Windchill® Oracle® to SQL Server Migration Guide

Windchill 9.1

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Contents

About This Guide **7**
Related Documentation 8
Technical Support 8
Documentation for PTC Products 8
Comments 9
Overview of the Migration Process **11**
Pre-Migration Steps **13**
Migrating Windchill Data from Oracle to SQL Server **17**
Appendix A: Verifying Service Pack 2 ..... **35**
Appendix B: Installing SQL Server Migration Assistant 2005 (SSMA) **37**
Appendix C: Sequences **39**
Appendix D: Windchill PartsLink Server Properties **41**
Appendix E: Retired Tables **43**
Appendix F: Migrating Localized Data **45**
Appendix G: Troubleshooting **47**

1
About This Guide

Related Documentation 8
Technical Support..... 8
Documentation for PTC Products..... 8
Comments 9

The *Windchill Oracle to SQL Server Migration Guide* describes how to migrate Windchill data from an Oracle database to a SQL server database. This guide is intended for technical staff members who are experienced in application installations and familiar with the installation hardware system. The Oracle to SQL Server migration process assumes an entry-level database administration skill level for both Oracle and SQL Server databases.

Related Documentation

The following documentation may be helpful:

- *Windchill 9.1 Software Matrices*
- *Windchill Upgrade Guide*
- *Getting Started with Windchill Installation and Configuration Guide*
- *Windchill Installation and Configuration Guide - Advanced*
- *Windchill Installation and Configuration Guide - Updating Existing Installation*
- *Windchill Rehost Guide*
- *Windchill Advanced Deployment Guide*
- *Windchill Customizer's Guide*
- *Windchill Business Administrator's Guide*
- *Windchill System Administrator's Guide*

If books are not installed on your system, see your system administrator.

Technical Support

Contact PTC Technical Support via the PTC Web site, phone, fax, or e-mail if you encounter problems using your Windchill solution or the product documentation.

For complete details, refer to Contacting Technical Support in the PTC Customer Service Guide. This guide can be found under the Related Links section of the PTC Web site at:http://www.ptc.com/support/index.htm

The PTC Web site also provides a search facility for technical documentation of particular interest. To access this page, use the following URL:http://www.ptc.com/support/support.htm

You must have a Service Contract Number (SCN) before you can receive technical support. If you do not have an SCN, contact PTC Maintenance Department using the instructions found in your PTC Customer Service Guide under Contacting Your Maintenance Support Representative.

Documentation for PTC Products

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- `Windchill Help Page` — Click **Help** in the header of any Windchill page to open the **Windchill Help** page, which provides you with a portal to all Windchill documentation, including:
  - A complete set of current online help topics for your products
  - Product tutorials available on the PTC Web site
  - Windchill manuals for users, administrators, and programmers

  In addition, you can click **Search All Help Sources** to access the Windchill Help Center, an online knowledgebase that includes a universal index of all Windchill documentation. You can search all of the documentation at once, or use the advanced search capability to customize your search. Once you have located a topic you want to reference later, you can bookmark that topic for quick access and even save your own comments about the topic.

- `Application CD` — All relevant PTC documentation is included on the CD for the application.
- `Reference Documents Web Site` — All books are available from the Reference Documents link of the PTC Web site at the following URL:

  http://www.ptc.com/appserver/cs/doc/refdoc.jsp

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  http://www.ptc.com/support/support.htm

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2
Overview of the Migration Process

The overall objective of this migration process is to extract Windchill data from an Oracle database to a SQL Server 2005 database. This is a two step process: first, migrating data to a staging database, then moving this data to a standard Windchill schema.

This process requires the use of the downloadable SQL Server Migration Assistant (SSMA) 2005 for Oracle v. 4.0, as well as the creation of two SQL Server 2005 databases. Therefore, you will need space twice the size of your Oracle database available on the server hosting SQL Server 2005.

The SSMA tool is used to:

- Convert the Oracle tables to SQL Server 2005 database tables
- Load the converted objects into a SQL Server 2005 database
- Migrate Data to a SQL Server 2005 database

Migrating data into the transitional database is the most important part of the process, since a database will be created using the script supplied by the Windchill solution to create objects in the destination database.

After the destination database has been created, the data from the transitional database is imported into the destination database. Sequences are re-seeded, and the process is completed.

3
Pre-Migration Steps

1. Open a Windchill shell and enter the following command:

   ```
   windchill stop
   ```

   This prevents new data from being entered into the Oracle Database.

2. Log in to the Oracle database.

3. Determine whether the PartUsesOccurrence table has content by executing the following command:

   ```
   Select count (*) from PartUsesOccurrence;
   ```

   Note:

   If this is not done, the data in the PartUsesOccurrence table will not migrate properly to the SQL Server database used by the SSMA tool. This is because there are NUMBER columns that have a scale greater than 28. This script can be found at `Windchill/db/sql/wnc/migration/OracletoSQLServer`

   a. If the table count is greater than 0, complete the following steps:

      Note:

      If the table count is equal to 0, continue with the next numbered step, page 13.

      - Back up the PartUsesOccurrence table
      - Execute the script `TempPartUsesOccurrence_Table.sql`

   b. Copy the data into the newly created table from the PartUsesOccurrence table by executing the following commands:

      ```
      Insert into TempPartUsesOccurrence Select * from
      PartUsesOccurrence;

      Commit;
      ```

   c. Verify that the data is in the TempPartUsesOccurrence table.

   d. Drop the PartUsesOccurrence table.

   e. Rename the TempPartUsesOccurrence table to PartUsesOccurrence by executing the following commands:

      ```
      Alter table TempPartUsesOccurrence rename to
      PartUsesOccurrence;
      ```

4. Determine whether the EPMMemberLink table has content by executing the following command:

   ```
   Select count (*) from EPMMemberLink;
   ```

Note:

If this is not done, the data in the EPMMemberLink table will not migrate properly to the SQL Server database used by the SSMA tool. This is because there are NUMBER columns that have a scale greater than 28. This script can be found at `Windchill/db/sql/wnc/migration/OracletoSQLServer`

a. If it is greater than 0, complete the following steps:

- Back up the table EPMMemberLink
- Execute one of the following scripts:
  - If you upgraded from 7.0 to 9.1, execute TempEPMMemberLink_Table_70.sql
  - If you upgraded from any other release, execute TempEPMMemberLink_Table.sql

b. Copy the data from the EPMMemberLink table into the newly created TempEPMMemberLink table by executing the following command:

```
Insert into TempEPMMemberLink Select * from EPMMemberLink;
Commit;
```

c. Verify that the data is in the TempEPMMemberLink table.

d. Drop the EPMMemberLink table.

e. Rename the TempEPMMemberLink table to EPMMemberLink by executing the following command:

```
Alter table TempEPMMemberLink rename to EPMMemberLink;
```

5. Execute the following SQL command:

```
Select count(*) from <table name> where COUNTERPARTID is NULL;
```

a. Replace table name with a table from the list below:

- ATTRIBUTEORGANIZER
- BOOLEANDEFINITION
- FLOATDEFINITION
- INTEGERDEFINITION
- MEASUREMENTSYSTEM
- QUANTITYOFMEASURE
- REFERENCEDEFINITION
- STRINGDEFINITION
- TIMESTAMPDEFINITION
- UNITDEFINITION
- URLDEFINITION

b. Note any tables with a count value greater than 1. This information will be necessary during the migration process.

For example, when the column COUNTERPARTID in these table had multiple values of NULL, the index error described in Appendix G: Troubleshooting, page 47 occurred. This is because Oracle UNIQUE constraint is not the same as UNIQUE constraint in SQL Server. Oracle allows the column in the UNIQUE index to have multiple values of NULL; however, SQL Server allows only one and this causes the Migrate Data step to fail.

6. If Windchill PartsLink is installed, rename the binary table to binary1 and the rule table to rule1. This is necessary, as “binary” and “rule” are reserved words in the SQL Server database. To rename these tables, use the following commands:

```
Alter table binary rename to binary1;

Alter table rule rename to rule1;
```

4
Migrating Windchill Data from Oracle to SQL Server

The Oracle to SQL Server migration process assumes an entry-level database administration skill level for both Oracle and SQL Server databases. The steps to install and configure SQL Server databases, Oracle, and SQL Server Migration Assistant are documented with each application and should be followed accordingly.

The following software is required:

- SQL Server Management Studio (See Chapter 3 of the*Windchill Installation and Configuration Guide - Advanced* for information on installing SQL server.
- SQL Server 2005 Service Pack 2

  Note:

  To verify that you have Service Pack 2, see Appendix A: Verifying Service Pack 2, page 35.
- SQL Server Migration Assistant (SSMA) 2005 for Oracle v.4.0. For information on installing this tool, see Appendix B: Installing SQL Server Migration Assistant 2005 (SSMA), page 37.
- SQL Server Migration Assistant (SSMA) 2005 for Oracle Extension Pack v.4.0. For information on installing this tool, seeAppendix B: Installing SQL Server Migration Assistant 2005 (SSMA), page 37.
- Oracle Client. For information on installing the Oracle Client, see the Installing Oracle chapter of the*Windchill Installation and Configuration Guide - Advanced*.

  Note:

  The Oracle Client must be installed on the same machine as the SSMA tool.

Use the following steps to migrate data from Oracle to a SQL Server database:

1. Install and configure a SQL Server database.
2. Verify connectivity to the Oracle source and the SQL Server database.
3. Create a staging database in the SQL server database.
   a. Log in to SQL Server Management Studio as a SQL Server system administrator (sa).
   b. From the **Object Explorer** section, right-click on the connected instance name and select **New Query**.
   c. In the **New Query** window, enter the following statement:

```
<CREATE DATABASE [staging] ON PRIMARY ( NAME =
N'staging', FILENAME = '<PATH>\staging.mdf', SIZE =
```

```
1024000KB, FILEGROWTH = 102400KB ) LOG ON ( NAME =
N'staging_log', FILENAME = '<PATH>\staging_log.ldf',
SIZE = 1024KB, FILEGROWTH = 10%)
```

Note:

This statement cannot be copied directly from this document; instead, it must be entered manually.

d. Replace the <*PATH*> variable with a valid location where the SQL Server database data files will be stored.

e. Click the **Execute** button from the toolbar.

