Oracle® Database Gateway for ODBC

User's Guide

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Primary Author: Maitreyee Chaliha

Contributor: Vira Goorah, Juan Pablo Ahues-Vasquez, Peter Castro, Charles Benet, Peter Wong, and Govind Lakkoju

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Preface

This manual describes the Oracle Database Gateway for ODBC, which enables Oracle client applications to access non-Oracle systems data through Structured Query Language (SQL). The gateway, with the Oracle database, creates the appearance that all data resides on a local Oracle database, even though the data can be widely distributed.

This preface covers the following topics:

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

This manual is intended for Oracle database administrators who perform the following tasks:

- Installing and configuring the Oracle Database Gateway for ODBC
- Diagnosing gateway errors
- Using the gateway to access non-Oracle system data

> **Note:** You should understand the fundamentals of Oracle Database Gateways and the UNIX based platform before using this guide to install or administer the gateway.

Documentation Accessibility

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Related Documents

For more information, see the following documents:

- *Oracle Database New Features Guide*
- *Oracle Call Interface Programmer's Guide*
- *Oracle Database Administrator's Guide*
- *Oracle Database Advanced Application Developer's Guide*
- *Oracle Database Concepts*
- *Oracle Database Performance Tuning Guide*
- *Oracle Database Error Messages*
- *Oracle Database Globalization Support Guide*
- *Oracle Database Reference*
- *Oracle Database SQL Language Reference*
- *Oracle Database Net Services Administrator's Guide*
- *SQL*Plus User's Guide and Reference*
- *Oracle Database Heterogeneous Connectivity User's Guide*
- *Oracle Database Security Guide*

Many of the examples in this book use the sample schemas of the seed database, which is installed by default when you install Oracle. Refer to *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1 Introduction

This chapter introduces the challenge faced by organizations when running several different database systems. It briefly covers Heterogeneous Services, the technology that the Oracle Database Gateway for ODBC is based on.

To get a good understanding of generic gateway technology, Heterogeneous Services, and how Oracle Database Gateways fit in the picture, reading the *Oracle Database Heterogeneous Connectivity User's Guide* first is highly recommended.

This chapter contains the following sections:

Overview

Heterogeneous data access is a problem that affects a lot of companies. A lot of companies run several different database systems. Each of these systems stores data and has a set of applications that run against it. Consolidation of this data in one database system is often hard - in large part because many of the applications that run against one database may not have an equivalent that runs against another. Until such time as migration to one consolidated database system is made feasible, it is necessary for the various heterogeneous database systems to interoperate.

Oracle Database Gateways provide the ability to transparently access data residing in a non-Oracle system from an Oracle environment. This transparency eliminates the need for application developers to customize their applications to access data from different non-Oracle systems, thus decreasing development efforts and increasing the mobility of the application. Applications can be developed using a consistent Oracle interface for both Oracle and non-Oracle systems.

Gateway technology is composed of two parts: a component that has the generic technology to connect to a non-Oracle system, which is common to all the non-Oracle systems, called Heterogeneous Services, and a component that is specific to the non-Oracle system that the gateway connects to. Heterogeneous Services, in conjunction with the Oracle Database Gateways, enable transparent access to non-Oracle systems from an Oracle environment.

Heterogeneous Services Technology

Heterogeneous Services provides the generic technology for connecting to non-Oracle systems. As an integrated component of the database, Heterogeneous Services can exploit features of the database, such as the powerful SQL parsing and distributed optimization capabilities.

Heterogeneous Services extend the Oracle SQL engine to recognize the SQL and procedural capabilities of the remote non-Oracle system and the mappings required to obtain necessary data dictionary information. Heterogeneous Services provides two types of translations: the ability to translate Oracle SQL into the proper dialect of the non-Oracle system as well as data dictionary translations that displays the metadata of the non-Oracle system in the local format. For situations where no translations are available, native SQL can be issued to the non-Oracle system using the pass-through feature of Heterogeneous Services.

Heterogeneous Services also maintains the transaction coordination between Oracle and the remote non-Oracle system.

> **See Also:** *Oracle Database Heterogeneous Connectivity User's Guide* for more information about Heterogeneous Services.

Oracle Database Gateway for ODBC

Oracle Database Gateway for ODBC is intended for low-end data integration solutions requiring the dynamic query capability to connect from an Oracle database to non-Oracle systems. Any data source compatible with the ODBC standards described in this chapter can be accessed using Oracle Database Gateway for ODBC.

The capabilities, SQL mappings, data type conversions, and interface to the remote non-Oracle system are contained in the gateway. The gateway interacts with Heterogeneous Services to provide the transparent connectivity between Oracle and non-Oracle systems.

Oracle Database Gateway for ODBC Architecture

To access the non-Oracle data store using Oracle Database Gateway for ODBC, the gateway works with an ODBC driver. The driver that you use must be on the same machine as the gateway. The non-Oracle system can reside on the same machine as the Oracle database or on a different machine.

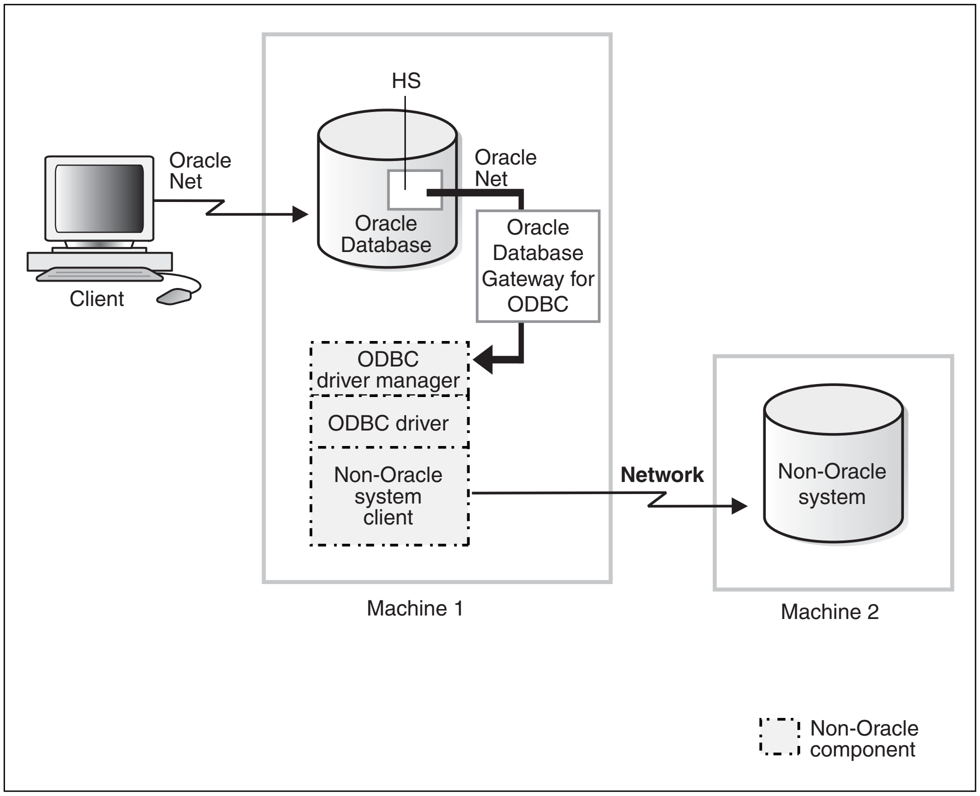
The gateway can be installed on the machine running the non-Oracle system, the machine running the Oracle database or on a third machine as a standalone. Each configuration has its advantages and disadvantages. The issues to consider when determining where to install the gateway are network traffic, operating system platform availability, hardware resources and storage.

> **Note:** The ODBC driver may require non-Oracle client libraries even if the non-Oracle database is located on the same machine. Refer to your ODBC driver documentation for information about the requirements for the ODBC driver.

Oracle and Non-Oracle Systems on Separate Machines

Figure 1–1 shows an example of a configuration in which an Oracle and non-Oracle database are on separate machines, communicating through Oracle Database Gateway for ODBC. The client connects to the non-Oracle system through a network.

