

# SQL Anywhere

Industry-leading database management and data movement technologies built for frontline environments

## EXPLOSION OF FRONTLINE DATA

The front lines have evolved into a mission-critical computing environment as businesses look for new ways to fuel competitive advantage and growth.

iAnywhere's award-winning solutions have been built from inception to enable frontline applications—whether server, desktop, remote, or mobile—to be just as reliable, secure, and available as those running in the data centers of a traditional enterprise.

SQL Anywhere® is a comprehensive package providing data management and data movement technologies that enable the rapid development and deployment of database-powered applications. SQL Anywhere offers enterprise caliber databases that scale from 64-bit servers with thousands of users down to small handheld devices. SQL Anywhere's data movement technologies extend information in corporate applications and enterprise systems to databases running in mission-critical frontline environments. Design and management tools within SQL Anywhere enable developers to implement and deploy frontline applications and equip administrators to easily manage and support them.

With SQL Anywhere developers can more easily architect an application's underlying data management, synchronization, security, and remote support using technologies that handle the complexities of frontline environments. As a result, developers can focus more attention on building applications to suit the specific needs of their customers, while reducing implementation time.

## SQL ANYWHERE TECHNOLOGIES

### SQL ANYWHERE SERVER

SQL Anywhere is a high performing and embeddable relational database-management system (RDBMS) that scales from thousands of users in server environments down to desktop and mobile applications used in widely deployed, zero-administration environments.

### ULTRALITE

UltraLite™ is a database-management system designed for small-footprint mobile devices such as PDAs and smartphones.

### MOBILINK

Mobilink™ is a highly-scalable, session-based synchronization technology for exchanging data among relational databases and other non-relational data sources.

### QANYWHERE

QAnywhere™ facilitates the development of robust and secure store-and-forward mobile messaging applications.

### SQL REMOTE

SQL Remote™ technology is based on a store and forward architecture that allows occasionally connected users to synchronize data between SQL Anywhere databases using a file or message transfer mechanism.

### DESIGN AND MANAGEMENT TOOLS

SQL Anywhere includes a powerful suite of tools to assist in the design and development of data-driven applications and to simplify the management of database, synchronization, and mobile messaging environments.

"The data management features in SQL Anywhere are incredible. The column compression feature has enhanced our performance by significantly decreasing time spent on compressing data, while the table encryption feature has allowed us to keep our data safe and secure.

— Christopher Pollach  
President  
Software Tool and Die Inc.

### SQL ANYWHERE® SERVER

SQL Anywhere is a high performing and embeddable relational database-management system (RDBMS) that scales from thousands of users in server environments down to desktop and mobile applications used in widely deployed, zero-administration environments. It is a small-footprint, enterprise-caliber database packed with features found in more resource-intensive and administratively demanding databases—features include transaction processing, referential integrity, stored procedures and triggers, materialized views, hot failover, and automatic backup and recovery.

### Easy to Use, Easy to Administer

SQL Anywhere includes features for self-administering, self-tuning, and remote support, making it ideal for widely deployed, zero-administration environments. For example, sophisticated event handling and scheduling capabilities can automate a set of maintenance activities to occur at predefined times or when certain conditions are met, such as when a disk reaches 90% capacity.

Remote support for SQL Anywhere databases is simplified with features like trace logging, auditing, and the ability to move databases with a simple file copy. An integrated error-reporting facility allows administrators to submit error reports and statistics, to query iAnywhere support for updates and the availability of bug fixes, and to check if previously-submitted problems have been fixed.

SQL Anywhere includes integrated graphical development tools for all stages of application development. Software developers can analyze and optimize many different aspects of an application, from designing and testing queries to debugging stored procedures to diagnostic tracing and synchronization monitoring.

### Performance and Scalability

Customer deployments demonstrate that SQL Anywhere can scale to thousands of users and hundreds of gigabytes of data. High performance is achieved out-of-the-box with a self-tuning query optimizer and innovative query processing algorithms. SQL Anywhere provides symmetric multiprocessor (SMP) support, including intra-query and inter-query parallelism for improved query processing. SQL Anywhere can truly scale on a wide range of platforms, from 64-bit UNIX, Linux and Windows platforms with multiple processors down to Windows Mobile devices where it requires as little as 4 MB of available memory.