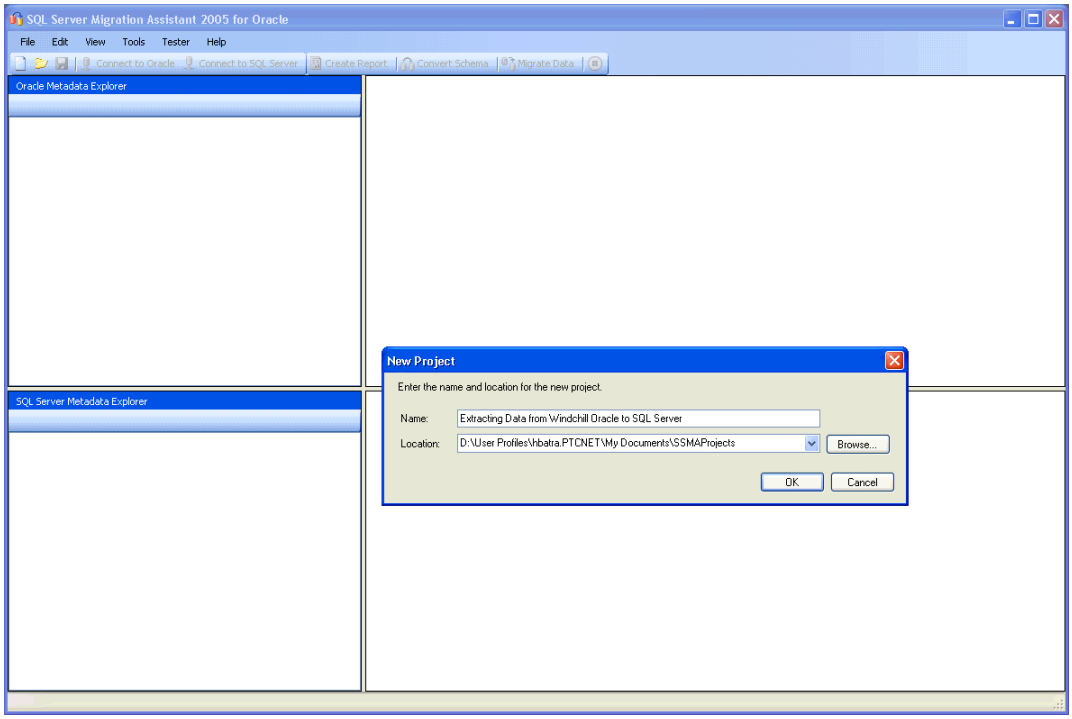
The following message should appear: Command(s) completed successfully

f. Refresh the database folder and verify that it exists.

Note:

The staging database does not need to have the final schema or filegroup structure installed. It is a transitional database used to migrate data from Oracle to a SQL Server database using SSMA. SSMA will create the destination objects from the source Oracle schema and migrate data in a series of steps.

4. Start SSMA and create a new project.



5. Connect to Oracle source as a database administrator, and connect to the SQL Server destination as a SQL Server system administrator (sa).

If you connect to the SQL Server and the message "Common requirement: CLR is turned off in target SQL Server instance" appears, log in to the SQL Server as a SQL Server system administrator (sa), open the **New Query** window, and execute the following commands to turn on CLR:

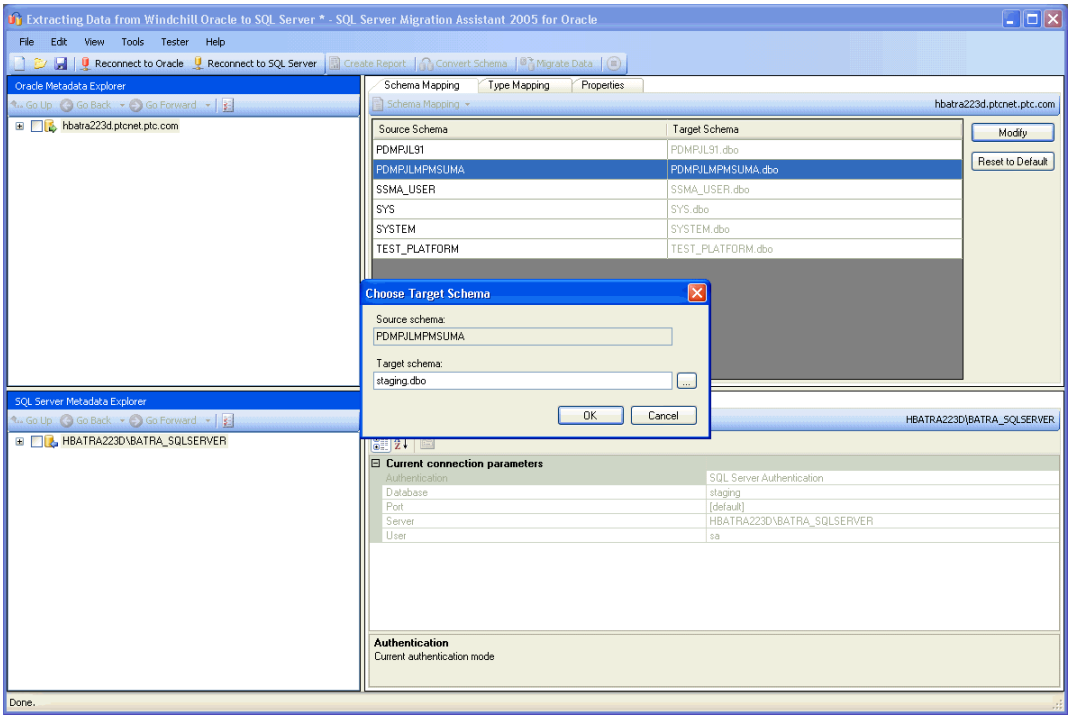
Note:

This statement cannot be copied directly from this document; instead, it must be entered manually.

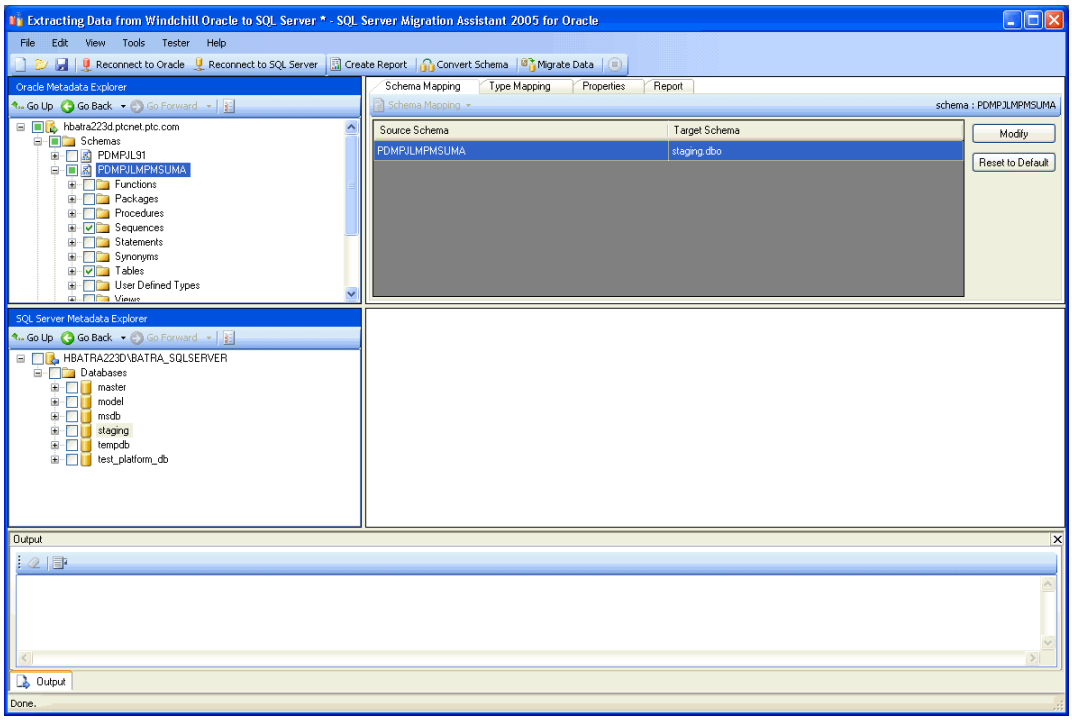
```
EXEC sp_configure 'show advanced options', '1';

GO

Reconfigure

GO

EXEC sp_configure 'show advanced options', '0';

GO
```

6. Select the source Oracle schema in the **Schema Mapping** tab in the top right pane. Click **Modify**

7. In the **Choose Target Schema** window, enter "staging.dbo" in the **Target schema** field.



8. Select the Oracle schema in the top left pane, and select the **Sequences** and **Tables** folders under the schema.



Note:

If your system contains localized data, you must edit the **Type Mapping** tab before continuing. For more information, see Appendix F: Migrating Localized Data, page 45.

Note:

If you have Windchill PartsLink installed, deselect the following table under the Table folder:

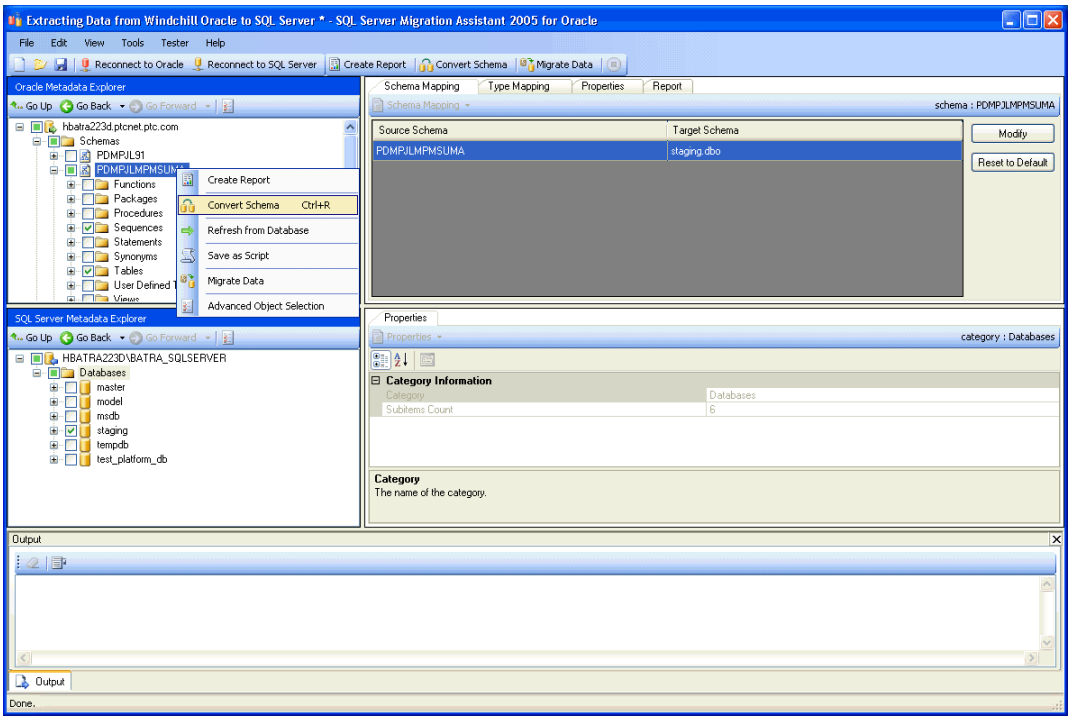
bulk_add	del_iba	del_obj	new_obj
bulk_add1	del_iba1	new_iba	obj_index
bulk_delete	del_iba2	new_iba1	reload_obj1
bulk_delete1	del_link	new_iba2	reload_obj2

These tables contain temporary data and do not need to be migrated.

