

Oracle® Essbase

SQL Interface Guide

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Authors: EPM Information Development Team

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Contents

Documentation Accessibility	5
Documentation Feedback	7
Chapter 1. About SQL Interface	9
Understanding the SQL Interface Process	9
Preparing to Use SQL or Relational Data Sources	9
Chapter 2. Configuring Data Sources	11
About Configuring Data Sources	11
Configuring Data Sources on Windows	11
Configuring Data Sources on UNIX	12
Using Oracle Call Interface	13
Chapter 3. Preparing Multiple-Table Data Sources	15
Methods for Preparing Multiple-Table Data Sources	15
Access Privilege Requirements	15
Preferred Method—Creating One Table or View	15
Joining Tables During Data Loads	15
Chapter 4. Loading SQL Data	17
About Loading Data and Building Dimensions	17
Using Substitution Variables	17
Rules for Substitution Variables	18
Creating and Using Substitution Variables	18
Creating Rules Files and Selecting SQL Data Sources	18
Selecting SQL Data Sources	19
Creating SQL Queries (Optional)	19
Performing Multiple SQL Data Loads in Parallel to Aggregate Storage Databases	19
Chapter 5. Using Non-DataDirect Drivers	23
About Non-DataDirect Drivers	23
Creating Configuration Files for Non-DataDirect Drivers	23
Keywords and Values Used Within Configuration Files	24

Finding Driver Names on Windows	26
Finding Driver Names on UNIX	27
Configuring Non-DataDirect Drivers	27
Appendix A. Enabling Faster Data Loads from Teradata Data Sources	29
Using Teradata Data Sources	29
Installing Required Teradata Software	29
Configuring Teradata as a Data Source	30
Setting Up the Environment for Using Teradata Parallel Transporter	32
Loading Teradata Data Using Teradata Parallel Transporter	33
Customizing Teradata TPT-API Load Settings	33
TD_MAX_SESSIONS	33
TD_TRACE_OUTPUT	34
TD_TRACE_LEVEL	34
TD_TENACITY_HOURS	34
TD_TENACITY_SLEEP	34
Support for Unicode and Multibyte Character Sets	35

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1

About SQL Interface

In This Chapter

Understanding the SQL Interface Process	9
Preparing to Use SQL or Relational Data Sources	9

Understanding the SQL Interface Process

You can use the SQL Interface feature to build dimensions and to load values from SQL and relational databases. For example, you can execute SQL statements that specify retrieval of only summary data.

You do not need SQL Interface for spreadsheet or text-file data sources that can be loaded using Oracle Essbase Administration Services, MaxL, or ESSCMD. See the *Oracle Essbase Database Administrator's Guide* and the *Oracle Essbase Technical Reference*.

With SQL Interface, you can load data from a Unicode-mode relational database to a Unicode-mode Oracle Essbase application. For information on the Essbase implementation of Unicode, see the *Oracle Essbase Database Administrator's Guide*.

SQL Interface works with Administration Services to retrieve data:

1. Using Administration Services, you write a SELECT statement in SQL.
2. SQL Interface passes the statement to a SQL or relational database server.

Note: As needed, SQL Interface converts SQL statements to requests appropriate to non-SQL databases.

3. Using the rules defined in the data-load rules file, SQL Interface interprets the records received from the database server.

For information on data-load rules files, see [Chapter 4, "Loading SQL Data."](#)

4. SQL Interface loads the interpreted summary-level data into the database.

Preparing to Use SQL or Relational Data Sources

SQL Interface is installed during Essbase Server installation. See the *Oracle Enterprise Performance Management System Installation and Configuration Guide* for information about initial configuration tasks.

- To prepare for using SQL or relational data sources:
- 1 **Configure the ODBC driver, and point it to its data source.**
See [Chapter 2, “Configuring Data Sources.”](#)
 - 2 **If data is contained within multiple tables, perform an action:**
 - Before using SQL Interface, in the SQL database, create one table or view.
 - During the data load, join the tables by entering a SELECT statement in Administration Services.
See [“Methods for Preparing Multiple-Table Data Sources” on page 15](#) for instructions.
 - 3 **Verify the data source connection by using Data Prep Editor, in Administration Services Console, to open the SQL source file.**
See [Chapter 4, “Loading SQL Data.”](#)
 - 4 **Create a rules file that tells SQL Interface how to interpret the SQL data that is to be used with the Essbase database.**
See [Chapter 4, “Loading SQL Data.”](#)

After these steps are complete, you can load data or build dimensions; see [Chapter 4, “Loading SQL Data”](#).

2

Configuring Data Sources

In This Chapter

About Configuring Data Sources.....	11
Configuring Data Sources on Windows	11
Configuring Data Sources on UNIX	12
Using Oracle Call Interface	13

About Configuring Data Sources

Before using SQL Interface to access data, you must configure the operating system of each data source and the driver required for each data source.

The Essbase installation provides DataDirect ODBC drivers.

