Oracle® TimesTen In-Memory Database

Release Notes

Release 11.2.1

E13080-05

August 2009

This document provides late-breaking information as well as information that is not yet part of the formal documentation.

To install the Oracle TimesTen In-Memory Database, run setup from the installation media pack.

For installation information, please see *Oracle TimesTen In-Memory Database Installation Guide*. This guide can be accessed from *install_dir*/doc/index.htm at the root of the installation media pack.

This document contains the following sections:

- Changes in this release
- Platforms
- Software requirements
- Deliverables
- Advance notice
- Known problems and limitations
- Contacting support

1 Changes in this release

This section lists changes in this release:

- Changes for Release 11.2.1.3.0 from Release 11.2.1.2.0
- Changes for Release 11.2.1.2.0 from Release 11.2.1.1.0
- Changes for Release 11.2.1.1.0 from Release 11.2.1.0.0
- Changes for Release 11.2.1.0.0 from Release 7.0.5.2.0

1.1 Changes for Release 11.2.1.3.0 from Release 11.2.1.2.0

- In an active standby pair replication scheme with a disaster recovery subscriber, if one or both master data stores have a failure threshold configured, then the disaster recovery subscriber inherits the failure threshold value when it is created with the `ttRepAdmin -duplicate -initCacheDR` utility. If the master data stores have different failure thresholds, then the higher value is used for the disaster recovery subscriber. (BugDB 7686572)

- In JDBC client/server mode, you can reuse a `Statement` with an open `ResultSet` for update. (BugDB 8536362)

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- When running a PL/SQL block that uses OUT parameters, `ttIsql` using the Client/Server Driver did not recognize that the parameters were OUT and did not display the updated values (`autoprint`). This problem has been fixed. (BugDB 8528518)

- The TimesTen integration of Oracle Clusterware on Windows did not fail back the virtual IP addresses of the master hosts after a failover. This problem has been fixed. (BugDB 8639286)

- The TimesTen integration of Oracle Clusterware on Windows did not restart the TimesTen daemon after it was stopped by the task manager. This problem has been fixed. (BugDB 8639248)

1.2 Changes for Release 11.2.1.2.0 from Release 11.2.1.1.0

- When using TimesTen OCI, incorrect results could be returned when these actions occurred:

  - Execute a SELECT statement.

  - Fetch an array.

  - Execute the SELECT statement again with new define variables.

  This problem has been fixed. (BugDB #8592579)

- Dynamic read-only cache groups can be replicated only by using an active standby pair. If you attempt to use another type of replication scheme for a dynamic read-only cache group, TimesTen now returns an error. You must now detach a grid member from the grid before you drop an active standby pair replication scheme that is defined within the member database. (BugDB #8581905)

- The `ttGridNodeStatus` built-in procedure returned information about the status of a standby master data store even though the active standby pair had been dropped. This problem has been fixed. (BugDB #8392567)

- In some circumstances PL/SQL returned the wrong error message. This problem has been fixed. (BugDB #8541146)

- The `autorefreshChangeLogInfo.sql` script has been renamed to `cacheInfo.sql`. The `autorefreshCleanup.sql` script has been renamed to `cacheCleanup.sql`. They are located in the *install_dir*/oraclescripts directory.

1.3 Changes for Release 11.2.1.1.0 from Release 11.2.1.0.0

For details about behavior changes in Release 11.2.1.1.0, see the Behavior Changes document.

- Access Control has been changed completely to be more compatible with Oracle security standards. See "Managing Access Control" in *Oracle TimesTen In-Memory Database Operations Guide* and "Privileges" in *Oracle TimesTen In-Memory Database SQL Reference*. There is new syntax for the ALTER USER, CREATE USER, DROP USER, GRANT and REVOKE SQL statements. See *Oracle TimesTen In-Memory Database SQL Reference*.

- By default, you must associate a TimesTen database with a cache grid before you can create cache groups within that database. See *Oracle In-Memory Database Cache User's Guide*.

- TimesTen integration with Oracle Clusterware has had significant changes. The syntax for the `ttCWAdmin` utility has changed. Attributes for the `cluster.oracle.ini` file have been changed. See "Clusterware Attributes for TimesTen" and "ttCWAdmin" in *Oracle TimesTen In-Memory Database Reference* and "Using Oracle Clusterware to Manage Active Standby Pairs" in *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide*.