9. In the Oracle schema list, right-click the database name and select **Convert Schema**.

Note:

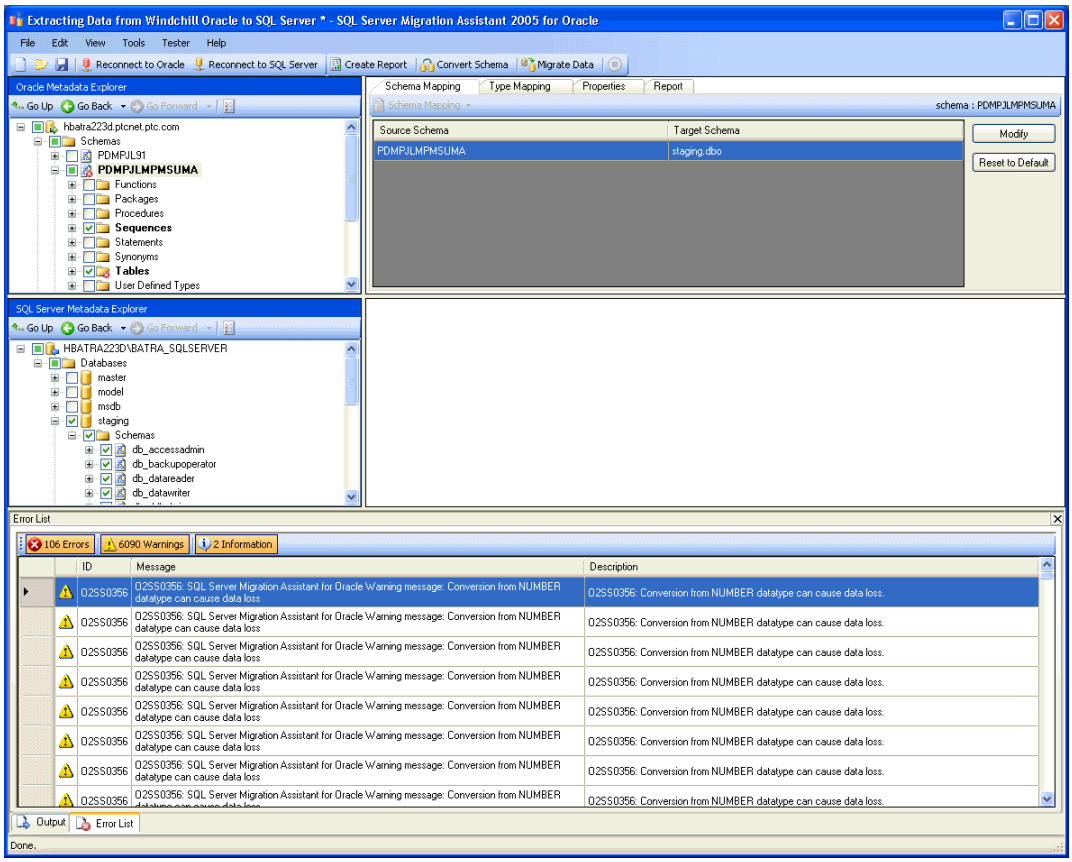
You must be connected to both Oracle and the SQL Server database for the **Convert Schema** option to be available. The schema conversion does not create the destination objects in the SQL Server.



Note:

This process can be time consuming, as all objects must be analyzed for type mapping and conversion processing. SSMA displays the progress on the bottom bar of the interface.

10. A **Warning and Error List** appears in the bottom pane of the window, listing all errors and warnings raised during schema conversion. Select the error message or warning to highlight the referenced object in the Oracle schema.

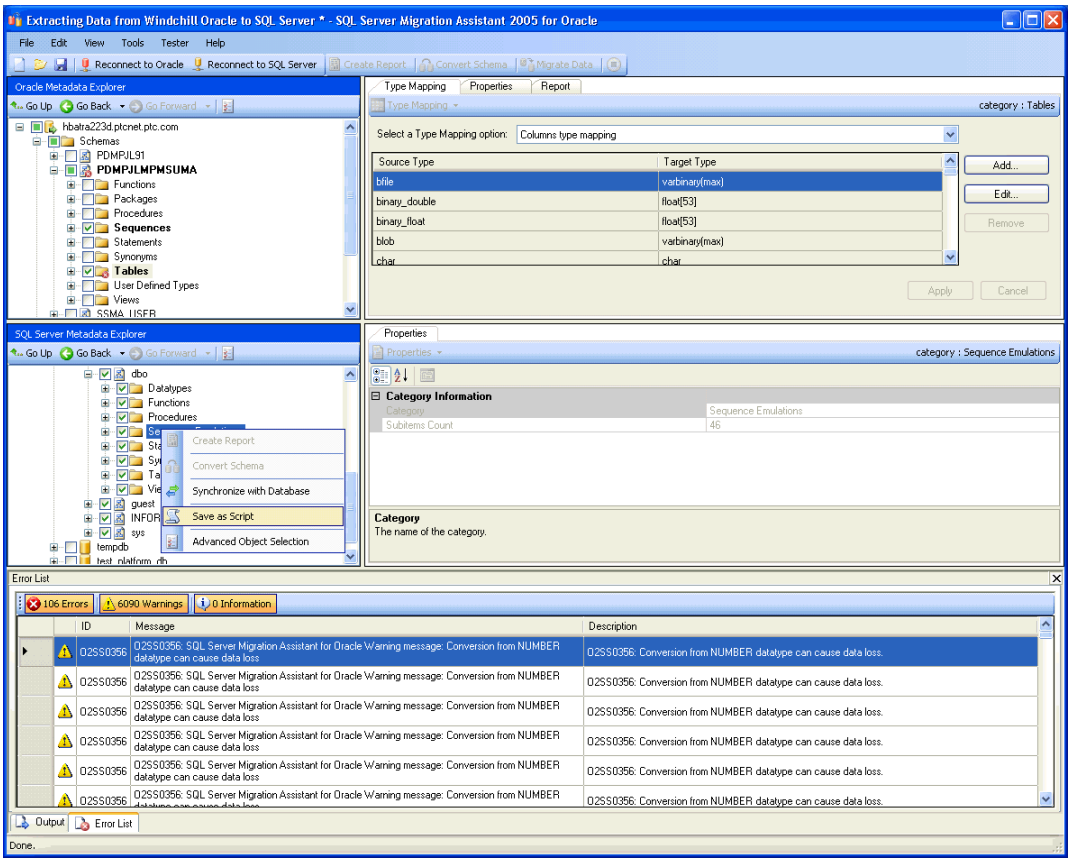


The following errors and warning messages are standard and do not need to be addressed:

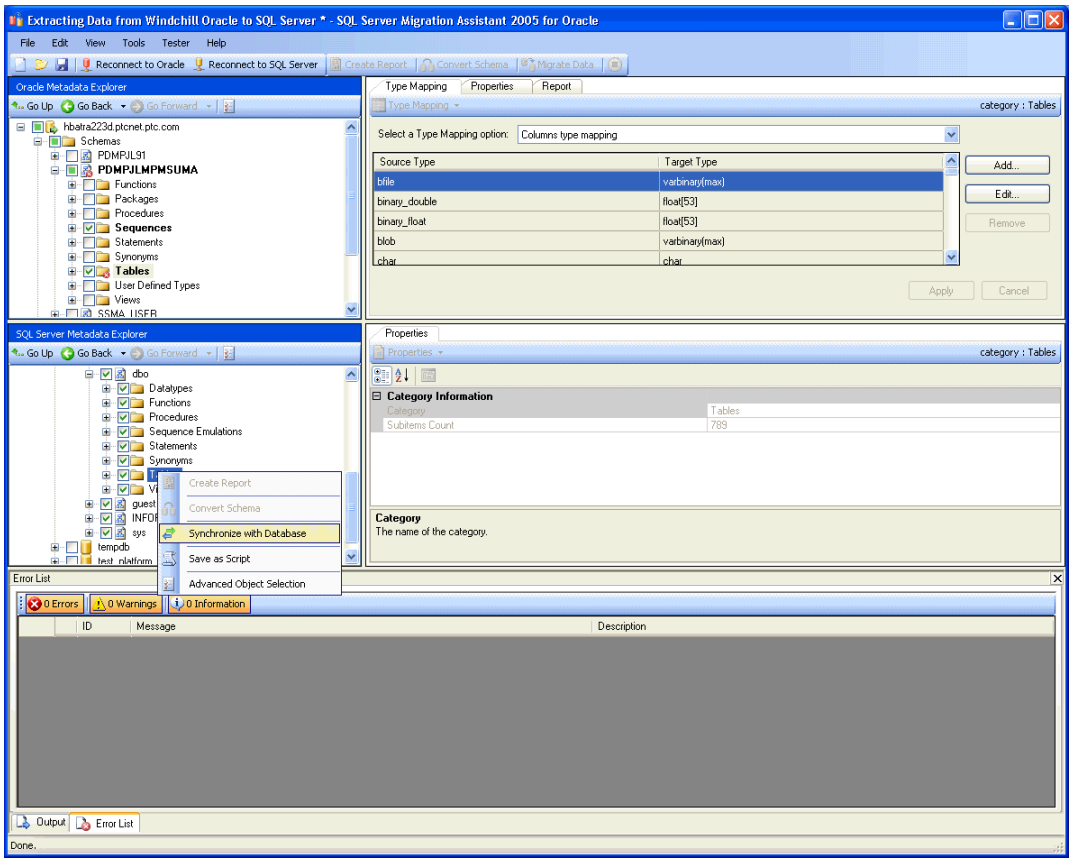
ID	Description
02SS0356	Conversion from NUMBER datatype can cause data loss. **Note:** For more information on this warning, see Appendix G: Troubleshooting, page 47.
02SS0239	ROWID column is not accessible because the 'Generic ROWID' project setting is disabled.
02SS0174	The declaration of the identifier 'ForEachDeletedRowTriggerCursor' was converted with error(s).
02SS0269	Functional Index cannot be converted.

Since the database created by the SSMA tool is temporary, errors describing problems with converting the schema are acceptable. All other errors should be addressed.

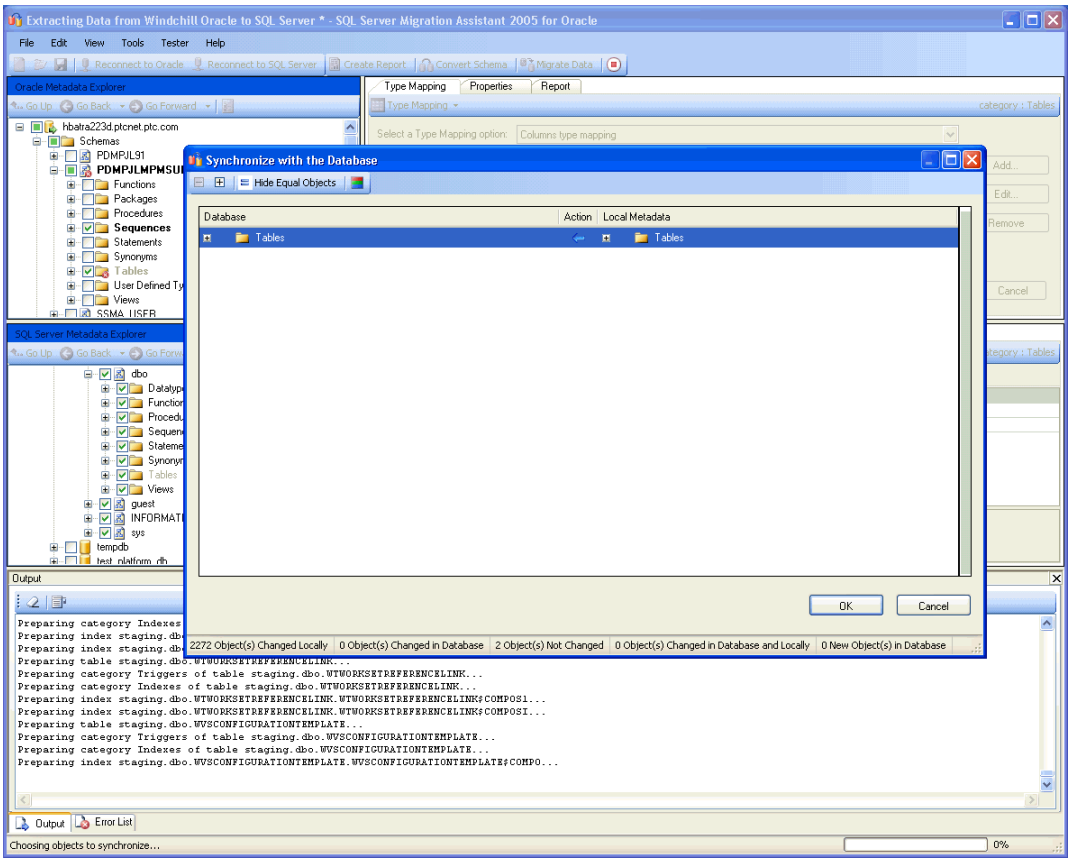
11. In the SQL Server Metadata explorer pane, select the **Sequence Emulation** folder under the **staging.dbo** database. Right-click, and select **Save as Script**. Save the script to a location you will remember, as it will be used later.



