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**MANAGEMENT BRIEF**

# VALUE PROPOSITION FOR MIGRATION

## Cost/Benefit Case for Microsoft SQL Server 2008 R2 and Windows Server 2008 R2 with Intel Xeon Processor 5600 and 7500 Series-based Servers


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## Opportunities

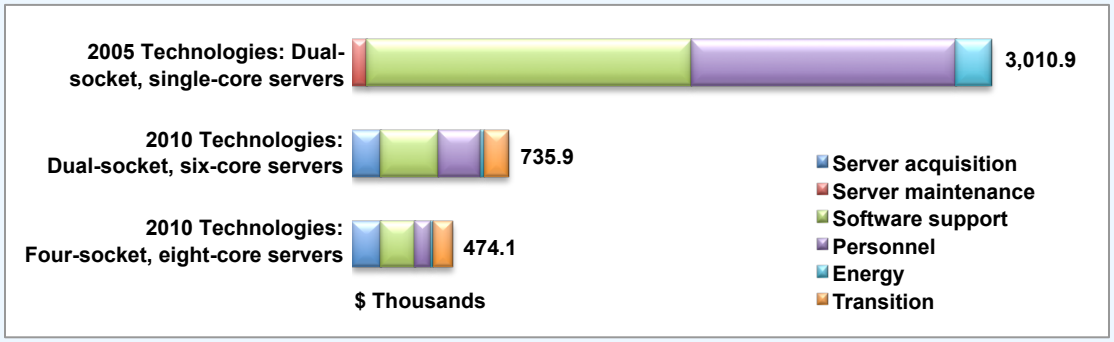
**Use of Microsoft SQL Server 2008 R2, Windows Server 2008 R2 with Hyper-V, and latest-generation servers based on Intel Xeon 5600 and 7500 series processors offers the potential to significantly reduce database server costs.**

**This report looks at two cost reduction opportunities: (1) SQL Server to SQL Server consolidation and (2) consolidation and migration of Oracle databases deployed on Sun UltraSPARC servers to SQL Server on latest-generation Intel processor-based servers.**

## SQL Server to SQL Server Consolidation

**If SQL Server 2005 databases deployed on 2005-vintage dual-socket servers are replaced by SQL Server 2008 R2 and consolidated onto latest-generation dual-socket Intel Xeon processor 5600 series-based servers with Windows Server 2008 R2 and Hyper-V, user's three-year costs may be reduced by an average of 76 percent.**

**If users employ four-socket Intel Xeon processor 7500 series-based servers, three-year costs may be reduced by an average of 84 percent. We summarize these results below.**




**We employ operating costs only (hardware maintenance, SQL Server and Windows support, server administration personnel and energy consumption) for 2005 Technologies. We include the same operating costs, plus the costs of new server acquisition, and transition costs including software upgrades, consolidation activities and staff retraining for 2010 Technologies.**

**Calculations are based on six installations with between 30 and 405 database instances in large and midsize organizations in multiple industries.**

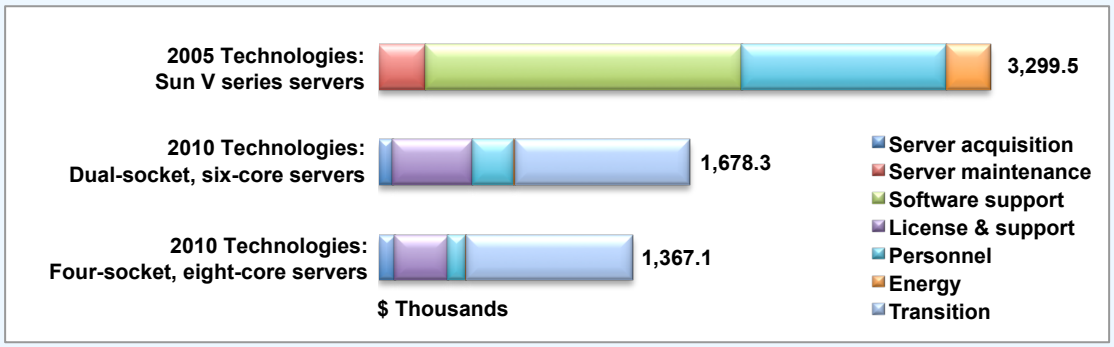
**Server consolidation ratios average 8.6:1 for use of dual-socket Intel Xeon 5600 series-based servers and 29:1 for use of four-socket Intel 7500 series-based servers. Average payback periods are less than five months and less than four months respectively.**

