

# Oracle® TimesTen In-Memory Database

Release Notes

Release 11.2.1

E13080-46

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This document provides late-breaking information for **TimesTen release 11.2.1.9.5**, as well as information that is not yet part of the formal documentation. The latest version of this document is the `readme.html` file in your installation directory. To reference the TimesTen documentation for the latest major releases, go to

<http://www.oracle.com/technetwork/products/timesten/documentation/>

Information about TimesTen 11.2.1 releases before **11.2.1.8.0** can be found at

<http://www.oracle.com/technetwork/products/timesten/documentation/1121-historic-183693.html>

To install the Oracle TimesTen In-Memory Database, run `setup` from the installation media pack. For installation information, see *Oracle TimesTen In-Memory Database Installation Guide*. This guide can be accessed from `install_dir/doc/` in the installation.

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## 1 Changes in this release

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## 1.1 Changes for Release 11.2.1.9.5 from Release 11.2.1.9.4

### 1.1.1 New Features in 11.2.1.9.5

- In this release, you can alter a table to add a NOT NULL column with a default value. The DEFAULT clause is required. In prior releases, you could only add nullable columns.

The syntax for this feature is:

```
ALTER TABLE ADD [COLUMN] columnname columnntype NOT NULL
DEFAULT defaultvalue
```

The restrictions on this feature are:

- You cannot add a NOT NULL column to a table that is part of a replication scheme. You must remove the table from the replication scheme first before you can add a NOT NULL column to it.
- If you alter a table and add a column with the NOT NULL DEFAULT clause, you cannot use the column as a primary key column. Specifically, you cannot specify the column in the command ALTER TABLE ADD *constraintname* PRIMARY KEY (*columnname* [, ...]).
- If you alter a table and add a column with the NOT NULL DEFAULT clause, you cannot use the column for time-based aging. Specifically, you cannot specify the column in the statement ALTER TABLE ADD AGING USE *ColumnName*.

The XLA function `ttXlaGenerateSQL` has been modified to support the NOT NULL clause for an ALTER TABLE ADD COLUMN...NOT NULL DEFAULT operation.

For nullable columns, `ttXlaColDesc_t.nullOffset` points to the column's null byte in the record. This field is 0 (zero) if the column is not nullable, or greater than 0 if the column can be NULL.

For nullable columns (`ttXlaColDesc_t.nullOffset > 0`), to determine if the column is NULL, add the null offset to the address of `ttXlaUpdate_t*` and check the (unsigned CHAR) byte there to see if it is 1 (NULL) or 0 (NOT NULL).

#### Example 1

```
Command> CREATE TABLE tab1 (col1 number);
Command> ALTER TABLE tab1 ADD COLUMN col2 NUMBER NOT NULL DEFAULT 10;
Command> ALTER TABLE tab1 ADD COLUMN col3 NUMBER DEFAULT 10 NOT NULL;
Command> INSERT INTO tab1 VALUES (10);
      1 row inserted.
Command> SELECT * FROM tab1;
```

```
< 10, 10, 10 >
1 row found.
```

### **Example 2**

```
Command> INSERT INTO tab1 VALUES (10,null,null);
871: COLUMN COL2 CANNOT BE SET TO NULL
The command failed.
```

### **1.1.2 Bug Fixes in 11.2.1.9.5**

- A problem is fixed where the replication peer failure state (TT\_REPLICATION\_INVALID), which is triggered by exceeding the replication threshold, was being reset on a database invalidation or unload. As a result, TimesTen issued the warning TT20100 instead of warning TT8025, after the reload. (BugDB 13777958)
- A problem is fixed where the memory usage for the TimesTen replication daemon agent could grow over time. This was due to a memory leak that could occur with asynchronous writethrough cache group(s) and CacheAWTMethod=0 (SQL array execution method). (BugDB 14005918)
- Error message TT116067 is enhanced to provide additional details about the cause of the failure it reports. The daemon log now contains information immediately after the error message about the underlying cause of the error. (BugDB 14009090)
- In TimesTen Release 11.2.1.7.0, a problem was fixed where an assertion failure could occur with asynchronous writethrough cache groups. The release notes for 11.2.1.7.0 have been updated to reflect this fix. The release note file is located at: <http://www.oracle.com/technetwork/products/timesten/documentation/1121-historic-183693.html> (BugDB 14146561)
- A problem is fixed where a core dump could occur on the TimesTen server when using an automatic client failover configuration with Oracle Clusterware. The problem could occur even when the server was idle. (BugDB 14176141)

### **1.2 Changes for Release 11.2.1.9.4 from Release 11.2.1.9.3**

- A problem has been fixed in which propagation of changes to Oracle from a global cache group could not resume after an active standby failover occurred. (BugDB 14012725)

### **1.3 Changes for Release 11.2.1.9.3 from Release 11.2.1.9.2**

- This release contains additional diagnostics that are captured in the database .inval file when an assertion is encountered.

### **1.4 Changes for Release 11.2.1.9.2 from Release 11.2.1.9.1**

- A problem existed in which an XLALSN was not advanced in the dbheader file after an XLA application did an acknowledge. This problem is fixed. (BugDB #12317769)
- An assertion failure could occur in an active/active replication scheme with clients sending concurrent requests to the system. This problem is fixed. (BugDB #13852031)

- For OCI, a problem was fixed where the schema name was not being used if passed as the leading part of the name to `OCIDescribeAny`. (BugDB #13852209)
- In previous releases, mapping of a `TT_TINYINT` column to a `NUMBER` column for an Asynchronous Writethrough cache group could result in data getting corrupted. This release fixes the problem. (BugDB #13920878)

## 1.5 Changes for Release 11.2.1.9.1 from Release 11.2.1.9.0

- When using cache grid, a problem existed where TimesTen would interpret a temporary failure as a permanent failure. This problem is fixed. (BugDB #13830396)

## 1.6 Changes for Release 11.2.1.9.0 from Release 11.2.1.8.8

### 1.6.1 Behavior Changes in Release 11.2.1.9.0

- Public synonyms cannot be created with the same name as a TimesTen built-in procedure. Previously this was allowed. TimesTen returns an error if an application references a public synonym that has the same name as a TimesTen built-in procedure.

### 1.6.2 New features in Release 11.2.1.9.0

- The dynamic cache group functionality has been expanded to include joins across tables that exist in multiple cache groups. The `DynamicLoadEnable` connection attribute has been enhanced to support this feature. See the *Oracle In-Memory Database Cache User's Guide* and the *Oracle TimesTen In-Memory Database Reference*.
- TimesTen is supported with Oracle Clusterware Release 11.2.0.2.
- This release contains a new built-in procedure, `ttOptCmdCacheInvalidate`, that allows applications to recompile or invalidate dependent commands. See the *Oracle TimesTen In-Memory Database Reference*.
- In this release, when performing a `ttRepAdmin -duplicate` operation, you can specify a local or remote IP address for the destination of the duplicate, using the options `-localIPAddress` and `-remoteIPAddress`. See "Duplicate a database" in the *Oracle TimesTen In-Memory Database Reference*. Also see and the *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide*.

