

CACHE CONNECT TO ORACLE

OVERVIEW



- Real-time performance for Oracle data
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Cache Connect to Oracle is an option to the Oracle TimesTen In-Memory Database that provides real-time, updatable caching for Oracle Database. The cache tables reside in the application tier and offload computing cycles from backend systems, enabling remarkably responsive and scalable real-time applications. Cache Connect to Oracle manages the cache tables in the Oracle TimesTen database, provides update propagation in both directions, enables pass through of SQL requests for non-cached data in Oracle Database, and automatically resynchronizes data after failures. Cache Connect to Oracle is fully compatible with the Replication – TimesTen to TimesTen option.

Real-Time Performance for Oracle Data

The majority of data in corporate databases is historical and infrequently accessed. But, buried within this data are pockets of information that should be instantly accessible when requested. Your best customers, open orders, recent transactions and product catalog are examples. Cache Connect to Oracle enables such information to be automatically copied and managed in Oracle TimesTen In-Memory Databases for real-time access. Cache Connect to Oracle provides the connection and bi-directional transfer of data between an Oracle Database and an Oracle TimesTen In-Memory Database.

By managing data in memory, and optimizing data structures and access algorithms accordingly, database operations execute with maximum efficiency, achieving dramatic gains in performance, even compared to a fully cached disk-based RDBMS.

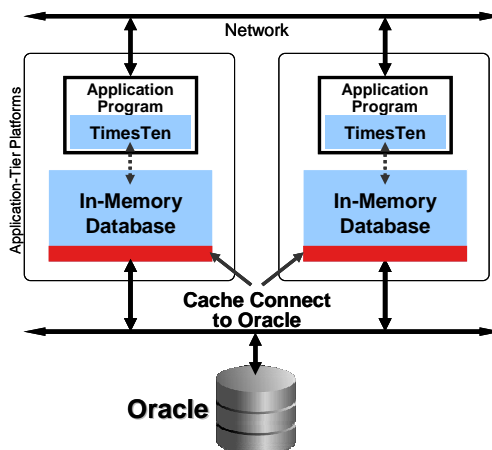


Figure 1. Cache Connect to Oracle added to the Oracle TimesTen In-Memory Database

Unlimited Read/Write Caching

Most caching products are read-only, and thus limited to a narrow set of functions. Because Cache Connect to Oracle supports full read/write SQL operations, it can be used for a wide range of applications. For example, capturing and processing data at network speeds, online commerce, securities trading systems, billing, real-time business process monitoring, real-time data analysis, and other transactional systems for which a read-only cache isn't applicable. Other examples include reference data, such as subscriber profiles, and look-up tables for authorizations and network configurations, where the cache is loaded at the start of each processing cycle then updated as changes occur.

Oracle Database Integration

Cache Connect to Oracle is specifically designed to use Oracle Database features and interfaces. The product supports the same recommended database character sets and mainstream data types as the Oracle Database, ensuring that data can be stored and processed with compatible semantics and behaviors. To enable maximum application transparency, Cache Connect to Oracle supports an SQL “pass through” feature, which allows the applications to transparently send SQL operations that cannot be satisfied by the cached data in the TimesTen database to the Oracle Database for execution. With the pass-through feature, applications only need to establish one connection to the Oracle TimesTen In-Memory Database as the connection to the Oracle Database is managed transparently by Cache Connect to Oracle. Users can configure different settings to specify what types of statements are to be passed through and under what circumstances.

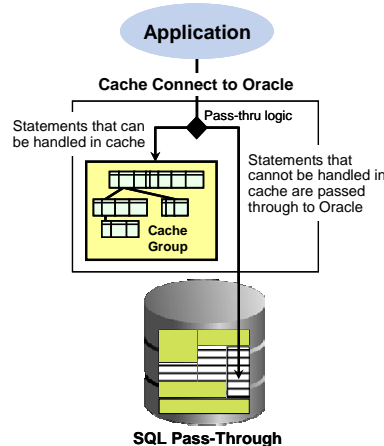


Figure 2. Transparent SQL Pass Through to Oracle

Flexible “Cache Group” Definitions

Cache Connect to Oracle uses the concept of a “cache group”, which describes a collection of in-memory database tables that map to all or a subset of the tables in an Oracle Database. A cache group can consist of all or a subset of the rows and columns in these tables. Multiple cache groups can be used to cache different sets of related tables in the Oracle Database. There are two basic categories of cache groups:

SYSTEM-MANAGED cache groups provide pre-determined caching behaviors that are managed entirely by Cache Connect to Oracle. System-managed cache groups support configurations for read-only caching with automatic refresh, asynchronous or synchronous write-through caching, on-demand data loading and automatic data aging. Data synchronization between the Oracle Database and the cache tables are automatically managed by Cache Connect to Oracle.