- The configuration for the transaction log buffer file size has been modified. See *Oracle TimesTen In-Memory Database Operations Guide*.

- JDBC now maps ODBC data types as follows:

  - SQL_FLOAT to Types.DOUBLE

  - SQL_DOUBLE to Types.VARCHAR

  - SQL_REAL to Types.FLOAT

1.3.1 New features in Release 11.2.1.1.0

See the "What's New" prefaces in the documentation to see the new features documented in a specific guide.

- TimesTen has implemented a parallel log manager.

- TimesTen supports parallel operation for the `ttMigrate` utility.

- TimesTen supports replication of tables with different table definitions. See "Replicating tables with different definitions" in *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide*.

- Replication throughput of active standby pairs can be increased from one thread to two by setting the `ReceiverThreads` first connection attribute. See *Oracle TimesTen In-Memory Database Reference*.

- An active standby pair replication scheme can replicate XLA bookmarks. See *Oracle TimesTen In-Memory Database C Developer's Guide* and *Oracle TimesTen In-Memory Database Java Developer's Guide*.

- Automatic client failover can be configured for data stores that have active standby pair replication schemes. This enables the client to fail over automatically to the server on which the standby data store resides. See *Oracle TimesTen In-Memory Database Operations Guide*.

- TimesTen materialized views can be refreshed asynchronously. See *Oracle TimesTen In-Memory Database Operations Guide* and *Oracle TimesTen In-Memory Database SQL Reference*.

- TimesTen offers Oracle-style behavior for duplicate parameter names. See "Duplicate parameter names" in *Oracle TimesTen In-Memory Database SQL Reference*.

- The DELETE, INSERT, and UPDATE SQL statements have been enhanced with the RETURNING...INTO clause. See *Oracle TimesTen In-Memory Database SQL Reference*.

- TimesTen supports the ROWID data type. See *Oracle TimesTen In-Memory Database SQL Reference*.

- VARCHAR2, NVARCHAR2, VARBINARY and TT_VARCHAR columns in replicated tables can have a size of 4 megabytes.

- You can retrieve executed commands such as SQL statements and built-in procedures from the SQL command cache. You can also view the query plan

information to monitor and troubleshoot queries. See *Oracle TimesTen In-Memory Database Operations Guide*.

- You can monitor DDL operations performed on Oracle tables that are cached in a TimesTen database. See *Oracle In-Memory Database Cache User's Guide*.

- Synchronous Data Guard can be used with IMDB Cache. See *Oracle In-Memory Database Cache User's Guide*.

- This release includes TimesTen Quick Start. The Quick Start includes demos, tutorials and an overview of the product with links to the product documentation. See `quickstart/index.html` at the root of your installation.

1.3.2 New attributes in Release 11.2.1.1.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `DuplicateBindMode`

- `DynamicLoadEnable` replaces `DisableDynamicLoad`.

- `LogBufMB` replaces `LogBuffSize`. The units have been changed from kilobytes to megabytes.

- `LogBufParallelism`

- `PLSQL_CCFLAGS`

- `PLSQL_CONN_MEM_LIMIT`

- `ReceiverThreads`

1.3.3 New built-in procedures in Release 11.2.1.1.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `ttGridDetachList`

- `ttSQLCmdCacheInfo`

- `ttSQLCmdCacheInfoGet`

- `ttSQLCmdQueryPlan`

1.3.4 New clusterware attributes in Release 11.2.1.1.0

Attributes for the `cluster.oracle.ini` file have been changed significantly. See "Clusterware Attributes for TimesTen" in *Oracle TimesTen In-Memory Database Reference*.

1.3.5 Utilities enhancements in Release 11.2.1.1.0

The syntax for the `ttCWAdmin` utility has changed significantly. See "ttCWAdmin" in *Oracle TimesTen In-Memory Database Reference*.

1.3.6 New SQL statements and functions in Release 11.2.1.1.0

- SYS_CONTEXT and UID functions

- CREATE MATERIALIZED VIEW LOG, DROP MATERIALIZED VIEW LOG and REFRESH MATERIALIZED VIEW statements. In addition, the CREATE MATERIALIZED VIEW statement has been enhanced.

1.3.7 New system tables and views in Release 11.2.1.1.0

See *Oracle TimesTen In-Memory Database SQL Reference* for more information about system tables and views.