For environments with large numbers of concurrent users, snapshot isolation can greatly reduce wait time, contention for locks, and deadlocks in environments where data is being changed frequently, giving the snapshot transaction a consistent view of the database. For environments with frequent, repeated requests joining large tables, SQL Anywhere provides materialized views offering the ability to pre-compute data, reducing response time and improving performance. A set of online analytical processing (OLAP) features further enable analysis of data in a database.

### Data Security and Availability

SQL Anywhere includes 128-bit strong encryption, resulting in true end-to-end security that meets the needs of customers in privacy-conscious industries such as government, healthcare and financial services. Database file encryption protects stored data from unauthorized access, while communications encryption protects the confidentiality and integrity of packets as they pass between the client machine and the database server. For applications that require only portions of the data to be secured, individual tables in the database can be encrypted. SQL Anywhere supports Federal Information Processing Standards (FIPS), is Common Criteria certified, and uses industry standard encryption algorithms and protocols, including AES, ECC, RSA, and SSL.

To ensure the availability of data and applications in the case of system failure, SQL Anywhere supports database mirroring and provides a SQL Anywhere agent for Veritas Cluster Server (VCS). Database mirroring enables the operation of multiple database servers so that if the primary database server becomes unavailable, it automatically

“SQL Anywhere is core to our operation. It provides a platform that works not only in a mobile environment, but also supports a very large database. We can actually provide this state of the art technology not only to the large agencies that have IT staff, but also to the small agencies that may have no IT staff.”

— Michael Kramer  
CEO and President  
HealthWyse Inc.

fails over to another server. The SQL Anywhere VCS agent provides for the configuration of a SQL Anywhere database server to be managed within a Veritas Cluster, including the ability to failover from one node to another, either manually or automatically.

#### **Broad Platform, Tool and Data Access Support**

SQL Anywhere was built on the premise that application developers should be given the option to choose the tools, technologies and platforms that best meet their needs and preserve existing investments in operating systems, databases, development skills and tools. SQL Anywhere operates on a wide range of operating systems (Windows, Linux, UNIX, NetWare and more), works with many different development tools (Sybase PowerBuilder®, Microsoft Visual Studio, Eclipse and more) and languages (C/C++/C#, VB.NET, Java, Perl, PHP, and others). SQL Anywhere also implements many different data access standards (ODBC, OLE DB, ADO/ADO.NET, JDBC, and more), and has extensive XML support, including a built-in Web services server, XML import/export capabilities and SQLX functionality.

#### **ULTRALITE**

Designed for small-footprint mobile devices, the UltraLite database management system provides full transaction-processing support, referential integrity, a choice of development models, strong encryption, and built-in synchronization with enterprise data stores through SQL Anywhere’s MobiLink synchronization solution.

#### **Broad Platform, Tool and Data Access Support**

UltraLite provides several object-based programming interfaces for straightforward access to data from different programming environments. Integration with popular development tools eases development for SQL programmers looking to create dynamic data-driven applications. UltraLite database applications can be developed and deployed for a range of handheld platforms, including Windows Mobile, Palm OS, and Symbian OS.

#### **Robust Data Management**

Data captured on small devices in the field should be treated with the same respect as data stored in enterprise databases within the walls of an organization. UltraLite ensures enterprise data integrity by bringing the robust data management benefits of enterprise databases—such as transaction processing, referential integrity and security—to small devices.

#### **Security for Small Devices**

UltraLite provides user authentication as well as local data store and communication stream encryption for devices operating outside corporate offices and firewalls. User authentication and strong local data encryption protect information—even if the device is lost or stolen. Communications encryption protects the confidentiality and integrity of packets as they pass between the mobile device and the database server.

