# POINTBASE EMBEDDED

## A transparent, full-featured and zero administration embedded Java™ database enabling software providers to accelerate development cycles and reduce time to market

Software vendors face a variety of data storage and management challenges as they develop today's Java-based enterprise applications. Some need to store metadata pertaining to application operation, while others wish to provide a database for application-specific data such as catalogs, images or information collected in the field. Still other vendors would like to offer a default database integrated with their application to speed customer deployment for evaluation and adoption of their product.

Many developers continue to believe that the answer is to store such data in flat-files or a costly licensed enterprise database. However, for Java applications this frequently generates an additional set of problems. Flat-files are slow and associated with many data integrity issues. Flat file-based data management is difficult to develop, hard to maintain and detracts from the process of creating application business logic.

However, traditional databases are not much better, since they are not portable across platforms. The correct database version must be obtained for each OS and jointly tested and supported by the software vendor with each new application release. The database must also be installed or upgraded separately from the application, with a DBA on hand to resolve compatibility conflicts with existing databases and optimize database performance.

### THE POINTBASE EMBEDDED DATABASE

PointBase helps software vendors meet these challenges with a platform-independent, relational database written entirely in Java. This powerful product can be embedded directly within your application making it completely transparent to the end-user. PointBase Embedded, delivering cross-platform portability, a small footprint, comprehensive security and zero administration, offers a low-cost, high-results solution to effective storage of metadata, application-specific data or out-of-the-box tutorials and demonstration materials.

Simple to deploy, PointBase Embedded minimizes licensing restrictions and charges imposed by leading database vendors, accelerates development and adoption cycles and lowers the total cost of ownership for a wide variety of applications. Relying on the capabilities of Java, you gain a powerful, flexible database that can be installed and operated with any application, on any platform.

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## Complete Portability for Faster Development

PointBase Embedded's Java-based portability minimizes the resources required to test and integrate your application across platforms. PointBase runs on any platform that supports a Java Virtual Machine (JVM) – in other words, on all major platforms – giving developers the flexibility to develop, test and deploy with the same JDBC syntax and data types. Now developers can test on a single platform and deploy everywhere. This speeds time to market for your application, eliminates expensive and complex database licensing and helps to produce software better designed for your customers' needs.

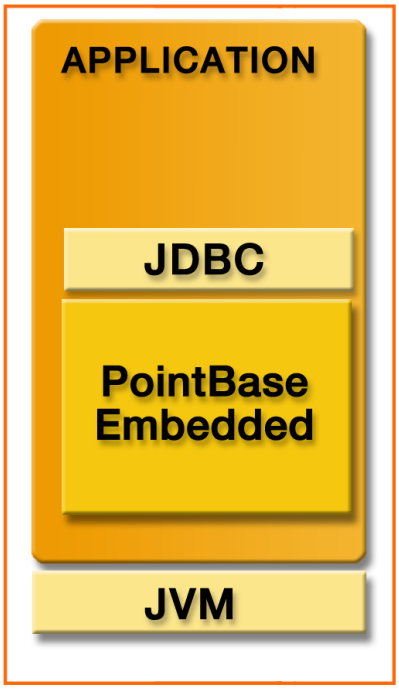


**Figure 1: PointBase Embedded: Complete Transparency within the Java Application**

## Robust, Full-Featured SQL Support and Java Connectivity

PointBase Embedded allows you to meet customer query and access requirements with comprehensive SQL support and Java connectivity. Features include:

- SQL-92 compliance for entry and transition levels
- SQL-99 key features compliance
- Triggers, views, temporary tables, subqueries, updateable result sets, batch updates and Java stored procedures
- Online query statistics and automatic statistics maintenance
- Sun-certified (J2EE™) Level 4 JDBC driver
- Full support for JDBC 1.2, JDBC 2.0 compliant, a subset of JDBC 2.0 Extension Interfaces and a subset of JDBC 3.0

## Complete Java-Based Security and Transaction Integrity

PointBase Embedded also offers enhanced Java-based security for encryption and role privileges, ensuring that database security issues will not affect the overall security of your application. Protected by complete encryption for both database storage and network communications – as well as supporting security standards including Blowfish, Twofish, DES, DES3, TEA, and IDEA – applications can be safely deployed in any enterprise environment. In addition, PointBase Embedded leverages the standard Java Transaction API to integrate with customers' existing application infrastructure, based on its support for the J2EE application server, transactional integrity and standard JDBC. PointBase Embedded serves as a resource manager to support the application server's transaction management.

