

D3 Oracle Gateway 2.1 User's Guide

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D3 Oracle Gateway

The D3 Oracle Gateway is an OSFI interface that allows the D3 programmer to open, read, write and select data from an Oracle database with all the standard D3 tools such as BASIC, Update Processor, Editor, AQL, and so on. Oracle's OCI interface is used to implement the D3 Oracle Gateway.

Due to differences in library code between versions of Oracle and D3, the D3 Oracle Gateway is shipped as an unlinked object that must be linked with your Oracle libraries. This procedure enumerates the tasks that must be completed to install the D3 Oracle Gateway.

Limitations

The following limitations apply to the D3 Oracle Gateway:

Item Locks

The Oracle database implements row locking on a transactional level. In a typical transaction, a row is retrieved using a `select` statement with the `for update` clause, and then updates are performed using the `update` or `delete` statements. A `commit` or `rollback` statement is executed to update the database, releasing the row lock. A transaction can consist of multiple rows retrieved and locked, which are *all* released when a `commit` or `rollback` statement is executed.

Since a D3 transaction can consist of multiple item locks, this behavior can pose a problem to an application. To overcome this limitation, the D3 Oracle Gateway internally keeps track of all item locks (`readu`) set and released (`write/release`) and only commits transactions when there are no outstanding item locks. This means that if an application locks multiple items and then performs a write on one of the locked items, the update will not be visible in the Oracle database until the remaining item locks are released.

Item-ID Must be Unique

The item-ID must be constrained to be unique in the underlying Oracle table. If it is not, then inserts will not fail when they should. Then each D3 write will create a new record, even if the item-ID already existed.

Supported Data Types

The following data types are supported for the underlying Oracle Table or View:

- VARCHAR2
- NUMBER
- CHAR
- DATE

Date Data Type

The date data type returns the date in the external (`oconv`) format, not the internal (`iconv`) numeric format.

Software Requirements

AIX

AIX version 5L 5.2.0.10 or higher and the C compiler must be installed on the system.

Linux

Redhat Enterprise Linux 5 or higher and the C compiler must be installed on the system.

D3 version 7.4.1 or later

You must have D3 7.4.1 or later installed on your system to continue.

Oracle version 11g Runtime Client

The Oracle version 11g runtime client.

Install and configure Oracle Net on both the D3 machine and the Oracle machine following the instructions in the Oracle documentation. Test the connection to Oracle using SQL*PLUS. (SQL*PLUS is included in the Oracle client runtime install.)

The Oracle files listed below are needed to build an OSFI Oracle-enabled monitor:

Directory	File Names and Description
ORACLE_HOME/lib/ or ORACLE_HOME/lib32/	Oracle libraries: libclnsh.so.ll.1 libnnzll.so

Directory	File Names and Description	
ORACLE_HOME/network/admin/	tnsnames.ora	This file is created using Oracle's network manager utility and is distributed to each node on the network. (You can copy this file from the Oracle server's /ORACLE_HOME/network/admin directory over to the D3 system.)

Before Starting

Backing up on AIX or Linux

These Unix files will change during the backup procedure. Back up these files to another directory or to tape before the installation:

- /usr/bin/d3
- /usr/bin/odbcdrv

Installation Steps for D3 AIX or Linux

► **To install the D3 Oracle Gateway for D3 AIX or Linux:**

1. Log in to Unix as root.
2. Log on to D3 as user dm to the dm account.
3. Shut down D3. Enter:

```
shutdown
```

4. Respond **Y** at the prompt Do you wish to continue (Y/N/O) ?

Wait for the Flush complete message to display. It may display before or after the virtual machine halted message.

5. **(For Aix Only)** Create a directory on which to mount the CD. Enter:

```
cd /  
mkdir /cdrom
```

6. **(For Aix Only)** Load and mount the D3 Oracle Gateway CD on the /cdrom directory. For example:

```
mount -v cdrfs -r /dev/cd0 /cdrom
```

If /dev/cd0 is not the correct device name, contact your system administrator for the correct device name.

7. Enter these commands:

For Linux:

```
cd /usr/lib/pick  
tar xvf /media/D3OracleGW/linux/D3OG*.tar  
/usr/lib/pick/D3OG_setup
```

For Aix:

```
cd /usr/lib/pick  
tar xvf /cdrom/aix/D3OG*.tar
```

/usr/lib/pick/D3OG_setup

WARNING— For AIX Only: If running a 64-bit version of Oracle, you must modify the `ADDON_LIBS=` item of the script in the `/user/lib/pick/dog-7.4.0` directory by changing the *lib* portion of the directory reference to *lib32*. For example: `/ora01/app/product/9.2.0/lib32`.

8. Define the `ORACLE_HOME` environment variable.
Contact your Oracle Database Administrator for assistance or refer to your Oracle documentation for the correct location for your system. Possible values are `/u01/app/oracle/product/11.1.0/client_1/`.
9. Back up the existing ODBC server (`/usr/bin/odbcdrv`) and monitor (`/usr/bin/ap` or `/usr/bin/d3`) since the next command overwrites them.
10. Change the user in the `pick0` file to root.
11. Run the `D3_setup` program. Enter:
D3_setup
See the *D3 AIX Installation Guide* for detailed instructions.
12. Restart the D3 virtual machine. Enter:
d3 -0
The installation is complete. To activate, contact TigerLogic Customer Service.

