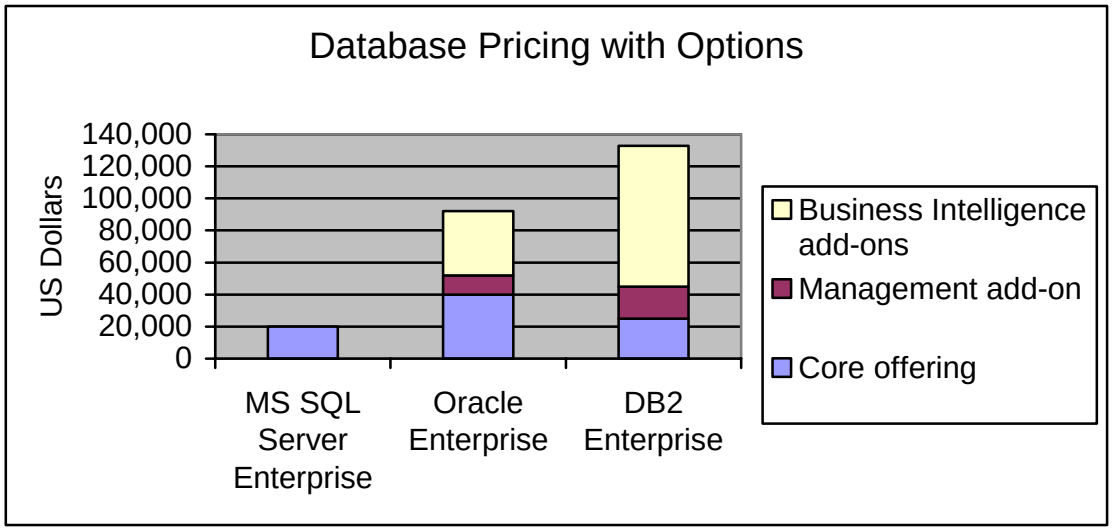
Options/Add-ons

Some vendors include the full functionality in the base product. For example, with Microsoft customers do not have to buy any additional “add-ons” for additional functionality. However, some other vendors such as IBM and Oracle include limited functionality in their base products and offer additional functionality through “options” or “add-ons." These options can be very expensive and sometimes end up costing more than the base product itself. So when evaluating different databases, customers should be aware of what functionality is included in the base product and what can be obtained only through options.

For IBM and Oracle, add-ons are very frequently required for anything but the most basic applications. Examples of add-ons offered by these vendors include: security, online analytical processing (OLAP), database tuning and management, and data mining. To complicate matters, most of the management, security, and business intelligence options that IBM and Oracle offer are only available with the Enterprise edition of their databases. This means that, in many cases, customers may have to upgrade from Standard to Enterprise at a significant cost when all they needed was a specific option, such as OLAP for a business intelligence application.

In contrast, Microsoft has adopted a strategy of providing full data management and analysis functionality in its baseline SQL Server database editions, giving customers a peace of mind in knowing they won’t have to incur large incremental costs to run their data management systems.

The following graph highlights the impact that options have on the total license cost for a database. It’s easy to see how options can dramatically change the total cost of a database solution.



	Microsoft SQL Server	Oracle	IBM
Enterprise Edition	$19,999	$40,000	$25,000
Management Tools Add-on	Included	$3,000 (Diagnostics Pack) $3000 (Tuning Pack) $3000 (Configuration Mgmt Pack) $3000 (Change Mgmt Pack) Total = $12,000	$9,910 (Recovery Expert) $10,000 (Performance Expert) Total = $19,910
OLAP Server Add-on	Included	$20,000 (OLAP Option)	$28,000 (OLAP Server)
Data Mining Add-on	Included	$20,000(Mining Option)	$60,000 (Intelligent Miner)
Total Cost	**$19,999**	**$92,000**	**$132,910**

Note: All prices are per processor and reflect pricing for purchases within the United States and are in United States dollars. Pricing based on information available on vendor Web sites.

