

Creating a PowerExchange Capture Registration and Extraction Map for an Oracle Source

Abstract

This article describes how to create a PowerExchange capture registration and extraction map for an Oracle data source from the PowerExchange Navigator. It also describes how to import the extraction map into PowerCenter to create a source definition that can be included in a PowerCenter mapping for a CDC session.

Supported Versions

- PowerExchange 10.0 or later

Table of Contents

Overview.	2
Adding a NODE Statement to the DBMOVER Configuration File on the Navigator System.	3
Adding CDC-Related Statements to the DBMOVER Configuration File on the Oracle Change Capture System.	4
Creating a Registration Group and Capture Registration with an Extraction Map.	7
Performing a Database Row Test with the Extraction Map.	11
Importing the Extraction Map into PowerCenter.	12

Overview

To perform PowerExchange for Oracle CDC, you must create a capture registration for each source table. PowerExchange generates an associated extraction map for each registration. You can then import the extraction map into PowerCenter Designer to create a source definition that can be included CDC mappings.

This article covers how to configure statements in the DBMOVER configuration files on the Oracle source system and PowerExchange Navigator system, create a registration group and capture registration in the PowerExchange Navigator, test the generated extraction map, and import the extraction map into PowerCenter Designer.

This article makes the following assumptions about your Oracle CDC environment:

- You use PowerExchange Express CDC for Oracle instead of PowerExchange Oracle CDC with LogMiner.
- You use the PowerExchange Logger for Linux, UNIX, and Windows, as recommended.
- The change capture process and PowerExchange Logger run on the Oracle source system. The PowerExchange Logger log files exist on the source system.
- The PowerCenter client and Integration Service Platform (ISP) run on a separate Linux, UNIX, or Windows system.
- The PowerExchange Navigator runs on a standalone Windows system.

The article leads you through completing the following tasks:

1. Adding a NODE statement to the DBMOVER configuration file on the PowerExchange Navigator system.
2. Adding CDC-related statements to the DBMOVER configuration file on the Oracle change capture system.
3. Creating a registration group and capture registration with a corresponding extraction group and extraction map in the PowerExchange Navigator.
4. Performing a database row test on the extraction map in the PowerExchange Navigator to verify that the map can be used to access source data.
5. Importing the extraction map into PowerCenter Designer to define a source definition.

Note: Instead of creating a capture registration individually for each Oracle source table in the PowerExchange Navigator, you can use the DTLUCBRG utility to generate capture registrations for multiple source tables. The utility generates the registration names.

This article does not cover configuring the PowerExchange Logger, using the DTLUCBRG utility, or configuring mappings and sessions in PowerCenter.

Adding a NODE Statement to the DBMOVER Configuration File on the Navigator System

In the dbmover.cfg file on the PowerExchange Navigator system, add a NODE statement that points to the PowerExchange Listener on the Oracle source system. The PowerExchange Navigator requires this information to get metadata or change data from the Oracle source when you create a capture registration or perform a database row test.

This topic focuses on only the required parameters for the NODE statement.

NODE Statement

Syntax:

```
NODE=({node_name|node1}
,TCPIP
,host_name
,{port_number|2480}
)
```

Parameter descriptions:

node_name|node1

A unique, user-defined name for the set of connection information in the NODE statement that points to the remote PowerExchange Listener on the Oracle system.

When you create a registration group and perform a database row test, you must enter this node name in the **Location** field so that the PowerExchange Navigator can communicate with the remote PowerExchange Listener to retrieve metadata or change data for the Oracle source. This node name does not need to match the name of the PowerExchange Listener process in the LISTENER statement in the DBMOVER file on the source system.

Default value is node1.

This scenario uses a node name of pwx961.

TCPIP

The communications protocol. The only valid value is **TCPIP**.

host_name

The TCP/IP host name or IP address for the PowerExchange Listener process that listens on the port specified in the *port_number* parameter.

This scenario uses a host name of ora11A.

{port_number|2480}

The number of the TCP/IP port on which the PowerExchange Listener process that runs on the system specified in *host_name* listens. Valid values are 1 through 65535. Default is 2480.

This scenario uses a port number of 2695.

Example statement:

```
NODE=(pwx961,TCPIP,ora11A,2695)
```

For more information about the NODE statement, including its optional parameters, see the *PowerExchange Reference Manual*.

