

Embedding Success With Advantage Database Server

A whitepaper from Sybase iAnywhere

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EXECUTIVE SUMMARY

As an application provider – ISV, OEM, VAR – your continued growth and profitability depend on bringing your products to market faster and more cost-effectively. Your reputation depends on customers being able to deploy your application right out of the box, quickly and easily to begin producing positive business results.

Industry analysts, veteran developers and other software industry experts agree that the best way to address these requirements is to devote your internal resources to core application development tasks and competencies while dealing with your data management requirements by embedding a proven, high-performance, full-featured data management system.

The advantages of this approach are clear and well documented.

Developer benefits include:

- Reduced time to market with a complete, fully integrated application
- Reduced development cost
- Shorter sales cycle (as customer evaluations of third party databases are eliminated)
- Simplified pricing and licensing
- Increased reliability
- Reduced risk
- Decreased support costs
- Increased profitability
- New market opportunities
- Improved customer satisfaction
- Enhanced competitive advantage

Customer (End-User) benefits include:

- Improved customer out-of-the-box experience
- Faster, easier deployment
- Increased performance, scalability and reliability
- Ease of use
- Low- to zero-maintenance- no DBA required
- Improved security
- Less expensive hardware requirements
- Lower total cost of ownership
- Faster time to desired results

Over the past two decades, application developers and customers in virtually every industry have come to appreciate the power, functionality and value they can realize from using this approach to create powerful business applications.

More significant, for nearly that long, developers have not only embraced the use of embedded databases in their applications, but they have specifically embraced the Advantage Database Server from Sybase iAnywhere.

There are many reasons for this that will be described in this whitepaper. For the moment, suffice it to say that Advantage Database Server (ADS) is a robust, high performance, fully scalable client/server data management system designed specifically to meet the needs of application developers.

“We needed something that would be robust, reliable, flexible, affordable, easy to install, use and maintain without the need for a DBA. It became apparent to us fairly quickly that the best solution for our customers and us was Advantage. It provided a seamless migration path for our Paradox users — a migration path that enabled us to move all of the data in Paradox into Advantage without losing a single record or transaction.”

Mike Stearns,
President, AccuBuild

Advantage Database Server:

- Allows both ISAM table-based and SQL-based data access, providing a growth path for legacy applications to today's modern technologies,
- Includes native development interfaces that enable developers to leverage their existing knowledge of popular development tools,
- Ensures security and data integrity,
- Requires zero administration,
- Enables easy installation on existing network infrastructures,
- Works tirelessly behind the application, delivering client/server performance, stability, and data integrity that today's mission-critical business applications demand, and
- Offers a cost structure that eliminates the dilemma ISVs, OEMs and other application providers once faced — namely the painful decision between the full functionality and high performance once found only in very expensive solutions versus the low functionality, performance and scalability characteristic of low-cost or open-sourced RDBMS solutions.

ADS provides the functionality, high-performance, scalability, security, reliability and cost structure you need to create applications that meet customers' business requirements and budget constraints, while allowing you to make a profit.

Equally important, ADS is a Sybase iAnywhere product. The same Sybase that has been a leader in developing and expanding innovative database technology for more than 20 years. The largest global enterprise software company exclusively focused on managing and mobilizing information from the data center to the point of action and the technology partner of choice for a loyal, global customer base encompassing key vertical markets including financial services, telecommunications, healthcare and government.

DESIGNED FOR APPLICATION DEVELOPERS

As previously noted, Advantage Database Server is a high-performance and fully scalable database system that enables ISVs, OEMs and other application providers to create powerful business applications faster and easier. It is specifically designed to meet application developers' technology and business requirements. Integrating ADS allows you to easily deploy robust applications with complete control of data integrity, multi-user concurrency, and data security.

