

Move on from SQLite:

10 reasons why Actian Zen should be your next embedded database

SQLite is a multiplatform database, directly embeddable inside applications. SQLite provides a quick and dirty way to replace reliance on file systems that lack access control, deduplication, consistency, concurrency, etc. with a basic database that provides portability and standardized access and leverages SQL developer expertise.

Teach yourself Zen.

Quickly and easily get up to speed on installing, configuring, and embedding next-generation Edge data management functionality.



10 Reasons in a Nutshell

1. Zen is faster than SQLite
2. Single architecture for clients and server
3. Zero ETL between clients and server
4. Concurrent write capability supports modern applications
5. Full ANSI SQL support
6. Ability to handle SQL and NoSQL
7. Support for time-series and larger JSON/BLOB data sets
8. Virtual Machine and Container support for Cloud deployment
9. Automated defragmentation
10. Proven track record of embedded OEM support

With Actian Zen, however, developers, product managers, business analysts, and others within OEMs, ISVs and enterprises can harness a complete data management solution at a lower total cost of ownership in a powerful, secure, and scalable engine. By moving to the Actian Zen database family, SQLite developers and users can overcome a number of drawbacks, as well as gain additional features, to achieve superior outcomes.

1. Zen is faster than SQLite

Embedded in an application, SQLite runs in the same process as the application, making it substantially faster than Microsoft SQL Server or equivalent DBs that use inter-process communications. Zen Mobile database for Android and iOS embeds the same way but has been optimized for far greater speed. In standardized benchmark testing, Zen outperforms SQLite by more than 2x on inserts, deletes, and updates. Furthermore, Zen Mobile has a small footprint, making it easy for developers to embed and distribute with their applications.

2. Single architecture for clients and server

SQLite is meant as a least common denominator replacement for traditional file systems, providing application data storage and retrieval across virtually any platform architecture. It is not meant as a database for multiple applications to use simultaneously. However, as applications evolve, adopt microservice architectures, and spread across virtual server instances and out to well-resourced client devices, server functionality is increasingly becoming a basic requirement.

The Actian Zen database provides embedded application functionality out to virtually any platform, with backward compatibility to serve applications running on older variants of Unix as well as those on the latest Windows, Linux, Android, and iOS platforms. But unlike SQLite, Zen provides client and server capabilities in a single architecture, purpose-built for networked, embedded environments.



3. Zero ETL between clients and server

SQLite offers good value in back-end systems that provide command and control and aggregate data to and from end-point client devices such as Android or iOS smartphones or industrial IoT devices, routers, or gateways. But its use often requires data conversion and mapping across these platforms.

This requirement can slow design and coding through multiple APIs, adding ETL overhead as well as maintenance and support nightmares. Additionally, ETL operations become an attack surface for hackers. Since Actian Zen databases support the same data types and file formats, accessing and moving data across platforms requires none of the typical ETL overhead and ensures encryption at rest and in transit. Plus, data portability extends across all supported platforms and versions of Actian Zen database, greatly simplifying development, deployment, maintenance, and security.

4. Concurrent write capability supports modern applications

Many modern applications require database support for use cases with downstream, parallel control and management of devices and their associated applications and data – meaning concurrent reads and writes. While SQLite can handle concurrent reads but not concurrent writes.

If an application has been designed to be multi-threaded, Actian Zen Mobile can provide concurrent write capability. Actian Zen Edge and Actian Zen Enterprise, using the same architecture, without any multi-threading or changes to existing applications other than calling the database, provide concurrent read and write capabilities for concurrent users.

5. Full ANSI SQL support

Unlike virtually all other SQL databases, SQLite does not provide full ANSI SQL support, meaning that some SQL calls embedded in application code require workarounds to move to or from SQLite. Actian Zen is 100% ANSI SQL compliant.

6. Ability to handle SQL and NoSQL

Actian Zen Edge and Enterprise Servers improve SQL performance for SQL users, but NoSQL performance will always be better. Plus, many application developers prefer standard programmatic APIs to access data. All versions of Actian Zen offer NoSQL support with the Btrieve 2 API for native Java and C/ C++ and SWIG for scripting languages such as Python, Perl, and PHP to enable the API to serve native objects in those environments.

7. Support for time-series and larger JSON/BLOB data sets

While SQLite can theoretically handle very large data, it has traditionally been used predominantly for smaller transaction-oriented data sets. If your workloads involve large data composed of varying-length strings in JSON or BLOB, an Actian Zen database is a better option because it provides improved management and performance with external files (up to 64 TB for a single file and table) and block sizes up to 1MB. Also, Zen provides an auto timestamp with nanosecond granularity to allow up to GHz speed time-series data collection. SQLite provides only manual use of its time function to sub-millisecond granularity through a non-ANSI-compliant set of functions.

8. Virtual Machine and Container support for Cloud deployment

Unlike Actian Zen, SQLite offers no server functionality and as a client-only database is unable to take advantage of virtual and cloud environments. Also, in Actian Zen Enterprise Server and its Zen Reporting Engine enables offloading of server demand and also supports use of Zen for DBaaS in the Cloud.

9. Automated defragmentation

Fragmentation of database files can degrade performance over time and consume memory resources, but packaged application providers are generally unable to maintain deployed environments. Although you can use the VACUUM command with SQLite, it is not automated or asynchronous, nor set up for zero-DBA environments. Actian Zen Enterprise Server includes automatic defragmentation that can run unattended on recently opened files with settings targeting files larger than 10MB, with 15% or more fragmentation, and more than 5% of records out of order. Defragmentation command line options enable you to configure monitoring, scheduling, and running multiple files in batch mode.

10. Proven track record of embedded OEM Support

SQLite was initially designed in 2000, whereas Actian Zen was initially designed as Btrieve and later Pervasive SQL (PSQL) and has been in production with many customers for over 30 years. Both SQLite and Actian Zen provide "set it and forget it" database capabilities, but Actian Zen was purpose-built with the aim of paring down full-blown databases to serve in embedded OEM environments, versus the more modest SQLite goal of moving up from standard file systems. As a result, Actian Zen provides zero-DBA for developers and programmatic, automated DBA functionality: auto-reconnect networking, defragmentation, multiuser support, concurrent writes, and more.

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