Adding CDC-Related Statements to the DBMOVER Configuration File on the Oracle Change Capture System

In the DBMOVER configuration file on the Oracle source system where change capture occurs, enter the statements that are required to perform PowerExchange Express CDC for Oracle with the PowerExchange Logger for Linux, UNIX, and Windows. In this scenario, the capture process and PowerExchange Logger run on the Oracle source system.

This topic focuses on the required and recommended statements specific to Oracle CDC. To perform a database row test on the extraction map, you must define at least the ORACLEID and ORAD CAPI_CONNECTION statements.

Statement Descriptions:

CAPT_PATH

Required. The path to the directory on the Linux, UNIX, or Windows system that contains the following control files for CDC:

- CCT file, which contains capture registrations
- CDEP file, which contains application names for PowerCenter extractions that use ODBC extractions
- CDCT file, which contains information about PowerExchange Logger for Linux, UNIX, and Windows log files

Syntax:

```
CAPT_PATH=path
```

Default is the PowerExchange root installation directory.

Informatica recommends that you use a unique directory name to separate these CDC files from the PowerExchange code. This practice makes migrating to a another PowerExchange version easier.

CAPT_XTRA

Required. The path to the local directory on the Linux, UNIX, and Windows system that stores extraction maps for CDC.

Syntax:

```
CAPT_XTRA=path
```

Default is the PowerExchange root installation directory.

ORACLE_CAPTURE_TYPE

Recommended. Indicates whether you use PowerExchange Express CDC for Oracle or PowerExchange Oracle CDC with LogMiner. You cannot use both of these Oracle CDC solutions in the same PowerExchange installation. This setting must be consistent with the Oracle CAPI_CONNECTION type.

Syntax:

```
ORACLE_CAPTURE_TYPE={D|L}
```

Parameter descriptions:

- **D.** For PowerExchange Express for Oracle.
- **L.** For PowerExchange Oracle CDC with LogMiner.

No default value is provided.

In this scenario, enter **D**.

ORACLEID

Required. The Oracle source instance, database, and connection information that is used for CDC. This scenario uses only the required parameters because the capture process runs on the source system.

Syntax:

```
ORACLEID=(collection_id  
         ,oracle_db)
```

Parameter descriptions:

collection_id

Required. A user-defined identifier for this ORACLEID statement. This value must match the ORACOLL parameter value in the ORAD CAPI_CONNECTION, the collection ID that you specified for the registration group, and the DBID value in the PowerExchange Logger pwxocl.cfg configuration file. Maximum length is eight characters.

This scenario uses a *collection_id* value of ORACOLID.

oracle_db

Required. The name of the Oracle database that contains the source tables that you registered for change data capture.

This scenario uses a name of ora1cdc.

ORACLE_UNHANDLED_NUMASCHAR

Optional. Controls whether or not capture registration processing for PowerExchange Express CDC or PowerExchange Oracle CDC with LogMiner sources handles NUMBER columns that have a precision greater than 28 or an undefined length as variable length strings, and handles FLOAT columns that have a precision greater than 15 as variable length strings.

Syntax:

```
ORACLE_UNHANDLED_NUMASCHAR={Y|N}
```

Parameter descriptions:

- **N**. PowerExchange uses its default processing of Oracle NUMBER data. If you have NUMBER columns that have a precision greater than 28 or an undefined length, or if you have FLOAT columns with a precision greater than 15, change data loss might occur.
- **Y**. PowerExchange handles NUMBER and FLOAT data in a manner that prevents data loss.

Default is **N**.

This scenario assumes that **N** is acceptable.

ORAD_CAPI_CONNECTION

Required. A named set of parameters that the Consumer API (CAPI) uses to connect to the change stream and control PowerExchange Express CDC for Oracle processing for Oracle data sources. This scenario assumes that you use only the required parameters.

Syntax:

```
CAPI_CONNECTION=(NAME=capi_connection_name  
                 ,TYPE=(ORAD,ORACOLL=collection_id,...)  
                 )
```

Parameter descriptions:

NAME=capi_connection_name

Required. A unique user-defined name for this CAPI_CONNECTION statement. Maximum length is eight alphanumeric characters.

TYPE=(ORAD,ORACOLL=collection_id,...)

Required. The type of CAPI_CONNECTION statement. For PowerExchange Express CDC for Oracle sources, this value must be **ORAD**.