## Small Footprint for Large Storage

Today's customers demand smaller applications that have less performance impact on their enterprise systems. PointBase Embedded supports this goal by maintaining a small footprint (approximately 1MB) while allowing storage of up to several terabytes of data, enabling your application to scale as needed. The result is powerful information management without lessening performance.

## The Zero-Administration Database

No DBA is required for Java applications when you use PointBase Embedded. Throughout development, the database automatically tunes along with the application, without any need to update statistics. Using an integrated API for online backups, developers can make the database completely administration-free and perform backups automatically from within their applications. It also provides a cost-based optimizer and automatic data recovery. Your organization uses fewer administration resources, allowing developers to focus on optimizing the application instead of system management issues.

## Support for Major Development Environments

PointBase Embedded integrates with all standard Java IDEs to leverage your existing corporate environment, including Sun™ ONE Studio, Borland® JBuilder™ and Oracle9*i* JDeveloper. Your development costs are reduced while engineers continue working with the tools they know and prefer.

## One-Step Deployment through Transparent Data Management

Embedded within your application and running on the same JVM, the PointBase database is completely transparent to the end user. PointBase JAR files can be packaged within your Java application, easing the deployment of your application by providing a single JAR file to your customers. By deploying with PointBase, you avoid the risk of conflicts with the settings of some existing database products. Such a fully integrated solution uses minimal system resources, while its scalable architecture accommodates application growth into the future. Thanks to its low impact on download size, PointBase Embedded can also be installed and upgraded, along with your application, over the Web or from a CD.

## Easy-to-Use Data Access Tools

To facilitate the development process, your team requires tools that enable rapid data creation, access and updates. PointBase Embedded provides PointBase Console, a user-friendly GUI, and PointBase Commander, a command line-oriented data access and scripting tool. Not only are these tools easy to learn and use, but they also allow developers maximum flexibility in creating, viewing, editing and manipulating data during development.

**KEY FEATURES:**

- Platform-independent, full-featured database written entirely in Java
- Small footprint
- Storage for several terabytes of data
- Zero administration
- Single JAR file for database and application installation
- Integration with all standard Java IDEs
- Functions as a resource manager for distributed XA transactions
- Complete encryption at the database and network level
- Easy-to-use data access tools
- Support for mobile platforms
- Multi-client server option

**KEY BENEFITS:**

- Transparent database embedded within your application
- Shortens development cycles and speeds time to market
- Complete portability across all platforms
- Low or no impact on application and system performance
- One-step installation and deployment
- Transactional integrity and security
- Elimination of complex database licensing fees
- Fast Web downloads for application testing, evaluation and deployment
- Easier application migrations and upgrades

## Extending Applications to Enterprise Environments

Increasingly, embedded databases are supporting applications used across and outside of the enterprise. In combination with its sister products, PointBase Micro and PointBase UniSync, PointBase Embedded allows your application to run seamlessly across multiple mobile platforms.

- PointBase Micro, optimized for PDAs, cell phones and other mobile computing devices, is a J2ME (CDC and MIDP) - compliant relational database that supports a subset of SQL and JDBC while maintaining an ultra-small footprint.
- PointBase UniSync provides bi-directional synchronization between PointBase databases and other JDBC - compliant databases including Microsoft® SQL Server™ and Oracle®.
- Customers can deploy in a client/server environment using the PointBase Embedded - Server Option.