12. In the SQL Server Metadata explorer, select the Tables folder under the staging.dbo database, and right-click to select **Synchronize with Database**. This will create the converted schema in the staging database in the SQL Server destination.



Click **OK** to create the schema for the staging database.

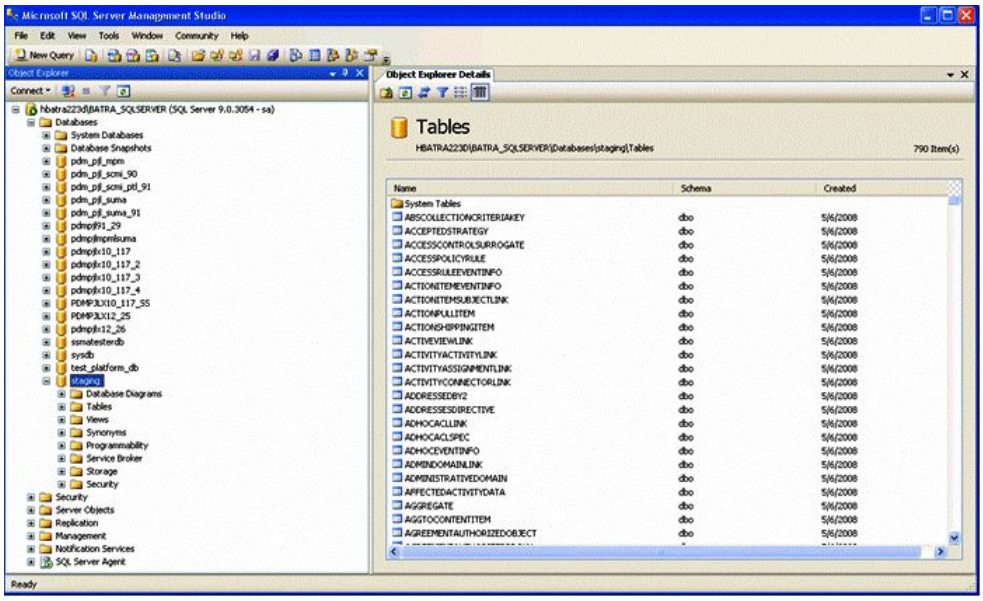


Note:

If the Tables folder is expanded, it will display a value of *[Not Found]* for each table. This is because the schema in the SQL Server database has not been created. It will be created after you click **OK**.

13. Start SQL Server Management Studio (SSMS). Log in as a SQL Server system administrator (sa), and verify the creation of the converted schema.

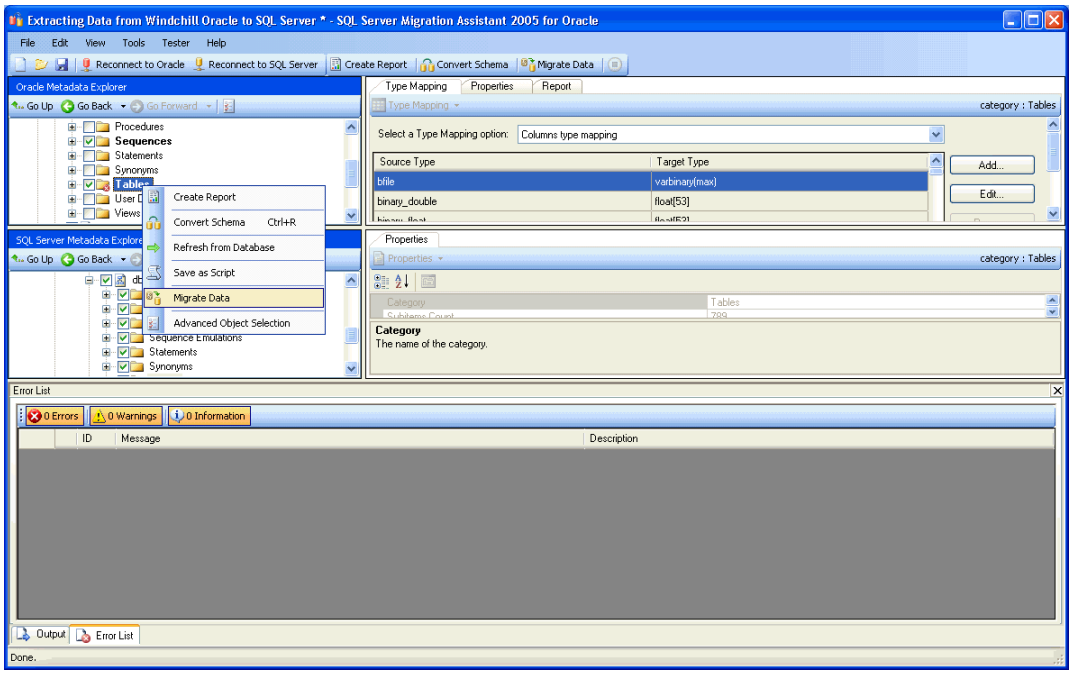
    If there were any tables that you noted in the pre-migration steps that had multiple values of null, disable the index for those tables. For more information, see the section on Index Errors in Appendix G: Troubleshooting, page 47.



Note:

If you are migrating localized data, use this step to confirm that the columns that have the value `VARCHAR2` in Oracle have been changed to `NVARCHAR(4000)`. For example, the column**CLASSNAMEKEYDOMAINREF** located in the **ACCESSPOLICYRULE** table should have a value of `NVARCHAR(4000)`.

14. Using SSMA, right-click the Tables folder in the Oracle schema list, and select **Migrate Data**.

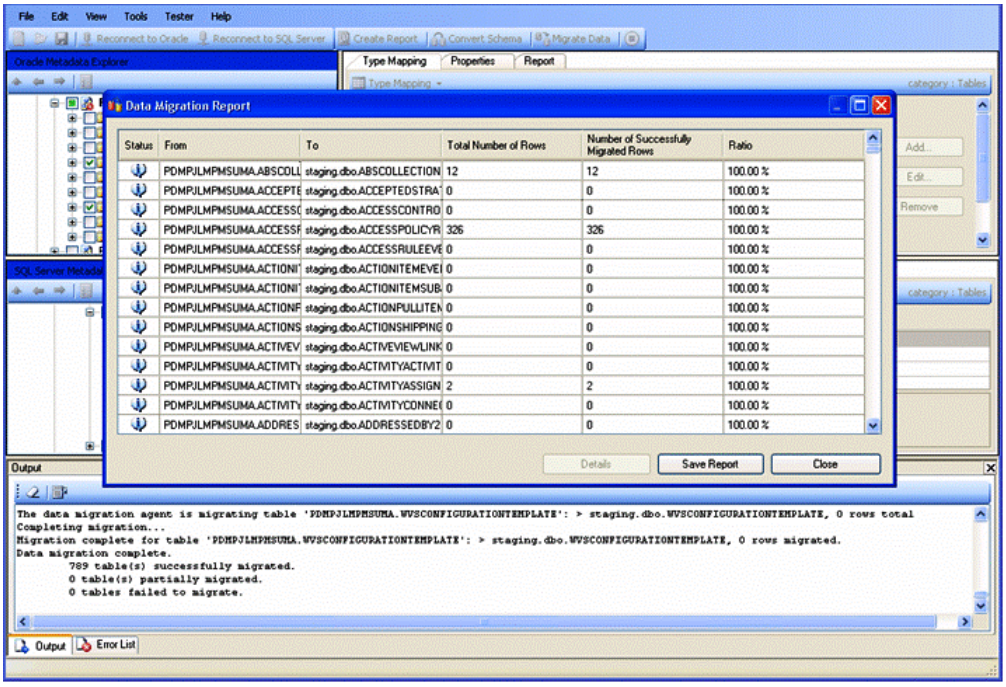


For information on common data migration errors, see Appendix G: Troubleshooting, page 47.

15. Verify that the data migration is complete for all tables in the report created by the SSMA tool. Address all issues where indicated. Additionally, log in to the SSMS to verify that the data appears in the tables indicated by the SSMA report.

Note:

If you get an error message see Appendix G: Troubleshooting, page 47.



16. Close SSMA once the data migration validation is complete.
17. Use the PTC Solution Installer (PSI) to create the destination database and login. Do this using the PTC Solution Installer CD. Note that this does not create the schema.

    Note:

    Database user name and password should match the database name.

    a. Launch the PTC Solution Installer (PSI).

       For more information on screens or user input fields mentioned in this step, see *Windchill Installation and Configuration Guide - Advanced* and navigate to the section titled "Installing a Standalone Product or Component".

    b. Select the **Advanced** installation type and click **Next**.

    c. Select **Standalone Product or Component** and click **Next**.

    d. Select **SQL Server Configuration** and click **Next**.

    e. Select **Create Windchill Database and Users** and click **Next**.

       Enter the relevant information.

    Note:

    If the SQL Server database is on a different machine from the installation, use the PSI to create the database on the same machine as SQL Server.

18. Log in to the SSMS tool.

    Make sure the database exists and has the correct filegroups by executing the following command in a **New Query** window:

    ```
    Select name from sys.filegroups
    ```

Note:

You must log in to SSMS as the database owner that was created with the PSI in order to execute the SQL statement.

Click **Execute** from the toolbar. The following filegroups should appear:

- PRIMARY
- BLOBS
- INDX
- WCAUDIT

19. Add the following properties to the site.xconf of the installation being modified to use SQL Server.

    The variable (in italics) of each property below should be replaced by your own values.

    <Property name="wt.db.dataStore" overridable="true" targetFile="codebase/wt.properties" value="SQLServer"/>

    <Property name="wt.pom.dbUser" overridable="true" targetFile="db/db.properties" value="*database name*"/>

    <Property name="wt.pom.dbPassword" overridable="true" targetFile="db/db.properties" value=" *database name* "/>

    <Property name="wt.pom.jdbc.service" overridable="true" targetFile="db/db.properties" value="*SQL Server Instance Name*"/>

    <Property name="wt.pom.jdbc.port" overridable="true" targetFile="db/db.properties" value="*SQL Server Port*"/>

    <Property name="wt.pom.jdbc.host" overridable="true" targetFile="db/db.properties" value="*SQL Server Host Name* "/>

    <Property name="wt.pom.jdbc.database" overridable="true" targetFile="db/db.properties" value="*database name*"/>

    Note:

    If you have PartsLink installed, there are additional properties that need to be added to the site.xconf. For a list of those properties, see Appendix D: Windchill PartsLink Server Properties, page 41.