In this parameter, you must include the **ORACOLL=collection_id** subparameter to specify the user-defined collection ID for the Oracle instance. This value must match the collection ID that is specified in the ORACLEID statement. This value should also match the value that is displayed in the **Instance** field for the registration group in the PowerExchange Navigator. This scenario uses a collection ID of ORACOLID.

Important: Do not also specify ORCL CAPI_CONNECTION statements for PowerExchange Oracle CDC with LogMiner in the same DBMOVER configuration file.

CAPX CAPI_CONNECTION

Required for continuous extraction mode with the PowerExchange Logger. If you want the CAPI to use continuous extraction mode for the extraction of change data from PowerExchange Logger log files, you must define a CAPX CAPI_CONNECTION statement. This scenario uses only the required parameters.

Syntax:

```
CAPI_CONNECTION=(NAME=capi_connection_name
                  ,TYPE=(CAPX,DFLTINST=instance_name,...)
                  )
```

Parameter descriptions:

NAME=capi_connection_name

Required. A unique user-defined name for this CAPI_CONNECTION statement. Maximum length is eight alphanumeric characters.

TYPE=(CAPX,DFLTINST=instance_name,...)

Required. Type of CAPI_CONNECTION statement. For continuous extraction mode with the PowerExchange Logger, this value must be **CAPX**.

In this parameter, you must include the **DFLTINST=instance_name** subparameter to specify the source instance identifier. For Oracle sources, enter the value that is displayed in the **Instance** field for the registration group in the PowerExchange Navigator. This value must also match the DBID value that is specified in the PowerExchange Logger configuration file. This scenario uses an *instance_name* of ORACOLID.

For additional information about these and other DBMOVER statements, see the *PowerExchange CDC Guide for Linux, UNIX, and Windows* and *PowerExchange Reference Manual*.

Example DBMOVER Statements:

This scenario uses the following example statements:

```
ORACLEID=(ORACOLID,oralcdc)
ORACLE_CAPTURE_TYPE=D
CAPI_CONNECTION=(NAME=CAPIXPRS,TYPE=(ORAD,ORACOLL=ORACOLID))
CAPI_CONNECTION=(NAME=ORACONT,TYPE=(CAPX,DFLTINST=ORACOLID))
ORACLE_UNHANDLED_NUMASCHAR=Y
/*
CAPT_PATH=//data/auser/pwx961/cdc_control_files
CAPT_XTRA=//data/auser/pwx961/extract_map5
```

Creating a Registration Group and Capture Registration with an Extraction Map

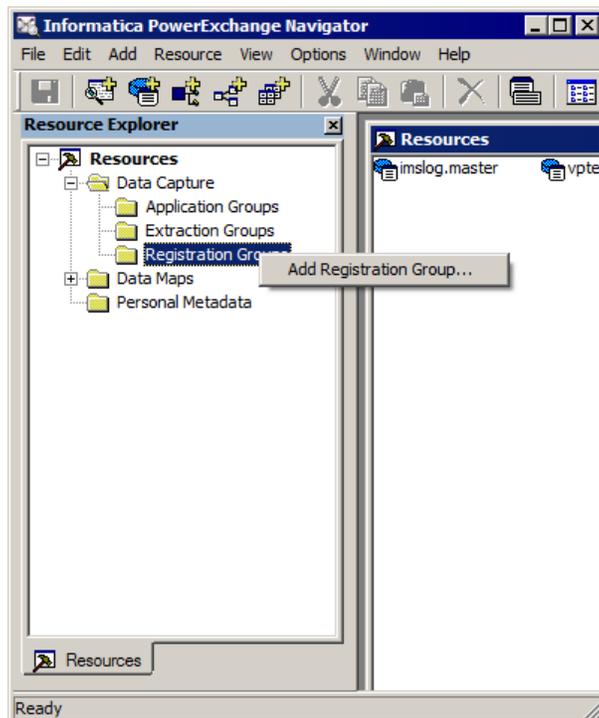
In the PowerExchange Navigator, create a registration group and add a capture registration to it. The PowerExchange Navigator provides a wizard to guide you through the registration process.

Note: Alternatively, you can add a capture registration to an existing registration group.

When you finish the registration process, the PowerExchange Navigator generates an extraction group and extraction map that corresponds to the registration group and capture registration that you added.

1. On the **Resources** tab of the **Resource Explorer**, expand the **Data Capture** node. Then right-click **Registration Groups** and click **Add Registration Group**.

The following image shows this shortcut menu option:



2. On the **Add Registration Group** page of the registration wizard, enter information in the following fields:

Name

Enter a user-defined name for the registration group. The maximum length is 16 characters.

