Server Cost of Ownership in ERM Customer Sites

A Total Cost of Ownership Study

An IDC White Paper

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Overview

IDC recently conducted a study of enterprises that deployed enterprise resource management (ERM) applications across multiple server platforms. This study's goal was to determine the total cost of ownership (TCO) metrics when comparing the IBM eServer iSeries-AS/400 ERM solutions with competing Unix server and SIAS server–based ERM solutions. SIAS refers to Standard Intel Architecture Server platforms, which were formerly called PC servers in other IDC TCO studies. As a category, SIAS systems are Intel-compatible servers running a variety of server operating systems (including Microsoft Windows NT Server, Microsoft Windows 2000, Novell NetWare, Unix, and Linux), databases, and packaged applications.

This research found overall iSeries TCO advantages for the ERM workloads studied, as well as advantages in the areas of availability of data and applications, IT staffing productivity, and user productivity. These advantages were even more pronounced in large-scale, complex mission-critical applications, such as ERM, which support hundreds of end users. For small firms, the five-year TCO was 91% greater for Unix servers and 95% greater for SIAS servers than for the IBM eServer iSeries servers. For larger implementations, the five-year TCO was 58% greater for comparable Unix servers and 72% greater for comparable SIAS server solutions than for IBM eServer iSeries servers. The study also revealed the iSeries' ability to support productivity savings as a function of reduced user downtime. This study found unplanned user downtime to be five times less for the iSeries ERM solutions than for comparable Unix server–based ERM solutions and 16 times less than for comparable SIAS server–based ERM solutions.

Methodology

To analyze user experiences in running ERM applications on different server platforms, IDC surveyed 24 commercial sites in the United States and Canada. We chose 12 iSeries sites from a list of sites provided by IBM, and we selected 12 Unix sites and SIAS server sites from an IT publication subscription list of ERM installations. All respondents

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were required to have installed a new third-party commercial or business application and server within the last two years. To qualify, the respondent's application must have been running "live" in a production environment for three months. Because the data for Unix and SIAS-based servers was gathered across multiple hardware, middleware, and application software platforms, customers should avoid extrapolating our analysis to any specific Unix or SIAS server products.

IDC notes that Unix server platforms are known for their ability to run scalable applications and large corporate databases that support many end users and to do so at levels of price/performance that improve each year. SIAS server vendors, including IBM and its server competitors, have continued to make significant progress in improving these servers along the same value dimensions — overall price/performance, availability, and improved productivity — over time. Typically, Unix servers and SIAS servers run a number of layered middleware and database packages, in addition to line-of-business applications such as ERM. Typically, the iSeries has a higher degree of integration and automated systems management than the competing platforms.

IDC collected the following information from study respondents: costs for hardware purchase, installation, training, maintenance, and upgrades; costs for ERM software purchase, installation, training, maintenance, and upgrades; staffing costs to support the servers over three-year and five-year periods. We also captured information regarding IT staff productivity and the amount of downtime to determine user productivity.

Summary of Results

As Table 1 shows, the iSeries has superior TCO along several dimensions: according to a number of company characteristics and according to two TCO time periods (three years and five years). Our analysis yields the following findings:

- For small companies, the three-year TCO was 60% greater for Unix server-based ERM solutions than for IBM eServer iSeries solutions and 95% greater for SIAS-based solutions than for comparable IBM eServer iSeries solutions for the same three-year period.
- For small companies, the five-year TCO was 91% higher for Unix servers than for iSeries servers and 95% higher for comparable SIAS servers than iSeries server-based solutions.

- For large companies, the three-year TCO was 58% higher for Unix servers than for iSeries servers and 45% higher for comparable SIAS servers than for iSeries server-based solutions.
- For large companies, the five-year TCO was 58% higher for Unix servers than for iSeries servers and 72% higher for comparable SIAS servers than for iSeries server-based solutions.