Specific examples of this developer-centric focus include:

- Inclusion of native development interfaces designed to leverage developers' existing knowledge of popular development environments including Delphi, C++Builder, Visual Studio .NET, Visual Basic, Visual C++, Visual FoxPro, Access, Java, Perl, PHP, CA-Clipper, CA-Visual Objects and more,
- Ability to move existing applications to client-server with minimal code changes,
- Ability to convert previously developed database applications to access ADS, without loss of data or corruption,
- No mandatory configuration requirements, enabling easy installation on existing network infrastructures,
- Flexible data access via native relational SQL or direct navigational database commands,
- Multi-platform support (Netware, Windows and Linux), and
- Lower acquisition and maintenance costs than SQL Server and Oracle.

While ADS features and capabilities discussed so far would more than explain its leadership position in the embedded database market and its more than three million deployed seats worldwide, there is much more to commend it as the smartest choice for application developers and end-users alike.

So, let's take a closer look.

“We evaluated a number of database products including Microsoft SQL Server, Oracle and others and none of them met our criteria for performance, low maintenance, ease-of-use and easy implementation. Only Advantage Database Server met our needs and provided the type of performance that sets our system above the competition.”

Don Kitchen,
Vice President of Research
and Development,
ScanCode Systems, Inc.

ADVANTAGE DATABASE SERVER: A CLOSER LOOK

Advantage Database Server is the high-performance, low maintenance, database server designed specifically for application developers who want an embeddable database with a wide range of high-end database features. It is noteworthy for an ease-of-use that is virtually unheard of in this category of software. It is also designed to enable developers to quickly and seamlessly extend existing applications that have matured to the point that they require the features, functionality, performance, scalability and security of a true relational database management system.

Consider ADS' broad range of features and benefits:

Development

- Advantage Data Architect (ARC)

Developers use this efficient, cohesive, and productive tool to create and administer Advantage enabled applications. Recently redesigned, ARC includes a new graphical interface with a more efficient workflow aimed at making application design and development faster. The benefit is dramatically increased developer productivity. Additionally, it allows developers to:

- Import and convert other table types (such as Paradox, dBASE, Access, Btrieve, Pervasive and MS SQL Server) to Advantage compatible tables;
- Create Advantage data dictionaries and define referential integrity rules, record and field level constraints;
- Create tables and indexes;
- Restructure existing tables;
- Encrypt/decrypt tables and dictionaries;
- Generate, test and optimize Advantage SQL queries using a visual query designer and SQL execution plan; and
- Generate code to automatically create tables and indexes using the Advantage Tables-to-Code Generator.

- SQL Scripting Language

Advantage includes an ANSI SQL PSM 2003 standard scripting language in the Advantage SQL engine. Constructs include but are not limited to If/Else statements, Do/While loops, local variables, local cursor variables populated via SELECT statements and exception handling.

Scripting also allows developers to easily create powerful triggers, stored procedures, and perform other database tasks, and to embed scripting code in Delphi TAdsQuery components, ADO.NET command objects, Advantage Data Architect, PHP applications and more.

- User Defined Functions

Allow developers to create custom, reusable functions that can be used in SQL statements or SQL scripts, just like existing scalar functions. By encapsulating frequently performed or complex operations into user defined functions, SQL statements or scripts become easier to write, understand, and debug.

- Extended Procedures

Advantage Extended Procedures are stored procedures that are easy to develop and easy to use. Like traditional stored procedures, Advantage Extended Procedures allow you to execute a set of code at the server where the data resides. This allows you to remove data intensive tasks from the workstations and reduces network traffic to a single send and receive operation.

Unlike traditional stored procedures, however, Advantage Extended Procedures allow developers to write, store, and execute stored procedures on the server using their preferred application development tools or with an ANSI SQL PSM 2003 standard scripting language. No database administrator and no special training are required to develop Advantage Extended Procedures.