### 1.6.3 Bug fixes in Release 11.2.1.9.0

- Fixed `ttBulkCp` NLS conversion problems that could occur with databases that used multibyte character sets. (BugDB 12548957)
- A problem has been fixed in which setting the `PLSQL_MEMORY_SIZE` connection attribute to a value of 2048 stopped manual RAM loading from working. (BugDB 12882032)
- In previous releases, if a user specified an argument that had the wrong data type when using the function `TO_CHAR`, `TO_NUMBER` or `TO_DATE`, TimesTen would fail with an assertion. In this release, TimesTen returns an error, in this case. (BugDB 12965491)

- Updating statistics on the system table `SYS.SYSAUTH$` would prevent users who were not the Instance Administrator from establishing new connections. This is fixed. (BugDB 12883865)
- A problem is fixed in which, under some circumstances, user log (`tterrors.log*`) and support log (`ttmesg.log*`) rotation does not occur. For example, this problem could occur when the main daemon is not logging to the daemon logs but is logging to the replication agent, cache agent or Server, for an extended time. (BugDB 12975853)
- In TimesTen OCI, using `OCIDescribeAny` to describe table columns of type `CHAR NOT NULL` or `VARCHAR NOT NULL` results in incorrect column length. This problem is fixed. (BugDB 12988605)
- An assertion was fixed for queries that had two or more nested-level complex views or derived tables in its `FROM` clause when the same column name was used in each view or derived table. (BugDB 13006645)
- In previous releases, the `cacheCleanUp.sql` script may not clean up all cache objects installed on Oracle. This is now fixed. (BugDB 13069393)
- In previous releases, using the ODBC `SQLDescribeCol` function to issue a query against a view that included a `UNION ALL` clause in the definition could result in incorrect column names. This is fixed. (BugDB 13090724)
- In previous releases, TimesTen would return error 3137 when an application attempted to insert into grid member in an uncommitted transaction. This is fixed. (BugDB 13116969)
- A problem existed where TimesTen would return error 954 when one connection to a database ran a PL/SQL procedure that executed a query against the database, while another connection altered the table referenced in the query at the same time. This problem is fixed. (BugDB 13147026)
- Killing a multi-threaded application during a connect could result in an `ORA-00600` error. It no longer results in the error. (BugDB 13251708)
- In previous releases, a SQL statement containing a comparison or calculation involving a column of type `TT_BIGINT` could cause TimesTen error 4053: `Internal error: Bad data type for char`. This is fixed. (BugDB 13256717)
- The `ttAdmin` utility is enhanced to allow users to determine if a database is automatically reloaded into memory after a failure, when the RAM policy is set to `manual`. See the *Oracle TimesTen In-Memory Database Reference*. (BugDB 13339311)
- The invalid use of aggregate functions with inline views could cause an assertion during compilation. Now error 2765: `invalid use of aggregate function is returned instead` (BugDB 13349543)
- In previous releases, for a "group restricted" TimesTen instance, some diagnostic files, such as `.inval` files, had incorrect permissions. This problem is fixed. (BugDB 13399296)
- A problem existed where an error was returned during `DELETE` operations on grid instances owned by multiple nodes in a global dynamic cache group. This problem is fixed. (BugDB 13402540)
- TimesTen internal bookkeeping is improved to remove unneeded TimesTen objects left behind in an Oracle database once an autorefresh operation was completed. (BugDB 13443440)

- In this release, multiple `ttRepAdmin -duplicate` operations can progress concurrently from multiple TimesTen databases caching the same Oracle database. This was not possible in previous releases. (BugDB 13468080)
- When a member of a grid is detached forcibly, all changes that have not been propagated to Oracle are discarded. In previous releases, global cache groups were unloaded. In this release, local AWT cache groups are unloaded also if any of the changes that were not propagated to Oracle belonged to a local AWT cache group. (BugDB 13516887)
- Executing multiple CRS admin operations concurrently on the active node of an active standby pair would result in an unexpected failover. This problem is fixed. (BugDB 13525183)
- On 64-bit systems, the `ttIsql` utility command `cmdcache` by `cmdid` would not accept values larger than the 32-bit `TT_INTEGER` type. This problem is fixed. (BugDB 13530046)
- An assertion failure occurred in the function `sbColGetTupNumAndPos` while executing a complex query that included inline views and `GROUP BY` clauses. This problem is fixed. (BugDB 13562164)
- In previous releases, a `COMMIT` after an update in an active standby pair would fail with TimesTen errors 971 and 16080. This release includes additional integrity checks to prevent the problem from occurring. (BugDB 13590358)
- For Windows systems, a problem is fixed where `oci.dll` would be left behind after uninstalling TimesTen. (BugDB 13599945)
- In previous releases, a `SELECT` statement that contained multiple `AND` operators could give unexpected results on a cache table. This is fixed. (BugDB 13701176)
- In previous releases, customers using readonly cache groups have reported significant `User Lock` contention on Oracle. This is fixed. (BugDB 13786327)

## 1.7 Changes for Release 11.2.1.8.8 from Release 11.2.1.8.5

- The JDBC Client Server driver leaked memory if the number of parameters in a `PreparedStatement` or `CallableStatement` was not an integral multiple of four. This is fixed. (BugDB 13018571)
- In previous releases, any committed deletes on cached tables in a global AWT cache group could not be propagated if the node was not attached; an attach request could not be completed until all committed updates on cached tables are propagated. This has been fixed in this release. During re-attach, after checking with all currently attached nodes that TimesTen can re-attach the failed node, grid enters a state that enables propagation to proceed. (BugDB 13416457)

This release includes the built-in procedure `ttGridFirstMemberAttach`. In the case that all attached members of the grid have died, call this built-in instead of `ttGridAttach` to attach the first member of the grid. The syntax of the `ttGridFirstMemberAttach` built-in is exactly the same as the existing `ttGridAttach` built-in procedure, which is documented in the *Oracle TimesTen In-Memory Database Reference*. Call the `ttGridFirstMemberAttach` only from one member. Ensure that the cache agents of all other members are stopped before calling this built-in procedure or the procedure fails. (BugDB #13465148)

- In previous releases, the `PLSQL_MEMORY_SIZE` was internally limited to 1 GB, which caused problems for PL/SQL applications that requested more memory. In this release, the 1 GB limit has been removed. (BugDB #13548390)

- In previous releases, the response time for reacting to terminated members of a grid was too long. In this release, TimesTen reduced the response time when there are errors associated with terminated grid members during a dynamic load, global query, or insert of a global cache group. (BugDB #13476427)

## 1.8 Changes for Release 11.2.1.8.5 from Release 11.2.1.8.4

- By default in this release, a dynamic load is allowed on queries that specify multiple cache groups. A dynamic load may happen on each cache group that has an equality constraint with a constant or parameter on a primary or foreign key. For a join query, a dynamic load happens only when a scan is executed by the join plan and a row is not found on the local node by the scan. (BugDB 13081079)

## 1.9 Changes for Release 11.2.1.8.4 from Release 11.2.1.8.3

### 1.9.1 Behavior Changes in Release 11.2.1.8.4

- Because of the fix for bug 12700101 to `OCIDescribeAny()`, the following types now return the proper scale and precision: `BINARY_FLOAT`, `BINARY_DOUBLE`, `NUMBER`, `TIMESTAMP`, `DATE`. In addition, `CHAR` versus `BYTE` semantics are correctly described for the `NCHAR`, `NVARCHAR` data types. You may need to update OCI applications that use `OCIDescribeAny()`.
- The following statements are prevented from being executed on a standby database in an active standby database pair: `CREATE USER`, `DROP USER`, `ALTER USER`, `GRANT` and `REVOKE`. If the connection attribute `DDLReplication` is set to greater than 1, `CREATE SYNONYM` and `DROP SYNONYM` also cannot be executed.