## Complete Technical Support for Your Implementation

PointBase provides full support for PointBase Embedded to further reduce the tight development cycles required for today's mission-critical projects. We provide up to three months of free support during evaluation, and, upon purchase, an additional 30 days of free installation support. Customers under contract receive technical support from PointBase engineers during standard business hours via a web-based support system. This includes access to a comprehensive and dynamic knowledge base that allows you to research your question or issue using a variety of criteria (product, keywords, or phrases) to determine if a resolution is readily available. You can also manage a personalized support account to obtain the current status of your incident.

## PointBase: Your Java OEM Partner

PointBase's proven database products are leading the next generation of development for Java-based applications. Market leaders including Sun®, BEA® and Macromedia® rely on PointBase for storing application metadata, for storing application-specific data or for use as a default database. Whether you are creating software for application servers, tools and systems management or applications for CRM, ERP, SFA and eCommerce, PointBase Embedded within your solution will help maximize your business success.

## PointBase Embedded Functionality

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|---|---|
| **J2EE Certification** | • Passed JDBC certification (J2EE 1.3.1 CTS)<br>• JDBC 3.0 compliant |
| **Security** | • SQL security for assigning privileges and roles<br>• Complete encryption (database and network levels)<br>• Standard encryption algorithms provide 32-128 bit encryption |
| **Interface** | • SQL-92 Entry and Transition Levels<br>• SQL-99 (key features) |
| **DDL** | • alter table add/drop constraints & columns<br>• connect/disconnect<br>• create/drop function<br>• create/drop procedure<br>• create/drop trigger<br>• create/drop index<br>• create/drop schema<br>• create/drop table<br>• create/drop read-only views<br>• create/drop user, roles<br>• grant/revoke privileges<br>• Includes: default values, null, primary key, foreign key, check constraints, full referential integrity<br>• Variable page sizes for individual tables and indexes, as well as BLOB/CLOB columns<br>• Identity columns (auto increment)<br>• Supports index organized and heap organized tables |
| **DML** | • insert<br>• update<br>• delete<br>• select including SQL functions in values clause, set clause, and predicates |
| **DQL** | • multi-table joins (includes support for hash joins)<br>• cost-based query optimizer<br>• on-line query statistics<br>• predicates: comparison, in, like, between<br>• SQL functions in select list and predicates<br>• aggregates (distinct, count, sum, max, min, avg, abs)<br>• correlated subqueries |
| **DCL** | • call<br>• return<br>• set path<br>• set assignment<br>• signal<br>• switchlogfile<br>• values<br>• unload<br>• load |
| **Scalar functions** | • add<br>• extract<br>• cast<br>• lower<br>• char_length<br>• multiply<br>• concatenation<br>• octet_length<br>• current_date<br>• position<br>• current_schema<br>• substring<br>• current_time<br>• subtract<br>• current_ timestamp<br>• trim<br>• current_user<br>• upper<br>• divide |

| | |
|---|---|
| **Distributed Transactions** | • Java transaction API<br>• 2-phase commit<br>• XA Datasource<br>• XA Connection |
| **International-ization** | • Unicode (international character set) support at the database, table and schema levels<br>• Locale settings (country and language) |
| **Backup** | • Online database backup<br>• API to load/unload database |
| **Transactions** | • start transaction<br>• set transaction<br>• set datalog<br>• savepoint<br>• rollback to savepoint<br>• rollback<br>• commit<br>• isolation levels: read_uncommitted, read_committed, repeatable_read, serializable<br>• deadlock detection |
| **Data Types** | • BLOB<br>• boolean<br>• CLOB<br>• decimal<br>• BigDecimal<br>• float<br>• numeric<br>• smallint<br>• timestamp<br>• bigInt<br>• char<br>• date<br>• double<br>• integer<br>• real<br>• time<br>• varchar |
| **Tunable Database Properties** | • Cache Size - Increase this size to reduce I/O at the cost of memory<br>• Database Page Size - Increase or decrease to change the number of rows read at a time<br>• Sort Size -buffer size of in memory sorting<br>• SQL Caching - reuse of a prepared statement |
| **Read Only Media** | • Support for read only database |
| **Other JDBC Features** | • Scrollable, sensitive, updateable, holdable cursors<br>• Support for batch update<br>• Updateable ResultSets<br>• JNDI<br>• Connection pools |



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