Defining D3 Oracle Gateway dm,hosts, File Entries

The D3 Oracle Gateway dm,hosts, file entries can be configured during installation or at a later time. All OSFI data sources MUST be identified by an entry in the dm,hosts, file. The dm,hosts, file converts a host name to a driver number and connection information. Each Oracle dm,hosts, file item identifies a specific schema -- the intersection of the computer name, the Oracle instance name within that computer, and the schema name within that instance.

Item-ID

The item-ID identifies the specific Oracle schema. It can be used within super Q-pointers and fully qualified path names.

Attribute 1

Attribute 1 of the dm,hosts, record is always the driver number for an OSFI driver. In the case of the D3 Oracle Gateway, the driver number is 3.

Attribute 2

Attribute 2 contains the logon string used to log on to the Oracle database for this schema. The password can appear as part of the logon string (scott/tiger@orcl).

Example dm,hosts, entry

Attr	Data	Description
item-ID	Oravms	The D3 name for the specific schema that is the intersection of the computer name, database instance name and schema name.
1	3	Unique driver number. This is the same for all D3 Oracle Gateway dm,hosts, file entries.
2	scott/tiger@orcl	Logon string: scott user name tiger password orcl as defined in the tnsnames.ora file

Creating Q-pointers

Create the D3 Oracle Gateway Q-pointers for each Oracle database. The remote Q-pointer defines the D3 view of an Oracle table. The name of each Oracle table column available to D3 is enumerated within the Q-pointer.

NOTE— Due to caching, each time that a super Q-pointer is modified, the current D3 session must be logged off to flush the super Q-pointer information from the server.

Item-ID

The super Q-pointer item-ID is used the same way as any other file-pointer item-ID -- as the name of a file to open.

Attributes 1 and 2

Attribute 1 is always a q. Attribute 2 is always blank for super Q-pointers.

Attribute 3

Attribute 3 has the Oracle table name, and an optional slash with a view name or number. The D3 Oracle Gateway only opens a file name once, and returns a pointer to the opened file descriptor for each subsequent open. Oracle tables (files) can be opened more than once with different sets of primary keys/columns, so we need a way to defeat the open caching for differing columns/primary keys. We do that with the tablename/view. Unless you intend to open the same Oracle table with differing primary key definitions or column definitions, you do not need to worry about this.

Attribute 4

Attribute 4 defines what primary keys and columns work with the Q-pointer. For an Oracle Q-pointer, the data is structured as:

```
pk1{.d1.pk2{...}}{/col1{/col2{...}}}
```

where:

Option	Description
<i>pkN</i>	Primary key piece N. A primary key within Oracle can consist of one or more columns. The standard procedure for implementing a multi-part item-ID in D3 is to delimit each part with a character that would not appear in the data, such as an asterisk.
<i>dN</i>	The character delimiting <i>pkN</i> from <i>pkN+1</i> .
<i>colN</i>	<ul style="list-style-type: none"> Each column name in the Oracle <i>table</i> that the D3 user wishes to reference must appear within the Q-pointer, delimited with a slash (/). The attribute number for each column defaults to the ordinal position within the slashes. To give an attribute a specific attribute number, prefix the column name with the number. For example, to make the column named <i>duedt</i> attribute 10, use the definition 10duedt. <p>Attributes MUST be defined in order.</p> <p>This example is illegal and produces undefined results:</p> <pre>ordno.*.partno/10duedt/3qord</pre> <p>This example is legal:</p> <pre>ordno.*.partno/3qord/10duedt</pre>

Example Q-pointer

Attr,value	Data	Description
item-ID	<i>orderpart</i>	D3 opens <i>orderpart</i> to access the <i>op</i> table within the Oracle database.
1	q	Q-pointer
2	blank	Not used by super Q-pointers.
3	<i>oravms:op/shortview</i>	<p><i>oravms</i> Item-id in the dm,hosts, file that references a particular schema on a specific instance of a specific system.</p> <p><i>op</i> Name of the table in the Oracle database.</p> <p><i>shortview</i> Name of this D3 view of this table. Unnecessary unless there is another Q-pointer that refers to a table named <i>op</i> in this, or any other schema.</p>
4	<i>ordno.*.partno/qord/10duedt</i>	<p><i>ordno</i> Name of the column within the <i>op</i> table representing the first field of the item-id.</p> <p><i>.*.</i> Delimiter between the first and second part of the item-id. It <i>MUST</i> be enclosed in periods.</p> <p><i>partno</i> Column name of the second field of the item-ID.</p>

Attr,value	Data	Description
		<p data-bbox="692 217 1154 407"><i>qord</i> Column named <i>qord</i>. Appears as attribute 1 because it is the first column defined and has no attribute number specified.</p> <p data-bbox="692 407 1154 567">10<i>duedt</i> Column named <i>duedt</i> in Oracle appears as attribute 10 in D3 because of the 10 before the name.</p>

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