"SQL Anywhere integrates well with our existing systems. It's flexible, reliable, backward and forward compatible, and handles large numbers of data exchanges each day. Our field workers aren't aware that there is a database on their device. It lets them focus on their jobs rather than having to worry about the technology."

— Greg Begg  
AMR Program Manager  
Sargent Electric

### **MOBILINK**

MobiLink is a highly-scalable, session-based synchronization technology for exchanging data among relational databases and other non-relational data sources. Advanced synchronization logic ensures the transactional integrity of the databases in the event a network connection is lost, and offers sophisticated strategies for the resolution of data change conflicts.

#### **Heterogeneous Synchronization**

MobiLink offers bidirectional exchange of information between remote SQL Anywhere or UltraLite databases and a variety of enterprise data sources including SQL Anywhere, Sybase Adaptive Server Enterprise, Oracle, Microsoft SQL Server and IBM DB2. MobiLink also provides the ability to synchronize to data sources other than databases, such as application servers, ERP systems such as SAP, Web services, XML files, or other third party relational databases.

#### **Scalable and Robust Performance**

A single MobiLink synchronization server can handle thousands of synchronization users, and multiple MobiLink servers can be run simultaneously to support load balancing and scalability to very large systems.

#### **Reliable and Secure**

Reliability is ensured through guaranteed data delivery. In the event that a network connection is lost or a message becomes corrupted during transmission, the missing data is automatically re-sent.

Strong 128-bit encryption can be used to ensure data is fully protected during transmission. The MobiLink server has built-in user authentication, and Java and .NET logic can be placed in the MobiLink server to allow for external authentication, when required.

#### **Implement and Manage Large Deployments**

MobiLink synchronization is designed to be easy to use for both database administrators and end users. MobiLink provides a set of integrated tools to automate the development of synchronization applications, such as creating synchronization scripts, conflict resolution rules, and shadow tables, as well as registering and managing a large number of remote users. Developers have complete control over the final form of all aspects of a MobiLink system, including set up of server-initiated synchronization. Events can carry out many tasks typically assigned to a mobile user such as automatic data synchronization once the device comes into network coverage.

#### **Handheld and Wireless Integration**

MobiLink supports wired, wireless and cradle-based synchronization. MobiLink's data transfer is extremely efficient and will allow a synchronization to pick up where it left off in the event of a lost network connection. For large sets of changes, MobiLink can create a file of database changes that can be broadcast to large groups of users. Server-initiated synchronization can be used to push important information to a mobile database such as a route change or a change in inventory.

#### **Subsetting of Data**

MobiLink includes the ability to subset data, partitioning both horizontally and vertically—or more complex user programmed schemes—to ensure that remote systems are only getting the customized data relevant to their job function. This allows companies to put data where it is most needed, without overloading a remote user's database with unused information. This also reduces the communication time, thus decreasing communication costs.

“Our most recent research indicates 24% of enterprise surveyed now have a functioning SOA, almost 100% growth from a year ago. Given we are at the early stages of the maturity curve we see this growth continuing and representing a significant opportunity for solution providers who facilitate this new paradigm.”

— John Andrews  
President  
Evans Data Corporation

### **File Transfer**

MobiLink provides the ability to download files to a remote device. This is useful when deploying a new remote database application, when a software upgrade is required on a remote device, or publishing non-relational static data.

### **Priority Synchronization**

Priority synchronization enables independent control over the synchronization of different data subsets. This also enables developers to maximize available communications bandwidth, which is particularly important for wireless or low bandwidth environments.

### **QANYWHERE**

QAnywhere facilitates the development of robust and secure store-and-forward messaging applications that are optimized for mobile environments. It extends the MobiLink server to function as a messaging server, either independently or in conjunction with traditional database synchronization configurations.

By extending SQL Anywhere’s Web services capabilities, QAnywhere also provides mobile Web services that ensure secure and reliable delivery for mobile devices.

### **Ease of Development and Administration**

The QAnywhere API delivers a simple and powerful messaging programming interface for development in C++, .NET, Java, and SQL. A server-side JMS connector provides seamless connection to any JMS supported system, providing an easy point of integration to enterprise applications. The new QAnywhere plug-in for Sybase Central simplifies administrative tasks and makes it easy for developers to test applications at development time, as well as to monitor and track messages in deployed systems.