Figure 1–1 Oracle and Non-Oracle Systems on Separate Machines



In this configuration:

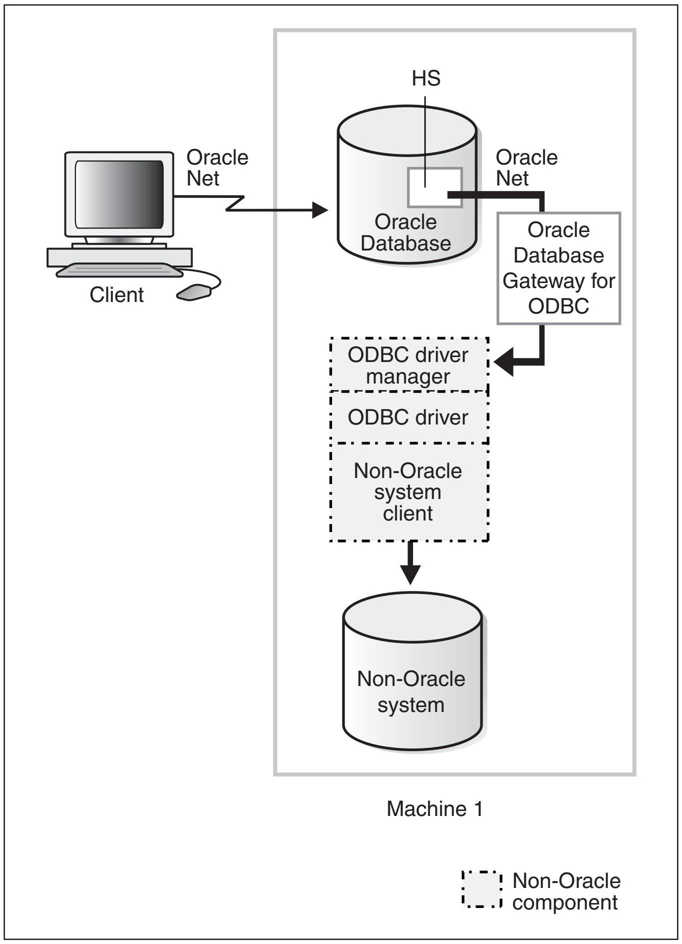
1. A client connects to the Oracle database through Oracle Net.
2. The Heterogeneous Services component of the Oracle database connects through Oracle Net to the gateway.
3. The gateway communicates with the following non-Oracle components:
   - An ODBC driver manager
   - An ODBC driver
4. Each user session receives its own dedicated agent process spawned by the first use in that user session of the database link to the non-Oracle system. The agent process ends when the user session ends.

> **Note:** The ODBC driver may require non-Oracle client libraries even if the non-Oracle database is located on the same machine. Refer to your ODBC driver documentation for information about the requirements for the ODBC driver.

Oracle and Non-Oracle Systems on the Same Machine

Figure 1–2 shows an example of a configuration in which an Oracle and non-Oracle database are on the same machine, again communicating through Oracle Database Gateway for ODBC.

Figure 1–2 Oracle and Non-Oracle Systems on the Same Machine



In this configuration:

1. A client connects to the Oracle database through Oracle Net.
2. The Heterogeneous Services component of the Oracle database connects through Oracle Net to the gateway
3. The agent communicates with the following non-Oracle components:
   - An ODBC driver manager
   - An ODBC driver

   The driver then allows access to the non-Oracle data store.
4. Each user session receives its own dedicated agent process spawned by the first use in that user session of the database link to the non-Oracle system. The agent process ends when the user session ends.

Note: The ODBC driver may require non-Oracle client libraries even if the non-Oracle database is located on the same machine. Refer to your ODBC driver documentation for information about the requirements for the ODBC driver.

ODBC Connectivity Requirements

To use Oracle Database Gateway for ODBC, you must have an ODBC driver installed on the same machine as the gateway. The ODBC driver manager and driver must meet the following requirements:

- The following ODBC catalog functions must work inside a transaction:
  - `SQLColumns`
  - `SQLForeignKeys`
  - `SQLGetFunctions`
  - `SQLGetInfo`
  - `SQLGetTypeInfo`
  - `SQLPrimaryKeys`
  - `SQLProcedureColumns`
  - `SQLProcedures`
  - `SQLStatistics`
  - `SQLTables`
- On Windows:
  - The ODBC driver must have compliance level to ODBC standard 3.0. For multi-byte support, the driver needs to meet ODBC standard 3.5.
  - The ODBC driver and driver manager must conform to ODBC application program interface (API) conformance Level 1 or higher. If the ODBC driver or driver manager does not support multiple active ODBC cursors, the complexity of SQL statements that you can execute using Oracle Database Gateway for ODBC is restricted.
- On UNIX:
  - The ODBC driver manager must be installed on the same machine.
  - The ODBC driver must have compliance level to ODBC Standard 3.0 and have a conformance level 1 or higher. If the ODBC driver works with an ODBC driver manager, the ODBC driver manager must be compliant with ODBC Standard 3.0 or higher. The ODBC driver must have compliance level to ODBC standard 3.0. For multi-byte support, the driver needs to meet ODBC standard 3.5.

    See Also: Your ODBC driver documentation for dependencies on an ODBC driver manager, and *Oracle Database Concepts* for more information on transaction isolation levels.
- The ODBC driver you use must support all of the core SQL ODBC data types and must support SQL grammar level `SQL_92`. The ODBC driver should also expose the following ODBC APIs:

- `SQLAllocHandle`
- `SQLBindCol`
- `SQLBindParameter`
- `SQLCancel`
- `SQLColAttribute`
- `SQLColumns`
- `SQLConnect`
- `SQLDescribeCol`
- `SQLDisconnect`
- `SQLDriverConnect`
- `SQLEndTran`
- `SQLExecDirect`
- `SQLExecute`
- `SQLFetch`
- `SQLForeignKeys`
- `SQLFreeHandle`
- `SQLFreeStmt`
- `SQLGetConnectAttr`
- `SQLGetData`
- `SQLGetDiagField`
- `SQLGetDiagRec`
- `SQLGetEnvAttr`
- `SQLGetFunctions`
- `SQLGetInfo`
- `SQLGetStmtAttr`
- `SQLGetTypeInfo`
- `SQLMoreResults`
- `SQLNumResultCols`
- `SQLParamData`
- `SQLPrepare`
- `SQLPrimaryKeys`
- `SQLProcedureColumns`
- `SQLProcedures`
- `SQLPutData`
- `SQLRowCount`
- `SQLSetConnectAttr`
- `SQLSetEnvAttr`

- `SQLSetDescField`
- `SQLSetDescRec`
- `SQLSetStmtAttr`
- `SQLStatistics` - If statistics are to be supported
- `SQLTables`

2

Oracle Database Gateway for ODBC Features and Restrictions

After the gateway is installed and configured, you can use the gateway to access data in non-Oracle systems, pass native commands from applications to the non-Oracle system, perform distributed queries, and copy data.

This chapter contains the following sections:

- Using the Pass-Through Feature
- AUTO COMMIT
- Known Restrictions
- Known Problems

Using the Pass-Through Feature

The gateway can pass native commands or statements from the application to the non-Oracle system using the DBMS_HS_PASSTHROUGH package.

Use the DBMS_HS_PASSTHROUGH package in a PL/SQL block to specify the statement to be passed to the non-Oracle system, as follows:

```
DECLARE
    num_rows INTEGER;
BEGIN
    num_rows := DBMS_HS_PASSTHROUGH.EXECUTE_IMMEDIATE@SYBS('command');
END;
/
```

Where *command* cannot be one of the following:

- BEGIN TRANSACTION
- COMMIT
- ROLLBACK
- SAVE
- SHUTDOWN

The DBMS_HS_PASSTHROUGH package supports passing bind values and executing SELECT statements.

Note: TRUNCATE cannot be used in a pass-through statement.

Note: As a general rule it is recommended that you COMMIT after each DDL statement in the pass-through especially when going to a Sybase database.

See Also: *Oracle Database PL/SQL Packages and Types Reference* and Chapter 3 of *Oracle Database Heterogeneous Connectivity User's Guide* for more information about the DBMS_HS_PASSTHROUGH package.

AUTO COMMIT

Some non-Oracle databases operate without logging. If read-only capability is desired under such environment, you need to set HS_TRANSACTION_MODEL=READ_ONLY_AUTOCOMMIT gateway parameter.

However, if you still need to have update capability, then set HS_TRANSACTION_MODEL=SINGLE_SITE_AUTOCOMMIT in the gateway initialization parameter file. Any update is committed immediately. Commit-confirm is not allowed for the targets operating without logging.