Note: The DataDirect ODBC drivers that connect to Oracle 11g databases are configured to enable multi-threaded connections and to disable uppercase conversion.

To configure non-DataDirect ODBC drivers, or to change the default settings for DataDirect ODBC drivers, see [Chapter 5, “Using Non-DataDirect Drivers.”](#)

For an example of how to configure the data source for Oracle BI Server, see [“Keywords and Values Used Within Configuration Files”](#) on page 24.

For detailed, driver-specific information on each DataDirect driver, see the *DataDirect Connect for ODBC Reference*. This document is typically located in the following directory:

`EPM_ORACLE_HOME/common/ODBC_directory/Merant/driver_version_number/Help`

For a list of supported drivers, see the *Oracle Enterprise Performance Management System Certification Matrix* (<http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html>).

Configuring Data Sources on Windows

On Windows, you use ODBC Administrator to configure data sources.

- To use ODBC Administrator to configure data sources:
- 1 **Select Start, then Administrative Tools, and then Data Sources (ODBC).**
- 2 **Select or add a data source, and enter the required information about the driver.**

For detailed instructions, see the ODBC provider documentation.

Note: SQL Interface does not support data source passwords that include a semicolon (for example, “pass;word”).

Configuring Data Sources on UNIX

- To configure data sources on UNIX:
- 1 **Open the appropriate data source configuration information file: `odbc.ini` or `.odbc.ini`.**

The location of the file that you need to update depends on whether Essbase is installed as part of Oracle Enterprise Performance Management System or Oracle Business Intelligence:

- EPM System—Update the `odbc.ini` file in the following folder:

`$HYPERION_HOME/common/ODBC/Merant/version`

In an EPM System installation, the `.odbc.ini` file that is located in `$ARBORPATH/bin` is linked to the `odbc.ini` file located in `$HYPERION_HOME/common/ODBC/Merant/version`.

- BI—Update the `.odbc.ini` file in the following folder:

`$ARBORPATH/bin`

In a Oracle Business Intelligence installation, the `.odbc.ini` file is not linked to another version of the file.

- 2 **Add a data source description.**
- 3 **If you add data sources or change driver products or data sources, you may need to edit the INI file to update ODBC connection and configuration information, such as data source name and driver product name.**

Update instructions and requirements vary by platform.

Note: SQL Interface does not support data source passwords that include a semicolon (for example, “pass;word”).

UNIX Example: Updating `odbc.ini` for DB2

Assume the following scenario:

- Essbase is installed as part of Oracle Enterprise Performance Management System. Therefore, update the `odbc.ini` file in `$HYPERION_HOME/common/ODBC/Merant/version`.

- The connection is to a DB2 database named “tbc_data” that is on the server named myserver.mycompany.com
- The ODBC data source named “db2data” invokes the DataDirect 7.1 Wire Protocol driver

To edit the `odbc.ini` file, use the `vi` command and insert these example statements (modified as necessary for your environment):

```
[ODBC Data Sources]
db2data=DB2 Source Data on myserver.mycompany.com
...
[db2data]
Driver=/vol1/Oracle/Middleware/EPMSysstem11R1/common/ODBC/Merant/7.1/lib/ARdb226.so
Database=tbc_data
IpAddress=myserver.mycompany.com
TcpPort=50000
```

Using Oracle Call Interface

You can use Oracle Call Interface (OCI) as an alternative to ODBC to significantly improve data load and dimension build performance. With this method, you use Data Prep Editor to specify an OCI connect identifier.

To use an Oracle OCI connect identifier, use the following syntax for the Data Source Name (DSN) identification:

```
server:port/Oracle_service_name
```

For example:

```
myserver:1521/orcl.us.oracle.com
```

See also *Oracle Essbase Administration Services Online Help*.

On AIX systems, when you load SQL data using OCI, you must enable asynchronous I/O or the data load fails with this message:

```
Cannot get async process state. Essbase Error(1021104): Cannot load instant client shared library [libociei.so].Make sure that the required binaries are present with correct environment variables set.
```

➤ To enable asynchronous I/O on AIX:

1 Run this command to determine the state of the `aio0` driver:

```
lsdev -C -l aio0
```

Example output:

```
aio0 Defined Asynchronous I/O
```

Defined indicates that the `aio0` driver is installed on the system but is not available for applications to use. If the driver is not available for applications, change the state of the `aio0` driver from *Defined* to *Available*.

2 Run the `cfgmgr` AIX command:

```
cfgmgr -l aio0
```

- 3 To make the *Available* state permanent (across system reboots), issue the `chdev` AIX command:**

```
chdev -l aio0 -P -a autoconfig='available'
```

You do not need to reboot the system to effectuate these changes.

Example output:

```
aio0 changed
```

- 4 Run this command to check the state of the `aio0` driver:**

```
lsdev -C -l aio0
```

Example output:

```
aio0 Available Asynchronous I/O
```

3

Preparing Multiple-Table Data Sources

In This Chapter

Methods for Preparing Multiple-Table Data Sources	15
Joining Tables During Data Loads	15

Methods for Preparing Multiple-Table Data Sources

- Before you use SQL Interface, in the SQL database, create one table or view.
- As you load data, join tables by entering a SELECT statement in Administration Services Console.