Location

Select the location of the Oracle source from which you want to capture changes.

This field lists the locations that are defined in NODE statements in the dbmover.cfg configuration file on the local PowerExchange Navigator system. In this scenario, enter the node name that you entered for the PowerExchange Listener on the Oracle source system, which is pwx961.

Type

Select **ORACLE** as the data source type.

UserID

Enter a valid Oracle database user ID.

Password

Enter the Oracle password that is associated with the specified user ID.

If you specify a user ID but omit the password, when you click **Next**, the PowerExchange Navigator displays the **Missing Password** dialog box. You must enter the password in this dialog box to continue.

Collection identifier

Enter the Oracle instance identifier that is specified in the ORACLEID statement in the DBMOVER configuration file on the source system.

Add Registration

Select this check box to add capture registrations to the registration group.

By default, this option is selected. Clear this option if you want to add only the registration group at this time.

The following image shows an example of the completed registration group fields:

The screenshot shows a dialog box titled "Add Registration Group". It contains the following fields and controls:

- Name:** Text box containing "Ora2RegGip".
- Location:** Dropdown menu showing "pwx961".
- Type:** Dropdown menu showing "ORACLE".
- User ID:** Text box containing "oracaptl".
- Password:** Text box with masked characters (dots).
- Collection Identifier:** Text box containing "ORACOLID".
- Add Registration:** A checked checkbox.
- Buttons:** "< Back", "Next >", "Cancel", and "Help".

3. Click **Next**.
4. On the **Add Capture Registration - Name and Filter** page, enter information in the following fields:

Name

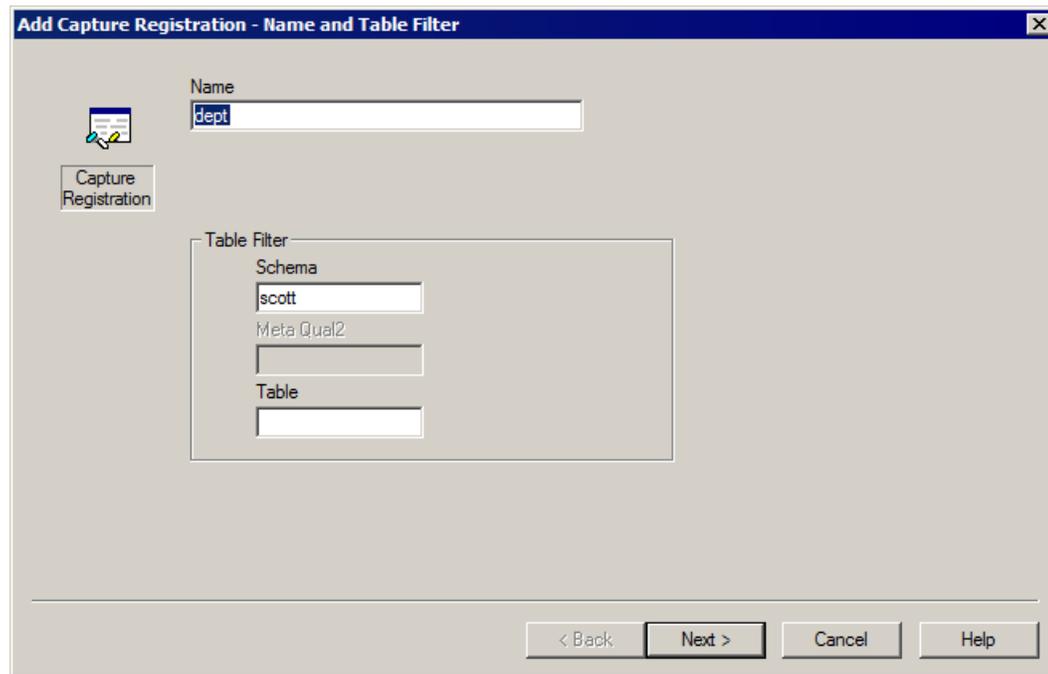
Enter a user-defined name for the capture registration. This name must be one to eight characters in length and begin with a letter. Use lowercase alphanumeric characters.

Table Filter > Schema and Table

Optional. Enter criteria for filtering the Oracle tables to be listed for registration. You can enter a mask or literal value in the **Schema** field, the **Table** field, or both. The maximum length of each field value is 128 characters. You can include the following wildcard characters:

- An asterisk (*) to represent one or more characters.
- A question mark (?) to represent a single character.

