TimesTen In-Memory Database
What’s New and Changed in the TimesTen 22.1 Release?

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Agenda

1. Introduction
2. Platform support
3. New core features
4. New Classic features
5. New Cache features
6. New Scaleout features
7. Other significant changes
Introduction

TimesTen 22.1 will be released in November 2021

This presentation highlights differences between the initial release (22.1.1.0) and the terminal patch set of the 18.1 release (18.1.4).
Oracle TimesTen – Class Leading In-Memory Database
25 Years of Extreme Performance

Pre-Oracle acquisition
- First commercial In-Memory RDBMS
- Replication for HA
- Online Upgrades
- Application-tier Cache for Oracle Database

TimesTen 6 TimesTen 7
- Oracle RAC integration
- National Language Support
- Oracle Data Types support
- SQL Developer Integration
- Enterprise Manager integration

TimesTen 11g 11.2.1
- Parallel log manager
- PL/SQL and OCI Support
- Oracle Clusterware integration for replication management
- ODP .NET Support
- BLOB, CLOB, NCLOB data types

TimesTen 11g 11.2.2
- Parallel Replication
- In-Memory Analytics
- Columnar Compression
- Index Advisor
- Oracle R Support
- In-Memory Star Join

TimesTen 11.2.2.x Enhancements
- Parallel data import from Oracle Database
- Parallel database restart
- Highly concurrent range indexes
- Parallel Replication with commit order optimization

TimesTen 18.1 with Scaleout
- Distributed Fault-Tolerant In-Memory Database
- All active data copies
- Transparent distributed SQL execution
- ACID Transactions
- Global Secondary Indexes

TimesTen 22.1
- Scaleout K up to 5
- Scaleout Cache
- Easier, faster upgrades
- Kubernetes Operator
- Prometheus Integration
- GoldenGate Integration

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## Platform support

### Server platforms

<table>
<thead>
<tr>
<th>Operating System</th>
<th>OS Versions</th>
<th>Java versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Linux 64-bit</td>
<td>7.4+, 8.2+</td>
<td>Oracle Java 8, 11, 17 and OpenJDK 8, 11, 17</td>
</tr>
<tr>
<td>RedHat Enterprise Linux 64-bit</td>
<td>7.4+, 8.2+</td>
<td>Oracle Java 8, 11, 17 and OpenJDK 8, 11, 17</td>
</tr>
<tr>
<td>SUSE Enterprise Server 64-bit</td>
<td>12, 15</td>
<td>Oracle Java 8, 11, 17 and OpenJDK 8, 11, 17</td>
</tr>
<tr>
<td>Solaris Intel and SPARC 64-bit</td>
<td>11.3, 11.4</td>
<td>Oracle Java 8 (both), 11 (SPARC only)</td>
</tr>
<tr>
<td>IBM AIX for Power PC 64-bit</td>
<td>7.1, 7.2</td>
<td>IBM Java 8, 11</td>
</tr>
</tbody>
</table>

**NOTE:** TimesTen *Scaleout* is only supported on *Linux* platforms
# Platform support

Client only platforms

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<tr>
<th>Operating System</th>
<th>OS Versions</th>
<th>Java versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Windows 64-bit</td>
<td>10, 11, Server 2012 R2, Server 2016, Server 2019</td>
<td>Oracle Java 8, 11, 17 and OpenJDK 8, 11, 17</td>
</tr>
<tr>
<td>macOS Intel 64-bit</td>
<td>10.15, 11 and 12</td>
<td>Oracle Java 8, 11, 17 and OpenJDK 11, 17</td>
</tr>
</tbody>
</table>
Platform support
Oracle Database and Clusterware

TimesTen Cache features (Classic and Scaleout) support Oracle Database 11.2, 12.1 and 19c

TimesTen Active-Standby Pair Replication supports Oracle Clusterware 19c for A/S pair management
New core features
For all deployment modes

Prometheus exporter for TimesTen
  • Facilitates monitoring of TimesTen using Prometheus

