Changes in This Release for Oracle Database PL/SQL Packages and Types Reference

This preface contains:

Changes in this Release

Review changes in this release of *Oracle Database PL/SQL Packages and Types Reference*.

New Features

This section lists the major new features in Oracle Database release 23ai *PL/SQL Packages and Types Reference*.

The following features are new in this release:

- DBMS_AUTOIM provides functions to manage the execution of the Automatic In-Memory feature.
- DBMS_SPM supports the SQL plan management feature by providing an interface for the DBA or other users to perform controlled manipulation of plan history and SQL plan baselines maintained for various SQL statements.
- DBMS_INMEMORY_ADVISE enables you to determine if a workload can benefit from Oracle's Database In-Memory feature.
- The `DBMS_VECTOR` package is a lightweight package that simplifies common operations with Oracle AI Vector Search, such as chunking and embedding data, generating text for prompts and images, or managing vector indexes.

  DBMS_VECTOR
- The `DBMS_VECTOR_CHAIN` package enables advanced operations with Oracle AI Vector Search, such as chunking and embedding data, generating text for prompts and images along with text processing and end-to-end similarity search.

  DBMS_VECTOR_CHAIN
- The `DBMS_HYBRID_VECTOR` package enables you to search by both vectors and keywords against hybrid vector indexes.

  DBMS_HYBRID_VECTOR
- `DBMS_DICTIONARY_CHECK` is a read-only and lightweight PL/SQL package procedure that helps you identify database dictionary inconsistencies.

DBMS_DICTIONARY_CHECK

- The `UTL_HTTP` package supports digest SHA-256.

  UTL_HTTP

- The `UTL_I18N` package supports three new procedures that detect the most likely Oracle character sets and Oracle languages for a given data sample: `DETECT_CHARSET`, `DETECT_LANGUAGE`, and `DETECT_LANGUAGE_CHARSET`.

  UTL_I18N

- The `DBMS_SAGA_ADM` package provides a collection of saga administration functions and procedures to define and manage saga participants, coordinators, and brokers.

  DBMS_SAGA_ADM

- The `DBMS_SAGA` package provides a collection of saga functions and procedures to initiate and finalize sagas.

  DBMS_SAGA

- The DBMS_FLASHBACK_ARCHIVE package includes the GET_CURRENT_LIFESPAN_DIGEST Function that generates the current lifespan digest for the specified row in a user table, and the VERIFY_BLOCKCHAIN_LIFESPAN Procedure that verifies the contents of the current lifespans, historical lifespans, or all lifespans of the user table rows that are protected using blockchain Flashback Archive.
- The DBMS_KAFKA package provides a PL/SQL interface for enabling Oracle SQL access to topics in Kafka clusters.
- The `DBMS_SEARCH` package enables you to create, maintain, and query ubiquitous search indexes.

  DBMS_SEARCH

- The `DBMS_SQL_FIREWALL` package enables users to administer SQL Firewall.

  DBMS_SQL_FIREWALL

- The `DBMS_CRYPTO` package has the following new features.

  DBMS_CRYPTO

  - New APIs for elliptic-curve Diffie–Hellman (ECDH) operations
    - `ECDH_GENKEYPAIR`: This function generates an EC public/private key pair
    - `ECDHDERIVE_SHAREDSECRET`: This function derives shared secret using private key of local application and public key from the remote application.
  - New `PKENCRYPT`/`PKDECRYPT` algorithm: `PKENCRYPT_RSA_PKCS1_OAEP_SHA2`
  - New chain modes `GCM CCM`
  - New `DBMS_CRYPTO` block cipher suites `AES_CCM_NONE` and `AES_GCM_NONE`
  - New signature and verification algorithms:
    - `SIGN_SHA224_ECDSA`
    - `SIGN_SHA256_ECDSA`
    - `SIGN_SHA384_ECDSA`
    - `SIGN_SHA512_ECDSA`
    - `SIGN_ECDSA`

- The DBMS_SCHEDULER package has a new DUMP_IN_MEMORY_TRACE procedure that dumps the scheduler in-memory trace buffer of the specified process state object address into the current trace file of the requester process.