Access Privilege Requirements

For creating one table or view and for joining tables, you must have SELECT access privileges to the tables in which data is stored. For creating one table or view, you must have CREATE access privileges in the SQL database.

Preferred Method—Creating One Table or View

SQL database servers read from one table and maintain one view more efficiently than they process multiple-table SELECT statements. Therefore, creating one table or view before you use SQL Interface greatly reduces the processing time required by SQL servers.

Joining Tables During Data Loads

If you cannot obtain CREATE privileges, you must use Administration Services to join tables during the data load.

- To join tables during the data load:
 - 1 Obtain SELECT access privileges to the tables in which relevant data is stored.
 - 2 In Administration Services Console, create a SELECT statement that joins the tables.
 - a. Identify the tables and columns that contain the data that you want to load into Essbase.
 - b. Select **File**, and then **Open SQL** to display **Open SQL Data Sources**.

See the *Oracle Essbase Administration Services Online Help*.

- c. Write a SELECT statement that joins the tables.

See [“Selecting SQL Data Sources” on page 19](#) and [“Creating SQL Queries \(Optional\)” on page 19](#).

Note: Essbase passes the SELECT statement to the database without verifying the syntax.

4

Loading SQL Data

In This Chapter

About Loading Data and Building Dimensions.....	17
Using Substitution Variables.....	17
Creating Rules Files and Selecting SQL Data Sources.....	18
Performing Multiple SQL Data Loads in Parallel to Aggregate Storage Databases.....	19

About Loading Data and Building Dimensions

After configuring one or more SQL data sources and preparing multiple-table data, you can use Oracle Essbase Administration Services to load data and build dimensions.

► To load data and build dimensions:

1 If you plan to use substitution variables, create them.

See “Using Substitution Variables” on page 17.

2 Create rules files and select a data source.

See:

- “Creating Rules Files and Selecting SQL Data Sources” on page 18
- “Performing Multiple SQL Data Loads in Parallel to Aggregate Storage Databases” on page 19

3 Load data into the Essbase database.

See the *Oracle Essbase Administration Services Online Help*.

Using Substitution Variables

Using substitution variables in SQL strings and data source names enables you to use one rules file for multiple data sources. One substitution variable can apply to all applications and databases on an Essbase server or to a particular application or database.

You can also define substitution variables for data source names (DSNs) and specify in the rules file the substitution variable names.

Rules for Substitution Variables

- Use only valid and appropriate SQL values. Essbase does not validate values.
- Be especially careful with quotation marks (single and double). Different databases require different conventions.
- Because the ampersand (&) is the Essbase identifier for substitution variables, do not begin SQL operators in SELECT, FROM, or WHERE clauses with ampersands.

Creating and Using Substitution Variables

► To create and use substitution variables:

- 1 Using the instructions in the *Oracle Essbase Administration Services Online Help*, create the substitution variable.
- 2 As you edit the rule file, open the SQL data source by selecting **File**, then **Open SQL**.
See the *Oracle Essbase Administration Services Online Help*.
- 3 In the **Open SQL Data Sources** dialog box, perform an action:
 - To specify a substitution variable for the DSN, select **Substitution Variables**, and select a substitution variable.
 - To specify a substitution variable in the query, in **Select**, **From**, or **Where**, enter the substitution variable (with its preceding ampersand), instead of a “field=value” string.
- 4 Click **OK/Retrieve** to retrieve the data for the rules file.

Note: You must set the values for the substitution variables before you use the rules file for a data load or dimension build.

Creating Rules Files and Selecting SQL Data Sources

1. Create a data-load rules file; see the *Oracle Essbase Administration Services Online Help*.
Data-load and dimension-build rules are sets of operations that Essbase performs on data as the data is loaded into Essbase databases or used to build the dimensions of Essbase outlines. The operations are stored in rules files.
2. Select a SQL data source.
See “[Selecting SQL Data Sources](#)” on page 19.
3. If you plan to create SQL queries in Essbase, see “[Creating SQL Queries \(Optional\)](#)” on page 19.

Selecting SQL Data Sources

► To select SQL data sources:

- 1 In **Administration Services Console**, open **Data Prep Editor** or a rules file.
- 2 Select **File**, then **Open SQL**.
- 3 In **Select Database**, enter the names of the Essbase Server, application, and database, and click **OK**.
- 4 In **Open SQL Data Sources**, select the data source or the substitution variable, and enter required information.

See “Opening an SQL Database” in the *Oracle Essbase Administration Services Online Help*.

- 5 Click **OK/Retrieve**.
- 6 In **SQL Connect**, enter the user name and password for the source database, and click **OK**.