- SYS.DBA_SYS_PRIVS and SYS.USER_SYS_PRIVS

- SYS.ALL_TAB_PRIVS, SYS.DBA_TAB_PRIVS and SYS.USER_TAB_PRIVS

- SYS.ALL_USERS, SYS.DBA_USERS and SYS.USER_USERS

- SYS.ALL_COL_PRIVS, SYS.DBA_COL_PRIVS and SYS.USER_COL_PRIVS

- SYS.SESSION_ROLES

1.4 Changes for Release 11.2.1.0.0 from Release 7.0.5.2.0

- The release numbering system has been changed. In the release number *a.b.c.d.e*, *a.b.c* represents the TimesTen release (11.2.1), *d* represents the patch release (0) and *e* represents the port patch (0).

- Demos are NOT added by default during installation. You must choose to include the demos at installation time.

- The TimesTen client library implementation of SQLPrepare performs a deferred prepare. The request is not sent to the server until required. See *Oracle TimesTen In-Memory Database C Developer's Guide*.

- TimesTen support has been added for these platforms: AIX 6.1, Asianux 3.0, Monta Vista 5.0, Windows Vista and Windows Server 2008.

- TimesTen no longer supports these platforms, development kits and compilers: AIX 5.2, HP-UX 11i v1, RedHat 3, Solaris 8 (Sparc), Solaris 10 x86 32-bit, SUSE Linux 9, TRU 64, JDK 1.4.x on all platforms, gcc 3.2.3, VC++ 6.0, VS.NET 2002, Sun Studio 10.

1.4.1 New features in Release 11.2.1.0.0

See the "What's New" prefaces in the documentation to see the new features documented in a specific guide.

- PL/SQL is supported in TimesTen. See *Oracle TimesTen In-Memory Database PL/SQL Developer's Guide*.

- The following SQL statements are new: ALTER FUNCTION, ALTER PACKAGE, ALTER PROCEDURE, CREATE FUNCTION, CREATE PROCEDURE, CREATE PACKAGE, CREATE PACKAGE BODY, DROP FUNCTION, DROP PACKAGE, DROP PROCEDURE. The ALTER SESSION SQL statement has been enhanced for PL/SQL support. See *Oracle TimesTen In-Memory Database SQL Reference*.

- OUT and IN OUT parameters are supported. OUT REF CURSORs are supported. See *Oracle TimesTen In-Memory Database PL/SQL Developer's Guide*, *Oracle TimesTen In-Memory Database C Developer's Guide* and *Oracle TimesTen In-Memory Database Java Developer's Guide*.

- Oracle Call Interface (OCI) applications can be used with TimesTen. See *Oracle TimesTen In-Memory Database C Developer's Guide*.

- The Oracle Pro*C/C++ Precompiler can be used with TimesTen. See *Oracle TimesTen In-Memory Database C Developer's Guide*.

- Oracle Clusterware can be used with TimesTen. See *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide*.

- A cache grid is a set of TimesTen databases that collectively manage application data using the relational data model. The cache grid provides users with Oracle databases a means to horizontally scale cache groups across multiple systems with read/write data consistency across the TimesTen databases and predictable latency for database transactions. See *Oracle In-Memory Database Cache User's Guide*.

- In a dynamic cache group, data in cache tables is loaded on demand. Dynamic cache groups are supported for read-only and writethrough cache groups. A user managed cache group can also be defined as dynamic if it does not use both the AUTOREFRESH cache group attribute and the PROPAGATE cache table attribute. See *Oracle In-Memory Database Cache User's Guide*.

- TimesTen supports bitmap indexes. See *Oracle TimesTen In-Memory Database SQL Reference*.

- Set operators are allowed in subqueries. See *Oracle TimesTen In-Memory Database SQL Reference*.

- ":" parameter markers have been enhanced. See *Oracle TimesTen In-Memory Database SQL Reference*.

- Multiline C-style comments can be included in SQL statements and PL/SQL blocks. See *Oracle TimesTen In-Memory Database SQL Reference*.

- XLA is updated when aging and cascading delete operations occur. See *Oracle TimesTen In-Memory Database C Developer's Guide* and *Oracle TimesTen In-Memory Database Java Developer's Guide*.

- TimesTen installation includes the Oracle Instant Client.

