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DATASHEET

Actian Zen

Embedded database built for real-time decision-making at the edge. Zen v17 AI delivers native vector search, semantic retrieval, and AI agent connectivity.

Key Capabilities

Native Vector Search & AI-Powered Hybrid Query

Native Vector Support with SQL Similarity Queries

Zen v17 AI adds native vector support that enables storing of AI embedding bringing Cosine, Euclidean distance, and dot-product similarity queries run directly in SQL - no separate vector store, no data export, no application-side stitching of relational and vector results.

In-Database MCP Support

Zen v17 AI exposes a native MCP (Model Context Protocol) server interface, enabling AI agents and LLM toolchains to interact directly with Zen databases for retrieval-augmented generation (RAG), semantic search, and other out of the box AI-driven workflows. Supports OAuth 2.1 and HTTP/SSE.

AI-Powered Hybrid Search at the Edge

Combine relational data, metadata filters, SQL joins, and vector similarity search in a single lightweight, zero-admin engine. Build complete RAG pipelines, semantic search, recommendation engines, and anomaly detection in embedded, edge, or fully air-gapped environments - without deploying separate vector infrastructure or relying on cloud connectivity.

Vector Indexes & Approximate Nearest-Neighbor Search

Vector Indexes enable approximate nearest-neighbor (ANN) lookups across large embedding datasets — delivering fast similarity retrieval directly in the Zen engine without external index infrastructure. Vector data is accessible via SQL, REST, and gRPC APIs, giving developers flexibility to query embeddings from any application layer while remaining within the same lightweight, zero-admin database used for all relational and NoSQL workloads.

SQL and NoSQL Data Access

SQL Access

Full ANSI SQL for reporting and local transactions via ODBC and JDBC. In Zen v17 AI, SQL-accessible vector similarity queries are available through SQL and NoSQL interfaces, enabling hybrid search across structured data, metadata filters, and vector embeddings, all within the same engine.

NoSQL Access - Btrieve & Btrieve 2 API

NoSQL API access for high-performance local data processing and analytics, supporting all popular programming languages. The Btrieve 2 API provides the same access calls as the original in a simplified, more intuitive client library, with SWIG files for C#, Perl, PHP, and Python.

Multi-Model Flexibility

Developers choose between SQL, NoSQL Btrieve, and gRPC and REST vector API – vector similarity access – all in one engine. Fast read, insert, update, and delete performance alongside full ACID response on writes. Handle JSON, BLOB, time-series, relational data, and vector embeddings without ETL or middleware.

Broad Language Support

Native access for Java, C, and C++ applications. SWIG-generated wrappers accelerate Python, C#, Perl, and PHP developers with a quicker ramp to productivity. A single API across popular programming languages improves developer velocity and reduces integration overhead.

Zero Database Administration

Self-Managing & Zero-Admin

Set it and forget it. Zen Enterprise Server is built for non-IT environments – no consultants, no DBA supervision required. Whether you never touch your app or continually patch and redeploy it, Zen Enterprise Server won't break your application under any circumstances.

Data Portability

Supports the same data types – structured, JSON, BLOB, and now vector embeddings – and file formats across the entire Actian Zen product line and prior PSQL versions. AES 256-bit data encryption extends across all supported platforms. No unsecured ETL work – just copy data and go.

Backward Compatibility

Upgrading to the latest release requires no data migration, code rewrite, or recompilation. Keep moving smoothly from release to release – from time series data stamps and JSON field parsing in earlier releases to native vector embeddings and AI-powered hybrid search in Zen v17 AI.

Making Applications Data-Driven & Intelligent

Zen Enterprise Server evolves with your application architecture. In Zen v17 AI, embedded AI is first-class – power RAG pipelines, semantic similarity queries, and anomaly detection directly from the embedded database layer, keeping sensitive data local and eliminating cloud dependency.