Facts about data source files:

- The data source file must be configured on the server computer.
- On UNIX platforms, the path for the SQL data source file is defined in the `.odbc.ini` file.
- On Windows, if the path for the SQL source file was not defined in ODBC Administrator, it can be entered in the Database box of the Define SQL dialog box.
- If a path is not defined, Essbase looks for the data source file in the directory from which Essbase Server is running.

Creating SQL Queries (Optional)

Instead of creating tables or views to select data for retrieval, you can write SELECT statements as you perform data loads.

Note: Creating SELECT statements in Essbase is usually slower than creating a table or view in the source database.

The SQL Statement box in the Open SQL Data Sources dialog box provides Select, From, and Where text boxes that help you write SQL queries. You can specify multiple data sources, filter the display of records, and specify how records displayed in Data Prep Editor are ordered and grouped.

Performing Multiple SQL Data Loads in Parallel to Aggregate Storage Databases

When loading SQL data into aggregate storage databases, you can use up to eight rules files to load data in parallel. Each rules file must use the same authentication information (SQL user name and password).

Essbase initializes multiple temporary aggregate storage data load buffers (one for each rules file), where data values are sorted and accumulated. When the data is fully loaded into the data load buffers, Essbase commits the contents of all buffers into the database in one operation, which is faster than committing buffers individually.

Note: This functionality is different than using the **import ... data to load_buffer with buffer_id** grammar to load data into a buffer, and then using the **import ... data from load_buffer with buffer_id** grammar to explicitly commit the buffer contents to the database. For more information on aggregate storage data load buffers, see the *Oracle Essbase Database Administrator's Guide*.

In MaxL, use the import database MaxL statement with the **using multiple rules_file** grammar. See the *Oracle Essbase Technical Reference*.

In the following example, SQL data is loaded from two rules files (`rule1.rul` and `rule2.rul`):

```
import database AsoSamp.Sample data
  connect as TBC identified by 'password'
  using multiple rules_file 'rule1' , 'rule2'
  to load_buffer_block starting with buffer_id 100
  on error write to "error.txt";
```

In specifying the list of rules files, use a comma-separated string of rules file names (excluding the `.rul` extension). The file name for rules files must not exceed eight bytes and the rules files must reside on Essbase Server.

In initializing a data load buffer for each rules file, Essbase uses the starting data load buffer ID you specify for the first rules file in the list (for example, ID 100 for `rule1`) and increments the ID number by one for each subsequent data load buffer (for example, ID 101 for `rule2`).

This feature requires parallel SQL connections. You must create a SQL configuration file named `esssql.cfg` in the `ESSBASE_CONFIG_PATH` to change the default settings for the ODBC driver you are using. (By default, SQL Interface disables parallel connections for the DataDirect ODBC drivers that are provided with Essbase.)

`ESSBASE_CONFIG_PATH` is an environment variable that points to `DOMAIN_HOME/config/fmwconfig/biconfig/essbase`, where `DOMAIN_HOME` is represented by `ORACLE_HOME/user_projects/domains/DOMAIN_NAME`.

`DOMAIN_NAME` is the name of the Oracle WebLogic Server domain specified at the time of the BI configuration setup process.

`ORACLE_HOME` is the directory under which all Oracle Middleware products are hosted or installed. For example,

```
/home/$userid/Oracle/Middleware/Oracle_Home
```

or

```
C:\Oracle\Middleware\Oracle_Home
```

The following examples enable parallel SQL connections:

- Microsoft SQL on Windows (non-DataDirect driver):

```
[  
Description "SQL Server"  
DriverName SQLSRV  
UserId 1  
Password 1  
Database 1  
SingleConnection 0  
UpperCaseConnection 0  
IsQEDriver 0  
]
```

- Microsoft SQL on UNIX and Linux (DataDirect driver):

```
[  
Description "DataDirect SQL Server Native Wire Protocol"  
DriverName ARSQLS  
UserId 1  
Password 1  
Database 1  
SingleConnection 0  
UpperCaseConnection 0  
IsQEDriver 1  
]
```

You must restart Essbase Server for the change to take affect.

5

Using Non-DataDirect Drivers

In This Chapter

About Non-DataDirect Drivers	23
Creating Configuration Files for Non-DataDirect Drivers.....	23
Configuring Non-DataDirect Drivers	27

About Non-DataDirect Drivers

You must configure all non-DataDirect drivers (drivers other than the DataDirect drivers distributed with Essbase) for all data sources.

Some, but not all, non-DataDirect drivers are tested and supported for Essbase. For detailed information about qualified drivers and data sources, see the *Oracle Enterprise Performance Management System Installation and Configuration Guide*.

The information in the section also applies if you want to change the default settings for DataDirect ODBC drivers that are distributed with Essbase.

Creating Configuration Files for Non-DataDirect Drivers

You create a configuration file (*ESSBASE_CONFIG_PATH/esssql.cfg*) when you want to connect to a database using non-DataDirect drivers, or when you want to change the default settings for the DataDirect ODBC drivers that are distributed with Essbase.