### 1.9.2 New features in Release 11.2.1.8.4

- TimesTen is now supported on Oracle Exalogic Elastic Cloud (Exalogic). The Exalogic certification was performed using the TimesTen with a quarter-rack Exalogic version 1.0 server. For details on installing TimesTen on Exalogic, see the *Oracle TimesTen In-Memory Database Installation Guide*.
- Using the `ttcwadmin -beginAlterSchema` command, you can alter an active standby pair scheme managed by Oracle Clusterware. An alter of a replication scheme is typically used to add or drop replicated objects that cannot be replicated automatically using the `DDLReplicationLevel=2` connection attribute. The replicated objects that can be included in an alter operation are cache groups, PL/SQL procedures, sequences, materialized views and indexes on tables with data.

### 1.9.3 Bug fixes in Release 11.2.1.8.4

- An asynchronous materialized view that was specified with a complete refresh at a specific interval experienced an increasing rate of refreshes. This problem has been fixed. (BugDB 12799775)
- Showing a plan for a query that contained an `OR` predicate involving columns with bitmap indexes defined on them caused an assertion. In this example, bitmap indexes are defined on columns `a` and `b`:

```
EXPLAIN SELECT * FROM bitm WHERE (a=1 OR b=1);
```

Displaying the query plan caused the database to be invalidated. This problem has been fixed. (BugDB 12381228)

- In previous releases, in some cases free blocks were not put onto free list causing a failure during checkpoint. Now, free blocks that are not in the free list are added correctly to the free list during database restart. (BugDB 11930552)
- On Linux systems, the cache agent incorrectly generated daemon log messages indicating that autorefresh had not completed. This release contains diagnostics to understand this problem. (BugDB 12320812)
- When performing an uninstall or upgrade, TimesTen now returns a warning indicating that all files in the install directory will be removed including user-created files. (BugDB 12399683)
- When an ALTER USER operation was executed in the standby database of an active standby pair, the standby would respond as if the operation were running in a local transaction. This problem is fixed. The following statements are prevented from being executed on the standby database: CREATE USER, DROP USER, ALTER USER, GRANT and REVOKE. If the connection attribute DDLReplication is set to greater than 1, CREATE SYNONYM and DROP SYNONYM also cannot be executed. (BugDB 12417310)
- A problem has been fixed where an assertion failure could occur when a query contained two IN lists with different data types on the same table. (BugDB 12548271)
- The ttBulkCp -t ignore|warn command was not truncating data that contained multibyte character sets. This problem is fixed. (BugDB 12548957)
- A problem is fixed where a checkpoint failure could occur after a ttXactAdmin -xactIdRollback operation. (BugDB 12555790)
- A memory leak in the TTClasses TTCmd class has been fixed. (BugDB 12561549)
- In previous releases, the user setting of the RecoveryThreads attribute was reset to 1 when using CRS and when RamPolicy was set to always or manual. This problem is fixed. (BugDB 12587494)
- A problem is fixed where the bookmark on the standby database of an active standby pair would not advance when the connection attribute DDLReplication was set to 2. (BugDB 12597878)
- A problem has been fixed where after switching the active and standby databases, both databases appeared to be using the same daemon port. (BugDB 12598573)
- A problem has been fixed where an assertion failure could occur when a query contained a subquery that had a GROUP BY, HAVING and an ORDER BY clause. (BugDB 12605257)
- In previous release, a SQL statement could fail to find a table in the FROM list on first attempt. This would occur in a query that had a left outer join with a view to define a derived table. This problem is fixed. (BugDB 12616424)
- The OCI client shipped with this release includes patch ARU: 10.2.0.4 ARU 11932704 for Sun Solaris x86-64 systems. The ARU addressed an OCI concurrency issue that prevented the cache agent or an Oracle In-Memory Database Cache application from performing correctly. (BugDB 12629581)
- The daemon log message "Large page alignment failed with error xxx" has been enhanced to indicate that the memory segment was created in normal pages because there was not enough huge pages. (BugDB 12633652)

- The `ttCacheAutorefreshStatsGet` built-in procedure is enhanced to include applied records. (BugDB 12639026)
- In previous releases, multiple calls to the `ttRepSubscriberWait` built-in procedure could increase log file growth. This problem is fixed. (BugDB 12641477)
- In previous releases, a `SELECT . . . GROUP BY` column or a `SELECT DISTINCT` column `FROM` operation could produce incorrect output when the column in the `GROUP BY` clause was a `NUMBER` data type with a `NOT NULL` constraint and there were no indexes on the column. This is fixed. (BugDB 12659721 and 12679817)
- A problem has been fixed where a core dump occurred during a reconnect in the rare case that permissions had been changed on a TimesTen DBI file. (BugDB 12662174)
- A problem has been fixed where a replication log record was missed. In that case, TimesTen returned multiple `TT16999` warning messages. (BugDB 12666539)
- A problem has been fixed where the TimesTen cache agent could drop user triggers on the Oracle database during startup. The conditions under which this problem could occur were: user triggers existed in the cache admin schema, the name of the user trigger had a number after the sixth character and the number in the user trigger name corresponded to an Oracle user ID. (BugDB 12668360)
- A problem has been fixed where memory would not be released after a bitmap index was dropped. (BugDB 12681981)
- A problem has been fixed that caused `CREATE ACTIVE STANDBY PAIR` and `CREATE REPLICATION` operations to take an excessive time to complete. (BugDB 12689047)
- A problem has been fixed where a segmentation fault could occur during a `SELECT COUNT` operation on an asynchronous writethrough cache group. (BugDB 12695463)
- Changes were made to the `OCIDescribeAny()` function to fix a problem where some data types returned incorrect scale and precision. The following types now return the proper scale and precision: `BINARY_FLOAT`, `BINARY_DOUBLE`, `NUMBER`, `TIMESTAMP`, `DATE`. In addition, `CHAR` versus `BYTE` semantics are correctly described for the `NCHAR`, `NVARCHAR` data types. You may need to update OCI applications that use `OCIDescribeAny()`. (BugDB 12700101)
- A problem is fixed where lock contention could occur when using the `ttOptUpdateStats` built-in procedure. (BugDB 12742011)
- In OCI programs that used the TimesTen client driver, batch inserts of input parameters that were Oracle numbers (the `SQLT_VNU` OCI type) would return invalid string or buffer lengths. This is fixed. (BugDB 12804356)

## 1.10 Changes for Release 11.2.1.8.3 from Release 11.2.1.8.2

- Parallel replication performance is improved by reducing compaction operations. Users are encouraged to call the `ttckptblocking` built-in procedure or the `ttcompact` utility during maintenance operations to manage their database space and to avoid long compaction operations during subsequent operations. (BugDB 10279257)
- A problem has been fixed where the subscriber data store in a replication scheme could use more heap memory than the master side and therefore run out of memory, causing replication to fail. (BugDB 11685169)

