WhereScape® RED

WHERESCAPE RED ADMINISTRATION GUIDE

6.8.7.0

www.wherescape.com

WhereScape®

WhereScape RED Installation and Administration Guide

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1. OVERVIEW

It is envisaged that WhereScape RED will be used by experienced data warehouse designers and implementers.
WhereScape RED provides an environment to facilitate the rapid production of prototype data warehouse analysis areas.
It also provides the functionality to move that prototype into a production environment and support the day-to-day running of a data warehouse.

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1.1 DOCUMENTATION ROADMAP

The WhereScape RED **Installation and Administration Guide**, the **online help**, and the WhereScape RED **User Guide** assume that you are proficient in the use of the Windows operating system.
WhereScape RED often provides multiple ways to accomplish a task. In some cases, you can use the main menu, the right-click menu, or a toolbar, or a key combination (e.g. Alt/M and Ctrl/M to raise menus).
Instructions in this documentation generally include only the most convenient method of accomplishing a task.

The following sources of information are available with WhereScape RED:

WhereScape RED Installation and Administration Guide

The **Installation and Administration Guide** is available either as online help, as a PDF, or in printed format. The Installation and Administration Guide provides the information needed to:

- Install the WhereScape RED software
- Validate the various software components required by WhereScape RED
- Install the WhereScape RED metadata
- Install a Scheduler
- Optionally install third-party data warehouse applications.

WhereScape RED User Guide

The WhereScape RED **User Guide** is available either as online help, as a PDF, or in a printed manual. The User Guide provides information on how to use WhereScape RED to build a data warehouse. It includes a set of tutorials to assist in the familiarization of the terms and methodologies embodied in WhereScape RED.

WhereScape RED Teradata User Guide

The WhereScape RED **Teradata User Guide** is available either as online help, as a PDF, or in a printed manual. The Teradata User Guide provides information on how to use WhereScape RED to build a data warehouse in Teradata. It includes a set of tutorials to assist in the familiarization of the terms and methodologies embodied in WhereScape RED.

Sql Admin User Guide

The **Sql Admin User Guide** is available either as online help, or as a PDF. It provides documentation in the use of the stand alone SQL query tool shipped as part of the WhereScape RED product.

WhereScape Forum

A **web forum** is available at http://www.wherescape.com. This forum contains information on the latest version, and bug reports that may be relevant for installation. In addition the WhereScape Blog is available at http://www.wherescape.com which may provide additional information.

1.2 HOW TO USE THIS MANUAL

WhereScape RED is designed to build data warehouse analysis areas within a database environment. The installation and configuration process is very rarely a simple task as it involves a number of layered products external to WhereScape RED. For the more complex cases a number of hours or days should be set aside to complete this task. Therefore, it is important that the reader begins the installation process with the correct expectations. Highlighted below are the major steps in the installation and setup of WhereScape RED. In many environments some of these steps will have been completed independently of the installation process, or may need to be completed by a third party.

Note: This document does not cover the creation and configuration of the database required to run the data warehouse. It does not cover the procedures required to create and maintain database users; nor does it cover the installation of the database client software. Refer to the database vendor manuals for assistance.

The **Installation and Configuration** chapters provide a logical outline for the installation and setup of WhereScape RED for the following databases:

- For SQL Server, see ***SQL Server Installation and Configuration*** (see "***7. SQL Server Installation and Configuration***" on page 24)
- For Teradata, see ***Teradata Installation and Configuration*** (see "***8. Teradata Installation and Configuration***" on page 42)
- For Oracle, see ***Oracle Installation and Configuration*** (see "***9. Oracle Installation and Configuration***" on page 52)
- For IBM DB2, see ***DB2 Installation and Configuration*** (see "***10. DB2 Installation and Configuration***" on page 73)

The rest of the manual deals with the following topics:

- ***Tutorial Data*** (see "***11. Tutorial Data***" on page 83) - creating and validating the tutorial data.
- ***Applications*** (see "***12. Applications***" on page 86) - loading the data warehouse applications.
- ***Upgrading*** (see "***13. Upgrading WhereScape RED***" on page 110) - upgrading WhereScape RED.
- ***Unix Connection*** (see "***14. Checking the Unix Connection***" on page 113) - checking the Unix connection.
- ***Test ODBC Source*** (see "***15. Testing an ODBC Source***" on page 115) - testing an ODBC source.

- ***Validate Repository*** (see "***16. Validating a Meta Repository***" on page 117) - validating a meta repository.
- ***Maintain Scheduler*** (see "***17.4 Maintaining the Windows Scheduler***" on page 142) - maintaining the Windows scheduler.
- ***Languages*** (see "***19. Languages***" on page 157) - creating and loading language files.

2. INSTALLING WHERESCAPE RED

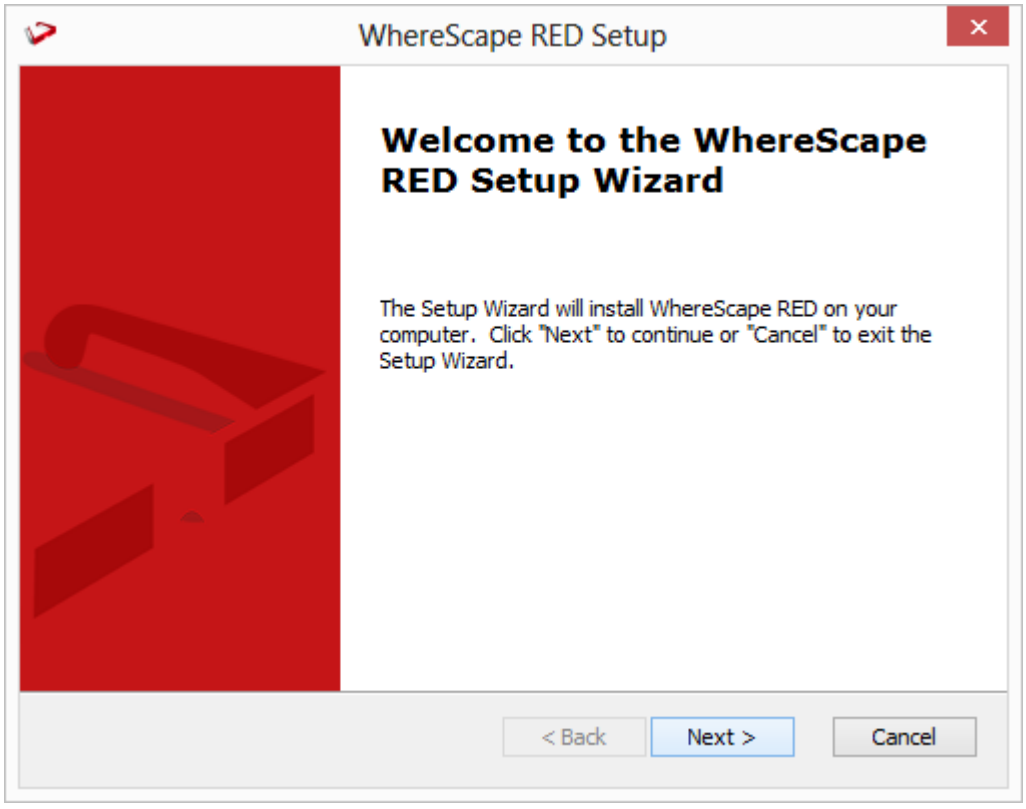
Use the following procedure to install the WhereScape RED software:

1 Stop any WhereScape RED schedulers running on the computer.

2 Close any other applications that are running.

3 Double-click the downloaded file RED_xxxxx.exe (For example: the downloaded file for version 6.8.7.0, would be RED_68700.exe).

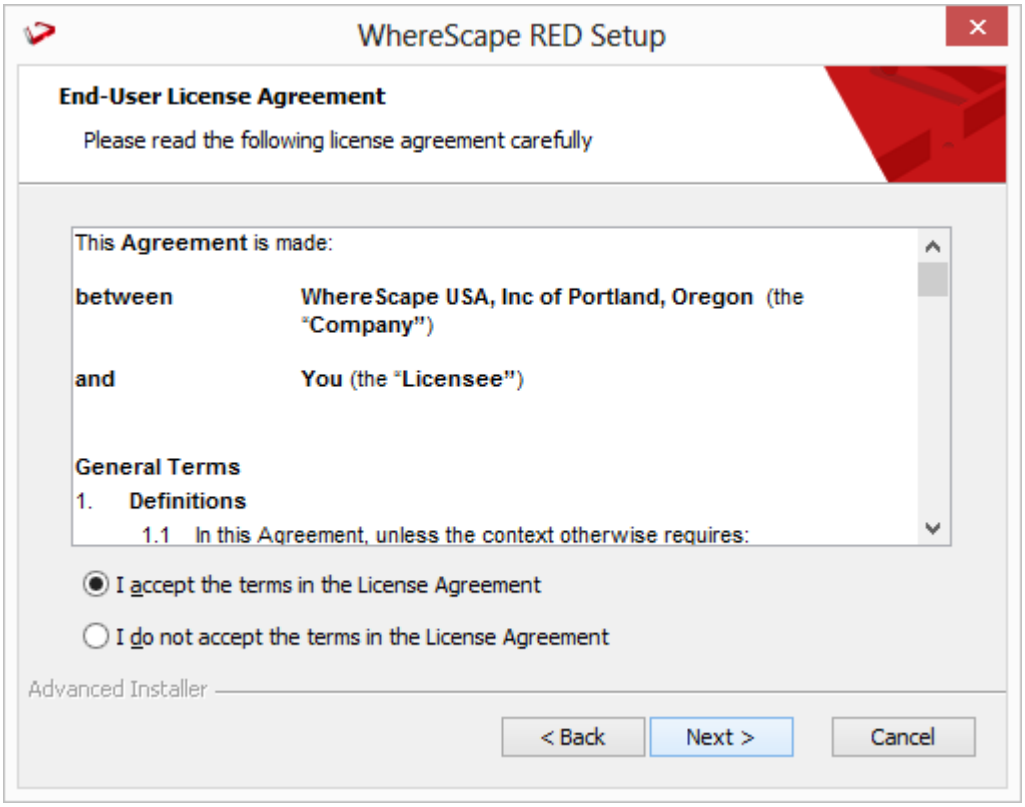
4 A dialog box displays, welcoming you to the WhereScape RED installation process. Click **Next**.



NOTE: Prerequisites Wizard screen
The installer will check for certain prerequisites that are needed to run some components of RED. If any of the prerequisites are missing, clicking **Next** will take users to the list of required prerequisites and install them.
To skip this step and jump directly to the installation of RED, click **Finish**.

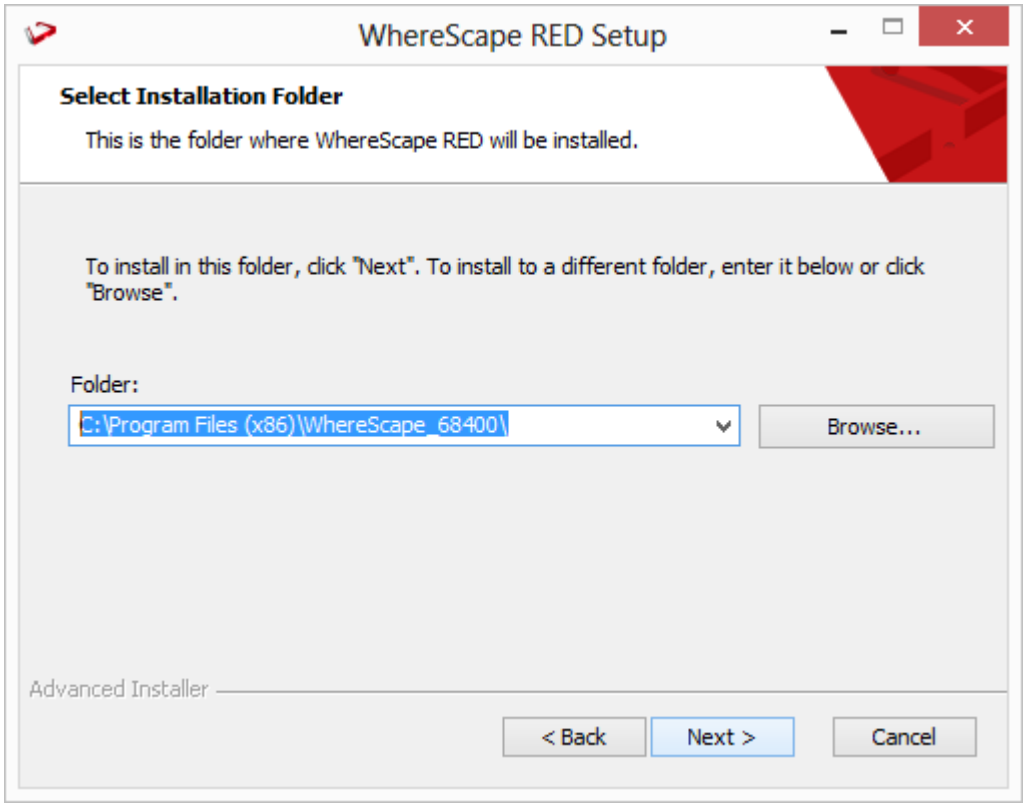
5 Read the license terms. If you do not accept the license agreement, you cannot continue with the installation.

6 Select the **I Accept the terms in the License Agreement** option and click **Next**.



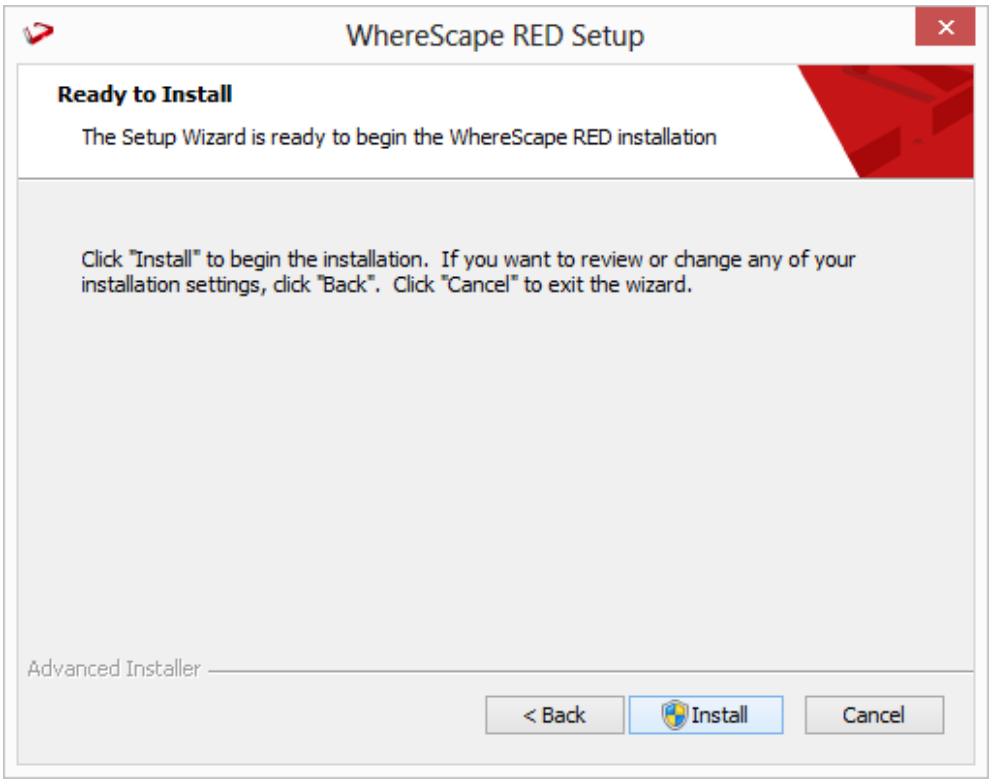
7 The **Installation Folder** dialog box displays, showing the directory where the WhereScape RED software will be installed.

- To change this directory, click **Browse...**
- Once you have selected the required installation folder, click **Next**.

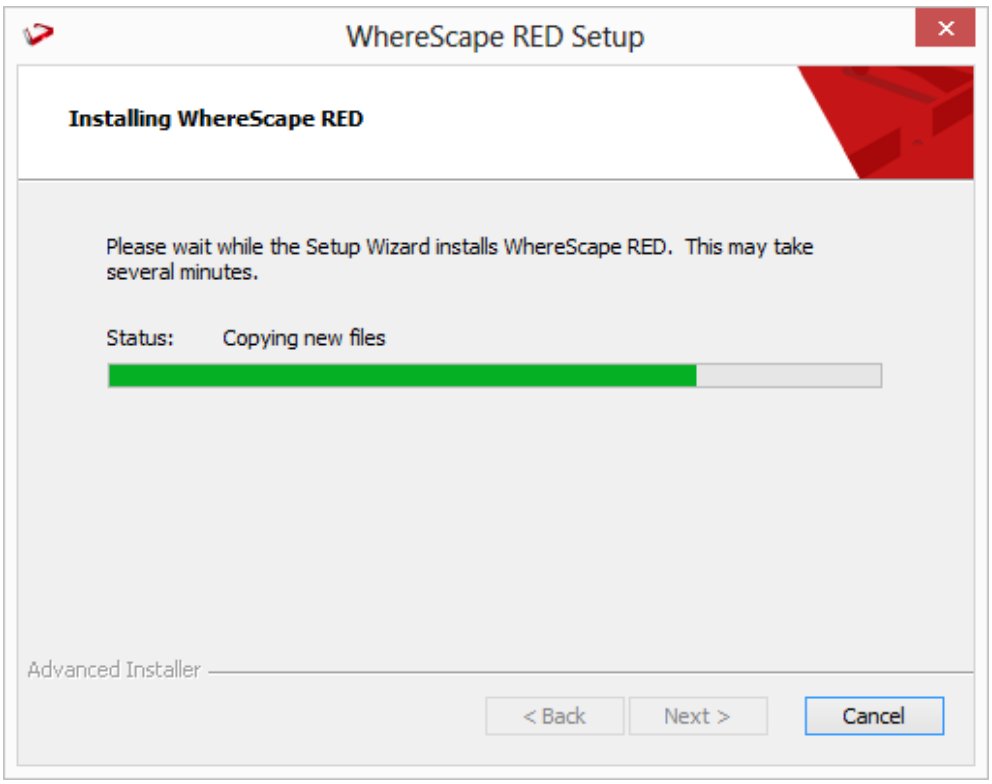


8 The **Ready to Install** dialog box displays, giving you the opportunity to go back and change any of the information you have entered so far.

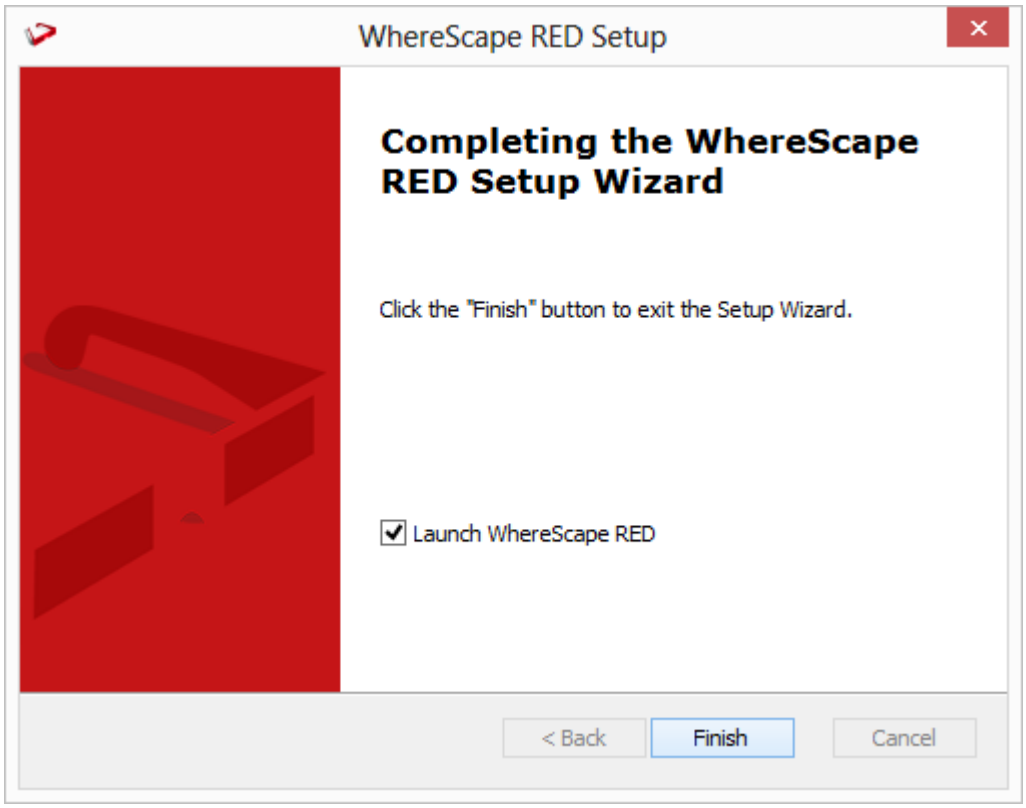
- Click **Install** to install the WhereScape RED software.



9 The Installing dialog box displays, showing you the progress as the files are copied.



10 A dialog box displays, informing you that the installation was successful. Click **Finish**.



Note: If a scheduler was running or a program open (when doing an upgrade), a dialog will display, advising you that a reboot is required to finish the install.

2.1 INSTALLING WHERESCAPE RED FROM THE COMMAND LINE

It is possible to install WhereScape RED from the command line and specify a custom installation directory using the APPDIR parameter by running a bat file.
This process can be used for all metadata database types where the exe file is configured to copy the APPDIR property into all other relevant properties.

NOTE: Command Line installations will only work as expected if the relevant version has not been previously installed yet. If the same version has already been installed, it should always be removed first.

Example

The following script example will load RED with full verbose logging:

```
@echo off
cd c:\users\user\downloads\
"RED_68500.exe" APPDIR="c:\WhereScape68500\" ALLUSERS=1 RebootYesNo="No"
Reboot="Suppress" /qn+ /L*vx "c:\WhereScape\log.txt"
exit
```

Please see Caphyon's Advanced Installer documentation for more details about command-line options: http://www.advancedinstaller.com/user-guide/msiexec.html

To install **versions of WhereScape RED older than 6.8.3.4** using the command line, please use the following script instead:

```
@echo off
cd c:\users\user\downloads\
msiexec /i "RED_68300.msi" APPDIR="C:\WhereScape68500\" ALLUSERS=1 RebootYesNo="No"
Reboot="Suppress" /qn+ /L*vx "c:\WhereScape\log.txt"
exit
```

Please see Microsoft Documentation for more details about Msiexec command-line options: https://msdn.microsoft.com/en-us/library/windows/desktop/aa367988(v=vs.85).aspx

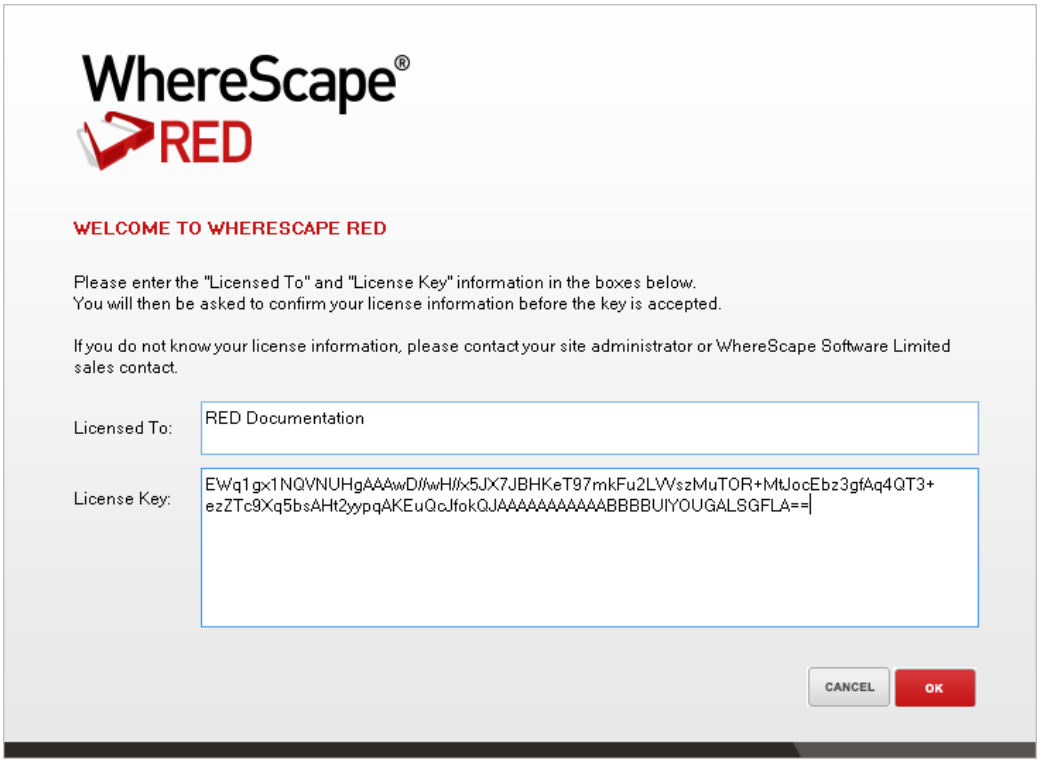
3. ADDING YOUR LICENSE

WhereScape RED requires a valid licensee and license key. This information and key are normally supplied in a separate email.

1 In WhereScape's Setup Administrator, click on the **Computer Setup** tab in the left pane;

- Then click on the **WhereScape RED License** icon.

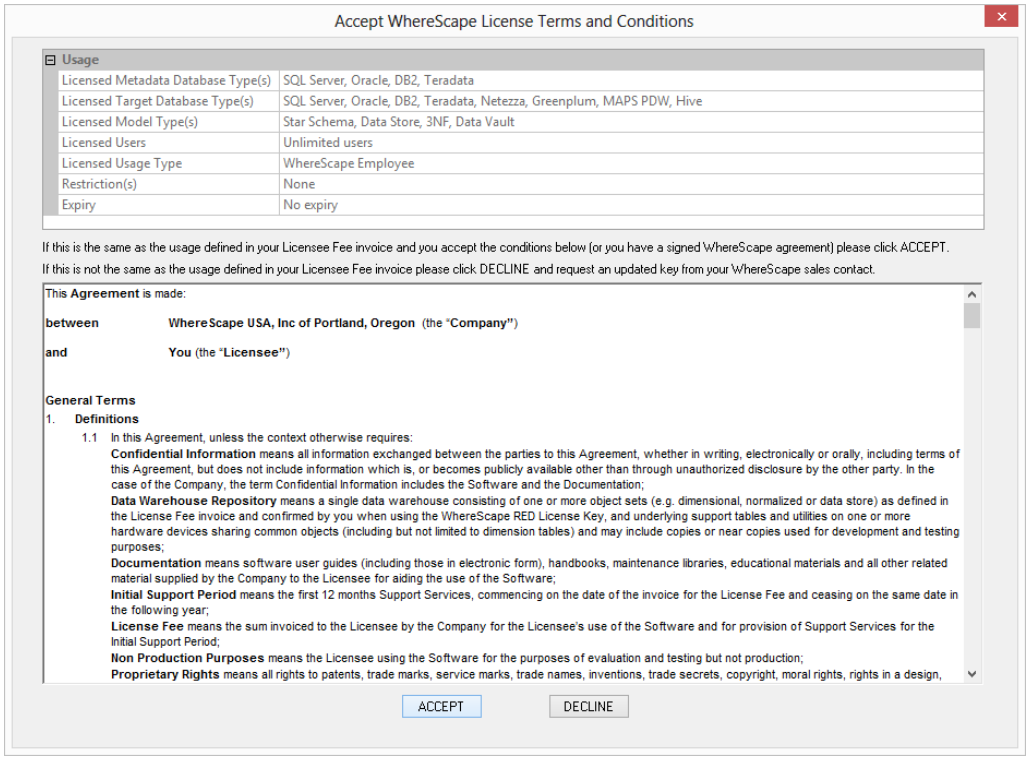
2 This menu option allows the entry of the license information.
Once validated the license information is stored in the registry and validated by the WhereScape RED program on startup.



3 The example above shows the entry of an evaluation license and key.
If the key fails to validate contact support@wherescape.com.

- Enter the license fields and click **OK**.

The license type dialog now displays:



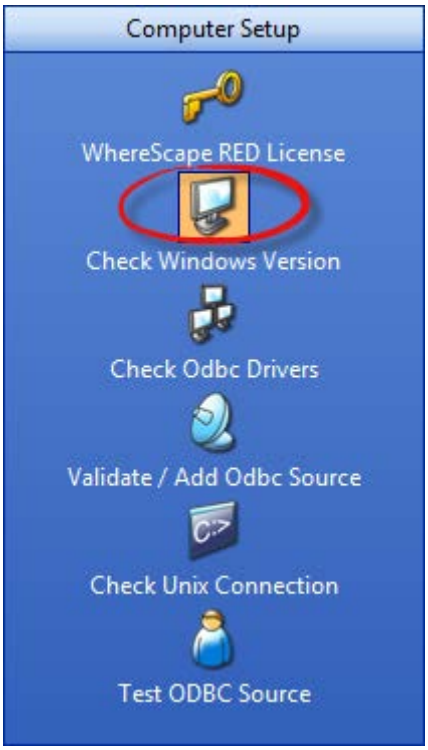
4 Click **ACCEPT** to confirm the type of license.

4. CHECKING YOUR WINDOWS VERSION

WhereScape RED requires a Windows 2008, Windows 2008 R2, Windows Vista, Windows 7 or Windows 8 environment with a screen size set to at least 1024x768. This step simply validates that the above requirements have been met. The WhereScape RED front end will run in other Windows environments, but the scheduler may not. WhereScape RED will not run under Windows 95, 98 or NT. Please note that if the minimum screen size of 1024x768 is used then the standard font size must also be used.

1 In WhereScape's Setup Administrator, click on the **Computer Setup** tab in the left pane.

- Then click on the **Check Windows Version** icon.

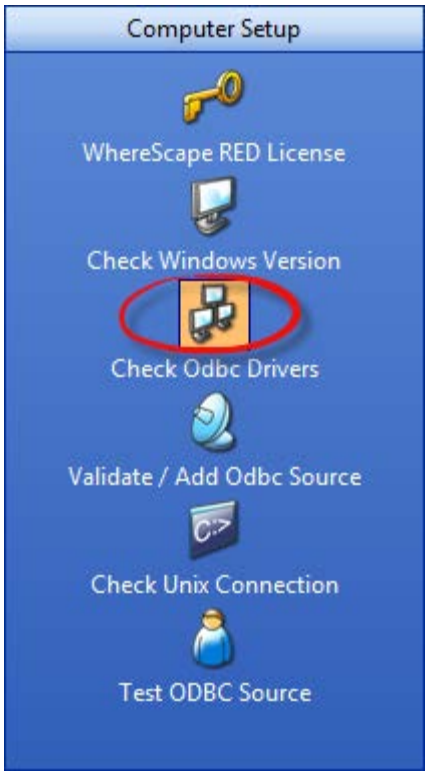


5. CHECKING YOUR ODBC DRIVERS

Both the SQL Server and Microsoft for Oracle ODBC drivers are shipped as normal in Windows 2008, Windows 2008 R2, Windows Vista, Windows 7 and Windows 8. This step will usually be a validation of the pre-installed drivers.
WhereScape RED connects to the data warehouse database using ODBC. This step checks that the ODBC driver is present and up to date.

1 In WhereScape's Setup Administrator, click on the **Computer Setup** tab in the left pane.

- Then click on the **Check Odbc Drivers** icon.



2 A list of ODBC drivers will be displayed provided the computer user has enough privileges to access the registry.

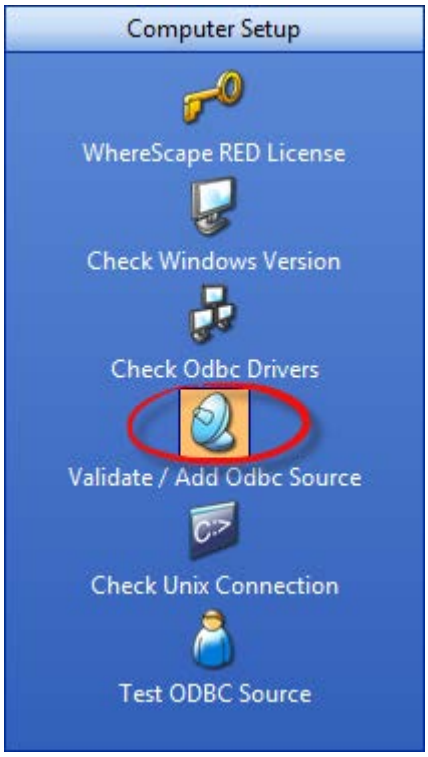
ODBC Driver

Driver Name	Driver File	Version	Status
Microsoft Access-Treiber (*.mdb)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Driver do Microsoft Paradox (*.db)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Driver do Microsoft Excel(*.xls)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft Text Driver (*.txt; *.csv)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Driver da Microsoft para arquivos texto (...	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft dBase-Treiber (*.dbf)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
SQL Server	C:\Windows\system32\SQLSRV32.dll	6.2.9200.16384 (...	OK
Microsoft Excel Driver (*.xls)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Driver do Microsoft dBase (*.dbf)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft Paradox-Treiber (*.db)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft ODBC for Oracle	C:\Windows\system32\msorcl32.dll	6.2.9200.16384 (...	OK
Microsoft Text-Treiber (*.txt; *.csv)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft Excel-Treiber (*.xls)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft Access Driver (*.mdb)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Driver do Microsoft Access (*.mdb)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft Paradox Driver (*.db)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Microsoft dBase Driver (*.dbf)	C:\Windows\system32\odbcjt32.dll	6.2.9200.16384 (...	
Teradata	C:\Program Files (x86)\Teradata\Client\...	14.10.00.00	OK
NetezzaSQL	C:\Windows\SysWOW64\nsqlodbc.dll	7.0.2.27689	
IBM DB2 ODBC DRIVER - DB2COPY1	C:\PROGRA~1\IBM\SQLLIB\BIN\DB2CL...		
IBM DB2 ODBC DRIVER	C:\Program Files\IBM\SQLLIB\BIN\DB2...		
PostgreSQL ANSI	C:\Program Files (x86)\Greenplum\gree...	08.04.0200	
PostgreSQL Unicode	C:\Program Files (x86)\Greenplum\gree...	08.04.0200	
SQL Server Native Client 11.0	C:\Windows\SysWOW64\sqlncli11.dll	2011.0110.3000.0...	OK
Oracle in OraClient11g_home1_32bit	C:\oracle\product\11.2.0\client_2\BIN\...	11.2.0.3.0	OK
Hortonworks Hive ODBC Driver	C:\Program Files (x86)\Hortonworks Hi...		

6. CREATING AN ODBC CONNECTION

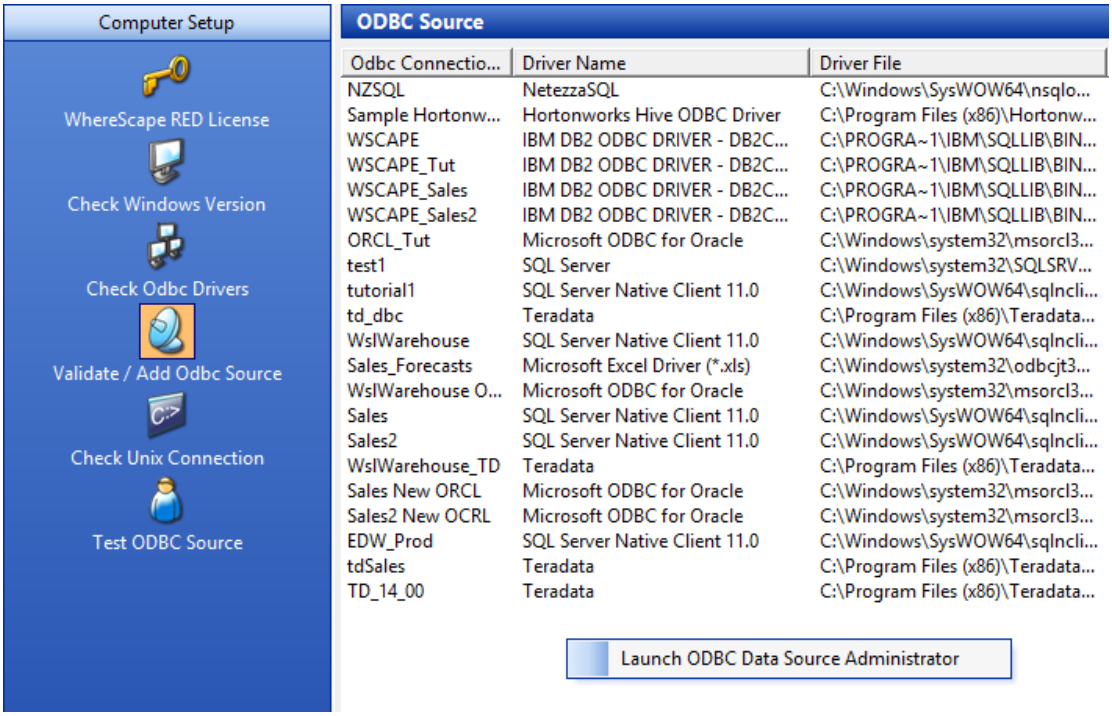
1 In WhereScape's Setup Administrator, click on the **Computer Setup** tab in the left pane.

- Then click on the **Validate/ Add Odbc Source** icon.



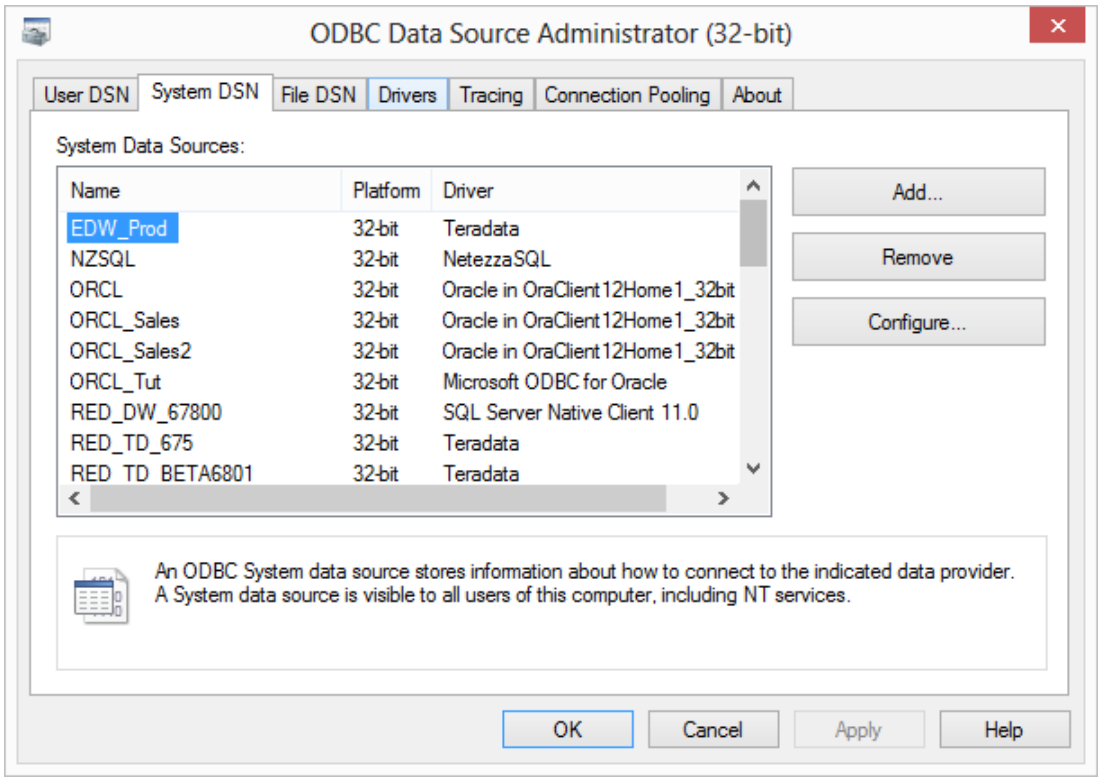
2 An entry needs to exist in the ODBC tables for the data warehouse database. This step lists all entries found that use an ODBC driver. If no entry exists for the data warehouse database then you will need to add one.

- Right-click in the anywhere on the right frame to bring up the **Launch ODBC Data Source Administrator** menu option.