## Oracle to SQL Server Migration

**A second cost reduction opportunity is to combine database server consolidation with migration from Oracle to SQL Server 2008 R2.**

If users replace Oracle 10g databases deployed on 2005-vintage Sun UltraSPARC-based Solaris servers with SQL Server 2008 R2 on the same Intel Xeon processor 5600 and 7500 series-based models as for SQL Server to SQL Server consolidation, they may realize average three-year cost reductions of 49 percent and 59 percent respectively. Windows Server 2008 R2 and Hyper-V are again employed.

For 2005 Technologies, we include operating costs only, including Oracle 10g support. For 2010 technologies, we include operating costs and costs of new server acquisition, as well as more extensive transition activities including database migration and data conversion. We summarize these results below.




We based these calculations on three installations with between 32 and 225 instances, again in multiple industries.

Server consolidation ratios average 8:1 for dual-socket Intel Xeon processor 5600 series-based and 24:1 for four-socket Intel Xeon processor 7500 series-based servers. Average payback periods are 15 and 13 months respectively.

## Conclusions

We draw certain conclusions. First, users may see a clear cost/benefit case for replacing old hardware and software technologies with SQL Server 2008 R2 and Windows Server 2008 R2 deployed on latest-generation Intel processor-based servers.

For SQL Server to SQL Server consolidation initiatives, net cost reductions and payback occur rapidly. For Oracle database migration initiatives, higher transition costs result in longer payback periods. Nevertheless, users may realize substantial cost savings.

Second, user experiences demonstrate the feasibility of both types of initiative. Although actual savings, consolidation ratios and other variables may vary between organizations, users may achieve significant reductions in hardware maintenance, software support, server administration and energy costs.

Users may also realize gains in such areas as improved availability, cross-organizational access to data, and more effective backup, recovery and security.

Database server consolidation offers a broader, longer-term potential. Organizations may not only reduce costs, but also increase the efficiency and resiliency of server infrastructures in ways that will enable them to better support growth and meet new business challenges far into the future.

# CONSOLIDATION ECONOMICS

## Opportunities

At yearend 2004, the typical U.S. Fortune 500 corporation contained fewer than 300 database server instances. By the end of 2009, the number had increased to more than 2,000. Similar trends have occurred in midsize business, in the public sector and in other types of organizations worldwide. SQL Server databases deployed on small x86 servers have seen the fastest rates of growth.

Multiplication of server databases has contributed to "server sprawl," resulting in low levels of utilization, unnecessary duplication of resources, and inflation of system administration and facilities costs.

Server consolidation has, to date, been applied more commonly to application and infrastructure servers than to database servers. Database consolidation has often raised complex performance issues, and has required that users address such issues as backup, recovery and security for multiple database instances on fewer physical servers.

As a result, many organizations have not realized the potential for database server consolidation. At a time of economic pressures, it is an obvious opportunity for cost savings.

## Technologies

Key technology shifts have made consolidation increasingly viable.

In less than five years, the "state of the art" in Intel processors has moved from single-core to eight-core models. Industry benchmarks, as well as user experiences, have confirmed major increases in performance for servers equipped with Intel Xeon 5600 and 7500 series processors.