  DBMS_SCHEDULER

- The DBMS_SQL and DBMS_TF packages are updated to support the ISO SQL standard-compliant BOOLEAN data type.

  DBMS_SQL

  DBMS_TF

- The DBMS_COMPRESSION package is updated to support the Advanced Low Index Compression for IOTs.

  DBMS_COMPRESSION

- The DBMS_SHARDING_DIRECTORY package is added to support the Oracle Globally Distributed Database directory-based data distribution method.

  DBMS_SHARDING_DIRECTORY

- The DBMS_AUTO_CLUSTERING package is added to support the automatic clustering and zone mapping.

  DBMS_AUTO_CLUSTERING

- The DBMS_AUTO_INDEX package has a new parameter AUTO_INDEX_INCLUDE_DML_COST for the DBMS_AUTO_INDEX.CONFIGURE procedure.

  DBMS_AUTO_INDEX

- The DBMS_BLOCKCHAIN_TABLE package has enhancements related to Blockchain Table User Chains, Blockchain Table Delegate Signer, and Blockchain Table Countersignature.

  DBMS_BLOCKCHAIN_TABLE

- The DBMS_DATA_MINING package is enhanced to support the following settings:

  – IMPORT_ONNX_MODEL procedure. To learn more, see IMPORT_ONNX_MODEL Procedure.

  Generalized Linear Model setting:

  – GLMS_LINK_FUNCTION. See DBMS_DATA_MINING — Algorithm Settings: Generalized Linear Model.

  XGBoost settings:

  – xgboost_interaction_constraints
  – xgboost_decrease_constraints
  – xgboost_increase_constraints
  – objective: survival:aft
  – xgboost_aft_loss_distribution
  – xgboost_aft_loss_distribution_scale
  – xgboost_aft_right_bound_column_name
    See DBMS_DATA_MINING — Algorithm Settings: XGBoost.

  Explicit Semantic Analysis settings:

  – ESAS_EMBEDDINGS

  - `ESAS_EMBEDDING_SIZE`
    See DBMS_DATA_MINING — Algorithm Settings: Explicit Semantic Analysis.

  Expectation Maximization setting:

  - `EMCS_OUTLIER_RATE`
    See DBMS_DATA_MINING — Algorithm Settings: Expectation Maximization.

  Exponential Smoothing settings:

  - `EXSM_SERIES_LIST`
  - `EXSM_INITVL_OPTIMIZE`
    See DBMS_DATA_MINING — Algorithm Settings: Exponential Smoothing.

  k-Means setting:

  - `KMNS_WINSORIZE`
    See DBMS_DATA_MINING — Algorithm Settings: *k*-Means.

  Global settings:

  - `ODMS_BOXCOX`
  - `ODMS_EXPLOSION_MIN_SUPP`
    See DBMS_DATA_MINING — Global Settings.

- The `DBMS_USERDIAG` package is a new package that allows you to perform a limited set of diagnosis operations on the PDB, such as establish trace operations. Most of the regular diagnostic mechanisms available in a CDB have been restricted out of security concerns.

  See DBMS_USERDIAG.

- The `DBMS_PIPE` package has been enhanced to support singleton pipes as well as persistent messaging using Cloud Object stores.

  DBMS_PIPE

- The `DBMS_MLE` package is updated to support the use of JavaScript modules.

  DBMS_MLE

- The `DBMS_AQMIGTOOL` package simplifies migration from Oracle Database Advanced Queuing (AQ) to Transactional Event Queue (TxEventQ) with orchestration automation, source and target compatibility diagnostics and remediation, and a unified user experience.

  DBMS_AQMIGTOOL

- The `DBMS_XMLSCHEMA_UTIL` package provides an interface for XML schema validation.

  DBMS_XMLSCHEMA_UTIL

- The `DBMS_SPACE` package provides an interface for analyzing and shrinking a bigfile tablespace.

  DBMS_SPACE

- DBMS_CACHEUTIL has new `TRUE_CACHE_KEEP` and `TRUE_CACHE_UNKEEP` procedures to manage assignments to the `KEEP` buffer pool for Oracle True Cache.