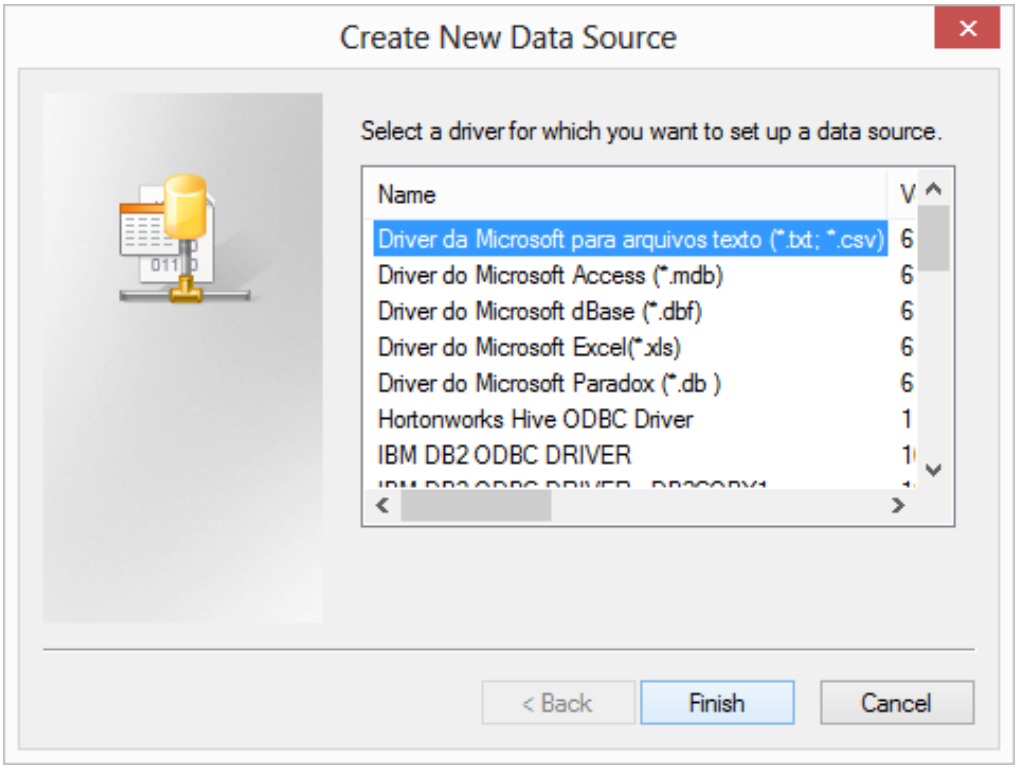
3 Click on the **System DSN** tab to view the system wide ODBC entries.

- Click on the '**Add...**' button to add a new entry.



NOTE: ODBC connections must be either **User DSN** or **System DSN**. **File DSN** connections are **not** supported.

4 Select the relevant driver and click **Finish**.



5 Enter the relevant details to create a new ODBC data source.

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7. SQL SERVER INSTALLATION AND CONFIGURATION

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7.7 SQL Server Quick Application 37

7.1 INSTALLATION AND CONFIGURATION INTRODUCTION

The steps provided here are an indication of the normal process required to install and configure WhereScape RED.
In some environments additional processes will be required.

1. Install the WhereScape RED software onto your PC. See ***Installing RED for SQL Server*** (see "***7.2 Installing RED for SQL Server***" on page 25)
2. Add your license key. See ***Adding your License*** (see "***3. Adding Your License***" on page 14)
3. Check your Windows version. See ***Checking your Windows Version*** (see "***4. Checking Your Windows Version***" on page 17)
4. Check your ODBC Drivers. See ***Checking your ODBC Drivers*** (see "***5. Checking Your ODBC Drivers***" on page 18)
5. Designate a database that is to be used as the data warehouse database. See ***Creating a SQL Server Database*** (see "***7.3.2 SQL Server Login Setup***" on page 26)
6. Add the definition of an ODBC data source to connect to the data warehouse database. See ***Configuring a SQL Server Metadata Connection (DSN)*** (see "***7.4 Configuring a SQL Server Metadata Connection (DSN)***" on page 27)
7. Create the WhereScape metadata repository. See ***Creating a Metadata Repository for SQL Server*** (see "***7.5 Creating a Metadata Repository for SQL Server***" on page 33)
8. Install a Windows Scheduler. See Installing a Windows Scheduler for SQL Server
9. If required, load the WhereScape tutorial tables into a separate database. It is highly recommended that the tutorials be undertaken. See ***Creating Tutorial Data*** (see "***11.1 Creating Tutorial Data***" on page 84)

Note: A Quickstart option is available for SQL Server. This option will perform all the required tasks (except the entering of a license key) when provided with a valid database server.

7.1.1 Problem Solving

If any problems happen in your install that cannot be resolved proceed as follows when running WhereScape's Setup Administrator utility:

1. Create a log file by selecting **Log/Start Log** from the menu bar. Enter a file name.
2. Step through at least:
   - Computer Setup --> Check Windows version
   - Computer Setup --> Check ODBC driver
   - Computer Setup --> Validate/Add Odbc source
   - Create/Validate Meta Repository --> Validate meta repository
3. Select **Log/Stop Log** to close off the log
4. Edit the log and remove any passwords that appear
5. Send your log file to support@wherescape.com

7.2 INSTALLING RED FOR SQL SERVER

Installation Prerequisites

WhereScape RED requires certain client and server components.

Client Prerequisites

- Windows Vista, Windows 7 or Windows 8.
- 250MB available disk space.
- ODBC Version 3.0 (normally shipped as part of the Operating System).
- For building a data warehouse, the appropriate Microsoft ODBC driver for SQL Server is required.

Server Prerequisites

- One of the following data warehouse database platforms is required: Microsoft SQL Server 2005, 2008, 2008R2, 2012, 2012R2 or 2014.
- To use the WhereScape RED Scheduler, a UNIX, Linux or Windows based server is also required (this may be the database server). WhereScape RED only supports sh and ksh under UNIX and bash under Linux.

Installation of WhereScape RED

To install WhereScape RED, see ***Installing WhereScape RED*** (see "***2. Installing WhereScape RED***" on page 8)

7.3 SQL SERVER DATABASE AND LOGIN SETUP

7.3.1 SQL SERVER DATABASE

Create a SQL Server database to be used as the RED metadata repository and data warehouse.
To use object placement across multiple schemas in RED, create the required schemas in the SQL database.

NOTE: The database name used for the RED repository must follow SQL Server rules for "Regular Identifiers". For example, the database name should not contain any spaces.
Please refer to SQL Server documentation for more details on rules for regular identifiers.

7.3.2 SQL SERVER LOGIN SETUP

Create a SQL Server login that will be used to set up the RED metadata repository and for access by the RED scheduler service.
The minimum SQL Server permissions are as follows:

7.3.2.1 Server Level Permissions

- **bulkadmin** - this role is required if you want to load files or use Native ODBC loads.

Permissions to kill a process when killing jobs in the scheduler

- VIEW SERVER STATE
- ALTER ANY CONNECTION

SQL Server 2012 roles

For SQL Server 2012 and later only, users can create server roles and grant them to the RED scheduler and RED users.

7.3.2.2 Database Permissions

Database roles (on the database with the RED metadata in it)

- db_datareader
- db_datawriter
- db_ddladmin

Database grants (on the database with the RED metadata in it)

- SELECT
- INSERT
- UPDATE
- DELETE
- EXECUTE

NOTE: When creating a new repository or validating the metadata in an existing repository, the SQL Server login used must have SYSADMIN or the ALTER TRACE permission.
This is because almost all the WhereScape procedures have a catch all with log file option exception handler. This ensures that in the event that the scheduler cannot log errors to the database, it can log errors to SQL Server logs and Application logs.

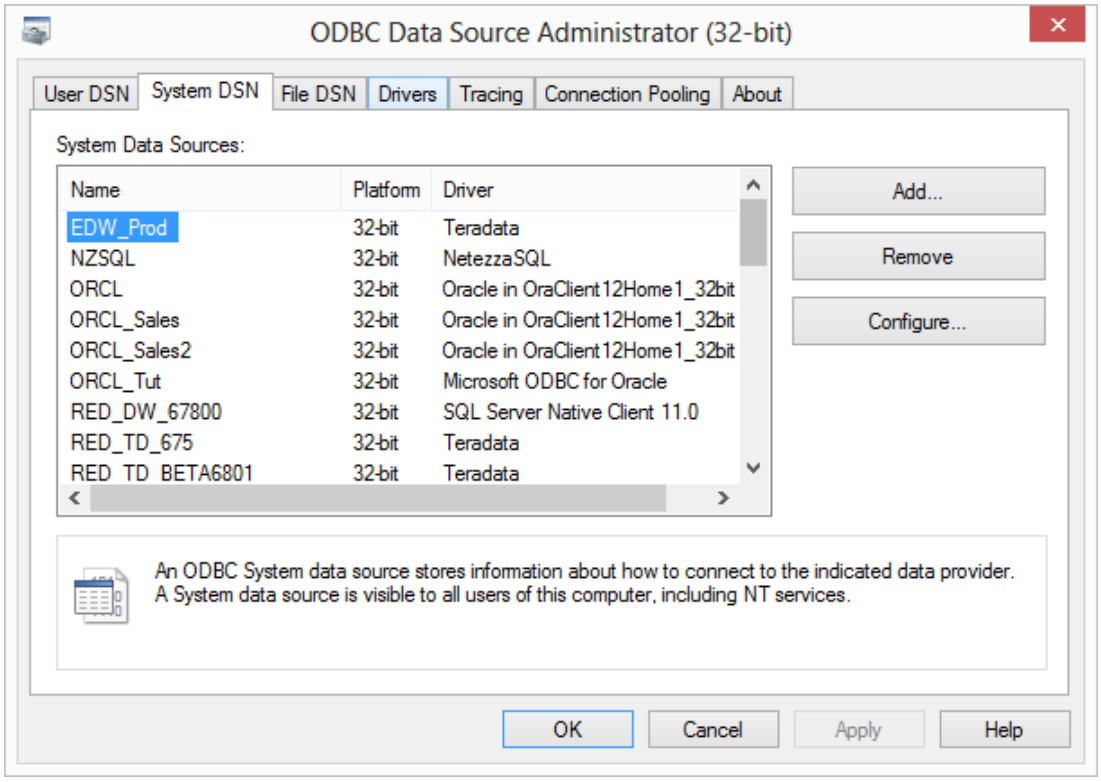
The SQL Server login for RED must have a default schema of **dbo**.

7.4 CONFIGURING A SQL SERVER METADATA CONNECTION (DSN)

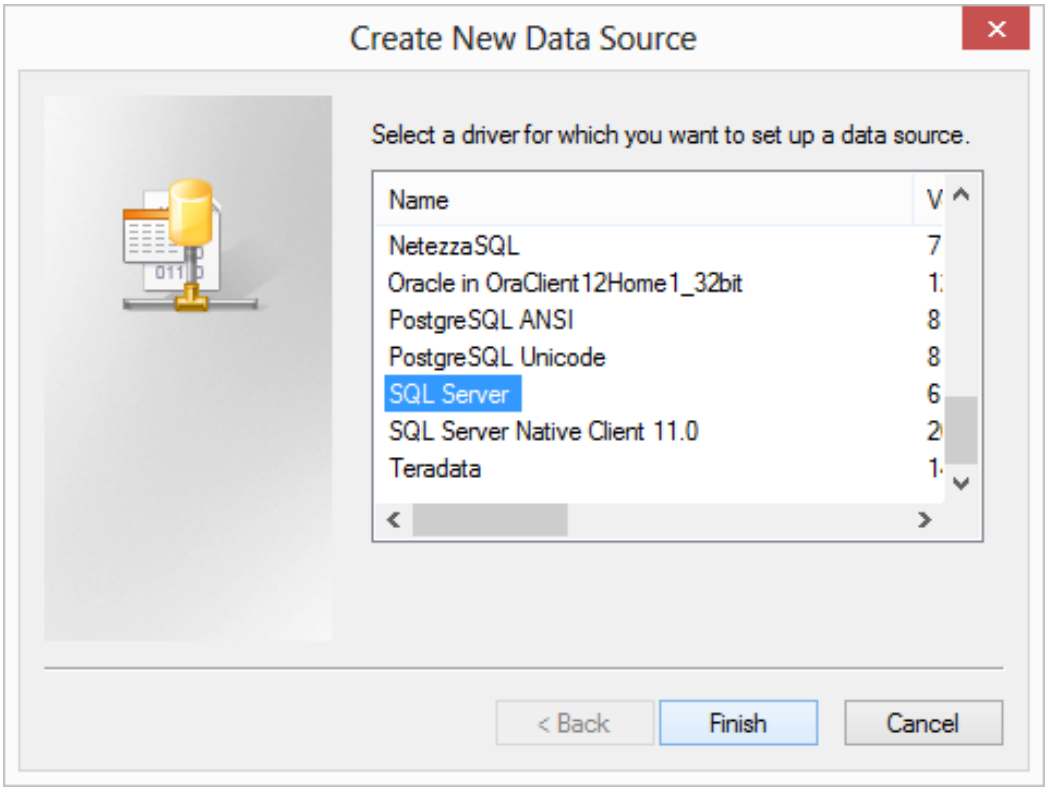
To begin adding an ODBC Source from WhereScape's Setup Administrator, see ***Creating an ODBC Connection*** (see "***6. Creating an ODBC Connection***" on page 20)

1 In ODBC Data Source Administrator, click on the **System DSN** tab to view the system wide ODBC entries.

- Click the '**Add...**' button to add a new entry.

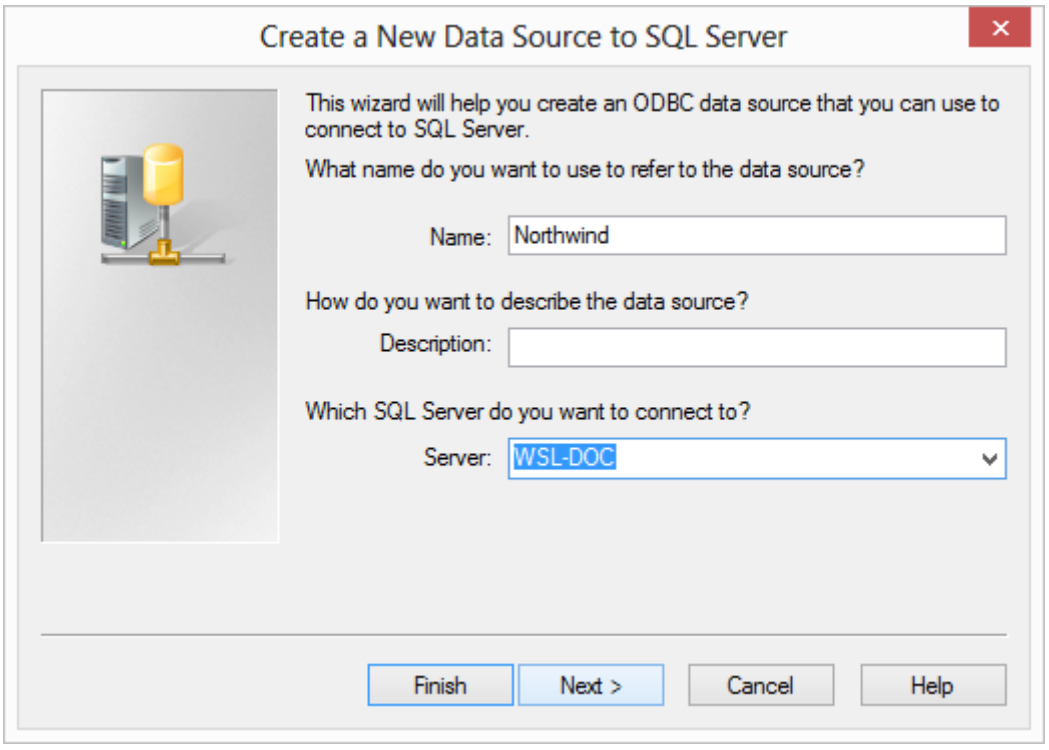


2 Select a **SQL Server** driver from the driver list.



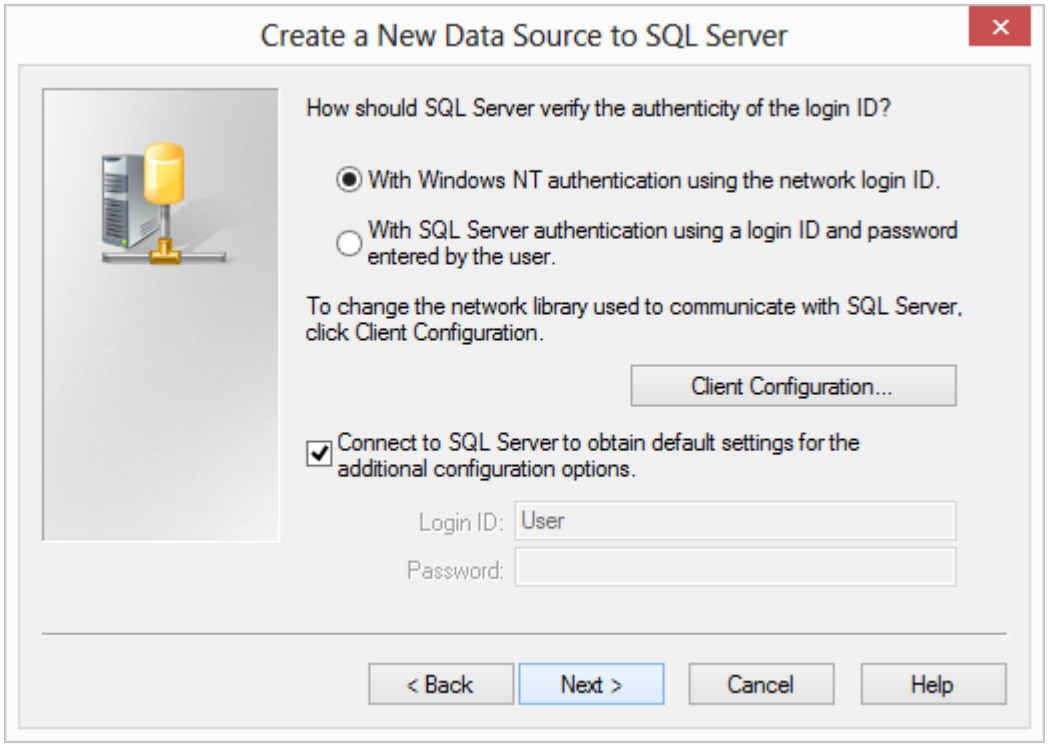
3 Enter a **Name** for the ODBC Source and select or enter the **Server**.

- Click **Next**.



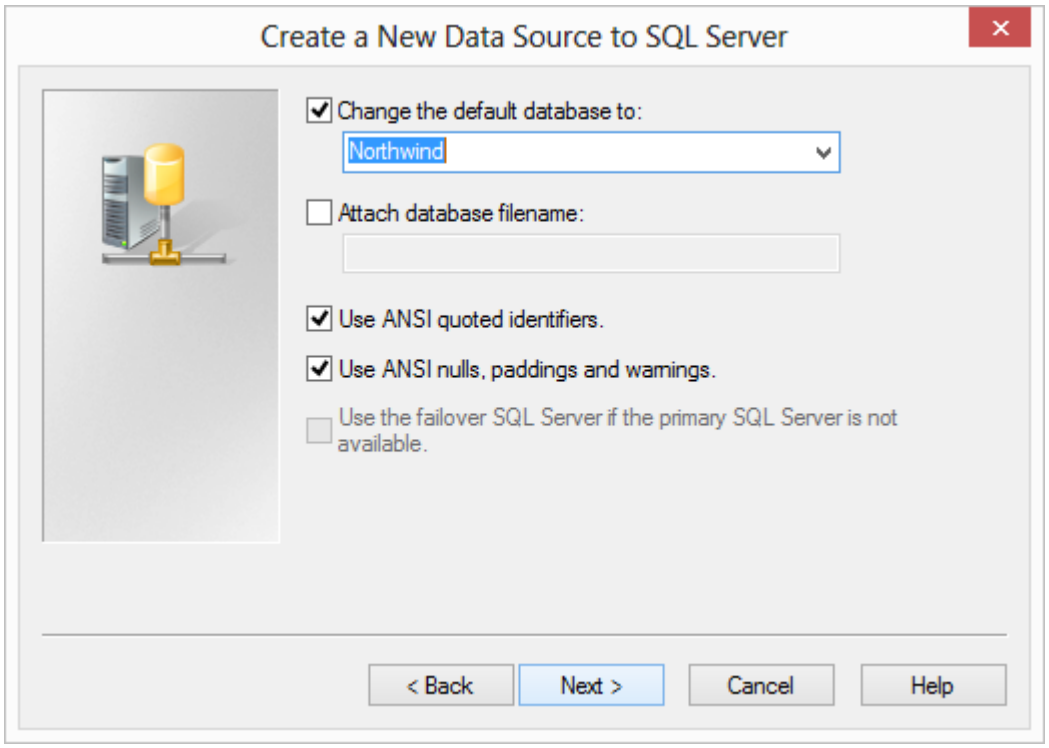
4 Another pop-up will appear with authentication details.

- Change as required or leave as shown if you are unsure.
- Click **Next.**



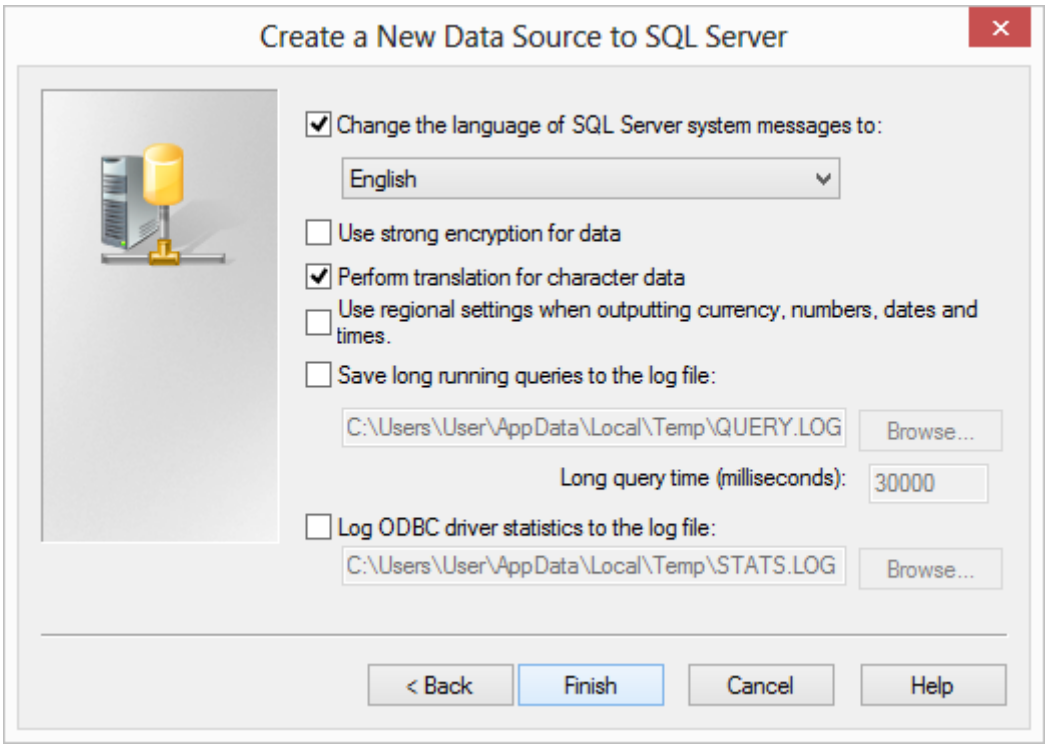
5 The next pop-up will provide the opportunity to select a database. The following example shows the selection of the Northwind database.

- Select a database from the drop-down-list and click **Next.**

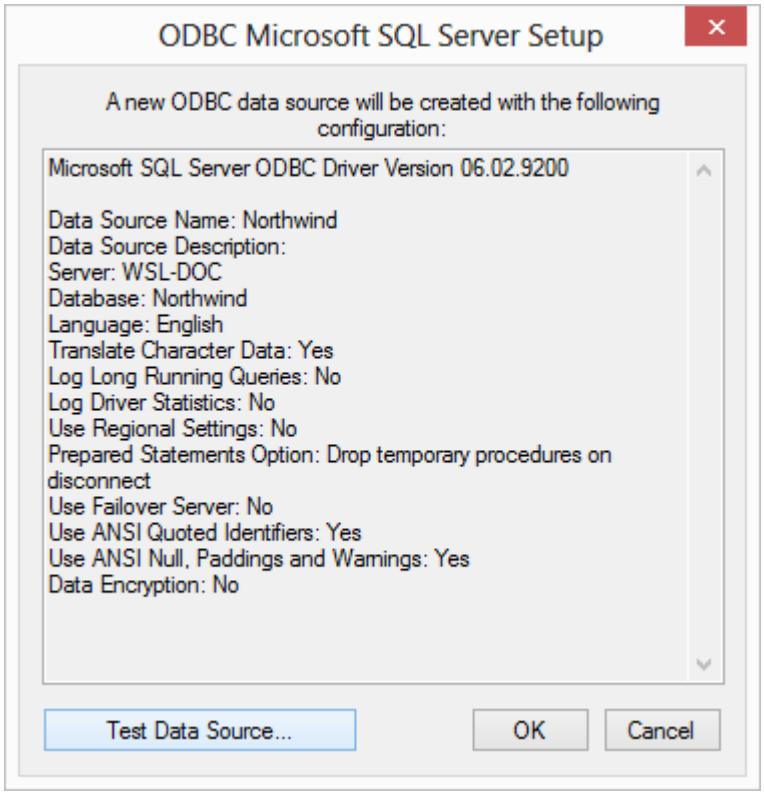


6 The last pop-up allows setting of other features if desired.

- Ensure the **regional settings** check-box is **not used**. If this is used then date and number formats will be in regional standards rather than native form.
- Click **Finish**.



7 Test the data source using the '**Test Data Source**...' button, otherwise just click **OK**.

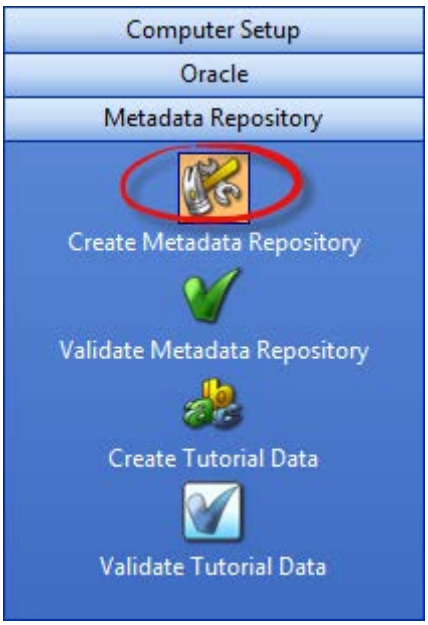


TIP: If multiple PCs will access the data warehouse they must all use the same data source name as entered here.

7.5 CREATING A METADATA REPOSITORY FOR SQL SERVER

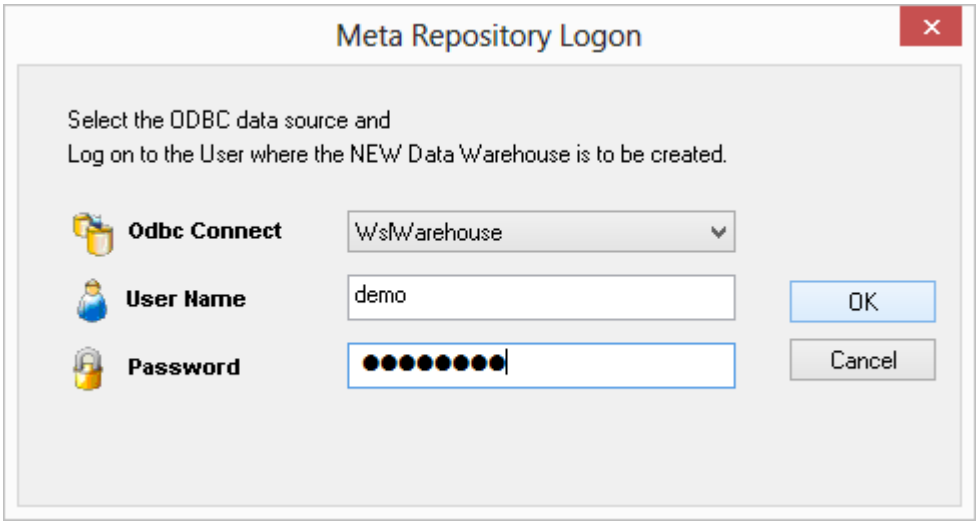
1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane.

- Then click on the **Create Metadata Repository** icon.



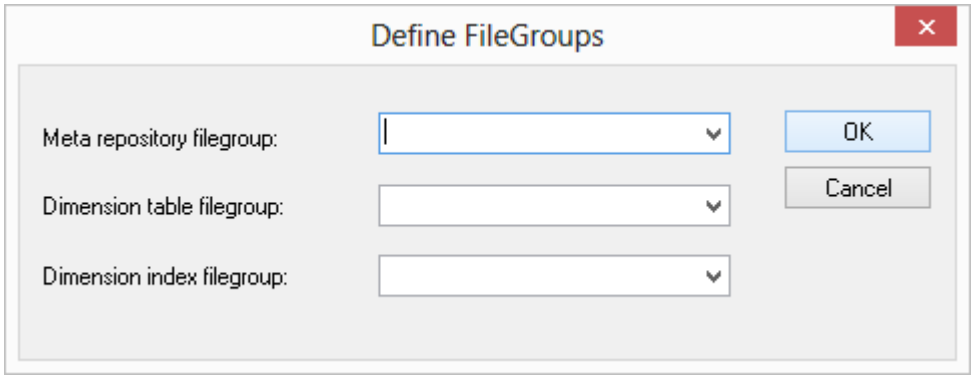
2 This option will create the WhereScape meta tables, sequences and procedures in the specified schema. It checks to ensure that the schema, database or user does not contain an existing metadata repository before starting the metadata install.

- Click on **Create Metadata Repository**.
- Enter the **Odbc Connect**, **User Name** and **Password** and click **OK**.



3 When creating a SQL Server metadata repository, an additional screen is displayed requesting **Filegroup** information.

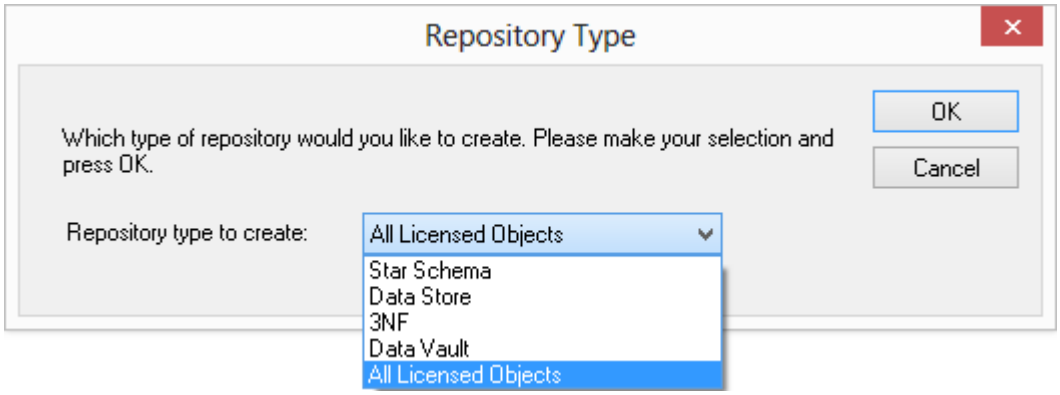
- Select the required **Filegroups** and click **OK**.
- If Filegroups are not being used, leave the Filegroups fields blank and click **OK**.



4 Depending on the type of license you have, the following dialog may be displayed.

This is just setting the default objects visible in RED. They can later be changed in RED under **Tools/Options**.

- If it is displayed, select the type of repository required and click **OK**.



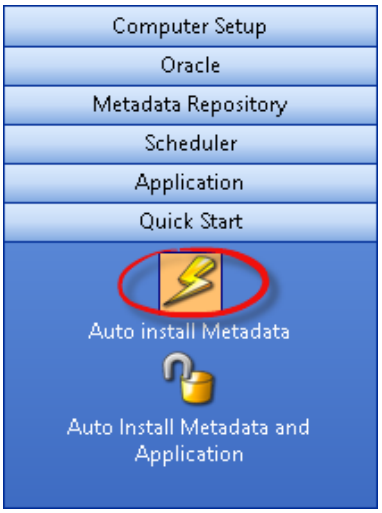
Data Vault Repository Type: Depending on the license type, users may have different repository type choices available.
Choosing a **Data Vault** repository type will create a metadata repository in RED with more appropriate Data Vault repository default settings such as Object Type Names, Global Naming of Tables, Indexes, Key Columns and Procedures/Scripts as well as other repository settings/user preferences.

NOTE: The metadata repository and data warehouse tables must both be created under the **dbo** schema when using SQL Server as the data warehouse server.
Ensure that the user creating the meta repository has the required privileges to create objects in dbo.

7.6 SQL SERVER QUICK START

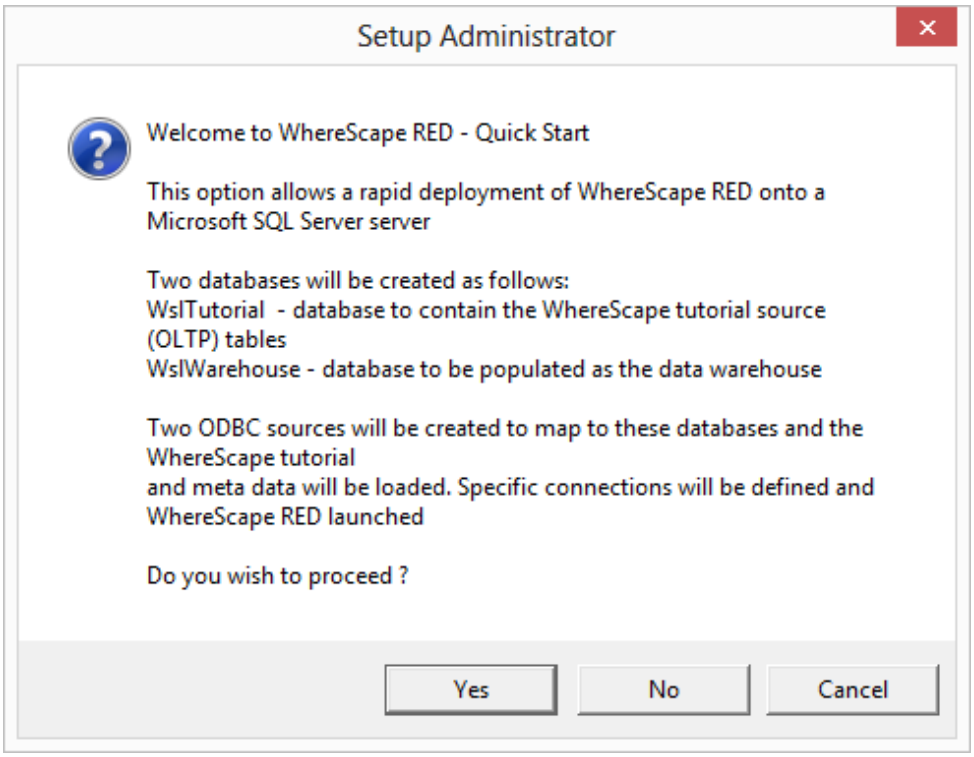
The quick start component of WhereScape's Setup Administrator attempts to do a rapid install of WhereScape RED onto a SQL Server database server.
It creates two databases on this server and then installs the RED software and the tutorial; finally invoking WhereScape RED and the on-line tutorial help.

1 On the **Quick Start** tab, click on the **Auto install Metadata** icon to start.

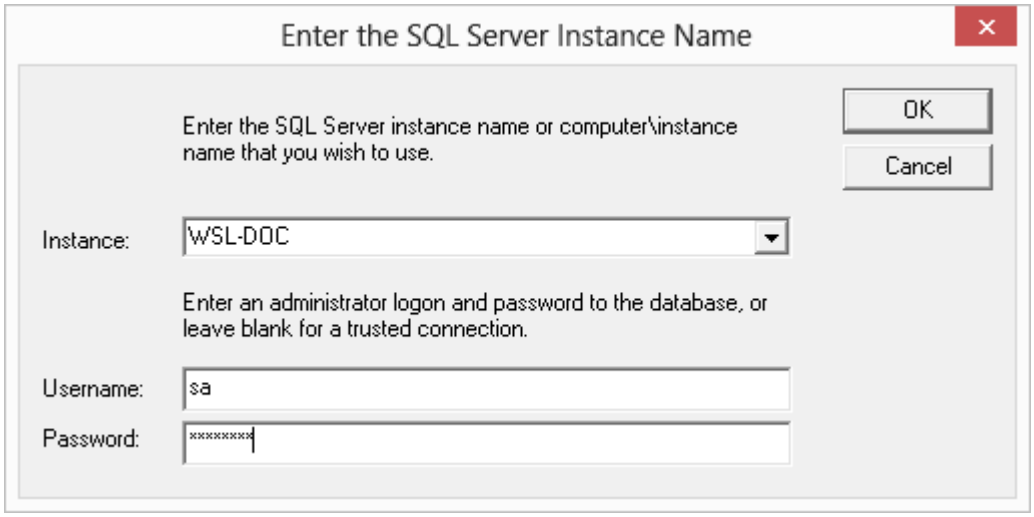


2 The following dialog is displayed.

- Click **Yes** to proceed with the creation of the databases.



3 You will first be asked for the SQL Server instance in which to load the metadata repository and tutorial.
The following dialog box is presented.

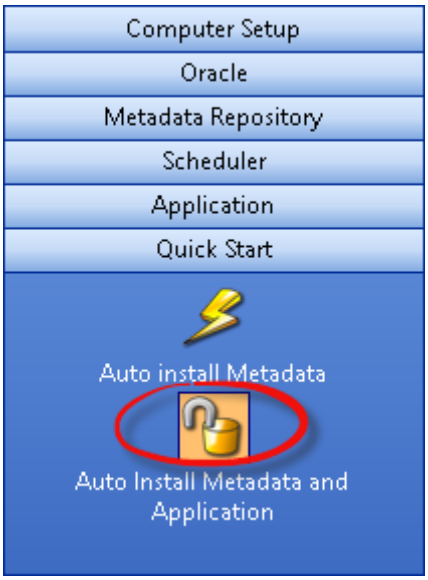


RED will attempt to locate all SQL Server servers available and list them in the drop-down. This process can fail for a number of reasons in which case the **Instance** name will need to be ascertained and entered.
Leave the **Username** and **Password** blank if using a trusted connection and no password is required. Click **OK** when complete.
Once the install has completed RED will allow you to logon to the newly created data warehouse.

7.7 SQL SERVER QUICK APPLICATION

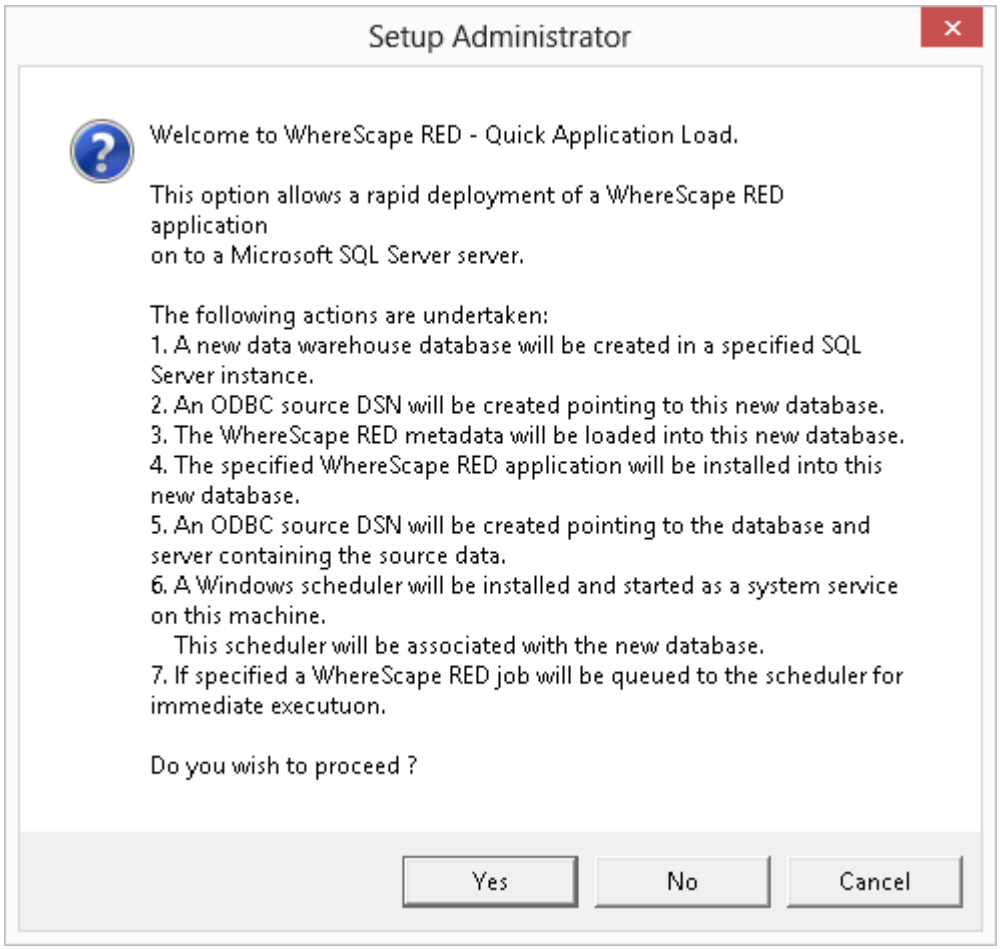
The quick application option for SQL Server attempts to create a Data Warehouse database, populate that database with the WhereScape metadata, load an application, install a scheduler and optionally run a batch job.
It provides a means of quickly installing a RED application and getting the contents of the tables loaded and populated.