Microsoft has also moved to new generations of software technology. SQL Server 2008 R2 and Windows Server 2008 R2 have delivered major gains in performance, scalability, resiliency and manageability, and have seen strong early adoption by users. Hyper-V provides new, more functional virtualization options.

These shifts materially facilitate consolidation. Experience has shown that the ability to concentrate databases on the same physical platform requires more than greater processor power. Highly effective system and workload management capabilities are also required to ensure that overall capacity is used efficiently, and that workloads do not interfere with each other.

SQL Server 2008 R2 features such as the Resource Governor, SQL Server Utility and Utility Control Point, along with enhancements in policy-based management, performance optimization and other areas, enable high levels of concentration. Additional capabilities in R2 improve performance and manageability for business intelligence applications.

SQL Server 2008 compression technology provides further benefits. Database compression not only means that less external storage capacity is required, but also that I/O loading is reduced – which tends to be higher for databases than for other types of server workload. Backup compression helps address the challenges of providing backup and recovery coverage for multiple databases.

Enhancements to security, audit and other functions also allow administrators to manage consolidated environments more efficiently.

Windows Server 2008 R2 and Hyper-V complement these capabilities, providing high levels of scalability for virtualized environments, as well as the ability to guest multiple generations of SQL Server databases and Windows operating systems, including 32-bit and 64-bit versions. System and workload management features integrate with and reinforce those of SQL Server 2008 R2.

In Windows Server 2008 R2, Microsoft has added a number of enhancements to Hyper-V in scalability (up to 384 virtual machines and 256 virtual processors on a single physical server), availability (Live Migration allows administrators to move virtual machines between physical servers without interrupting operations) and management of physical and virtual resources.

Nevertheless, many organizations continue to employ outdated technologies. Economic pressures have contributed to the reluctance to invest in upgrades. However, technological obsolescence may mean that organizations fail to realize opportunities for cost reduction.

This is the case not only among SQL Server users, but also among organizations that have deployed Oracle databases on RISC servers in the past. Migration from Oracle to lower-cost databases, and from Sun Microsystems RISC servers to x86 platforms have become industry-wide trends.

Migration from Sun SPARC-based servers has been particularly widespread. Earlier SPARC-based models were characterized by relatively poor performance, and by high system administration overhead and energy consumption. Performance limitations may mean high license and support fees for Oracle databases priced on a per core basis.

Migration between databases is typically a more difficult, lengthy and expensive process than upgrades. Organizations have often been reluctant to undertake major migration projects.

Again, however, the industry "state of the art" has evolved considerably in recent years. Migration tools and methodologies have become more sophisticated, and availability of third-party services has improved. This is particularly the case for Oracle to SQL Server migration, where economic pressures as well as the capabilities of SQL Server 2008 R2 have made this an increasingly attractive option.

There are thus multiple reasons to reevaluate opportunities for consolidation and migration.

## Savings

Organizations consolidate servers for a number of reasons. Typically, however, the potential for cost savings is a major consideration.

This report examines the cost savings that may be realized through two types of initiative – SQL Server to SQL Server consolidation, and consolidation and migration of Oracle databases – that exploit the potential of SQL Server 2008 R2, Windows Server 2008 R2 and Intel Xeon processor 5600 and 7500 series-based servers.

We have based our calculations on examples that involve consolidation and/or migration of databases employed for a variety of departmental and IT applications.

Comparisons do not include ERP systems, large data warehouses and other systems that would normally be deployed on dedicated servers, and clustered to ensure high levels of availability and continuity. These would typically be subjects of separate initiatives.

# SQL SERVER TO SQL SERVER CONSOLIDATION

## Cost Comparisons

Cost comparisons draw upon the experiences of more than 40 organizations that have conducted SQL Server consolidation initiatives using x86 servers. We used input from these organizations to construct six composite installations in financial services, health care, IT services, manufacturing, retail and professional services companies.