Multi-core Licensing

After reviewing database editions and options, the next item to consider is the overall licensing model. Database vendors typically offer two models:

- User and Server Model—Requires a license for each user or device plus a license for the server
- Per Processor Model—Requires a license for each processor

This paper will review the per processor model in more detail, as this is an area where technological advances in hardware may lead into wide cost discrepancies between vendors. Specifically, multicore is a technological innovation that will drive database performance over the next few years. Intel and AMD have announced plans to ship processors with two, four, or more cores starting in 2005. Multicore expands the amount of threads available to an application. As a result of this, modern enterprise usage with concurrent workloads can highly benefit from the additional threads. Because the leading enterprise operating systems and most applications are ready to support the multithreaded environment, multicore chips are expected to deliver a 35 to 50 percent performance increase. This is yet another way in which Moore's law works to benefit customers.

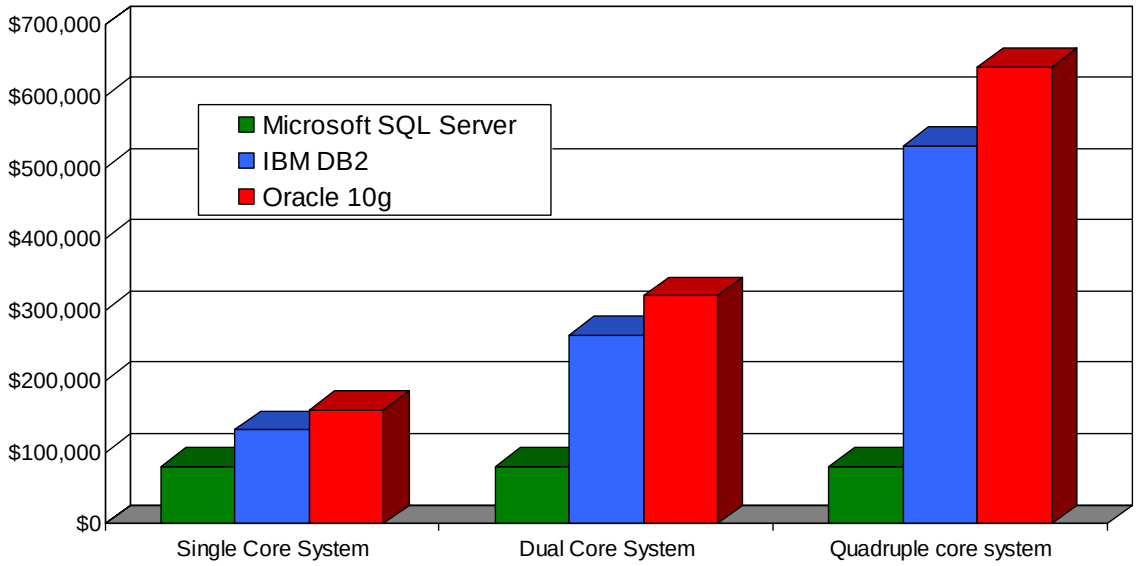
However, the enterprise database industry has widely taken the position of considering a core equal to a processor, for per processor licensing models. Oracle and IBM have both clearly stated their position[*]. In fact, IBM has sold dual core servers for years in their RISC lines and continues to charge for each core[†].

In contrast, Microsoft has recently announced a new multicore licensing policy, in which it continues to reduce enterprise computing costs by licensing the processor, not the core, for Microsoft software currently licensed on a per processor basis. In other words, licensing requirements for per-processor software will be determined by the number of processors, not cores.

The following graph shows the impact of multicore pricing on enterprise database editions. SQL Server 2000 Enterprise Edition, when installed on a four-processor server, will require four processor licenses for a total cost of about $80,000. With dual-core processors, the software will run on eight cores, but only four processor licenses will be required so the total cost remains the same. On the other hand, IBM and Oracle charge per core, so in the same scenario the license cost would double. With quad-core systems, the license cost would double once again, so that IBM and Oracle database licenses could easily wind up costing more than eight times what the equivalent licenses from Microsoft would cost.

[*] A multicore chip with N processor cores is treated as N processors… a chip that has 2 processor cores in it would need to be licensed for 2 processors" – Oracle Database Licensing Guide, September, 2004

[†] IBM, which has been selling dual-core servers for about three years, considers two cores as two processors for software licensing purposes, according to a company representative" – cited by CNet, September 7, 2004



Note: All prices are for purchases within the United States and are in United States dollars. Pricing based on information available on vendor Web sites.