Security & Platform Support

Encryption & Data Security

AES 256-bit data encryption across all supported platforms. Data portability and encryption extend across multiple versions of Actian Zen database products. Sensitive data stays close to where it is created, searched, and acted on – with no unsecured ETL pipeline.

Platform & Deployment Flexibility

Windows 10, Windows Server 2012/2016/2019/Nano, Linux, macOS. VM support for VMware vSphere, Nutanix AHV, Microsoft Hyper-V, Docker with Kubernetes orchestration and Helm Chart support. Intel x86/x64 and ARM 64-bit.

Edge, Embedded & Air-Gap Ready

Deploy in enterprise, branch, and remote field environments. Zen Enterprise Server supports captive data, embedded analytics, and AI inference in environments where connectivity is inconsistent or nonexistent – making it ideal for IoT gateways, industrial devices, and autonomous systems.

Virtualization & Container Support

Full support for VMware vSphere, Nutanix AHV, Microsoft Hyper-V, Citrix Xen, Docker, and Kubernetes. Zen Core extends to Android, iOS, Windows IoT Core, and embedded Linux platforms, enabling a consistent data management layer from edge devices to on-premise servers.

Three Capabilities, One Engine

Bring AI to Your Data

Run RAG, semantic search, and AI-assisted workflows against governed local data - with nothing shipped to an outside service.

- Native vector search & hybrid query in SQL - no bolt-on vector store
- MCP server support - connect AI agents and LLMs directly to Zen
- RAG pipelines, semantic search, and anomaly detection at the edge
- AI-powered applications in air-gapped or disconnected environments

Handle Any Data Type, Any Access Pattern

One engine for relational, NoSQL, time-series, JSON, BLOB, and now vector embeddings - without ETL overhead or architectural complexity.

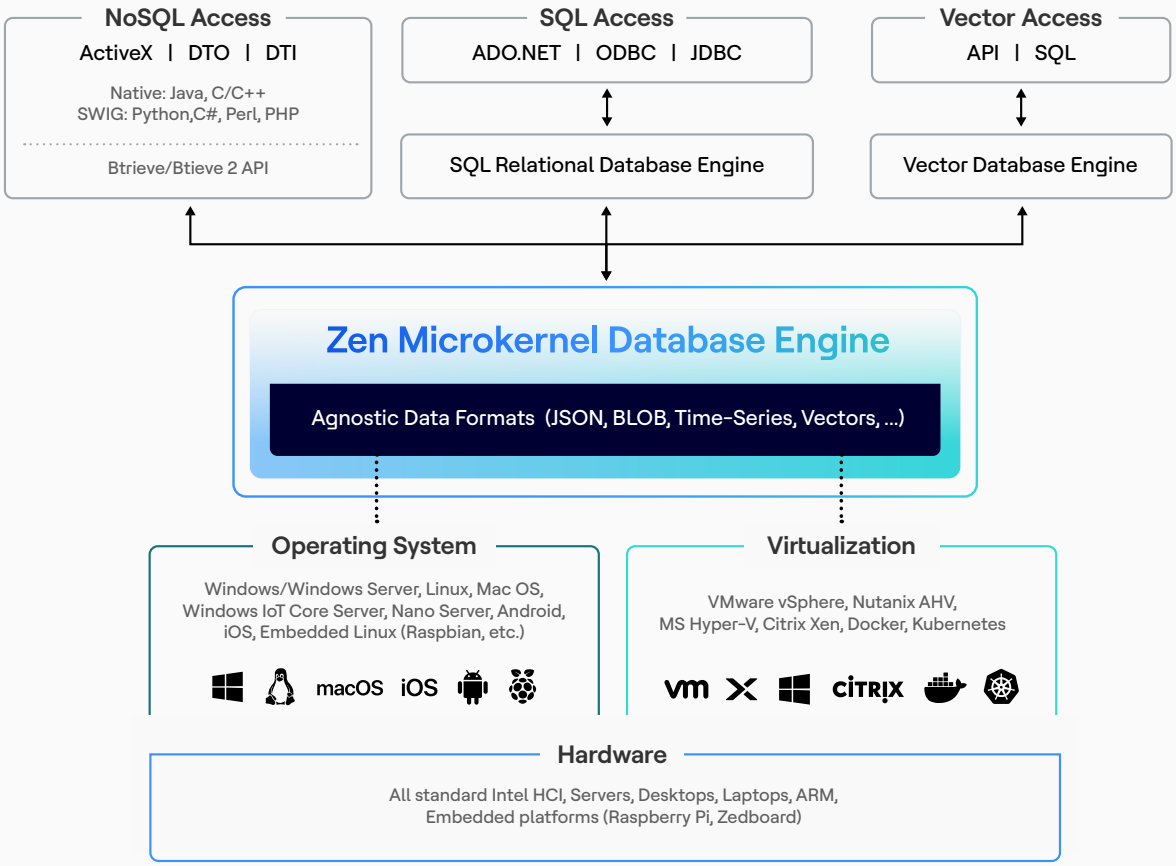
- SQL via ODBC and JDBC; NoSQL via Btrieve and Btrieve 2 APIs; vector access via gRPC and REST APIs.
- Vector similarity queries join existing SQL and NoSQL interfaces in Zen v17 AI
- Full ACID response on writes; fast read/insert/update/delete performance
- Single API across Java, C, C++, Python, C#, Perl, and PHP