Support for password complexity checking functions in profiles

Configurable network buffer size for Client-Server
  • Can significantly improve throughput with large result sets and/or slow networks

Additional options when creating certificates with the `ttCreateCerts` utility

New `ttPageLevelTableInfo` builtin to display details of table page allocations

PL/SQL support for multiple OUT reference cursors

TimesTen Driver Manager (TTDM) productized and supported

Minor changes to TTClasses API for ODBC 3 64-bit support

Change to naming of directory for bundled Oracle instant client
  • Instant client directory name is now release independent
New Classic features
For Classic and Classic Cache deployment modes

New ramPolicy (enduring) for ‘persistent’ shared memory
  • Database segment persists across instance stop/start

Fast software upgrades for patch releases and patch sets
  • Utilizes ramPolicy ‘enduring’
  • Avoids the need to unload/load the database from/to memory during a patch release upgrade
  • Applies only to patch and patch set upgrades, not major release upgrades

SNMPv3 support
  • SNMP support updated to v3
    - Can still generate v1 traps, but use is discouraged (v1 is insecure)
  • Uses net-snmp package
    - Customer must install this separately; not packaged with TimesTen
  • Supports use of D-TLS to encrypt communications
    - Requires use of net-snmp 5.6 or later with tsm security model enabled

Explicit support for running the instance daemon under systemd
New Classic Cache features
For Classic Cache deployment mode

Dynamic loading of multiple cache instances
• Increases the range of SQL statements that qualify for dynamic load
• Limited to single table cache groups in this release

LRU aging based on table row thresholds
• A more granular alternative to the existing memory threshold based mechanism
• More suitable for some use cases

Hybrid (rootless) cache groups
New Scaleout features
For Scaleout and Scaleout Cache deployment modes

Maximum K-safety copies increased to 5
• Allows for increased levels of availability

Automated Software Upgrade
• Some support for online software upgrade
• Only for patch and patchset upgrades in this release
• Limited to specific scenarios in this release
• Offline upgrade also improved and simplified

Security enhancements
• Centralized management of client-server TLS certificates

Static READONLY Cache Groups
• Support for static READONLY autorefresh cache groups in Scaleout

Global Indexes
• Increased flexibility and performance

Stored PL/SQL procedures and functions
• Support for the creation of stored procedures and functions
GoldenGate compatibility
An alternative cache refresh mechanism for READONLY caching

Certified with GoldenGate 19c and later

GoldenGate parallel replicat is supported (with GoldenGate 21.3 and later) for higher throughput
Newly deprecated features
Deprecated in this release, will be removed in a future release

Scaleout PhysicalGroups

Temporary databases (Temporary=1)

Static autorefresh cache groups with legacy replication

The TTC_RollbackRequiredOnFailover client connection attribute
  • The default for this is now always 1 (on)

Local shared memory ipc (shmipc) for client-server connections
Removed features
Were deprecated in a previous release

The ttSQLCmdCacheInfo2 and ttSQLCmdCacheInfo3 builtins
  • Users and applications should query the SYS.V$SQL_CMD_CACHE system view instead, using an explicit select list

Asynchronous Materialized Views

ReceiverThreads DSN attribute

Some ttMigrate options
  • -convertTypesToTT
  • -convertTypesToOra
**Significant behavior changes**
May impact users or applications

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Two extra columns in the ttSQLCmdCacheInfo result set
- Users and applications should query the SYS.V$SQL_CMD_CACHE system view instead, using an explicit select list

The TTC_RollbackRequiredOnFailover client connection attribute
- The default for this is now always 1 (on)

TTClasses API changes
- Type changes for some method arguments.

**ttRepAdmin –duplicate**
- The –setMasterRepStart option is now the default
- Use -noSetMasterRepStart in the unlikely event that you want the original behavior
Want to learn more?

  • Product Information
    - Presentations, use cases, whitepapers, FAQs, …
  • Software Downloads
  • Product Documentation
  • TimesTen Demo / Learning VM download

TimesTen QuickStart and Samples (https://github.com/oracle/oracle-timesten-samples)

Q & A