Known Restrictions

If you encounter incompatibility problems not listed in this section or in "Known Problems" on page 2-3, contact Oracle Support Services. The following section describes the known restrictions:

- BLOB and CLOB data cannot be read by pass-through queries
- Updates or deletes that include unsupported functions within a WHERE clause are not allowed
- Does not support stored procedures
- Cannot participate in distributed transactions; they support single-site transactions only
- Does not support multithreaded agents
- Does not support updating LONG columns with bind variables
- Does not support rowids
- COMMIT or ROLLBACK in PL/SQL Cursor Loops Closes Open Cursors
- SQL Syntax
-

COMMIT or ROLLBACK in PL/SQL Cursor Loops Closes Open Cursors

Any COMMIT or ROLLBACK issued in a PL/SQL cursor loop closes all open cursors, which can result in the following error:

```
ORA-1002:  fetch out of sequence
```

To prevent this error, move the COMMIT or ROLLBACK statement outside the cursor loop.

SQL Syntax

This section lists restrictions on the following SQL syntax:

- WHERE CURRENT OF Clause
- CONNECT BY Clause
- ROWID
- EXPLAIN PLAN Statement

WHERE CURRENT OF Clause

UPDATE and DELETE statements with the WHERE CURRENT OF clause are not supported by the gateway because they rely on the Oracle ROWID implementation. To update or delete a specific row through the gateway, a condition style WHERE clause must be used.

CONNECT BY Clause

The gateway does not support the CONNECT BY clause in a SELECT statement.

ROWID

The Oracle ROWID implementation is not supported.

EXPLAIN PLAN Statement

The EXPLAIN PLAN statement is not supported.

- SQL*Plus COPY Command with Lowercase Table Names

  You need to use double quotes to wrap around lowercase table names.

  For example:

  ```
  copy from tkhouser/tkhouser@inst1 insert loc_tkhodept using select * from
  "tkhodept"@holink2;
  ```
- Database Links

  The gateway is not multithreaded and cannot support shared database links. Each gateway session spawns a separate gateway process and connections cannot be shared.

> **See Also:** Appendix B, "Supported SQL Syntax and Functions" for more information about restrictions on SQL syntax.

Does not support CALLBACK links

Oracle Database Gateway for ODBC does not support CALLBACK links. Trying a CALLBACK link with the gateway will return the following error message:

```
ORA-02025: All tables in the SQL statement must be at the remote database
```

Known Problems

This section describes known problems and includes suggestions for correcting them when possible. If you have any questions or concerns about the problems, contact Oracle Support Services.

The following known problems are described in this section:

- Encrypted Format Login
- Date Arithmetic

Encrypted Format Login

Oracle database no longer supports the initialization parameter DBLINK_ENCRYPT_LOGIN. Up to version 7.3, this parameter's default TRUE value prevented the password for the login user ID from being sent over the network (in the clear). Later versions automatically encrypt the password.

Date Arithmetic

The following SQL expressions do not function correctly with the gateway:

```
date + number
number + date
date - number
date1 - date2
```

Statements with the preceding expressions are sent to the non-Oracle system without any translation. If the non-Oracle system does not support these date arithmetic functions, then the statements return an error.

A

Data Type Conversion

Oracle maps ODBC data types to supported Oracle data types. When the results of a query are returned, Oracle converts the ODBC data types to Oracle data types.

The tables in this appendix show how Oracle maps ODBC data types to supported Oracle data types when it is retrieving data from a non-Oracle system.

This appendix contains the following table:

- Table A–1, " Mapping ODBC Data Types to Oracle Data Types"

Mapping ODBC Data Types to Oracle Data Types

The Oracle Database Gateway for ODBC maps the data types used in ODBC-compliant data sources to supported Oracle data types. When the results of a query are returned, the Oracle database converts the ODBC data types to Oracle data types. For example, the ODBC data type SQL_TYPE_TIMESTAMP is converted to Oracle's DATE data type.

If a table contains a column whose data type is not supported by Oracle Database Gateway for ODBC, the column information is not returned to the Oracle database.

Table A–1 maps ODBC data types into Oracle data types.

Table A–1 Mapping ODBC Data Types to Oracle Data Types

ODBC	Oracle	Comment
SQL_BIGINT	NUMBER(19,0)	-
SQL_BINARY	RAW	-
SQL_CHAR	CHAR	-
SQL_DECIMAL(p,s)	NUMBER(p,s)	-
SQL_DOUBLE	FLOAT(53)	-
SQL_FLOAT	FLOAT(53)	-
SQL_INTEGER	NUMBER(10) Note: It is possible under some circumstance for the INTEGER ANSI data type to map to Precision 38, but it usually maps to Precision 10.	-
SQL_INTERVAL_YEAR	INTERVAL_YEAR_TO_MONTH	-
SQL_INTERVAL_MONTH	INTERVAL_YEAR_TO_MONTH	-

Table A–1 (Cont.) Mapping ODBC Data Types to Oracle Data Types

ODBC	Oracle	Comment
SQL_INTERVAL_YEAR_TO_MONTH	INTERVAL_YEAR_TO_MONTH	-
SQL_INTERVAL_DAY	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_HOUR	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_MINUTE	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_SECOND	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_DAY_TO_HOUR	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_DAY_TO_MINUTE	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_DAY_TO_SECOND	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_HOUR_TO_MINUTE	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_HOUR_TO_SECOND	INTERVAL_DAY_TO_SECOND	-
SQL_INTERVAL_MINUTE_TO_SECOND	INTERVAL_DAY_TO_SECOND	-
SQL_LONGVARBINARY	LONG RAW	-
SQL_LONGVARCHAR	LONG Note: If an ANSI SQL implementation defines a large value for the maximum length of VARCHAR data, it is possible that ANSI VARCHAR will map to SQL_LONGVARCHAR and Oracle LONG.	-
SQL_NUMERIC(p[,s])	NUMBER(p[,s])	-
SQL_REAL	FLOAT(24)	-
SQL_SMALLINT	NUMBER(5)	-
SQL_TYPE_TIME	CHAR(15)	-
SQL_TINYINT	NUMBER(3)	-
SQL_TYPE_DATE	DATE	-
SQL_TYPE_TIMESTAMP	DATE	-
SQL_VARBINARY	RAW	-
SQL_VARCHAR	VARCHAR2	-
SQL_WCHAR	NCHAR	-
SQL_WVARCHAR	NVARCHAR	-
SQL_WLONGVARCHAR	LONG	if Oracle DB Character Set = Unicode. Otherwise, it is not supported
SQL_BIT	NUMBER(3)	-

B

Supported SQL Syntax and Functions

This appendix contains the following sections:

- Supported SQL Statements
- Oracle Functions

Supported SQL Statements

Oracle Database Gateway for ODBC supports the following statements, but only if the ODBC driver and non-Oracle system can execute them *and* if the statements contain supported Oracle SQL functions:

- `DELETE`
- `INSERT`
- `SELECT`
- `UPDATE`

With a few exceptions, the gateway provides full support for Oracle `DELETE`, `INSERT`, `SELECT`, and `UPDATE` statements.

The gateway does not support Oracle data definition language (DDL) statements. No form of the Oracle `ALTER`, `CREATE`, `DROP`, `GRANT`, or `TRUNCATE` statements can be used. Instead, for `ALTER`, `CREATE`, `DROP`, and `GRANT` statements, use the pass-through feature of the gateway if you need to use DDL statements against the non-Oracle system database.

Note: `TRUNCATE` cannot be used in a pass-through statement.

See Also: *Oracle Database SQL Language Reference* for detailed descriptions of keywords, parameters, and options.

DELETE

The `DELETE` statement is fully supported. However, only Oracle functions supported by the non-Oracle system can be used.

INSERT

The `INSERT` statement is fully supported. However, only Oracle functions supported by the non-Oracle system can be used.

SELECT

The SELECT statement is fully supported, with these exceptions:

- `CONNECT BY` *condition*
- `NOWAIT`
- `START WITH` *condition*
- `WHERE CURRENT OF`

UPDATE

The `UPDATE` statement is fully supported. However, only Oracle functions supported by the non-Oracle system can be used. Also, you cannot have SQL statements in the subquery that refer to the same table name in the outer query. Subqueries are not supported in the SET clause.

Oracle Functions

All functions are evaluated by the non-Oracle system after the gateway has converted them to the native SQL. Only a limited set of functions are assumed to be supported by the non-Oracle system. Most Oracle functions have no equivalent function in this limited set. Consequently, although post-processing is performed by the Oracle database, Oracle Database Gateway for ODBC does not support many Oracle functions, possibly impacting performance.