Productivity gains were also associated with iSeries deployment:

- The iSeries sites had 3.5 servers managed per IT staff member, compared with 2.2 servers per staff member for Unix server sites and 1.3 servers per staff member for SIAS server sites. This resulted in iSeries TCO advantages over Unix servers and SIAS servers of 37% and 60%, respectively.
- The iSeries provides significant productivity savings as a function of reduced user downtime. This study found user downtime to be five times less for the iSeries ERM solutions than for comparable Unix server–based ERM solutions and 16 times less than for comparable SIAS server–based ERM solutions.
- This IDC TCO study found that iSeries customers also experienced reduced IT staff time spent on ongoing support, including service and repair.

In small companies with high growth, the iSeries TCO advantage increases over time as operational costs become a more important expense factor compared with product acquisition and deployment. The benefits of deploying the iSeries platform are even more pronounced at the five-year milestone than at the three-year milestone.

Table 1
TCO Summary in Small and Large Environments

	Small Companies				Large Companies			
	Three-Year TCO		Five-Year TCO		Three-Year TCO		Five-Year TCO	
	($)	Difference (%)	($)	Difference (%)	($)	Difference (%)	($)	Difference (%)
Average number of users	217		330		5,075		5,151	
IBM iSeries–AS/400 solution	246,348		143,546		129,216		98,300	
SIAS server–based solution	329,532	34	279,958	95	187,967	45	169,165	72
Unix server–based solution	393,395	60	274,081	91	204,138	58	155,080	58

Notes:
TCO is calculated per 100 users.
Small companies show high growth, while large companies show slow growth.
Source: IDC, 2001

For large companies, the iSeries server's scalability, built-in management, and integrated software capabilities give the product an even greater TCO advantage over comparable server platforms.

The iSeries Value Proposition

The iSeries' value proposition has long included high availability, scalability, balanced performance, ease of management, and TCO. These features have helped establish the product's reputation as a robust server environment for strategic line-of-business applications, such as ERM, supply chain, and customer relationship management (CRM), and for a new generation of emerging ebusiness applications. The iSeries' strong value proposition, which is the result of a combination of scalable hardware, packaged software solutions, and IBM support, is especially appealing during the current economic downturn. This period of increasing turnover among software developers and IT staffers has made it more difficult to implement mainstream ebusiness applications quickly, even as corporations strive to gain market share in a price-competitive marketplace.

Recent system enhancements in the iSeries server platform continue to build on the IBM AS/400's reputation as a strong platform for running line-of-business applications. IBM recently improved the clustering and high-availability features in the iSeries to protect both the data and applications that run on the platform. The high-availability software reduces downtime and thus boosts employee productivity at sites running on iSeries servers.

The iSeries has a built-in relational database, IBM DB2 Universal Database for iSeries. Therefore, IT managers do not need to acquire a separate database product, which can add from $40,000 to $100,000 to the purchase price of a competing server platform. DB2 is a scalable database that is an important element of ERM total solutions.

Further, IBM has increased the iSeries' level of "openness" to other networked systems, possibly in response to criticism that the system is too dependent on IBM proprietary software technologies. The iSeries' built-in support for the WebSphere Application Server, TCP/IP, the Apache Web server, XML data protocols, Lotus Domino collaborative software, Java, and the Linux operating system allows iSeries customers to get the best of both worlds — the ability to implement portable applications and computing environments that are associated with the Internet and the freedom to negotiate with multiple software vendors to get the best deals for packaged line-of-business software applications that run on many server platforms.

IBM's highly successful WebSphere Application Server now provides iSeries with a middleware framework for linkage between incoming Web transactions and core business data and logic. As a result, the iSeries is a reliable platform for supporting the expansion of ebusiness infrastructure that is needed to deploy ecommerce applications. For these new applications to benefit a corporation's bottom line, users need a platform that has the scalability, ease-of-use, and high degree of integration necessary for successful, large-scale, mission-critical ebusiness application deployments.

At the same time, IDC notes that Unix server vendors and SIAS-based server vendors have continued to make similar advancements in their total solution sets. They have made great efforts in terms of integrating independent software components and improving their scalability. Historically, vendors of industry-standard platforms have been able to close the performance gap with vendors that have more integrated offerings because the technologies of the former group better integrate hardware and software components and reduce complexity. The purpose of this study was to assess the status of these competing approaches vis a vis a relatively complex, large-scale, and mission-critical application: ERM.