1 On the **Quick Start** tab, click on the **Auto Install Metadata and Application** icon to start.



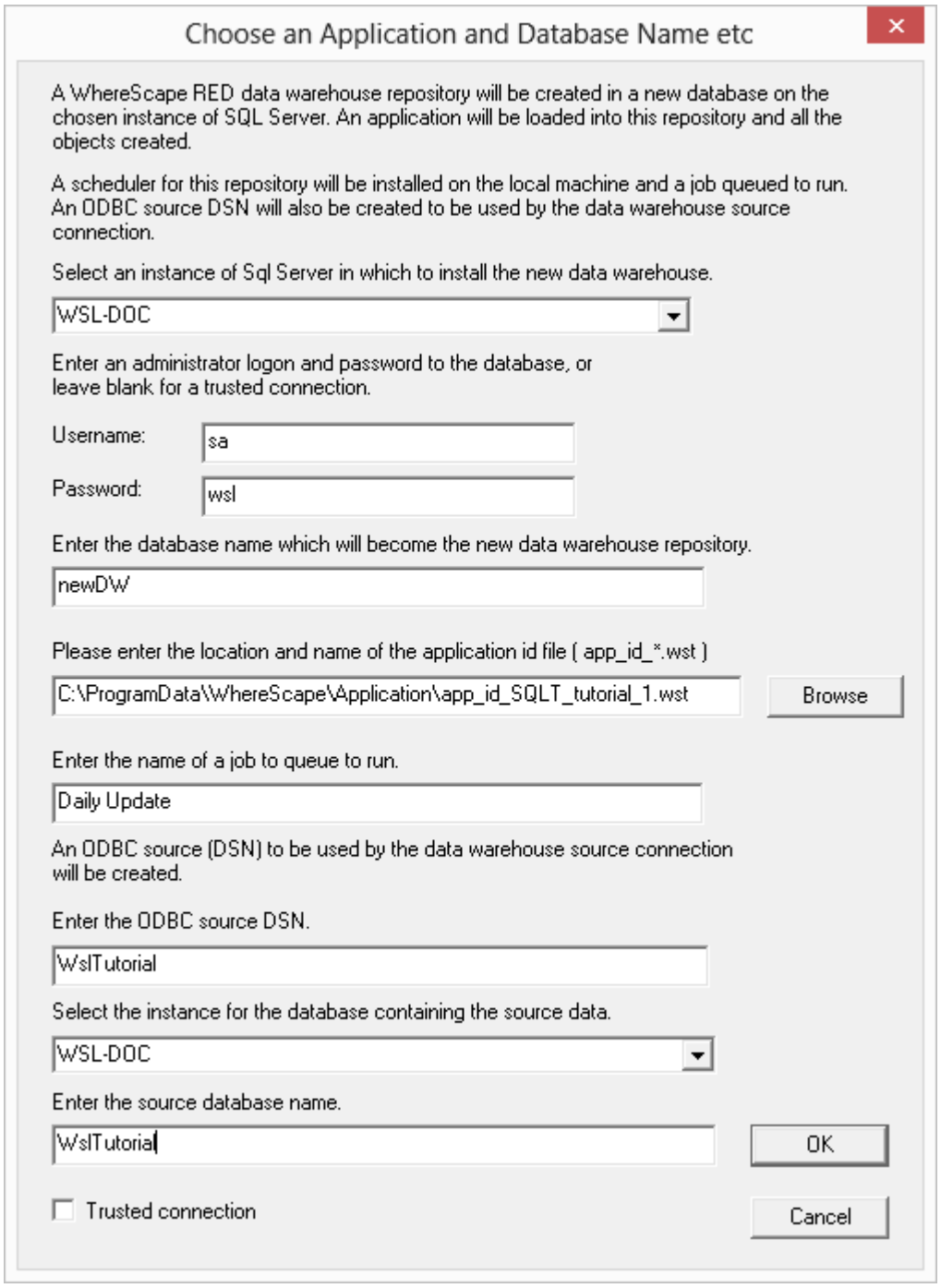
2 The following dialog is displayed.

- Click **Yes** to proceed.



3 The following dialog is displayed.

- Once all the values have been entered, click **OK** to proceed with the creation of the databases and the loading of the application.



The quick application can also be initiated from the command line or from a Windows batch file.

Windows Command Line Invocation

The syntax for calling from the command line is as follows:

adm.exe -QA [-SWITCH "switch value"]

The switches that can be applied supply information to the Setup Administrator utility. When all switches are provided the application install will occur automatically. Where some switches are left out a partially completed dialog will appear. The missing information can be provided and the install will then proceed.

Note: Where a parameter for a switch contains spaces, the parameter must be enclosed in double quotes.

The switches are:

Switch	Parameter to be supplied
-QA	Indicates that this is a "Quick Application". No parameter is required.
-SS	The SQL Server instance name where the Data Warehouse database will reside
-SL	The administrator user name for the SQL Server instance defined with the -SS switch. If this switch is not provided a Trusted connection is assumed.
-SP	The administrator password for the SQL Server instance defined with the -SS switch.
-SN	The Data Warehouse database name. This database will be created in the instance defined by -SS. An ODBC Source DSN of the same name will also be created on the PC.
-AN	The RED application name. This is the name of the 'id' file and is typically of the structure app_id_XXXX_vvvvvv.wst where XXXX is the application identifier and vvvvvv is the application version. For example the tutorial application would be app_id_SQLT_tutorial_6.wst
-AD	The RED application directory. This is the directory in which the file defined by the -AN switch resides.
-LI	The SQL Server instance that contains the source database.
-LD	The ODBC source DSN name as defined in the Connection object in the data warehouse application. This ODBC source will be created.
-LN	The database name on the SQL Server instance as defined by the -LI switch. This is the database that contains the source data.
-LT	This switch does not have a parameter. If set it flags the ODBC source DSN as defined in the -LD switch as a trusted connection.
-JN	The name of a job in the data warehouse that is to be run once all other tasks are completed.

-CC	The name of the cube connection if appropriate. If set then all cubes will be updated to have this as the Analysis Services connection.
-DC	The name of the Data Warehouse connection if appropriate. If set then all cubes will be updated to have this as their Source connection.
-CD	The name of the cube database in Analysis Services if appropriate. If set then all cubes will be updated to have this database as their Analysis Services database.

For Example a batch file to call an application load of the tutorial may look as follows:

```
@echo off
c:\
cd \Program Files\WhereScape\
adm -QA -SS "WSL-TEST"     -SN new_dw -LT -AN app_id_SQLT_tutorial_3.wst     -AD "c:\Program Files\WhereScape\" -LI WSL-TEST -LD tutorial -LN tutorial -JN "Daily Update"  -CC Cubes -CD My_database -DC DataWarehouse
exit
```

8. TERADATA INSTALLATION AND CONFIGURATION

IN THIS CHAPTER

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8.2 Installing RED for Teradata.....43
8.3 Creating a Teradata Environment.....44
8.4 Configuring a Teradata Metadata Connection (DSN) 45
8.5 Creating a Metadata Repository for Teradata 50

8.1 INSTALLATION AND CONFIGURATION INTRODUCTION

The steps provided here are an indication of the normal process required to install and configure WhereScape RED. In some environments additional processes will be required.

1 Install Teradata Tools and Utilities 13.10 (or greater) or on a suitable computer. These tools and utility components are required:
   - CLI
   - Teradata ODBC Driver
   - BTEQ
   - Fast Load / Multiload or TPT
   - Fast Export
   - Teradata ARCMAIN (this is required to use RED's Backup functionality to Export/Restore the Metadata - Teradata Arc)

2 Install the WhereScape RED software onto your PC. See ***Installing RED for Teradata*** (see "***8.2 Installing RED for Teradata***" on page 43)

3 Add your license key. See ***Adding your License*** (see "***3. Adding Your License***" on page 14)

4 Check your Windows version. See ***Checking your Windows Version*** (see "***4. Checking Your Windows Version***" on page 17)

5 Check your ODBC Drivers. See ***Checking your ODBC Drivers*** (see "***5. Checking Your ODBC Drivers***" on page 18)

6 Designate a database or user that is to be used as the meta data database. For testing or evaluation purposes this database or user may be a Teradata Express database server. WhereScape RED requires the Teradata database version 13 or greater as the data warehouse database server. Record the database and server names for this database. Create a database user to hold the metadata tables.

7 Allocate the privileges required by WhereScape RED See ***Creating a Teradata Environment*** (see "***8.3 Creating a Teradata Environment***" on page 44).

8 Add appropriate entries to the hosts file on the computer for the server.

9 Add a definition of an ODBC data source to connect to the data warehouse database. See ***Configuring a Teradata Metadata Connection (DSN)*** (see "***8.4 Configuring a Teradata Metadata Connection (DSN)***" on page 45)

10 Create the WhereScape metadata repository under the data warehouse user that you created. See ***Creating a Metadata Repository for Teradata*** (see "***8.5 Creating a Metadata Repository for Teradata***" on page 50)

11 Install a Windows Scheduler. See Installing a Windows Scheduler for Teradata

12 Install a Unix Scheduler. See Installing a Unix Scheduler for Teradata

13 Install a Teradata Unix Loader. See Installing a Teradata Unix Loader

14 If required, load the WhereScape tutorial tables into a separate database user. It is highly recommended that the tutorials be undertaken. See ***Create Tutorial Data*** (see "***11.1 Creating Tutorial Data***" on page 84)

8.1.1 Problem Solving

If problems occur in your install that cannot be resolved, proceed as follows when running WhereScape's Setup Administrator utility:

1 Create a log file by selecting **Log/Start Log** from the menu bar. Enter a file name.

2 Step through at least:
- Computer Setup --> Check Windows version
- Computer Setup --> Check ODBC driver
- Computer Setup --> Validate/Add Odbc source
- Create/Validate Meta Repository --> Validate meta repository

3 Select **Log/Stop Log** to close off the log

4 Edit the log and remove any passwords that appear.

5 Send your log file to support@wherescape.com

8.2 INSTALLING RED FOR TERADATA

Installation Prerequisites

WhereScape RED requires certain client and server components.

Client Prerequisites

- Windows Vista, Windows 7 or Windows 8
- 250MB available disk space
- ODBC Version 3.0 (normally shipped as part of the Operating System).
- For building a data warehouse, Teradata Tools and Utilities 13.10 or greater is required.

Server Prerequisites

- One of the following data warehouse database platforms is required: 13.10, 14.x or 15.
- To use the WhereScape RED Scheduler, a UNIX, LINUX or Windows based server is also required. WhereScape RED only supports sh and ksh under Unix and bash under Linux.
- When installing a Unix/Linux scheduler, the server will need to have Teradata Tools and Utilities for Linux/UNIX installed and configured as a prerequisite before the scheduler can be installed.

Installation of WhereScape RED

To install WhereScape RED, see ***Installing WhereScape RED*** (see "***2. Installing WhereScape RED***" on page 8)

8.3 CREATING A TERADATA ENVIRONMENT

The creation of the Teradata repository and user(s) that will be used to administer and maintain the data warehouse must be performed outside of this utility.

The RED repository is recommended to be a Teradata database for a more secure database environment.
WhereScape recommends following Teradata best practices related to ROLEs and PROFILEs, but does not mandate they be used.

RED repositories require these permissions for administration:

GRANT EXECUTE, SELECT, INSERT, UPDATE, DELETE, STATISTICS, SHOW, TABLE, VIEW, MACRO ON RED_REPOSITORY TO RED_REPOSITORY;
GRANT EXECUTE PROCEDURE ON RED_REPOSITORY TO RED_REPOSITORY WITH GRANT OPTION;

RED developers do not need TABLE or VIEW permissions to the repository database.
RED developers only require INSERT, UPDATE, DELETE and SELECT on metadata repository views. Please contact WhereScape should you need assistance in configuring a Teradata secure repository environment.

For DBC permissions the following is required:

GRANT SELECT ON DBC.ErrorMsgs; – to log error messages into error logs. This is always accessed through the locking for access modifier.
GRANT SELECT ON DBC.TablesV; – to describe Tables in a database within databases the user has permission to.
GRANT SELECT ON DBC.ColumnsV; – to describe columns associated with a table within databases the user has permission to.

NOTE: COLLATION
If your Teradata database's default collation is UNICODE, please ensure that the user must be created with COLLATION = ASCII, DEFAULT CHARACTER SET LATIN;

As an example, for our data warehouse, or decision support system, we will create a user, 'dssdemo'. An example sql script to create this 'dssdemo' user is shipped and can be found in the WhereScape RED program directory:

- ..\Teradata**Recreate_dssdemo.sql**

Please note that **this script will need to be modified** to reflect the Teradata environment created at your site.

NOTE: Timezone Settings

Teradata can generate CURRENT_TIMESTAMP, CURRENT_TIME and CURRENT_DATE to reflect the session time and session time zone (as opposed to the current date and time on the Teradata server).
This can result in date/time/timestamp comparisons behaving unexpectedly and impact the RED scheduler. A Teradata Customer Service Engineer can configure this using a DBSCONTROL field called TimeDateWZControl.

The values for TimeDateWZControl are:
1 (disabled)
2 (enabled with UTC i.e. all datetime data is stoRED in UTC on disk)
3 (enabled with LOCAL i.e. all datetime data is stoRED in system LOCAL time on disk)
0 (returns the field to disabled)

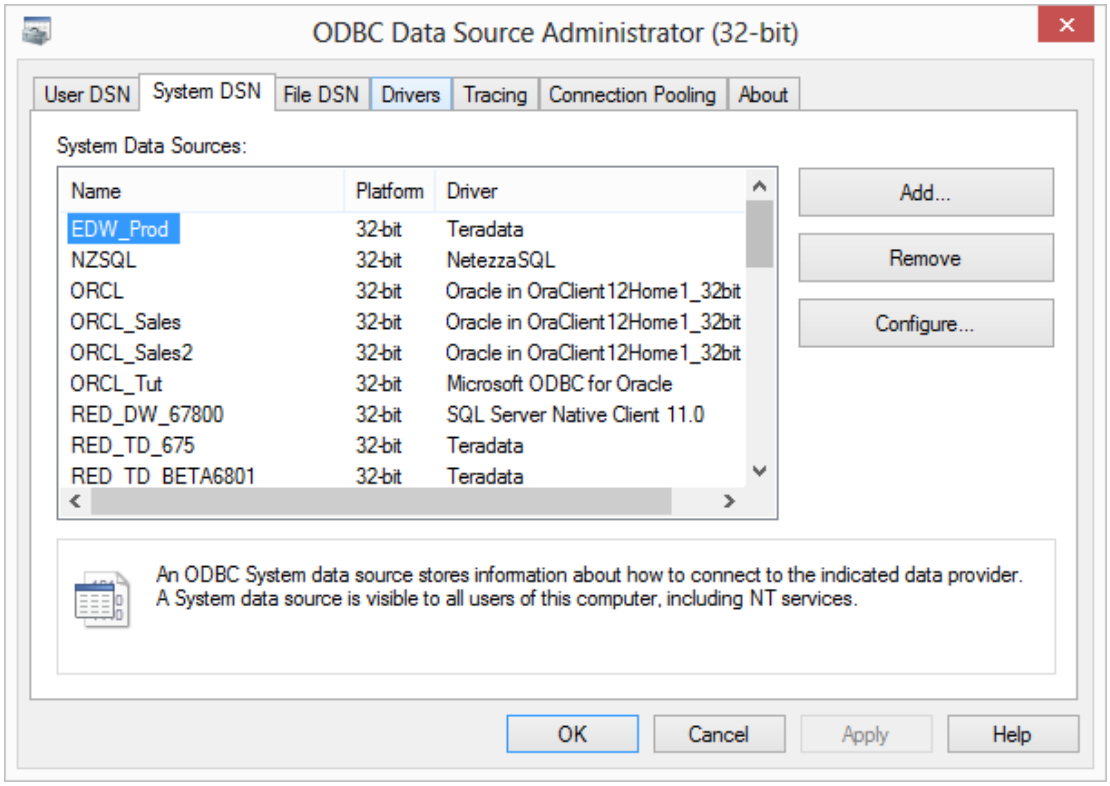
Please ensure TimeDateWZControl is disabled if you are not using temporal fields.

8.4 CONFIGURING A TERADATA METADATA CONNECTION (DSN)

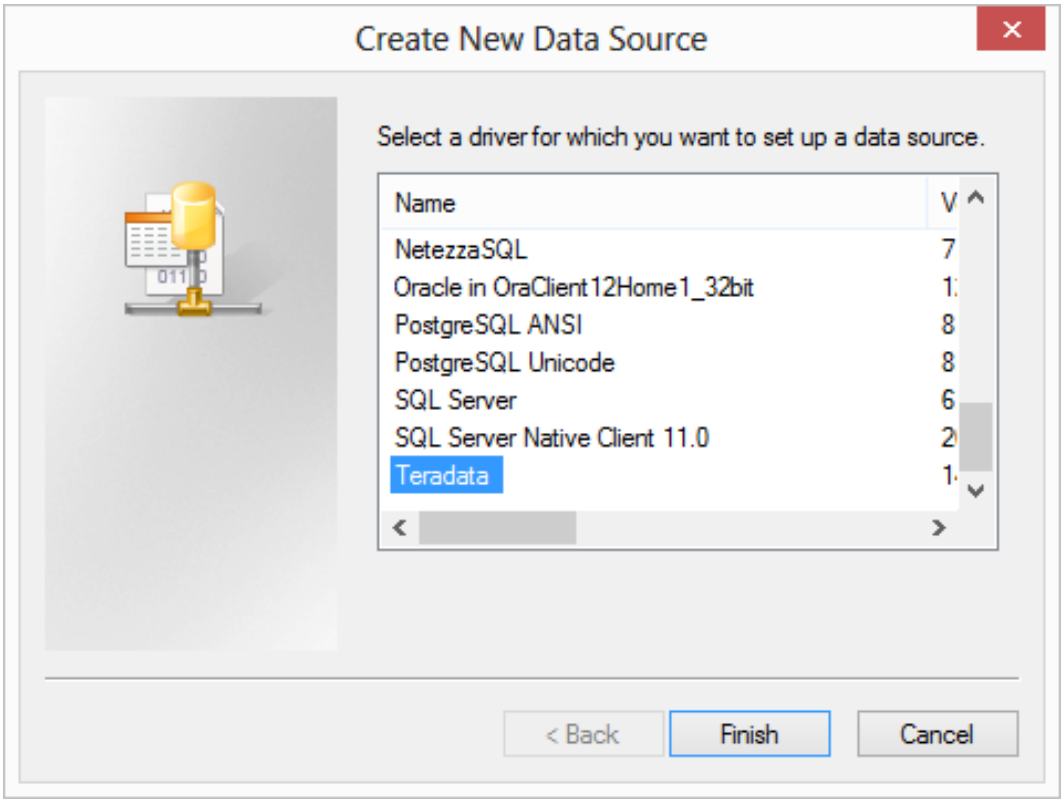
To begin adding an ODBC Source from WhereScape's Setup Administrator, see ***Creating an ODBC Connection*** (see "***6. Creating an ODBC Connection***" on page 20).

1 In ODBC Data Source Administrator, click on the **System DSN** tab to view the system wide ODBC entries.

- Click on the '**Add...**' button to add a new entry.

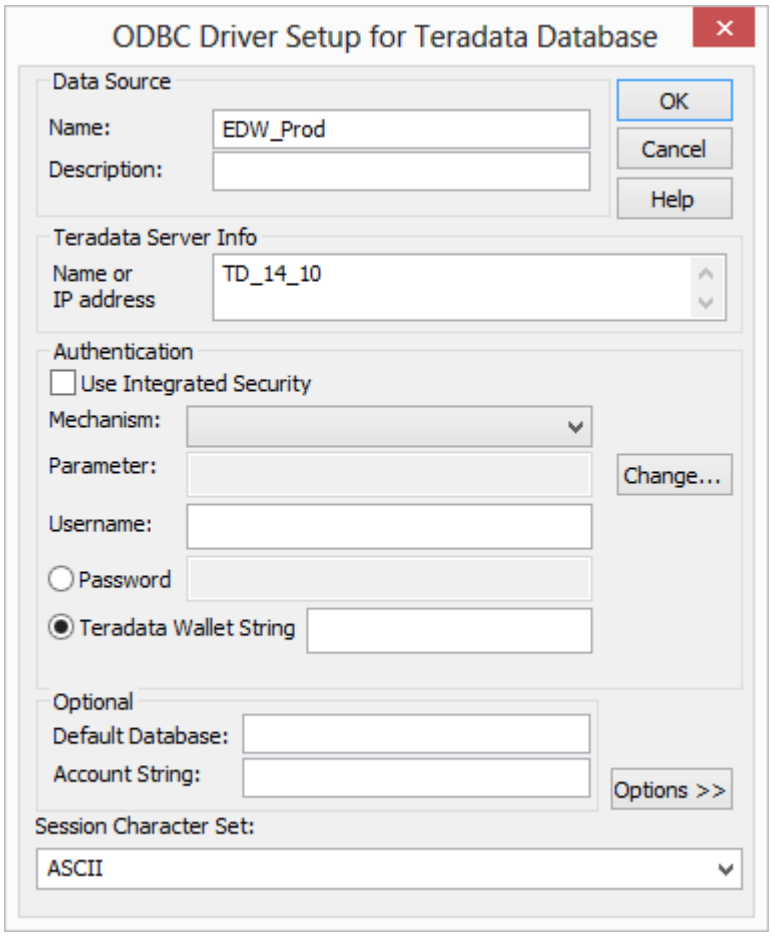


2 Select a **Teradata** driver from the driver list.



3 A pop-up as shown below will appear.

- Enter a **Name** for the Data Source.
- Next, enter the **Name or IP Address** for the Teradata Server Info.
- The **Session Character Set** field must be set to **ASCII** - this is the only character-encoding scheme supported for Teradata.



NOTE: The name entered for the **Teradata Server Name** should appear in the **hosts** file on the computer in this form:

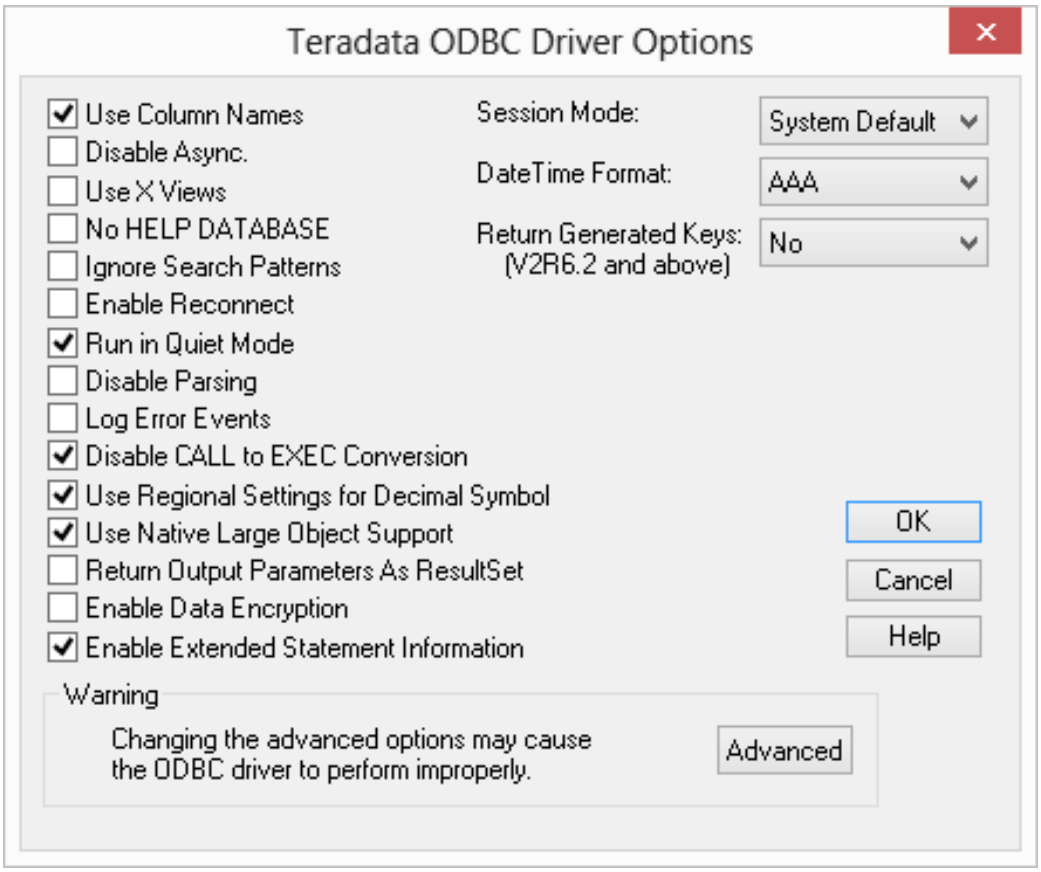
(IP address) (Teradata Server Name) (Teradata Server Name)Cop1
For the example in the ODBC screen shot above for TD_14_00, this entry would present if the server had an IP address of 10.12.123.60 and a name of "TD_14_00":
10.12.123.60 TD_14_00 TD_14_00Cop1

An alternative approach is to add the same entry to a dynamic name server (DNS).

---

4 If using the ODBC source for a RED Scheduler, click on **Run in Quiet Mode**.

- Click **OK**.



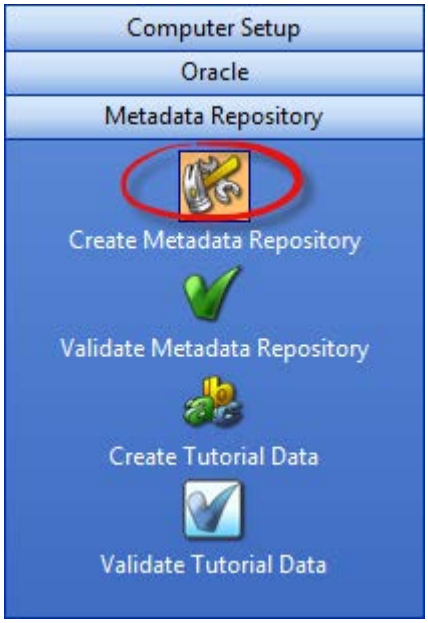
5 Click **OK** again.

TIP: If multiple PCs will access the data warehouse they must all use the same data source name as entered here.

8.5 CREATING A METADATA REPOSITORY FOR TERADATA

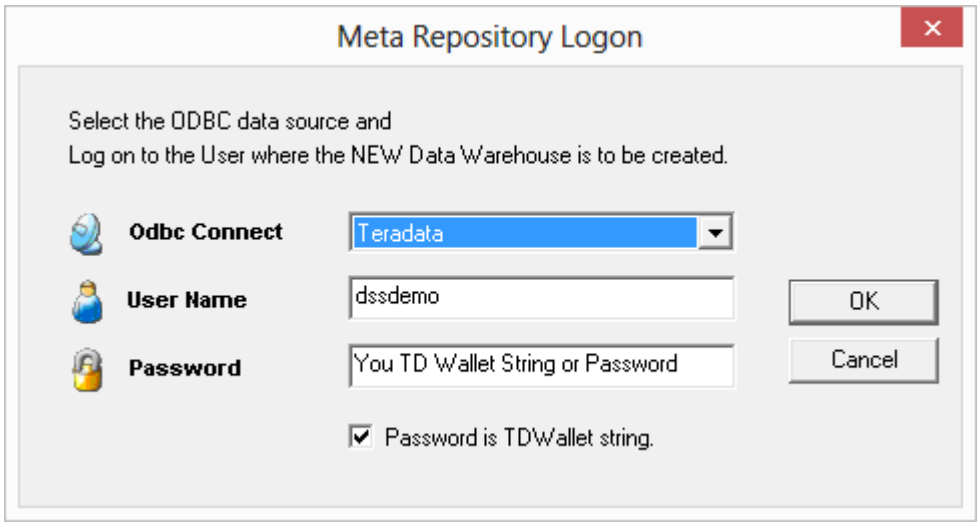
1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane;

- Then click on the **Create Metadata Repository** icon.
  This option will create the WhereScape meta tables, sequences and procedures in the specified schema.
  It checks to ensure that the schema, database or user does not contain an existing metadata repository before starting the metadata install.



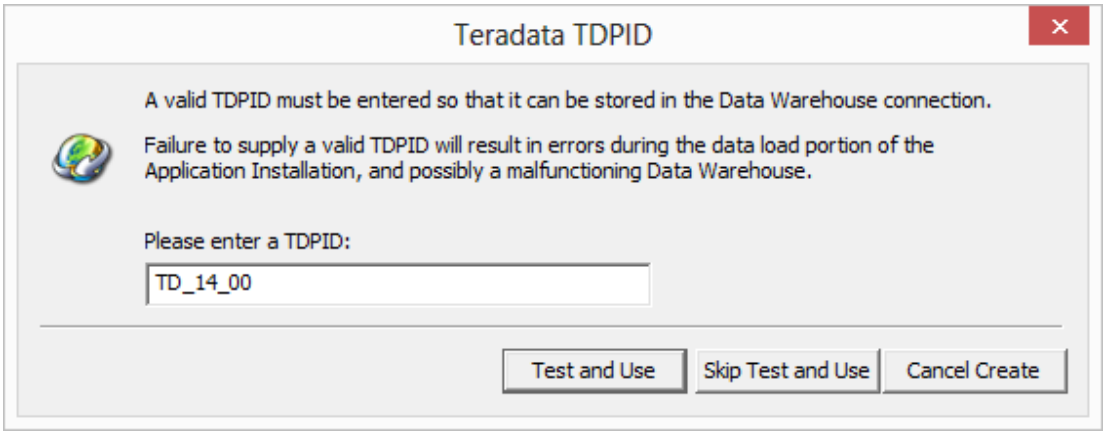
2 After clicking on **Create Metadata Repository**, enter the **Odbc Connect**, **User Name** and **Password or TD Wallet String.**

- Click **OK**.



3 When creating a Teradata metadata repository, two additional screens are displayed:

- First, a dialog is displayed for the Teradata server name (TDPID). Enter the **TDPID**.
- Click **Test and Use.** If you skip the test and provide an invalid or wrong **Teradata TDPID**, native loads will not work in WhereScape RED.



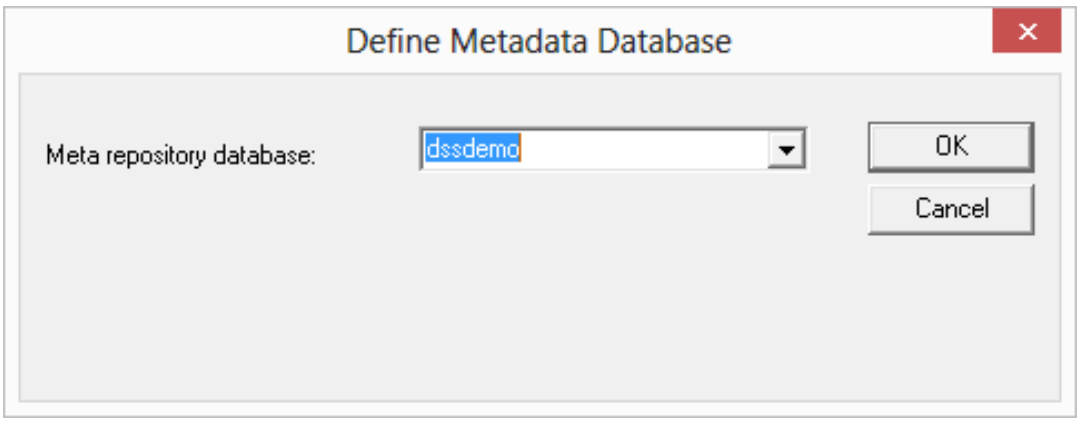
NOTE: The name entered for the **Teradata Server Name** should appear in the **hosts** file on the computer in this form:

(IP address) (Teradata Server Name) (Teradata Server Name)Cop1
For the example in the ODBC screen shot above for TD_14_00, this entry would present if the server had an IP address of 10.12.123.60 and a name of "TD_14_00":
10.12.123.60 TD_14_00 TD_14_00Cop1

An alternative approach is to add the same entry to a dynamic name server (DNS).

4 A second additional dialog is displayed for the Metadata Repository database.

- Enter the name of the user or database in which the metadata repository is being created.
- Click **OK**.



WhereScape®

9. ORACLE INSTALLATION AND CONFIGURATION

IN THIS CHAPTER

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9.3 Creating an Oracle User 55
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9.6 Creating a Metadata Repository for Oracle 70

9.1 INSTALLATION AND CONFIGURATION INTRODUCTION

The steps provided here are an indication of the normal process required to install and configure WhereScape RED. In some environments additional processes will be required.

1. Install the Oracle 10g, 11g or higher database client software on a suitable PC.
2. Install the WhereScape RED software onto your PC. See ***Installing RED for Oracle*** (see "***9.2 Installing RED for Oracle***" on page 53)
3. Add your license key. See ***Adding your License*** (see "***3. Adding Your License***" on page 14)
4. Check your Windows version. See ***Checking your Windows Version*** (see "***4. Checking Your Windows Version***" on page 17)
5. Check your ODBC Drivers. See ***Checking your ODBC Drivers*** (see "***5. Checking Your ODBC Drivers***" on page 18)
6. Designate a database that is to be used as the data warehouse database. For testing or evaluation purposes this may be a PC based database. WhereScape RED requires the Oracle database version 10.1 or greater as the data warehouse database. Record the SID for this database. Create the database user (schema) that is to be used to hold the metadata and data warehouse tables. Allocate the privileges required by WhereScape RED. See ***Creating an Oracle DSS User*** (see "***9.3 Creating an Oracle User***" on page 55)
7. Establish the Oracle Net connections required to allow access to the data warehouse database from the PC. Record the **Server** name for the connection.
8. Add the definition of an ODBC data source to connect to the data warehouse database. See ***Configuring an Oracle Metadata Connection (DSN)*** (see "***9.4 Configuring an Oracle Metadata Connection (DSN)***" on page 61)
9. Create the WhereScape metadata repository under the data warehouse schema that you created. See ***Creating a Metadata Repository for Oracle*** (see "***9.6 Creating a Metadata Repository for Oracle***" on page 70)
10. Install a Windows Scheduler. See Installing a Windows Scheduler for Oracle
11. Install a Unix Scheduler. See Installing a Unix Scheduler for Oracle

12 If required, load the WhereScape tutorial tables into a separate database schema. It is highly recommended that the tutorials be undertaken. See ***Creating Tutorial Data*** (see "***11.1 Creating Tutorial Data***" on page 84)

9.1.1 Problem Solving

If problems occur in your install that cannot be resolved proceed as follows when running WhereScape's Setup Administrator utility:

1 Create a log file by selecting **Log/Start Log** from the menu bar. Enter a file name.
2 Step through at least:
- Computer Setup --> Check Windows version
- Computer Setup --> Check ODBC driver
- Computer Setup --> Validate/Add Odbc source
- Oracle --> Validate Oracle user privileges (if an Oracle DataWarehouse)
- Create/Validate Meta Repository --> Validate meta repository

3 Select **Log/Stop Log** to close off the log
4 Edit the log and remove any passwords that appear.
5 Send your log file to support@wherescape.com

9.2 INSTALLING RED FOR ORACLE

Installation Prerequisites

WhereScape RED requires certain client and server components.

Client Prerequisites

- Windows Vista, Windows 7 or Windows 8.
- 250MB available disk space
- ODBC Version 3.0 (normally shipped as part of the Operating System).
- For building a data warehouse, a version 10.1 database client or greater is required. A 32-bit Oracle client installation will be necessary.
- WhereScape RED supports the Microsoft ODBC for Oracle and DataDirect's OBDC Driver for Oracle.

Server Prerequisites

- One of the following data warehouse database platforms is required: Oracle version 10g, 11g or higher.
- To use the WhereScape RED Scheduler, a UNIX, LINUX or Windows based server is also required (this may be the database server). WhereScape RED only supports sh and ksh under Unix and bash under Linux.

Installation of WhereScape RED

To install WhereScape RED, see ***Installing WhereScape RED*** (see "***2. Installing WhereScape RED***" on page 8)

NOTE: The WhereScape RED installer selects the following installation directory as the default location for RED on a 64-bit windows server: C:\Program Files (x86)\WhereScape. This is where 32-bit applications normally reside on a 64-bit Windows platform.

However, if Oracle 10g is involved, either as the data warehouse repository, or as a source system, installing RED in "Program Files (x86)" can cause an issue. Oracle does not like directories that have a parenthesis in their name. Applications using Oracle cannot be located in such a directory. This includes WhereScape RED using ODBC to connect to Oracle. The result is that WhereScape RED will not be able to connect to Oracle. (This issue does not usually occur with Oracle 11g).
To prevent this, change the installation directory of WhereScape RED. Options include:

C:\WhereScape
D:\Program Files\WhereScape (if a second drive is available)

It is not good practice to install 32-bit applications in C:\Program Files\WhereScape on a 64-bit machine.

9.3 CREATING AN ORACLE USER

The creation of the Oracle database user that will be used to administer and maintain the data warehouse must be performed outside this utility. The **SQL Admin** utility can be used to execute the sql required to create such a user, or the database administrator should be contacted.

A list of the required privileges is displayed when this option is selected. Many of these privileges must be allocated as specific privileges and cannot be granted as part of a role. For example if a 'grant dba to dssuser' command is executed WhereScape RED will still need these privileges specifically granted as 'dba' is a roll.

Note: WhereScape RED makes use of the dbms_lock and dbms_sql packages supplied by Oracle. When using Oracle, privileges obtained by the owner via a role cannot be referenced in a procedure. Therefore RED requires that these privileges be granted to the user. This is an Oracle restriction and not something imposed by WhereScape.

For our data warehouse, or decision support system, we will create a user, 'dssdemo'. An example sql script to create this 'dssdemo' user is shipped and can be found in the WhereScape RED program directory:

- ..\Oracle**Recreate_dssdemo.sql**

Please note that **this script will need to be modified** to reflect the data warehouse schema chosen at your site. An example script follows below.
Note that this script would normally need to be run under the sys user.

1. The dss user created is dssdemo in this case:

```
drop user dssdemo cascade;
create user dssdemo identified by wsl;
alter user dssdemo default tablespace DEMODATA;
alter user dssdemo temporary tablespace TEMP;

grant create session to dssdemo;
grant resource to dssdemo;
grant create table to dssdemo;
grant create view to dssdemo;
grant create sequence to dssdemo;
grant create procedure to dssdemo;
grant select any table to dssdemo;
grant create materialized view to dssdemo;
grant create database link to dssdemo;
grant query rewrite to dssdemo;
grant select on sys.v_$database to dssdemo;
grant alter session to dssdemo;
grant select on sys.v_$session to dssdemo;
grant execute on sys.dbms_lock to dssdemo;
grant execute on sys.dbms_sql to dssdemo;
grant create any view to dssdemo;
grant unlimited tablespace to dssdemo;
grant alter system to dssdemo;
grant select_catalog_role to dssdemo;
```

NOTE:
select any table - this is only required to gain access to tables in other schema. It is not required if specific grants have been provided to the tables that are required, such as with the tutorial.
alter system - some dbas do not like granting the ALTER SYSTEM privilege as it is very powerful. With this privilege, you can make wide reaching changes including altering initialization parameters. RED only uses ALTER SYSTEM to kill jobs. Rather than granting ALTER SYSTEM, you can compile Ws_User_Abort (contained in C:\Program Files\WhereScape\Oracle) under the SYS user. Then grant execute on SYS.Ws_User_Abort to dssdemo.