We developed two sets of scenarios for each installation:

1. ***2005 Technologies scenarios***. Numbers of instances, servers and full time equivalent (FTE) system administration personnel for these were based on user-supplied data.

   For calculation purposes, installed bases were normalized to the use of dual-socket servers configured with two 3.6 GHz single-core Intel Xeon processors with Microsoft SQL Server 2005 and Windows Server 2003. Calculations are for three-year operating costs, including hardware maintenance, software support, system administration personnel and energy consumption.

2. ***2010 Technologies scenarios***. These are for consolidation of databases to (1) dual-socket servers configured with two quad-core Intel Xeon 5600 series 3.33 GHz processors and (2) four-socket servers configured with eight-core Intel Xeon 7500 series 2.4 GHz processors.

   Databases and operating systems were upgraded to SQL Server 2008 R2 and Windows Server 2008 R2 respectively during the consolidation process, and were transferred to new servers as Hyper-V guests. Databases were not otherwise modified.

   Calculations are for operating costs – including the same items as for 2005 Technologies scenarios – as well as for acquisition of new servers, and for transition activities from initial planning to testing and quality assurance of consolidated environments. Costs for use of dual-socket and four-socket servers were calculated separately.

   Server acquisition costs include licenses for basic server and power management, prepaid three-year support for these and prepaid three-year hardware maintenance. Calculations do not include costs of new licenses for SQL Server 2008 R2 and Windows Server 2008 R2. It was assumed that existing Microsoft Software Assurance agreements covered upgrades to these.

In 2005 Technologies scenarios, mixes of SQL Server 2005 Enterprise and Standard editions, and Windows Server 2003 Enterprise and Standard editions were employed.

In 2010 Technologies scenarios, SQL Server 2008 R2 Enterprise Edition and Windows Server 2008 R2 Datacenter Edition are employed for most configurations. Use of these was typically more cost-effective than use of SQL Server 2008 Standard Edition and Windows Server 2008 Standard or Enterprise Editions, for which additional Microsoft licenses would have been required for guest instances.

Three-year costs were then calculated for these installations and scenarios, which are summarized in figure 1.

For all scenarios, hardware, maintenance and software support costs were calculated using “street” prices; i.e., discounted prices paid by organizations upon which installations were based. Software support costs were calculated for Microsoft Software Assurance coverage.

Figure 1

**Installations and Scenarios Summary:**
**SQL Server to SQL Server Consolidation**

| INDUSTRY | HEALTH CARE | RETAIL | PROFESSIONAL SERVICES |
|---|---|---|---|
| **Database instances** | 30 | 77 | 103 |
| **2005 Technologies**<br>**Dual-socket, single-core servers** | 23 x 2/2 x Xeon 3.6 GHz<br>1.05 sysadmin FTEs | 37 x 2/2 x Xeon 3.6 GHz<br>1.25 sysadmin FTEs | 75 x 2/2 x Xeon 3.6 GHz<br>3.15 sysadmin FTEs |
| **2010 Technologies #1**<br>**Dual-socket, six-core servers** | 4 x 2/12 x Xeon 3.33 GHz<br>0.2 sysadmin FTE | 5 x 2/12 x Xeon 3.33 GHz<br>0.25 sysadmin FTE | 19 x 2/12 x Xeon 3.33 GHz<br>0.95 sysadmin FTE |
| **Server Consolidation Ratio** | **5.8:1** | **7.4:1** | **3.9:1** |
| **2010 Technologies #2**<br>**Four-socket, eight-core servers** | 2 x 4/32 x Xeon 2.4 GHz<br>0.1 sysadmin FTE | 2 x 4/32 x Xeon 2.4 GHz<br>0.1 sysadmin FTE | 5 x 4/32 x Xeon 2.4 GHz<br>0.35 sysadmin FTE |
| **Server Consolidation Ratio** | **11.5:1** | **18.5:1** | **15:1** |
| **INDUSTRY** | **MANUFACTURING** | **IT SERVICES** | **FINANCIAL SERVICES** |
| **Database instances** | 144 | 326 | 405 |
| **2005 Technologies**<br>**Dual-socket, single-core servers** | 126 x 2/2 x Xeon 3.6 GHz<br>4.85 sysadmin FTE | 172 x 2/2 x Xeon 3.6 GHz<br>3.8 sysadmin FTEs | 263 x 2/2 x Xeon 3.6 GHz<br>8.6 sysadmin FTEs |
| **2010 Technologies #1**<br>**Dual-socket, six-core servers** | 10 x 2/12 x Xeon 3.33 GHz<br>0.45 sysadmin FTE | 18 x 2/12 x Xeon 3.33 GHz<br>0.55 sysadmin FTE | 25 x 2/12 x Xeon 3.33 GHz<br>1.2 sysadmin FTEs |
| **Server Consolidation Ratio** | **12.6:1** | **9.6:1** | **10.5:1** |
| **2010 Technologies #2**<br>**Four-socket, eight-core servers** | 3 x 4/32 x Xeon 2.4 GHz<br>0.2 sysadmin FTE | 5 x 4/32 x Xeon 2.4 GHz<br>0.25 sysadmin FTE | 7 x 4/32 x Xeon 2.4 GHz<br>0.35 sysadmin FTE |
| **Server Consolidation Ratio** | **42:1** | **34.4:1** | **37.6:1** |