Key Operational Metrics

As our study shows, ERM implementations based on iSeries platforms enjoy a significant TCO advantage over Unix server solutions and SIAS server–based solutions. The average iSeries server (375 users) supported many more users than the Unix servers (201 users) and SIAS servers (113 users) for ERM — a difference of 46% and 70%, respectively (see Table 2).

The second key operational metric driving the iSeries' low TCO is management overhead. On a per-server basis, the iSeries requires only two-thirds the IT support staff of the Unix platform and only 40% of the staff of the SIAS platform. The iSeries sites had 3.5 servers per IT staff member, compared with 2.2 servers per staff member for Unix server sites and 1.3 servers per staff member for SIAS server sites — an advantage of 37% and 60%, respectively.

The operating life for iSeries servers tends to be longer than that of the competing platforms — 8.0 years compared with 6.6 years for Unix servers and 4.5 years for SIAS servers. This lengthy period of ownership for iSeries and AS/400 servers is a strong sign that customers are getting value out of their initial purchase and that the iSeries platform, on average, can be leveraged over more years than competing server platforms.

Table 2
Key Cost/Performance Metrics

	iSeries-AS/400 Solution	SIAS-Based Solution	Unix-Based Solution
Users per server	375.1	112.8	200.7
Servers per IT staff	3.5	1.3	2.2
Server operating life (years)	8.0	4.5	6.6

Source: IDC, 2001

Of course, TCO for an ERM solution is a function of the hardware, server operating system, middleware (layered software including transactional software, database software, and Internet infrastructure

software), and application implementation. Unix and SIAS-based solutions are often built on "solution stacks" of these software layers that are provided by a variety of vendors. Each software element contributes in a unique way to overall TCO. Integrating the multiple components of these varying solution bundles can be a challenge for speed of deployment and for cost of ownership.

The use of packaged software reduces an IT manager's development and administrative costs. Typically, businesses must employ software programmers to build or to adapt custom programs for business processing. Skilled programmers are often in high demand, and their salaries can escalate during times when programmers with specific skill sets are in short supply. However, the use of packaged applications reduces the need to employ an in-house programming staff, and it reduces the overhead associated with lengthy software development cycles and subsequent updates of the custom software.

In our research, we measured ERM implementations under a variety of solution bundles. The fact that the iSeries-based solution has a much more integrated approach and a highly mature software environment is an important factor in its success with this TCO metric.

Staffing

The iSeries' strong showing in the area of staffing levels needed for ERM deployments is a major contributor to its superior TCO results. A single operations staff person can support more users and more servers in the iSeries environment than in the Unix and SIAS-based server computing environments.

The iSeries has an integrated architecture with database and management tools that are designed to support robust and easy-to-maintain solutions. This is especially vital for ebusiness and for other mission-critical applications that require the IT staff to focus on business solutions rather than on the simple availability and integration of key applications. The challenge for Unix and SIAS-based server solutions is that integration often must be done across more "moving parts" that increase the total staff time associated with integration tasks, which often can result in higher levels of downtime.

Availability and User Productivity Savings

Another important factor leading to the iSeries' advantage in mission-critical applications such as ERM is the metric of user productivity, which is measured in large part by the amount of time that users have access to business-critical applications (see Table 3).

IDC quantified this factor by measuring the total number of unplanned downtime hours per year for each platform and by comparing that figure to the average total downtime hours for all platforms. We then took the difference and multiplied that number by the

average loaded IT salary. Our findings suggest that iSeries users experienced fewer unplanned downtime hours per month and had fewer users affected by unplanned outages. As a result, iSeries users are spending less idle time waiting for applications to come back online and more time executing their business than users of other platforms. IDC feels that planned downtime is a function of IT operational practices, which vary from site to site.

The iSeries provides significant productivity savings as a function of reduced user downtime — which this study found to be five times less than that of comparable Unix server–based ERM solutions and 16 times less than that of comparable SIAS server–based ERM solutions. IDC found that iSeries customers also experienced reduced IT staff time spent on ongoing support, including service and repair.