Deploy Anywhere, Manage Nothing

Zero-admin embedded database that runs on every platform - from IoT devices to enterprise servers - with seamless portability and backward compatibility.

- Zero DBA - no consultants or IT staff required
- AES 256-bit encryption; seamless data portability across platforms
- Backward compatible - upgrade without migrating data or rewriting code
- Windows, Linux, macOS, ARM, x86, Docker, Kubernetes, VMware, IoT

Reference Architecture



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Technical Specifications

Specification	Detail
Deployment	On-premises or private cloud; Windows, Linux, macOS; Intel x86/x64 & ARM 64-bit
Virtualization	VMware vSphere, Nutanix AHV, Microsoft Hyper-V, Docker with Kubernetes & Helm Chart support
Edge & Embedded	Android, iOS, Windows IoT Core, embedded Linux (Raspbian, etc.) via Actian Zen Core
SQL Access	ADO.net, ODBC, JDBC, ANSI SQL; vector similarity queries (Zen v17 AI); full ACID on writes
NoSQL Access	Btrieve and Btrieve 2 APIs; native Java, C, C++; SWIG wrappers for Python, C#, Perl, PHP
AI & Vector	Native vector data type; cosine, L2, dot-product similarity; RAG pipeline support; MCP Server
MCP Server	Native MCP (Model Context Protocol) server - AI agent & LLM access via OAuth 2.1 and HTTP/SSE
Data Formats	Structured tables, JSON, BLOB, time-series, vector embeddings; same formats across all Zen editions
Security	AES 256-bit encryption at rest; encryption spans all supported platforms and Zen versions
Portability	Same data types and file formats across Windows, Linux, macOS, Zen Edge, and Zen Core - no ETL required
Compatibility	Backward compatible with all prior PSQL versions; no data migration or code changes required on upgrade
Developer Tools	Btrieve 2 API SDK; SWIG files for Python, C#, Perl, PHP; ODBC/JDBC drivers

Run AI where your data already lives.

Deploy in embedded, edge, on-premises, or air-gapped environments. Keep every query, embedding, and result inside your trust boundary. Connect to data anywhere. Run everything locally.

actian.com/databases/zen > Documentation: **docs.actian.com/zen >**

About Actian

Actian empowers enterprises to confidently manage and govern data at scale. Organizations trust Actian data management and data intelligence solutions to streamline complex data environments and accelerate the delivery of AI-ready data. Designed to be flexible, Actian solutions integrate seamlessly and perform reliably across on-premises, cloud and hybrid environments. Learn more about Actian, the data and AI division of **HCLSoftware**, at **actian.com**.

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