- A problem has been fixed where TimesTen would pass internal PL/SQL blocks and SQL statements to Oracle in PassThrough mode 3. In this release, only user provided PL/SQL blocks and SQL statements are passed through to Oracle. (BugDB 11711960)
- A problem in which calls to the `ttOptGetColStats` built-in procedure could cause data store invalidations in the `sbBlkReportBadBlock` function has been fixed. (BugDB 11722743)
- The message received if a user cannot login after a `ttMigrate` restore operation has been enhanced to indicate that you must reset user passwords. (BugDB 11785520)
- In previous releases, when a `DROP ACTIVE STANDBY` operation failed, the `ttCWAdmin -drop` operation exited with 0, which is considered "success." Now, `ttCWAdmin` retries the operation and returns a failure exit code when a `DROP ACTIVE STANDBY` operation fails. (BugDB 11792124)
- You can now select PassThrough levels 4 and 5 in the Windows TimesTen ODBC Setup dialog. (BugDB 11791297)
- In previous releases, system calls may not have appeared in sequential order in the log. In this release, the log write patterns are sequential. (BugDB 11800993)
- Dynamic load operations for asynchronous writethrough cache groups have been made more efficient by eliminating unnecessary queries against the Oracle database when a child table whose parent table has the same foreign key is already in the TimesTen cache. (BugDB 11818527)
- A problem has been fixed where TimesTen would generate incorrect checkpoint files resulting in a database recovery failure. (BugDB 11850267)
- In previous releases, under certain configurations, bidirectional replication could result in a false failed transaction message in the conflict resolution file after duplicate updates. This problem has been fixed. (BugDB 11870111)
- In previous releases, when using PL/SQL, the TimesTen database would assert when an internal error (`ORA-00600`) occurred. In this release, the `ORA-00600` error is caught and no assertion occurs in the TimesTen database. (BugDB 11871451)
- By default TimesTen Clusterware now replicates the XLA bookmark. (BugDB 11906642)
- In previous releases, create replication failed when a replication scheme included a parent table that had an `ON DELETE CASCADE` relationship with a child table and that child table was not being replicated. TimesTen now returns error message 12275 "Failed to convert replicated XLA bookmarks to non-replicated for read only subscriber." TimesTen also returns additional error messages that explain why the conversion failed. (BugDB 11937457)
- In previous releases, if an application attempted to retrieve XLA records from a standby or subscriber store using a replicated bookmark, the operation would fail. This problem has been fixed. (BugDB 12347410)
- A problem has been fixed where the row count returned for a detail table and the materialized view were different. (BugDB 12367259)
- A problem has been fixed where a query on a table with two multi-column indexes would return an incorrect result set. (BugDB 12386402)

- A problem has been fixed where values in the systemstats table would only be 0 and would not update. This would occur after a TimesTen installation upgrade for data stores that had been created in a previous release of TimesTen. (BugDB 12394892)
- A problem has been fixed where bitmap indexes could cause incorrect results for an IN or GROUP BY clause. (BugDB 12400780)

### 1.11 Changes for Release 11.2.1.8.2 from Release 11.2.1.8.1

- A problem has been fixed where specific complex queries that contained a COUNT aggregation in one of the SELECT clauses of a SET operator combined with a UNION statement could return inconsistent results. (BugDB 11711323)
- When an instance needs to be transferred to a new grid member and the current member still needs access to the instance, the thread that moves the instance gives up its lock and retries if there is any chance of a deadlock. The elapsed time of all retries is determined by the lock time out value. (BugDB 11712111)
- Selecting rows that are being deleted, unloaded or updated could result in the following: Assertion failed: (((sbCurHdr\_p)cur)->state) == sbCurStEmpty) [index.c:/main/47:sbIxCurNext():8330] PID 14031 (timestenorad) CONN 78 (Cache Load). This problem is fixed. (BugDB 13496920)

### 1.12 Changes for Release 11.2.1.8.1 from Release 11.2.1.8.0

- In previous releases of TimesTen, a maximum of 50 prepared PL/SQL statements per connection was allowed. This release allows a maximum of 5,000 PL/SQL statements per connection. Previous releases also allowed the caching of only 50 recently-used PL/SQL blocks in each session. This limit also has been increased to 5,000. (BugDB 11827656)
- A problem was fixed whereby parallel replication tracks could stall due to starvation waiting on a semaphore. (BugDB 11836584)
- A problem was fixed that could cause parallel replication to get stuck when connections switch tracks and frequently rollback transactions. (BugDB 11893103)

## 2 Platforms

Platform or operating system	C/C++ compiler support	JDK support
Microsoft Windows 2000, Windows XP, Windows Vista, Windows 7 and Windows Server 2003 and 2008 for Intel IA-32 and EM64T and AMD64 CPUs.	Compiled and tested with Intel 8. VS .NET 2003, VS 2005 and VS 2008 are also supported. To use the TimesTen debug library, you <i>must</i> use VS .NET 2003.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
Asianux 2.0 and 3.0 for Intel IA-32 and EM64T and AMD64 CPUs.	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0

<b>Platform or operating system</b>	<b>C/C++ compiler support</b>	<b>JDK support</b>
Solaris 9 and 10 for UltraSparc CPUs, 32-bit and 64-bit.	64-bit compiled with Sun Studio 11.  32-bit shipped with a TimesTen client library compiled with gcc 3.4.6 and a client library compiled with SunStudio 11.	Sun JDK 5.0 and 6.0
Solaris 10 for x86-64.	Compiled with Sun Studio 10. Tested on AMD64 CPUs.	Sun JDK 5.0 and 6.0
SUSE Linux Enterprise Server 10 for Intel IA-32 and EM64T and AMD64 CPUs.	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
SUSE Linux Enterprise Server 10 for Itanium2 CPUs for 64bit-only.	Compiled and tested with Intel 9.1. gcc 3.4.5 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
SUSE Linux Enterprise Server 11 for Linux x86-84, for 64-bit only	gcc 4.3	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
Red Hat Enterprise Linux 4, 5 and 6 for Intel Itanium2 CPUs, for 64-bit only.	Compiled and tested with Intel 9.1. gcc 3.4.5 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
Red Hat Enterprise Linux 4, 5 and 6 for Intel IA-32 and EM64T and AMD64 CPUs.	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
Oracle Linux 4, 5 and 6 for Intel IA-32 and EM64T and AMD64 CPUs.	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
MontaVista Linux Carrier Grade Edition Release 4.0, 5.0, and 6.0 for Intel IA-32, EM64T and AMD64 CPUs.	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.	Sun JDK 5.0 and 6.0 JRockit JDK 5.0 and 6.0
HP-UX 11i v2 and 11iv3 for PA-RISC.	Compiled and tested with the HP compiler.	HP
HP-UX 11i v2 and 11iv3 for Itanium2.	Compiled and tested with the HP compiler.	HP
AIX 5L 5.3 and 6.1 for POWER CPUs.	Compiled and tested with the AIX compiler.	IBM

TimesTen is not supported with LinuxThreads.

TimesTen is supported on Oracle VM guest x86 and x86-64 operating systems on Oracle Linux 4, 5 and 6 or Red Hat Enterprise Linux 4, 5 and 6 systems.

TimesTen is certified on the Oracle Exalogic Elastic Cloud (Exalogic). It was tested on the version 1.0 server.

## 2.1 Client/Server configurations

A TimesTen client on any supported platform can connect to a TimesTen server on any platform where TimesTen is supported.

For configuration details see "Configuring TimesTen Client and Server" in the *Oracle TimesTen In-Memory Database Operations Guide*.

## 2.2 Oracle In-Memory Database Cache

Oracle In-Memory Database Cache (IMDB Cache) allows you to cache Oracle database data in TimesTen. The TimesTen installation includes Oracle Instant Client, and the following Oracle server releases are supported with this option:

- Oracle Database 10g Release 2 (Oracle 10.2.0.4.0 or above)
- Oracle Database 11g Release 1
- Oracle Database 11g Release 2

For details about required patches, see [Section 6.10, "IMDB Cache."](#)

Also, see "Setting up the Oracle and TimesTen systems" in *Oracle In-Memory Database Cache User's Guide*.

