

Oracle TimesTen In-Memory Database



Oracle TimesTen In-Memory Database is a memory-optimized relational database that provides applications with extremely fast response time and very high throughput as required by many applications in a wide range of industries. Deployed in the application tier, TimesTen databases reside entirely in physical memory with persistence to disk storage for recoverability. Applications access the in-memory databases using standard SQL interfaces. High availability is provided through real-time transactional replication.

INDUSTRY LEADING FAST AND RELIABLE SQL IN-MEMORY DATABASE

KEY FEATURES

- Low latency
- Microsecond response time
- Multi-user concurrency
- Durability and Persistence
- Transactional parallel replication
- Supports SQL and PL/SQL via ODBC, JDBC, ODP.NET, OCI and Pro*C/C++

KEY BENEFITS

- Real time performance
- Consistent response time
- Automated database failover
- Zero data loss
- Supports OLTP and analytic workloads

Real-Time Performance

Oracle TimesTen In-Memory Database (TimesTen) delivers real-time performance by changing the assumptions around where data resides at runtime. By managing data in memory, and optimizing data structures and access algorithms accordingly, database operations execute with maximum efficiency, achieving dramatic gains in responsiveness and throughput, even compared to a fully cached disk-based RDBMS. In addition to using the conventional client/server connections to the database, applications may further improve on transaction response time by embedding the TimesTen database within the application, thus eliminating inter-process communication and network overheads.

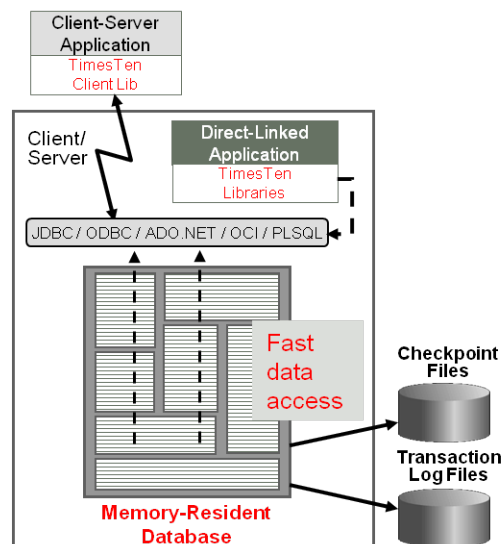


Figure 1. Oracle TimesTen In-Memory Database

REAL-TIME DATA MANAGEMENT FOR PERFORMANCE-CRITICAL APPLICATIONS

- Telecom and networking
- Capital markets
- Defense and intelligence
- Travel and reservations
- Call Center applications
- Self-service portals
- Smart Metering
- Gaming
- Real Time Business Intelligence
- Fraud detection

Real-time data management has two performance dimensions – response time and throughput. With TimesTen, a transaction that reads a database record can take 2.37 microseconds, and transactions that update or insert a record can take less than 8 microseconds (measured on Oracle Linux running Intel Xeon E5-2680 2.7GHz processors). Consequently, throughput is measured in tens to hundreds of thousands of transactions per second, using commodity hardware.