Personnel costs are for Windows system administrators, and are based on an annual average salary of $73,885 increased by 48.3 percent to allow for benefits, bonuses and related items, multiplied for three years. Personnel costs for database administrators (DBAs) are not included, as databases were not substantially modified.

Energy costs are for electricity consumption by servers as well as by power and cooling equipment supporting these. Costs were calculated based on specific utilization levels and hours of operation for each installation using a conservative assumption for average price per kilowatt/hour.

Transition costs for 2010 Technologies scenarios include planning, preparation, consolidation, testing of new hardware and software environments, staff retraining, quality assurance and other activities that would typically form part of a SQL Server and Windows server consolidation initiative.

Calculations assume that in-house DBAs and system administrators perform tasks. Calculations include time spent on consolidation activities as well as staff retraining, and are based on average hourly rates for personnel that reflect average annual salaries increased by 48.3 percent.

Allowance was made for 15 days of classroom training for DBAs in SQL Server 2008 R2 and for system administrators in Windows Server 2008 R2 including Hyper-V.

## Installation Variations

There are variations in consolidation ratios and FTE staffing (shown in figure 1), as well as in three-year costs and payback periods between installations. These reflect differences in database sizes, applications and characteristics, and in degrees of efficiency in 2005 Technologies scenarios.

Three-year costs for 2010 Technologies scenarios using dual-socket servers range from 58 percent to 85 percent less than for 2005 equivalents, while payback periods range from three to eight months.

For 2010 Technologies scenarios employing four-socket servers, three-year costs range from 71 percent to 90 percent less than for 2005 equivalents, while payback periods range from two to seven months. Figure 2 shows these variations.

Figure 2
**Three-year Costs Variations:**
**SQL Server to SQL Server Consolidation**

| INSTALLATION | HEALTH CARE | RETAIL | PROFESSIONAL SERVICES |
|---|---|---|---|
| **2005 Technologies** | | | |
| **Operating costs ($)** | **866,389** | **1,189,700** | **2,641,329** |
| **2010 Technologies (Dual-socket, six-core servers)** | | | |
| **Operating costs** | 163,896 | 205,207 | 773,889 |
| **Server acquisition** | 41,426 | 51,783 | 196,774 |
| **Transition costs** | 56,519 | 64,097 | 150,957 |
| **Total ($)** | **261,841** | **321,087** | **1,121,620** |
| **Percent less** | **69.8%** | **73.0%** | **57.5%** |
| **Payback (months)** | **6.3** | **5.6** | **8.3** |
| **2010 Technologies (Four-socket, eight-core servers)** | | | |
| **Operating costs** | 131,573 | 131,868 | 359,745 |
| **Server acquisition** | 69,924 | 69,924 | 174,811 |
| **Transition costs** | 54,318 | 60,892 | 102,395 |
| **Total ($)** | **255,815** | **262,684** | **636,951** |
| **Percent less** | **70.5%** | **77.9%** | **75.9%** |
| **Payback (months)** | **7.0** | **5.3** | **5.4** |