1.4.2 New attributes in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `DDLCommitBehavior`

- `PLSQL`, `PLSQL_MEMORY_ADDRESS`, `PLSQL_MEMORY_SIZE`, `PLSCOPE_SETTINGS`, `PLSQL_OPTIMIZE_LEVEL`, `PLSQL_TIMEOUT`. These attributes are available only on Linux platforms.

- `CacheGridEnable` and `CacheGridMsgWait`

- `DisableDynamicLoad` and `DynamicLoadErrorMode`

- `OracleNetServiceName` replaces `OracleID`.

- `TCP_Port2`, `TTC_FailoverPortRange`, `TTC_Server2`, `TTC_Server_DSN2`

1.4.3 Clusterware attributes in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database Reference* and *Oracle TimesTen In-Memory Database TimesTen to TimesTen Replication Guide* for more information.

- The TimesTen integration with Oracle Clusterware requires a `cluster.oracle.ini` file that contains clusterware attributes.

1.4.4 New built-in procedures in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `ttCacheConfig`

- `ttCacheDbCgStatus`

- `ttCacheDDLTrackingConfig`

- `ttGridAttach`

- `ttGridCreate`

- `ttGridDestroy`

- `ttGridDetach`

- `ttGridInfo`

- `ttGridNameSet`

- `ttGridNodeStatus`

- `ttPLSQLMemoryStats`

1.4.5 New utilities in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `ttCWAdmin`

1.4.6 Utilities enhancements in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database Reference* for more information.

- `ttIsql` has been enhanced to support PL/SQL operations. It has new commands for creating and executing PL/SQL blocks, reporting PL/SQL errors and returning server output. It also includes enhanced parameter handling. `ttIsql` has new commands to list PL/SQL objects and other database objects such as tables, sequences and views. These metadata commands make it possible to list user-owned objects separately from system-owned objects.

- TimesTen supports parallel operation for the `ttMigrate` utility.

- `ttRepAdmin -showstatus` has a new asynchronous writethrough cache monitoring option: `-awtmoninfo`.

- `ttSchema` has new options to display PL/SQL program units.

1.4.7 New system tables and views in Release 11.2.1.0.0

See *Oracle TimesTen In-Memory Database SQL Reference* for more information.

