



Aberdeen Group

**SAP Implementations
Using IBM DB2 and
Sun Solaris:
A User Study**

An Executive White Paper

July 2000

Aberdeen Group, Inc.
*One Boston Place
Boston, Massachusetts 02108 USA
Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeem.com*

SAP Implementations Using IBM DB2 and Sun Solaris: A User Study

Executive Summary

This *Executive White Paper* researches the real-world effectiveness and advantages of IBM's DB2 database management system using Sun's Solaris operating environment for the SAP R/3 packaged application. For this study, Aberdeen has performed qualitative, in-depth research among enterprises and service providers that have implemented SAP using typical popular configurations.

Aberdeen's overall findings show that users' key criterion for an SAP database and operating environment is that the combination must be "low-maintenance." It should be easily scalable, robust in the sense that little operator intervention is required and downtime is minimal, and well suited to rapid customization and integration with other applications and databases for particular user needs. It should also provide low administrative and customization costs.

Aberdeen research also found that DB2 offers significant advantages to SAP/Solaris users for implementing business-critical SAP solutions, particularly in the areas of scalability, robustness, and customization. Users' reported experiences field-verify DB2's excellent performance in industry-standard benchmarks and IBM's reputation for robust solutions. Likewise, users report that extensive IBM SAP/Solaris support and partnerships allow more rapid and more extensive customization than in users' previous experience.

These findings are likely to continue to hold true over the next year. Recent and upcoming IBM DB2 improvements should allow increased scalability in SAP implementations and provide extensions in integration and customization.

Implementing more effective Internet support is likely to yield the largest return on investment (ROI) for users' SAP implementations over the next year. Therefore IBM's outstanding e-Business support and Sun's outstanding Internet support, which come along with the DB2/Solaris combination, can be particularly useful for savvy SAP users.

Users should also be aware that, according to Aberdeen's research, the Internet is driving a fundamental shift in importance toward application benefits and away from cost of ownership. Application benefits include not only the traditional direct benefits — increases in sales and decreases in the cost of goods sold — but also indirectly caused "negative benefits." Negative benefits accrue when implementing a feature enables the user organization to "dodge a bullet," avoiding long-term loss of sales and customers. For example, improved scalability and robustness reduce Internet downtime. In the short run, that translates into increased off-hour sales. In the long term, it translates into competitive Web site differentiation that prevents 25% or more of a customer base from defecting to competing sites. Negative benefits are "compounded" in the sense that relatively subtle differences in the application's database/platform scalability, robustness, and flexibility can lead to much more marked differences in customer success.

Project Scope

This study outlines Aberdeen's qualitative research findings, which are based on interviews with user organizations and service providers that have deployed SAP on IBM DB2 and Sun Solaris, with some comparisons to Microsoft SQL Server on Windows NT and Oracle on Sun Solaris. The aim of this document is to provide supplementary information for SAP/Solaris users considering DB2 as the underlying database.

DB2/Solaris/SAP Customer Criteria

DB2 acts as an *embedded database* for SAP. Aberdeen defines an "embedded database" as a database used specifically to support an enterprise application or solution, with the user's main focus being on the solution rather than the database. Thus, the primary function of DB2 as an embedded SAP database is to support and enhance an enterprise's SAP R/3 application.

Embedded databases such as those used with SAP are increasingly important to Information Systems (IS) users seeking to enhance, extend, and integrate not only SAP implementations but also a wide variety of applications. The Internet has enhanced this trend, because IS users seeking to act in "Internet time" need to customize and upgrade at the application level rather than the database level — and because the robustness and administrative costs of the underlying database are key to the robustness and administrative costs of an Internet application. As a result, Aberdeen recommends that IS buyers consider carefully the acquisition of an embedded database as a separate decision from the acquisition of SAP and its platform.

Aberdeen research shows that critical success factors/criteria for an embedded database should be different from those used to acquire an enterprise database. Aberdeen studies of successful embedded database implementations (including this study) find that users place relatively little stress on upfront costs and much more emphasis on scalability and robustness to ensure 24x7 uptime, near-lights-out administration to minimize administrative costs, and flexibility and programmer productivity for rapid online upgrade and application integration (Table 1).

Users may also wish to consider database license costs, which database development tools are available, the likely deployment and training costs, database vendor service and support, and database security features.

How DB2 Meets the Criteria

Aberdeen writings on databases (e.g., Aberdeen's Impact, *The New IBM DB2 Universal Database: Not an Old Gray Mare but a Young Blue Racehorse*, March 1999) make it clear that IBM DB2 has major strengths for enterprise-scale database implementations. These strengths translate into an exceptional ability to meet user criteria for an embedded SAP database.