If an Oracle SQL function is not supported by Oracle Database Gateway for ODBC, this function is not supported in `DELETE`, `INSERT`, or `UPDATE` statements. In `SELECT` statements, these functions are evaluated by the Oracle database and processed after they are returned from the non-Oracle system.

If an unsupported function is used in a `DELETE`, `INSERT`, or `UPDATE` statement, it generates the following Oracle error:

```
ORA-02070: database db_link_name does not support function in this context
```

Oracle Database Gateway for ODBC assumes that ODBC driver provider that is being used supports the following minimum set of SQL functions:

- `AVG(`*exp*`)`
- `LIKE(`*exp*`)`
- `COUNT(*)`
- `MAX(`*exp*`)`
- `MIN(`*exp*`)`
- `NOT`

C

Data Dictionary

Data dictionary information is stored in the non-Oracle system as system tables and is accessed through ODBC application programming interfaces (APIs). This appendix documents data dictionary translation support. It explains how to access non-Oracle data dictionaries, describes how to use supported views and tables, and explains data dictionary mapping.

This appendix contains the following topics:

- Accessing the Non-Oracle Data Dictionary
- Views and Tables Supported by Oracle Database Gateway for ODBC

Accessing the Non-Oracle Data Dictionary

Accessing a non-Oracle data dictionary table or view is identical to accessing a data dictionary in an Oracle database. You issue a SELECT statement specifying a database link. The Oracle data dictionary view and column names are used to access the non-Oracle data dictionary. Synonyms of supported views are also acceptable.

For example, the following statement queries the data dictionary table ALL_USERS to retrieve all users in the non-Oracle system:

```
SQL SELECT * FROM all_users@sid1;
```

When you issue a data dictionary access query, the ODBC agent:

1. Maps the requested table, view, or synonym to one or more ODBC APIs (see Section , "Data Dictionary Mapping"). The agent translates all data dictionary column names to their corresponding non-Oracle column names within the query.
2. Sends the sequence of APIs to the non-Oracle system.
3. Possibly converts the retrieved non-Oracle data to give it the appearance of the Oracle data dictionary table.
4. Passes the data dictionary information from the non-Oracle system table to Oracle.

> **Note:** The values returned when querying the Oracle Database Gateway for ODBC data dictionary may not be the same as those returned by the Oracle SQL*Plus DESCRIBE command.

Views and Tables Supported by Oracle Database Gateway for ODBC

Oracle Database Gateway for ODBC supports only the views and tables shown in Table C–1.

If you use an unsupported view, you receive an Oracle error message stating no rows were selected.

If you want to query data dictionary views using `SELECT... FROM DBA_*`, first connect as Oracle user `SYSTEM` or `SYS`. Otherwise, you receive the following error message:

```
ORA-28506: Parse error in data dictionary translation for %s stored in %s
```

Using Oracle Database Gateway for ODBC, queries of the supported data dictionary tables and views beginning with the characters `ALL_` may return rows from the non-Oracle system when you do not have access privileges for those non-Oracle objects. When querying an Oracle database with the Oracle data dictionary, rows are returned only for those objects you are permitted to access.

Data Dictionary Mapping

The tables in this section list Oracle data dictionary view names and the equivalent ODBC APIs used. Table C–1 shows a list of all Oracle data dictionary view names supported by Oracle Database Gateway for ODBC.

Table C–1 Oracle Database Gateway for ODBC Data Dictionary Mapping

View	ODBC API
ALL_CATALOG	`SQLTables`
ALL_COL_COMMENTS	`SQLColumns`
ALL_CONS_COLUMNS	`SQLPrimaryKeys, SQLForeignKeys`
ALL_CONSTRAINTS	`SQLPrimaryKeys, SQLForeignKeys`
ALL_IND_COLUMNS	`SQLStatistics`
ALL_INDEXES	`SQLStatistics`
ALL_OBJECTS	`SQLTables, SQLProcedures, SQLStatistics`
ALL_TAB_COLUMNS	`SQLColumns`
ALL_TAB_COMMENTS	`SQLTables`
ALL_TABLES	`SQLStatistics`
ALL_USERS	`SQLTables`
ALL_VIEWS	`SQLTables`
DICTIONARY	`SQLTables`
DICT_COLUMNS	`SQLTables`
USER_COL_COMMENTS	`SQLColumns`
USER_CONS_COLUMNS	`SQLPrimaryKeys, SQLForeignKeys`
USER_CONSTRAINTS	`SQLPrimaryKeys, SQLForeignKeys`
USER_IND_COLUMNS	`SQLStatistics`
USER_INDEXES	`SQLStatistics`
USER_OBJECTS	`SQLTables, SQLProcedures, SQLStatistics`
USER_TABCOLUMNS	`SQLColumns`
USER_TAB_COMMENTS	`SQLTables`
USER_TABLES	`SQLStatistics`

Table C–1 (Cont.) Oracle Database Gateway for ODBC Data Dictionary Mapping

View	ODBC API
USER_USERS	SQLTables
USER_VIEWS	SQLTables

Oracle Database Gateway for ODBC Data Dictionary Descriptions

The Oracle Database Gateway for ODBC data dictionary tables and views provide the following information:

- Name, data type, and width of each column
- The contents of columns with fixed values

In the descriptions that follow, the values in the Null? column may differ from the Oracle data dictionary tables and views. Any default value is shown to the right of an item.

Table C–2 ALL_CATALOG

Name	Type	Value
OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	VARCHAR2(11)	"TABLE" or "VIEW" or "SYNONYM"

Table C–3 ALL_COL_COMMENTS

Name	Type	Value
OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(30)	-
COMMENTS	VARCHAR2(4000)	NULL

Table C–4 ALL_CONS_COLUMNS

Name	Type	Value
OWNER	VARCHAR2(30)	-
CONSTRAINT_NAME	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(4000)	-
POSITION	NUMBER	-

Table C–5 ALL_CONSTRAINTS

Name	Type	Value
OWNER	VARCHAR2(30)	-
CONSTRAINT_NAME	VARCHAR2(30)	-
CONSTRAINT_TYPE	VARCHAR2(1)	"R" or "P"

Table C–5 (Cont.) ALL_CONSTRAINTS

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
SEARCH_CONDITION	LONG	NULL
R_OWNER	VARCHAR2(30)	-
R_CONSTRAINT_NAME	VARCHAR2(30)	-
DELETE_RULE	VARCHAR2(9)	"CASCADE" or "NO ACTION" or "SET NULL"
STATUS	VARCHAR2(8)	NULL
DEFERRABLE	VARCHAR2(14)	NULL
DEFERRED	VARCHAR2(9)	NULL
VALIDATED	VARCHAR2(13)	NULL
GENERATED	VARCHAR2(14)	NULL
BAD	VARCHAR2(3)	NULL
RELY	VARCHAR2(4)	NULL
LAST_CHANGE	DATE	NULL

Table C–6 ALL_IND_COLUMNS

Name	Type	Value
INDEX_OWNER	VARCHAR2(30)	-
INDEX_NAME	VARCHAR2(30)	-
TABLE_OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(4000)	-
COLUMN_POSITION	NUMBER	-
COLUMN_LENGTH	NUMBER	-
DESCEND	VARCHAR2(4)	"DESC" or "ASC"

Table C–7 ALL_INDEXES

Name	Type	Value
OWNER	VARCHAR2(30)	-
INDEX_NAME	VARCHAR2(30)	-
INDEX_TYPE	VARCHAR2(27)	NULL
TABLE_OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	CHAR(5)	"TABLE"
UNIQUENESS	VARCHAR2(9)	"UNIQUE" or "NONUNIQUE"