Table 3
Productivity Metrics

User Productivity	iSeries-AS/400 Solution	SIAS-Based Solution	Unix-Based Solution
Unplanned downtime hours per month	0.24	2.70	1.00
% of internal users affected	42	63	53
Unplanned user downtime hours per year/100 users	1,235	20,250	6,344
Availability (%)	99.98	99.67	99.90

Source: IDC, 2001

The iSeries' reliability is enhanced by the system's tightly integrated hardware and software architecture. Thus, operational errors that are associated with integrating layered software on competing server platforms are avoided. Further, its scalability and job management capability accommodate incremental workloads that are added to the system while it is running. This flexibility compares favorably with SIAS server platforms, which may run out of headroom for growing applications and databases, forcing IT managers to upgrade their SIAS systems or to replace them with larger SIAS systems — with the latter option costing companies both time and money.

The iSeries Platform

The iSeries system is based on powerful 64-bit IBM RISC microprocessors. The iSeries microprocessors support state-of-the-art copper and silicon-on-insulator (SOI) processor technologies found on other IBM eServers, including zSeries mainframes and pSeries Unix/RISC servers.

Its support of dynamic logical partitioning (LPAR) allows the iSeries server to be divided into partitions so that workloads can be isolated within specific partitions and multiple workloads, including Linux applications, can be run simultaneously without interfering with one another. Workload management software allows system administrators to move system resources, including processors and memory, between partitions, if needed to support expanding workloads, resulting in a high degree of operational flexibility.

iSeries also offers optional Intel-based coprocessors, based on IBM eServer xSeries technology, that can run Microsoft Windows NT Server or Microsoft Windows 2000. These coprocessors can act as front-end servers that support specific applications from other server operating environments — with the added advantage that the coprocessors can access data that is stored within the iSeries' built-in database.

The iSeries has a high degree of automation built into its design, including automated storage management. It has the ability to automatically store and manage files without any user or operator intervention. This capability, called virtual storage, reduces the need for system administrators to take actions associated with file storage and disk-volume management.

Line-of-business applications are packaged software applications that are used in place of traditional custom applications for specific computing workloads. Although the iSeries is seen as an enterprise server platform, the IBM AS/400 was originally designed to be sold to small and medium-sized businesses — and to business units within large businesses — as an integrated "solution" set that could be rapidly deployed. In many cases, the companies that purchased the AS/400 had no full-time software developers on staff. Instead, they relied on the broad inventory of business applications that were sold with the AS/400 platform, on the system's built-in database, and on the support and service provided by IBM and its channel partners.

The emerging area of ebusiness has brought a new wave of software applications to the new iSeries platform. New categories of applications are coming into play, including support for end-to-end ebusiness transactions, ecommerce shopping, and Internet-enabled supply-chain and CRM. This study found that a high percentage of iSeries-AS/400 sites surveyed, 42%, were running ebusiness applications on their server platform, compared with 14% of the SIAS server sites surveyed and 38% of the Unix sites surveyed. Importantly, the iSeries provides a single, systemwide security system that ensures the integrity of ecommerce business transactions over the Internet. It supports virtual private networks (VPNs), Secure Sockets Layer (SSL) transactions, and transport layer security (TLS).

Other Hardware Platforms: Unix Servers and SIAS Servers

Unix servers typically include the following elements: hardware, Unix operating system, layered software or "middleware" for transaction monitoring, Internet functionality, and database and application software. Before the advent of the Internet, software programmers had to write to a specific Unix operating system's application programming interfaces (APIs), which was a labor-intensive task. Further, the resulting software had to be optimized, or tuned, to provide good performance for business applications.

Today, the responsibility of optimizing Unix software is often a labor-intensive task for IT personnel and system administrators, forcing a move to preintegrated "solution stacks" for Unix server systems in recent years. Moreover, any custom programs that have been written for a specific "flavor" of Unix have to be updated and maintained over time, and additional layered software packages may have to be installed over time, to complete the total Unix server solution.

However, the increased use of "solution stacks" should eventually reduce the cost of integrating layered software on Unix servers. This trend toward greater integration may also reduce somewhat the cost of independent database products, which today add substantially to the cost of Unix server platforms that are purchased by IT organizations. Typically, Unix midrange servers excel at supporting large databases and their associated applications, and they are generally more scalable than SIAS servers. Unix servers, ranging from entry servers to midrange servers, remain under intense price competition from less costly SIAS servers.