### 2.2.1 Platform support

IMDB Cache is supported on the 32-bit and 64-bit platforms specified in this table:

Environment	32-bit	64-bit
Microsoft Windows 2000, Windows XP, Windows 7, Windows Vista and Windows Server 2003 and 2008 for Intel IA-32 and EM64T and AMD64 CPUs	Yes	Yes
Asianux 2.0 and 3.0 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes
Solaris 9 and 10 for UltraSparc CPUs	Yes	Yes
Solaris 10 for AMD64 CPUs systems		Yes
SuSE LINUX Enterprise Server 10 for Intel IA-32, EM64T and AMD64 CPUs	Yes	Yes
SuSE LINUX Enterprise Server 10 for Itanium2 CPUs		Yes
Oracle Enterprise Linux 4 and 5 for Intel IA-32 CPUs.	Yes	Yes
Oracle Enterprise Linux 4 and 5 for EM64T and AMD64 CPUs.		Yes
Red Hat Enterprise Linux 4 and 5 running on Intel Itanium2 processors		Yes
Red Hat Enterprise Linux 4 and 5 for Intel IA-32 and EM64T and AMD64 CPUs	Yes	Yes
HP-UX 11i v2 and 11iv3 for PA-RISC 32-bit and 64-bit	Yes	Yes
HP-UX 11i v2 and 11iv3 for Itanium2	Yes	Yes
AIX 5L 5.3 and 6.1 for POWER CPUs	Yes	Yes

## 2.3 Replication configurations

TimesTen-to-TimesTen replication is supported only between identical platforms and bit-levels.

Oracle Clusterware 11.1.0.7 and 11.2.0.2 are supported with TimesTen active standby pair replication. For more details, see the *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide*

### 3 Software requirements

For software requirements, refer to *Oracle TimesTen In-Memory Database Installation Guide*.

### 4 Deliverables

You should receive the following with your copy of the Oracle TimesTen In-Memory Database:

- **Release Notes.** This document (which you are now reading) covers late-breaking information not included in the formal documentation.
- **Oracle TimesTen Media Pack.** The media pack includes the Oracle TimesTen libraries and executables, demo programs, utilities and online documentation. The documentation included on the media pack consists of:
  - **Oracle TimesTen In-Memory Database Release Notes (Part Number E13080).** See the description above.
  - **Oracle TimesTen In-Memory Database Installation Guide (Part Number E13063).** See the description above.
  - **Oracle In-Memory Database Cache Introduction (Part Number E14261).** This guide describes the features of Oracle In-Memory Database Cache and provides information to help developers plan an IMDB Cache application.
  - **Oracle TimesTen In-Memory Database Operations Guide (Part Number E13065).** This guide provides information about configuring TimesTen and using the `ttIsqL` utility to manage a database. It also provides a basic tutorial for TimesTen.
  - **Oracle TimesTen In-Memory Database C Developer's Guide (Part Number E13066).** This guide describes how to compile and link your C application with Oracle TimesTen and how to set up and work with Oracle TimesTen databases. It covers topics that include error handling, event management and performance tuning. It also provides a reference for C language-specific APIs.
  - **Oracle TimesTen In-Memory Database Java Developer's Guide (Part Number E13068).** This guide describes how to compile and link your Java application with Oracle TimesTen and how to set up and work with Oracle TimesTen databases. It covers topics that include error handling, event management and performance tuning. It also provides a reference for Java language-specific APIs.
  - **Oracle TimesTen In-Memory Database TTClasses Guide (Part Number E13074).** This guide describes the Oracle TimesTen C++ Interface Classes library. The library provides wrappers around the most common ODBC functionality.
  - **Oracle TimesTen In-Memory Database PL/SQL Developer's Guide (Part Number E13076).** This guide describes and explains how to use PL/SQL in the TimesTen database. It is intended for anyone developing PL/SQL-based applications for the Oracle TimesTen In-Memory Database.

- **Oracle TimesTen In-Memory Database PL/SQL Packages Reference (Part Number E14000).** This guide provides a reference to all PL/SQL packages available for use with the TimesTen database. It is intended for anyone developing PL/SQL-based applications for the Oracle TimesTen In-Memory Database.
- **Oracle Data Provider for .NET Oracle TimesTen In-Memory Database Support User's Guide (Part Number E18485).** ODP.NET support for Oracle TimesTen In-Memory Database (TimesTen) enables ADO.NET data access from .NET client applications to TimesTen databases. This document covers features specific to ODP.NET support of and use with TimesTen.
- **Oracle TimesTen In-Memory Database Reference (Part Number E13069).** This guide provides a reference to all Oracle TimesTen utilities, built-in procedures and attributes and provides a reference to other features of TimesTen.
- **Oracle TimesTen In-Memory Database SQL Reference (Part Number E13070).** This guide contains a complete reference to all TimesTen SQL statements, expressions and functions, including TimesTen SQL extensions.
- **Oracle TimesTen In-Memory Database Error Messages and SNMP Traps (Part Number E13071).** This guide contains a complete reference to the TimesTen error messages and information about using SNMP traps with TimesTen.
- **Oracle TimesTen In-Memory Database System Tables and Limits Reference (Part Number E17114).** This document provides a reference for TimesTen system tables, replication tables and system limits.
- **Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide (Part Number E13072).** This guide provides background information to help you understand how Oracle TimesTen replication works and step-by-step instructions and examples that show how to perform the most commonly needed tasks. It includes information about TimesTen integration with Oracle Clusterware.
- **Oracle In-Memory Database Cache User's Guide (Part Number E13073).** This guide provides background information to help you understand how to create and manage Oracle In-Memory Database Cache and cache grid.
- **Oracle TimesTen In-Memory Database Troubleshooting Procedures Guide (Part Number E13075).** This guide describes how to troubleshoot some of the problems users encounter when using TimesTen.
- **Oracle TimesTen In-Memory Database JDBC Extensions Java API Reference (Part Number E13083) and Oracle TimesTen In-Memory Database JMS/XLA Java API Reference (Part Number E13084).** These references describe TimesTen extensions to JDBC classes and interfaces and the TimesTen JMS/XLA package.
- **Oracle Enterprise Manager System Monitoring Plug-in for Oracle TimesTen In-Memory Database Release Notes (Part Number E13081) and Oracle Enterprise Manager System Monitoring Plug-in for Oracle TimesTen In-Memory Database Installation Guide (Part Number E13082).** This guide and the release notes document describe the Oracle Enterprise Manager Plug-in for TimesTen.

If any of these items is missing, contact Oracle TimesTen support. See "[Contacting support](#)" on page 25.

## 5 Advance notice

This section lists deprecated and removed items and desupport of platforms, Oracle releases, JDK releases and compilers.

### 5.1 Deprecated items in Release 11.2.1.8.0

The `MonInterval` Clusterware attribute

## 6 Known problems and limitations

This section contains known problems and limitations.

### 6.1 Installing and uninstalling TimesTen

- TimesTen is not supported with these Oracle Linux 5 kernels: Oracle Linux 5 GA with virtualization option (2.6.18-8.el5xen), Oracle Linux 5 Update 1 with virtualization option (2.6.18-53.el5xen), Oracle Linux 5 Update 2 with virtualization option (2.6.18-92.el5xen).

TimesTen is supported with these Oracle Linux 5 kernels: Oracle Linux 5 kernel version 2.6.18\* without the `xen` suffix and without the virtualization option, Oracle Linux 5 Update 4 with virtualization option (2.6.18-164.el5xen), Oracle Linux 5 Update 5 with virtualization option (2.6.18-194.el5xen).

The `uname -r` Linux command displays the Linux kernel version.