    Note:

    If you have the property wt.db.maxBytesPerChar set to 3, it needs to be changed to 1, as it is unnecessary when using SQL Server. The property should appear as follows:

    <Property name="wt.db.maxBytesPerChar" overridable="true" targetFile="codebase/wt.properties" value="1"/>

    If you have to make this change, you will need to rebuild your customizations.

20. In a Windchill shell, use the following command to propagate the previous values:

    ```
    xconfmanager -p
    ```

21. To create the SQL Server schema, complete the following steps:

    - Open a Windchill shell and navigate to the <*Windchill*>/db/sqlServer
    - At the command line, execute the following command:

      ```
      create_ddl_wt.bat
      ```

      Note:

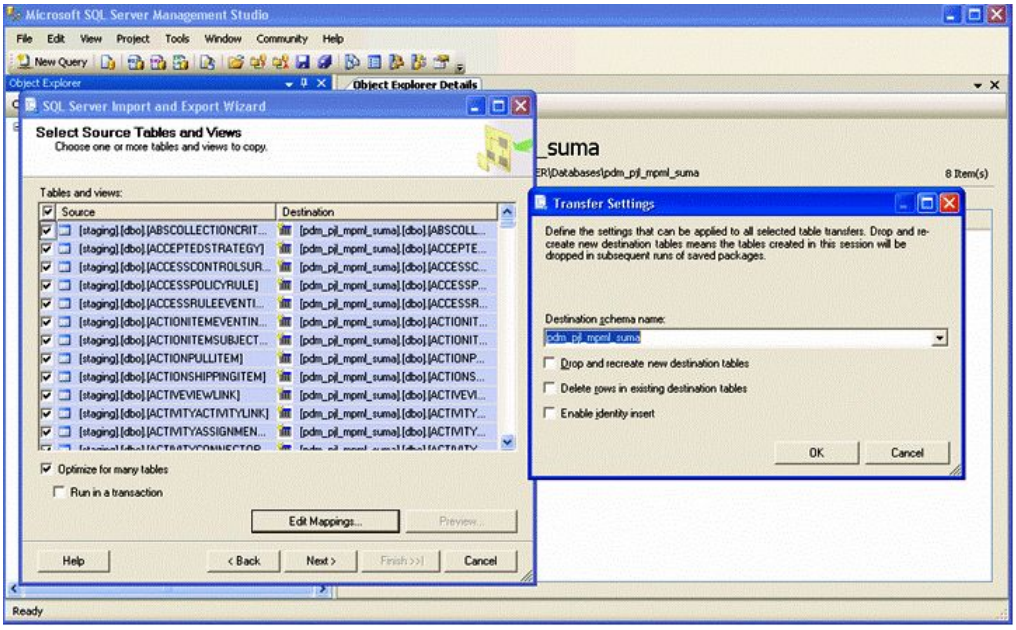
      Run all scripts for your customized tables, indexes, and sequences now.

22. Check the final database to see that the tables exist

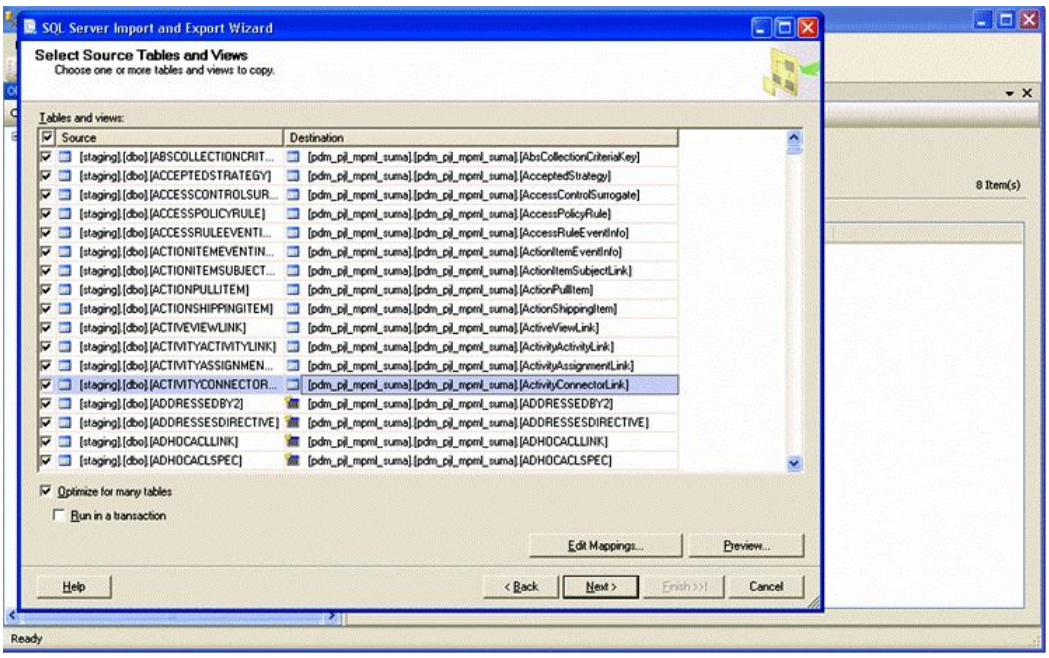
23. Right-click the destination database, and choose **Tasks→Import Data**.

24. In the SQL Server Import and Export wizard, choose the source (staging) database, and the destination (final) database. When prompted for **Table Copy or Query**, select **Copy data from one or more tables or views**.

25. On the **Select Source Table and Views** step of the wizard, check the top check-box to select all source tables. Click the **Edit Mappings** button to change the destination schema to the correct one.



26. Click on the first source table, and hold down the TAB key. This will tab through the source and destination mappings, aligning the tables to their correct naming conventions.



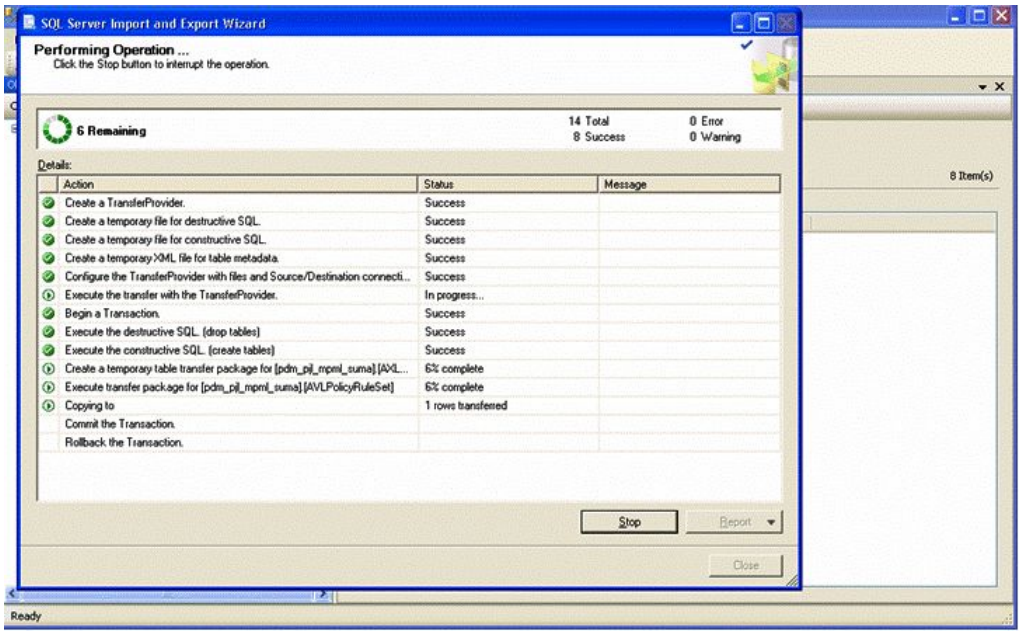
Note:

If this schema has been upgraded from a previous Windchill release and you find tables that do not have a corresponding table in the destination database, those tables may have been retired. SeeAppendix E: Retired Tables, page 43 for a complete list of tables that were retired from 7.0 to 9.1 and from 8.0 to 9.1.

27. On the **Select Source Tables and Views** step, select the **Optimize for many tables** check box.

    Click **Next**.

28. You do not need to save the data migration package, but select **Execute** immediately. Click **Next** or **Finish**. Click **Finish** again, and the package executes.



29. For SQL Server databases, sequences are implemented with tables and procedures. These will be automatically created when the sequences are modeled in Oracle. If you have additional sequences, the associated tables and procedures should have been created when scripts from customizations were executed.

    The sequence tables will start with *wt_sequence_<sequence name>*, and the procedures will be found under `<Database name> > Programmability > Stored Procedures` . The procedures will start with *wt_get_next_sequence_<sequence_name>*.

    Note:

    If you created a sequence with the command `exec wtpk.createSequence('seq_name',start_num,inc_value)` for your Oracle Installation, there will not be an associated table in the SQL Server database.

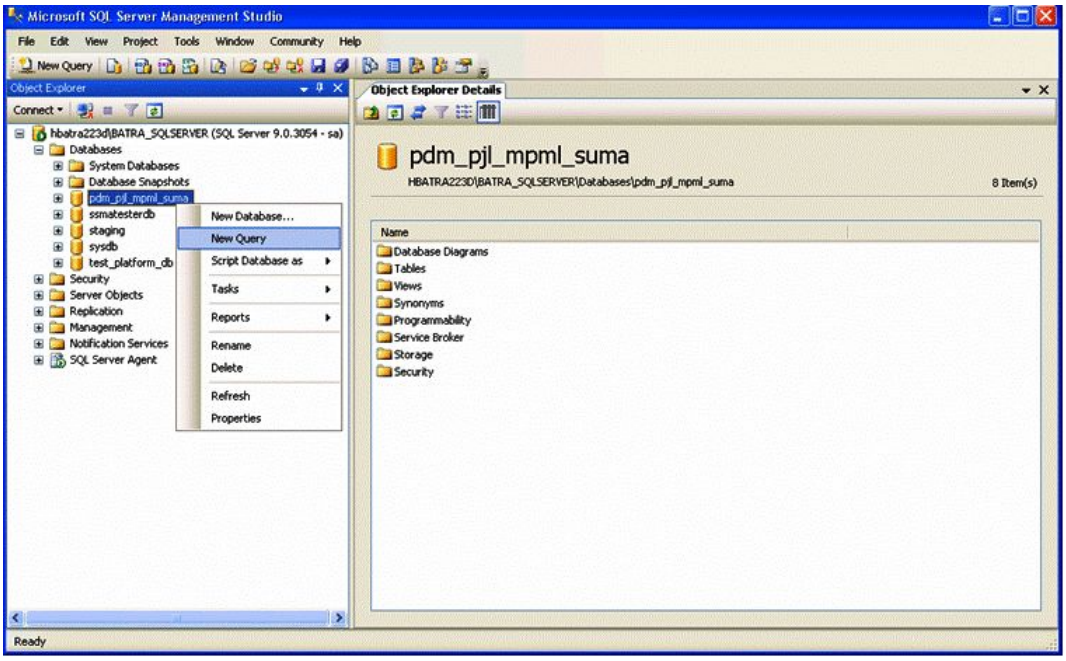
    If additional sequences are necessary, model the new sequence class as an implementation of the wt.fc.DatastoreSequence interface.