- SYS.ALL_SYS_PRIVS, SYS.DBA_SYS_PRIVS and SYS.USER_SYS_PRIVS

- SYS.ALL_TAB_PRIVS, SYS.DBA_TAB_PRIVS and SYS.USER_TAB_PRIVS

- SYS.ALL_USERS, SYS.DBA_USERS and SYS.USER_USERS

- SYS.ALL_ARGUMENTS, SYS.DBA_ARGUMENTS and SYS.USER_ARGUMENTS

- SYS.ALL_DEPENDENCIES, SYS.DBA_DEPENDENCIES and SYS.USER_DEPENDENCIES

- SYS.ALL_ERRORS, SYS.DBA_ERRORS and SYS.USER_ERRORS

- SYS.ALL_IDENTIFIERS, SYS.DBA_IDENTIFIERS and SYS.USER_IDENTIFIERS

- SYS.ALL_OBJECTS, SYS.DBA_OBJECTS and SYS.USER_OBJECTS

- SYS.ALL_PLSQL_OBJECT_SETTINGS, SYS.DBA_PLSQL_OBJECT_SETTINGS and SYS.USER_PLSQL_OBJECT_SETTINGS

- SYS.ALL_PROCEDURES, SYS.DBA_PROCEDURES and SYS.USER_PROCEDURES

- SYS.ALL_SOURCE, SYS.DBA_SOURCE and SYS.USER_SOURCE

- SYS.ALL_STORED_SETTINGS, SYS.DBA_STORED_SETTINGS and SYS.USER_STORED_SETTINGS

- SYS.DBA_OBJECT_SIZE and SYS.USER_OBJECT_SIZE

- SYS.PUBLIC_DEPENDENCY

2 Platforms

Environment	32-bit	64-bit	Compiler notes
Microsoft Windows 2000, Windows XP, Windows Vista and Windows Server 2003 and 2008 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 8. VS .NET 2003, VS 2005 and VS 2008 are also supported. To use the TimesTen debug library, you *must* use VS .NET 2003.
Asianux 2.0 and 3.0 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.
Solaris 9 and 10 for UltraSparc CPUs.	Yes	Yes	Compiled with Sun Studio 11. Shipped with a TimesTen client library compiled with gcc 3.2.3.
Solaris 10 for x86-64.	No	Yes	Compiled with Sun Studio 10. Tested on AMD64 CPUs.
SuSE LINUX Enterprise Server 10 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.
SuSE LINUX Enterprise Server 10 for Itanium2 CPUs.	No	Yes	Compiled and tested with Intel 9.1. gcc 3.4.5 and 4.1.0 are also supported.
Red Hat Enterprise Linux 4 and 5 for Intel Itanium2 CPUs.	No	Yes	Compiled and tested with Intel 9.1. gcc 3.4.5 and 4.1.0 are also supported.
Red Hat Enterprise Linux 4 and 5 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.

Environment	32-bit	64-bit	Compiler notes
Oracle Enterprise Linux 4 and 5 for Intel IA-32 and EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.
Monta Vista Linux Carrier Grade Edition Release 4.0 and 5.0 for Intel IA-32, EM64T and AMD64 CPUs.	Yes	Yes	Compiled and tested with Intel 9.1. gcc 3.4.6 and 4.1.0 are also supported.
HP-UX 11i v2 and 11iv3 for PA-RISC.	Yes	Yes	Compiled and tested with the HP compiler.
HP-UX 11i v2 and 11iv3 for Itanium2.	Yes	Yes	Compiled and tested with the HP compiler.
AIX 5L 5.3 and 6.1 for POWER CPUs.	Yes	Yes	Compiled and tested with the AIX compiler.

3 Software requirements

For software requirements please 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 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 data store. 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 data stores. It covers topics that include error handling, event management and performance tuning. It also provides a reference for all 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 data stores. 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 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 Reference (Part Number E13069).** This guide provides a reference to all Oracle TimesTen utilities, built-in procedures and APIs 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 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.

- **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 an Oracle In-Memory Database Cache.

- **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 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 Installation Guide (Part Number E13081).** The Oracle TimesTen In-Memory Database Plug-in extends Oracle Enterprise Manager Grid Control to add support for monitoring TimesTen databases. The installation guide contains information to review before installing the Oracle TimesTen In-Memory Database Plug-in. The installation guide also contains the procedures necessary to install the plug-in, view data about the target instance, and to uninstall the plug-in.

- **Oracle Enterprise Manager System Monitoring Plug-in for Oracle TimesTen In-Memory Database Release Notes (Part Number E13082).** This document provides late-breaking information in the formal documentation for Oracle

Enterprise Manager System Monitoring Plug-in for Oracle TimesTen
In-Memory Database.

- **Oracle TimesTen In-Memory Database Release Notes (Part Number E13080).**
  (See the description above.)

- **Oracle TimesTen In-Memory Database Behavior Changes**

If any of these items is missing, please contact Oracle TimesTen support. See

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 11.2.1.1.0

- `LogBuffSize` attribute. Use `LogBufMB` instead. The units have changed from
  kilobytes to megabytes.

- Including sequence values in a CREATE VIEW statement is deprecated.

5.2 Removed items in Release 11.2.1.1.0

- `Authenticate` attribute

- It is not possible to set the `Logging` attribute to 0. The only possible value is 1.

- `ttCommitLSN` built-in procedure

- `ttLogBufPrint` built-in procedure

- `ttuser` built-in procedure

- `ttUserPrivileges` built-in procedure

- The `-at` and `-af` options of the `ttXactLog` utility have been removed.

5.3 Deprecated items in Release 11.2.1.0.0

- The `GroupRestrict` and `Authenticate` attributes are deprecated. They will be
  removed in a later release.

5.4 Removed items in Release 11.2.1.0.0

- SELECT FOR UPDATE ON ORACLE SQL statement

- DURATION clause in CREATE CACHE GROUP and ALTER CACHE GROUP
  SQL statements

- The `ttCacheAgingMemoryThresholdSet` and `ttCacheAgingIntervalSet`
  built-in procedures

- The `TransparentLoad` attribute and the `TT_TRANSPARENT_LOAD` ODBC
  option have been removed. Use dynamic cache groups instead.

- The `OracleID` attribute has been removed. Use `OracleNetServiceName`
  instead.

- The `ExclAccess` attribute has been removed.