The following image shows an example of the completed registration name and filter fields:



5. Click **Next**.

6. On the **Add Capture Registration - Tables and Columns** page, perform the following actions:

a. In the **Tables** list, double-click the row for an Oracle table that you want to register.

The **Tables** list shows the tables that match the filter criteria that you entered, if any. The **Columns** list shows the columns in the table that you select.

Note: If the table contains column names that are longer than 128 characters, an error message indicates that you cannot register the table.

b. In the **Columns** list, select one or more columns to include in the capture registration. Include the primary key columns to ensure uniqueness of captured rows.

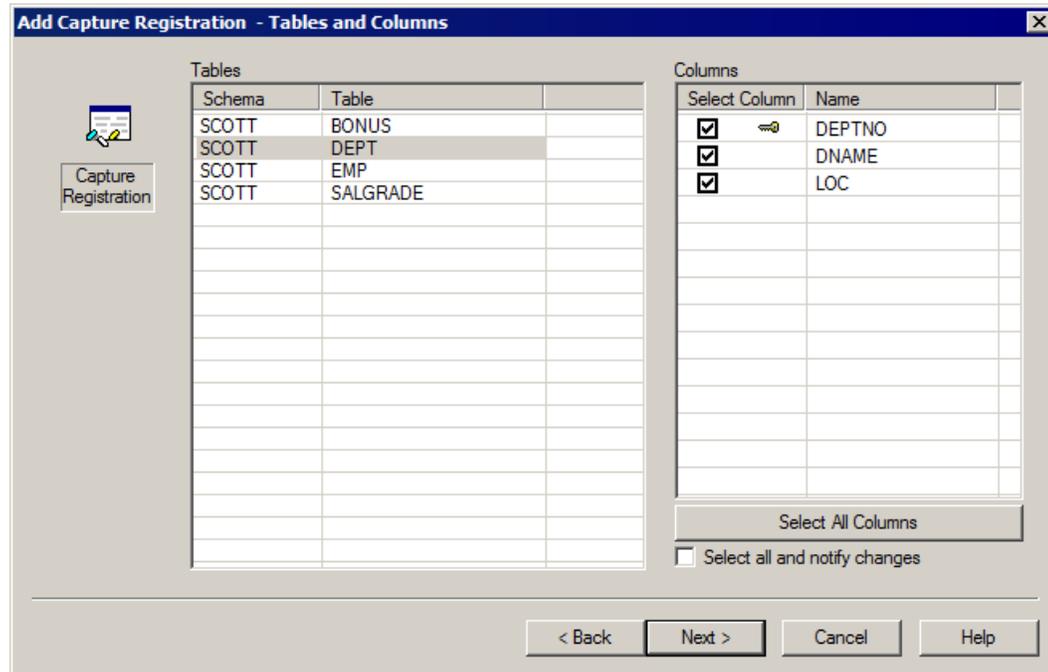
To select columns individually, select the **Select Column** check box next to each column name. To select all columns, click the **Select All Columns** button or select the **Select all and notify changes** check box.

If you select the **Select all and notify changes** check box, PowerExchange tries to capture change data for all columns. Oracle CDC fails with an error message in the following situations:

- A change record for the registered table contains a column that you did not select for CDC.
- A change record for the registered table does not contain a column that you selected for CDC.
- The table definition is modified in a way that is incompatible with the PowerExchange capture registration. For example, the datatype of a column is changed from numeric to character without a corresponding change in the capture registration.

Tip: Select all columns for which you want to capture change data since you can define a registration only once in a registration group for given source. You can edit the corresponding extraction map to extract data for a subset of the captured columns.

The following image shows a selected table and the selected columns in the table, including the primary key column:



- Click **Next**.
- In the **Add Capture Registration - Type** dialog box, enter information in the following fields:

Type

Accept the only valid value of **Synchronous**.

Status

Select **Active** to make the registration available to PowerExchange for change data capture. The initial default value is **Inactive**.

Note: If you do not want to activate the registration now, you can change the status from **Inactive** to **Active** later.

Condense

Select **Part** if you use the PowerExchange Logger for Linux, UNIX, and Windows for Oracle CDC, as recommended.

If you accept the default value of **None**, PowerExchange does not use the PowerExchange Logger to process changes for the registered source table. However, you can change this setting later, before you start a CDC session.