    For more information on creating additional numbering sequences, see the *Windchill Customizer's Guide*.

30. In `Sequence Emulations.sql` file created earlier in the migration procedure, replace the database name staging and dbo to the name of the destination database. For the list of these sequences, see Appendix C: Sequences, page 39.

31. After all instances of dbo and the name of the staging database have been changed to match the name of the destination database, execute the script in the **New Query** window of the SSMS tool.

To open a **Query** window, select the applicable database in the left pane. Right-click and select **New Query**.

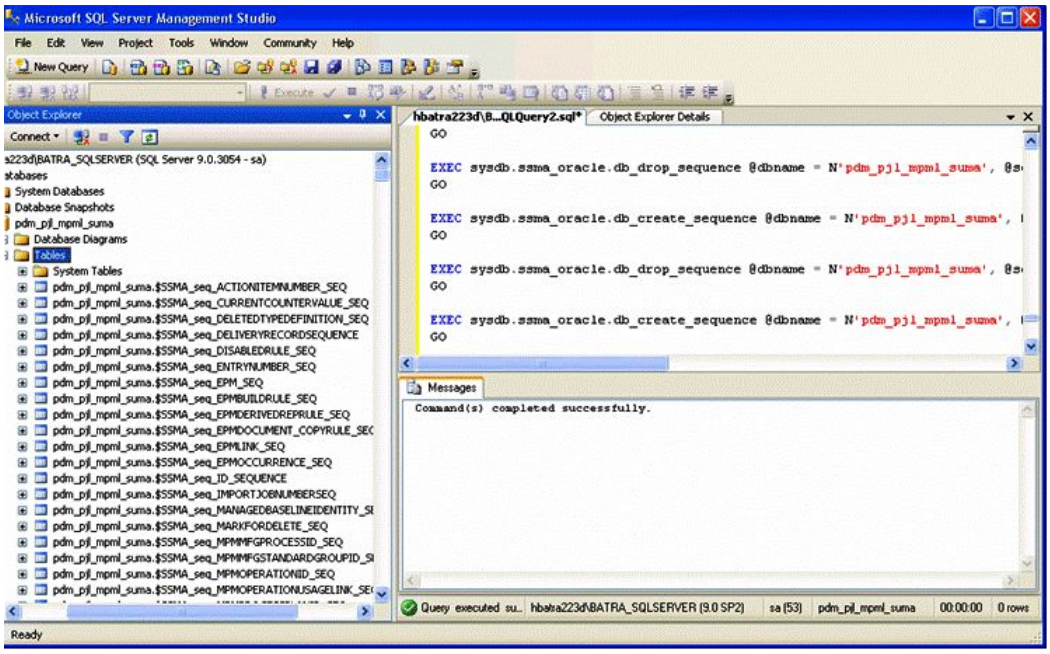


Copy and paste the contents of the file `Sequence Emulatations.sql` into the window, and execute. You should see the message, "Command(s) completed successfully".

Note:

It is important to stay logged into the SSMS tool as a SQL Server system administrator (sa) for the script to run successfully. The script must have access to the database sysdb to call the following procedures: sysdb.ssma_oracle.db_drop_sequence and sysdb.ssma_oracle.create_sequence. A SQL Server system administrator (sa) is the owner of the database sysdb.

32. Verify the script has executed as expected. New tables should appear under the Tables folder and start with $SSMA_seq*. Associated procedures should appear under `<database name> > Programmability > Stored Procedures` and start with $SSMA_sp_get_nextval_*.



Note:

Check for any customized sequences at this time as well.

33. To move the sequence values from Oracle to the SQL Server database, perform the following steps:

    - Open a Windchill shell of the installation that has been migrated.
    - Navigate to <*Windchill*>/db/sqlServer.
    - At the command line, execute the following command:

    ```
    execute_sql_script.bat
    wnc\migration\OracleToSQLServer\alter_sequence_value.sql
    ```

    This script re-seeds sequences for the following solutions, if they are installed on your system: Windchill MPMLink, Windchill ProjectLink, Windchill PDMLink, Windchill PartsLink and Windchill Supplier Management. SQL statements will not be executed for solutions that are not installed. This prevents sequences from starting at the very first number and helps avoid conflicts.

    Note:

    It is acceptable to see warnings after the script has been executed. The messages contain the old and new sequence values.

34. If you have any customized sequences, create a new script. The content will be derived from the name of the sequence created in the destination database and the name of the modeled customized sequence.

    Note:

    Replace `<variable>` with a variable name and `CUSTOMIZED SEQUENCE_NAME` with your customized sequence.

    Note:

    This statement cannot be copied directly from this document; instead, it must be entered manually.

    ```
    Declare @v_<variable> BIGINT
    ```

```
SET @v_<variable> = (SELECT IDENT_SEED('$SSMA_seq_<CUSTOMIZED
SEQUENCE_NAME>'))

DBCC CHECKIDENT('wt_sequence_<CUSTOMIZED SEQUENCE_NAME>',
RESEED,@v_<variable>)

GO
```

If the sequence is based on a column in a table, execute the following commands:

```
Declare @v_<variable> BIGINT
SET @v_<variable> = (SELECT MAX(<column name>) FROM <Table
Name>)
DBCC CHECKIDENT('wt_sequence_<SEQUENCE_NAME>',
RESEED,@v_<variable>)
GO
```

35. Validate the SQL Server sequences. To check the seed value and increment value of one sequence, use the following queries:

    Note:

    This statement cannot be copied directly from this document; instead, it must be entered manually.

    - To see the value of one sequence:
      - Select `IDENT_CURRENT('<sequence table name>')`

        Note:

        This statement cannot be copied directly from this document; instead, it must be entered manually.

      - Verify that it matches the value of the LAST_NUMBER column for each sequence in the Oracle database.
    - To see the value of each sequence:

      Select `TABLE_NAME, IDENT_CURRENT(TABLE_NAME)` as `IDENT_CURRENT` from `INFORMATION_SCHEMA.TABLES` where `IDENT_CURRENT(TABLE_NAME)` is not null and TABLE_NAME like 'wt_sequence%'
    - To see the seed value for only one table in the SQL database:

      ```
      Select IDENT_INCR('sequence table name>')
      ```
    - To see the incremental value of all sequences:

      ```
      Select TABLE_NAME, IDENT_INCR(TABLE_NAME) AS IDENT_INCR from
      INFORMATION_SCHEMA.TABLES where IDENT_INCR(TABLE_NAME) is not
      null and TABLE_NAME like 'wt_sequence%'
      ```

      Note:

      You must be logged into SSMS as the database owner that was created with the PSI installer in order for the values to be returned.

36. Validate that the system brings up Apache, Tomcat, and the Method Server.

Note:

If Windchill PartsLink is installed, classified parts do not appear on the **Classification Search** page by default. You must run the following command to reload classification and data from Windchill PDMLink to the Windchill PartsLink server:

```
windchill com.ptc.windchill.partslink.AdminApp -reload
```

For more information, see the *Windchill PartsLink Classification and Reuse Administrator's Guide*.

37. Once the system has been validated, back up the final destination database, and drop the staging database.

38. From a Windchill shell, execute the registry editor application to migrate the registry from Oracle to SQL Server:

    a. Change directory to the <*Windchill*>\installer\instreg directory.

       For example: `cd ptc\Windchill_9.1\installer\instreg`

    b. Execute the following command:

       Note:

       On Windows, a semi-colon separates the JAR file names; file paths use back slashes.

       Windows

       ```
       java -cp
       PSI-install.jar;InstallFramework.jar;
       com.ptc.windchill.install.psiedit
       <path_to_registry_file>
       ```

       Example Windows command line

       ```
       java -cp
       PSI-install.jar;InstallFramework.jar;
       com.ptc.windchill.install.psiedit
       ii5584f756.11b5afd9256.-8000\psi_iir_.xml
       ```

A
Appendix A: Verifying Service Pack 2

There are two ways to verify that Service Pack 2 (SP2) is installed on your system:

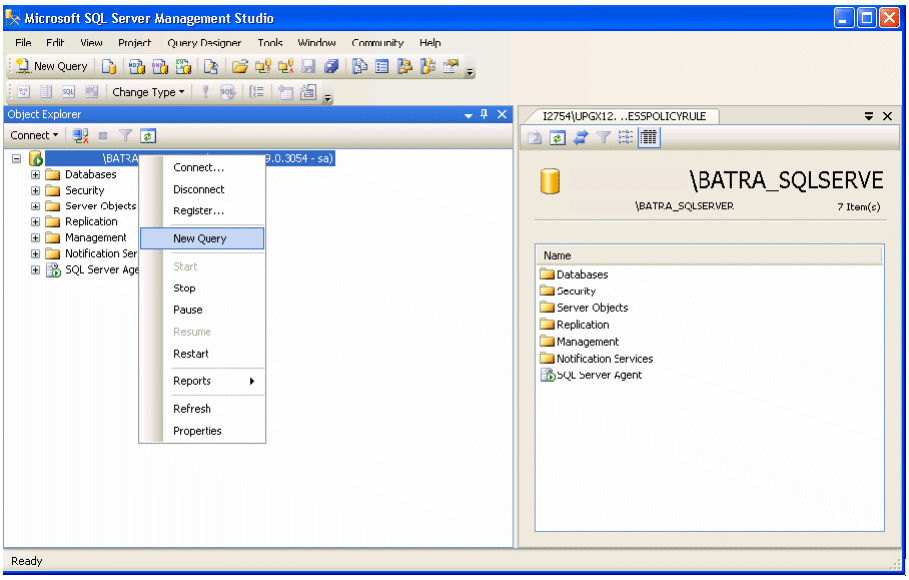
1. Open SQL Server Management Studio (SSMS) and select **About** from the **Help** menu.

   The following information should appear:

Microsoft SQL Server Management Studio	9.00.3042.00
Microsoft Analysis Services Client Tools	2005.090.3042.00
Microsoft Data Access Components (MDAC)	2000.085.1117.00 (xpsp_sp2_rtm.040803-2158)
Microsoft MSXML	2.6 3.0 5.0 6.0
Microsoft Internet Explorer	6.0.2900.2180
Microsoft .NET Framework	2.0.50727.1433
Operating System	5.1.2600

2. Open SQL Server Management Studio (SSMS).

   a. From the **Object Explorer** section in SSMS, right-click on the connected instance name and select **New Query**.



b. In the **New Query** window, enter the following statement:

Note:

Some PDF readers display the following command incorrectly. The following command should have no spaces between the "@" symbols.

```
Select @@ version
```

c. Click on the **Execute** button in the toolbar. The following value should be returned:

```
Microsoft SQL Server 2005 - 9.00.3054.00 (Intel X86)
Mar 23 2007 16:28:52
Copyright (c) 1988-2005 Microsoft Corporation
Standard Edition on Windows NT 5.1 (Build 2600: Service Pack 2)
```

If the SP2 is not installed, install it now. If it is not installed, the Oracle to SQL Server migration will fail.