Performance

- **Client/Server Architecture**

The client/server processing and high-speed database engine of Advantage Database Server means significantly less network traffic and better performance. Network traffic and concurrency are formidable problems for non-client/server multi-user database applications. These applications cause large amounts of network traffic because the client machine performs all database processing. Advantage optimizes multi-user performance by intelligently dividing database operations between the client and the server. Client/server architecture moves the processing of database requests to the server, where the data is stored, which dramatically reduces network traffic.
- **SQL Query Optimization**

Allows all queries to be logged as an application runs (through a test suite, for example) and be reviewed later to determine if there are optimization issues with SQL queries. This is easier and more efficient than performing a specific optimization check for each query in an application.
- **Caching**

Index pages, temporary tables and temporary cursors are cached at the server, providing increased performance
- **High Speed Locking**

Advantage Database Server uses an intelligent lock management system that eliminates lock retries and network traffic. It uses an internal queuing algorithm that allows application locks to occur without making network operating system lock API calls. All locking information is maintained internally in the lock queues. Advantage also allows for read-through index locking and immediate index write locking. Read-through index locking increases multi-user index read performance immensely, and the write lock queuing and elimination of lock retries greatly increases multi-user database application performance.
- **Full Text Search Capability**

Provides very fast content searches of character, memo and BLOB fields. Full text search (content) indexes can be built on specific fields to provide extremely fast $O(\log N)$ searches. The full text search function CONTAINS can be used in SQL statements and traditional record filters. In SQL SELECT statements, result sets can be ordered with the SCORE() function.
- **Communications Compression**

Communications compression provides reduced network traffic between ADS clients and the Advantage Database Server. Compression may provide a 100 percent to 500 percent speed increase when using slow networks (dial-up) with encrypted data. In situations with reasonably fast servers and a reasonably fast network (10/100 Mbit), a 5 percent to 20 percent speed increase may be possible.
- **Optimized Filters**

Advantage Optimized Filters (AOFs) provide industry-leading database filtering optimization. AOFs speed table filter and SQL WHERE clause processing by using high-speed indexes to filter out data. No table data is ever read that does not pass the filter (SQL WHERE clause) condition. AOFs dramatically reduce the amount of table data that must be retrieved from the disk, which leads to greatly improved performance.

Scalability

- Fully Scalable
ADS scales to support hundreds of concurrent users accessing very large volumes of data at blink-of-an-eye speed.
It is fully scalable from local, peer-to-peer, to client/server – with one set of source code.
- DBF Tables And Memos Greater Than Four Gigabytes
ADS supports DBF tables greater than four Gigabytes. It is the only database management system that supports DBF tables this large.
- High Availability
Multiple Advantage servers can be clustered to provide a redundant and highly-available data infrastructure.

Security

- Database Security
Because ADS runs on the server at a supervisor level, your Advantage application has full control over who can access the database and how the database can be modified. Only Advantage applications may access the database. Non-Advantage applications have no database access.

ADS database security functionality allows you to "hide" files in the database from all users who are not accessing data through an Advantage application. It also allows the system administrator to remove network access rights from all users who could potentially damage the database.
- Flexible User Access Control
ADS provides further database security functionality by allowing the creation of user accounts to control access to database tables, columns, views, and stored procedures. This access control mechanism consists of two database properties: login requirement and access rights verification. Individual user's access to tables, columns, views, or stored procedures can be specified. User groups can be defined in the database to ease the task of setting up users with similar access rights.
- Database Encryption
ADS supports encryption of database data, physically encrypting record data to protect it from unauthorized viewing. The Advantage encryption scheme uses a case-sensitive password to encode data, requiring a password to view data in its unencrypted form. ADS encryption capabilities provide an easy way to integrate data security over the network. The data stored in tables and memo files on the server is encrypted as well as the table data passed over the network. If the ADS application has the correct password, it will be able to decrypt the data on the client. The ADS encryption engine incorporates a 160-bit, RC4-compatible encryption algorithm that ensures data is secure as it travels over the network.
- Encrypted Indexes
Indexes on dictionary bound Advantage Database Tables (ADTs) can be encrypted, providing enhanced security.
- Encrypted Communications
All communication with the Advantage Database Server can be encrypted when using dictionary connections, providing enhanced security.
- Triggers
Because a trigger is executed on the server in response to an insert, update, or delete operation, triggers can provide a very powerful means to maintain business rules at the database level, independent of the client application. Because of this independence, triggers are quite effective for enforcing complex security authorizations and for providing transparent and independent event logging and auditing.