Maintenance and Support

In addition to databases licenses, customers typically buy maintenance and support. Maintenance and support are usually priced as a percentage of the list or net license prices. Maintenance gives customers the right to newer versions of the software, including in most cases patches or service packs. Vendors normally offer different levels of support, ranging from business hours support all the way up to dedicated, on-site support.

When making comparisons of the different maintenance and support models, customers usually find that Oracle and IBM tend to have significantly higher costs than Microsoft. For example, Microsoft provides service packs and security patches for free, whereas both Oracle and IBM require customers to pay maintenance and support fees to get patches and updates.

Price Comparison

After reviewing some of the direct and indirect costs that affect database pricing, the next step is to compare the different vendor database solutions side by side.

Microsoft SQL Server 2000 and Oracle 10g

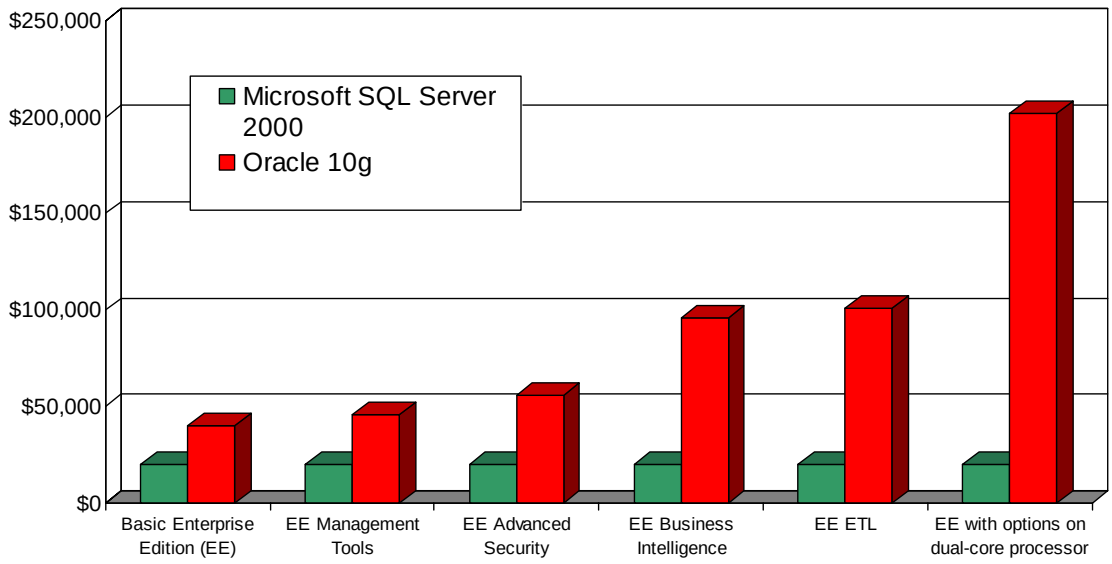
SQL Server 2000 provides management, security, and business intelligence capabilities as an integrated solution at no additional cost. Oracle sells these important features as add-ons, and most of these features are available only with Oracle 10*g* Enterprise Edition. These include:

- Key management features like diagnostic tools, performance monitoring tools, and tuning tools. These management tools are included as standard features in SQL Server 2000 Standard and Enterprise Edition. However, these tools are only available as extra-cost options with both editions of Oracle 10*g*.
- Advanced security features like network data packet, public key infrastructure (PKI), and single sign-on support. These important security capabilities are included with SQL Server 2000 Standard and Enterprise Edition at no additional cost. Oracle provides these features as extra-cost options and only makes them available with the Enterprise edition. This means users of Oracle 10*g* Standard Edition must find alternative solutions or install add-on security products from third-party software providers.
- Business intelligence components like online analytical processing (OLAP), enterprise reporting, and data mining. Again, these features are included in SQL Server 2000 Standard and Enterprise Edition. Oracle, however, offers these items only as extra-cost options and only with Oracle 10*g* Enterprise Edition.

In the table and graph that follows, significant price differences between SQL Server 2000 and Oracle 10*g* arise when comparing the costs associated with these key data management features. These price differences are accentuated when considering multicore processors.