ESSBASE_CONFIG_PATH is an environment variable that points to *DOMAIN_HOME/config/fmwconfig/biconfig/essbase*, where *DOMAIN_HOME* is represented by *ORACLE_HOME/user_projects/domains/DOMAIN_NAME*.

DOMAIN_NAME is the name of the WebLogic Server domain specified at the time of the BI configuration setup process.

ORACLE_HOME is the directory under which all Oracle Middleware products are hosted or installed. For example,

```
/home/$userid/Oracle/Middleware/Oracle_Home
```

or

```
C:\Oracle\Middleware\Oracle_Home
```

Note: Oracle Hyperion Enterprise Performance Management System Configurator may add entries to `essbase.cfg` during ODBC driver configuration, as well as during Essbase Server configuration, cluster configuration, and JVM setup.

By default, some ODBC data source drivers may be disabled by the presence of a semicolon (;) comment indicator at the beginning of the data source entry in `essbase.cfg`. If you are unable to connect to a non DataDirect data source, you may need to edit `essbase.cfg` to make sure that the data sources you are using are listed, and are not disabled by the semicolon comment indicator.

See:

- [“Keywords and Values Used Within Configuration Files” on page 24](#)
- [“Finding Driver Names on Windows” on page 26](#)
- [“Finding Driver Names on UNIX” on page 27](#)

Keywords and Values Used Within Configuration Files

The `esssql.cfg` configuration file must contain the driver file name (`DriverName`) and an optional description (`Description`). The configuration file may contain additional keywords, the values for which are 0 or 1. See [Table 1](#).

Table 1 Configuration File Keywords and Values for Non-DataDirect Drivers

Keyword	Value	Value = 0	Value = 1
Description	(Optional) A description of the driver, enclosed in double quotation marks The default value for <code>Description</code> is " "	N/A	N/A
DriverName	(Required) The driver file name	N/A	N/A
UpperCaseConnection	0 or 1	Driver case-sensitive—Connection information not converted (default) Tip: If the connection to the database server fails and the Application log shows an “invalid username/password; logon denied” message, check the case of the username and password in your database and compare it to what you are entering in Administration Services Console. To switch off case-sensitivity, change this value from 0 to 1.	Driver not case-sensitive—Connection information converted to uppercase
UserId	0 or 1	User ID not required (default)	User ID required
Password	0 or 1	Password not required (default)	Password required

Keyword	Value	Value = 0	Value = 1
Database	0 or 1	Database name not required (default)	Database name required
Server	0 or 1	Server name not required (default)	Server name required
Application	0 or 1	Application name not required (default)	Application name required
Dictionary	0 or 1	Dictionary name not required (default)	Dictionary name required
Files	0 or 1	File name not required (default)	File name required
SingleConnection	0 or 1	Driver thread-safe—Multiple active connections permitted Note: Not recommended for non-Data Direct drivers, or for DataDirect drivers except for those used to connect to Oracle 11g databases, for which it is the default; may cause instability.	Driver not thread-safe—One active connection permitted (default) The recommendation for all DataDirect drivers except for those used to connect to Oracle 11g databases.
IsQEDriver	0 or 1	Driver a non-DataDirect driver (default)	Driver a DataDirect driver Note: You can specify configuration information for DataDirect drivers. For example, you can specify information for a version of a DataDirect driver that Essbase does not support.
ConvertUTF16toUTF8	0 or 1	No conversion of UTF16 data to UTF8 (this is the default).	Convert UTF16-encoded data from an Oracle BI data source to UTF8. This is required on UNIX for SQL data loads to Essbase from OBI.

Defaults apply to values that are not specified. The defaults applied within configuration files differ from the Essbase default values that apply if no `esssql.cfg` file exists.

Keywords and values must be separated by at least one space, and the set of keywords and values for each driver must be enclosed within brackets ([]).

Different drivers may require additional values. See the driver documentation for specific information.

The following example of an `esssql.cfg` file includes configuration information for these drivers:

- Oracle Wire Protocol; this entry changes the default settings for the DataDirect drivers distributed with Essbase
- Microsoft SQL Server, a non-DataDirect driver
- Oracle BI Server
- Teradata

```
[
Description "Oracle Wire Protocol"
DriverName ARORA
UpperCaseConnection 0
```

```

UserId 1
Password 1
Database 1
SingleConnection 0
IsQEDriver 1
]

[
Description "Microsoft SQL Server 32-bit"
DriverName SQLSRV32
UpperCaseConnection 0
UserId 1
Password 1
Database 1
SingleConnection 0
IsQEDriver 0
]

[
Description "Oracle BI Server"
DriverName libnqsodbc
UpperCaseConnection 0
UserId 1
Password 1
Database 1
SingleConnection 0
IsQEDriver 0
ConvertUTF16toUTF8 1
]

[
Description "Teradata"
DriverName TDATA32
UpperCaseConnection 0
UserId 1
Password 1
Database 1
SingleConnection 0
IsQEDriver 0
]

```

Note: The DataDirect ODBC drivers that connect to Oracle 11g databases are configured to enable multi-threaded connections and to disable uppercase conversion. To enable multi-threaded connections for the SQL Server Wire Protocol driver, see [“Performing Multiple SQL Data Loads in Parallel to Aggregate Storage Databases”](#) on page 19.