2. To use object placement **across multiple schemas** in WhereScape RED, the RED user also needs to be granted the following privileges:

```
grant select any table to dssdemo;
grant create any view to dssdemo;
grant drop any view to dssdemo;
grant create any table to dssdemo;
grant drop any table to dssdemo;
grant delete any table to dssdemo;
grant insert any table to dssdemo;
grant update any table to dssdemo;
grant alter any table to dssdemo;
grant global query rewrite to dssdemo;
grant create any materialized view to dssdemo;
grant drop any materialized view to dssdemo;
grant alter any materialized view to dssdemo;
grant create any index to dssdemo;
grant drop any index to dssdemo;
grant alter any index to dssdemo;
grant select any sequence to dssdemo;
grant create any sequence to dssdemo;
grant drop any sequence to dssdemo;
grant analyze any to dssdemo;
grant select_catalog_role to dssdemo;
```

3. To do loads from **Hadoop** using multiple schemas, the RED user also needs be granted the following privilege:

```
grant select_catalog_role to dssdemo;
```

9.3.1 CREATING ORACLE INDIVIDUAL USERS

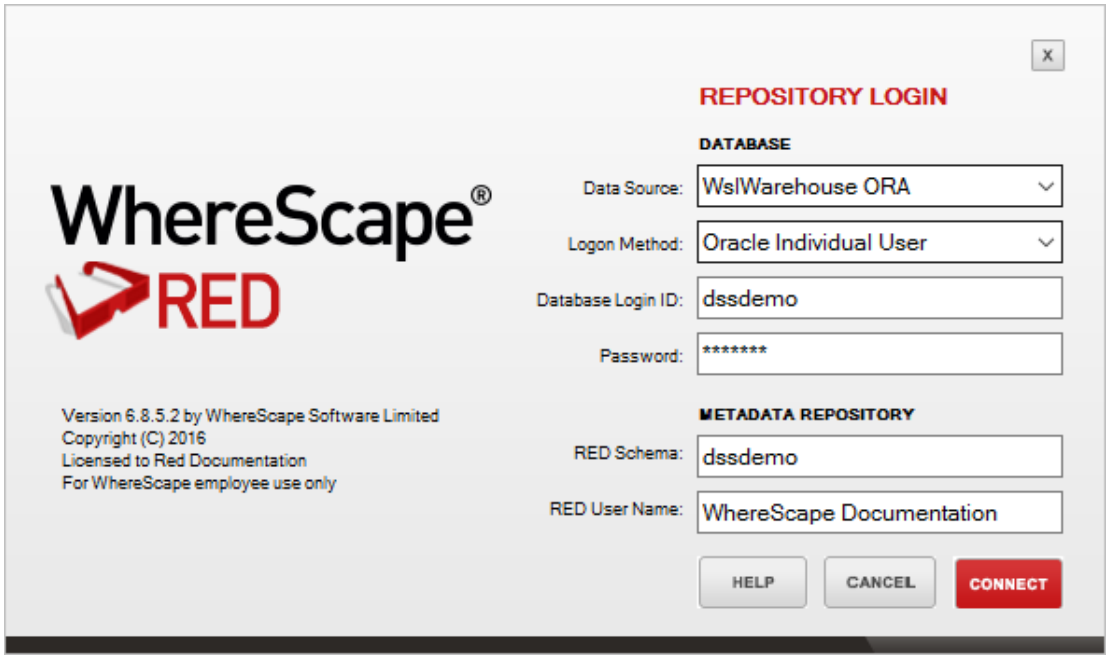
For Oracle users wanting each developer to log into Oracle using their own username and password, they can use the **Oracle Individual User** Logon Method.
The Oracle Individual User option allows a user, with the appropriate permissions, to log into WhereScape RED and then operate as the RED schema.
This method enables customers to configure RED ensuring that users logged in via this method cannot edit the metadata user password in the connections, and also ensuring that the password is encrypted in **Tools>Options**.
To authorize users to log in to RED using the Oracle Individual User method, a DBA will need to grant users select on the **ws_dbc_connect** table, as well as the **CREATE SESSION** system privilege.
This method is also useful for tracking individual WhereScape RED user activity in the Oracle database. Their authenticating user name is now stored in the CLIENT_IDENTIFIER field of v$session which can be used by Oracle's auditing, functioning to track individual developer activity.

Oracle individual users will need to be created and granted certain privileges. Alternatively, for existing Oracle database users, they just need to granted the following privileges below:

```
grant create session to oracle_user1
grant select on dssdemo.ws_dbc_connect to oracle_user1
```

1 To ensure the **Repository Privacy Settings** is locked in **Tools>Options**, the RED metadata user needs to log in to RED before any individual user. To log in:

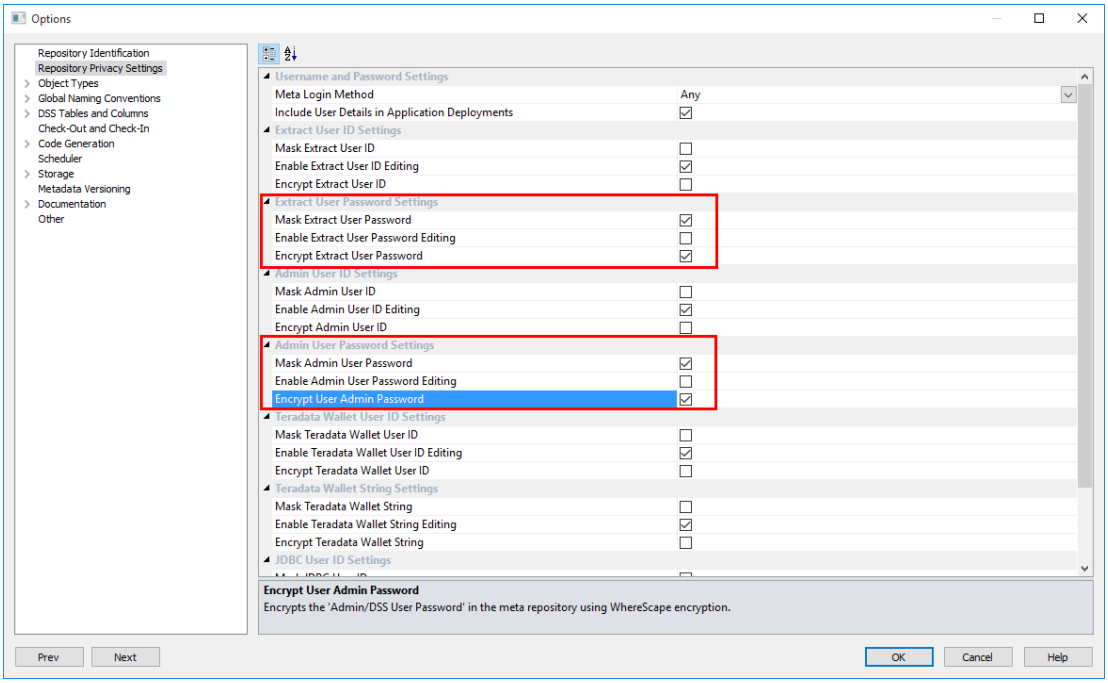
- Select the **DB User/Password** option from the Logon Method drop-down menu.
- Enter the user name and password for the metadata user.
- Enter the RED schema.



2 Once logged in to RED, the metadata user needs to do the following in **Tools>Options>Repository Privacy settings**:

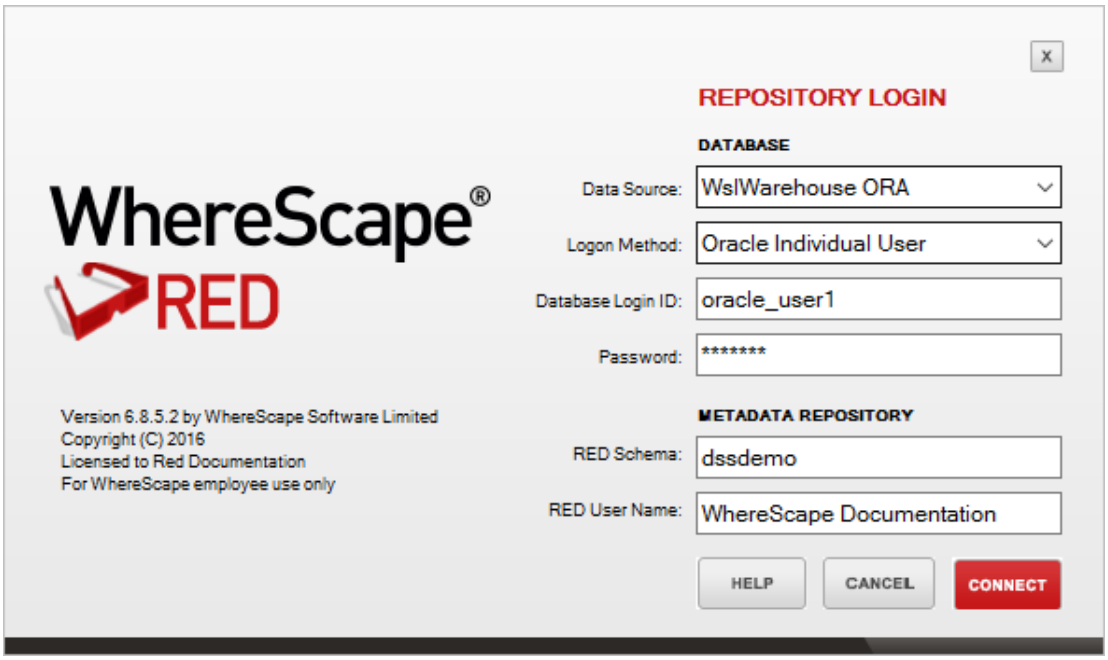
- Check the option to enable the **Mask Extract User Password**.
- Un-check the option to disable the **Extract User Password Editing** (this will lock down the metadata user password in the connections).
- Check the option to enable the **Mask Admin User Password**.
- Un-check the option to disable the Enable **Admin User Password Editing** (this will lock down the Admin/Dss User Password in the connection properties).

NOTE: Encrypt User/Admin User Password Options
Users should also check the options to enable **Encrypt User Password** and **Encrypt Admin User password** as shown in the example screenshot below.
For **UNIX/Linux scheduler** processing User and Password Encryption implications, please see section 5.1.1.2 Settings - Repository Privacy Settings in the RED User Guide.

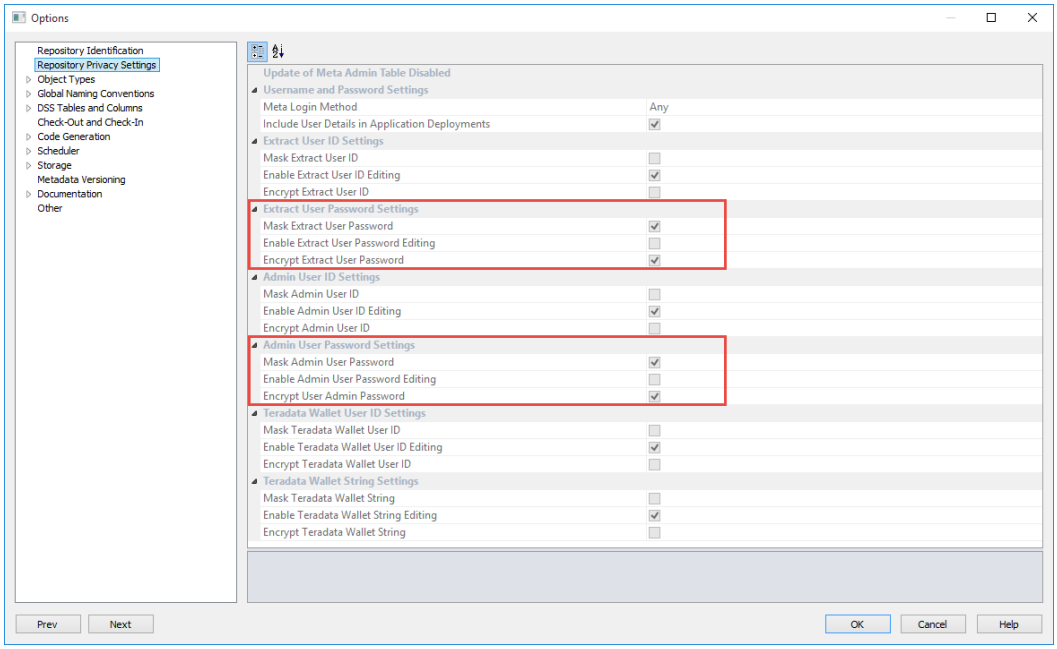


3 Multiple users can then login to RED using their own credentials by:

- Selecting the **Oracle Individual User** option from the **Logon Method** drop-down menu.
- Entering their user name and password.
- Entering the RED schema.



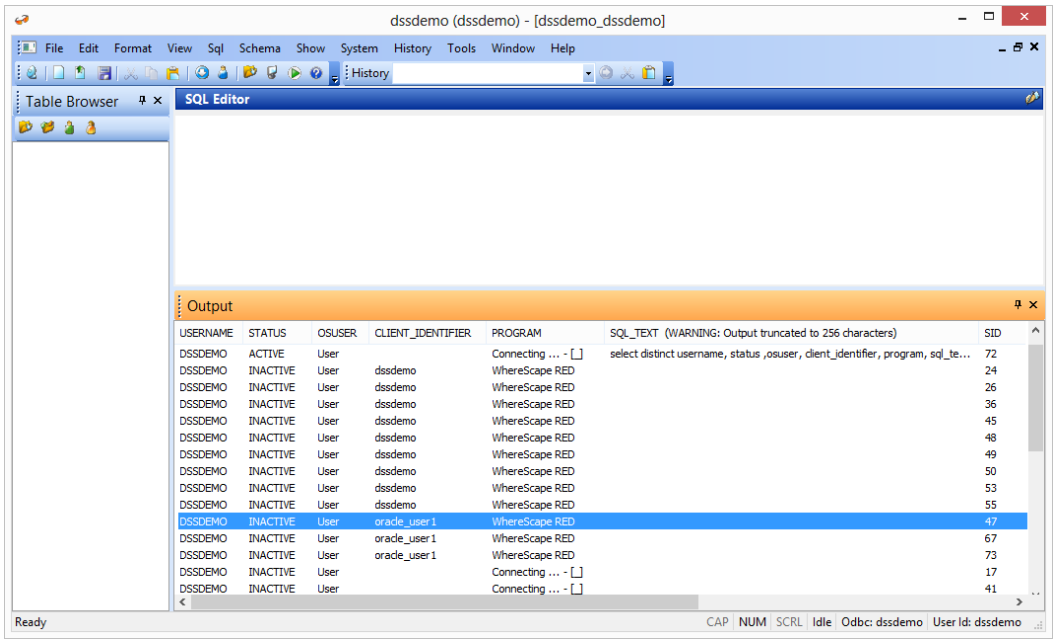
4 Users that log in to RED via the **Oracle Individual User** method will have their **Repository Privacy Settings** completely disabled.



WhereScape RED TIP: Oracle Individual User System Information

The permissions below are required to list and see user session, session locks and user locks information for Oracle individual users.

```
grant select on sys.v_$sql to dssdemo;
grant select on sys.v_$sess_io to dssdemo;
grant select on sys.v_$locked_object to dssdemo;
grant select on sys.v_$lock to dssdemo;
```



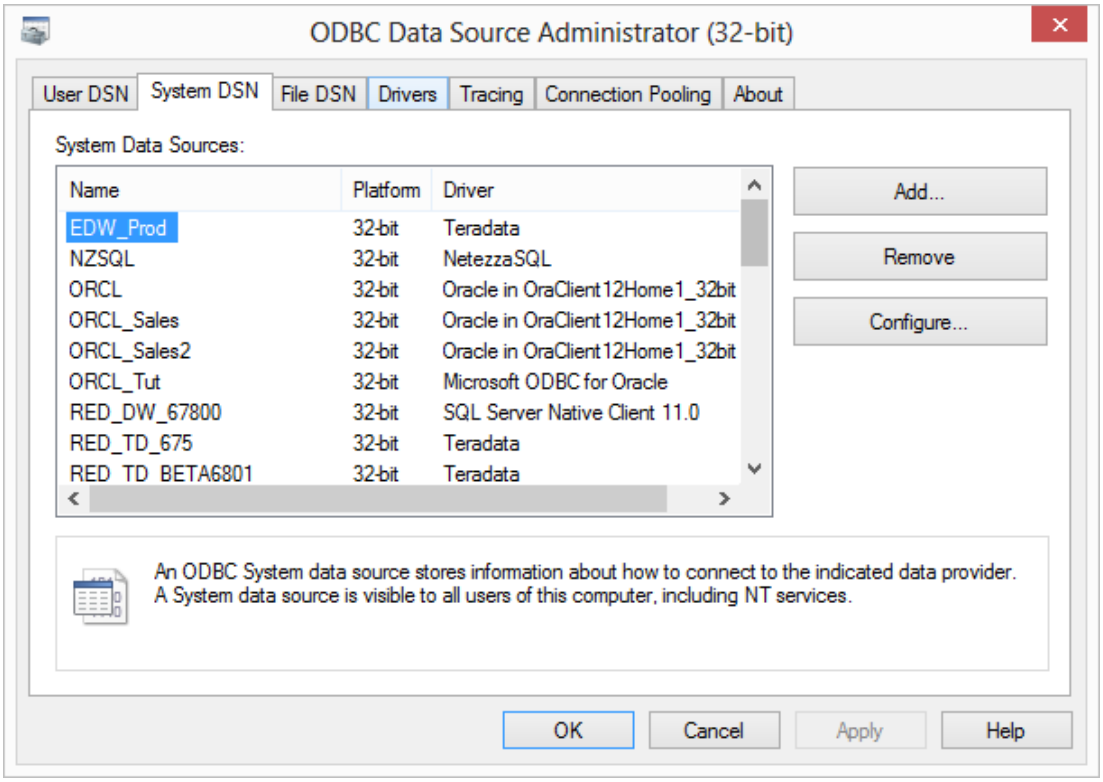
9.4 CONFIGURING AN ORACLE METADATA CONNECTION (DSN)

WhereScape RED supports both the **Microsoft** ODBC Driver for Oracle and the **DataDirect** ODBC Driver for Oracle.
See below instructions for setting up either one of these drivers.
To begin adding an ODBC Source from WhereScape's Setup Administrator, see ***Creating an ODBC Connection*** (see "***6. Creating an ODBC Connection***" on page 20).

Setting up a Microsoft ODBC Driver for Oracle:

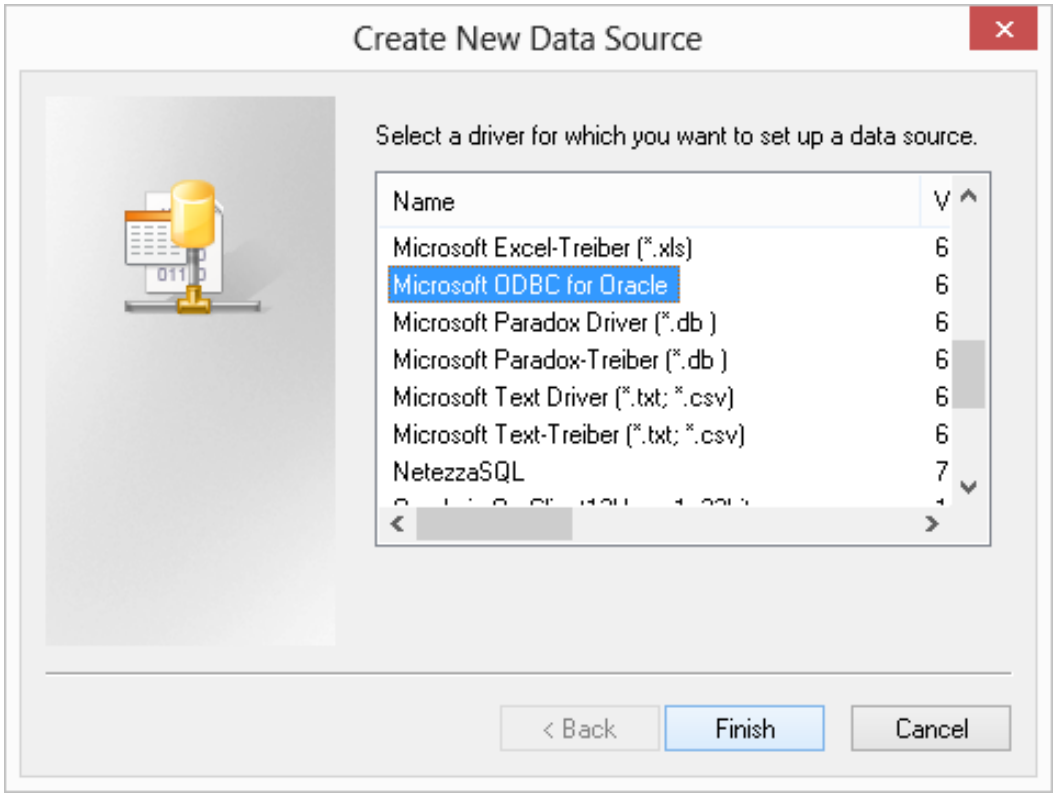
1 In ODBC Data Source Administrator, click on the **System DSN** tab to view the system wide ODBC entries.

- Click on the '**Add...**' button to add a new entry.



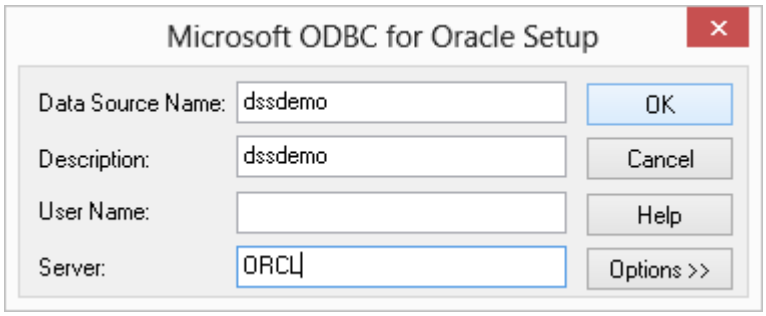
2 Select the **Microsoft ODBC for Oracle** driver from the driver list.

- Click **Finish**.



3 At this stage the connection to the Oracle client is checked, so if a failure occurs it is probably due to the Oracle client not being present or installed incorrectly.

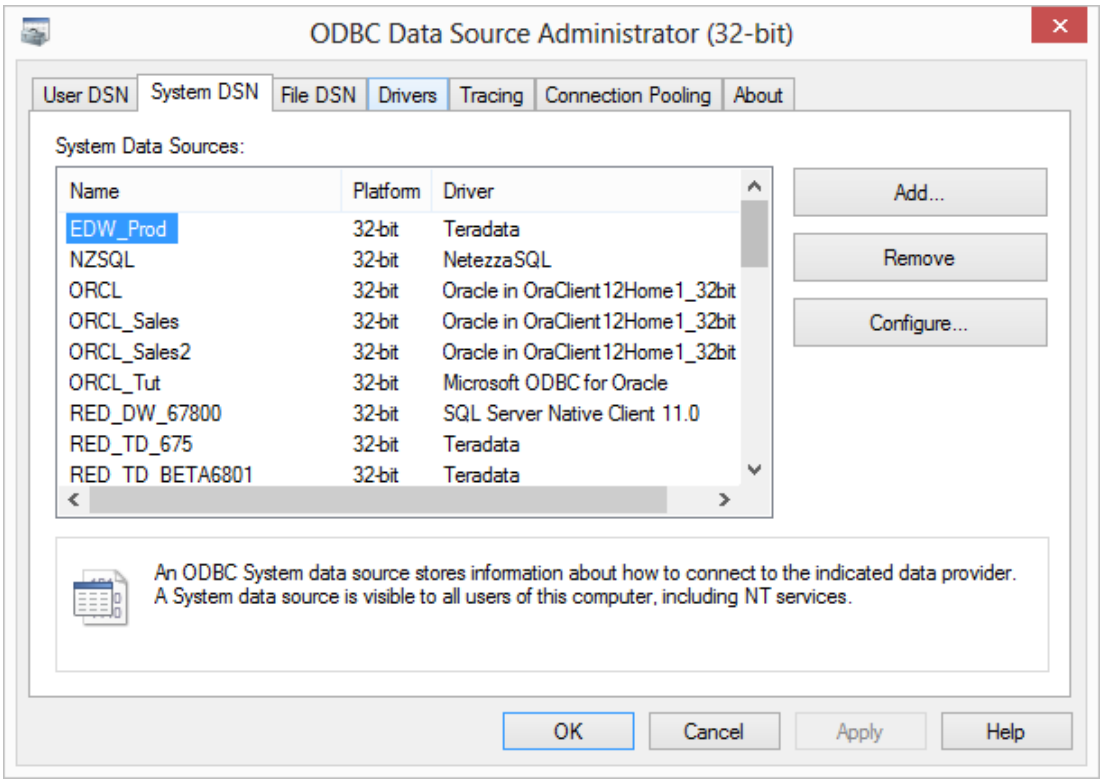
- In the dialog box that follows, the **Data Source Name** and **Description** can be set to the SID for simplicity.
- The **User Name** is not required.
- The **Server** is the Oracle client connection to the data warehouse database, and is typically (but not necessarily) the SID.



Note: The Server must be a valid Tnsnames entry.

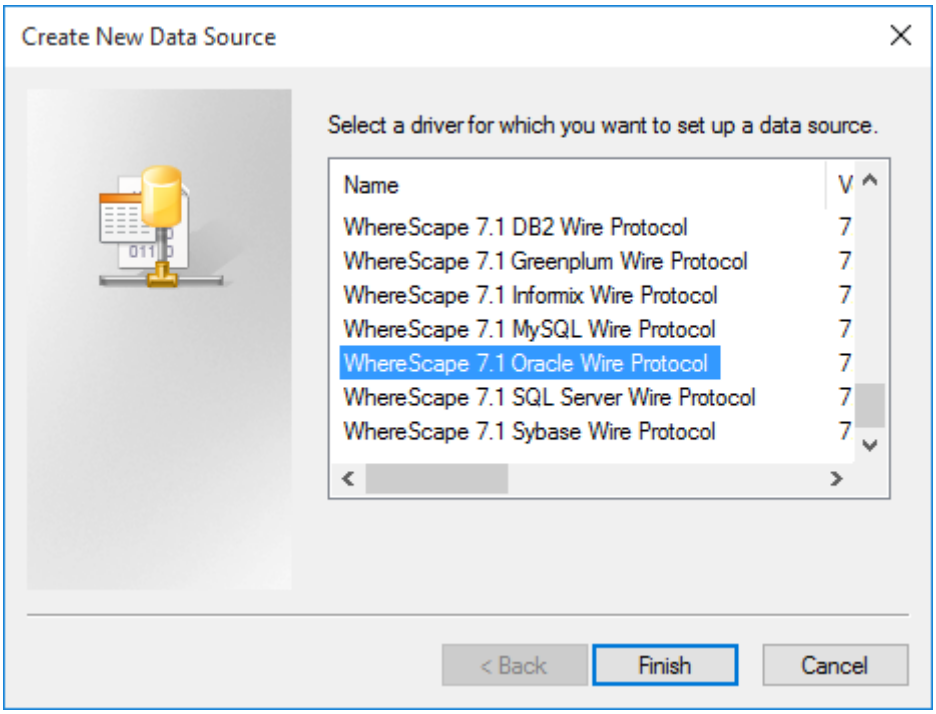
Setting up a Data Direct ODBC Driver for Oracle:

1 In ODBC Data Source Administrator, click on the **System DSN** tab and click on the '**Add...**' button to add a new entry.



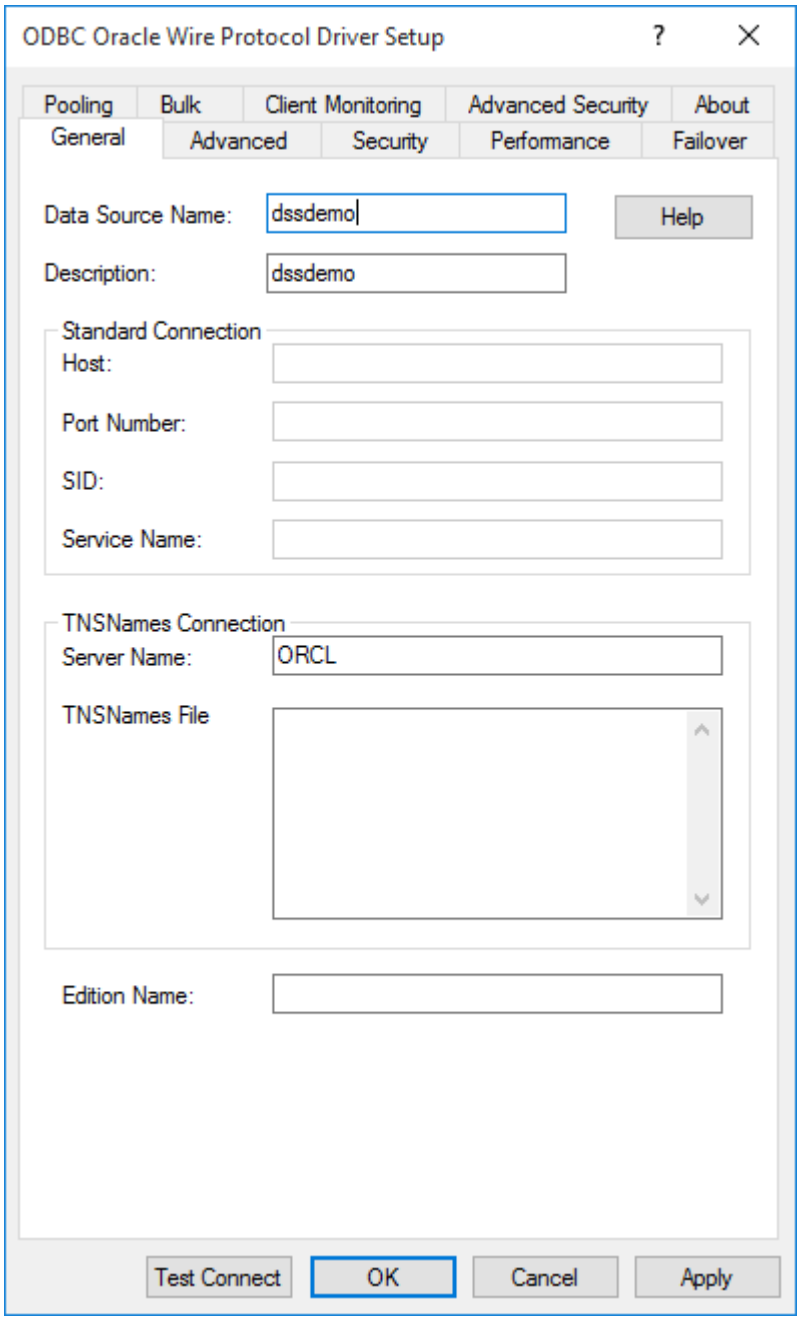
2 Select the **WhereScape 7.1 Oracle Wire Protocol** driver from the list.

- Click **Finish**.



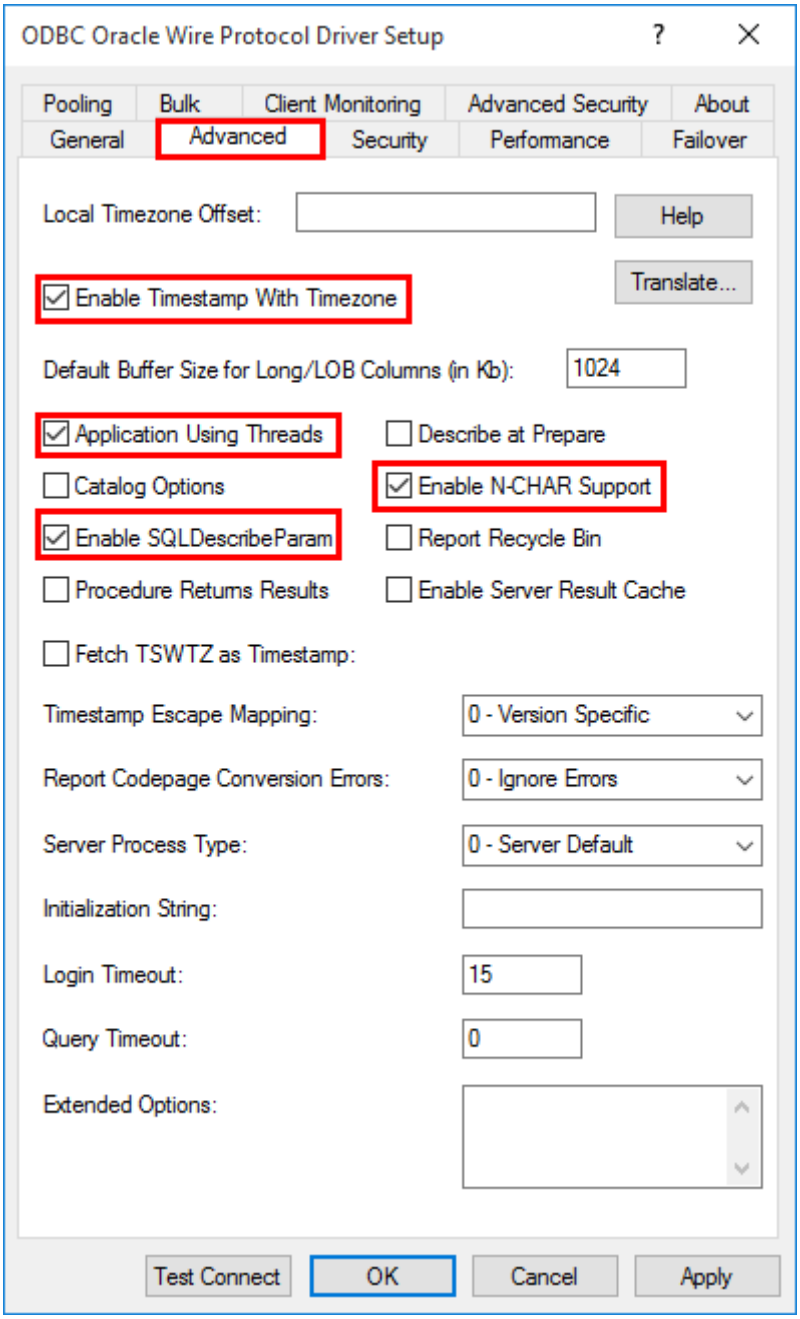
3 Enter the the **Data Source Name** and **Description** - these can be set to the SID for simplicity.

- The **Server** is the Oracle client connection to the data warehouse database, and is typically (but not necessarily) the SID.
- The remaining fields are usually not required.



4 Switch to the **Advanced tab** and tick the following check-boxes:

- Enable Timestamp With Timezone
- Application Using Threads
- Enable SQLDescribeParam
- Enable N-CHAR Support



5 To test this connection, click on **Test Connect**, otherwise click **OK**.

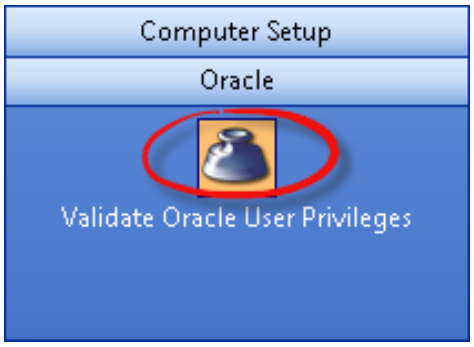
NOTE: When using the *SQL Admin* tool in conjunction with DataDirect's Oracle ODBC driver the *Enable SQLDescribeParam option must be enabled* in the ODBC driver setup menu.

TIP: If multiple PCs will access the data warehouse they must all use the same data source name as entered here.

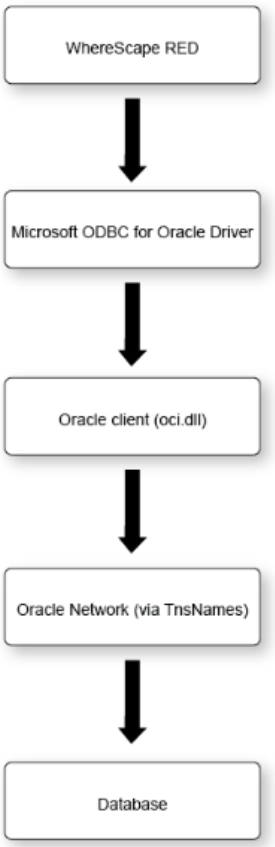
9.5 VALIDATING ORACLE USER PRIVILEGES

1 To validate the Oracle user privileges, click on the **Oracle** tab.

- Then click on the **Validate Oracle User Privileges** icon.



This option tests that an ODBC connection can be made to the Oracle database running the data warehouse.
The diagram below shows some of the layers involved in making up this type of connection.



If this connection fails then we need to isolate where the failure is occurring. The Oracle documentation can provide assistance in resolving the problem. Starting from the bottom and working back up the layers we can perform the following tests:

1. Log on to the host running the database, and check that a direct connection to the database works via a tool such as sqlplus. This will test that the database is active and receiving connections.
2. Issue a Tnsping from a dos shell on the PC (e.g. tnsping ORCL) where ORCL is the tnsnames connection entry for the data warehouse database. This will check the Oracle network layer. If the Tnsping responds with an **OK** then the database server is visible through the network layer.
3. Connect to the data warehouse database using sqlplus from the PC. Again this test checks the network layer and a small part of the Oracle client software.
4. Attempt an ODBC connection using the Oracle supplied ODBC tool (normally called **Oracle ODBC Test** and located within the Oracle program menu). This tool is normally loaded as part of the Oracle client. It provides an independent test of the ODBC, Oracle client and network layers. Initially attempt to connect using the Oracle supplied ODBC driver. This will confirm that all layers apart from the ODBC driver are working correctly. If a failure occurs consult the Oracle documentation.
5. Perform the same test as step (4) but this time using the Microsoft ODBC for Oracle driver.

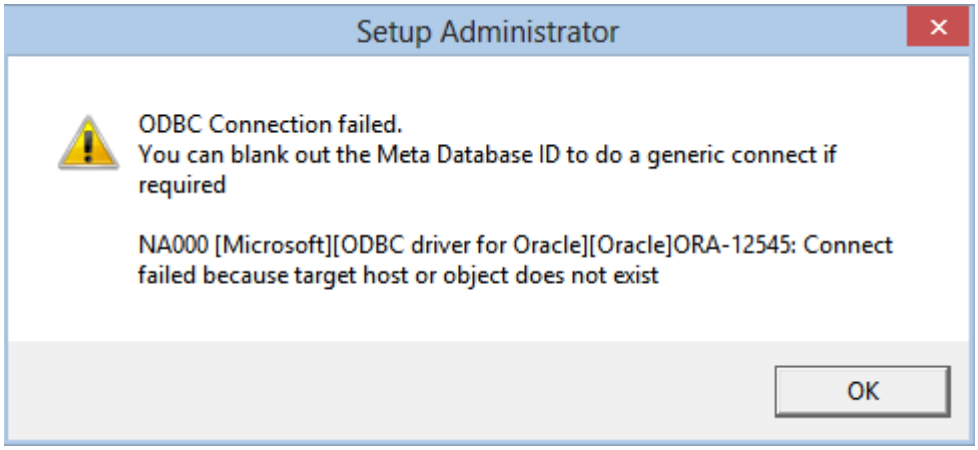
NOTE: A connect error **NA000** usually means the ODBC driver is not functioning correctly. This may be due to a Microsoft service pack dependency. Acquire the ODBC drivers from Microsoft and try again. The file is mdac_typ.exe and is a free download from Microsoft.

Some combinations of the Oracle client software and the Microsoft ODBC driver for Oracle result in a connection error **NA000**. If the connection fails and all other possibilities have been checked then the following may address the problem on Windows 2000 systems.

Run RegEdit
Under the HKEY_LOCAL_MACHINE\ SOFWARE\ Microsoft\ MSDTC\ MTxOCI entry edit OracleOciLib and set it to Oci.dll (The default is Ociw32.dll).