- The following new procedures are introduced in the `DBMS_APP_CONT` package to enhance the Application Continuity functionality:

  - `APPLY_REPLAY_RULE`
  - `GET_REPLAY_RULES`
  - `RESET_REPLAY_RULES`

- The following new procedures are introduced in the DBMS_APP_CONT_ADMIN package to enhance the Application Continuity protection check:
  - ENABLE_AC
  - ENABLE_TAC
  - ACCHK_SET_FILTER
  - ACCHK_SHOW_FILTERS
  - ACCHK_CLEAR_FILTER
  - DISABLE_FAILOVER
  - ENABLE_RESET_STATE
  - MODIFY_SERVICE
  - SET_DRAINING
  - SET_LOAD_BALANCING
- The DBMS_CLOUD_AI package allows you to create AI profiles and configure them for access to a Large Language Model (LLM).

  DBMS_CLOUD_AI
- The DBMS_CLOUD_NOTIFICATION package allows you to send messages or the output of a SQL query to a provider.

  DBMS_CLOUD_NOTIFICATION
- The DBMS_CLOUD_PIPELINE package allows you to create data pipelines for loading and exporting data in the cloud.

  DBMS_CLOUD_PIPELINE
- The DBMS_CLOUD_REPO package provides for use of and management of cloud hosted code repositories from Oracle Database.

  DBMS_CLOUD_REPO

Deprecated Features

Review this list of deprecated features in Oracle Database release 23ai *Oracle Database PL/SQL Packages and Types Reference*.

Oracle recommends that you do not use deprecated features or values in new applications. Support for deprecated features is for backward compatibility only. For more information about deprecated features, see *Oracle Database Upgrade Guide*.

Deprecation of the mkstore wallet management command line tool

The mkstore wallet management command line tool is deprecated with Oracle Database 23ai, and can be removed in a future release.
To manage wallets, Oracle recommends that you use the orapki command line tool.

Deprecation of DBMS_RESULT_CACHE Function Names

Oracle is changing the names of several DBMS_RESULT_CACHE function names in Oracle Database 23ai.
The following functions and procedures are deprecated:

- BLACK_LIST function. Use BLOCK_LIST function.

- BLACK_LIST_ADD procedure. Use BLOCK_LIST_ADD procedure.
- BLACK_LIST_CLEAR procedure. Use BLOCK_LIST_CLEAR procedure
- BLACK_LIST_REMOVE procedure. Use BLOCK_LIST_REMOVE procedure
- OBJECT_BLACK_LIST function. Use OBJECT_BLOCK_LIST function
- OBJECT_BLACK_LIST_ADD procedure. Use OBJECT_BLOCK_LIST_ADD procedure.
- OBJECT_BLACK_LIST_CLEAR procedure. Use OBJECT BLOCK LIST_CLEAR procedure.
- OBJECT_BLACK_LIST_REMOVE procedure. Use OBJECT_BLOCK_LIST_REMOVE procedure.

Deprecation of DBMS_XMLSTORE

The PL/SQL package `DBMS_XMLSTORE` is deprecated in Oracle Database 23ai.
`DBMS_XMLSTORE` is a non-standard Oracle-proprietary package that enables you to store and manipulate XML data in Oracle Database. This package is deprecated, and can be desupported in a future release. Oracle recommends that you use regular SQL DML and with standard XQuery and SQL/XML to store and manage XML data. Using standard functionality provides future-proof way to store and manipulate XML data.

Deprecation of DBMS_XMLGEN PL/SQL Package

The PL/SQL package `DBMS_XMLGEN` is deprecated in Oracle Database 23ai.
`DBMS_XMLGEN` is a non-standard Oracle-proprietary package that is provided to generate and convert XML documents from SQL queries or with PL/SQL. This package is deprecated, and can be desupported in a future release. Oracle recommends that you use SQL/XML operators to generate XML from relational columns instead. Using ANSI SQL/XML operators for any generation and modification of XML documents provides a standardized and future-proof way to work with XML documents.