Table 1: Key User Criteria for an SAP Embedded Database

Criterion	Key Success Indicators	Differences from Typical Database Criteria
Scalability	<ul style="list-style-type: none"> • Handles ten of thousands of users • Handles terabytes of data • Requires fewer hardware upgrades from capacity overload 	<ul style="list-style-type: none"> • Greater emphasis on avoiding system downtime due to capacity upgrade
Robustness	<ul style="list-style-type: none"> • Allows online backup, data loading, database reorganization • Offers rapid failover, load balancing 	<ul style="list-style-type: none"> • Greater emphasis on 24x7 operation without nightly/weekend downtime
Manageability	<ul style="list-style-type: none"> • Offers near-lights-out database administration with minimal monitoring required • Provides a high degree of administrative task automation 	<ul style="list-style-type: none"> • Greater emphasis on minimizing administrative costs as the size of the system increases
Flexibility	<ul style="list-style-type: none"> • Can rapidly connect SAP to other enterprise applications to exchange data • Can easily provide SAP data to a Web site 	<ul style="list-style-type: none"> • Greater emphasis on EAI capabilities
Programmer Productivity	<ul style="list-style-type: none"> • Can rapidly customize SAP and the database to particular user needs with minimal system downtime 	<ul style="list-style-type: none"> • Greater emphasis on online upgrade in Internet situations (e.g., mySAP.com)

Source: Aberdeen Group, July 2000

Scalability

The Aberdeen Impact cited above notes DB2's prowess as evidenced in Transaction Processing Council (TPC) benchmarks, especially for large database performance (the TPC-D benchmarks). A recent (February 2000) SAP benchmark for IBM Solution Series (including DB2) for SAP Business Information Warehouse (SAP BW) achieved throughput of 3,144,179 rows per hour — an outstanding result.

Aberdeen maintains that there are several solid technical reasons why DB2 can achieve such strong decision support results in SAP and general benchmarks. DB2 has extensive experience in cost-based optimizer technology and was among the first to adopt dynamic bitmapping and hashed joins (key high-end querying technologies). DB2 avoids high-overhead index maintenance and employs recursive Structured Query Language (SQL) to reduce query preparation time. For very high-end clustered Massively Parallel Processing (MPP) implementations, DB2 offers support for both clustering and MPP (including Solaris implementations); and IBM notes that it is presently the only parallel database supported by release 2.0A/B of SAP BW.

Aberdeen research strongly indicates that this querying scalability is a key need of most SAP users today. SAP implementations are increasingly being used as key parts of a user's Business Intelligence strategy, to gather and mine enterprise and Web data for competitive advantage. By providing added decision support scalability, DB2 enables not only deeper data mining but also greater system robustness because of the reduced need to upgrade to greater capacity.

Users should also note that, along with other major high-end databases, DB2 does well in supporting tens of thousands of users and in easing capacity upgrades via its management utilities and support services.

Robustness

DB2 gets high marks for emphasizing online backup and providing clustering-type failover and shadow databases for SAP implementations (upcoming with DB2 Version 6.1 and SAP R/3 Version 4.6). Where DB2 really stands out from the pack is in its support for some subtle but key determinants of robustness: online database reorganization (reorg) and connections to systems management solutions.

Reorg is an often-underestimated part of database maintenance. Every database starts with optimal data storage on multiple disks and steadily degrades insertions and deletions to a haphazard patchwork quilt. As a result, performance steadily degrades to the point where end-user response time becomes unacceptable, and unnecessary capacity upgrades become inevitable. The solution is periodic reorganization of the database back to its optimal state — but to take a terabyte database offline for the hours that reorg requires is simply not an option for many users. Hence, DB2's online reorg facility is an important feature to users.

Likewise, an embedded SAP database is not an island, and monitoring the database for problems that can cause SAP failure must be part of a larger SAP-wide and even enterprise architecture-wide administration effort. For maximum robustness, the database should be well integrated with a comprehensive systems management solution. DB2's administrative integration with IBM's Tivoli systems management solution (e.g., a Tivoli Storage Manager Interface with IBM's enterprise backup solution) should deliver added robustness in the field.

Manageability

DB2's robustness features such as online backup and reorg also aid administrators in managing the database, especially when those features are combined with scripting capabilities (e.g., SAPDBA Planning Calendar) that allow administrators to automatically schedule and trigger maintenance chores. The graphical user interface (GUI) of DB2 Control Center supports single-point-of-control remote administration of multiple databases, and offers SAP-specific extensions such as log file and backup management and password change. The current version of DB2 con-

tains a version of DB2 Control Center in Java — a feature especially appropriate for Sun Solaris platforms. DB2 EXPLAIN can offer information about SAP R/3 SQL statement processing via the SAP GUI.