B
Appendix B: Installing SQL Server Migration Assistant 2005 (SSMA)

Use the following procedure to install the SQL Server Migration Assistant (SSMA) 2005 for Oracle v.4.0:

1. Navigate to the following address to download the SSMA tool:

   http://www.microsoft.com/downloads/details.aspx?FamilyID=6d9bc6a7-75da-493e-bee5-50f4a4352b91&DisplayLang=en

   Note:

   The previous link goes to a third-party Web site and the link might change before this document can be updated. If the link does not work, navigate to the Microsoft Web site and download "SQL Server Migration Assistant 2005 for Oracle v4.0."

   The Web page allows you to install the following components:

   - SQL Server Migration Assistant (SSMA) 2005 for Oracle v.4.0
   - SQL Server Migration Assistant (SSMA) 2005 for Oracle Extension Pack v.4.0

2. Download and install the SQL Server Migration Assistant (SSMA) 2005 for Oracle v.4.0 as instructed

3. Download and install the SQL Server Migration Assistant (SSMA) 2005 for Oracle Extension Pack v.4.0 as instructed, with the following exceptions:

   a. When the installer asks for the **SQL Server Name**, exit and copy the following scripts from `<Windchill>/db/sqlserver/wnc/migration/OracleToSqlServer` to `C:\Program Files\Microsoft SQL Server Migration Assistant 2005 for Oracle Extension Pack\scripts\`

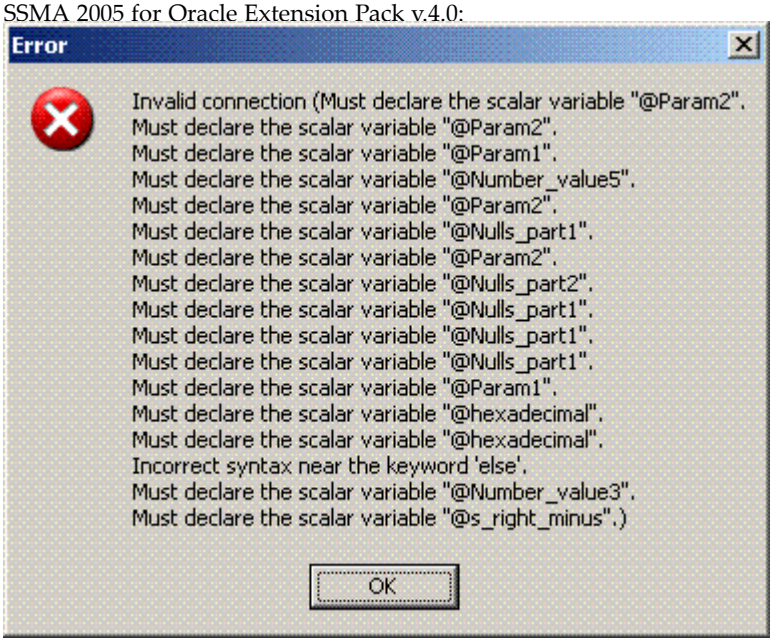
      Note:

      You will be replacing files in this step. When the system prompts you, click **OK** to continue.

      - standard.sql
      - standard2005.sql
      - standard2008.sql

4. Navigate to `C:\Program Files\Microsoft SQL Server Migration Assistant 2005 for Oracle Extension Pack\bin\` and execute the `SSMA Script Installer.exe` to complete the Extension Pack installation.

If Step 3, page 37 is not done, you see the following errors while you are installing the SSMA 2005 for Oracle Extension Pack v.4.0:



C
Appendix C: Sequences

This is a sample of the file Sequence Emulations.sql. All variable values should be replaced by the value of the staging database. All values in bold, need to be replaced by the value of the destination database.

USE **staging**
GO
IF NOT EXISTS(SELECT * FROM sys.schemas WHERE [name] = N'**dbo**')
EXEC ('CREATE SCHEMA **dbo**')
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name =
N'DISABLEDRULE_SEQ', @seed = 21, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name =
N'ENTRYNUMBER_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name = N'ENTRYNUMBER_SEQ', @seed = 141, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name =
N'EPM_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name = N'EPM_SEQ', @seed = 1, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name = N'EPMBUILDRULE_SEQ' GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**staging**', @schema = N'**dbo**', @name =
N'EPMBUILDRULE_SEQ', @seed = 1, @increment = 30
GO

For example, all the entries were replaced with the final database in the example above

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**pdm_pjl_mpml_suma**', @schema = N'**pdm_pjl_mpml_suma**', @name = N'DISABLEDRULE_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**pdm_pjl_mpml_suma**', @schema = N'**pdm_pjl_mpml_suma**', @name = N'DISABLEDRULE_SEQ', @seed = 21, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**pdm_pjl_mpml_suma**', @schema = N'**pdm_pjl_mpml_suma**', @name = N'ENTRYNUMBER_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N'**pdm_pjl_mpml_suma**', @schema = N'**pdm_pjl_mpml_suma**', @name = N'ENTRYNUMBER_SEQ', @seed = 141, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N'**pdm_pjl_mpml_suma**', @schema = N'**pdm_pjl_mpml_suma**', @name = N'EPM_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N' **pdm_pjl_mpml_suma**, @schema = N' **pdm_pjl_mpml_suma**', @name = N'EPM_SEQ', @seed = 1, @increment = 1
GO

EXEC sysdb.ssma_oracle.db_drop_sequence @dbname = N' **pdm_pjl_mpml_suma**', @schema = N' **pdm_pjl_mpml_suma**', @name = N'EPMBUILDRULE_SEQ'
GO

EXEC sysdb.ssma_oracle.db_create_sequence @dbname = N' **pdm_pjl_mpml_suma**', @schema = N' **pdm_pjl_mpml_suma**', @name = N'EPMBUILDRULE_SEQ', @seed = 1, @increment = 30
GO

D
Appendix D: Windchill PartsLink Server Properties

The following properties need to be added to the site.xconf of the installation converted for the PartsLink server to start. These properties would have been set automatically, if PartsLink had been installed with SQL Server.

<Property name="nitidus.sqlcache.db.service" overridable="true" targetFile="partslink/conf/main.properties" value="DatabaseName=**database_name**"/>

<Property name="nitidus.sqlcache.db.driver" overridable="true" targetFile="partslink/conf/main.properties" value="com.ptc.jdbc.sqlserver.SQLServerDriver"/>

<Property name="nitidus.sqlcache.db.url" overridable="true" targetFile="partslink/conf/main.properties" value="jdbc:ptc:sqlserver:$(nitidus.sqlcache.db.host):$(nitidus.sqlcache.db.port); $(nitidus.sqlcache.db.service)"/>

<Property name="nitidus.sqlcache.db.port" overridable="true" targetFile="partslink/conf/main.properties" value="**SQLServerPort**"/>

<Property name="nitidus.sqlcache.db.dataStore" overridable="true" targetFile="partslink/conf/main.properties" value="SQLServer"/>

<Property name="nitidus.sqlcache.db.host" overridable="true" targetFile="partslink/conf/main.properties" value="//**SQLServerHostName\Instance_Name**"/>

<Property name="nitidus.sqlcache.db.user" overridable="true" targetFile="partslink/conf/main.properties" value="**dbUser**"/>

<Property name="nitidus.sqlcache.db.password" overridable="true" targetFile="partslink/conf/main.properties" value="**dbPassword**"/>

<Property name="nitidus.security.accept" overridable="true" targetFile="partslink/conf/main.properties" value="$(classification.server.hostname);$(classification.client.pdmlink.hostname);**SQLServerHost**"/>

Note:

All the values in bold are to be replaced with your appropriate values

E
Appendix E: Retired Tables

If you Upgraded from 7.0 to 9.1, and then migrated from Oracle to SQL Server, tables that were retired when upgrading to 9.1 will not have a corresponding tables. You will have all or some of the retired 7.0 tables listed below:

- ACCESSPOLICY
- ANNOTATIONSETTARGETS
- CADNAMEREGISTRYENTRY
- DBPREFENTRY
- DERIVEDIMAGEKEY
- EPMBUILDLINKSRULE
- EXTENDEDPAGERESULTS
- I2WURLDATA
- IASERVER
- IASPUBLISHCRITERIA
- IASPUBLISHSELECTOR
- MYPAGEQUERYABLE
- PAGERESULTS
- PRINCIPALDOMAINKEY
- PUBLSELECTORTOSCHEDULING
- QUASIPART RDCONTEXTNODE
- RDINTERMEDIATENODE
- RDNODEKEY
- RLMAPPING
- RSRLMAPPING
- RULEHISTORYENTRY
- SIMPLEDATAMAPPING
- SITEIASLINK
- SKELETONBOOKMARK
- TEMPPAGERESULTS
- WTPRODUCT
- WTPRODUCTMASTER

- WTSERIALNUMBEREDPART
- WTSERIALNUMBEREDPARTMASTER
- WTSNPARTINSTANCE

If you Upgraded from 8.0 to 9.1, and then migrated from Oracle to SQL Server, tables that were retired when upgrading to 9.1 will not have a corresponding tables. You will have all or some of the retired 8.0 tables below:

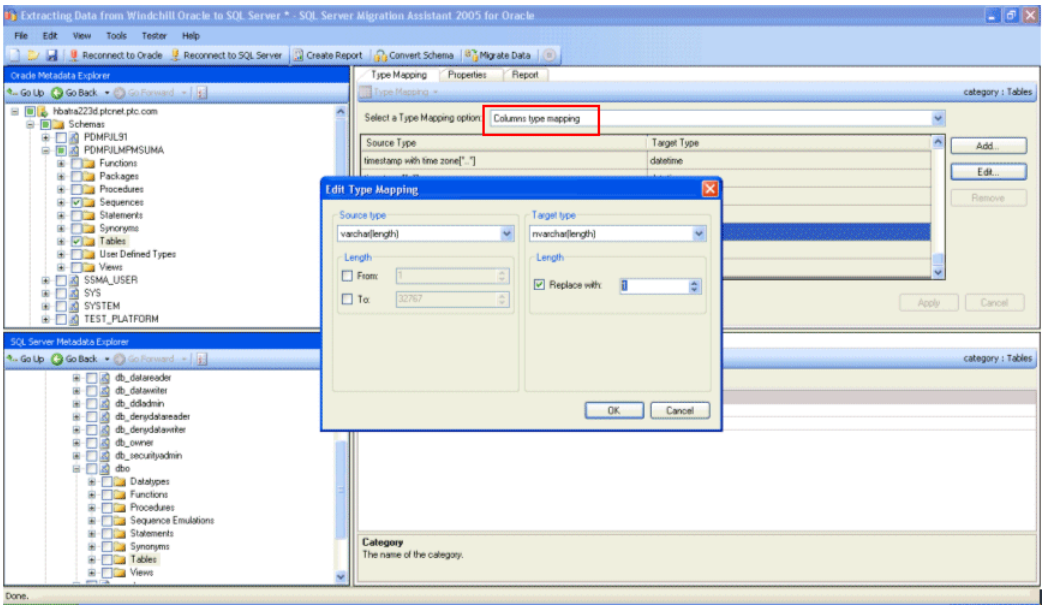
- ACCESSPOLICY
- DBPREFENTRY
- DERIVEDIMAGEKY
- EPMBUILDLINKRULE
- EPMFTBASELIEMEMBER
- I2WURLDATA
- IASERVER
- IASPUBLISHCRITERIA
- IASPUBLISHSELECTOR
- MYPAGEQUERYABLE
- PENDINGCHANGE
- PUBLSELECTORTOSCHEDULING
- RLMAPPING RSRLMAPPING
- SIMPLEDATAMAPPING
- SITEIASLINK
- TEMPPAGERESULTS
- WTPRODUCT
- WTPRODUCTMASTER
- WTSERIALNUMBEREDPART
- WTSERIALNUMBEREDPARTMASTER
- WTSNPARTINSTANCE