### **Reliable and Efficient Message Delivery**

QAnywhere leverages the inherent capabilities of SQL Anywhere and MobiLink to provide secure message storage and transmission as well as ensuring guaranteed delivery of messages. QAnywhere handles the challenges of wireless networks, such as slow speed, spotty coverage, and dropped network connections. By setting transmission rules, messaging applications can send and receive data in ways that optimize performance, cost, and bandwidth. For example, high priority messages might be sent immediately over a wide area wireless network but the transmission of very large or low priority messages could be delayed until a high-speed network is available.

### **Mobile Web Services**

QAnywhere provides new support for mobile Web services, allowing mobile applications to reliably and securely make Web service requests while disconnected and receive responses when reconnected to a network. Applications can make object method calls in the traditional manner automatically causing QAnywhere to build a SOAP request, and managing the store and forward transmission of requests and responses. Furthermore, responses can be received even when an application is no longer running or across different instances of an application.

### **SQL REMOTE**

SQL Remote™ technology is based on a store and forward architecture that allows occasionally connected users to synchronize data between SQL Anywhere databases using a file or message transfer mechanism such as FTP or email. Only data changes are sent, minimizing communication costs. SQL Remote performs change capture using transaction log scanning, which preserves transactional integrity, making it ideal for many business applications. Further, this powerful method minimizes performance impact on the server.

### iANYWHERE PROFESSIONAL SERVICES

iAnywhere Professional Services can deliver tailored services to assist during the design, development, and deployment of your SQL Anywhere projects:

- Planning and executing your upgrade to SQL Anywhere 10
- Providing essential knowledge transfer for understanding the SQL Anywhere architecture
- Ensuring performance and overall quality of the environment
- Assisting with the design and development of your MobiLink synchronization solution
- Configuring and implementing SQL Anywhere high availability

For more information contact your local iAnywhere sales representative, visit [www.iAnywhere.com/services](http://www.iAnywhere.com/services), or call 1-800-801-2069.

SQL Anywhere includes a powerful suite of tools to assist in the design and development of data-driven applications and to simplify the management of database, synchronization, and mobile messaging environments.

#### Centralized Control and Administration

Sybase Central™ provides a graphical user interface to design, debug, and administer SQL Anywhere and UltraLite databases, and MobiLink and QAnywhere servers. In addition to facilitating routine tasks, Sybase Central also provides performance statistics, application profiling and the ability to manage events and schedules, synchronization system modeling, Web services, and connection profiles.

#### Integrated Design Environment

PowerDesigner Physical Data Model combines object-oriented, conceptual and physical data object modeling capabilities in a single environment. Developers can model the overall physical structure of a database, build a Physical Data Model (PDM) using diagrams, create and use business rules and other model objects, generate triggers, procedures, scripts and databases or reverse engineer existing databases.

#### Application Profiling

Performance analysis is simplified with the Application Profiling Wizard. Using captured database activity, the Application Profiling Wizard recommends system changes based on profiles of stored procedures, functions, triggers and events, identification of deadlocks, database schema design, and more. Developers can review detailed analysis through a single graphical user interface.

#### Index Selection and Optimization

The Index Consultant streamlines the process of selecting indexes for a database or a query by creating many different sets of virtual indexes during its analysis. The queries and other requests for each set are then optimized and analyzed, resulting in a set of recommendations. A set of queries can be captured from a live SQL Anywhere database for analysis by the Index Consultant.

#### .NET Development and Integration

The SQL Anywhere Explorer gives developers quick access to SQL Anywhere databases right from Visual Studio and allows them to leverage their knowledge of .NET languages to create powerful applications. In addition, SQL Anywhere includes DataWindow .NET which helps you rapidly build and deploy data driven applications, easily incorporating your complex business rules, and delivering sophisticated data presentation.