Supplemental Log Group Name

Enter the name of the supplemental log group to be created for the source table. By default, the PowerExchange Navigator enters the *schema_tablename* as the supplemental log group name.

You must define a supplemental log group for each Oracle table for which you want PowerExchange to capture change data. The supplemental log group must contain all of the table columns for which change data is to be captured. PowerExchange generates DDL for creating the named supplemental log group when you complete the capture registration.

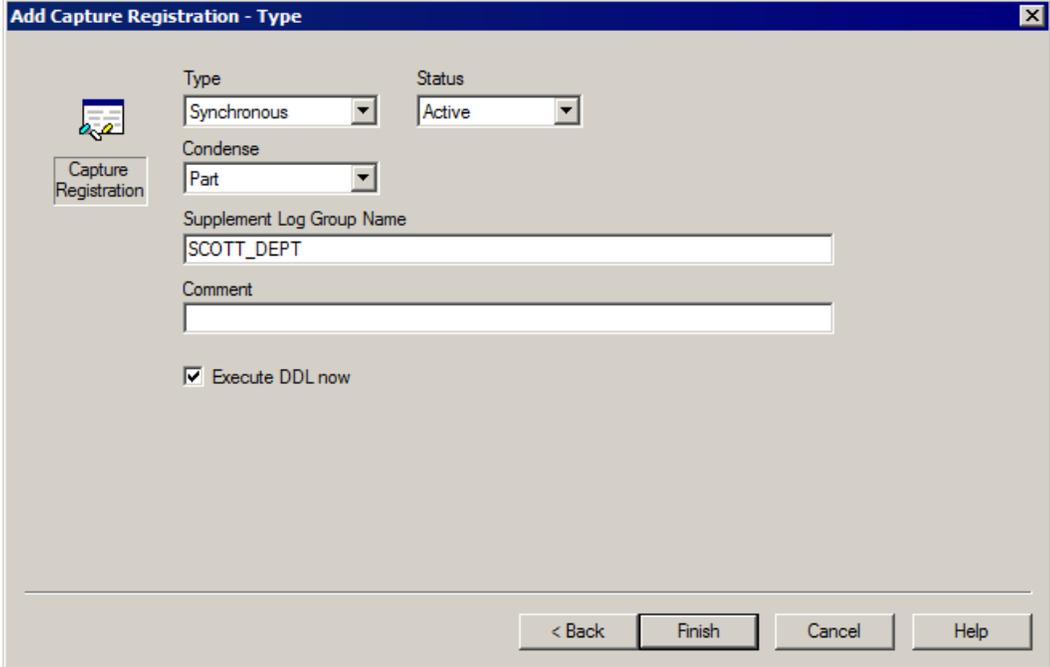
Comment

Optionally, enter comments about the capture registration.

Execute DDL now

Select this check box to run the generated DDL for creating the supplemental log group when you click **Finish**. Clear this check box if you want to run the DDL later or if you do not have the authority to run the DDL. You can give the file with the generated DDL to your DBA to run for you.

The following image shows the completed registration type fields:



9. Click **Finish**.
10. In the **Save Supplement Log Group SQL to File** dialog box, enter the name of the .sql file to which to save the generated DDL for creating the supplemental log group. Then click **Save**.
By default, this file is saved to the PowerExchange root installation directory.
The PowerExchange Listener writes the capture registration to the CCT file on the Oracle source system. In the PowerExchange Navigator, the capture registration appears in the list of capture registrations on the **Registration Group** tab in the **Resource Explorer**. The PowerExchange Navigator also generates an extraction group and extraction map that corresponds to the registration group and capture registration.
11. In **Resource Explorer**, verify that the extraction group appears under the **Extraction Groups** node. Open the extraction group and verify that the extraction map is listed.