- The Cache Administrator (web-based user interface) has been removed.

- TimesTen no longer supports these platforms: AIX 5.2, HP-UX 11i v1, RedHat 3, Solaris 8 (Sparc), Solaris 10 x86 32-bit, SuSE Linux 9 and TRU 64.

- TimesTen no longer supports Oracle9*i* or Oracle 10.1.0.*x*.

- TimesTen no longer supports JDK 1.4.*x* on all platforms. Also, classes15.jar and classes16.jar have been removed.

- TimesTen no longer supports the gcc 3.2.3 compiler, Visual C++ 6.0, Visual Studio .NET 2002 and Sun Studio 10.

5.5 Deprecated items in Release 7.0.3.0.0

- The `ttCacheMonitor` built-in procedure is deprecated. It is supported for backward compatibility only and will be removed in a later release.

5.6 Deprecated items in Release 7.0.1.0.0

These items are supported for backward compatibility only and will be removed in a later release.

- WITH LIMIT clause in CREATE CACHE GROUP and ALTER CACHE GROUP SQL statements

- `ttCachePolicy` built-in procedure. Use `ttCachePolicySet` instead.

- Restricted cache groups

- The `ttRepPolicy` built-in procedure is deprecated. Use `ttRepPolicySet` instead.

- The `ttXlaDeleteBookmark` built-in procedure is deprecated. Use `ttXlaBookmarkDelete` instead.

6 Known problems and limitations

This section contains known problems and limitations.

6.1 Installing and uninstalling TimesTen

- 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 need to uninstall TimesTen and reinstall all of the components you wish to have on your system.

- When re-installing TimesTen on UNIX, existing `sys.odbc.ini` and `sys.ttconnect.ini` files are optionally saved as `sys.odbc.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.

- 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.'

- When uninstalling TimesTen on Windows, the `oci.dll` file shipped with the TimesTen installation sometimes cannot be removed because it is in use by a process that is not part of TimesTen.

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.

6.3 PL/SQL

- PL/SQL is not available in TimesTen on the Windows operating system.

- TimesTen PL/SQL supports a subset of Oracle PL/SQL supplied packages and subprograms. See "TimesTen Supplied PL/SQL Packages" in *Oracle TimesTen In-Memory Database PL/SQL Developer's Guide* for details.

- 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' or 'utl_file_temp' for the location parameter string.