“Making the transition [from Paradox] was easy. It took 15 minutes to install [Advantage Database Server] into our application. We didn’t have to make any code changes. We followed five steps, ran a small test, and it was up and running in an hour. Competitive programs run through the same 400-file transition took up to three days before they were ready to run Operations Plus [a back-office management application for the securities industry].”

Gary Blair,
Senior Programmer,
Techmate

- **Server Side Aliases**
Client applications can connect to ADS via a server side alias name and, therefore, do not need to know the location of the data or have a data share available. This provides increased security and makes deploying ADS enabled applications easier.

Reliability

- **Real World Successful Implementations**
Through 15 years of continuous development and with more than three million seats deployed worldwide across a broad range of industries, Advantage Database Server has become the trusted solution for small, medium and large organizations that rely on it to power mission-critical applications.

In addition, ADS is backed by a fully trained, readily accessible technical services department helping customers get the most out of their client/server solutions through exceptional support, training and consulting.
- **Transaction Processing Safeguards**
ADS provides database stability and eliminates database corruption by ensuring that every database operation is executed completely or is not executed at all. Entire database update operations are executed on the server. Therefore, if the application, workstation, or network fails, the database operation will either successfully be transmitted to the Advantage Database Server or not transmitted at all.
- **Online Backup**
Provides the ability to create a hot backup of a database even if others are using and modifying the database. Full and differential backups can be created making it easy to provide a structurally identical backup image of the database for later usage or for disaster recovery. This provides the data integrity, security, and availability that database users require.
- **Replication**
Allows the creation and maintenance of a duplicate copy of data and/or subsets of data in a database across distributed systems. This provides many benefits including, the ability to restore a database in the event of a catastrophic event, increased availability of data by making local data available to remote locations, increased reporting efficiency and speed by enabling an offline reporting system, and improved decision making by removing the tendency for localized silos of data that are never made available to distributed offices.

ADS Replication, which can be uni- or bi-directional, enables easy transmittal of updates in a source database to structurally equivalent tables in one or more target databases with few, if any, source code or data structure changes.

CUSTOMER SATISFACTION = PROOF

All the technical information and marketing assertions in the world are not equal to a single comment from a customer. No solution, after all, can truly be called a solution unless it delivers the desired results in demanding real-world settings.

For nearly 15 years, Advantage Database Server has been doing just that. Customers across a variety of industries have found that ADS is simply the best high performance, low maintenance server, particularly for small to medium sized business applications. As a result, they are devoted fans of ADS.

"It took me half the time to develop my application and it ran two or three times faster."

Robert Cornelisse,
Director,
Ticket Team

Developers have used ADS to create:

- A fast, robust, affordable, enterprise class construction management software solution including accounting, document management, project management and scheduling to help construction organizations control costs, improve profitability and stay competitive.
- A practice management solution for financial planners, attorneys and law firms that is used by more than 100,000 attorneys and other professionals in the legal industry.
- A client/server patient management solution for veterinarians that enables users to create custom records, a variety of reports, and collect important medical data with stable, robust database access.
- A comprehensive, reliable, easy to deploy and use, front- and back-office business management solution used by hundreds of staffing companies in the United States and Canada to serve their clients and applicants more effectively and run their businesses more efficiently.
- A transportation and warehouse management system (used by companies including Johnson & Johnson, Robert Bosch Canada, RICOH and Timex) that automates and streamlines shipping and warehousing processes to increase customer productivity and profitability customers.
- A suite of back-office automation solutions (used by more than 80 brokerage firms and 30,000 broker/dealer representatives worldwide) for managing complex commission and transaction structures, customer and broker/dealer profiles and data, and products offered in the financial securities industry.
- An access control system to manage the sales of tickets for sporting events, the efficient admission of ticket holders to events and to prevent fraud.

Start developing and deploying applications with Advantage Database Server today. . .for free!

Of course, the best way to determine if Advantage Database Server can power your success is to try it for yourself. Download a 30-day Advantage Database Server trial for free at www.AdvantageDatabase.com. There's no risk to you. All you have to lose are your application development headaches.

For additional information, please contact us at 1-800-801-2069 or on the Web at www.AdvantageDatabase.com.

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