Table C–7 (Cont.) ALL_INDEXES

Name	Type	Value
COMPRESSION	VARCHAR2(8)	NULL
PREFIX_LENGTH	NUMBER	0
TABLESPACE_NAME	VARCHAR2(30)	NULL
INI_TRANS	NUMBER	0
MAX_TRANS	NUMBER	0
INITIAL_EXTENT	NUMBER	0
NEXT_EXTENT	NUMBER	0
MIN_EXTENTS	NUMBER	0
MAX_EXTENTS	NUMBER	0
PCT_INCREASE	NUMBER	0
PCT_THRESHOLD	NUMBER	0
INCLUDE_COLUMNS	NUMBER	0
FREELISTS	NUMBER	0
FREELIST_GROUPS	NUMBER	0
PCT_FREE	NUMBER	0
LOGGING	VARCHAR2(3)	NULL
BLEVEL	NUMBER	0
LEAF_BLOCKS	NUMBER	0
DISTINCT_KEYS	NUMBER	
AVG_LEAF_BLOCKS_PER_KEY	NUMBER	0
AVG_DATA_BLOCKS_PER_KEY	NUMBER	0
CLUSTERING_FACTOR	NUMBER	0
STATUS	VARCHAR2(8)	NULL
NUM_ROWS	NUMBER	0
SAMPLE_SIZE	NUMBER	0
LAST_ANALYZED	DATE	NULL
DEGREE	VARCHAR2(40)	NULL
INSTANCES	VARCHAR2(40)	NULL
PARTITIONED	VARCHAR2(3)	NULL
TEMPORARY	VARCHAR2(1)	NULL
GENERATED	VARCHAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL
BUFFER_POOL	VARCHAR2(7)	NULL
USER_STATS	VARCHAR2(3)	NULL
DURATION	VARCHAR2(15)	NULL
PCT_DIRECT_ACCESS	NUMBER	0
ITYP_OWNER	VARCHAR2(30)	NULL

Table C–7 (Cont.) ALL_INDEXES

Name	Type	Value
ITYP_NAME	VARCHAR2(30)	NULL
PARAMETERS	VARCHAR2(1000)	NULL
GLOBAL_STATS	VARCHAR2(3)	NULL
DOMIDX_STATUS	VARCHAR2(12)	NULL
DOMIDX_OPSTATUS	VARCHAR2(6)	NULL
FUNCIDX_STATUS	VARCHAR2(8)	NULL

Table C–8 ALL_OBJECTS

Name	Type	Value
OWNER	VARCHAR2(30)	-
OBJECT_NAME	VARCHAR2(30)	-
SUBOBJECT_NAME	VARCHAR2(30)	NULL
OBJECT_ID	NUMBER	0
DATA_OBJECT_ID	NUMBER	0
OBJECT_TYPE	VARCHAR2(18)	"TABLE" or "VIEW" or "SYNONYM" or "INDEX" or "PROCEDURE"
CREATED	DATE	NULL
LAST_DDL_TIME	DATE	NULL
TIMESTAMP	VARCHAR2(19)	NULL
STATUS	VARCHAR2(7)	NULL
TEMPORARY	VARCHAR2(1)	NULL
GENERATED	VARCHAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL

Table C–9 ALL_TAB_COLUMNS

Name	Type	Value
OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(30)	-
DATA_TYPE	VARCHAR2(106)	-
DATA_TYPE_MOD	VARCHAR2(3)	NULL
DATA_TYPE_OWNER	VARCHAR2(30)	NULL
DATA_LENGTH	NUMBER	-
DATA_PRECISION	NUMBER	-
DATA_SCALE	NUMBER	-
NULLABLE	VARCHAR2(1)	"Y" or "N"
COLUMN_ID	NUMBER	-

Table C–9 (Cont.) ALL_TAB_COLUMNS

Name	Type	Value
DEFAULT_LENGTH	NUMBER	0
DATA_DEFAULT	LONG	NULL
NUM_DISTINCT	NUMBER	0
LOW_VALUE	RAW(32)	NULL
HIGH_VALUE	RAW(32)	NULL
DENSITY	NUMBER	0
NUM_NULLS	NUMBER	0
NUM_BUCKETS	NUMBER	0
LAST_ANALYZED	DATE	NULL
SAMPLE_SIZE	NUMBER	0
CHARACTER_SET_NAME	VARCHAR2(44)	NULL
CHAR_COL_DEC_LENGTH	NUMBER	0
GLOBAL_STATS	VARCHAR2(3)	NULL
USER_STATS	VARCHAR2(3)	NULL
AVG_COL_LEN	NUMBER	0

Table C–10 ALL_TAB_COMMENTS

Name	Type	Value
OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	VARCHAR2(11)	"TABLE" or "VIEW"
COMMENTS	VARCHAR2(4000)	NULL

Table C–11 ALL_TABLES

Name	Type	Value
OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
TABLESPACE_NAME	VARCHAR2(30)	NULL
CLUSTER_NAME	VARCHAR2(30)	NULL
IOT_NAME	VARCHAR2(30)	NULL
PCT_FREE	NUMBER	0
PCT_USED	NUMBER	0
INI_TRANS	NUMBER	0
MAX_TRANS	NUMBER	0
INITIAL_EXTENT	NUMBER	0
NEXT_EXTENT	NUMBER	0
MIN_EXTENTS	NUMBER	0

Table C–11 (Cont.) ALL_TABLES

Name	Type	Value
MAX_EXTENTS	NUMBER	0
PCT_INCREASE	NUMBER	0
FREELISTS	NUMBER	0
FREELIST_GROUPS	NUMBER	0
LOGGING	VARCHAR2(3)	NULL
BACKED_UP	VARCHAR2(1)	NULL
NUM_ROWS	NUMBER	-
BLOCKS	NUMBER	-
EMPTY_BLOCKS	NUMBER	0
AVG_SPACE	NUMBER	0
CHAIN_CNT	NUMBER	0
AVG_ROW_LEN	NUMBER	0
AVG_SPACE_FREELIST_BLOCKS	NUMBER	0
NUM_FREELIST_BLOCKS	NUMBER	0
DEGREE	VARCHAR2(10)	NULL
INSTANCES	VARCHAR2(10)	NULL
CACHE	VARCHAR2(5)	NULL
TABLE_LOCK	VARCHAR2(8)	NULL
SAMPLE_SIZE	NUMBER	0
LAST_ANALYZED	DATE	NULL
PARTITIONED	VARCHAR2(3)	NULL
IOT_TYPE	VARCHAR2(12)	NULL
TEMPORARY	VARCHAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL
NESTED	VARCHAR2(3)	NULL
BUFFER_POOL	VARCHAR2(7)	NULL
ROW_MOVEMENT	VARCHAR2(8)	NULL
GLOBAL_STATS	VARCHAR2(3)	NULL
USER_STATS	VARCHAR2(3)	NULL
DURATION	VARHCAR2(15)	NULL
SKIP_CORRUPT	VARCHAR2(8)	NULL
MONITORING	VARCHAR2(3)	NULL

Table C–12 ALL_USERS

Name	Type	Value
USERNAME	VARCHAR2(30)	-

Table C–12 (Cont.) ALL_USERS

Name	Type	Value
USER_ID	NUMBER	0
CREATED	DATE	NULL

Table C–13 ALL_VIEWS

Name	Type	Value
OWNER	VARCHAR2(30)	-
VIEW_NAME	VARCHAR2(30)	-
TEXT_LENGTH	NUMBER	0
TEXT	LONG	NULL
TYPE_TEXT_LENGTH	NUMBER	0
TYPE_TEXT	VARCHAR2(4000)	NULL
OID_TEXT_LENGTH	NUMBER	0
OID_TEXT	VARCHAR2(4000)	NULL
VIEW_TYPE_OWNER	VARCHAR2(30)	NULL
VIEW_TYPE	VARCHAR2(30)	NULL

Table C–14 DICTIONARY

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
COMMENTS	VARCHAR2(4000)	NULL

Table C–15 DICT_COLUMNS

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(30)	-
COMMENTS	VARCHAR2(4000)	NULL

Table C–16 USER_CATALOG

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	VARCHAR2(11)	"TABLE" or, "VIEW" or "SYNONYM"

Table C–17 USER_COL_COMMENTS

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(30)	-
COMMENTS	VARCHAR2(4000)	NULL

Table C–18 USER_CONS_COLUMNS

Name	Type	Value
OWNER	VARCHAR2(30)	-
CONSTRAINT_NAME	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(4000)	-
POSITION	NUMBER	-

Table C–19 USER_CONSTRAINTS

Name	Type	Value
OWNER	VARCHAR2(30)	-
CONSTRAINT_NAME	VARCHAR2(30)	-
CONSTRAINT_TYPE	VARCHAR2(1)	R or P
TABLE_NAME	VARCHAR2(30)	-
SEARCH_CONDITION	LONG	NULL
R_OWNER	VARCHAR2(30)	-
R_CONSTRAINT_NAME	VARCHAR2(30)	-
DELETE_RULE	VARCHAR2(9)	"CASCADE" or "NO ACTION" or "SET NULL"
STATUS	VARCHAR2(8)	NULL
DEFERRABLE	VARCHAR2(14)	NULL
DEFERRED	VARCHAR2(9)	NULL
VALIDATED	VARCHAR2(13)	NULL
GENERATED	VARCHAR2(14)	NULL
BAD	VARCHAR2(3)	NULL
RELY	VARCHAR2(4)	NULL
LAST_CHANGE	DATE	NULL