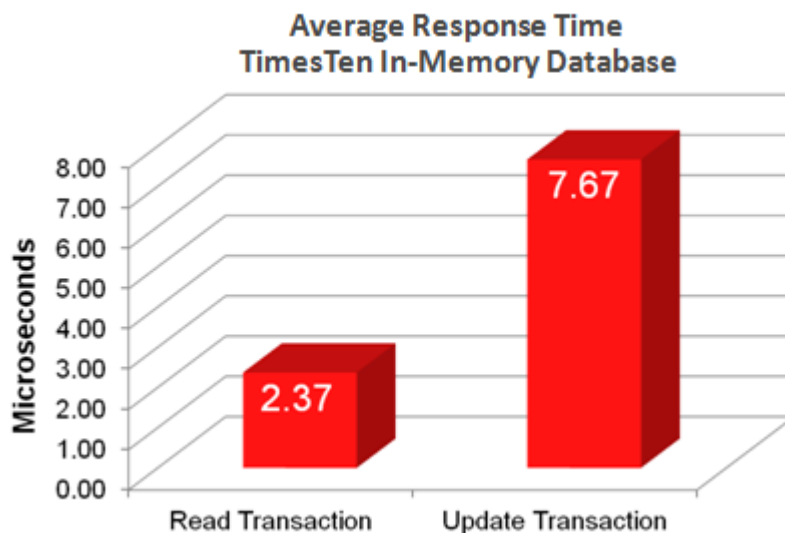


Figure 2. Oracle TimesTen In-Memory Database Average Response Time

Multi-User Concurrency, Persistence and Durability

Oracle TimesTen In-Memory Database uses memory-optimized data layout and access methods for highly concurrent workloads. Applications access TimesTen databases using standard SQL and PL/SQL via JDBC, ODBC, ODP.NET, Oracle Call Interface (OCI), and Pro*C/C++ programming interfaces. While the best response time is achieved with TimesTen running in-process with the application, conventional client/server access is used when a database is shared by applications running on a number of servers.

Oracle TimesTen databases are fully persistent and recoverable. Durability is achieved through a combination of transaction logging and database checkpointing to disk.

Workloads

TimesTen is suitable for use by response-time critical OLTP (online transaction processing) applications as well as analytic applications for real-time decision-making. Example of OLTP applications include call processing, session management, online-charging, billing and rating management in telecommunications, trading platforms in financial services, high volume Web applications, travel and airline reservation systems, smart metering, gaming and many others. Examples of analytic applications include business intelligence interactive dashboard visualization, risk management, real-time fraud detection, and others.

FLEXIBLE REPLICATION

- Active Standby
- Active Standby with Read-only Subscribers
- Asynchronous and synchronous replication
- Parallel replication for high throughput
- Streaming TCP/IP for optimized LAN and WAN support

RELATED PRODUCTS

- Oracle TimesTen Application-Tier Database Cache
- Oracle Exalytics
- Oracle SQL Developer
- Oracle Enterprise Manager
- Oracle Clusterware

High Availability

Availability is an essential requirement for most real-time applications. Industries that operate 24x7, such as telecommunications, and global systems that are Web-accessible, such as travel and reservations sites, cannot tolerate service downtime. Securities trading systems must remain continuously available while financial markets are open. The more real-time the system, the more likely it needs to be highly available.

TimesTen Replication uses memory-optimized, transactional replication technology over a high-throughput low-latency network protocol for performance, reliability, and robustness. Key functionalities include:

- Asynchronous replication provides maximum performance, and decouples the application from the subscriber receipt process of replicated elements.
- Synchronous replication provides maximum availability and data consistency between the active and standby databases; the application is blocked until the transaction has been both received and committed on the standby database.
- Hot read availability of the standby database; additional read capacity can be provided by configuring additional read-only subscribers.
- Parallel replication provides replication throughput scaling while maintaining transaction execution order.
- Automated failure detection and failover to the standby database, achieved by seamless integration with Oracle Clusterware.
- Online upgrade enables software upgrades without application down time.
- Flexible configuration supports a range of topologies over LAN and WAN.



Oracle TimesTen Application-Tier Database Cache

For applications with existing data already residing in an Oracle database, caching a performance-critical subset of the data into the TimesTen In-Memory Database is a practical solution to improve application response time. Applications perform read/write operations on the cache tables using SQL and PL/SQL with automatic persistence, transactional consistency, and data synchronization with the Oracle Database. Oracle TimesTen Application-Tier Database Cache is a database option for the Oracle Database, Enterprise Edition. See Oracle TimesTen Application-Tier Database Cache product data sheet for more information.

**CONTACT US**

For more information about Oracle TimesTen In-Memory Database, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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Hardware and Software, Engineered to Work Together

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