#### Creation and Management of Synchronization Environments

With MobiLink's Create Synchronization Model wizard, developers can create a model of a synchronization environment, defining what subset of data to synchronize and how conflicts are handled. The MobiLink Monitor is an administration tool that provides detailed information about the performance of MobiLink synchronizations, including start/end times, data volume uploaded/downloaded, successful completions, conflicts, and more.

#### Development and Testing

SQL Anywhere includes additional graphical development tools that help accelerate the implementation of database applications including the Interactive SQL query editor, integrated database object debugger, and stored procedure profiler.

#### Deployment Wizard and Tools

The Deployment Wizard can be used to create a Microsoft Windows Installer Package file or a Microsoft Windows Installer Merge Module file customized for an application's requirements, greatly reducing the database footprint.

#### Easy Report Generation

InfoMaker is a powerful, easy-to-use reporting tool that enables developers to query a wide range of databases and create sophisticated reports and forms—without writing code, or learning a programming language.

### SQL ANYWHERE DEVELOPER EDITION

The SQL Anywhere Developer Edition is offered at no charge for development and testing. It includes all of the features of the deployment version of SQL Anywhere, and will not expire at any time. Download your copy at: <http://www.iAnywhere.com/downloads>

### iANYWHERE DEVELOPER COMMUNITY

Join fellow developers at the iAnywhere Developer Community Web site, your one-stop source for technical information to assist in the development and deployment of solutions for mobile, wireless, embedded and small to medium sized business environments. The community Web site provides a central point of access for technical resources, including maintenance releases, engineering bug fixes (EBFs), betas, evals, code samples and more. In addition, it provides a forum in which thousands of industry experts worldwide interact and share ideas through newsgroups, Webcasts and events.

<http://www.iAnywhere.com/developer>

### SQL ANYWHERE SERVER

#### System Requirements and Supported Platforms

- Windows x86, x64 and Itanium
- Windows Mobile
- Novell NetWare
- Linux x86, x64 and Itanium
- Sun Solaris SPARC and x86
- Mac OS X on Intel
- IBM AIX
- HP-UX PA-RISC and Itanium
- Requires a minimum of 8 MB RAM and 4 KB per client connection (8 KB for UNIX)

#### Client/Server Communications Protocols

- TCP/IP
- Novell NetWare SPX
- Shared memory
- IPv6 support for Windows and Linux

#### SQL Compliance

- Entry-level ANSI SQL 92 + extensions
- With minor exceptions is compliant with SQL-2003 core specifications
- Transact-SQL (TSQL)

#### Database Features

- Full transaction processing
- Built-in referential and entity integrity, including cascading updates and deletes
- Row-level locking
- High-performance, self-tuning, cost-based query optimizer
- Materialized views\*
- Snapshot isolation\*
- Advanced query execution algorithms
- Dynamic cache sizing
- Column compression\*
- SQL and Java triggers and stored procedures
- External stored procedures (callable external DLLs)
- Binary Large Object (BLOB) support
- XML import and export and SQLX functionality
- Database mirroring and cluster support\*
- Online table and index defragmentation
- Online backup
- Event scheduling and handling
- Strong encryption for database files and network communications
- Table encryption\*, customizable auditing\*, password rules\*, SH256 hashing, Kerberos authentication\*
- FIPS 140-2 conformance\*
- Advanced cache management system
- Application profiling utilities
- Integrated HTTP server

- Remote Data access to other RDBMSs and file system\*
- On Line Analytical Processing (OLAP support)\*
- Internationalization features including NCHAR data type\*, accent sensibility, Unicode Collation Algorithm, and ICU Unicode support\*
- Dynamic, multiple database support
- Windows Performance Monitor integration