Performing a Database Row Test with the Extraction Map

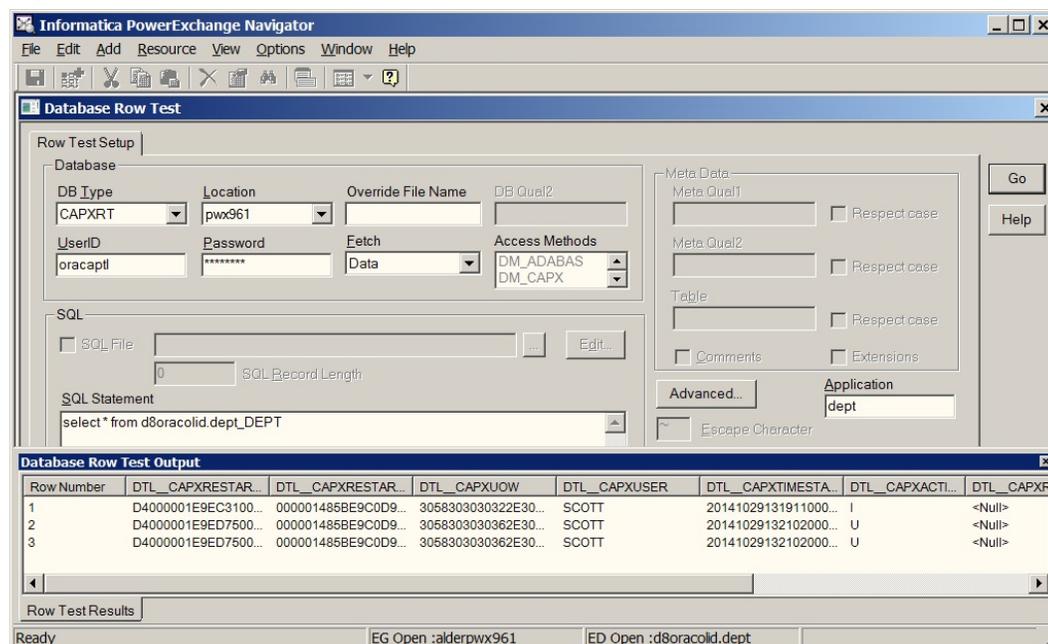
Perform a database row test on the extraction map that is associated with the capture registration that you created. The row test verifies that the extraction map can be used to access change data in an Oracle source table.

Perform the row test before you import the extraction map into PowerCenter and create a source definition for a CDC session.

1. Open the extraction group that corresponds to the registration group that you created.
2. Open an extraction map that corresponds to a capture registration that you created.

- Click **File > Database Row Test**, or click the **Row Test** button on the toolbar.
The **Database Row Test** dialog box appears.
- In the **DB Type** list, select **CAPXRT**. This setting allows you to preview data directly from the source table, rather than from the PowerExchange Logger log files.
- In the **Location** list, select the node name that you specified for the PowerExchange Listener on the Oracle source system.
This name must be specified in a **NODE** statement in the local `dbmover.cfg` file and in the **Location** field for the registration group. This scenario uses the name of `pw961`.
- In the **UserID** and **Password** fields, verify that your Oracle user ID and password are displayed.
These values match the **UserID** and **Password** values that you entered for the registration group.
- In the **Fetch** list, select **Data** to preview data.
The row test will display a **SELECT** statement for the registered table in the **SQL Statement** box.
- In the **Application** field, enter any value.
- Click **Go**.

The **Database Row Test Output** window displays rows of the changes that occurred on the source table, if any. The following image shows example output:



Note: The row test results include the generated `DTL__` columns that PowerExchange adds to extraction maps. These columns contain CDC-related information, such as the SQL change type and time stamp. When you import the extraction map into Designer, the PowerExchange Client for PowerCenter (PWXP) includes the PowerExchange-generated columns in the source definition.

Importing the Extraction Map into PowerCenter

Import the PowerExchange extraction map that corresponds to the capture registration that you created into PowerCenter Designer to create a source definition. You can then include the source definition in a mapping for a CDC session.

- In PowerCenter Designer, click **Sources > Import from PowerExchange**.

2. Enter the following required information:
 - In the **Location** attribute, enter the node name of the PowerExchange Listener on the Oracle source system. This name must be specified in a NODE statement on the local system.
 - In the **User Name** attribute, enter the Oracle database user ID.
 - In the **Password** attribute, enter the password of the specified user.
 - In the **Source Type** list, select **ORACLE**.
 - Select the **CDC Datamaps** option to list Oracle extraction maps defined for the specified location.

For information about additional attributes, see *PowerExchange Interfaces for PowerCenter*.

3. Enter optional filter criteria based on schema name, table name, or both to narrow the list of extraction maps.

4. Click **Connect**.

Designer displays the extraction maps in the **Selected Datamaps** box.

5. Select the extraction map or maps that you want to import.

6. Click **OK**.

Designer generates source definitions based on the extraction maps and displays the source definitions in the workspace. For the source definition names, Designer uses the extraction map names.

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