Another common problem is where multiple Oracle homes are in use (especially where Oracle Discoverer has been installed). Ensure that the PATH variable references an 8.1.7 or later Oracle directory. The OCI used by the Microsoft odbc driver utilizes features not found in older versions of the OCI.

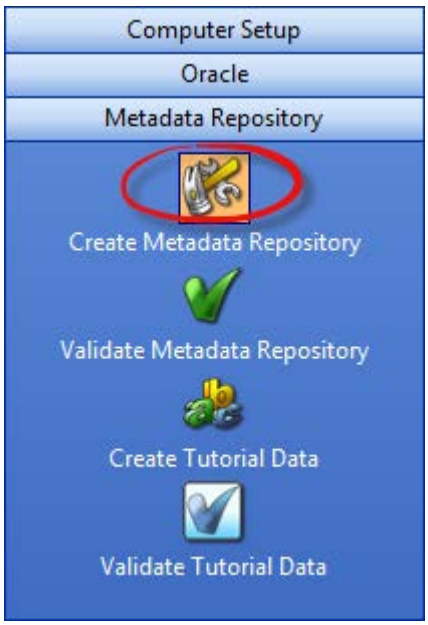
If you are still unable to connect record the error message as displayed on connection failure and contact support@wherescape.com.
The following example shows the error message "2800 (Microsoft)(ODBC driver for Oracle)ORA_01017: invalid username/password; logon denied"


Setup Administrator
ODBC Connection failed.
You can blank out the Meta Database ID to do a generic connect if required
NA000 [Microsoft][ODBC driver for Oracle][Oracle]ORA-12545: Connect failed because target host or object does not exist
OK

9.6 CREATING A METADATA REPOSITORY FOR ORACLE

1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane.

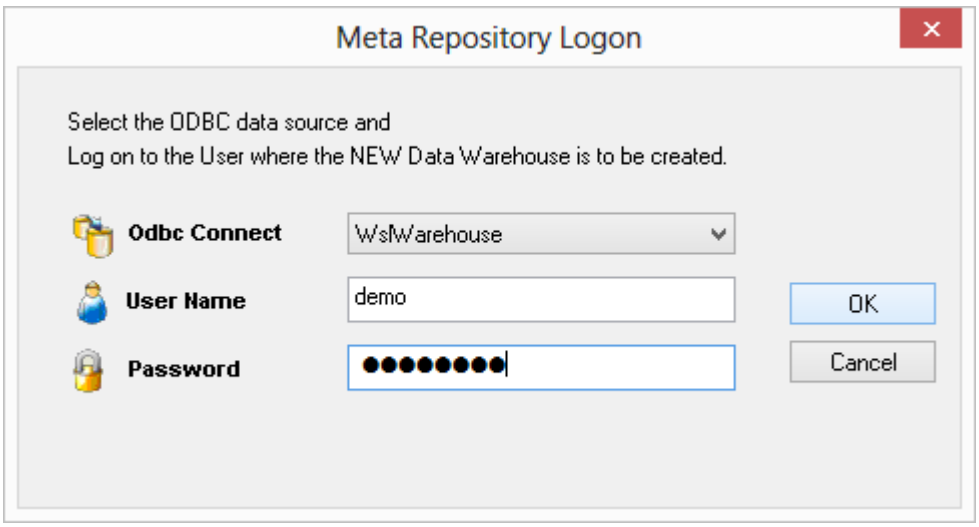
- Then click on the **Create Metadata Repository** icon.



2 This option will create the WhereScape meta tables, sequences and procedures in the specified schema.

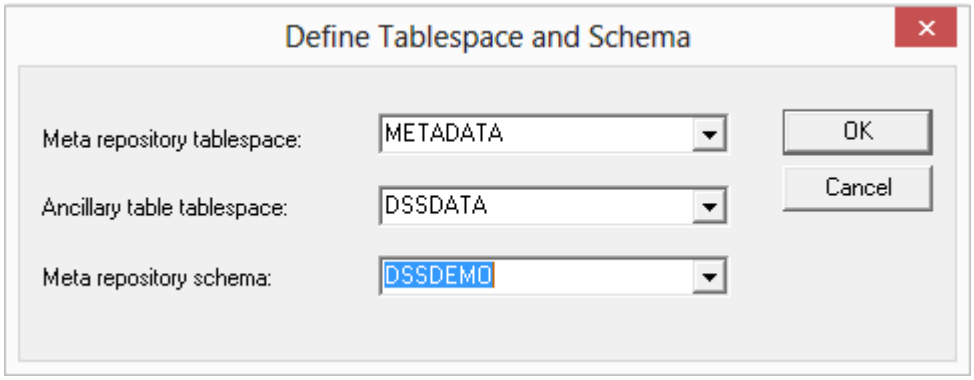
It checks to ensure that the schema, database or user does not contain an existing metadata repository before starting the metadata install.

- Click on Create Metadata Repository.
- Enter the **ODBC Connect**, **User Name** and **Password** and click **OK**.



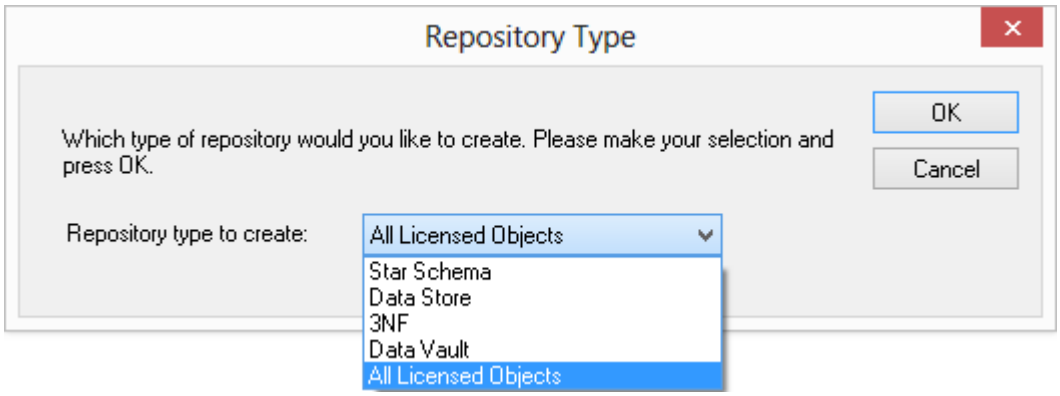
3 When creating an Oracle metadata repository, an additional screen is displayed requesting **Tablespace** information.

- Select the required Tablespaces and click **OK**.
- If Tablespaces are not specified, the user's default Tablespace will be used.



4 Depending on the type of license you have, the following dialog may be displayed:

- If it is displayed, select the type of repository required and click **OK**.



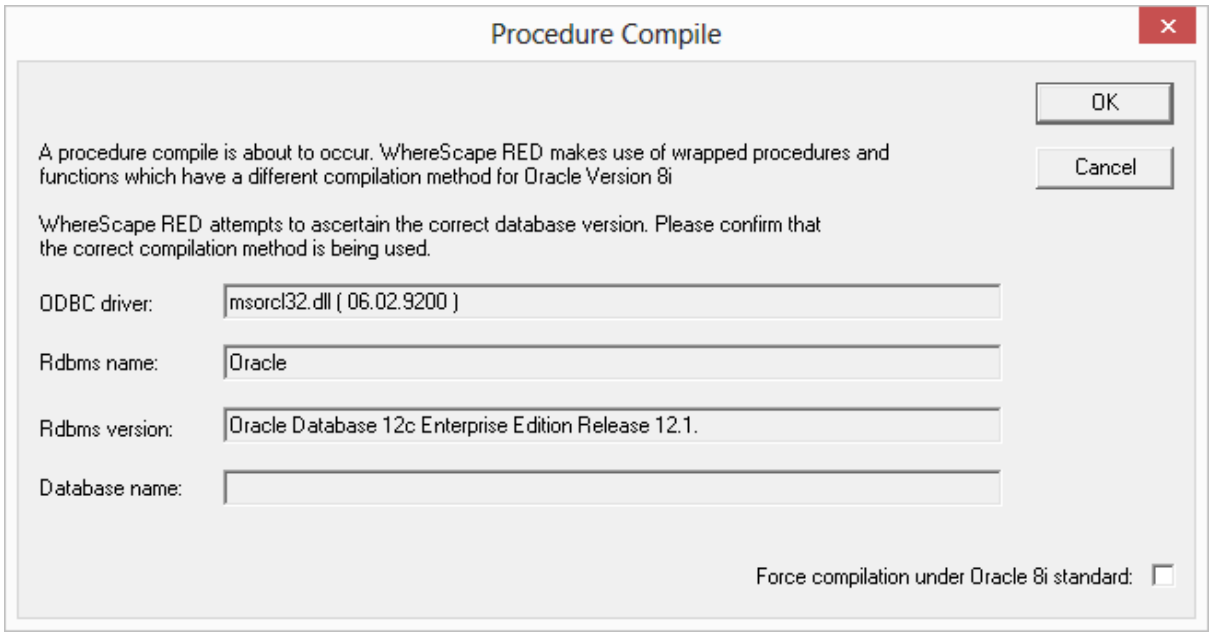
Note - Repository Types: This is just setting the default objects visible in RED. They can later be changed in RED under **Tools/Options**.

Data Vault Repository Type: Depending on the license type, users may have different repository type choices available.
Choosing a **Data Vault** repository type will create a metadata repository in RED with more appropriate Data Vault repository default settings such as Object Type Names, Global Naming of Tables, Indexes, Key Columns and Procedures/Scripts as well as other repository settings/user preferences.

---

5 The procedure compile dialog is displayed:

- To force the compilation under the Oracle 8i standard, tick the check-box on the rightmost bottom corner of the Procedure Compile dialog. Otherwise, click **OK.**



6 If a procedure fails to compile then scroll to the right in the right pane to see if any of the returned error codes help in ascertaining what the problem is.

For **Oracle** common causes of procedure compilation failures are:

- Running an Oracle version prior to 8.1.7
- Insufficient room in the SYSTEM table space.
- Insufficient privileges. (See notes below)
- Memory parameters set too small in the Oracle instance.

Insufficient privileges on procedure compile (Oracle)

Compiles of the WhereScape procedures may fail where the required privileges have not been granted. The bulk of the WhereScape procedures are used by the scheduler, so they can be left uncompiled if the scheduler is not to be used. The following procedures however must successfully compile for WhereScape RED to function correctly:

Ws_Procedure_Save, Ws_Procedure_Compile, WsWrkAudit, WsWrkError, WsParameterRead and WsParameterWrite
If one or more procedures fail to compile then use the **Validate Metadata Repository** option to compile the procedures once the problem has been rectified.

10. DB2 INSTALLATION AND CONFIGURATION

IN THIS CHAPTER

10.1 Installation and Configuration Introduction 73
10.2 Installing RED for DB2 74
10.3 Creating a DB2 Schema 75
10.4 Configuring a DB2 Metadata Connection (DSN) 79
10.5 Creating a Metadata Repository for DB2 81

10.1 INSTALLATION AND CONFIGURATION INTRODUCTION

The steps provided here are an indication of the normal process required to install and configure WhereScape RED. In some environments additional processes will be required.

1. Install the IBM DB2 9.7 or 10.1 client access software on a suitable PC.
2. Install the WhereScape RED software onto your PC. See ***Installing RED for IBM DB2*** (see "***10.2 Installing RED for DB2***" on page 74)
3. Add your license key. See ***Adding your License*** (see "***3. Adding Your License***" on page 14)
4. Check your Windows version. See ***Checking your Windows Version*** (see "***4. Checking Your Windows Version***" on page 17)
5. Check your ODBC Drivers. See ***Checking your ODBC Drivers*** (see "***5. Checking Your ODBC Drivers***" on page 18)
6. Designate a database that is to be used as the data warehouse database. For testing or evaluation purposes this may be a PC based database. WhereScape RED requires the DB2 database version 9.7 or greater as the data warehouse database. Create the database schema that is to be used to hold the metadata and data warehouse tables. Allocate the privileges required by WhereScape RED. See ***Creating a DB2 Dss Schema*** (see "***10.3 Creating a DB2 Schema***" on page 75)
7. Add the definition of an ODBC data source to connect to the data warehouse database. See ***Configuring a DB2 Metadata Connection (DSN)*** (see "***10.4 Configuring a DB2 Metadata Connection (DSN)***" on page 79)
8. Create the WhereScape metadata repository under the data warehouse schema that you created. See ***Creating a Metadata Repository for IBM DB2*** (see "***10.5 Creating a Metadata Repository for DB2***" on page 81)
9. Install a Windows Scheduler. See Installing a Windows Scheduler for IBM DB2
10. Install a Unix Scheduler. See Installing a Unix Scheduler for IBM DB2
11. If required, load the WhereScape tutorial tables into a separate database schema. It is highly recommended that the tutorials be undertaken. See ***Creating Tutorial Data*** (see "***11.1 Creating Tutorial Data***" on page 84)

10.1.1 Problem Solving

If problems occur in your install that cannot be resolved proceed as follows when running the WhereScape's Setup Administrator utility:

1. Create a log file by selecting **Log/Start Log** from the menu bar. Enter a file name.
2. Step through at least:
   - Computer Setup --> Check Windows version
   - Computer Setup --> Check ODBC driver
   - Computer Setup --> Validate/Add Odbc source
   - Create/Validate Meta Repository --> Validate meta repository
3. Select **Log/Stop Log** to close off the log
4. Edit the log and remove any passwords that appear.
5. Send your log file to support@wherescape.com

10.2 INSTALLING RED FOR DB2

Installation Prerequisites

WhereScape RED requires certain client and server components.

Client Prerequisites

- Windows Vista, Windows 7 or Windows 8.
- 250MB available disk space
- ODBC Version 3.0 (normally shipped as part of the Operating System).
- For building a data warehouse, a version 9.7 database client or greater is required.

Server Prerequisites

- One of the following data warehouse database platforms is required: IBM DB2 9.7, 10.1. or 10.5.
- To use the WhereScape RED Scheduler, a UNIX, LINUX or Windows based server is also required (this may be the database server). WhereScape RED only supports sh and ksh under Unix and bash under Linux.

Installation of WhereScape RED

To install WhereScape RED, see ***Installing WhereScape RED*** (see "***2. Installing WhereScape RED***" on page 8)

10.3 CREATING A DB2 SCHEMA

The creation of the DB2 database and schema that will be used to administer and maintain the data warehouse must be performed outside this utility. If required, the DB2 command window can be used to execute the required sql, or the database administrator should be contacted.

NOTE1: Users and Groups in DB2 are not managed by DB2, rather they're mappings from operating system users and groups. The following example assumes DB2 is installed locally on windows. It also assumes WhereScape RED is running on the same windows machine. For more complex scenarios, support@wherescape.com or your database administrator.

NOTE2: WhereScape metadata tables should not be compressed. Possible tables for compression in DB2 are tables that have many more SELECT queries compared to INSERT, UPDATE and DELETE queries. Most large metadata tables are accessed by the WhereScape RED scheduler in the form of regular INSERT statements, so are not candidates for compression. Compressing metadata tables may adversely affect the performance of the WhereScape RED scheduler.

To complete the tutorials, the following database objects are required:

- one database
- two schemas (one for the data warehouse and one for the tutorial data)
- one buffer pool
- one system temporary tablespace
- one (or more) tablespaces

For our data warehouse, or decision support system, we will create a user, 'dssdemo'. An example sql script to create this 'dssdemo' user is shipped and can be found in the WhereScape RED program directory:

- ...\DB2**Recreate_dssdemo.sql**

Please note that **this script will need to be modified** to reflect the data warehouse database and schema chosen at your site.

Note: If the user creating the metadata is not the same user who will sign into WhereScape RED, additional grants to those below will be required.

An example script follows. The database created is **wscape**, the data warehouse schema is **dssdemo**, the schema for tutorials is **tutorial**, the buffer pool is **RED**, the system temporary tablespace is **REDtemp01**, the two tablespaces created are **metadata** and **dssdata**.

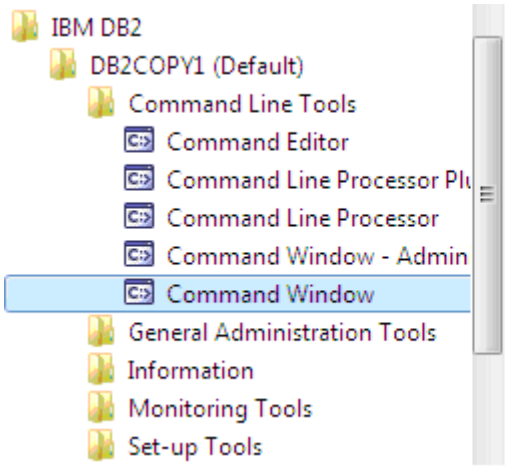
```
CREATE DATABASE wscape
AUTOMATIC STORAGE YES
ON 'c:\'
DBPATH ON 'c:\'
USING CODESET IBM-1252
TERRITORY US COLLATE
USING SYSTEM PAGESIZE 4096;

CONNECT TO wscape;

CREATE SCHEMA dssdemo;

CREATE SCHEMA tutorial;

CREATE BUFFERPOOL RED PAGESIZE 32768;

CREATE SYSTEM TEMPORARY TABLESPACE REDtemp01
PAGESIZE 32 K
MANAGED BY AUTOMATIC STORAGE
EXTENTSIZE 32 OVERHEAD 10.67 PREFETCHSIZE 32 TRANSFERRATE 0.04
BUFFERPOOL RED;

CREATE TABLESPACE metadata
PAGESIZE 32 K
MANAGED BY SYSTEM
USING ('C:\DB2TS\METADATA')
EXTENTSIZE 32 OVERHEAD 10.67 PREFETCHSIZE 32 TRANSFERRATE 0.04
BUFFERPOOL RED
DROPPED TABLE RECOVERY OFF;

CREATE TABLESPACE dssdata
PAGESIZE 32 K
MANAGED BY SYSTEM
USING ('C:\DB2TS\WHOUSE')
EXTENTSIZE 32 OVERHEAD 10.67 PREFETCHSIZE 32 TRANSFERRATE 0.04
BUFFERPOOL RED
DROPPED TABLE RECOVERY OFF;

GRANT DBADM ON DATABASE TO USER username;
```

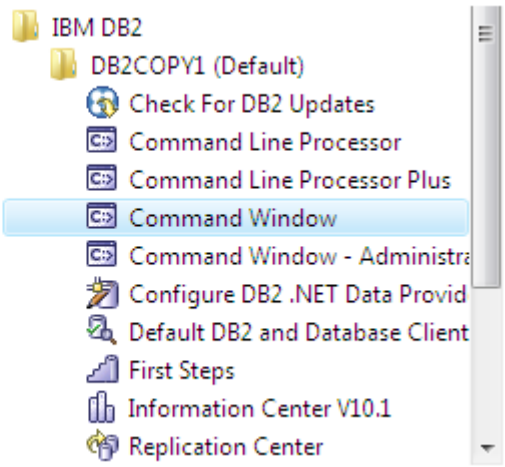
Where username is:

- the name of any users creating new metadata repositories
- the name of any users validating any existing metadata repositories
- the name of any windows users running the WhereScape RED windows scheduler

The default user running a windows scheduler is "system". You can change the windows scheduler to run as a different user via the services control panel in windows.

The best way to run this script is to use the **IBM DB2 Command Window**. Start the command window from the start menu in Windows:

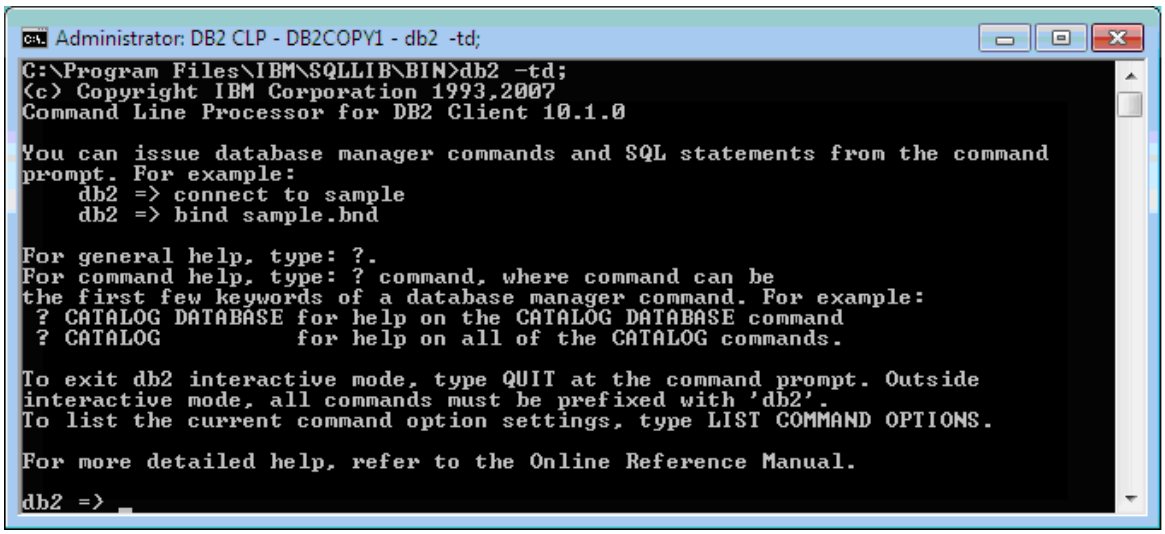




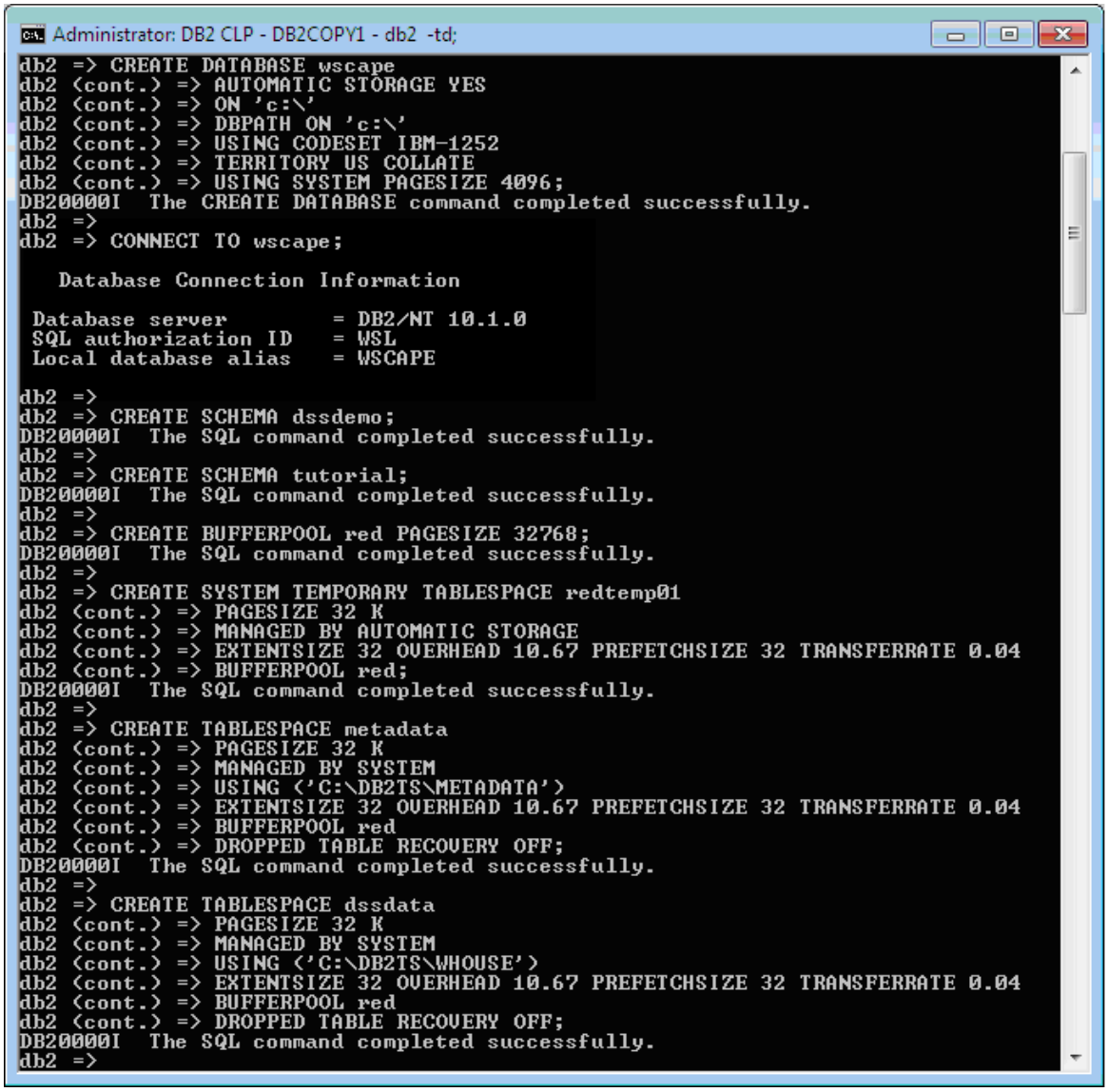
Start the command line processor by entering:

```
db2 -td;
```

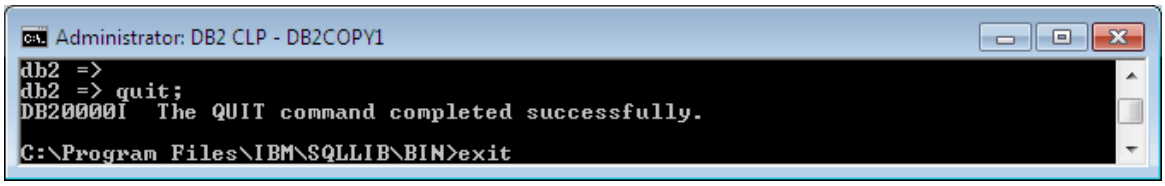
You should see this output:



Now paste in the script above:



Once all the database objects have been created you may choose to **quit** the command processor and **exit** the *IBM DB2 Command Window*, as follows:



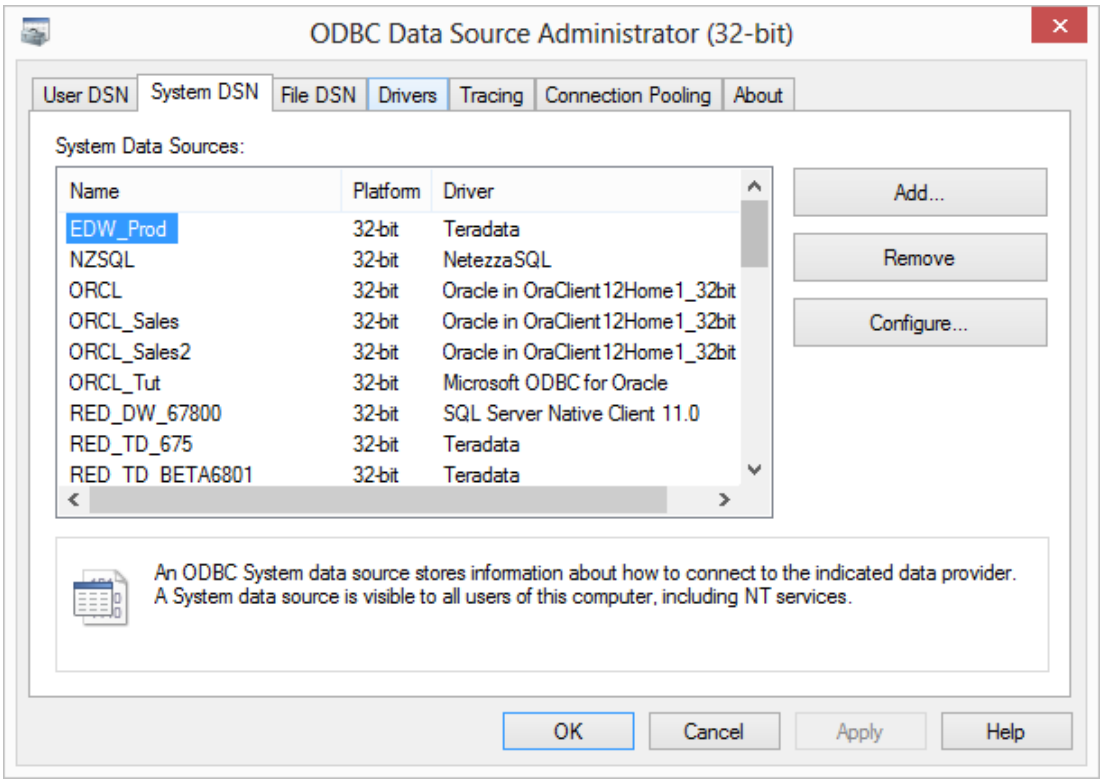
Note: The create database statement cannot be run using SQL Admin or any other tool that connects to DB2 using ODBC. It should be run using the DB2 command window. The rest of the commands (from create schema onwards) can be run using SQL Admin, once the database has been created. Also, any commands run using the DB2 command window cannot include carriage returns or line feeds. The supplied sample script has each command on a single line.

10.4 CONFIGURING A DB2 METADATA CONNECTION (DSN)

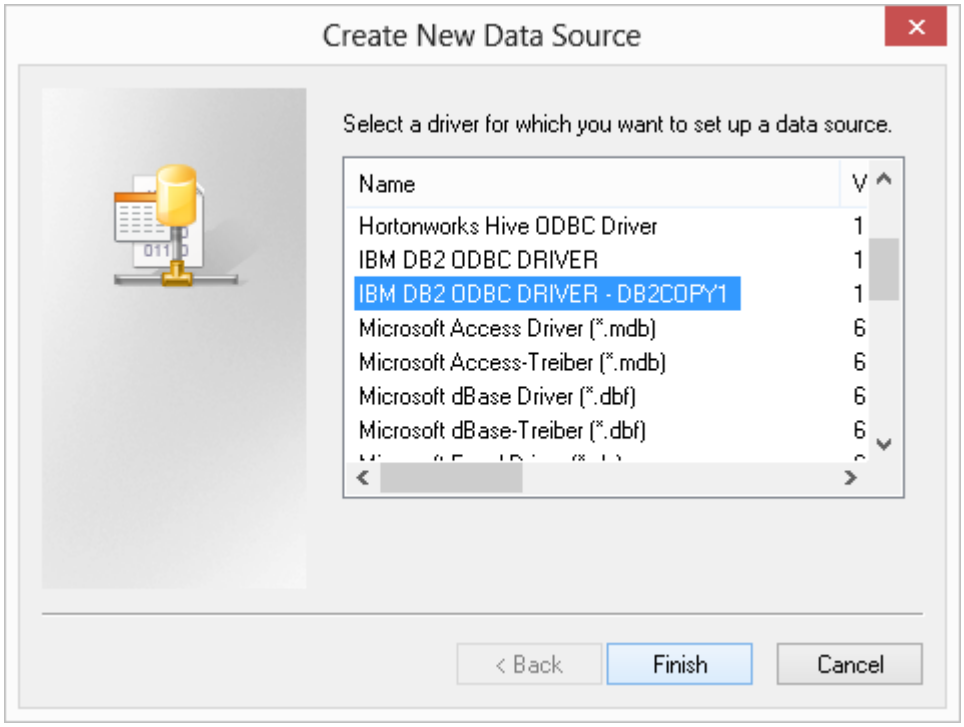
To begin adding an ODBC Source from WhereScape's Setup Administrator, see ***Creating an ODBC Connection*** (see "***6. Creating an ODBC Connection***" on page 20).

1 In ODBC Data Source Administrator, click on the **System DSN** tab to view the system wide ODBC entries.

- Click on the '**Add...**' button to add a new entry.

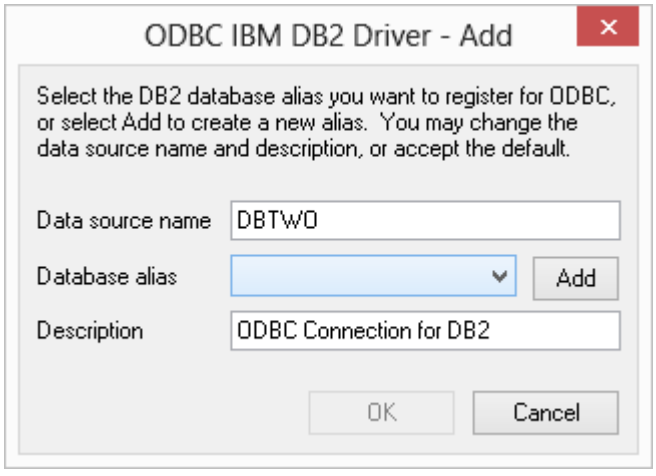


2 Select an **IBM DB2 ODBC DRIVER** driver from the driver list and click **Finish**.



3 A pop-up as shown below will appear.

- Enter a name for the **Data source name**.
- Choose the **Database alias** from the drop-down list.
- Enter a **Description**.
- Click **OK**.

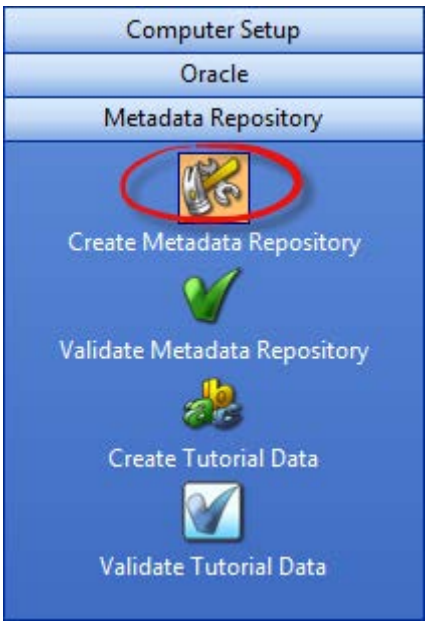


TIP: If multiple PCs will access the data warehouse they must all use the same data source name as entered here.

10.5 CREATING A METADATA REPOSITORY FOR DB2

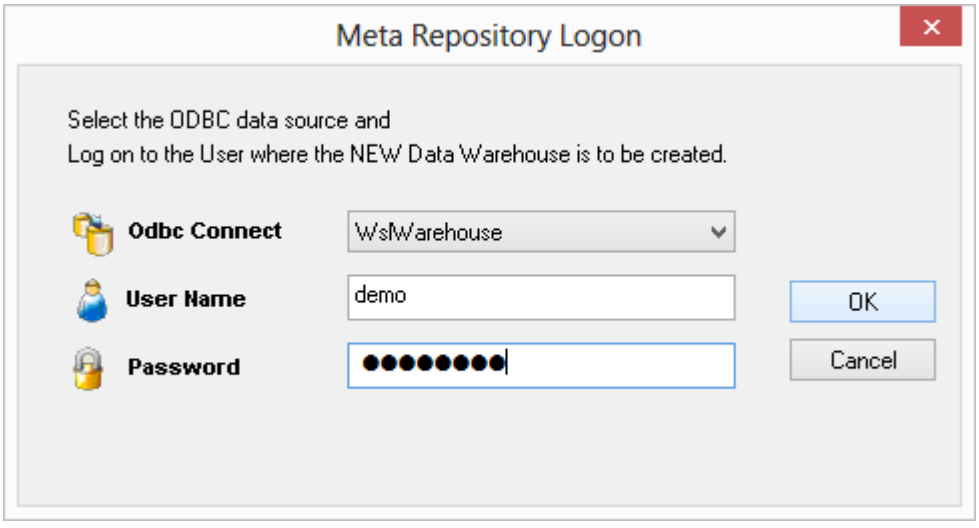
1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane.

- Then click on the **Create Metadata Repository** icon.



2 This option will create the WhereScape meta tables, sequences and procedures in the specified schema. It checks to ensure that the schema, database or user does not contain an existing metadata repository before starting the metadata install.

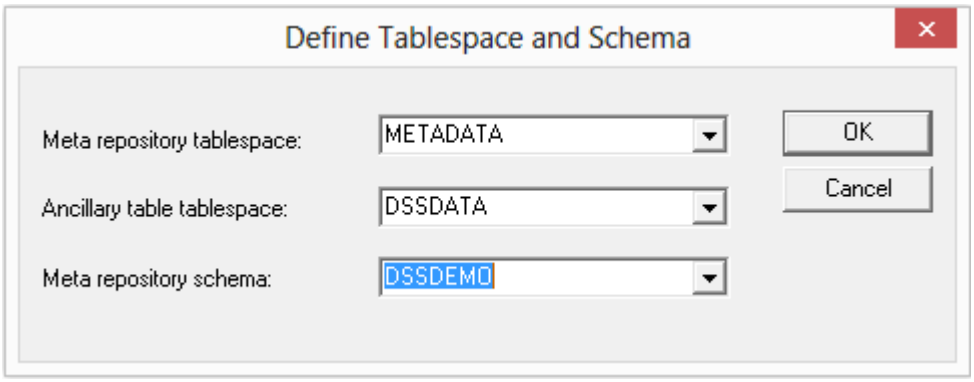
- Click on Create Metadata Repository.
- Enter the **ODBC Connect**, **User Name** and **Password** and click **OK**.



3 When creating a DB2 metadata repository, an additional screen is displayed requesting **Tablespace** and **Schema** information.

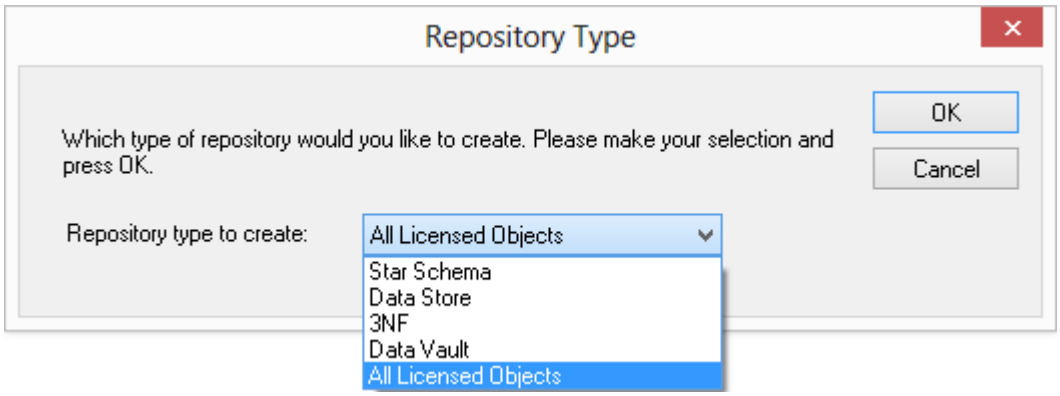
Select the following fields:

- Tablespace where the metadata repository will reside
- Tablespace where initial dimensions will be created
- Schema used for the metadata repository
- Click **OK**.



4 Depending on the type of license you have, the following dialog may be displayed:

- If it is displayed, select the type of repository required and click **OK**.



Note - Repository Types: This is just setting the default objects visible in RED. They can later be changed in RED under **Tools/Options**.

Data Vault Repository Type: Depending on the license type, users may have different repository type choices available.
Choosing a **Data Vault** repository type will create a metadata repository in RED with more appropriate Data Vault repository default settings such as Object Type Names, Global Naming of Tables, Indexes, Key Columns and Procedures/Scripts as well as other repository settings/user preferences.

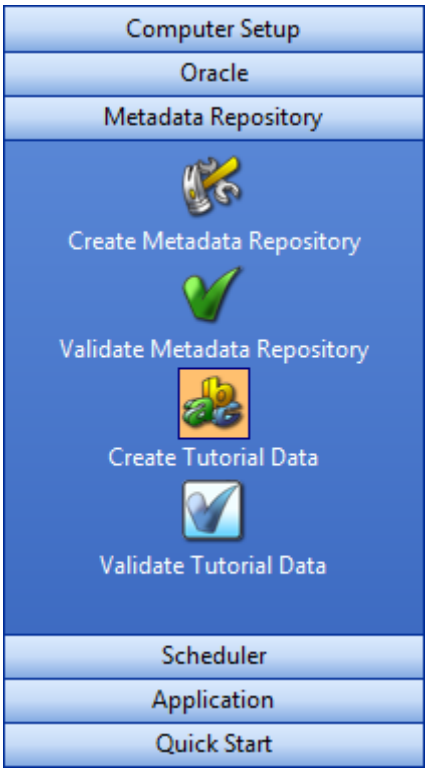
---

11. TUTORIAL DATA

The tutorial data component of WhereScape's Setup Administrator attempts to validate, upgrade or perform an initial install of the WhereScape tutorial tables.
The tutorial tables are only required if the tutorial is to be undertaken. They can be ignored if desired.