| INSTALLATION | MANUFACTURING | IT SERVICES | FINANCIAL SERVICES |
|---|---|---|---|
| **2005 Technologies** | | | |
| **Operating costs ($)** | **3,618,451** | **3,243,974** | **6,505,578** |
| **2010 Technologies (Dual-socket, six-core servers)** | | | |
| **Operating costs** | 349,946 | 546,886 | 897,440 |
| **Server acquisition** | 96,168 | 173,102 | 240,419 |
| **Transition costs** | 90,276 | 113,871 | 202,709 |
| **Total ($)** | **536,390** | **833,859** | **1,340,568** |
| **Percent less** | **85.2%** | **74.3%** | **79.4%** |
| **Payback (months)** | **3.0** | **5.2** | **4.1** |
| **2010 Technologies (Four-socket, eight-core servers)** | | | |
| **Operating costs** | 187,702 | 286,844 | 398,344 |
| **Server acquisition** | 97,395 | 162,325 | 227,254 |
| **Transition costs** | 82,633 | 99,447 | 147,129 |
| **Total ($)** | **367,730** | **548,616** | **772,727** |
| **Percent less** | **89.8%** | **83.1%** | **88.1%** |
| **Payback (months)** | **2.4** | **4.0** | **2.8** |

## Conclusions

Migration to SQL Server 2008 R2 and consolidation of databases onto latest-generation Intel Xeon processor 5600 and 7500 series-based servers equipped with Windows Server 2008 R2 and Hyper-V offers significant opportunities. The potential exists not only for significant multi-year cost savings, but also for rapid payback.

These gains may be realized with comparatively small upfront expenditures. If Software Assurance agreements are in place, existing licenses may be transferred. Initial costs are for server acquisition and transition only.

Users can take advantage of Microsoft licensing options to minimize costs of running large numbers of instances on single servers.

Consolidation places a premium on the reliability, availability and serviceability (RAS) characteristics of underlying servers. Because databases are concentrated on fewer servers, downtime will tend to affect more applications and users. Avoidance of unplanned (i.e., accidental) as well as planned outages becomes more important than in less efficient environments.

From this perspective, the RAS enhancements realized for SQL Server 2008 R2 and Windows Server 2008 R2 are also important facilitators of consolidation. The risks that organizations might incur through high levels of concentration are significantly lower now than was the case for previous generations of Microsoft technology.

One further point should be noted. The savings quantified here are for consolidation and upgrades of SQL Server 2005 databases. Larger gains may be realized by organizations that replace even earlier technologies, such as SQL Server 2000.

# ORACLE DATABASE MIGRATION

## Cost Comparisons

Cost comparisons draw upon the experiences of 16 organizations that have migrated Oracle databases on Sun RISC servers to SQL Server on x86 servers. Input from these was used to construct three composite installations of petroleum and pharmaceutical companies, and a higher education institution.

Two sets of scenarios were again developed for each installation:

1. ***2005 Technologies scenarios***. Numbers of instances, servers and full time equivalent (FTE) system administration personnel for these were based on user-supplied data.

   Installed bases were normalized to use of Oracle 10g deployed on Sun V240 (dual-socket) V440 (four-socket) and V890 (eight-socket) servers with the Solaris 10 operating system.