Finding Driver Names on Windows

► To find driver names on Windows:

- 1 Using a method from [step 1](#) in [“Configuring Data Sources on Windows”](#) on page 11, start ODBC Administrator:

The **ODBC Data Source Administrator** dialog box opens.

Configured data sources are listed in **the User Data Sources** box. Drivers that are not properly configured but are listed in the User Data Sources box can be ignored.

- 2 Select the **Drivers** tab.
- 3 Obtain the file name of the preferred driver by scrolling to the right.

For example, the file name for the Microsoft Access Driver is ODBCJT32 . DLL.

Finding Driver Names on UNIX

- To find driver names on UNIX, view the `.odbc.ini` file.

See [“Configuring Data Sources on UNIX” on page 12](#).

Configuring Non-DataDirect Drivers

Essbase recognizes the basic configuration information for DataDirect drivers, such as the name of the driver and whether the name and password are case-sensitive. You must provide configuration information for non-DataDirect drivers, or if you want to change the default settings for the DataDirect drivers that are distributed with Essbase.

- To provide configuration information:
 - 1 Create a configuration file (a text file) named `esssql.cfg`.
 - 2 Place the file in the `ESSBASE_CONFIG_PATH`.

`ESSBASE_CONFIG_PATH` is an environment variable that points to `DOMAIN_HOME/config/fmwconfig/biconfig/essbase`, where `DOMAIN_HOME` is represented by `ORACLE_HOME/user_projects/domains/DOMAIN_NAME`, and `DOMAIN_NAME` is the name of the Oracle WebLogic Server domain specified at the time of the BI configuration setup process.

`ORACLE_HOME` is the directory under which all Oracle Middleware products are hosted or installed. For example,

```
/home/$userid/Oracle/Middleware/Oracle_Home
```

or

```
C:\Oracle\Middleware\Oracle_Home
```

Note: If you do not create a configuration file, Essbase uses default values that may prevent you from connecting to SQL databases.



Enabling Faster Data Loads from Teradata Data Sources

In This Appendix

Using Teradata Data Sources	29
Installing Required Teradata Software	29
Configuring Teradata as a Data Source	30
Setting Up the Environment for Using Teradata Parallel Transporter	32
Loading Teradata Data Using Teradata Parallel Transporter	33
Customizing Teradata TPT-API Load Settings	33
Support for Unicode and Multibyte Character Sets	35

Using Teradata Data Sources

You can use Teradata Parallel Transporter (TPT) from Teradata Tools and Utilities to significantly improve data load performance. With this method, ODBC is used to extract the database schema; then TPT retrieves the data.

For information about the versions of Teradata databases that Essbase supports as data sources, and supported Teradata ODBC drivers, see the *Oracle Enterprise Performance Management System Certification Matrix* (<http://www.oracle.com/technetwork/middleware/bi-foundation/hyperion-supported-platforms-085957.html>).

Installing Required Teradata Software

The customer is responsible for having the correct Teradata license and ODBC version installed and configured on the Essbase Server computer. See the Teradata documentation for installation instructions.

- From Teradata Tools and Utilities, install Teradata Parallel Transporter Export Operator, Shared ICU Libraries for Teradata, Teradata GSS Client, and CLI. (For Linux installations, select libraries built by GCC 3.3.)
- Install the Teradata ODBC driver.

Configuring Teradata as a Data Source

► To configure Teradata as a data source:

1 Install Teradata drivers, which you must obtain from Teradata.

- Oracle Essbase Studio uses JDBC drivers. The JDBC Teradata driver must be installed on the computer on which Essbase Studio Server runs.

Essbase Studio uses the JDBC Teradata driver to deploy cubes in streaming mode.

To deploy cubes in non-streaming mode, the ODBC Teradata driver must be installed on the computer on which Essbase Server runs.

- Essbase Server uses ODBC drivers. The ODBC Teradata driver must be installed on the computer on which Essbase Server runs.

2 Stop Essbase Server from the Windows Services panel using the Oracle Process Manager and Notification Server (OPMN) service: EPM_epmsystem1.

3 Backup the OPMN configuration file (opmn.xml).

For example:

```
C:\Oracle\Middleware\user_projects\epmsystem1\config\OPMN\opmn\opmn.xml
```

4 Open the opmn.xml file in a text editor.

5 To properly load the Teradata drivers, the opmn.xml file must include a statement that points to the location of the Teradata libraries.