	Oracle 10g		**Microsoft SQL Server 2000**	
Standard	Standard Edition	$15,000	Standard Edition	$4,999
Total Cost		**$15,000**		**$4,999**
Enterprise	Enterprise Edition	$40,000	Enterprise Edition	$19,999
	Management Packs	$6,000	Management Tools	Included
	Advanced Security	$10,000	Network Encryption, Single sign-on, PKI	Included
	Business Intelligence (OLAP and Data Mining)	$40,000	Data Mining and Analysis Services and ETL	Included
Total Cost		**$96,000**		**$19,999**
Enterprise with Multicore	Cost of additional core (dual-core processor)	$96,000	Cost of additional core	Included
Total Cost		**$192,000**		**$19,999**

For more information and comparison tables, visit http://www.microsoft.com/sql/evaluation/compare/pricecomparison.asp.



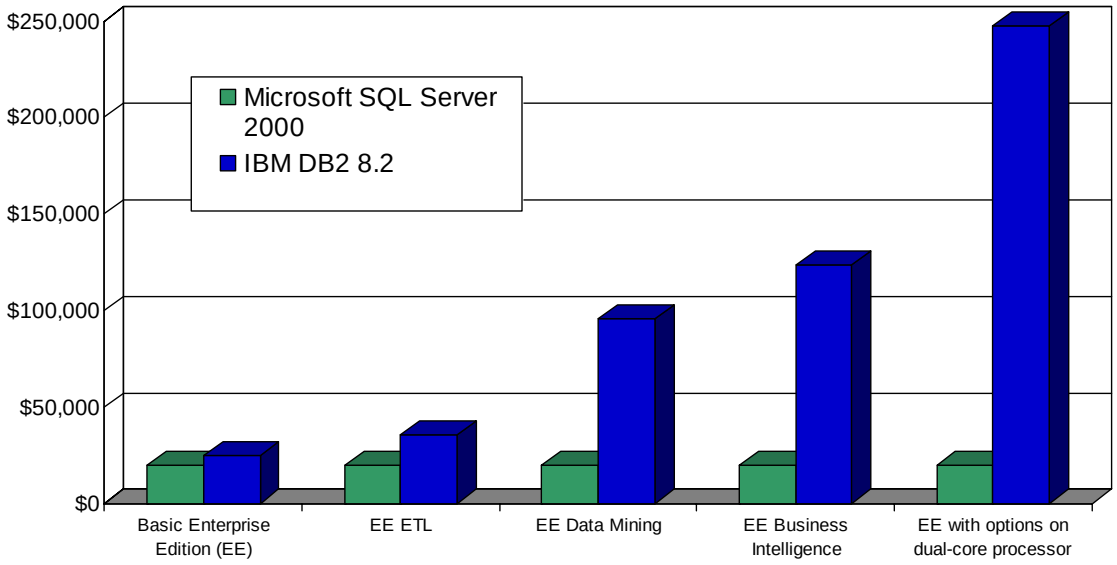
Note: All prices are per processor and reflect pricing for purchases within the United States and are in United States dollars. Pricing based on information available on vendor Web sites. These are the cost savings per processor. The savings will increase when additional processors are added.

Microsoft SQL Server 2000 and IBM DB2 8.2

The base price for IBM DB2 version 8.2 Enterprise Server Edition is 25 percent more expensive than SQL Server 2000 Enterprise Edition, and IBM charges considerably more for important add-on features such as online analytical processing (OLAP), data transformation, and data mining, items that Microsoft includes as standard product features in SQL Server 2000. The following table and graph compares the prices differences between SQL Server 2000 and DB2 8.2. As before, these price differences are accentuated with considering multicore processors.

	IBM DB2 version 8.2		Microsoft SQL Server 2000	
Standard	Workgroup Edition	$7,500	Standard Edition	$4,999
	Total Cost	**$7,500**	**Total Cost**	**$4,999**
Enterprise	Enterprise Edition	$25,000	Enterprise Edition	$19,999
	Warehouse Manager Add-on	$10,600	Data Transformation Services	Included
	Intelligent Miner Add-on	$60,000	Data Mining	Included
	OLAP Server Add-on	$28,000	OLAP Server	included
	Total Cost	**$123,600**	**Total Cost**	**$19,999**
Enterprise with Multicore	Cost of additional core (dual-core processor)	$123,600	Cost of additional core	Included
	Total Cost	**$247,200**		**$19,999**

For more information and comparison tables, visit http://www.microsoft.com/sql/evaluation/compare/IBM/db2v8.asp.