Table C–20 USER_IND_COLUMNS

Name	Type	Value
INDEX_NAME	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(4000)	-
COLUMN_POSITION	NUMBER	-
COLUMN_LENGTH	NUMBER	-
DESCEND	VARCHAR2(4)	"DESC" or "ASC"

Table C–21 USER_INDEXES

Name	Type	Value
INDEX_NAME	VARCHAR2(30)	-
INDEX_TYPE	VARCHAR2(27)	NULL
TABLE_OWNER	VARCHAR2(30)	-
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	VARCHAR2(11)	"TABLE"
UNIQUENESS	VARCHAR2(9)	"UNIQUE" or "NONUNIQUE"
COMPRESSION	VARCHAR2(8)	NULL
PREFIX_LENGTH	NUMBER	0
TABLESPACE_NAME	VARCHAR2(30)	NULL
INI_TRANS	NUMBER	0
MAX_TRANS	NUMBER	0
INITIAL_EXTENT	NUMBER	0
NEXT_EXTENT	NUMBER	0
MIN_EXTENTS	NUMBER	0
MAX_EXTENTS	NUMBER	0
PCT_INCREASE	NUMBER	0
PCT_THRESHOLD	NUMBER	0
INCLUDE_COLUMNS	NUMBER	0
FREELISTS	NUMBER	0
FREELIST_GROUPS	NUMBER	0
PCT_FREE	NUMBER	0
LOGGING	VARCHAR2(3)	NULL
BLEVEL	NUMBER	0
LEAF_BLOCKS	NUMBER	0
DISTINCT_KEYS	NUMBER	-
AVG_LEAF_BLOCKS_PER_KEY	NUMBER	0
AVG_DATA_BLOCKS_PER_KEY	NUMBER	0
CLUSTERING_FACTOR	NUMBER	0
STATUS	VARCHAR2(8)	NULL
NUM_ROWS	NUMBER	0
SAMPLE_SIZE	NUMBER	0
LAST_ANALYZED	DATE	NULL
DEGREE	VARCHAR2(40)	NULL
INSTANCES	VARCHAR2(40)	NULL
PARTITIONED	VARCHAR2(3)	NULL

Table C–21 (Cont.) USER_INDEXES

Name	Type	Value
TEMPORARY	VARCHAR2(1)	NULL
GENERATED	VARCHAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL
BUFFER_POOL	VARCHAR2(7)	NULL
USER_STATS	VARCHAR2(3)	NULL
DURATION	VARHCAR2(15)	NULL
PCT_DIRECT_ACCESS	NUMBER	0
ITYP_OWNER	VARCHAR2(30)	NULL
ITYP_NAME	VARCHAR2(30)	NULL
PARAMETERS	VARCHAR2(1000)	NULL
GLOBAL_STATS	VARCHAR2(3)	NULL
DOMIDX_STATUS	VARCHAR2(12)	NULL
DOMIDX_OPSTATUS	VARCHAR2(6)	NULL
FUNCIDX_STATUS	VARCHAR2(8)	NULL

Table C–22 USER_OBJECTS

Name	Type	Value
OBJECT_NAME	VARCHAR2(128)	-
SUBOBJECT_NAME	VARCHAR2(30)	NULL
OBJECT_ID	NUMBER	0
DATA_OBJECT_ID	NUMBER	0
OBJECT_TYPE	VARCHAR2(18)	"TABLE" or "VIEW" or "SYNONYM" or "INDEX" or "PROCEDURE"
CREATED	DATE	NULL
LAST_DDL_TIME	DATE	NULL
TIMESTAMP	VARCHAR2(19)	NULL
STATUS	VARCHAR2(7)	NULL
TEMPORARY	VARCHAR2(1)	NULL
GENERATED	VARCHAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL

Table C–23 USER_TABCOLUMNS

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
COLUMN_NAME	VARCHAR2(30)	-
DATA_TYPE	VARCHAR2(106)	-
DATA_TYPE_MOD	VARCHAR2(3)	NULL

Table C–23 (Cont.) USER_TABCOLUMNS

Name	Type	Value
DATA_TYPE_OWNER	VARCHAR2(30)	NULL
DATA_LENGTH	NUMBER	-
DATA_PRECISION	NUMBER	-
DATA_SCALE	NUMBER	-
NULLABLE	VARCHAR2(1)	"Y" or "N"
COLUMN_ID	NUMBER	-
DEFAULT_LENGTH	NUMBER	NULL
DATA_DEFAULT	LONG	NULL
NUM_DISTINCT	NUMBER	NULL
LOW_VALUE	RAW(32)	NULL
HIGH_VALUE	RAW(32)	NULL
DENSITY	NUMBER	0
NUM_NULLS	NUMBER	0
NUM_BUCKETS	NUMBER	0
LAST_ANALYZED	DATE	NULL
SAMPLE_SIZE	NUMBER	0
CHARACTER_SET_NAME	VARCHAR2(44)	NULL
CHAR_COL_DECL_LENGTH	NUMBER	0
GLOBAL_STATS	VARCHAR2(3)	NULL
USER_STATS	VARCHAR2(3)	NULL
AVG_COL_LEN	NUMBER	0

Table C–24 USER_TAB_COMMENTS

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
TABLE_TYPE	VARCHAR2(11)	"TABLE" or "VIEW"
COMMENTS	VARCHAR2(4000)	NULL

Table C–25 USER_TABLES

Name	Type	Value
TABLE_NAME	VARCHAR2(30)	-
TABLESPACE_NAME	VARCHAR2(30)	NULL
CLUSTER_NAME	VARCHAR2(30)	NULL
IOT_NAME	VARCHAR2(30)	NULL
PCT_FREE	NUMBER	0
PCT_USED	NUMBER	0
INI_TRANS	NUMBER	0

Table C–25 (Cont.) USER_TABLES

Name	Type	Value
MAX_TRANS	NUMBER	0
INITIAL_EXTENT	NUMBER	0
NEXT_EXTENT	NUMBER	0
MIN_EXTENTS	NUMBER	0
MAX_EXTENTS	NUMBER	0
PCT_INCREASE	NUMBER	0
FREELISTS	NUMBER	0
FREELIST_GROUPS	NUMBER	0
LOGGING	VARCHAR2(3)	NULL
BACKED_UP	VARCHAR2(1)	NULL
NUM_ROWS	NUMBER	-
BLOCKS	NUMBER	-
EMPTY_BLOCKS	NUMBER	0
AVG_SPACE	NUMBER	0
CHAIN_CNT	NUMBER	0
AVG_ROW_LEN	NUMBER	0
AVG_SPACE_FREELIST_BLOCKS	NUMBER	0
NUM_FREELIST_BLOCKS	NUMBER	0
DEGREE	VARCHAR2(10)	NULL
INSTANCES	VARCHAR2(10)	NULL
CACHE	VARCHAR2(5)	NULL
TABLE_LOCK	VARCHAR2(8)	NULL
SAMPLE_SIZE	NUMBER	0
LAST_ANALYZED	DATE	NULL
PARTITIONED	VARCHAR2(3)	NULL
IOT_TYPE	VARCHAR2(12)	NULL
TEMPORARY	VARHCAR2(1)	NULL
SECONDARY	VARCHAR2(1)	NULL
NESTED	VARCHAR2(3)	NULL
BUFFER_POOL	VARCHAR2(7)	NULL
ROW_MOVEMENT	VARCHAR2(8)	NULL
GLOBAL_STATS	VARCHAR2(3)	NULL
USER_STATS	VARCHAR2(3)	NULL
DURATION	VARCHAR2(15)	NULL
SKIP_CORRUPT	VARCHAR2(8)	NULL
MONITORING	VARCHAR2(3)	NULL

Table C–26 USER_USERS

Name	Type	Value
USERNAME	VARCHAR2(30)	-
USER_ID	NUMBER	0
ACCOUNT_STATUS	VARCHAR2(32)	OPEN
LOCK_DATE	DATE	NULL
EXPIRY_DATE	DATE	NULL
DEFAULT_TABLESPACE	VARCHAR2(30)	NULL
TEMPORARY_ TABLESPACE	VARCHAR2(30)	NULL
CREATED	DATE	NULL
INITIAL_RSRC_ CONSUMER_GROUP	VARCHAR2(30)	NULL
EXTERNAL_NAME	VARCHAR2(4000)	NULL

Table C–27 USER_VIEWS

Name	Type	Value
VIEW_NAME	VARCHAR2(30)	-
TEXT_LENGTH	NUMBER	0
TEXT	LONG	NULL
TYPE_TEXT_LENGTH	NUMBER	0
TYPE_TEXT	VARCHAR2(4000)	NULL
OID_TEXT_LENGTH	NUMBER	0
OID_TEXT	VARCHAR2(4000)	NULL
VIEW_TYPE_OWNER	VARCHAR2(30)	NULL
VIEW_TYPE	VARCHAR2(30)	NULL

D

Initialization Parameters

The Oracle database initialization parameters in the `init.ora` file are distinct from gateway initialization parameters. Set the gateway parameters in the initialization parameter file using an agent-specific mechanism, or set them in the Oracle data dictionary using the `DBMS_HS` package. The gateway initialization parameter file must be available when the gateway is started.