   V240 servers were equipped with two UltraSPARC IIIi 1.5 GHz processors, while V440 servers were equipped with four UltraSPARC IIIi 1.6 GHz processors, and V890 servers with eight UltraSPARC IV 1.35 GHz processors. All processors were single-core models.

   Calculations are for three-year operating costs, including Sun hardware and operating system maintenance, Oracle software support, system administration personnel and energy consumption.

   Oracle software support costs are for mixes of Oracle 10g Enterprise Edition and Standard Edition. Costs also include support for Oracle Diagnostics and Tuning Packs. These are typically employed with Oracle databases and provide database management functionality incorporated by Microsoft in SQL Server 2008 at no additional charge.

2. ***2010 Technologies scenarios***. These employ the same software and server platforms as for SQL Server to SQL Server consolidation comparisons; i.e., SQL Server 2008 R2 is deployed using Windows Server 2008 R2 with Hyper-V on the same platforms as for SQL Server to SQL Server consolidation comparisons.

   These are (1) dual-socket servers configured with two quad-core Intel Xeon 5600 series 3.33 GHz processors and (2) four-socket servers configured with eight-core Intel Xeon 7500 series 2.4 GHz processors. Costs for use of these were again calculated separately.

   SQL Server 2008 R2 Enterprise Edition and Windows Server 2008 R2 Datacenter Edition were employed for most configurations for cost-effectiveness, and servers were again equipped with basic server and power tools.

   Operating costs were calculated in the same manner as for SQL Server to SQL Server consolidation comparisons. Server acquisition costs, however, include license fees for SQL Server 2008 R2 and Windows Server 2008 R2; i.e., it is not assumed that upgrades are covered under Microsoft Software Assurance agreements.

   Transition costs include more extensive activities than for SQL Server to SQL Server consolidation comparisons.

   Costs include planning; analysis of source database schemas, creation of target database structures, data conversion, deployment and testing of new hardware and software environments, and other activities performed by in-house staff as well as external specialists; and DBA and system administrator training in SQL Server 2008 R2 and Windows Server 2008 R2.

Installations and scenarios are summarized in figure 3.

Figure 3
**Installations and Scenarios Summary:**
**Oracle Database Migration**

| INDUSTRY | ENERGY | HIGHER EDUCATION | LIFE SCIENCES |
|---|---|---|---|
| **Database instances** | 32 | 76 | 225 |
| **2005 Technologies**<br>**Sun Fire servers** | 2 x V890, 5 x V440<br>7 x V240<br>0.85 sysadmin FTE | 17 x V440, 36 x V240<br>2.3 sysadmin FTEs | 5 x V890, 28 x V440<br>93 x V240<br>6.1 sysadmin FTEs |
| **2010 Technologies #1**<br>**Dual-socket, six-core servers** | 3 x 2/12 x Xeon 3.33 GHz<br>0.25 sysadmin FTE | 6 x 2/12 x Xeon 3.33 GHz<br>0.55 sysadmin FTE | 15 x 2/12 x Xeon 3.33 GHz<br>1.2 sysadmin FTE |
| **Server Consolidation Ratio** | **4.7:1** | **8.8:1** | **8.4:1** |
| **2010 Technologies #2**<br>**Four-socket, eight-core servers** | 1 x 4/32 x Xeon 2.4 GHz<br>0.15 sysadmin FTE | 2 x 4/32 x Xeon 2.4 GHz<br>0.25 sysadmin FTE | 5 x 4/32 x Xeon 2.4 GHz<br>0.45 sysadmin FTE |
| **Server Consolidation Ratio** | **14:1** | **26.5:1** | **25.2:1** |

Maintenance and software support costs for 2005 Technologies scenarios and for new server acquisition and software support for 2010 Technologies scenarios were again calculated using "street" prices. Energy costs were also calculated in the same manner as for SQL Server to SQL Server consolidation.