- If you are installing Oracle TimesTen on a new 64-bit RedHat Linux system, you may find that it is not enabled for 32-bit applications. According to the Redhat Enterprise Linux installation guide: 'Users of AMD64, Intel(R) EM64T, and Itanium systems who want support for developing or running 32-bit applications are encouraged to select the Compatibility Arch Support and Compatibility Arch Development Support packages to install architecture specific support for their systems.'
- On Windows 64-bit systems, TimesTen 32-bit and 64-bit instances of the same major release cannot coexist on the same system.
- On Windows systems, you cannot perform a modified or incremental installation. For example, if you originally installed only the Oracle TimesTen Client and later wanted to install the Oracle TimesTen Data Manager, you must uninstall TimesTen and reinstall all of the components you want to have on your system.
- To run TimesTen 32-bit on AIX, you must install the appropriate fix or higher mentioned at:

<http://www-01.ibm.com/support/docview.wss?uid=isglfixinfo105065>

Without this operating system patch, core dumps or other serious problems may occur when running TimesTen.

The root IBM APAR is: IZ10231: R27 OVERWRITTEN AFTER DLSYM EXECUTION APPLIES TO AIX 5300-06.

See <http://www-01.ibm.com/support/docview.wss?uid=isglIZ10231>.

- For releases 11.2.1.5.0 and later, you must relink applications on AIX after installing TimesTen. Failure to do so results in an application execution error similar to the following:

```
Could not load program _application_:
Dependent module _tt_inst_dir_/lib/libtten.a(libtten.so) could not be loaded.
File _tt_inst_dir_/lib/libtten.a is not an archive or the file could not be
read properly.
System error: Exec format error
```

- When re-installing TimesTen on UNIX, existing `sys.odbcc.ini` and `sys.ttconnect.ini` files are optionally saved as `sys.odbcc.ini.old` and `sys.ttconnect.ini.old` files and new demo files are installed. In this case, you must manually merge any additional DSNs that may have been defined after reinstalling.
- To work properly on MontaVista Linux, include the `libaio` and `libelf` library packages.

## 6.2 Upgrading TimesTen

- The `ttMigrate` utility cannot migrate foreign key dependencies between objects owned by different users to TimesTen release 11.2.1.1.0 and later without a workaround. To work around this problem, first restore the parent tables. Then grant the owner of the child tables the appropriate `REFERENCES` privileges on its parent tables. Finally, restore the child tables.
- The `ttMigrate` utility cannot migrate materialized views to TimesTen release 11.2.1.1.0 and later without a workaround. To work around this problem, first restore the detail tables referenced by the materialized view. Then grant the owner of the materialized view `SELECT` privileges on every detail table. Finally, restore the materialized view.

## 6.3 Log Files

- Support log files do not rotate properly on Windows operating systems. When the `MaxSupportLogFiles` limit is reached, new log files should overwrite old files in the order they were created. On Windows systems, new log files randomly overwrite the old files.

## 6.4 PL/SQL

- PL/SQL is not supported on Solaris x86 and Linux Itanium systems.
- `PLSQL_CODE_TYPE=NATIVE` can be specified, but it is implemented as `INTERPRETED`.
- JRockit on 32-bit Linux allocates a default heap that is 50 percent of available physical memory up to 1 gigabyte. Users of JRockit on 32-bit platforms may need to choose a value for `PLSQL_MEMORY_ADDRESS` other than the default (10000000). Consider values such as `B0000000`, which ensures that the PL/SQL shared memory is not part of the JRockit heap.
- Using `q'` (quoting syntax) is not supported.
- The `EXECUTE IMMEDIATE` statement cannot be used to execute a PL/SQL anonymous block.
- `UTL_FILE` access is limited to a temporary directory located in `install_dir/plsql/utl_file_temp`. The instance administrator can grant access to `UTL_FILE` to specific database users. Users can reference the directory

using `UTL_FILE` if and only if they provide the string `'UTL_FILE_TEMP'` for the location parameter string.

- With Java 6 on 32-bit AIX, connections to a PL/SQL-enabled database using the TimesTen direct driver may fail because of a memory address conflict between the Java memory segment and the TimesTen PL/SQL memory segment. Such a failure is reported as error TT8517:

```
SQLException: [TimesTen][TimesTen 11.2.1.4.0 ODBC Driver][TimesTen]TT8517:
Cannot attach PL/SQL shared memory;
PLSQL_MEMORY_ADDRESS not valid or already in use
```

The conflict can be resolved by specifying a smaller Java memory maximum size using the `-Xmx` option to `java` or the `IBM_JAVA_OPTIONS` environment variable. For example: `java -Xmx64M`. Use `java -verbose:sizes` to see the current default Java memory size.

An alternative solution is to explicitly set the TimesTen `PLSQL_MEMORY_ADDRESS` connection attribute to a value that does not conflict with the Java segment. Potential good values for `PLSQL_MEMORY_ADDRESS` may include `0xe0000000` and `0xa0000000`, depending on the environment and other factors. See the AIX documentation for a complete discussion of how Java uses memory on AIX.

## 6.5 TimesTen OCI support

See "Oracle Call Interface Support" in *Oracle TimesTen In-Memory Database C Developer's Guide* for detailed information about and limitations.

- TimesTen OCI is not supported on Solaris x86 or Linux Itanium systems.
- Certain PL/SQL blocks with `OUT` parameters, when executed against TimesTen OCI, can generate an ORA-12899 error when the data coming back from the PL/SQL block overflows the bound output buffer. This occurs only when the parameters are bound with the UTF16 character set.
- If `NLS_LANG` is set to a value that is not supported by TimesTen, spurious errors such as "Cannot connect" may result.
- When an `INSERT` or `UPDATE` statement is executed which has an array of structures bound as parameters (using `OCIBindArrayOfStruct`), the first execution of the statement succeeds. Subsequent executions may result in a numeric overflow error, a uniqueness constraint violation or a truncation error.

## 6.6 TimesTen support for Oracle Pro\*C/C++ Precompiler

See "TimesTen Support for Oracle Pro\*C/C++ Precompiler" in *Oracle TimesTen In-Memory Database C Developer's Guide* for detailed information about known problems and limitations.

- TimesTen Pro\*C/C++ is not supported on Solaris x86 or Linux Itanium systems.
- The windows link line for a Pro\*C application that uses `SQLLIB` functions should include both `OCI.LIB` and `ORASQL11.LIB`. The correct order is `OCI.LIB` first, then `ORASQL11.LIB`. Reversing the order can lead to the `SQLLIB` functions not working.
- When a variable is declared as `long long` on 32-bit Solaris and 32-bit HP-UX platforms, Pro\*C generates its size as `long`.

- When compiling a Pro\*C/C++ demo, this message may appear: "System default option values taken from: `install_dir/ttoracle_home/instantclient_11_1/precomp/admin/pscscfg.cfg`." The path name may be incorrect.

## 6.7 JDBC

- On HP/UX 11 systems, 32-bit JDBC client and direct drivers cannot coexist in one JVM due to some problems with loading shared libraries.
- If a JDBC application running in a time zone that has Daylight Savings Time selects a non-existent time using `ResultSet.getTimeStamp()`, it gets a time that is an hour behind. For example, in Pacific Standard Time, on the day when the time changes from Standard to Daylight Savings Time, the time between 2:00 a.m. and 2:59 a.m. does not exist. So, if a JDBC application running in Standard Time selects a value of '2002-04-07 02:00:00' using `getTimeStamp()` it gets '2002-04-07 01:00:00'.