1 Click on the **Metadata Repository** tab in the left pane, then click on either:

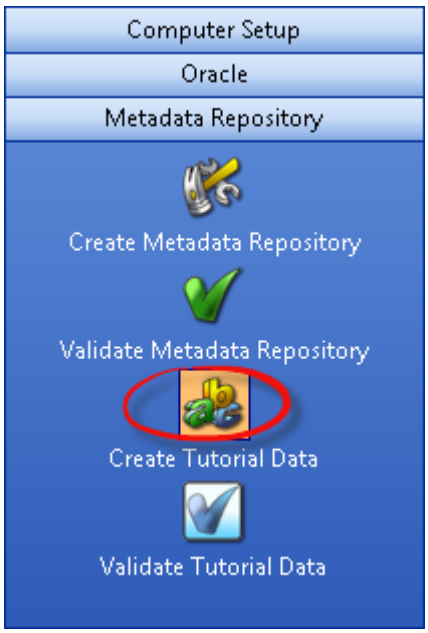
- The ***Create Tutorial Data*** (see "***11.1 Creating Tutorial Data***" on page 84) option to create (or re-create) the set of tables in the specified schema (user).
- The ***Validate Tutorial Data*** (see "***11.2 Validating Tutorial Data***" on page 85) option to check for the existence of WhereScape RED tutorial tables.



11.1 CREATING TUTORIAL DATA

1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane.

- Then click on the **Create Tutorial Data** icon.



This option will create, or re-create, the WhereScape tutorial tables within the schema (user) or database provided. The normal practice is to locate these tables in a different schema from the data warehouse user for Oracle and in a different database for SQL Server. The data warehouse user will need select access to these tables to perform the tutorial. The tutorial documentation assumes these tutorial tables will be loaded under the user 'wtutorial' for Oracle or in the Tutorial database for SQL Server. Another user or database may be used if desired. The user chosen must have sufficient privileges to allow the creation of the tables. When this option is chosen an ODBC connection dialog will appear, and if a valid user is entered the tables will be created and populated under the specified user.
Please ensure that no tables that match those shown in the Validate tutorial tables section exist under the specified user. If existing tables are found, a prompt will be issued, and if proceed is chosen then all data will be deleted from the tables and the tutorial data loaded.

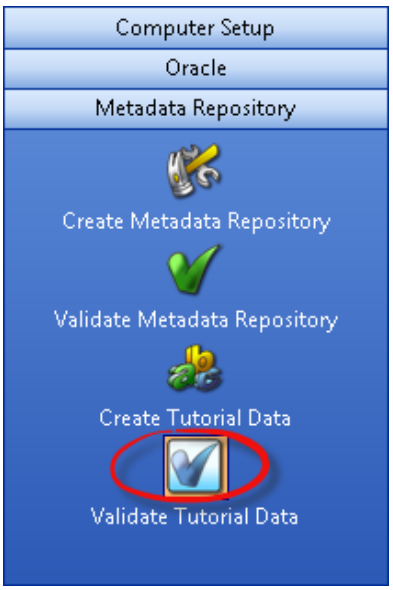
Teradata

When creating tutorial tables for Teradata, an additional dialog is displayed for the user or database name that the tutorial data will be created in.

- Enter the name of the user or database in which the tutorial data will be created and click **OK**.

11.2 VALIDATING TUTORIAL DATA

1 In WhereScape's Setup Administrator, click on the **Metadata Repository** tab in the left pane.
- Then click on the **Validate Tutorial Data** icon.



This option validates that the tutorial tables exist in the given schema.
The tables are based around a simple sales model and are as follows:

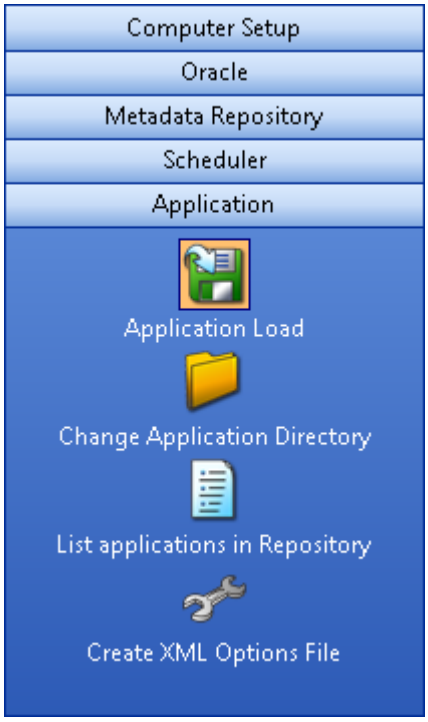
Table	Contents
product	A list of products including a product code (sku), description, group and subgroup
prod_group	A description of each product group
prod_subgroup	A description of each product sub group
prod_line	A description of each product line
code_table	A table containing the codes and descriptions for product groups, sub groups and lines. A code type of 'pg','sg' and 'pl' is used to differentiate the different codes.
customer	A list of customers containing names and addresses.
order_line	The lines on a sale. Includes the specific product code, quantities and values
order_header	The header for a sale. Includes the customer code, order data and ship date
kpi	Used to generate a KPI dimension
budget	Budget data for sales of products to customers
forecast	Demand forecast data for products and customers

12. APPLICATIONS

The application component of WhereScape's Setup Administrator attempts to list, upgrade or perform an initial install of a third-party supplied data warehouse application.

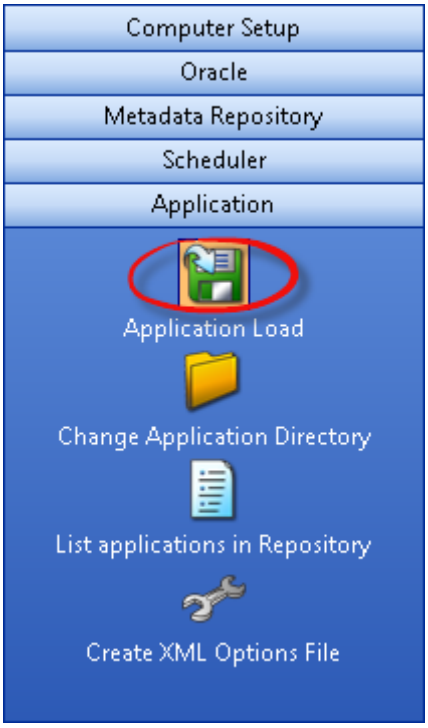
1 Click on the **Application** tab in the left pane; then click:

- ***Application Load*** (see "***12.1 Loading an Application***" on page 87) to load the metadata, tables procedures, scripts etc. provided as part of the application.
- ***Change Application Directory*** (see "***12.3 Changing the Application Directory***" on page 105) to change the directory of applications to be installed.
- ***List applications in Repository*** (see "***12.4 Listing Applications***" on page 106) to list all applications that have been applied to the chosen metadata repository.



12.1 LOADING AN APPLICATION

1 In WhereScape's Setup Administrator, click on the **Application** tab in the left pane, then click on the **Application Load** icon.



Loading an application inserts various objects into the chosen metadata repository. An application is best defined as a set of objects that are shipped to allow inclusion of those objects into a remote repository.

NOTE: An application can only be loaded into a metadata repository running on the same database type as that of the application creator. (e.g. An Oracle application cannot be loaded into a SQL Server metadata repository).

During the load of an application a number of cross environment mappings need to be resolved. These are:

Connections

Connections are normally unique for each metadata repository. They provide the path to the source data and this nearly always varies. Even though an application can ship a set of connections, these connections will nearly always need modification. Alternatively a connection shipped with an application may map to an existing connection, and this can be done as part of the load process. If you are unsure whether or not a connection is required, it can be added and later modified.

Tablespaces (Filegroups in SQL Server and Databases in Teradata)

If an application ships table or index objects then these objects will typically have a tablespace (filegroup in SQL Server and database in Teradata) associated with them. During the load it will be necessary to map these tablespaces (filegroups in SQL Server and databases in Teradata) to those available for the metadata repository.

Object Changes

The application may ship objects that already exist in the metadata. In such a case the process during the load is to create a version of the existing object and then replace it with the new object. At the start of the load a check is made to see if any objects will be replaced. If the application is a patch or an upgrade of an existing application version then this will be normal. The load can be stopped at this point to allow for further investigation.

Table Changes

If the load replaces table objects, it may in turn need to alter the physical table in the database to match the new definition. Again, if this is a patch or an application upgrade, this may be desirable. If not, the proposed actions should be reviewed before proceeding.

Procedure Changes

New procedures, scripts, or modifications may be loaded as part of the application load. In the case of procedures these procedures will need to be recompiled. The load can perform this action, but any failures or issues will need to be resolved after the load has completed.

The following section covers the actual application load process.

NOTE1: It is always a good idea to backup the WhereScape RED metadata before running an application load. See the section ***Backing Up the Metadata before Loading Applications*** for details.

NOTE2: Some database operations, such as converting existing non-partitioned tables to partitioned tables, cannot be done using a deployment application. In these cases some manual intervention may be required to update the target databases to match the new metadata.

12.1.1 BACKING UP THE METADATA BEFORE LOADING APPLICATIONS

It is always a good idea to backup the WhereScape RED metadata before running an application load.
A metadata backup can be used to restore the metadata to the state before the application was loaded.

There are three options for backing up the metadata:

1. In RED, use the **Backup/Unload the metadata to disk** option to unload the metadata to a WhereScape Proprietary backup. See the section **Unloading Metadata** in the WhereScape RED User Guide for more information.
2. In RED, use the **Backup/Export the metadata** option to backup the metadata using the data warehouse database's backup utility. See the section **Backup using DB Routines** in the WhereScape RED User Guide for more information.
3. In RED, use the **Tools/Build application tables** option to build an application of the objects being replaced. This is achieved by selecting the new application files you're about to load in the **Previous application** box of the Define and build an application distribution dialog. See the section **Application Creation** in the WhereScape RED User Guide for more information.

Note: If the table changes in the application are being applied to the data warehouse database, then it is also a good idea to backup the data warehouse tables being changed.

12.1.2 APPLICATION LOAD PROCESS

An application consists of multiple files that are loaded from a directory. The default directory is the WhereScape program directory. Another directory may be specified by clicking on the **Change Application Directory** button. The last selected application directory is the default directory for the next application load.
Once the directory has been selected, the application load is started by clicking on the **Application Load** button. This displays the available applications in the right pane.

NOTE: If the **Change Application Directory** button was used, then the list of available applications will already be displayed and the **Application Load** button doesn't need to be clicked.

An example application list follows:

Available Applications

App Id	Version	Metadata Version	Database	File Name	Comments
SQLT	base_1	6.8	SQL Server	app_id_SQLT_base_1.wst	Base 1- dim_date
SQLT	templates	6.8	SQL Server	app_id_SQLT_templates.wst	This application contains all templates use...
SQLT	tutorial_1	6.8	SQL Server	app_id_SQLT_tutorial_1.wst	Tutorial 1 - Basic star schema fact table
SQLT	tutorial_2	6.8	SQL Server	app_id_SQLT_tutorial_2.wst	Tutorial 2 - Rollup fact tables, ASCII file loa...
SQLT	tutorial_3	6.8	SQL Server	app_id_SQLT_tutorial_3.wst	Tutorial 3 - Scheduling and dependencies ;
SQLT	tutorial_4	6.8	SQL Server	app_id_SQLT_tutorial_4.wst	Tutorial 4 - Complex dimensions and hierar...
SQLT	tutorial_5	6.8	SQL Server	app_id_SQLT_tutorial_5.wst	Tutorial 5 - Analysis Services Cubes
SQLT	tutorial_6	6.8	SQL Server	app_id_SQLT_tutorial_6.wst	Tutorial 6 - KPI fact tables
TERT	tutorial_1	6.8	Teradata	app_id_TERT_tutorial_1.wst	Tutorial 1 - Populating a Defined Model
WSLT	base_1	6.8	Oracle	app_id_WSLT_base_1.wst	Base 1 - dim_date
WSLT	templates	6.8	Oracle	app_id_WSLT_templates.wst	This application contains all templates use...
WSLT	tutorial_1	6.8	Oracle	app_id_WSLT_tutorial_1.wst	Tutorial 1 - Basic Star Schema Fact Table
WSLT	tutorial_2	6.8	Oracle	app_id_WSLT_tutorial_2.wst	Tutorial 2 - Rollup fact tables, ASCII file loa...
WSLT	tutorial_3	6.8	Oracle	app_id_WSLT_tutorial_3.wst	Tutorial 3 - Scheduling and dependencies
WSLT	tutorial_4	6.8	Oracle	app_id_WSLT_tutorial_4.wst	Tutorial 4 - Complex Dimensions and Hiera...
WSLT	tutorial_5	6.8	Oracle	app_id_WSLT_tutorial_5.wst	Tutorial 5 - Analysis Services Cubes
WSLT	tutorial_6	6.8	Oracle	app_id_WSLT_tutorial_6.wst	Tutorial 6 - KPI Fact Tables

- To load an application, either right-click on the Application and select **Install Application** from the pop-up menu or double-click on the Application. Ensure the Application being installed has the same database type as the Metadata Repository, otherwise installation will fail.
- Once this menu option is chosen, enter the ODBC data source and logon to the meta repository and click **OK**.

NOTE: Applications created in 3D cannot be loaded into the latest version of RED if they were created in WhereScape 3D before version 2.8.0.0. To complete the application load process; export the XML file from the latest version of 3D **OR** complete the application load process in a version of RED earlier than 6.8.6.3.

---

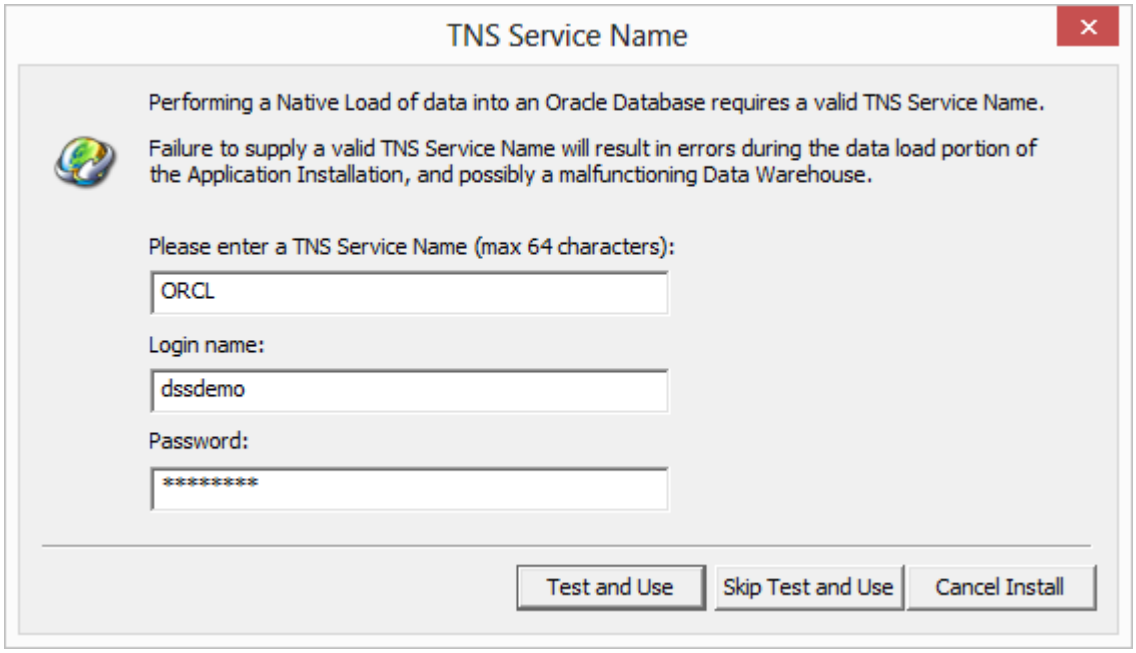
1. Teradata Applications

NOTE1: When loading an application into Teradata, the **TDPID** will be tested. If the TDPID test fails at this stage, a dialog will appear asking you to enter the correct TDPID.
Click **Test and Use** after entering the TDPID and relevant credentials. If you skip the test and provide an invalid TDPID, native loads will not work in WhereScape RED.
Teradata native loads use bteq which connects natively to the database using its own internal protocols without using the ODBC driver. Therefore ODBC settings are not relevant in this process and a valid Teradata **TDPID** is required to load application procedure and scripts successfully using native load.

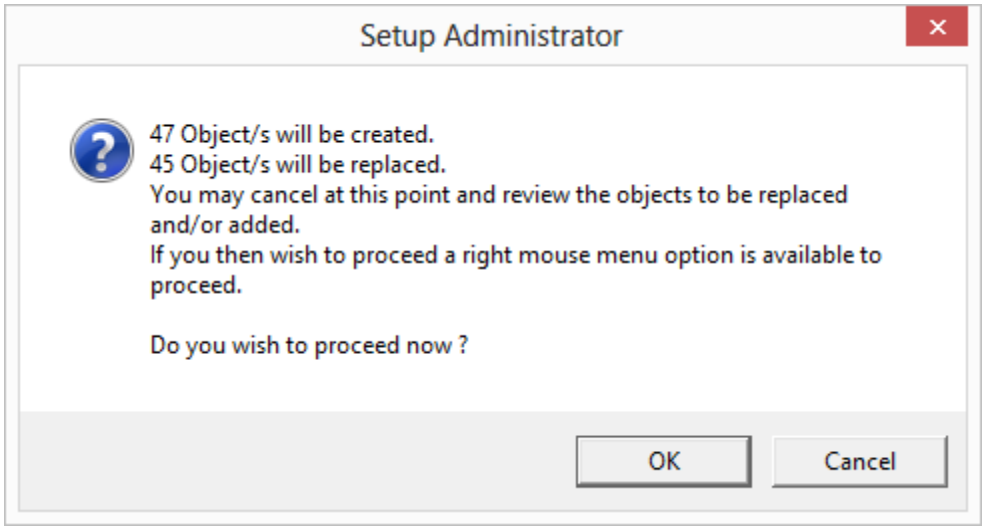
NOTE2: After the TDPID check, an additional dialog is displayed for selecting the metadata repository database. Select the database and click **OK**.

2. Oracle applications

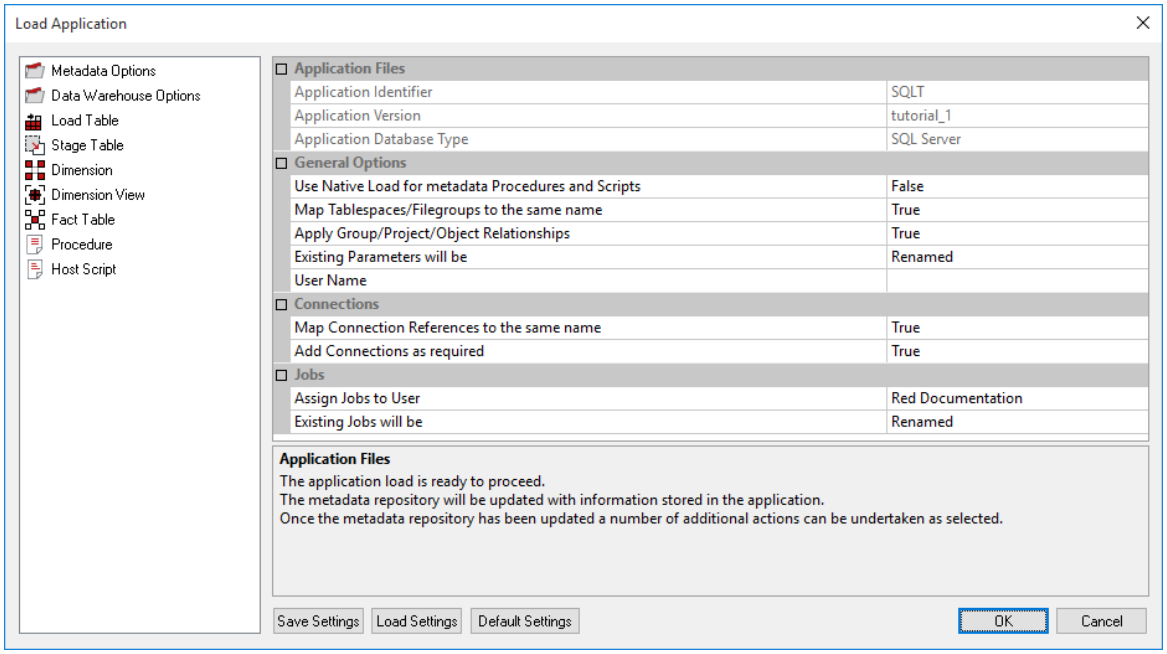
When loading an application into Oracle, the **TNS Name** will be tested. If the TNS Name test fails at this stage, a dialog will appear asking you to enter the correct TNS Name.
Click **Test and Use** after entering the TNS Name. If you skip the test and provide an invalid TNS Name, native loads will not work in WhereScape RED.



A list of all the objects in the application is displayed in the right pane. Each object will be identified as either new to the metadata, or as replacing an existing object. For example:



A dialog will appear after the list has been displayed advising of what is to occur. You may cancel the application load at this point and review the objects to be replaced. The load can then be continued by using the right-click menu option when positioned over any object. Click **OK** to proceed with the application load. A new dialog will appear providing options for the application load:



If you click **OK**, the objects will be inserted into the metadata.

Metadata Options

Application Files	
Application Identifier	SQLT
Application Version	tutorial_1
Application Database Type	SQL Server
General Options	
Use Native Load for Metadata Procedures and Scripts	False
Map Tablespaces/Filegroups to the same name	True
Apply Group/Project/Object Relationships	True
Existing Parameters will be	Renamed
Connections	
Map Connection References to the same name	True
Add Connections as required	True
Jobs	
Assign Jobs to User	ETL Quickstart
Existing Jobs will be	Renamed

Use Native Load for Metadata Procedures and Scripts

This option causes the metadata for procedures and scripts to be loaded into the target metadata repository using the target repository's load utility instead of ODBC. This can have significant performance advantages when loading large applications, when loading applications into a slow target database or over a slow network. The loaders used are: **SQL*Loader** for Oracle, **bcp** for SQL Server and **BTEQ** for Teradata data warehouses.

Map Tablespace/Filegroups to the same name

Every table in Oracle and DB2 is located in a **tablespace**. SQL Server tables may be in **filegroups**.

If this option is set, existing tablespaces and filegroups in the target data warehouse database will automatically be matched to their same ones on the source repository. If the tablespace/filegroup does not exist in the the target data warehouse database, a Tablespace selection dialog will pop-up so a tablespace/filegroup can be selected. This dialog appears once for each tablespace/filegroup that cannot be matched.

Note: This option is not available for Teradata.

Apply Group/Project/Object Relationships

If this option is marked as true, the project group relationships are updated in the target data warehouse database.

Existing Parameters will be

The options are

- **Updated/Overwritten**
- **Retained**
- **Renamed**

Map Connection References to the same name

Use this option to ensure that any objects with linked connections map to an existing connection using the same name as the connection that linked to in the metadata repository where the application was built. If a connection does not exist in the target metadata repository and the option *Add new connections as required by the application* is not selected, then an alternative connection must be selected using the **Connection Build** dialog. This dialog appears once for each tablespace/filegroup that cannot be matched.

Add Connections as required

If this option is set, all connection objects included in the application that do not exist in the target metadata repository and that are used by objects in the application will be added to the target metadata repository.

Assign Jobs to User

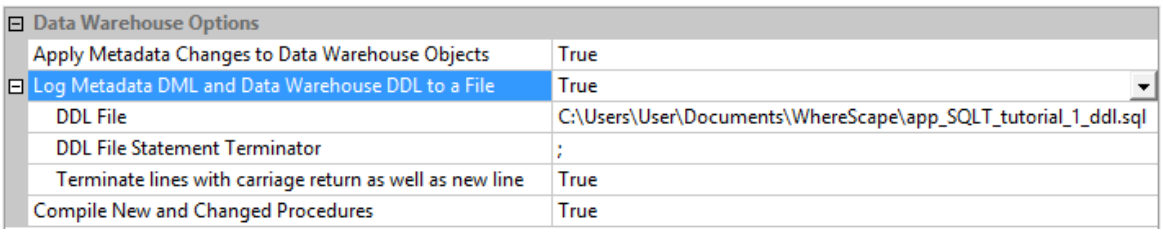
All jobs in the WhereScape scheduler belong to a user. If this option is marked as true, the user name specified in the **User name for any jobs added by the application** drop-down is set as the user name of all jobs loaded by the application. If the specified user name does not exist, it is then created.

Existing Jobs will be

The options are

- **Updated/Overwritten**
- **Retained**
- **Renamed**

Data Warehouse Options



Apply Metadata Changes to Data Warehouse Objects

If this option is marked as True, the changes contained in the application are applied to the metadata according to the options selected for each object type.

Log Metadata DML and Data Warehouse DDL to a File

If this option is marked as True, the changes contained in the application are written to a file.

- **DDL File** - Option to enter the file name/path for the DDL file.
- **DDL File Statement Terminator** - Option to specify the statement terminator.
- **Terminate lines with carriage return as well as new line** - Option to terminate lines with a carriage return.

Compile New and Changed Procedures

If this option is marked as true then all procedure objects loaded by the application load are compiled in the target data warehouse database.

NOTE: Depending on the type of database, invalid procedures may not compile.

Data Warehouse Table/View Options

Load Table	
New Load Tables will be	Created
New Load Tables will be Versioned	False
New Load Table Indexes will be	Created
Existing Load Tables will be	Recreated
Existing Load Tables will be Versioned	True
Existing Load Table Indexes will be	Recreated

For each table and view object loaded by the application load, it is possible to specify whether or not the metadata changes should be applied to the data warehouse table or view; and to the indexes on these objects. The change action can be specified by object type. New objects can have a different action to existing objects of the same type. Possible actions are:

- **Created** - available for new tables and indexes of any object type
- **Recreated** - available for existing tables and indexes of any object type
- **Altered** - available for existing tables and indexes of most object types (not available for load tables or views)
- **Nothing** - available for all new and existing object types and indexes.

This dialog also enables you to set whether or not new or existing objects are to be versioned. Set to **True** to use versioning, else set to **False**.

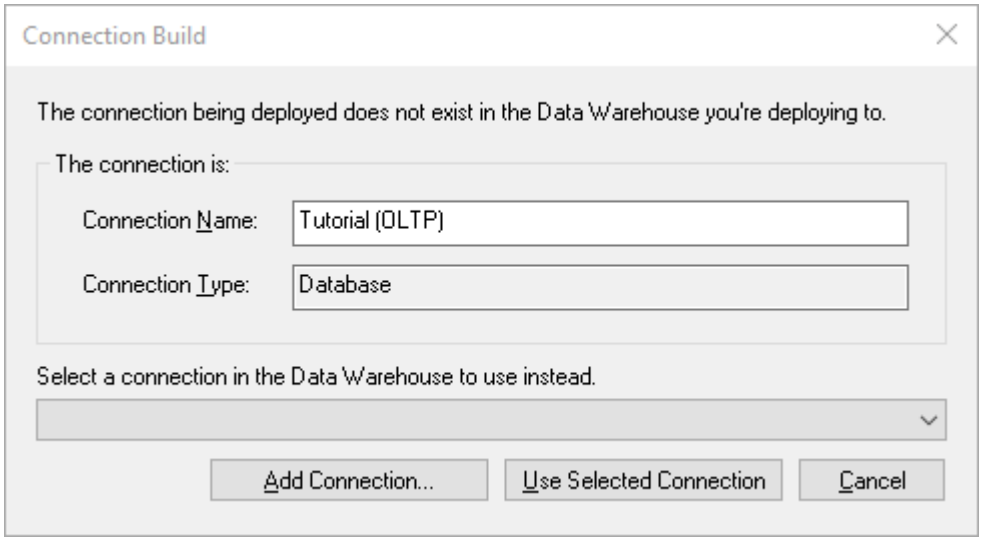
Stage Table	
New Stage Tables will be	Created
New Stage Tables will be Versioned	False
New Stage Table Indexes will be	Created
Existing Stage Tables will be	Recreated
Existing Stage Tables will be Versioned	True
Existing Stage Table Indexes will be	Recreated
Alter allows columns to be dropped	False

Another option enables you to set whether or not columns are allowed to be dropped by object type, for tables being altered. Set to **True** to allow columns that are not in the metadata, to be dropped; else set to **False**. This option applies to Stage, Permanent Stage, Dimension/Model, ODS, Normal, Fact and Aggregate Tables.

Object action settings may be saved and reloaded later for another application using the **Save Settings** and **Load Settings** buttons. Supplied default settings may also be loaded by clicking on the **Default Settings** button.

The Connection Build dialog

The Connection Build dialog appears when the connection used by an imported table does not exist in the destination Data Warehouse.



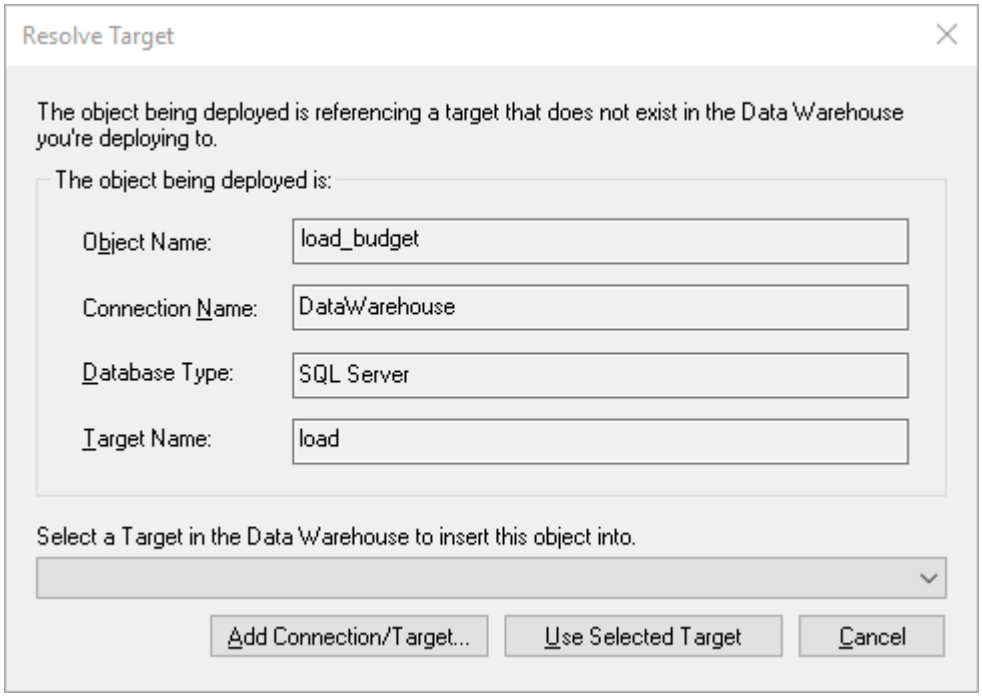
The Connection Build dialog appears if the following criteria are met:

- If the connection the table uses *is* included in the exported files, but the **Add Connections as required** setting is disabled, the dialog is shown with the **Add Connection** button. Pressing the **Add Connection** button adds the connection included in the exported files to the destination Data Warehouse.
- If the connection the table uses *is not* included in the exported files, the dialog is shown without the **Add Connection** button. The user is required to select an existing connection in the destination Data Warehouse.

WhereScape RED TIP: If a new connection is added then it will need to be modified to match the database and user names of the new environment, on the relevant **Connection Properties' dialog** in WhereScape RED.

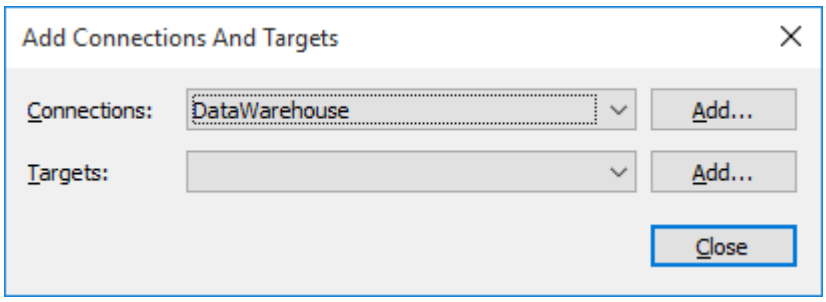
Loading Applications with Targets

When importing tables that contain targets which do not exist in the destination Data Warehouse, users can select existing targets from the list or add new ones using the **Add Connection/Target** in the Resolve Target dialog, see the topic below for more information.



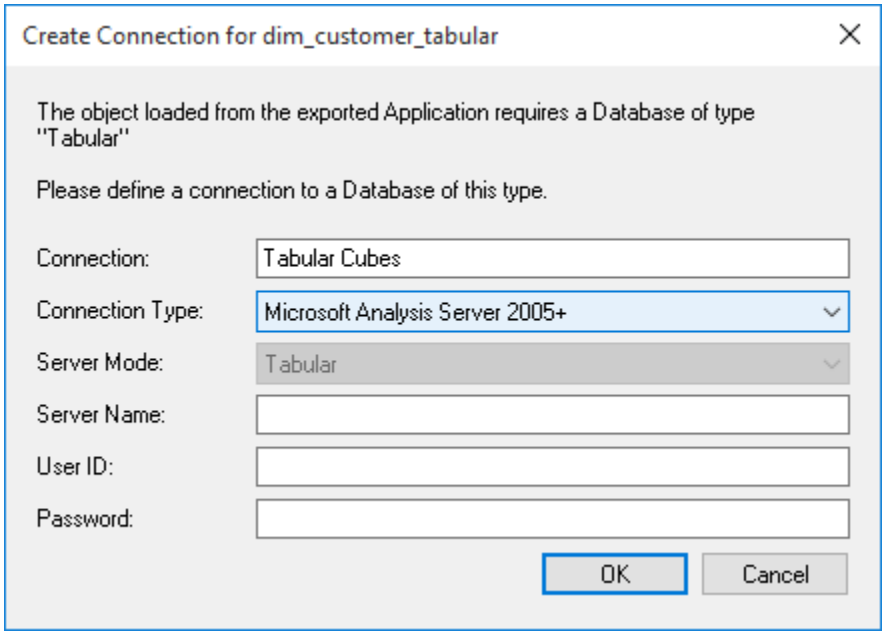
Adding Connections and Targets

On the **Add Connections and Targets** screen, click the **Add** button to add your desired connection.



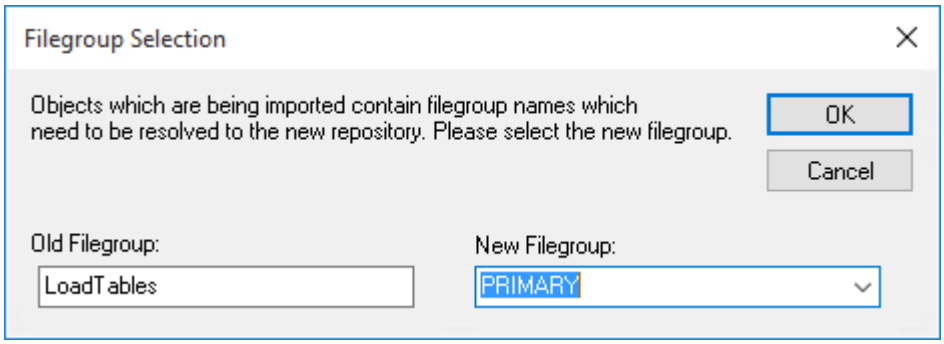
Setup Administrator recognizes you are trying to import a table that references a specific connection type and that option will be selected by default in the Connection Type drop-down list. In the example below, Setup Administrator recognizes a tabular table imported from a Microsoft Analysis Services 2005+ connection and selects it.

Enter the connection details and click OK to create the connection.

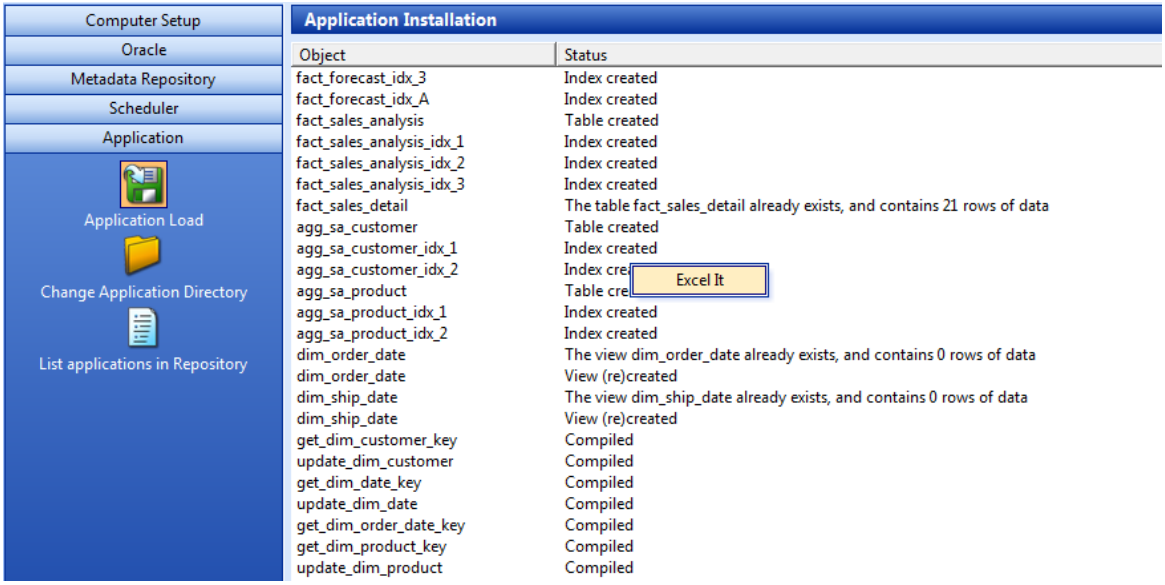


The Filegroup /Tablespace Selection dialog

Filegroups/Tablespaces may need to be manually remapped to the corresponding Filegroup/Tablespace available to the metadata repository.
A dialog box as follows will appear for each Filegroup/Tablespace encountered that is not automatically mapped (See Filegroup/Tablespace options above).



The drop-down list box **New Filegroup** provides a list of all filegroups visible to the repository.
A dialog box will appear when the application load has completed. The full results should be reviewed by scrolling back, or you can right-click and click **Excel It** to send the results to Excel.


Computer Setup
Oracle
Metadata Repository
Scheduler
Application
Application Load
Change Application Directory
List applications in Repository
Application Installation
Object
Status
fact_forecast_idx_3 Index created
fact_forecast_idx_A Index created
fact_sales_analysis Table created
fact_sales_analysis_idx_1 Index created
fact_sales_analysis_idx_2 Index created
fact_sales_analysis_idx_3 Index created
fact_sales_detail The table fact_sales_detail already exists, and contains 21 rows of data
agg_sa_customer Table created
agg_sa_customer_idx_1 Index created
agg_sa_customer_idx_2 Index cre
agg_sa_product Table cre
Excel It
agg_sa_product_idx_1 Index created
agg_sa_product_idx_2 Index created
dim_order_date The view dim_order_date already exists, and contains 0 rows of data
dim_order_date View (re)created
dim_ship_date The view dim_ship_date already exists, and contains 0 rows of data
dim_ship_date View (re)created
get_dim_customer_key Compiled
update_dim_customer Compiled
get_dim_date_key Compiled
update_dim_date Compiled
get_dim_order_date_key Compiled
get_dim_product_key Compiled
update_dim_product Compiled

12.2 CREATING AND LOADING APPLICATIONS FROM THE COMMAND LINE

It is possible to create and load applications from the command line by running a bat file. The WhereScape RED Application directory contains an example bat file WSL_Application_Create_Restore_Point_and_Load.bat for creating and loading.
If you right-click on this file and select **Edit** you will see the steps outlined as well as the details on the options available.
The first step **creates** a restore point application (R) based on objects about to be loaded. This process calls the command line functionality of RED and creates the application file.
The second step **loads** an application (A) into a test WhereScape RED repository. It uses an xml file to specify various options, calls the command line automation functionality of Setup Administrator and loads the application (A).

The WhereScape RED Application directory contains example xml files:

- WSL_Application_Load_SQL.xml for SQL Server
- WSL_Application_Load_DB2.xml for DB2
- WSL_Application_Load_ORA.xml for Oracle

The tags in the xml file need to be edited as the login/connection details etc need setting.
The Batch Application Create options and the Batch Application Load options are listed at the end of the bat file. The values for these variables will also need to be customized before running this file.