This appendix contains a list of the gateway initialization parameters that can be set for each gateway and their description. It also describes the initialization parameter file syntax. It includes the following sections:

- Initialization Parameter File Syntax
- Oracle Database Gateway for ODBC Initialization Parameters
- Initialization Parameter Descriptions

Initialization Parameter File Syntax

The syntax for the initialization parameter file is as follows:

1. The file is a sequence of commands.
2. Each command should start on a separate line.
3. End of line is considered a command terminator (unless escaped with a backslash).
4. If there is a syntax error in an initialization parameter file, none of the settings take effect.
5. Set the parameter values as follows:

   ```
   [SET][PRIVATE] parameter=value
   ```

   Where:

   `parameter` is an initialization parameter name. It is a string of characters starting with a letter and consisting of letters, digits and underscores. Initialization parameter names are case sensitive.

   `value` is the initialization parameter value. It is case sensitive. An initialization parameter value is either:

   a. A string of characters that does not contain any backslashes, white space or double quotation marks (")

   b. A quoted string beginning with a double quotation mark and ending with a double quotation mark. The following can be used inside a quoted string:

  - backslash (\) is the escape character
  - \n inserts a new line
  - \t inserts a tab
  - \" inserts a double quotation mark
  - \\ inserts a backslash

  A backslash at the end of the line continues the string on the next line. If a backslash precedes any other character then the backslash is ignored.

For example, to enable tracing for an agent, set the `HS_FDS_TRACE_LEVEL` initialization parameter as follows:

```
HS_FDS_TRACE_LEVEL=ON
```

`SET` and `PRIVATE` are optional keywords. You cannot use either as an initialization parameter name. Most parameters are needed only as initialization parameters, so you usually do not need to use the `SET` or `PRIVATE` keywords. If you do not specify either `SET` or `PRIVATE`, the parameter is used only as an initialization parameter for the agent.

`SET` specifies that, in addition to being used as an initialization parameter, the parameter value is set as an environment variable for the agent process. Use `SET` for parameter values that the drivers or non-Oracle system need as environment variables.

`PRIVATE` specifies that the initialization parameter should be private to the agent and should not be uploaded to the Oracle database. Most initialization parameters should not be private. If, however, you are storing sensitive information like a password in the initialization parameter file, then you may not want it uploaded to the server because the initialization parameters and values are not encrypted when uploaded. Making the initialization parameters private prevents the upload from happening and they do not appear in dynamic performance views. Use `PRIVATE` for the initialization parameters only if the parameter value includes sensitive information such as a user name or password.

`SET PRIVATE` specifies that the parameter value is set as an environment variable for the agent process and is also private (not transferred to the Oracle database, not appearing in dynamic performance views or graphical user interfaces).

Oracle Database Gateway for ODBC Initialization Parameters

This section lists all the initialization file parameters that can be set for the Oracle Database Gateway for ODBC. They are as follows:

- HS_DB_DOMAIN
- HS_DB_INTERNAL_NAME
- HS_DB_NAME
- HS_DESCRIBE_CACHE_HWM
- HS_LANGUAGE
- HS_LONG_PIECE_TRANSFER_SIZE
- HS_OPEN_CURSORS
- HS_RPC_FETCH_REBLOCKING
- HS_RPC_FETCH_SIZE

- HS_FDS_SHAREABLE_NAME
- HS_TIME_ZONE
- IFILE
- HS_FDS_CONNECT_INFO
- HS_FDS_DEFAULT_OWNER
- HS_FDS_TRACE_LEVEL
- HS_TRANSACTION_MODEL
- HS_FDS_FETCH_ROWS
- HS_FDS_REMOTE_DB_CHARSET
- HS_FDS_SQLLEN_INTERPRETATION
- HS_FDS_REPORT_REAL_AS_DOUBLE

Initialization Parameter Description

The following sections describe all the initialization file parameters that can be set for gateways.

HS_DB_DOMAIN

Property	Description
Default value	`WORLD`
Range of values	`1` to `199` characters

Specifies a unique network sub-address for a non-Oracle system. The `HS_DB_DOMAIN` initialization parameter is similar to the `DB_DOMAIN` initialization parameter, described in the *Oracle Database Reference*. The `HS_DB_DOMAIN` initialization parameter is required if you use the Oracle Names server. The `HS_DB_NAME` and `HS_DB_DOMAIN` initialization parameters define the global name of the non-Oracle system.

> **Note:** The `HS_DB_NAME` and `HS_DB_DOMAIN` initialization parameters must combine to form a unique address in a cooperative server environment.

HS_DB_INTERNAL_NAME

Property	Description
Default value	`01010101`
Range of values	`1` to `16` hexadecimal characters

Specifies a unique hexadecimal number identifying the instance to which the Heterogeneous Services agent is connected. This parameter's value is used as part of a transaction ID when global name services are activated. Specifying a nonunique number can cause problems when two-phase commit recovery actions are necessary for a transaction.

HS_DB_NAME

Property	Description
Default value	HO
Range of values	1 to 8 characters

Specifies a unique alphanumeric name for the data store given to the non-Oracle system. This name identifies the non-Oracle system within the cooperative server environment. The HS_DB_NAME and HS_DB_DOMAIN initialization parameters define the global name of the non-Oracle system.

HS_DESCRIBE_CACHE_HWM

Property	Description
Default value	100
Range of values	1 to 4000

Specifies the maximum number of entries in the describe cache used by Heterogeneous Services. This limit is known as the describe cache high water mark. The cache contains descriptions of the mapped tables that Heterogeneous Services reuses so that it does not have to re-access the non-Oracle data store.

If you are accessing many mapped tables, increase the high water mark to improve performance. Increasing the high water mark improves performance at the cost of memory usage.

HS_LANGUAGE

Property	Description
Default value	System-specific
Range of values	Any valid language name (up to 255 characters)

Provides Heterogeneous Services with character set, language, and territory information of the non-Oracle data source. The value must use the following format:

```
language[_territory.character_set]
```

Note: The globalization support initialization parameters affect error messages, the data for the SQL Service, and parameters in distributed external procedures.

Character Sets

Ideally, the character sets of the Oracle database and the non-Oracle data source are the same. In almost all cases, HS_LANGUAGE should be set exactly the same as Oracle database character set for optimal character set mapping and performance. If they are not the same, Heterogeneous Services attempts to translate the character set of the non-Oracle data source to the Oracle database character set, and back again. The translation can degrade performance. In some cases, Heterogeneous Services cannot translate a character from one character set to another.

> **Note:** The specified character set must be a superset of the operating system character set on the platform where the agent is installed.

As more Oracle databases and non-Oracle databases use Unicode as database character sets, it is preferable to also run the gateway in Unicode character set. To do so, you must set HS_LANGUAGE=AL32UTF8. However, when the gateway runs on Windows, the Microsoft ODBC Driver Manager interface can exchange data only in the double-byte character set, UCS2. This results in extra ratio expansion of described buffer and column sizes. Refer to HS_FDS_REMOTE_DB_CHARSET for instruction on how to adjust to correct sizes.

Language

The language component of the HS_LANGUAGE initialization parameter determines:

- Day and month names of dates
- AD, BC, PM, and AM symbols for date and time
- Default sorting mechanism

Note that Oracle does not determine the language for error messages for the generic Heterogeneous Services messages (ORA-25000 through ORA-28000). These are controlled by the session settings in the Oracle database.

Territory

The territory clause specifies the conventions for day and week numbering, default date format, decimal character and group separator, and ISO and local currency symbols. Note that the level of globalization support between the Oracle database and the non-Oracle data source depends on how the gateway is implemented.