Personnel costs for 2005 Technologies scenarios are for Solaris system administrators. Calculations were based on an annual average salary of $79,261 per year, increased by 48.3 percent and multiplied for three years. Personnel costs for 2010 Technologies scenarios are for Windows system administrators, and were calculated using the same values as for SQL Server to SQL Server consolidation.

Transition costs for 2010 Technologies scenarios include between 50 and 200 person-days of project management, technical assistance and skills transfer activities by a third-party professional services firm, as well as time spent by in-house DBAs and system administrators.

Allowance was made for 25 days of classroom training for DBAs in SQL Server 2008 R2, and for system administrators in Windows Server 2008 R2 including Hyper-V.

## Installation Variations

As for SQL Server to SQL Server consolidation, there are variations in consolidation ratios and FTE system administration staffing (shown in figure 3), as well as in three-year costs and payback periods between installations (shown in figure 4). These again reflect differences in database sizes, applications and other characteristics.

Three-year costs for use of dual-socket servers in 2010 Technologies scenarios vary from 41 percent to 53 percent less than for 2005 equivalents, while the comparable range for four-socket servers is 51 percent to 63 percent. Payback periods for 2010 Technologies scenarios for use of dual-socket servers vary from 14 to 18 months, and for four-socket servers from 12 to 16 months.

## Conclusions

Oracle database migration offers the same benefits as for SQL Server to SQL Server consolidation – maintenance, software, system administration personnel and energy costs may be reduced, and improvements may be realized in such areas as improved availability, cross-organizational access to data, and more effective backup, recovery and security.

Figure 4
**Three-year Costs Variations: Oracle Database Migration**

| INSTALLATION | ENERGY | HIGHER EDUCATION | LIFE SCIENCES |
|---|---|---|---|
| **2005 Technologies** | | | |
| **Operating costs ($)** | **1,257,739** | **2,475,067** | **6,165,844** |
| **2010 Technologies (Dual-socket, six core servers)** | | | |
| **Operating costs** | 155,071 | 327,718 | 762,047 |
| **Server acquisition** | 121,245 | 242,491 | 606,227 |
| **Transition costs** | 420,391 | 887,400 | 1,512,293 |
| **Total ($)** | **696,707** | **1,457,609** | **2,880,567** |
| **Percent less** | **44.6%** | **41.1%** | **53.3%** |
| **Payback (months)** | **17.0** | **18.0** | **13.9** |
| **2010 Technologies (Four-socket, eight-core servers)** | | | |
| **Operating costs** | 98,067 | 180,512 | 392,795 |
| **Server acquisition** | 94,062 | 188,124 | 470,311 |
| **Transition costs** | 403,772 | 851,843 | 1,421,552 |
| **Total ($)** | **595,901** | **1,220,479** | **2,284,658** |
| **Percent less** | **52.6%** | **50.7%** | **62.9%** |
| **Payback (months)** | **15.2** | **16.0** | **11.8** |

The principal difference in costs for server consolidation and server migration between is that server migration entails significantly more transition activities. Converting databases is a more challenging process than replacing servers, and more substantial changes in skills and practices are required. Upfront costs are correspondingly higher. Facing economic pressures, users have often spread migrations over multi-year periods.

Other factors, however, may come into play. For example, replacement of Sun SPARC-based servers has been driven not only by cost reduction, but also by concerns about the future of SPARC technology. The uncertain status of SPARC in the wake of Oracle's acquisition of Sun has magnified such concerns.

Moreover, an aging server infrastructure can embed inefficiencies whose effects may be felt well beyond three-year cost measurement periods.

Even in the current economic environment, databases continue to expand, and it can be expected that growth will accelerate as conditions improve. Poor performance and low capacity utilization may cause sustained, long-term growth not only in database license in support fees, but also in a wide range of other server-related cost variables.

The alternative is to commence migration at an early stage. Costs may be significantly reduced within a few years, and future cost inflation may be avoided.

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