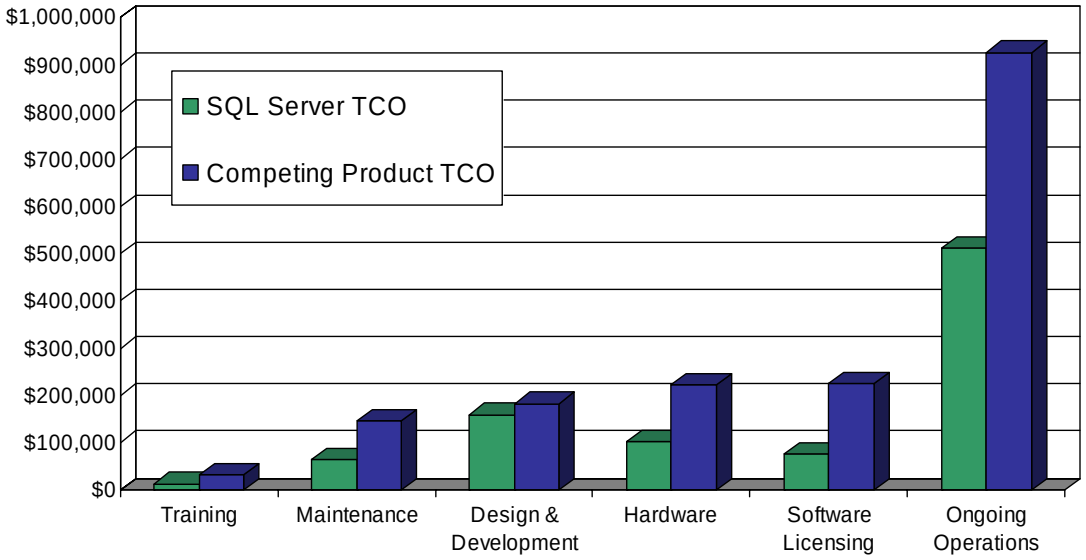


Note: All prices are per processor and reflect pricing for purchases within the United States and are in United States dollars. Pricing based on information available on vendor Web sites. These are the cost savings per processor. The savings will increase when additional processors are added.

Total Cost of Ownership (TCO)

After looking at the cost of database software, the next step is to bring everything together with a comparison of total cost of ownership (TCO). Independent third-party studies have validated that SQL Server offers lower TCO across multiple cost categories, with the largest savings usually coming from ongoing operations. In fact, a study by NerveWire[‡] found that SQL Server's cost advantages versus the competing product translated into a *47 percent cost savings over the three year period* covered in the survey. The results of the study are summarized as follows.

Application Type	Cost	SQL Server TCO	Competing Product TCO	Percentage Savings
Cross Organizational Applications (100+ users)	Ongoing Operations	$511,928	$926,078	45%
	Design & Development	$158,381	$181,875	13%
	Software Licensing	$75,000	$225,000	67%
	Hardware	$101,500	$221,500	54%
	Maintenance	$64,500	$145,125	56%
	Training	$12,627	$31,388	60%
	Total TCO	**$923,936**	**$1,730,966**	**47%**
Departmental Applications (50-100 users)	Ongoing Operations	$209,411	$312,886	33%
	Design & Development	$37,474	$49,274	24%
	Software Licensing	$15,000	$45,000	67%
	Hardware	$34,300	$74,300	54%
	Maintenance	$12,900	$29,025	56%
	Training	$1,681	$3,643	54%
	Total TCO	**$310,767**	**$514,128**	**40%**



[‡] http://www.microsoft.com/sql/evaluation/compare/tco.asp.

Conclusion

Understanding the direct and indirect costs of deploying and managing an enterprise database solution allows customers to make a more informed decision when considering which database is best for their organization. Knowing all components of the licensing models and the new multicore technology and how these influence the overall cost is a crucial step in understanding database pricing.

For those who have done the critical analysis, SQL Server 2000 has proven repeatedly to provide a cost-effective solution that is well able to meet users' high service-level expectations. With savings across hardware, software, operations, and maintenance the benefits of SQL Server 2000 are substantial.

- Lower hardware costs
- Lower software licensing costs
- Reduced support and maintenance costs
- Ability to meet business/user requirements

This paper demonstrates that, compared with other database management solutions, SQL Server 2000 features lower hardware costs, decreased software licensing, and significantly reduced support and maintenance costs.