- a. Locate the following statement in the opmn.xml file:

```
<variable id="ESS_CSS_JVM_OPTION7" value="-  
Djava.util.logging.config.class=oracle.core.ojdl.logging.LoggingConfiguration"/>
```

- b. After this statement, add a statement similar to the following one:

```
<variable append="true" id="PATH" value="C:\Program Files\Teradata\Client  
\14.00\Shared ICU Libraries for Teradata\lib"/>
```

6 When using Teradata data sources with Essbase Server, and using OPMN to monitor and control the Oracle Essbase Agent process, you must update the opmn.xml file with variables for the operating system you are using.

Note: The absolute path value cannot contain spaces. The examples of absolute path values are based on a 64-bit machine configuration.

64-bit Windows

Add these variables:

- TWB_ROOT: Teradata root
- PATH: Teradata shared libraries
- PATH: Teradata client DLL libraries
- PATH: Teradata Call-Level Interface Version 2 routines

- PATH: Teradata message DLL libraries

64-bit Windows example:

```
<variable id="TWB_ROOT" value="C:\PROGRA~1\Teradata\Client\14.00"/>
<variable append="true" id="PATH" value="C:\PROGRA~1\Teradata\Client\14.00\SHARED~1\lib"/>
<variable append="true" id="PATH" value="C:\PROGRA~1\Teradata\Client\14.00\TERADA~1\bin64"/>
<variable append="true" id="PATH" value="C:\PROGRA~1\Teradata\Client\14.00\CLIV2"/>
<variable append="true" id="PATH" value="C:\PROGRA~1\Teradata\Client\14.00\TERADA~1\msg64"/>
```

64-bit AIX

Add these variables:

- LIBPATH: Teradata ODBC libraries
- LIBPATH: Teradata shared libraries
- LIBPATH: ODBC components needed to load Teradata ODBC drivers
- LIBPATH: Teradata client libraries
- COPERR: Directory where the `errmsg.txt` file resides
- NLSPATH: Teradata message libraries

64-bit AIX example:

```
<variable append="true" id="LIBPATH" value="/opt/teradata/client/ODBC_64/lib"/>
<variable append="true" id="LIBPATH" value="/opt/teradata/client/13.10/tdicu/lib64"/>
<variable append="true" id="LIBPATH" value="/usr/odbc/lib:/usr/odbc/drivers"/>
<variable append="true" id="LIBPATH" value="/usr/lib:/usr/teragss/aix-power/client/lib"/>
<variable id="COPERR" value="/usr/libperion/essbase"/>
<variable id="NLSPATH" value="/opt/teradata/client/13.10/odbc_32/msg/%N"/>
<variable append="true" id="NLSPATH" value="/usr/lib/nls/msg/%L/%N"/>
<variable append="true" id="NLSPATH" value="/usr/lib/nls/msg/%L/%N.cat"/>
```

64-bit LINUX

Add these variables:

- TWB_ROOT: Teradata root
- TD_ICU_DATA: Teradata shared libraries
- NLSPATH: Teradata ODBC message libraries
- COPERR: Directory where the `errmsg.txt` file resides
- COPLIB: Directory where the `libcliv2.so` library file resides
- LD_LIBRARY_PATH: Teradata libraries
- PATH: Teradata client directories

Note: The `errmsg.txt` and `libcliv2.so` files typically reside in the same directory. Therefore, the value for the COPERR and COPLIB variables is typically identical.

64-bit LINUX example:

```
<variable id="TWB_ROOT" value="/opt/teradata/client/13.10/tbuild"/>
<variable id="TD_ICU_DATA" value="</opt/teradata/client/13.10/tdicu/lib64>"/>
<variable id="NLSPATH" value="</opt/teradata/client/13.10/odbc_64/msg/%N >"/>
<variable append=true id=NLSPATH value=/opt/teradata/client/13.10/tbuild/msg64/%N/>
<variable id="COPEER" value="/usr/lib64"/>
<variable id="COPLIB" value="/usr/lib64"/>
<variable append=true id=LD_LIBRARY_PATH value=/opt/teradata/client/13.10/tbuild/
lib64/>
<variable append=true id=LD_LIBRARY_PATH value=/usr/lib64/>
<variable append=true id=PATH value=/opt/teradata/client/13.10/tbuild/bin/>
<variable append=true id=PATH value=/opt/teradata/client/13.10/tbuild/lib64/>
```

7 Save the `opmn.xml` file.

8 Start Essbase Server from the Windows Services panel using the Oracle Process Manager and Notification Server service (EPM_epmsystem1).

9 Verify the following:

- Essbase Server: Use the Data Prep Editor in Administration Services Console to connect to a Teradata database using a DNS.
- Oracle Essbase Studio: Perform a cube deployment in non-streaming mode, which uses the Teradata ODBC driver.