The process typically involves the following steps:

1. Create an application (A) in RED containing your data warehouse changes.
2. RUN WSL_Application_Create_Restore_Point_and_Load.bat from the command line; which creates a restore point application (R) and applies application (A) to a test WhereScape RED repository.
3. If the changes are incorrect, they can be undone by loading the restore point application (R).

Batch Application CREATE options

The following options are available on RED to create applications.

Option	Description
/BA	Selects batch application create.
/U	User name.
/P	Password.
/C	DSN name.
/M	metaschema/database for DB2/Teradata logon.
/D	Directory to save application files to.
/I	New application files identifier.
/V	New application files version.
/AP	Project name - all objects in a Project; and associated jobs.
/AG	Group name - all objects in a Group; and associated jobs.
/ALL	All objects - all objects, jobs and parameters.
/RC	Remove connections - drop all connections from the application.
/RJ	Remove jobs - drop all jobs from the application.
/RP	Remove parameters - drop all parameters from the application.
/AF	Absolute application id file name which restore point is being created for.

If using a trusted connection, the user and password are not necessary.

Batch Application LOAD options

The following options are available on Setup Administrator to load applications.

Option	Description
/AL	Select application load.
/AF	Absolute application ID file name.
/LF	Absolute log file name.
/PF	Absolute xml parameter file name.
/SO	Stay open - Setup Administrator does not close after the application has been created. Relevant for /AL LOAD option. Relevant for -QA, -QR, -WS, -QL and -QV application switch options. Not relevant for -QS switch option. For switch options, see ***SQL Server Quick Application*** (see "***7.7 SQL Server Quick Application***" on page 37).

12.2.1 SETUP ADMINISTRATOR PROCESS EXIT CODES

When installing an application using the command line, the Setup Administrator process will return one value from a set of exit codes from its process when exiting.
After an application install, when the Setup Administrator process exits, users can check the exit codes to determine the cause for a possible problem with the application install.

The set of Setup Administrator exit codes is the following:

Exit Code Name	Exit Code	Description
AdmExitedNormally	0	The user clicked the main window's X button in the top right, the Exit item from the File menu, or the task that ran completed without error.
InternalError	1	An unexpected internal error occurred. The user should contact WhereScape support supplying any relevant log files.
CommandCancelled	2	The user clicked the cancel button from one of the presented dialog boxes, thus aborting the running task.
RequiredParameterMissing	3	One or more required parameters is missing e.g. a name for the Scheduler, an ODBC DSN, a user name, a password.
OdbcError	4	An error was reported from the RDBMS that Setup Administrator was communicating with.
FileIoError	5	A specified file or directory was unable to be opened, read from or written to.
ServiceControlManagerError	6	An error was reported from the Windows Service Control Manager. Often this is because Setup Administrator needs to be run "As Admin" when dealing with the SCM.
OracleCompilationError	7	An Oracle stored procedure has failed to compile.
MetaDataError	8	Metadata was/wasn't found in the specified RDBMS, or the metadata failed to upgrade, or the metadata is corrupt, or the metadata type mismatches i.e. trying to import an Oracle application into Teradata metadata.

ItemsCheckedOut	9	In batch mode, if you want to overwrite checked out items, you must explicitly state so by setting the option to true in the settings.
NotLicensed	10	License does not permit objects of a specific type to be imported.

Users can test for these values using a batch file and take action accordingly.

Below is an example batch file that can be used to check Setup Administrator's exit code.

Example batch file - SQL:

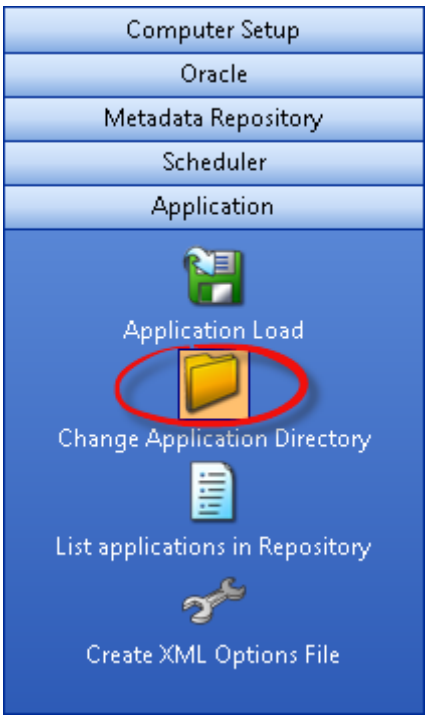
```
@echo off

Adm.exe /AL /AF "app_con_SQLT_base_1.wst" /LF "ImportLog.txt" /PF
"WSL_Application_Load_SQL.xml"

if errorlevel 8 goto MetaDataError
if errorlevel 5 goto FileIoError
if not errorlevel 0 goto ImportError

echo Successfully imported
goto end

:MetaDataError
sendmail -recipient admin@company.com -subject "Import failed" -body
"Corrupt meta data found during application import. Re-install the Data
Warehouse"
goto end

:FileIoError
sendmail -recipient admin@company.com -subject "Import failed" -body
"ExportedDiagram.xml is missing, re-generate it then re-run this process"
goto end

:ImportError
sendmail -recipient admin@company.com -subject "Import failed" -body
"Unable to import the application file ExportedDiagram.xml"
goto end

:end
```

Example batch file - 3D:

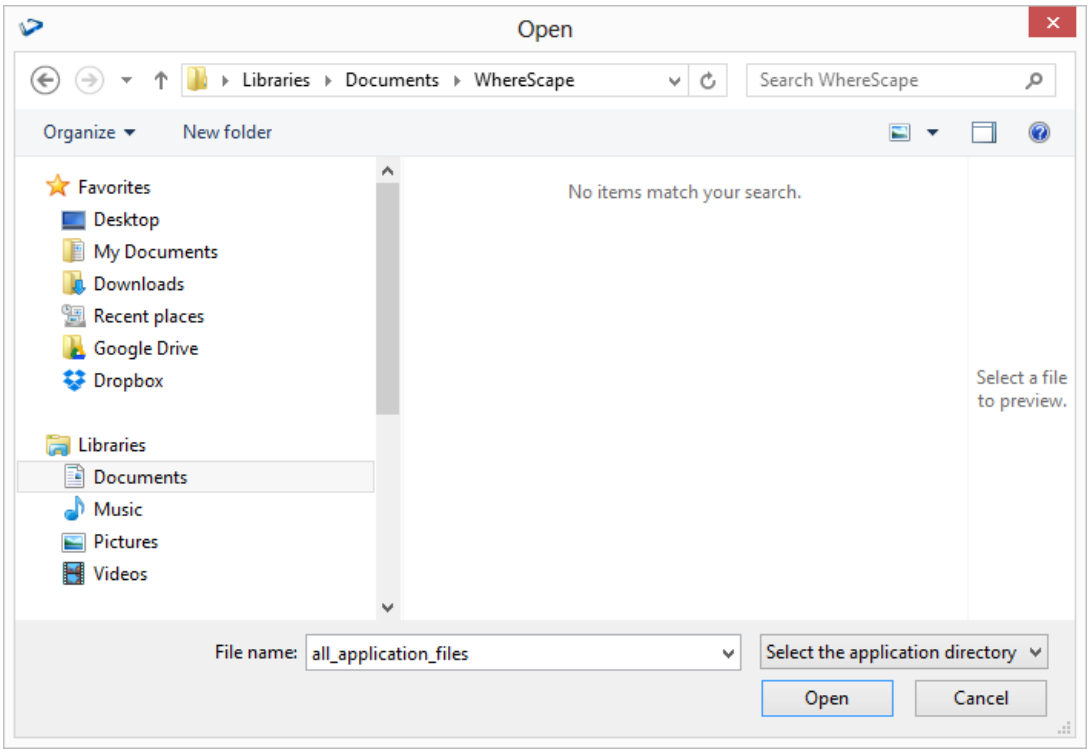
```
@echo off

Start /wait /D "C:\Program Files (x86)\WhereScape" Adm.exe /AL /AF
"ExportedDiagram.xml" /LF "C:\temp\test\ImportLog.txt"

if %errorlevel% equ 8 goto MetaDataError
if %errorlevel% equ 5 goto FileIoError
if not %errorlevel% equ 0 goto ImportError
echo Successfully imported
goto end

:MetaDataError
sendmail -recipient admin@company.com -subject "Import failed" -body
"Corrupt meta data found during application import. Re-install the Data
Warehouse"
goto end

:FileIoError
sendmail -recipient admin@company.com -subject "Import failed" -body
"ExportedDiagram.xml is missing, re-generate it then re-run this process"
goto end

:ImportError
sendmail -recipient admin@company.com -subject "Import failed" -body
"Unable to import the application file ExportedDiagram.xml"
goto end

:end
```

12.3 CHANGING THE APPLICATION DIRECTORY

1 In WhereScape's Setup Administrator, click on the **Application** tab in the left pane, then click on the **Change Application Directory** icon.

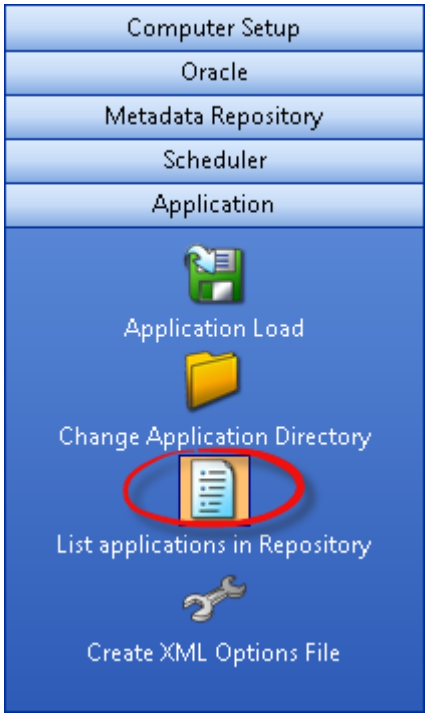


2 A dialog will allow you to browse and select a new application directory.



12.4 LISTING APPLICATIONS

1 In WhereScape's Setup Administrator, click on the **Application** tab in the left pane, then click on the **List applications in Repository** icon.



2 The **List applications in Repository** menu option will prompt for a logon to the required metadata repository. Applications are applied to a specific metadata repository.
Once logged on a list of the applications that have been installed into that repository will be shown. If no applications have been loaded then the list will be empty. An example output is as follows:

List Installed Applications

App Id	Name	Version	Status	Date installed
SQLT	WhereScape Tutorials (SQL Server)	tutorial_2	Completed	2007-02-13 17:32:16.257

This example shows that the tutorial_2 application has been loaded into the metadata.

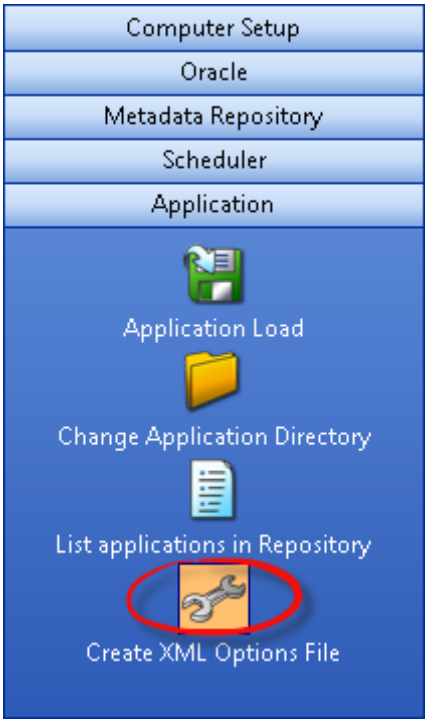
12.5 TESTING APPLICATIONS

A testing application set consists of a Procedure and an XML script and provides the ability to define a series of tests against data warehouse objects; either comparing them to an expected value or to the results of a query.
The XML script contains the test definitions. Each test is a new XML node in the XML script and contains a name, a test query, an expected value, or a comparison query.
The procedure simply runs the tests and determines whether the tests are passed or not. This is most likely to be run as a scheduled job within WhereScape RED.

12.6 XML FILES FOR APPLICATION LOADS

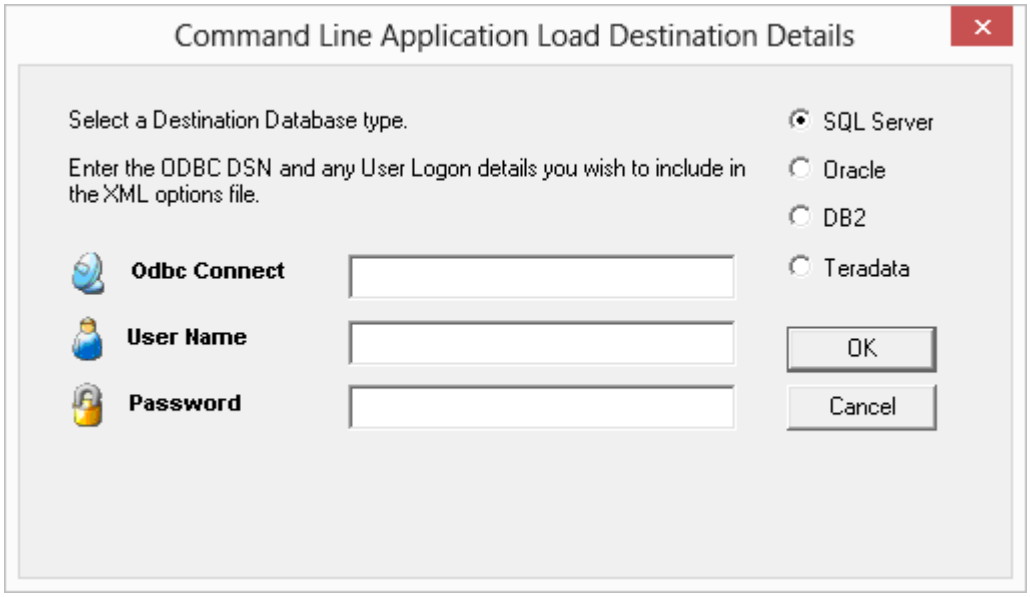
If applications are being loaded using the command line, the saved application load options in the local registry can be outputted to an xml file for use in the application load.

1 To create the xml file click on **Create XML Options File** in the left pane.

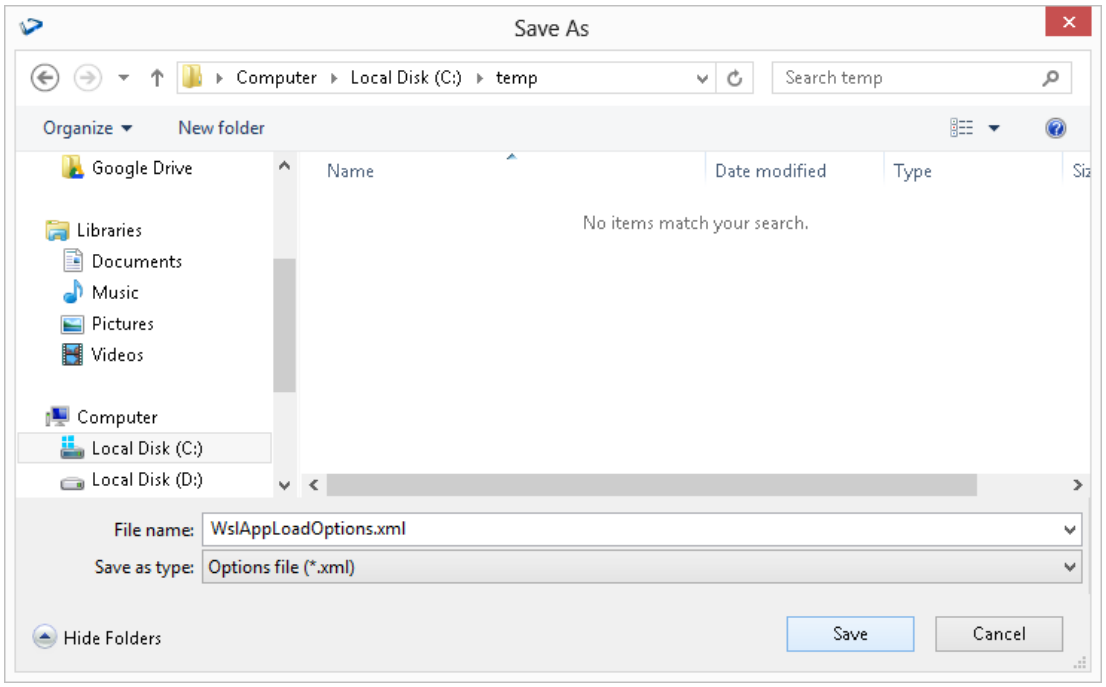


2 If the load options have not yet been saved into the local registry, a message will appear; prompting you to select the application to be loaded and to saved the load settings for that application.

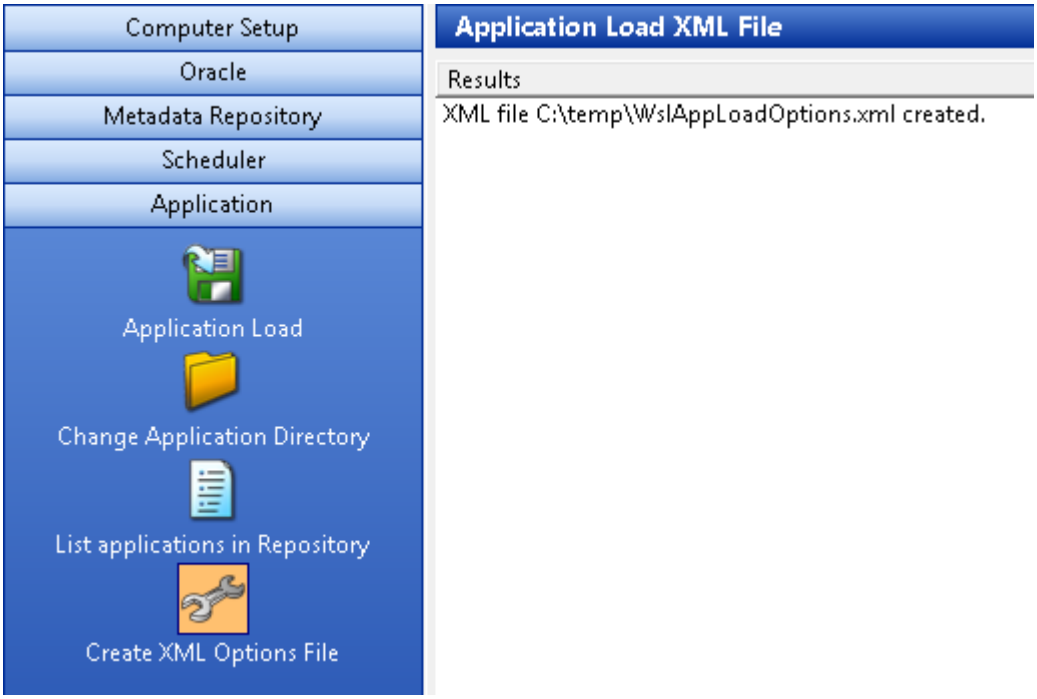
- Enter in the **Odbc Connection**, **User Name** and **Password** to add the destination details to the XML options file.



3 Choose the location where you want to save the XML.



4 The results will confirm that the XML file has been created.



13. UPGRADING WHERESCAPE RED

WhereScape Versions

WhereScape RED has a four part version number normally shown as xx.xx.xx.xx. An example of this may be 6.0.6.0. The first number represents the major release. The second number represents the metadata repository version. The third and fourth numbers relate to application specific releases.
From the example above we see that the current version is version 6 of WhereScape RED. We are on version 6.0 of the metadata repository.

Metadata Changes

A change from a 6.0.. release to a 6.5.. release would indicate a change in the metadata tables. All metadata changes are non destructive. They simply add new columns or new meta tables. In this way they can be applied without harming an existing metadata repository. The impact of a metadata change is that the associated applications (namely the RED executable, the Scheduler, security module etc.) will need to be at the same metadata version. Therefore a 6.0.6.0 version of RED may not successfully run against a version 6.5 metadata repository.

Application changes

The final two numbers in the version represent application releases. Applications are deemed to be all of the executable images supplied with WhereScape RED as well as the UNIX scheduler scripts and the stored procedures. Application changes reflect enhancements and bug fixes. A change in the first number indicates a major enhancement in one of the application components.

Upgrading RED

Upgrading WhereScape RED consists of the following steps:

1. Allow any active jobs to complete. Halting active jobs will allow running tasks to complete with no new tasks starting. Aborting active jobs will kill any running tasks and stop running jobs.
2. Stop all schedulers. Windows schedulers can be stopped with WhereScape's Setup Administrator. To stop a UNIX or Linux scheduler, kill the active scheduler process and comment their crontab entries (to stop the scheduler re-starting itself).
3. Close any WhereScape programs that are running on your machine.
4. Install the new version of RED on your machine.
5. Back up your metadata.

6 In RED Setup Administrator, select the Validate Metadata Repository option. This function may re-compile existing or create new metadata procedures; metadata tables may be altered or new tables created.
When performing an upgrade of RED:
- Click **OK** when prompted to validate metadata tables.
- Click **Yes** when prompted to re-create metadata views.
- Click **Yes** when prompted to re-compile metadata procedures.

Warning: If the above steps are not all completed during an upgrade the metadata may be left in an inconsistent state.

7 For **Oracle** metadata updates see the note below on **recompiling Oracle invalid procedures** during a RED upgrade.

8 Back up your metadata again (just in case).

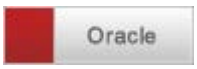
9 If using a UNIX or Linux scheduler and this is a major application enhancement then rename the wsl/bin directory to say wsl/bin_versionxxxxxx. Create a new bin directory and ftp over the files under the unix directory (see the main install instructions). Change the protections on the files (chmod 750 *.sh).

10 Restart all schedulers. Windows schedulers can be restarted with WhereScape's Setup Administrator. For any UNIX or Linux schedulers, uncomment any commented out crontab entries - this is enough to restart the schedulers.

11 Restart any halted or aborted jobs.

NOTES:

1. There are different versions of the scripts for each database and for UNIX versus Linux. You should also be looking in the sub directory with the highest version number.



When using a UNIX/Linux scheduler for Oracle, it is recommended that users copy the new meta_backup_680.sh file to use Datapump's expdb/impd instead the deprecated exp/imp tools.
This version uses the data pump export executables expdp/impdp. It assumes that the scheduler and the Oracle database reside on the same server.

2. Metadata tables do not change between minor releases, but metadata procedure often and usually do change.

3. RED will not let you sign into an old repository version using a newer version of RED

4. RED will let you sign into a new repository version using an older version of RED, but it will warn you that this may potentially cause issues

5. It is very important when using the windows scheduler to have the installed RED version on the scheduler server EXACTLY matching the stored procedures.

---

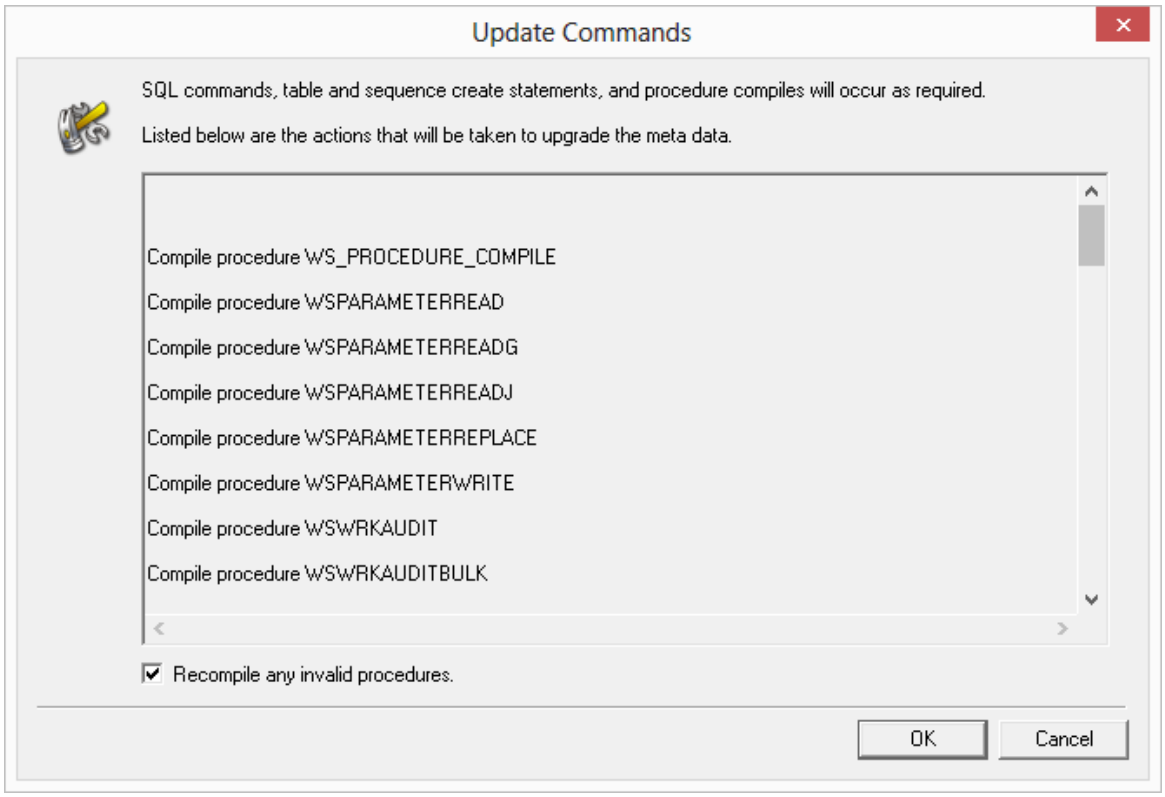
6. Side by side installations are possible (two versions in two directories on the same machine), but be careful with schedulers. If you install the new version of RED in a new directory, you will have to remove and reinstall all windows schedulers in order for the scheduler(s) to use the new version of RED.

7. As a general rule, the UNIX and Linux scheduler scripts, metadata tables/procedures and RED front end should all be in sync.

8. If the scripts for the UNIX or Linux scheduler have changed, you should replace files in your old and new shell scripts in the WhereScape Program Files directory and see if any have changed.

Oracle invalid procedures

When validating an Oracle Metadata Repository, tick the **Recompile any invalid procedures** check-box to have any invalid user procedures recompiled during a metadata validate.

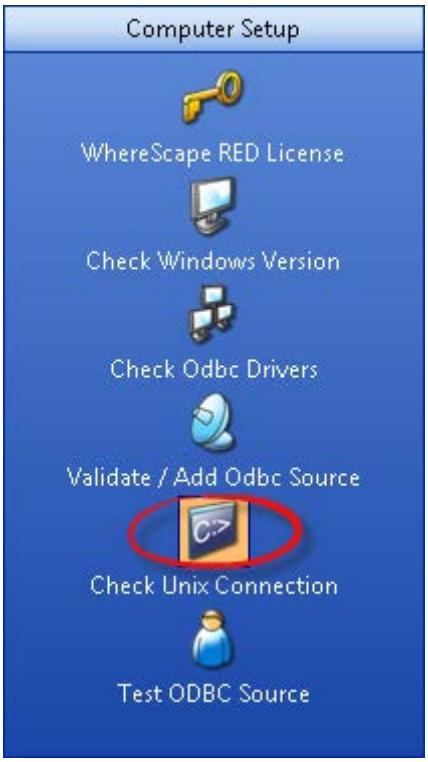


14. CHECKING THE UNIX CONNECTION

This section applies to **IBM DB2** and **Oracle** data warehouses only.

1 To check the UNIX connection, click on the **Computer Setup** tab.

- Then click on the **Check Unix Connection** icon.



WhereScape RED can allow the user to browse a Unix file system and utilize the drag and drop functionality to setup the loading of files from a Unix file system. It can also perform interactive file loads. To facilitate this and to obviate the need to port code to every Unix environment the Telnet protocol is used for the Unix connectivity.
This step is not necessary for the successful running of a Unix based data warehouse environment. As mentioned above it is provided to simplify the process of setting up the loading of Unix files. This step is totally unnecessary for a Windows based data warehouse environment.

If you want to use these Unix drag and drop assistants then consult the WhereScape RED User Guide for an explanation of Unix connections and perform the following tasks:

2. Identify a Unix user that allows direct logon to a Unix shell prompt without passing though a menu system.
3. Ensure that the Unix user has the Oracle 'sqlldr' program in the path after a normal logon. If not then interactive loads will not be possible. Scheduled loads should still function correctly.
4. Complete the dialog box presented specifying the Unix user and password identified in step (1).
5. Click **OK** to proceed. A timeout of 20 seconds is enabled, so that if connection is not achieved within that time the process will terminate. The Telnet window will be displayed to assist in debugging any problems. It will be closed on completion or timeout.
6. Review the results and attempt to address any problems. A file called 'WslTelnet.log' is created in the installation directory containing the full dialog of the connection attempt. The message 'Telnet connection worked. All OK' will be displayed if the connection worked. If successful record the parameters used as these will need to be defined when setting up a Connection within WhereScape RED itself. If a connection cannot be achieved then remove all reference to a username and password from the file mentioned above and mail it to support@wherescape.com.

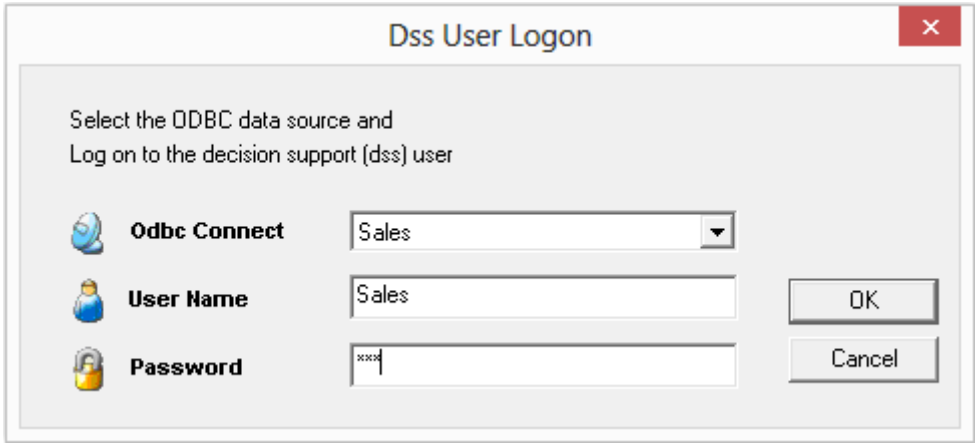
15. TESTING AN ODBC SOURCE

1 To test an ODBC source, click on the **Computer Setup** tab.

- Then click on the **Test ODBC Source** icon.

2 Select the **ODBC connection** from the drop-down list and enter the **User Name** and **Password**.

- Click **OK**.

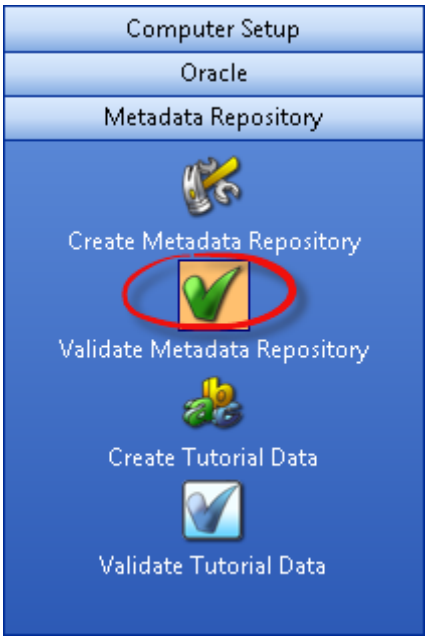


3 If the logon using the ODBC connection was successful, the following message will be displayed.

16. VALIDATING A META REPOSITORY

1 To validate a Metadata Repository, click on the **Metadata Repository** tab.

- Then click on the **Validate Metadata Repository** icon.



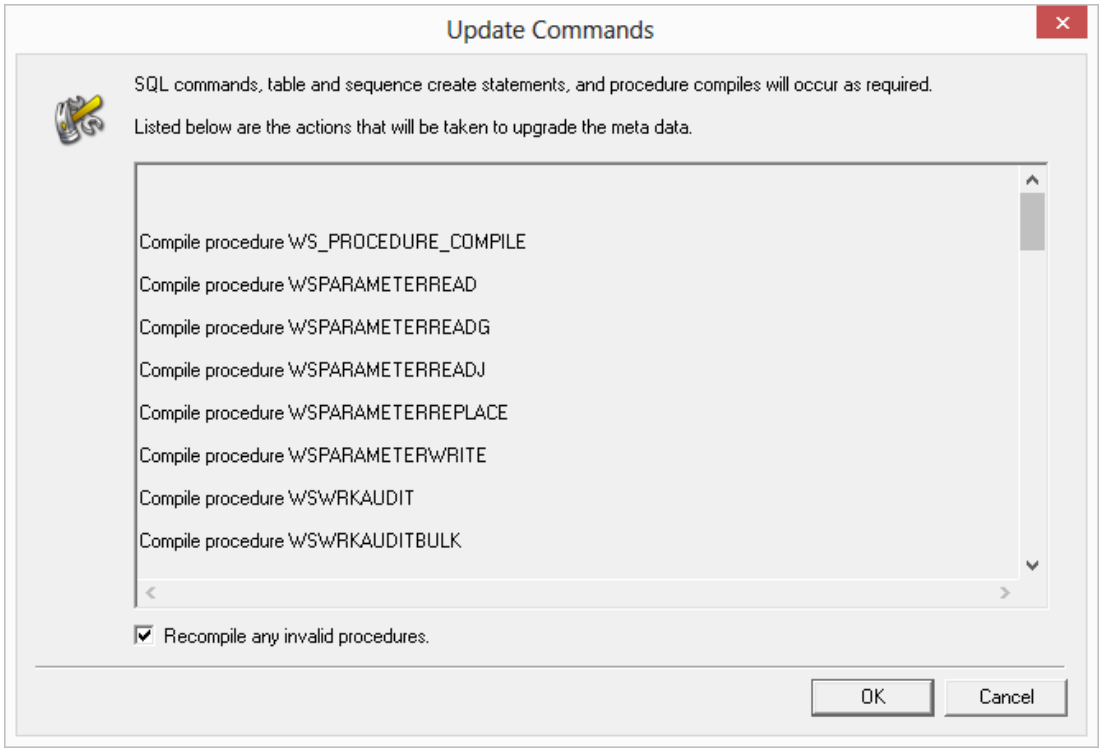
This option validates the version of the meta tables installed in the specified SQL Server database, Oracle schema, DB2 schema or Teradata Database/User. If requested it goes on to validate the tables, sequences and procedures against the installation media. A validate can be run at any stage to confirm that all tables and procedures are up to date and that the procedures are in a compiled and valid state. This option can be used to recompile a procedure that has become invalid. This option should be used when installing a new version of RED and for SQL Server all procedures should be recompiled.

If a mismatch is found or a procedure is found to be invalid, the user is given the option of updating the metadata. If chosen the metadata will be upgraded to the latest version.

NOTE: Ensure the scheduler is not running and no users are accessing the metadata before doing an upgrade.

Oracle invalid procedures

When validating an Oracle Metadata Repository, tick the **Recompile any invalid procedures** check-box to have any invalid user procedures recompiled during a metadata validate.



16.1 VALIDATING A METADATA REPOSITORY USING THE COMMAND LINE

Is it possible to Validate the Metadata Repository using the Command Line by running a bat file. This process can be used for all metadata database types: it validates the tables and alters or creates/copies any tables that require changes.
All the process steps are logged to a file: **My Documents\WhereScape\WhereScape_quick_validate.log.**

During this process:

- All Teradata metadata views are recreated
- Oracle sequences and procedures are validated and updated if required
- All non Oracle procedures are recompiled
- All metadata indexes are recreated
- Any Oracle non metadata procedures that are invalid are compiled
- Finally the metadata version in ws_meta_tables.mt_version is updated

To have a metadata repository validated from the command line, create a bat file using the following batch application quick validate options and check the example below:

Batch Application Quick Validate options

ADM -QV

-SN DSN
-SL LoginId
-SP Password

-DS .....
//SQLServer Dimension filegroup
//Teradata – not used
//Oracle Dimension Table Tablespace
//DB2 Ancillary Table Tablespace

-IS.....
//SQLServer Dimension Index Filegroup
//Teradata – not used
//Oracle Dimension Index Tablespace
//DB2 Metadata Repository Schema

-MS.....
//SQLServer Metadata Filegroup
//Teradata Metadata Repository Database
//Oracle Metadata Repository Tablespace
//DB2 Metadata Repository Tablespace

Example

The following example validates an Oracle repository named **WslWarehouse_ORA**, using a connection with username **dssdemo** and password **wsl.**
It recreates the Oracle Dimension Index Tablespace, validates the Oracle Metadata Repository Tablespace and validates/updates the Oracle Dimension Table Tablespace, recompiling any procedures that may be invalid, during the validate process.

```
@echo off
cd "c:\Program Files (x86)\wherescape\"
adm -QV -SN WslWarehouse_ORA -SL dssdemo -SP wsl -IS RED_METADATA -MS
RED_METADATA -DS RED_METADATA
exit
```

17. SCHEDULER INSTALLATION AND CONFIGURATION

The Install Scheduler option installs and starts a copy of the WhereScape Windows scheduler. The scheduler runs as a system service and can also be maintained through the normal Windows services functions.

This chapter covers both Windows and UNIX/Linux scheduler installation and maintenance.

IN THIS CHAPTER

17.1 Diagram Overview of RED and Scheduler database access 120
17.2 Installing a Windows Scheduler 125
17.3 Installing a UNIX/Linux Scheduler.....131
17.4 Maintaining the Windows Scheduler 142

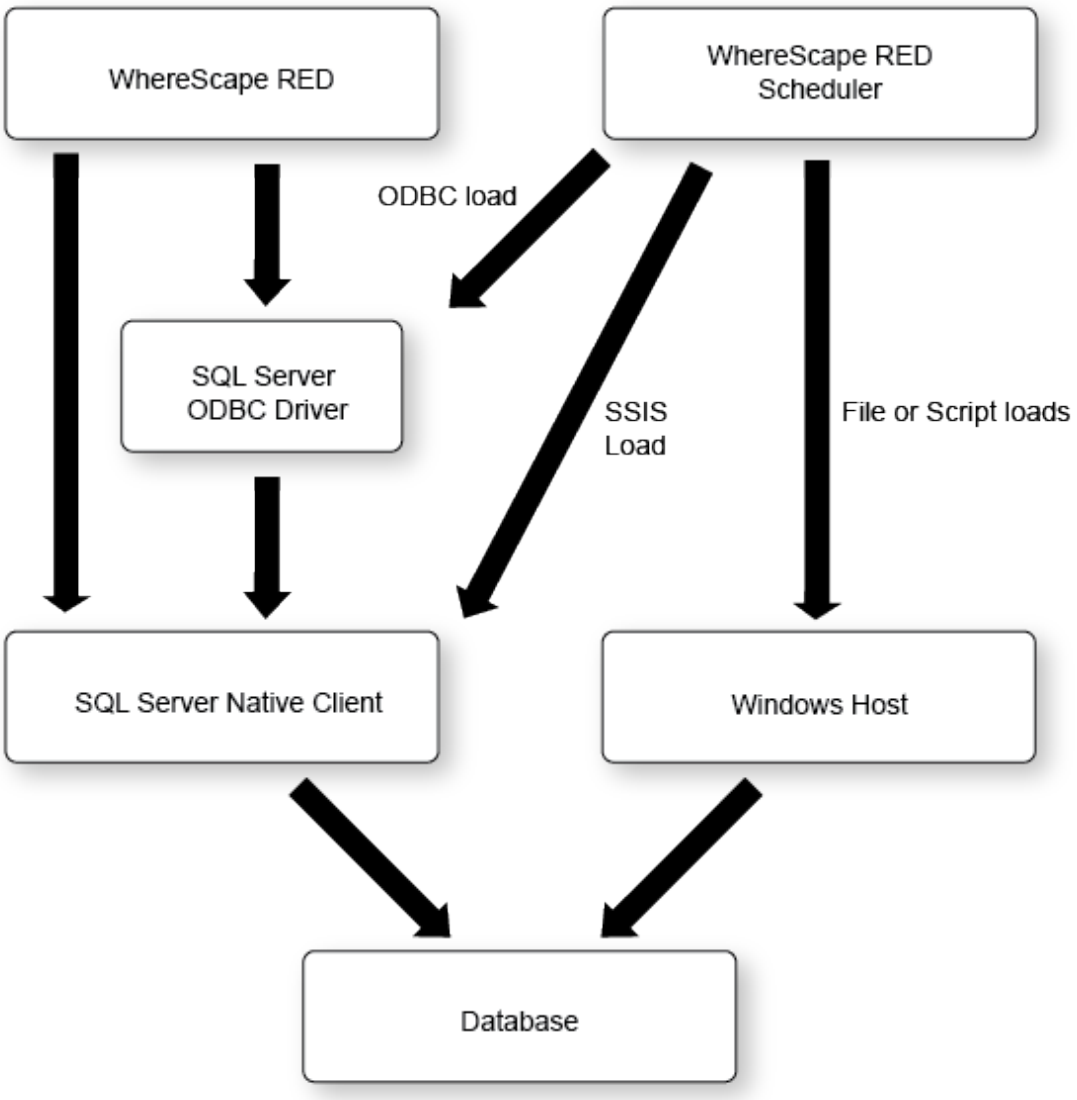
17.1 DIAGRAM OVERVIEW OF RED AND SCHEDULER DATABASE ACCESS

The following diagrams in this chapter provide an overview of how WhereScape RED and the scheduler access SQL Server, Oracle, Teradata and DB2 databases.