HS_LONG_PIECE_TRANSFER_SIZE

Property	Description
Default value	64 KB
Range of values	Any value up to 2 GB

Sets the size of the piece of LONG data being transferred. A smaller piece size means less memory requirement, but more round-trips to fetch all the data. A larger piece size means fewer round-trips, but more of a memory requirement to store the intermediate pieces internally. Thus, the initialization parameter can be used to tune a system for the best performance, with the best trade-off between round-trips and memory requirements, and network latency or response time.

HS_OPEN_CURSORS

Property	Description
Default value	50

Property	Description
Range of values	1 to the value of OPEN_CURSORS initialization parameter of Oracle database

Defines the maximum number of cursors that can be open on one connection to a non-Oracle system instance.

The value never exceeds the number of open cursors in the Oracle database. Therefore, setting the same value as the OPEN_CURSORS initialization parameter in the Oracle database is recommended.

HS_RPC_FETCH_REBLOCKING

Property	Description
Default value	ON
Range of values	OFF or ON

Controls whether Heterogeneous Services attempts to optimize performance of data transfer between the Oracle database and the Heterogeneous Services agent connected to the non-Oracle data store.

The following values are possible:

- OFF disables reblocking of fetched data so that data is immediately sent from agent to server.
- ON enables reblocking, which means that data fetched from the non-Oracle system is buffered in the agent and is not sent to the Oracle database until the amount of fetched data is equal or higher than the value of HS_RPC_FETCH_SIZE initialization parameter. However, any buffered data is returned immediately when a fetch indicates that no more data exists or when the non-Oracle system reports an error.

HS_RPC_FETCH_SIZE

Property	Description
Default value	50000
Range of values	1 to 10000000

Tunes internal data buffering to optimize the data transfer rate between the server and the agent process.

Increasing the value can reduce the number of network round-trips needed to transfer a given amount of data, but also tends to increase data bandwidth and to reduce latency as measured between issuing a query and completion of all fetches for the query. Nevertheless, increasing the fetch size can increase latency for the initial fetch results of a query, because the first fetch results are not transmitted until additional data is available.

HS_TIME_ZONE

Property	Description
Default value for '[+|-]hh:mm'	Derived from the NLS_TERRITORY initialization parameter
Range of values for '[+|-]hh:mm'	Any valid datetime format mask

Specifies the default local time zone displacement for the current SQL session. The format mask, [+|-]hh:mm, is specified to indicate the hours and minutes before or after UTC (Coordinated Universal Time—formerly Greenwich Mean Time). For example:

```
HS_TIME_ZONE = [+ | -] hh:mm
```

HS_TRANSACTION_MODEL

Property	Description
Default Value	COMMIT_CONFIRM
Range of Values	COMMIT_CONFIRM, READ_ONLY, READ_ONLY_AUTOCOMMIT, SINGLE_SITE, SINGLE_SITE_AUTOCOMMIT

Specifies the type of transaction model that is used when the non-Oracle database is updated by a transaction.

The following values are possible:

- COMMIT_CONFIRM provides read and write access to the non-Oracle database and allows the gateway to be part of a distributed update. To use the commit-confirm model, the following items must be created in the non-Oracle database:
  - Transaction log table. The default table name is HS_TRANSACTION_LOG. A different name can be set using the HS_FDS_TRANSACTION_LOG parameter. The transaction log table must be granted SELECT, DELETE, and INSERT privileges set to public.
  - Recovery account. The account name is assigned with the HS_FDS_RECOVERY_ACCOUNT parameter.
  - Recovery account password. The password is assigned with the HS_FDS_RECOVERY_PWD parameter.
- READ_ONLY provides read access to the non-Oracle database.
- SINGLE_SITE provides read and write access to the non-Oracle database. However, the gateway cannot participate in distributed updates.
- READ_ONLY_AUTOCOMMIT provides read access to the non-Oracle database that do not have logging.
- SINGLE_SITE_AUTOCOMMIT provides read and write access to the non-Oracle database which do not have logging. Any update is committed immediately, and the gateway cannot participate in distributed updates.

IFILE

Property	Description
Default value	None
Range of values	Valid parameter file names

Use the IFILE initialization parameter to embed another initialization file within the current initialization file. The value should be an absolute path and should not contain environment variables. The three levels of nesting limit do not apply.

See Also: *Oracle Database Reference*

HS_FDS_CONNECT_INFO

Property	Description
Default Value	None
Range of Values	Not applicable

HS_FDS_CONNECT_INFO which describes the connection to the non-Oracle system.

The default initialization parameter file already has an entry for this parameter. The syntax for HS_FDS_CONNECT_INFO for the gateway is as follows:

```
HS_FDS_CONNECT_INFO=dsn_value
```

where, *dsn_value* on Microsoft Windows, is the name of the system DSN defined in the Microsoft Windows ODBC Data Source Administrator and on UNIX based system, it is data source name configured in the odbc.ini file.

The entry for *dsn_value* is case sensitive.

HS_FDS_DEFAULT_OWNER

Property	Description
Default Value	None
Range of Values	Not applicable

The name of the table owner that is used for the non-Oracle database tables if an owner is not specified in the SQL statements.

Note: If this parameter is not specified and the owner is not explicitly specified in the SQL statement, then the user name of the Oracle user or the user name specified when creating the database link is used.

HS_FDS_TRACE_LEVEL

Property	Description
Default Value	OFF
Range of values	OFF, ON, DEBUG

Specifies whether error tracing is turned on or off for gateway connectivity.

The following values are valid:

- OFF disables the tracing of error messages.
- ON enables the tracing of error messages that occur when you encounter problems. The results are written by default to a gateway log file in LOG directory where the gateway is installed.
- DEBUG enables the tracing of detailed error messages that can be used for debugging.

HS_FDS_SHAREABLE_NAME

Property	Description
Default Value	None
Range of Values	Not applicable

Specifies the full path name to the ODBC driver manager.

This is a required parameter, whose format is:

```
HS_FDS_SHAREABLE_NAME=odbc_installation_path/lib/libodbc.sl
```

Where:

odbc_installation_path is the path where the ODBC driver is installed.

This parameter applies only to UNIX based platforms.

HS_FDS_FETCH_ROWS

Property	Description
Default Value	100
Range of Values	Any integer between 1 and 1000
Syntax	HS_FDS_FETCH_ROWS=*num*

HS_FDS_FETCH_ROWS specifies the fetch array size. This is the number of rows to be fetched from the non-Oracle database and to return to Oracle database at one time. This parameter will be affected by the HS_RPC_FETCH_SIZE and HS_RPC_FETCH_REBLOCKING parameters.

HS_FDS_REMOTE_DB_CHARSET

Property	Description
Default Value	None
Range of values	Not applicable
Syntax	HS_FDS_REMOTE_DB_CHARSET

This parameter is valid only when HS_LANGUAGE is set to AL32UTF8 and the gateway runs on Windows. As more Oracle databases and non-Oracle databases use Unicode as database character sets, it is preferable to also run the gateway in Unicode character set. To do so, you must set HS_LANGUAGE=AL32UTF8. However, when the gateway runs on Windows, the Microsoft ODBC Driver Manager interface can exchange data only in the double-byte character set, UCS2. This results in extra ratio expansion of described buffer and column sizes. To compensate, the gateway can adjust to correct size if HS_FDS_REMOTE_DB_CHARSET is set to the corresponding non-Oracle database character set. For example, HS_FDS_REMOTE_DB_CHARSET=KO16KSC5601.

HS_FDS_SQLLEN_INTERPRETATION

Property	Description
Default Value	64
Range of values	{64|32}
Syntax	HS_FDS_SQLLEN_INTERPRETATION= {64|32}

This parameter is only valid for 64 bit platforms. ODBC standard specifies SQLLEN (of internal ODBC construct) being 64 bit on 64 bit platforms, but some ODBC driver managers and drivers violate this convention, and implement it as 32 bit. In order for Oracle Database Gateway for ODBC to compensate their behavior, you need to specify HS_FDS_SQLLEN_INTERPRETATION=32 if you use these types of driver managers and driver.

HS_FDS_REPORT_REAL_AS_DOUBLE

Property	Description
Default Value	FALSE
Range of Values	TRUE, FALSE

Enables Oracle Database Gateway for ODBC treat SINGLE FLOAT PRECISION fields as DOUBLE FLOAT PRECISION fields.

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