Deprecation of XML DB Repository

The Oracle XML DB Repository is deprecated with Oracle Database 23ai.
Oracle recommends that you replace any functionality used in XML DB Repository with alternative technologies. As a result of this deprecation, all XML DB Repository interfaces (for example Repository-specific Java classes `oracle.xdb.servlet`, `oracle.xdb.event`, and `oracle.xdb.spi`) are consequently deprecated as well.

Deprecation of DBMS_HANG_MANAGER Package

The `DBMS_HANG_MANAGER` package is deprecated in Oracle Database 23ai. Use `DBMS_BLOCKER_RESOLVER` instead.
The `DBMS_HANG_MANAGER` package provides a method of changing some configuration parameters and constraints to address session issues. This package is being replaced with `DBMS_BLOCKER_RESOLVER`. `DBMS_HANG_MANAGER` can be removed in a future release.

Deprecation of Traditional Auditing Packages and Functions

Traditional auditing packages and functions are deprecated in Oracle Database 23ai.

With the desupport of traditional auditing, the PL/SQL packages and functions associated with traditional auditing are deprecated, This deprecation includes the packages and functions `INIT_CLEANUP`, `DEINIT_CLEANUP`, and `IS_CLEANUP_INITIALIZED`. While these packages or functions continue to operate in Oracle Database 23ai, you can neither add to or modify traditional auditing configurations.

Deprecation of Oracle OLAP

Analytic workspaces, the OLAP DML programming language, financial reporting, and the OLAP Java API continue to be deprecated in Oracle Database 23ai.

Be aware that OLAP will not be supported beyond the term of the current release (Oracle Database 23ai) premier support. Oracle strongly recommends that you do not start new projects using OLAP and begin migrating applications using OLAP to alternatives now. If your application requires an in-database dimensional model, then consider using Oracle Analytic Views. Analytic views provide a dimensional semantic model, calculations, and query semantics using data in Oracle Database. When used with columnar tables, analytic views provide query performance similar to the OLAP Option. If your application requires support for advanced dimensional analytics, what-if analysis, or forecasting, then consider Oracle Essbase. Oracle Essbase is a multidimensional database management system with support for complex dimensional business analytics.

Related Topics

- Oracle Database Changes Desupports and Deprecations in *Oracle Database Upgrade Guide*

Desupported Features

This section lists the desupported features in Oracle Database Release 23ai *Oracle Database PL/SQL Packages and Types Reference*.

For more information about desupported features in this release, see *Oracle Database Upgrade Guide*

The following features are desupported in this release:

Desupport of Oracle Enterprise Manager Database Express

Oracle Enterprise Manager Database Express (EM Express) is desupported in Oracle Database Release 23ai.
EM Express is a web-based database management tool that is built inside Oracle Database. It supports key performance management and basic database administration functions. EM Express was deprecated in Oracle Database 21c. Many of EM Express's capabilities are now available in Oracle Cloud Infrastructure (OCI) Database Management service, Oracle Enterprise Manager Cloud Control, or Oracle SQL Developer.

Desupport of Service Attribute Value SESSION_STATE_CONSISTENCY = STATIC Parameter

The service attribute values `FAILOVER_TYPE = TRANSACTION` with `SESSION_STATE_CONSISTENCY = STATIC` are no longer a supported service attribute combination.
In previous releases, you could use the service parameter `SESSION_STATE_CONSISTENCY` to manage session state automatically using Application Continuity by setting `SESSION_STATE_CONSISTENCY` to `DYNAMIC` or `STATIC`. However, starting with Oracle Database 23ai, you can no longer use the `STATIC` option. Instead, use one of the following failover options:

- `FAILOVER_TYPE = AUTO` with `SESSION_STATE_CONSISTENCY = AUTO`
- `FAILOVER_TYPE = TRANSACTION` with `SESSION_STATE_CONSISTENCY = DYNAMIC`

These configurations enforce session state tracking in Oracle Database, ensuring that session state is preserved at session migration and session failover.

Desupport of Oracle Wallet Manager (OWM)

Starting with Oracle Database 23ai, the Oracle Wallet Manager (OWM) is desupported. Oracle recommends using the `orapki` command line tool to replace OWM.

Related Topics

- Oracle Database Changes Desupports and Deprecations in *Oracle Database Upgrade Guide*