Setting Up the Environment for Using Teradata Parallel Transporter

Follow the instructions in [Chapter 2, “Configuring Data Sources,”](#) and then perform these tasks:

- Add an entry to the hosts file for the Teradata database; for example:
172.27.24.181 tera2db tera2cop1
- Configure a system ODBC DSN for \$TELAPI\$<tera> where <tera> is the name of the Teradata data source; for example:
DSN = \$TELAPI\$tera2db
- For UNIX operating systems, ensure needed environment variable paths are defined in the appropriate location (the Windows installation automatically updates needed environment variables):
 - TD ODBC driver
 - CLIV2
 - TD GSS
 - Shared ICU
 - TPT export operator files
 - DataDirect ODBC driver
- In addition, in the appropriate path for the operating system, set the following variables for Teradata Parallel Transporter. (For details, see the “Code Samples” appendix in *Teradata*

Parallel Transporter Application Programming Interface Programmer Guide); for example, for Solaris SPARC:

- `export LD_LIBRARY_PATH = <library path>:$LD_LIBRARY_PATH`
`export LD_LIBRARY_PATH = /usr/tbuild/12.00.00/lib:$LD_LIBRARY_PATH`
- `export NLSPATH = <directory path of the catalog>/%N:$NLSPATH`
`export NLSPATH = /usr/tbuild/12.00.00/msg/%N:$NLSPATH`
- (If CLI is not installed in the default directory) `export COPERR = <directory location of errmsg.cat >`
`export COPERR = /usr/lib`

Loading Teradata Data Using Teradata Parallel Transporter

Follow the instructions in [Chapter 4, “Loading SQL Data.”](#) When you open the SQL data source, select the desired data source name with the prefix \$TELAPI\$ that you defined as the ODBC DSN. For the SQL statement, define a native Teradata query in the SQL SELECT, FROM, and WHERE statements. Do NOT include carriage returns or line feeds in these statements. Each entry must be in a single statement. See the relevant Teradata documentation for native Teradata SQL query rules.

Customizing Teradata TPT-API Load Settings

When using the Teradata TPT-API for data load, you can customize settings that provide greater flexibility while loading data through the TPT-API. The following settings, if included in `essbase.cfg`, allow you to customize Teradata TPT-API data load options.

- `TD_MAX_SESSIONS`
- `TD_TRACE_OUTPUT`
- `TD_TRACE_LEVEL`
- `TD_TENACITY_HOURS`
- `TD_TENACITY_SLEEP`

TD_MAX_SESSIONS

Specifies the maximum number of Teradata data load sessions that can be logged on.

Syntax

```
TD_MAX_SESSIONS n
```

Where *n* is an integer specifying the maximum number of data load sessions that can be logged on. Values: 0-255, where zero terminates the data load session. The default value is 4.

TD_TRACE_OUTPUT

Sets the location for Teradata tracing messages.

Syntax

```
TD_TRACE_OUTPUT tracefile
```

Where *tracefile* is a file name, or path to a file name, for tracing messages. The default value is "Essbase_TPT_Trace.txt". This file is in the *ORACLE_INSTANCE* location; for example, /scratch/aime/Oracle/Middleware/user_projects/epmsystem1/.

TD_TRACE_LEVEL

Sets the Teradata driver tracing level. The default is TD_OFF.

Syntax

```
TD_TRACE_LEVEL trace_constant
```

Where *trace_constant* can be one of the following constants:

- "TD_OPER"—Enables tracing for driver-specific activities
- "TD_OFF"—Tracing is disabled
- "TD_OPER_ALL"—Enables all driver-level tracing
- "TD_OPER_CLI"—Enables tracing for activities involving CLIV2
- "TD_OPER_NOTIFY"—Enables tracing for activities involving the Notify feature
- "TD_OPER_OPCOMMON"—Enables tracing for activities involving the operator
- NULL—Ends argument list

TD_TENACITY_HOURS

Sets the number of hours that the Teradata load driver continues retrying a logon when the maximum number of allowed operations are already running on the Teradata database.

Syntax

```
TD_TENACITY_HOURS n
```

Where *n* can be a positive or negative integer, *-n* to *n*. The default value is 4. A zero value disables this retry option. A negative value terminates the data load.

TD_TENACITY_SLEEP

Sets the number of minutes that the Teradata load driver continues retrying a logon when the maximum number of allowed operations are already running on the Teradata database.

Syntax

TD_TENACITY_SLEEP *n*

Where *n* can be zero or a positive integer. The default value is 6.

Support for Unicode and Multibyte Character Sets

Teradata supports multibyte character set (MBCS) and Unicode text, which Essbase Server retrieves using TPTapi.

To use this functionality, perform these tasks:

- Verify that the client character set that Essbase Server uses is installed or enabled in the Teradata database.
- Make sure that the character set of the ODBC driver matches the character set that Essbase Server passes to TPTapi.

To do so, you should create the ODBC connection DSN with the character set name that matches that used by the \$ESSLANG variable, as shown in [Table 2](#).

Table 2 Supported Character Sets

Character Set	\$ESSLANG Variable Setting
Latin (covers almost all western languages)	Various
Japanese	KANJISJIS_05
Unicode	UTF8

Note: Essbase retrieves data in the supported character set; however, the SQL queries must be in English.