Typically, customers purchase SIAS servers to reduce their reliance on expensive Unix-style programming. However, the SIAS servers bring their own set of challenges, chiefly in their general lack of scalability compared with most Unix server architectures, regardless of the operating system that is running on the SIAS servers.

Traditionally, IT managers have compensated for this lack of scalability by installing many two- or four-processor SIAS servers within their sites and by dedicating specific servers to specific workloads or computing tasks. Therefore, more SIAS servers than iSeries or Unix servers are required to support equivalent workloads and equivalent numbers of end users. IDC notes that a new generation of SIAS servers, based on Intel's 64-bit Itanium microprocessor, is due to be shipped in volume, starting in 2002. These 64-bit servers will compete with Unix/RISC servers, and they will be more scalable than today's 32-bit SIAS servers.

ERM Packaged Applications

A variety of packaged applications are available for the iSeries, including ERM, CRM, materials resource planning (MRP) for manufacturing sites, and others. In addition, the system's optional Intel coprocessors can run thousands more packages written for Microsoft Windows NT Server or Microsoft Windows 2000.

IDC believes that the combined iSeries-AS/400 server platform is one of the most widely used ERM platforms worldwide. IBM has strong application support from ERM vendors such as J.D. Edwards, Geac Computer, IBS, Intentia International, MAPICS, SAP, and Baan, to name just a few independent software vendors (ISVs) that supply ERM applications.

Challenges

TCO Challenges

The iSeries provides many TCO advantages over comparable Unix servers. However, those Unix servers are becoming extremely price competitive, as they compete in the marketplace with scalable Intel-based SIAS servers. High availability for Unix servers is improving, and midrange servers are adding partitioning and clustering capabilities that improve resource management. However, because most Unix servers require separate database products, it is unlikely that Unix servers will soon be able to match the integrated database capabilities and pricing of the iSeries. When compared with SIAS servers, the iSeries offers a much higher degree of scalability and reliability. However, IDC notes that SIAS servers are also being enhanced to improve both of those attributes. While progress along those value dimensions has been relatively slow, a new generation of IA64-based SIAS servers is expected to bring greater performance and scalability to SIAS servers starting in CY02.

Market Challenges

The AS/400 built a strong reputation over the years in the midrange server market but suffered from its "proprietary" image. In part, this perception resulted from the AS/400's direct competition with server platforms that are available from a variety of OEMs running Unix and Microsoft Windows NT Server/Microsoft Windows 2000 operating systems. With the introduction of iSeries models, however, IBM increased the overall openness of the platform by expanding its ability to run cross-platform applications and Internet ecommerce software. IDC believes that IBM will need to broaden its efforts to market the many benefits of the new iSeries platform to new customers outside of its traditional AS/400 installed base.

Conclusion

This study shows that the iSeries enjoys significant TCO advantages versus two of the most widely used types of servers running ERM applications: Unix servers and SIAS servers. Specifically, in a five-year calculation, Unix servers showed a 91% higher TCO compared to iSeries, and SIAS servers running ERM line-of-business applications resulted in a 95% higher TCO than comparable iSeries implementations. Among the factors contributing to this TCO advantage are the iSeries' integration of database and management features, which reduces the need for layered software and the additional system administration. The iSeries also enjoys productivity advantages: This study found user downtime to be five times less for the iSeries ERM solutions than for comparable Unix server–based ERM solutions and 16 times less than for comparable SIAS server–based ERM solutions. Moreover, this study has shown the iSeries' ability to support large numbers of end users at less cost than the comparable Unix servers — and to support more users with higher levels of data availability than comparable SIAS servers.

Customers already view the IBM eServer iSeries as a solid ebusiness platform that can deliver on mission-critical applications, such as ERM and line-of-business applications, as well as a wide variety of Internet-enabled ecommerce applications. The iSeries' scalability, availability, and staffing efficiencies are even more important in today's mission-critical ERM and ebusiness environments than they were in the traditional packaged software environment that preceded the Internet age. The iSeries TCO story continues to be a strong one, combining high staff productivity with reduced ongoing costs that are due to a highly integrated, cost-effective ebusiness server platform.

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