- When using 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 will be reported as error 8517:

```
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.

6.4 TimesTen OCI support

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

- 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.

6.5 TimesTen support for Oracle Pro*C/C++ Precompiler

- 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/pcscfg.cfg." The path name may be incorrect.

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.

6.6 TimesTen integration with Oracle Clusterware

- The TimesTen integration with Oracle Clusterware is not available on these platforms: Solaris 32-bit SPARC, HP-UX PA-RISC, HP-UX Itanium 32-bit, AIX 32-bit.

- 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.

6.7 JDBC

- On HPUX 11 systems, 32-bit JDBC client and direct drivers cannot co-exist 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 will get '2002-04-07 01:00:00'.

6.8 JMS/XLA

- 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 it is 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

- If DDL tracking is enabled on the Oracle database, destroying a data store 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.

- Oracle In-Memory Database Cache supports the following Oracle server releases:

  - Oracle 11*g* Release 1 (All platforms except Windows x64)

  - Oracle 10*g* Release 2 (10.2.0.4.0 or above)

- 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 releases 10.2.0.3 and above but does not occur in Oracle Database 11*g*. There are two solutions:

  - Set the CURSOR_SHARED Oracle server parameter to EXACT.

  - Install the appropriate Oracle patch for Oracle release 10.2.0.3 or above.

  See Metalink document 793948.1.

- 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.

- Local dynamic asynchronous writethrough (AWT) cache groups have a problem when there are update or delete operations on a dynamically loaded row that is

waiting to be propagated to Oracle. Such operations may result in dynamically loading the same row again.

There are 3 scenarios in which such a situation can arise. For example:

- A delete of a dynamically loaded row on TimesTen followed by a select operation results in a dynamic load because the row no longer exists in TimesTen. The application should use `ttRepSubscriberWait` to ensure that the changes are propagated to Oracle. The application should also use `ttRepSubscriberWait` for update operations to ensure data integrity.

- When time-based aging is configured, a dynamically loaded row is deleted at the end of the time interval. To avoid reloading the same row while any changes made to this rows are propagated to Oracle, the aging interval should be set to a large enough interval to ensure that changes to dynamically loaded rows are propagated to Oracle.

- When LRU aging is configured, the aging threshold should be set large enough so that any changes to the rows that are aging out are pushed to Oracle before they are dynamically loaded again.

Use a global AWT cache group if it is appropriate for your application. Global AWT cache groups resolve these problems automatically.

- 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 make sure 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 more than one field, the session `NLS_TIMESTAMP_FORMAT` is lost. You can work around this issue by changing the SQL statement to use `TO_TIMESTAMP(?, 'syyyy-mm-dd hh24:mi:ss.ff9')` and `TO_DATE(?,'syyyy-mm-dd hh24:mi:ss')`.

- Nullable foreign keys can result in rows without a corresponding parent row. The rows may become stale and 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 to TimesTen Replication

- If the first operation in a two-safe user session is an ALTER TABLE operation, the ALTER TABLE will not be 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 2 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 data stores cause a predicate to be evaluated and generate an exception only on the receiving data store. The store will then reject 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.

- For replication to work efficiently, it must be able to quickly translate host names of peers into IP addresses. For this to happen efficiently on Windows, make sure that a Windows machine is set up to query either a valid WINS server or a valid DNS server that has correct information about the hosts on the network. In the absence of such servers, static HOST-to-IP entries can be entered in either a `%windir%\system32\drivers\etc\hosts` or `%windir%\system32\drivers\etc\lmhosts` file.

  Without any of these four options, a Windows machine resorts to broadcasting, which is extremely slow, to detect peer nodes. Also, if the Windows machine cannot communicate with a defined WINS server or DNS server, or if incorrect information is stored on those servers, the hostname resolution will be extremely slow. Use the ping command to test whether a host can be efficiently located. The `ping` command should immediately respond if host name resolution is set up properly.

- 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 data store. This situation can be confirmed by the following query:

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

  If this query returns either no rows, or a row with the data store's main host name 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 make sure 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 machine 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.

6.12 SQL*Plus

■ TimesTen does not support SQL*Plus connections to TimesTen databases.

6.13 SQL, utilities and procedures

■ TimesTen and the Oracle Database interpret the literal N'\UNNNN' differently. In TimesTen, N'\u*nnnn*' (where *nnnn* is a number) is interpreted as the national character set character with the code *nnnn*. In the Oracle Database, N'\u*nnnn*' is interpreted as 6 literal characters. The \u is not treated as an escape. This difference causes unexpected behavior. For example, loading a cache group with a WHERE clause that contains a literal can fail. This can also affects dynamic loading and cache grid operation. Applications should use the UNISTR SQL function instead of literals.

■ 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.

■ On HP-UX 32-bit and 64-bit platforms, using the ADD_MONTH function causes a segmentation violation.

■ ROUND(date) is supported only for Oracle DATE types.

■ For ROUND (date), ADD_MONTHS, GREATEST, and LEAST FUNCTIONS: An assertion may occur during SQL statement preparation:

- When using either a CASE expression or the DECODE function as one of the arguments to the function and the expected data type is datetime AND

- The return values of either the CASE expression or the DECODE function are NULL or parameter binding (i.e.: decode (x,0,NULL, ?)).

For example:

```
SELECT GREATEST (CASE WHEN 'A' LIKE '__' THEN? END, TIME '11:11:11') FROM DUAL;
```

As a workaround, CAST the bind variable or NULL value to the expected datetime data type:

```
SELECT GREATEST (CASE WHEN 'A' LIKE '__' THEN CAST (? as TIME) END, TIME
'11:11:11') FROM DUAL;
```

■ 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 (e.g. 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 so as 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.

- The MERGE statement may not be used to insert into or update from a detail table of a materialized view.

- If an application process on HP-UX is connected to a TimesTen data store and if the application process calls the `ttXactIdRollback` utility API for a transaction associated with the same data store, the call may fail due to the inability to attach to the shared memory segment for the data store.

- 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 will fail:

```
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.

6.14 TTClasses

- A problem with TTClasses causes NCHAR / NVARCHAR2 parameters and columns to be bound incorrectly. This results in parameter and column data being transferred to/from the database without a null terminator.

6.15 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 will work 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 for 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

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