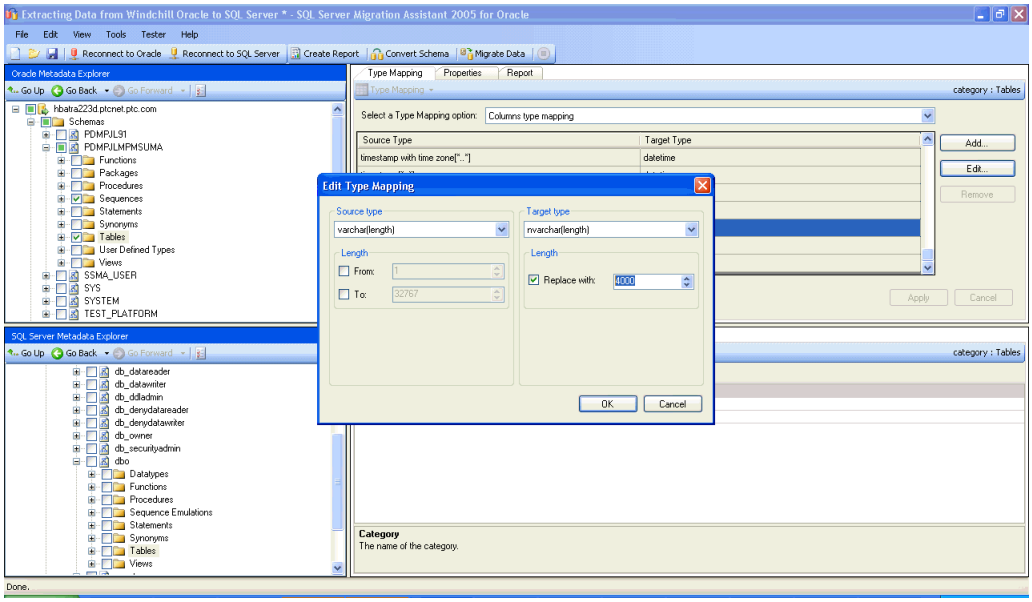
F
Appendix F: Migrating Localized Data

If your system contains localized data, you must edit the **Type Mapping** tab before continuing. Failure to do this will result in the corruption of your multi-byte data.

1. Make sure you have the **Tables** and **Sequences** folders selected in the Oracle schema in the top left pane.
2. Select the **Type Mapping** tab.
3. From the **Select a Type Mapping option** drop-down list at the top of the pane, select **Column Type Mapping**.
4. Click the **Edit** button to change each of the source type values listed below to the corresponding target types. After changing each value, click **OK**.

Source type	Target type
CHAR	NCHAR
VARCHAR	NVARCHAR(length) **Note:** Replace the default value of 1 with a value of 4000.
VARCHAR2	NVARCHAR(length) **Note:** Replace the default value of 1 with a value of 4000.





5. Click the **Apply** button on the right side of the **Type Mapping** to finish.

G
Appendix G: Troubleshooting

This appendix describes common problems that may occur and their solutions.

Warning O2SS0356 (Conversion from NUMBER datatype can cause data loss)

Warning O2SS0356 (Conversion from NUMBER datatype can cause data loss) is thrown when the SSMA tool encounters a NUMBER column and does not have a precision and scale associated with it. By default, SSMA converts NUMBER to float(53), but a source NUMBER can hold more decimal digits than float(53).

Windchill's testing of Oracle to SQL Server migration has not found any data loss occurring with this warning. If the SSMA tool does encounter a column with more data then it can migrate, it will fail. See Potential Errors When Migrating Data, page for information about errors you may encounter.

Potential Errors When Migrating Data

There are two potential errors that can occur when the SSMA tool has problems importing data in a column of Oracle type NUMBER to SQL server.

- OCI-22053: Overflow Error
- Decimal's scale value must between 0 and 28 inclusive. Parameter name: scale

Both errors occur because the SQL Server does not have an exact equivalent of Oracle data type NUMBER. By default, SSMA maps the column type NUMBER to float(53). In some cases, when the source number contains too many significant digits, the data migration can fail with an overflow error. Overflow errors are possible when there are more than twenty-six significant digits in the source number (a .NET limitation).

The second error occurs when the scale is greater than 28. The Oracle type **NUMBER**. **Precision** can range from 1 to 38, and the **Scale** can range from -84 to 127. The SSMA tool cannot interpret a scale beyond 28.

Use the following procedure to fix both errors.

1. Create a script that names the table that you are going to modify Temp<*Table Name*>. Change columns that are NUMBER type to VARCHAR2(53) in the Oracle database
2. Execute the script and confirm that the table looks correct.
3. Copy the data from the original table by executing the following commands:

```
Insert into Temp<TableName>

Select * from <TableName>;

Commit;
```

4. Verify that the data is in the Temp<*Table Name*> table, and then drop the original table.
5. Rename Temp<*Table Name*> to the original table name.

Note:

This should not happen with the EPMMemberLink or PartUsesOccurrence tables, as long as the scripts were executed before the migration was started.

Index Errors

When migrating data, you may see error messages such as: "Error: Cannot insert duplicate key row in object `staging.dbo.<Table Name>` with unique index `<TABLE NAME>$UNIQUE`."

There are two possible reasons an error message may occur when migrating data:

- The column in the UNIQUE index has multiple values of NULL in the source table. The Oracle UNIQUE constraint is not the same as the UNIQUE constraint in SQL Server. Oracle allows multiple values of NULL, and the SQL Server database allows only one.
- The index length exceeds the SQL Server's size limit of 900.

To determine the problem, look in the **Target** table in the SQL Server to find the columns contained in the index. Select **Table Name→Indexes** and click <Table Name>$Unique. From there, you can see the size of the column. Verify that the size of the column would not exceed 900 if the value listed were multiplied by two. If the index only contains one column regardless of the size, you should query the column of the table in Oracle and check if there are multiple values of NULL.

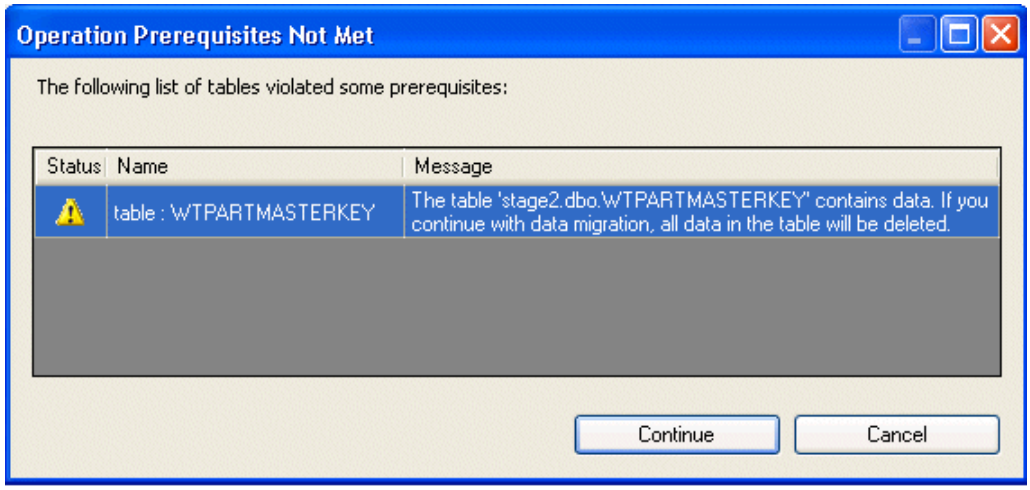
Use the following procedure to disable indexes:

1. Log in to SSMS as a SQL Server system administrator (sa).
2. Right-click on the staging database and select **New Query**.
3. In the **New Query** window, execute the following SQL commands:

```
ALTER INDEX [<table name>$UNIQUE] on staging.dbo.<table name>
DISABLE

GO
```

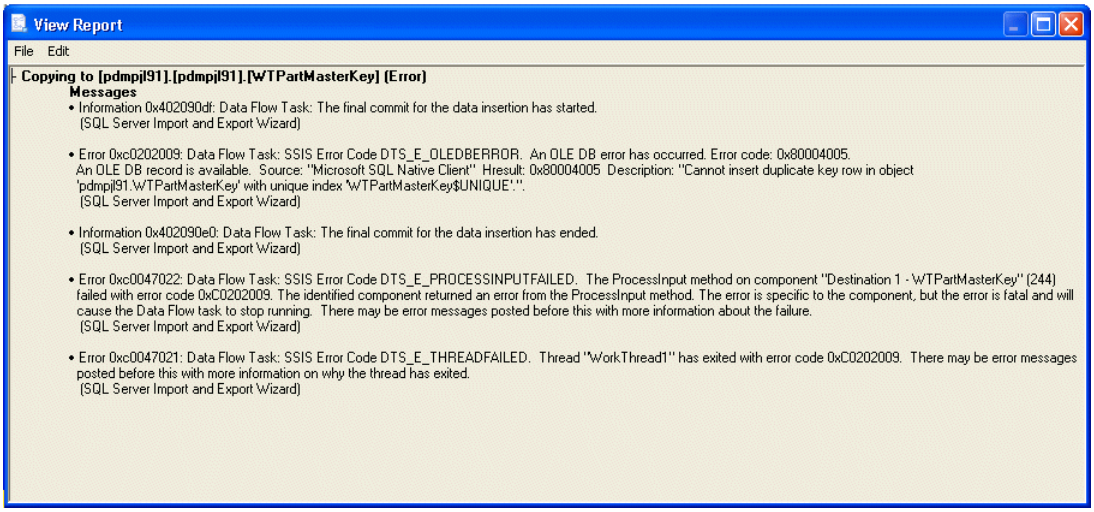
4. Return to the SSMA tool, and select the tables for which the migration failed. Select **Migrate Data**.

   If some of the data has been migrated from the Oracle table to the corresponding table in the SQL Server database, the following window may appear:



5. Click **Continue**. The data will be imported from the appropriate table.

If you received an error message because the index size exceeded SQL Server's 900 limit, you may encounter the following error again when importing data from the staging database to the final database:



If this error message appears, use the following procedure:

1. Log in as the database owner created with the PSI installer.
2. Right-click the destination database and select **New Query**.
3. In the **New Query** window, execute the following SQL statement:

   ```
   ALTER INDEX [<table name$UNIQUE>] on <table name> DISABLE
   GO
   ```

   Note:

   Remember the table name and index that was disabled; this information will be necessary later.

4. Click **Back** in the SQL Server Import and Export Wizard.
5. When you have returned to the previous screen in the wizard, click **Finish**. This allows the wizard to restart and begin the import again.
6. After the migration process has been completed, rebuild the index that has been disabled:

   ```
   ALTER INDEX [<table name$UNIQUE>] on <table name> REBUILD
   ```