#### Development Features

- Graphical schema design and reverse-engineering tools
- Graphical database management and browsing tools
- Graphical query plan viewer, query editor, integrated stored procedure debugger, profiler and synchronization monitoring tool
- Index Consultant
- Native data access through ADO.NET, OLE DB, ODBC 3.5/level 2, JDBC 3.0, Embedded SQL and Sybase Open Client
- Broad programming tool support including Sybase PowerBuilder, Microsoft Visual Studio (including integrated SQL Anywhere Explorer\*), Sybase DataWindow.NET\*, Borland Delphi, and many more
- Support for .NET 1.0 and 2.0\*
- Broad programming language support including C#, VB.NET, C/C++, ASP, ASP.NET, JSP, Java, PHP and Perl DBD
- Advanced OLAP functionality including rollup and recursive union
- Accessibility support for people with disabilities in conformance with the US Federal Government Rehabilitation Act Section 508

#### Database Statistics

- Databases per server: 255
- Database size: limited only by memory, disk space and platform restrictions
- Characters per database object name: 128

#### Table Statistics

- Indexes per table: up to 2048
- Table size: limited only by file size
- Tables per database: up to 4 billion
- Columns per table: 999
- Field size: 2 GB
- Rows per table: limited only by file size
- Row size: limited by file size

#### Stored Procedure and Trigger Statistics

- Max length of stored procedure: 2 GB
- Stored procedures per database: up to 4 billion
- Triggers per database: up to 4 billion
- Nesting: limited by disk space and server memory

## ULTRALITE

### Supported Platforms for Deployment

- Windows
- Windows Mobile
- Palm OS
- Symbian OS\*

### Database Features

- Customized ultra-small database with a fingerprint as small as 300 KB for handheld devices and smart phones
- Strong data and communications stream encryption
- Support for NVFS memory expansion cards on Palm OS Version 4 and above
- SQL functionality including transaction processing, referential integrity, multi-table joins, and UNION operations
- High-performance updates and retrievals through use of indexes and query plans
- Binary Large Object (BLOB) support
- Extensive support for programming tools including AppForge Crossfire, Metrowerks CodeWarrior, and Microsoft Visual Studio

### Database Statistics

- Database size: limited by available storage (max 2 GB)
- Row size: 16 KB, with additional space for BLOB data
- Table size: limited by database size
- Tables per database: limited only by device memory
- Rows per table: 16 million\*
- Columns per table: 65535
- Tables referenced per transaction: no limit

## SYNCHRONIZATION

### MOBILINK FEATURES

- Reliable, bidirectional synchronization between remote and enterprise systems including SQL Anywhere, Sybase Adaptive Server Enterprise, Oracle, Microsoft SQL Server, IBM DB2, application servers, ERP systems and Web services
- Wizard-based synchronization configurations
- Remote support for both SQL Anywhere and UltraLite databases
- Multiple synchronization and network server-based protocols including TCP/IP, HTTP, HTTPS, Palm HotSync, Microsoft ActiveSync
- Optional strong 128-bit encryption for synchronization communication, including SSL/TLS using RSA encryption compatible with HTTP server

- Advanced conflict detection and programmable resolution
- Optimized for wireless synchronization
- Scalable to support thousands of remote databases from a single MobiLink server
- Support for horizontal and vertical subsetting of data
- Priority-based synchronization of multiple subsets of data
- File transfer
- Server-initiated synchronization and notifications
- Broadcast downloads for bandwidth efficiency
- Embeddable synchronization logic using SQL, Java or Microsoft Visual Studio .NET
- Flexible user authentication logic

### SQL REMOTE FEATURES

- Reliable, bidirectional message-based synchronization
- Multiple synchronization and network protocols including FTP, file-based, email (VIM, MAPI, SMTP)
- Advanced conflict detection and programmable resolution
- Support for wireless synchronization
- Scalable to support thousands of remote databases
- Support for horizontal and vertical subsetting of data
- Support for SQL Anywhere databases

### APPLICATION MESSAGING

#### QAnywhere Features

- Comprehensive messaging API provides a powerful and flexible programming model for building mobile messaging applications
- Transmission rules optimize the performance, cost, and bandwidth of message delivery
- Reliable and efficient message delivery with compression and transactional capabilities
- Secure message storage and transmission
- Push notification of messages waiting to be delivered
- Connectors to back-end JMS-based enterprise systems
- Mobile Web services support\*

\* Denotes new feature or significant enhancement with version 10.

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