Flexibility

IBM offers extensive Enterprise Application Integration (EAI) capabilities integrated with DB2 and appropriate to SAP implementations, including IBM MQSeries Workflow and IBM WebSphere data access support. These features allow SAP users to trade data with other enterprise applications and with Web sites. The IBM development capabilities contained in MQSeries, DB2, WebSphere, and the IBM development tools allow rapid implementation of data connectivity.

Programmer Productivity

The key to IBM's ability to provide enhanced programmer productivity for DB2-based SAP extensions is IBM's strong commitment to Java. The ability to combine Java with transactional DB2 operations means that extensions to SAP via DB2 are easy to "Web-ify," are easy to apply to a wide variety of operating platforms, and are highly scalable — because they include database support.

Note that IBM's Java support is especially appropriate for the Java-centric Sun Solaris platform. And that the DB2 programming tools give SAP programmers access to the DB2 scalability, robustness, manageability, and flexibility features cited above.

Other Value-Adds

IBM offers extensive SAP-specific support, including a joint SAP-IBM worldwide, DB2-specific, 24x7 support service that complements SAP's Online Service System (OSS), an SAP Web-based hotline for SAP-related DB2 inquiries, joint SAP-IBM DB2 education, and SAP support from IBM's services arm.

Methodology

To gather data for the case studies, Aberdeen has conducted telephone interviews with each supplier's customers to determine "postmortem" their history of administrative and other embedded database/platform costs, benefits, and experiences. Customers surveyed were solicited from the suppliers and from Aberdeen's own list of users.

It is important to note that the survey does not fully take into account the different features and functionality of the operating environment itself. A comparison of these elements is beyond the scope of this research project. Suppliers should be contacted directly for the exact capabilities of their products.

Research Results

User experiences offer preliminary confirmation that DB2's theoretical advantages for SAP on Solaris do indeed translate into practical advantages in real-world SAP/Solaris implementations. Although SAP implementations that use the latest DB2

technology are less than a year old, DB2 in SAP/Solaris implementations already receives high marks for scalability, robustness, manageability, flexibility, and programmer productivity.

Users also confirm that the user criteria cited above (scalability, robustness, manageability, flexibility, and programmer productivity) are of high priority to their implementations, and that the meanings of these criteria to users of an embedded database such as DB2 for SAP are indeed different from past meanings.

Finally, users confirm that the Internet is of increasing importance in their SAP implementations, and that IBM's and DB2's e-Business support places them in an exceptionally strong position to take advantage of Solaris' prevalence in Internet implementations and SAP's Internet initiatives such as mySAP.com.

Aberdeen Conclusions

Aberdeen recommends that users consider the choice of database separately from the choice of SAP platform, because the database is an increasingly important factor in the long-term success of the SAP implementation. Likewise, Aberdeen recommends that IS buyers use a new set of criteria for choosing such a database, because today's SAP places new demands on its embedded databases.

Based on these new criteria, Aberdeen concludes that IBM's DB2 database used for SAP implementations on Sun Solaris platforms has significant advantages for IS buyers. Specifically, DB2 scores high on the key embedded database criteria that users find particularly valuable in both the short and long terms: scalability, robustness, manageability, flexibility, and programmer productivity. Moreover, as SAP implementations are increasingly woven into a web (pun intended) of enterprise and Internet applications, buyers should consider how well the chosen database supports rapid and ongoing integration with the rest of enterprise computing in an Internet architecture — an area in which DB2 does especially well.

User case studies offer preliminary confirmation of these findings in the real world. Users report that they are able to achieve exceptional scalability and robustness, cost-effective and near-lights-out administration, and rapid extension and upgrade of their SAP/DB2/Solaris implementations. Aberdeen therefore recommends that IS buyers strongly consider DB2 for their SAP/Solaris implementations.

*Aberdeen Group, Inc.
One Boston Place
Boston, Massachusetts
02108
USA*

*Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com*

*© 2000 Aberdeen Group, Inc.
All rights reserved
July 2000*

Aberdeen Group is a computer and communications research and consulting organization closely monitoring enterprise-user needs, technological changes and market developments.

Based on a comprehensive analytical framework, Aberdeen provides fresh insights into the future of computing and networking and the implications for users and the industry.

Aberdeen Group performs specific projects for a select group of domestic and international clients requiring strategic and tactical advice and hard answers on how to manage computer and communications technology.