## 6.8 XLA and JMS/XLA

- TimesTen does not generate an XLA (Transaction Log API) record for `CREATE MATERIALIZED VIEW LOG` operations. See *Oracle TimesTen In-Memory Database C Developer's Guide* for other details about XLA.
- XLA and JMS/XLA return incorrect information for index types for a `CREATE INDEX` statement. The value reflected in the `flag` field of `ttXlaCreateIndexTup_t` in XLA and the `INDEX_TYPE` value of `CREATE_INDEX` in JMS/XLA, always return "R," indicating regular indexes, regardless of the actual index type.
- To use XLA bookmarks in an active standby pair that is managed by Oracle Clusterware, create the XLA bookmark after starting the active standby pair replication scheme (`ttCWAdmin -start`). Use `ttCWAdmin -status` to ensure that the role of the standby database has become 'STANDBY'.
- JMS/XLA depends on the Oracle GDK for internationalization support. TimesTen distributions include a version of `orai18n.jar` in `install_dir/lib` that JMS/XLA is tested against. JMS/XLA may work with other versions of `orai18n.jar` but those versions are not supported. See *Oracle TimesTen In-Memory Database Java Developer's Guide* for other details.
- To achieve the highest throughput, JMS/XLA applications running on Linux should follow performance guidelines presented in the section entitled "Handling high event rates" in *Oracle TimesTen In-Memory Database Java Developer's Guide* to work around these issues.

## 6.9 Cache grid

- If an insert of a new instance in one grid node does not propagate to the Oracle database before a dynamic load operation for the same instance is executed on a child table in another grid node, then the dynamic load operation results in "0 rows found."

## 6.10 IMDB Cache

- Oracle server bug 7512227 causes TimesTen autorefresh to miss inserts and updates on the Oracle base table. Autorefresh does not miss deletes. The Oracle Server bug applies to Oracle 10g releases 10.2.0.3 and 10.2.0.4. It also applies to Oracle Database 11g Release 1 but does not occur in Oracle Database 11g Release 2. There are two solutions:
  - Set the `CURSOR_SHARING` Oracle server parameter to `EXACT`.
  - Install the appropriate Oracle patch for Oracle release 10.2.0.3 or above.See Metalink document 793948.1.
- When trying to create a global cache group, the database can become invalidated if there are more than 15 errors in the cache group definition. This only happens when connecting to the 11.2.0.1 Oracle Server. The workaround is to use Oracle Server release 10g, 11gR1, or an 11gR2 release higher than 11.2.0.1.0.
- There is a known issue (BugDB 9359437) that during a `FLUSH CACHE GROUP` operation, TimesTen may lock the tables and rows in the cache group tables. This can cause blocking or a deadlock if your application attempts to update the rows concurrently.
- If an application performs multiple `UNLOAD BY ID` operations on a cache group, there is potential for a deadlock with the autorefresh transaction executed by the cache agent. The deadlock occurs only if those same rows are being updated on the Oracle database at the same time.
- `CREATE`, `ALTER` and `DROP CACHE GROUP` statements are not supported in serializable isolation mode.
- If DDL tracking is enabled on the Oracle database, destroying a database that has cache groups may result in the DDL trigger on a cached table not being dropped from the Oracle database. The user must manually drop each of these triggers using the `DROP TRIGGER` statement on the Oracle database. The DDL trigger name of a table with an Oracle object with identifier *X* is `TT_X_DDL_T`. The object identifier of an Oracle table can be retrieved from the `V$ALL_OBJECTS` view on the Oracle database.
- For autorefresh cache groups, after a transaction that executes several DML operations on an Oracle base table (for example in a bulk insert), we recommend that you coalesce the autorefresh log table index (the `logseq` column in the change table). Use `ALTER INDEX index_name COALESCE`.
- Caching an Oracle synonym that is owned by a different user results in error 5140: `Could not find owner.synonym in Oracle. May not have privileges`. The workarounds are:
  - The owner of the synonym can create the cache group.
  - Create a new private synonym that points to the original synonym and then create the cache group. The user who owns the cache group that caches the synonym must match the owner of the synonym.
- For IMDB Cache to work correctly, the value returned by the `hostname` command and the `uname -n` command (UUCP address) must be the same. If `hostname` and `uname -n` return different values, IMDB Cache may report constraint violation failures on Oracle. Alternatively, you can use `uname -s` to ensure that the Internet and the UUCP addresses are the same.

- Set `SQLNET.SEND_TIMEOUT` and `SQLNET.RCV_TIMEOUT` to a value large enough to avoid unnecessary timeouts during normal operations. For example, setting each parameter to 100 seconds forces any communication call from TimesTen to Oracle to time out within 200 seconds.
- With `Passthrough=3`, if a JDBC application calls `setTimestamp()` on a passthrough statement when binding multiple fields, the session `NLS_TIMESTAMP_FORMAT` is lost. You can work around this issue by changing the SQL statement to use `TO_TIMESTAMP(?, 'yyyy-mm-dd hh24:mi:ss.ff9')` and `TO_DATE(?, 'yyyy-mm-dd hh24:mi:ss')`.
- The description of the `PassThrough` general connection attribute in *Oracle TimesTen In-Memory Database Reference* should include this statement: "Passthrough execution of DDL statements does not result in commits on TimesTen."
- Nullable foreign keys can result in rows without a corresponding parent row. The rows may become stale and may not be refreshed properly through a manual refresh or autorefresh operation. They may not get removed through unload or aging operations, and they may not be updated on Oracle through a flush statement.
- When using IMDB Cache, the following JDBC methods are not supported with Oracle pass-through modes 1 through 3:
 

```
PreparedStatement.setAsciiStream(),
PreparedStatement.setUnicodeStream(),
PreparedStatement.setBinaryStream(),
PreparedStatement.setCharacterStream().
```

## 6.11 TimesTen integration with Oracle Clusterware

- When you perform one of these actions:
  - Answer the prompt for which host should be designated as the host for the active database.
  - Enter the `ttCWAdmin -create` command.

You receive the message:

```
"Warning!! Data store on host(s) host list may be destroyed
in Order to be duplicated from active after the roll out.
Please back up this data store manually if necessary, before
executing ttCWAdmin -start".
```

If a database with the specified DSN exists on the host for the standby database, the old database will be destroyed and replaced with the database that is created by the `ttCWAdmin -create` command.

The warning has no meaning if there is no database with the specified DSN on the standby host.

- Spurious internal errors in the logs may be generated during TimesTen Clusterware operations. These errors are benign. Run `ttCWAdmin -status` to verify the status of the system.

## 6.12 TimesTen to TimesTen Replication

- Cross-release replication and migration from a database that does not have manual parallel replication enabled to a database that does have manual parallel replication enabled does not work when one of the databases is release 11.2.1.6.x

or 11.2.1.7.x. Migration from a database without manual parallel replication to a database with manual parallel replication is possible for the following release combinations:

- Before 11.2.1.6.0 to 11.2.1.6.0
- Before 11.2.1.6.0 to 11.2.1.8.0 or later
- 11.2.1.8.0 or later to 11.2.1.8.0 or later

To migrate from an 11.2.1.6.x or 11.2.1.7.x database without manual parallel replication to a database with manual parallel replication, upgrade each database to 11.2.1.8.0 without manual parallel replication first.