USER-MANAGED cache groups allow the users to select from all of the attributes and SQL statements to define customized caching behaviors. The applications are responsible for manually initiating data loading, propagation, and refresh mechanisms that best meet their application requirements.

Automated Data Loading and Refresh

Cache Connect to Oracle provides a number of options for determining how and when data from Oracle is loaded into the cache, depending on the type of cache group created. SQL operations, such as LOAD and REFRESH, are used to populate a cache group and periodically update the contents, either in whole or incrementally. Read-only cache groups can also be defined to automatically refresh incremental changes from the Oracle Database, at user-specified intervals.

Transactional Update Propagation

Updates to the cache are asynchronously or synchronously write-through to Oracle Database, depend upon the desired trade off between performance and consistency. Synchronous write-through will ensure that, if the Oracle Database cannot accept the update(s), the transaction is rolled back from the Oracle TimesTen In-Memory Database. Whereas asynchronous write-through leverages the speed of Oracle TimesTen by first committing the transactions locally, and then using asynchronous write-through to send the updates to the Oracle Database. Asynchronous write-through cache groups provide better application response time and transaction throughput.

For read-only cached groups, incremental updates in the Oracle Database are asynchronously refreshed to the cache tables in Oracle TimesTen.

High Availability and Automatic Resynchronization

Cache Connect to Oracle is designed to continue running even after the Oracle Database server or network connection has been lost. Committed transactions to the cache tables in Oracle TimesTen are tracked and, once the connection is restored, propagated to Oracle Database. Similarly, committed transactions to the cached tables in Oracle Database are tracked and refreshed to Oracle TimesTen, once connection to the Oracle Database is restored. Cache tables in Oracle TimesTen can also be replicated using Oracle TimesTen data replication to provide high availability in the middle-tier.

Dynamic Data Caching and Data Aging

In addition to the automated data synchronization between the cache tables and their corresponding tables in the Oracle Database, some applications may choose to load the cached data on-demand. For example, a Call Center application may choose to

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- Telecom and networking
- Capital markets
- Defense and intelligence
- Travel and reservations
- Service-Oriented Architectures (SOA)
- Middle-tier data caching
- Operational data stores
- Business intelligence
- Business activity monitoring
- Self-service portals
- Call centers

RELATED PRODUCTS AND SERVICES:

- Oracle TimesTen In-Memory Database
- Replication – TimesTen to TimesTen

load the caller's current billing statement when routing the call to a qualified call agent, rather than pre-loading the entire set of billing statements for all customers into the cache in memory. A complementary feature for dynamic data loading is the automatic data aging feature to remove old data or least-recently-used (LRU) data. Data aging enables the applications to free up space for new cache data while keeping the "hot" data available in memory.

Web-based Configuration Utility

Cache Connect to Oracle provides a Web-based GUI, the Cache Administrator, to create and manage cache groups.

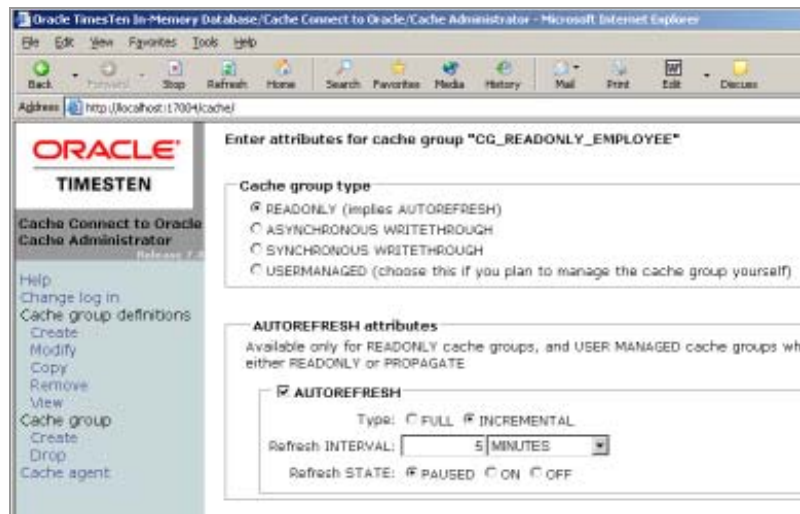


Figure 3. Cache Administrator

For more information about Cache Connect to Oracle, visit

<http://www.oracle.com/technology/products/timesten>

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