- Replication for an altered table can fail if the replication agent is stopped immediately after the `ALTER TABLE` statement has been issued and the agent has not advanced past the end of the `ALTER TABLE` transaction. This problem can occur regardless of return service policy. If you must stop the replication agent after an `ALTER TABLE` transaction, issue a `ttRepSubscriberWait` call to ensure that the replication agent restart point has advanced beyond the alter table operation.
- TimesTen can return error message `TT6003` when using master-subscriber two-safe replication and autorefresh cache groups. This can occur, specifically, if the first replicated two-safe transaction has either a `LOAD CACHE GROUP` or an `ALTER CACHE GROUP SET AUTOREFRESH STATE` operation on an autorefresh cache group. To work around this problem, either avoid doing a `LOAD` or `ALTER` on the first replication transaction or use active standby pair replication.
- Access to the `NEXTVAL SQL` function of a sequence is not supported in a query on a standby node of an active standby pair.
- If the first operation in a two-safe user session is an `ALTER TABLE` operation, the `ALTER TABLE` is not replicated. The workaround is to do some other operation on the table in the same session before altering the table.
- Under very rare circumstances, it is possible for a pair of replicated detail tables and their corresponding materialized view to diverge. This divergence can only happen if the materialized view satisfies both of the following conditions:
  - The view definition has two or more predicates.
  - One of the predicates contains an expression that can generate an exception such as numeric overflow, division by zero or string truncation.

Replicating an update to a detail table can cause divergence if differences in the order of predicate evaluation on the two databases cause a predicate to be evaluated and generate an exception only on the receiving database. The store then rejects the update, resulting in divergence of the detail table and the materialized view. To prevent such divergence, users should avoid replicating materialized views that have predicates that can generate exceptions during expression evaluation. The `SQL CAST` operator can be used in some cases to avoid arithmetic overflow.

- Foreign key and uniqueness constraints cannot be checked at the statement level if `ttXlaApply` is used to implement replication.
- When changing the state of a replication receiver (that is, to `start` or `stop`) when replication has been configured to use a secondary IP address, a misconfiguration of the `/etc/hosts` file may cause `ttRepAdmin` to print the error: `Alter replication with 'ALTER REPLICATION...port 0' failed:`

TT0907: Unique constraint (REPSTORESIX) violated. This error is caused by replication not recognizing the local database. This situation can be confirmed by the following query:

```
SELECT * FROM ttrep.ttstores WHERE is_local_store <> 0x0;
```

If this query returns no rows, or returns a row with the main host name of the database set to the result of the `hostname` command rather than the host you specified, you have encountered a configuration problem with `/etc/hosts`.

To correct the problem, you must ensure that the special host name you are using is defined in `/etc/hosts` and that there is an IP address in common between your special host name and the result of the `hostname` command.

Example: your `hostname` command returns `softswitch` and your system has two Ethernet cards with the addresses 10.10.15.136 and 192.168.15.136. Then the IP addresses defined for `softswitch` should include both IP addresses.

## 6.13 SQL\*Plus

- TimesTen does not support SQL\*Plus connections to TimesTen databases. Use `ttIsql`.

## 6.14 SQL, utilities and procedures

- TimesTen does not update the following statistics because of scalability issues caused by updating them frequently: `db.table.rows_read`, `db.table.rows_inserted`, `db.table.rows_updated`, `db.table.rows_deleted`, `db.index.hash.inserts`, `db.index.hash.deletes`, `db.index.hash.rows_fetched.count`, `db.index.range.inserts.count`, `db.index.range.deletes`, `db.index.range.updates`, `db.index.range.rows_fetched.count`, `db.index.temporary.rows_fetched.count`.
- Executing a query against multiple outer joins with the set operators `UNION`, `MINUS` or `INTERSECT` can result in abnormal termination. To work around this problem, define a view to encapsulate each of the outer joins. Then execute the query against the views.
- When using scalar functions that accept `TIME`, `DATE` or `TIMESTAMP` data types as arguments, you must prefix the function with a literal indicating the data type. For example:

```
SELECT GREATEST (TIME '10:10:10', TIME '12:12:12' ) FROM DUAL;
```

If you do not specify the datetime literal, TimesTen treats the data type as `CHAR`. Functions that accept datetime literals as arguments are: `GREATEST`, `LEAST`, `ROUND` and `ADD_MONTHS`.

- The `ORDER BY` clause is not supported in a `CREATE TABLE AS SELECT` statement.
- The maximum sum of the total number of tables specified in a query and all temporary aggregates needed to handle the query is 32. A temporary aggregate is needed to handle scalar or aggregate subqueries. A query fails with the message `Statement that needs more than 31 nesting levels has not been implemented` when the sum of tables and temporary aggregates in a query is greater than 32.

- COUNT distinct with CHAR type uses binary sorting order and binary comparison semantics even when the NLSSORT attribute was set to a value different than binary.
- When the NLS\_SORT session parameter is set to a multilingual sort (for example, FRENCH\_M), the LIKE operator may produce incorrect results when the pattern match wild-card symbols are applied to the space character.
- SQL query strings in JDBC applications should contain only characters from the database character set. Unicode characters not in the database character set are converted to replacement characters during parsing of the query. Potential workarounds include:
  - Using AL32UTF8 as the database character set.
  - Parameterizing the query to avoid non-database character set characters in the query text.
- The TO\_CHAR SQL function provides inconsistent results (truncates or rounds) when applied to BINARY\_FLOAT and BINARY\_DOUBLE values. TO\_CHAR also truncates some NUMBER values that should instead be rounded.
- If an application process on HP-UX is connected to a TimesTen database and if the application process calls the ttXactIdRollback utility API for a transaction associated with the same database, the call may fail due to the inability to attach to the shared memory segment for the database.
- The fourth argument (stats) to the ttOptSetColIntvlStats built-in procedure is a compound structure that cannot be parameterized using ODBC functions. This means that a statement such as the following fails:
 

```
SQLPrepare(hstmt, "call ttOptSetColIntvlStats('t1', 'c1', 1, ?)", SQL_NTS);
```

Similarly, the ttIsql describe command fails because the "stats" argument does not have one of the known types.

## 6.15 TTClasses

- When recompiling TTClasses on AIX 5.3, ensure that the C++ compiler is at least version 8, patch release 13 (8-feb2007). Older versions may cause programs to fail to connect to TimesTen.

## 6.16 Client/Server

- In the Windows ODBC **Client DSN Setup** dialog box, when the **Server Name** refers to a UNIX host, the **Refresh** button to get the list of DSNs on that server sometimes fails to obtain the list. Enter a known DSN in the **Server DSN** field to create the client DSN entry successfully. TimesTen connections from Windows using that client DSN works normally.
- When setting multiple client connections to a TimesTen server, do not set the stack size (using the `-ServerStackSize` daemon option or `ServerStackSize` attribute) to less than 64KB on 64-bit systems and 48KB on 32-bit systems. If the stack size is too small, the TimesTen Server dies with SIGSEGV on most UNIX system, or SIGBUS on HP-UX. The default stack size is 128 KB on 32-bit systems and 256 KB on 64-bit systems.
- On UNIX, when using `ttlocalhost`, a client of one TimesTen instance cannot connect with a server of another TimesTen instance. For example, a 32-bit

TimesTen client cannot connect to a 64-bit TimesTen server when using `ttlocalhost`. The workaround is to use `ttShmHost` (shared memory IPC) or `localhost` (127.0.0.1).

- While using shared memory as IPC, the application may see the error message 24 from the client driver if the application reaches the system-defined, per process file descriptor limit. This may happen during a connect operation to the Client DSN when the `shmat` system call fails because the application has more open file descriptors than the system-defined per-process file descriptor limit.

## 7 Contacting support

For information about obtaining technical support for Oracle TimesTen products, go to the following Web address: <http://www.oracle.com/support/contact.html>

## 8 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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