17.1.1 SQL SERVER DIAGRAM OVERVIEW

The following diagram provides an overview of how WhereScape RED and the scheduler access a **SQL Server** database.

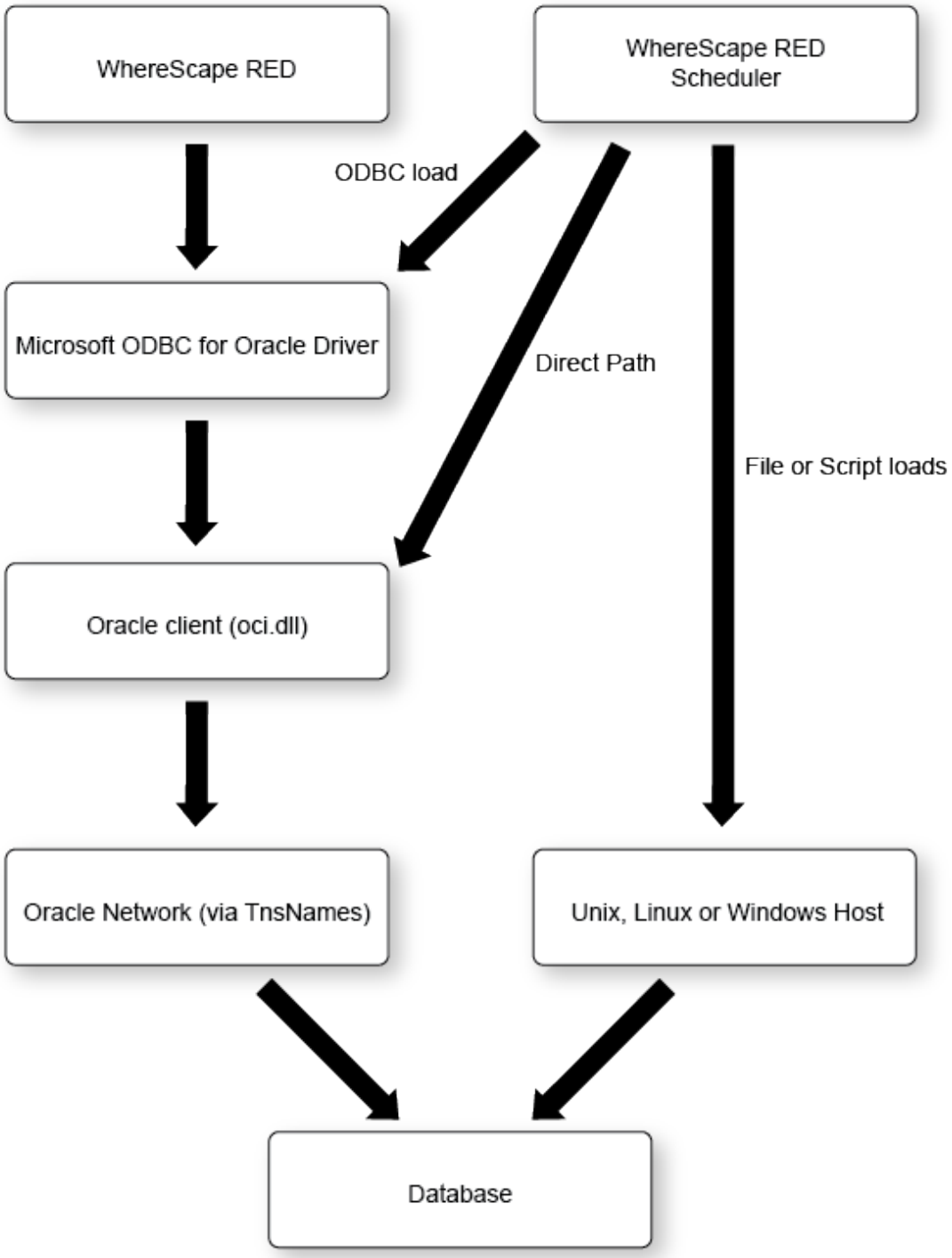
The scheduler makes use of the ODBC layer to perform the routine tasks involved in scheduling and running jobs. WhereScape RED and the scheduler can also use SSIS to load data into SQL Server.
For file or script based loads, the scheduler actions the load on the host system using **BULK INSERT**.



17.1.2 ORACLE DIAGRAM OVERVIEW

The following diagram provides an overview of how WhereScape RED and the scheduler access an **Oracle** database.

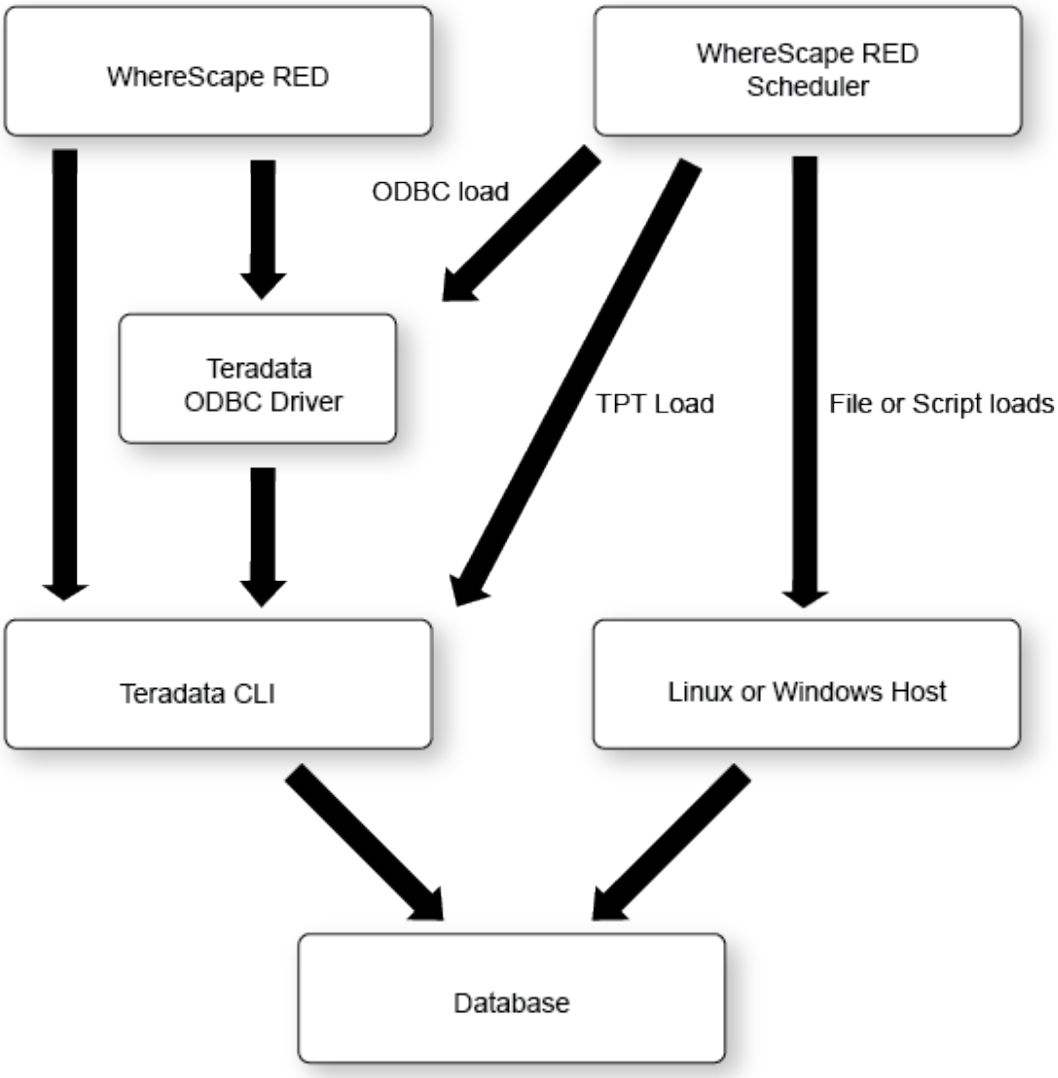
The scheduler makes use of the ODBC layer to perform the routine tasks involved in scheduling and running jobs. When loading data from an ODBC source the scheduler can either use the **ODBC layer** or the **Oracle Direct Path** load facility.
For file or script based loads, the scheduler actions the load on the host system utilizing **Oracle SQL* Loader**.



17.1.3 TERADATA DIAGRAM OVERVIEW

The following diagram provides an overview of how WhereScape RED and the scheduler access a **Teradata** database.

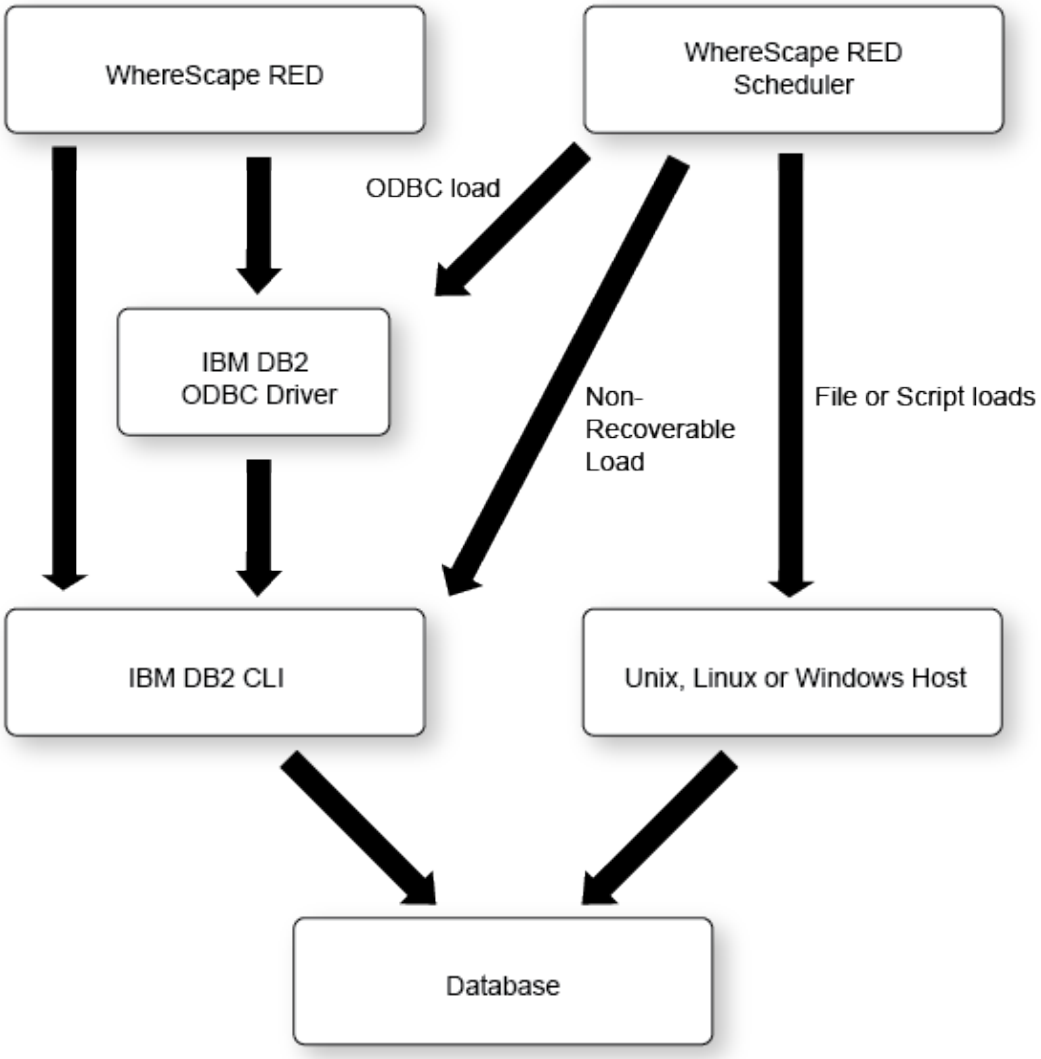
The scheduler makes use of the ODBC layer to perform the routine tasks involved in scheduling and running jobs. WhereScape RED and the scheduler can also use the **TPT ODBC operator** to load data into Teradata. For file or script based loads, the scheduler actions the load on the host system using **fastload, multiload and TPT** (load and update operators).



17.1.4 DB2 DIAGRAM OVERVIEW

The following diagram provides an overview of how WhereScape RED and the scheduler access a **DB2** database.

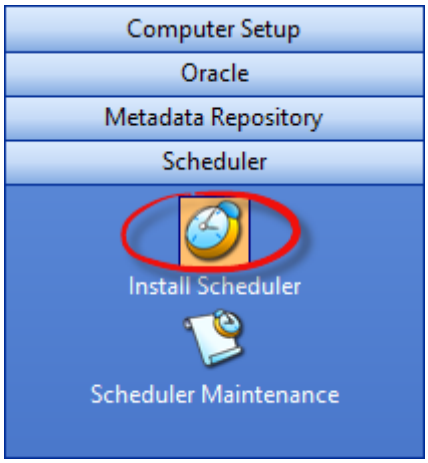
The scheduler makes use of the ODBC layer to perform the routine tasks involved in scheduling and running jobs. WhereScape RED and the scheduler can also use **CLI non-recoverable loads** to load data into DB2. For file or script based loads, the scheduler actions the load on the host system utilizing the **DB2 Load statement**.



17.2 INSTALLING A WINDOWS SCHEDULER

1 In WhereScape's Setup Administrator, click on the **Scheduler** tab in the left pane.

- Then click on the **Install Scheduler** icon.

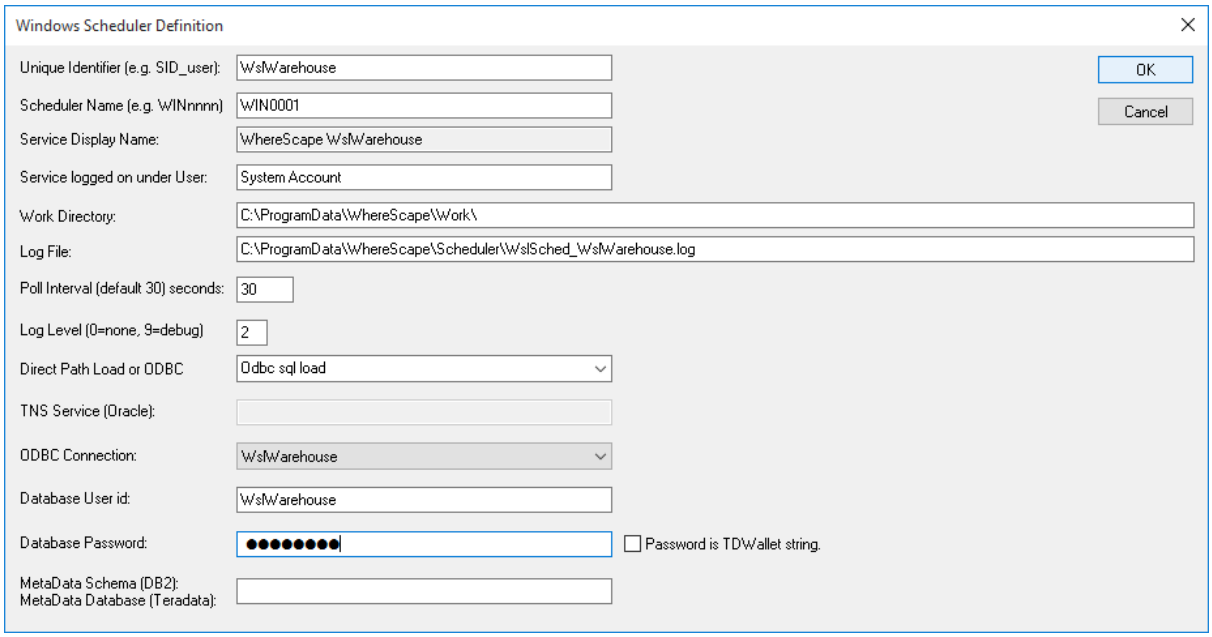


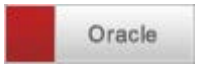
NOTE1: To install or maintain the Scheduler you need to run RED's Setup Administrator as an **Administrator**.

NOTE2: A windows scheduler must be run as either the system service account or as a user with administrator privileges in windows.

2 On selection of this menu option the following dialog box will appear. The dialogs below show SQL Server, Oracle, Teradata and DB2 scheduler definition examples.
For configuration settings specific to each database, please see the field description below.

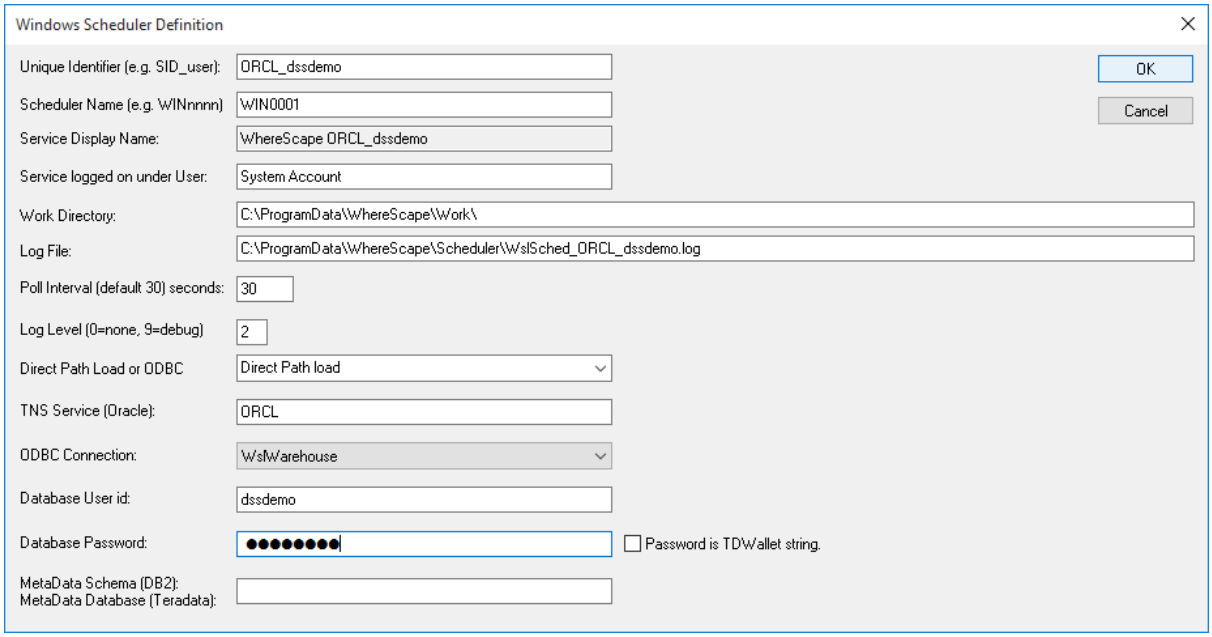
example:



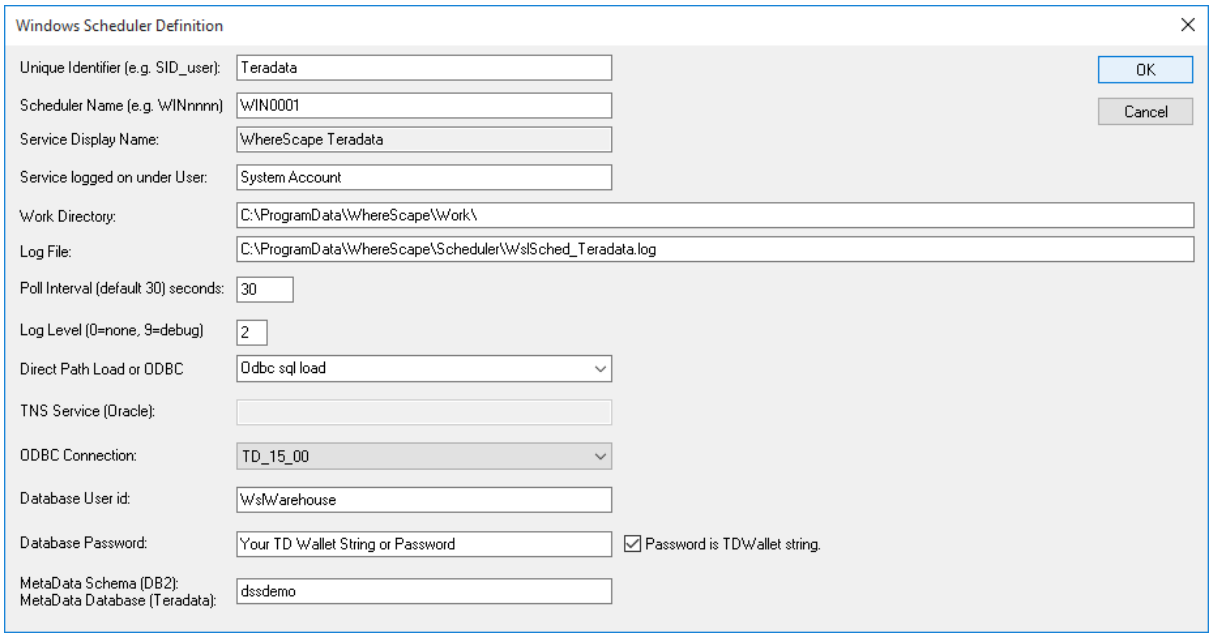


example:

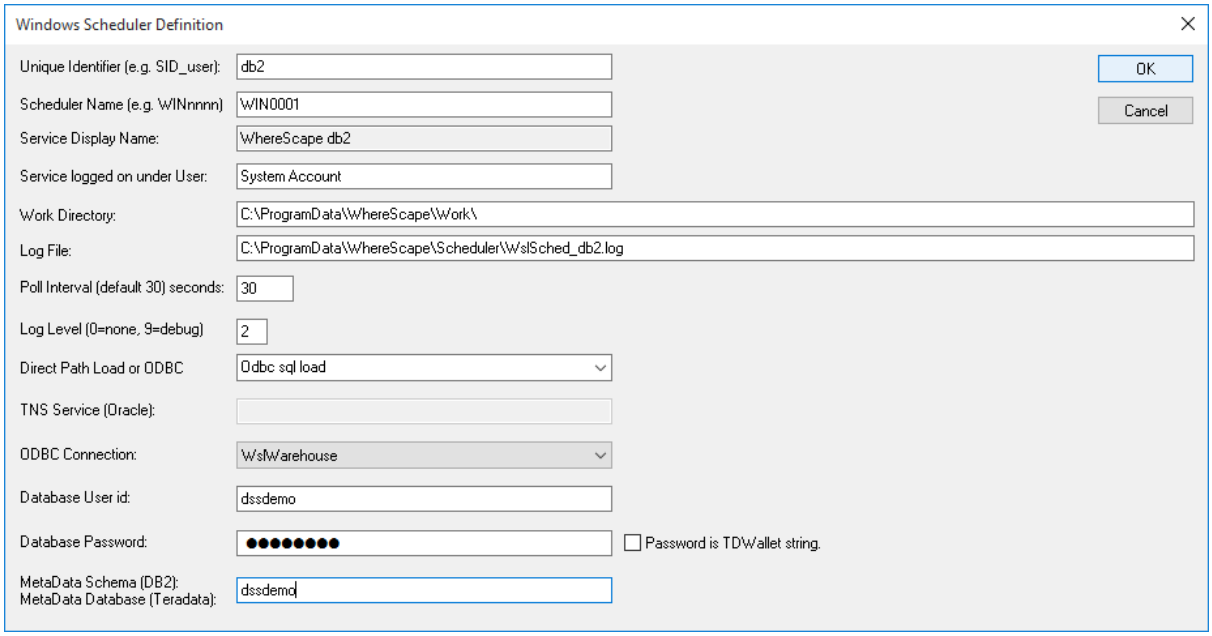
NOTE: The WhereScape windows scheduler for Oracle requires the Oracle client 8.1.7 or later software. The Oracle client software should be a close version match to the Oracle Database version, that is the same major release or one release either side.



Teradata example:



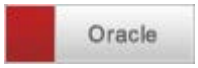
DB2 example:



Unique Identifier

Each scheduler requires a unique name, this unique name is the name by which the service is referenced.

Possibly the database name and user e.g. WslWarehouse_sa



Possibly the SID and user e.g. ORCL_dssdemo

Possibly the environment name and metadata owner e.g. prod_dssdemo

Possibly the instance name and metadata schema e.g. DB2COPY1_dssdemo

Scheduler Name

When scheduling a job with WhereScape RED it is possible to assign the job to a specific scheduler. Each scheduler should therefore have a unique name. The default name is WIN0001. Most users change this to be the scheduler machine's name followed by a number, e.g.: DWHP01, where DWHP is the name of the windows scheduler server.

Service Display Name

This field displays the name that the scheduler will appear under when viewed through the Windows services. It is a combination of the string 'WhereScape' and the unique identifier.

Service Logged on Under User

This is the name of the Windows local user account that the scheduler service will use when logging on. The default setting is **System Account**, also known as the **Local System** service account. To set the scheduler to use a Windows domain user account with a password, use the Service Account option from the right-click menu. If a domain user account is specified then the contents of this field (on the **Windows Scheduler Definition** dialog) are ignored.

NOTE: A domain user account will require the **log on as a service** privilege in order for it to work. This is assigned automatically when setting the log on account using the Services console in Windows.

Work Directory

The directory used to store some temporary files created by the scheduler.

WhereScape RED TIP1: Two schedulers should not use the same work directory.

WhereScape REDTIP2: Setting Log Level 9 will create an additional detailed log file for each thread of each job that is run.

Log File

The full path for this scheduler to write a log file. The log file contains information on the scheduler service, it does not contain information about individual job tasks run by the scheduler. This file may become large if log level 9 is set.

Poll Interval

This defines the frequency of the scheduler polling the database, looking for work. The default is 30 seconds. If set to a very low interval such as 1 then the impact on the database may be noticeable.

Log Level

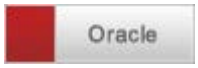
This defines the level of detail written to the log file by the scheduler service. This should be left at the default level unless requested by WhereScape Support.

The following logging levels are available:

- 0 = log no information
- 1 = log fatal errors only
- 2 = log major events (default)
- 3 = log major events and write ODBC Load statistics to the audit log in the database
- 9 = full debug information

Direct Path load or Odbc load

This should always be **ODBC sql load** for SQL Server, Teradata and DB2 schedulers.



When using an Oracle repository this option determines the method used by the scheduler to insert data when using the **ODBC Load** load type.
Select one of the two available ODBC load methods from the drop-down list:

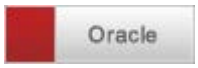
Odbc sql load: When this option is selected the scheduler will always load data using the standard ODBC driver method.
Direct Path load: When this option is selected the scheduler will attempt to load data using the Oracle **Direct Path method**, via the OCI library. If it is unable to use the Direct Path method, the scheduler will revert to using the standard ODBC driver method.

Direct Path ODBC loads are considerably faster and so this option should be set to **Direct Path load** in most situations.

Note: Once a scheduler service has been created this option cannot be changed. To change the scheduler from **Odbc sql load** to **Direct Path load** or vice versa, create a new scheduler service and remove the old one.

TNS Service

This is not required for SQL Server, Teradata or DB2 schedulers.



If you select the **Direct Path load** option from the Direct Path load or ODBC drop-down-list, enter the database server as defined in the tnsnames.ora file on this field. Normally this will be the same name as entered for the 'server' in an ODBC source definition.

ODBC Connection

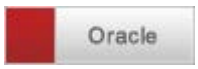
The ODBC connection field requires the ODBC source name that will provide a connection to the data warehouse system. The scheduler uses ODBC to connect to the data warehouse.

Database User Id

For Windows Authentication, leave this field empty. For SQL Server Authentication, enter a database username.

Database Password

For Windows Authentication, leave this field empty. For SQL Server Authentication, enter the password for the database username entered in the **Database User Id** field.



The password for the User the Scheduler will use when connecting to the data warehouse database.

The password or Teradata Wallet String for the User the Scheduler will use when connecting to the data warehouse Teradata database.

Metadata Schema (DB2) / Metadata Database (Teradata)

This is not set for SQL Server/Oracle schedulers.

The Database Name or User Name where the metadata repository is stored. This must be entered for Teradata.

The Schema in DB2 where the metadata repository is stored. This must be entered for DB2.

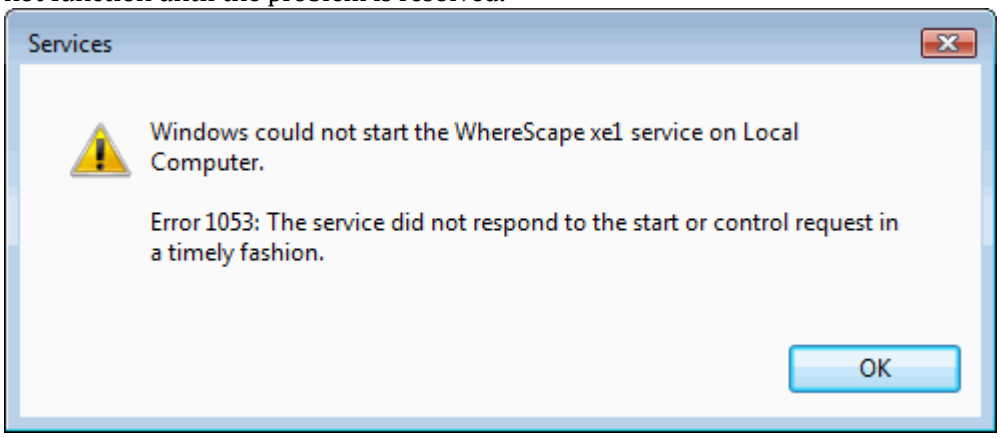
DB2 Grants

DB2 DB2 only: From DB2 9.7, additional grants are required to run the WhereScape RED Windows Scheduler as the system service account in Windows. See ***Creating a Metadata Repository for IBM DB2*** (see "***10.5 Creating a Metadata Repository for DB2***" on page 81) for more details.

NOTE: A windows scheduler must be run as either the system service account or as a user with administrator privileges in windows.

Oracle Error Messages:

The following error message may appear as the scheduler starts. In such an event the scheduler will not function until the problem is resolved.



This error may be the result of an old version of the Oracle Call Interface (OCI) dynamic link library (dll) being in the path. The WhereScape scheduler requires Oracle client 8.1.7 or above. This situation can occur when an Oracle product such as Discoverer is installed. Discoverer may install an older version of the oci.dll file. If it does, its location will be put in the Windows path in front of the 8.1.7+ client version.

A work-around is to copy an 8.1.7 or later version of the oci.dll file into the WhereScape program directory. To see if an oci.dll is valid, right-click on the file and select properties and then version. A valid oci.dll will have version 8.1.7 or later.

17.3 INSTALLING A UNIX/LINUX SCHEDULER

The Unix scheduler must be manually installed and maintained.
The scheduler consists of a series of shell scripts that are controlled by the cron process. The bulk of the work undertaken by the WhereScape scheduler takes place in the WhereScape procedures within the database. To obviate the need to provide a port to each Unix platform this series of shell scripts are used. They should run with no modification on all Unix platforms and have been tested under Unix offerings from Sun, HP, IBM and Linux.
The Unix scheduler can process every type of load except for ODBC loads, Native ODBC loads and XML loads. It cannot process OLAP Cubes.

WARNING: For UNIX/Linux scheduler processing, the **Encrypt User** and **Password** options in RED's Repository Privacy Settings cannot be used. Encrypt options are only supported when using a Windows scheduler.

Installation

The installation of the Unix scheduler needs to be undertaken by someone familiar with the Unix environment and the running of database processes from Unix. The tasks that need to be undertaken are:

1. Unix User and Shell

Acquire a Unix user name that has access to cron and the database data warehouse environment. A reasonable quantity of disk space is also required if the automated backups of the metadata repository are used. The user should log on to Unix without passing through a menu system if possible. Log on to the user.

This user will need to have a .profile file in "/home/<user>/.profile" otherwise ws_sched_check_600.sh will not work. If this file doesn't exist it will need to be created.

The WhereScape scheduler consists of a number of shell scripts. By default some of these shell scripts will run in the Bourne shell and some will run in the Korn shell. If Linux is being used then the Bash shell is used exclusively.

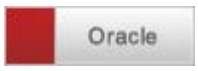
Note: During setup it is recommended that the Korn shell be used as the default shell for the user installing the scheduler (or Bash if running Linux).

---

2. Create directories

Create the following directories (if not already present) to be used by the WhereScape scheduler.
If the directory names are not appropriate and others must be used then it will be necessary to alter the WhereScape supplied scripts.

- wsl (top level directory for WhereScape directories)
- wsl/bin (used to store the WhereScape scripts)
- wsl/sched (used for the scheduler job and log files)
- wsl/sched/job (used for the scheduler job files)
- wsl/sched/joblog (used for the scheduler job logs)
- wsl/sched/log (used for the scheduler logs)
- wsl/export (used for the automated exports of the metadata)
- wsl/expback (used to hold compressed copies of the metadata exports)
- wsl/log (used for export and archive logs)

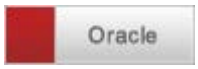


Oracle only directories

- wsl/mon (used for the monitoring process)
- wsl/mon/db (used for database monitoring scripts and control files)
- wsl/mon/job (used for job monitoring scripts)
- wsl/mon/log (used for monitoring log files)

3. Copy supplied Unix files

FTP the scheduler files shipped with WhereScape RED to the wsl/bin directory on the Unix system (use ASCII mode). All files should be copied over.
WhereScape RED ships with several different versions of the unix files for the scheduler. The appropriate version of the files should be copied to the server. The following lists the files shipped:



- ...\WhereScape\Oracle\Unix\Version_nnn\...
- ...\WhereScape\Oracle\Linux\Version_nnn\...

...\WhereScape\Teradata\Unix\Version_nnn\...

- ...\WhereScape\Teradata\Linux\Version_nnn\...

- ...\WhereScape\DB2\Unix\Version_nnn\...
- ...\WhereScape\DB2\Linux\Version_nnn\...

NOTE: There may be several different versions of the scheduler files for a given database and platform (Unix or Linux). These are identified by version numbers **nnn**.

For example, there may be three different folders in:

...\WhereScape\Oracle\Linux\: Version_010, Version_410 and Version_560.

...\WhereScape\Teradata\Linux\: Version_560 and Version_600

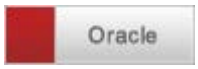
...\WhereScape\DB2\Linux\: Version_010, Version_410 and Version_560.

The highest version number script less than or equal to the version of RED in use should always be used.
In the table that follows, the **nnn** in file names refers to the version number of the script. Some scripts will have **010**, some will have **411,** others **560** or **680**, etc.

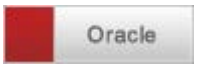
A definition of the files follows:

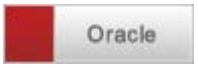
File	Purpose
oraenv (for Oracle) **tdenv (for Teradata)** **dbenv (for DB2)**	Contains the template of a script for setting environmental variables. This needs to reside in the home directory of the Unix user and must be tailored for the database user and environment. It may be renamed to reflect the actual environment. • e.g. oraenv_SID_user for Oracle • e.g. tdenv_TDPID_user for Teradata • e.g. dbenv_SID_user
crontab	Contains the template of the required cron commands. This file needs to be modified to include the HOME directory of the Unix user, and the name of the environment file. It is then used to update the crontab tables.
ws_start_nnn.sh	Script to start the scheduler. This script is normally called by the ws_sched_check_nnn.sh script and is passed the database environment file name as a parameter.
ws_sched_check_nnn.sh	Script to check that the scheduler is running. This script is normally executed by cron every 20 minutes. If the scheduler is found to be absent it attempts to start a new iteration. By default the scheduler will terminate if its database is shut down. This script will therefore start the scheduler after a system start-up or a database start-up.
ws_sched_nnn.sh	The actual scheduler script. This script looks for new scheduler jobs every x seconds. The default is every 30 seconds. This script must be modified to change the default behavior. It calls the ws_job_wait_010.sh script to perform the actual checking and initiating of a job. It terminates when ws_job_wait_010.sh returns an error, and relies upon cron for a restart.

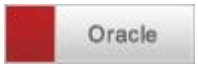
ws_sched_status_nnn.sh	This script is called by ws_sched_nnn.sh to update the scheduler status in the scheduler metadata. It's a wrapper of the metadata database procedure ws_sched_status (i.e. it calls the database procedure ws_sched_status and returns it's results to the calling script).
ws_job_wait_nnn.sh	This script performs the bulk of the work. It is called by ws_sched_nnn.sh on a regular basis. It checks for any job waiting to run. If it locates a job that is ready to run it will create and start a script in the $HOME/wsl/sched/job directory for each thread of that job. These job threads in turn perform the actual processing and log their results to $HOME/wsl/sched/joblog. Under normal operation it is not necessary to check or inspect these files.
ws_job_check_nnn.sh	This script is called to check the status of running jobs. It is called by ws_sched_nnn.sh on a regular basis (the interval is defined in ws_sched_nnn.sh). It checks that any job running in the scheduler is actually running in the Unix environment. If a job is not found under Unix then it is aborted in the scheduler. This scenario can occur as the result of a database or machine crash. If a job abort is required the results are logged to $HOME/wsl/sched/log/job_check_'env file name'.log. Under normal operation it is not necessary to check or inspect this file.
cleanup_nnn.sh	This script is normally executed by cron and cleans up files created by the WhereScape scheduler. It deletes old versions of the jobs, job logs, and backups. It will also delete any temporary scripts created in the running of host scripts or file loads from within the scheduler. The location of these temporary scripts is defined within the WhereScape RED Unix Connection object. The default value in the cleanup script is /tmp and this must be altered if a different temporary directory is used for a Connection.



Oracle/DB2 only files

meta_backup_nnn.sh	This script is normally called by the cron process once or maybe more times a day to perform an automated export backup of the metadata tables. It creates a number of command files and a database export in the $HOME/wsl/export directory named with the date/time of the export.  It is recommended that users copy the new meta_backup_680.sh file to use Datapump's expdb instead the deprecated exp tool. This version uses the data pump export executable expdp. It assumes that the scheduler and the Oracle database reside on the same server.

meta_archive_nnn.sh	This script is normally called by cron once a day to compress and tar the files in the $HOME/wsl/export directory and relocate them to the $HOME/wsl/expback directory. This action is performed purely to save on disk space usage.
meta_restore_nnn.sh	This script can be executed to restore from a meta repository backup. It will overwrite any existing metadata. It can be used to restore to a schema/database/user other than the one from which the backup was taken. It does not however restore the WhereScape procedures. If a full recovery or a new user create is required then the WhereScape metadata install would normally be performed before actioning this restore. If the restore is from an export that has been moved to the expback directory you will need to uncompress the export and move it and associated files back to the export directory.  It is recommended that users copy the new meta_restore_680.sh file to use Datapump's impd instead the deprecated imp tool. This version uses the data pump import executable impdp. It assumes that the scheduler and the Oracle database reside on the same server.

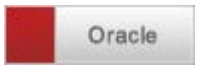
 **Oracle only files**

ws_mon_nnn.sh	The main monitoring script. This script in turn calls the database and job monitoring scripts to perform the monitoring. By default the monitor process checks the jobs every 15 minutes and the database every 60 minutes. This script can be edited to change the frequency of the checks if required. Also a log level of 9 can be set to produce debug logging.
ws_mon_db_nnn.sh	This script checks the database status and if necessary calls the notify script to notify of a database down. Also checks to see if the criteria for database monitoring has changed and if changed calls the refresh script.
ws_mon_notify_nnn.sh	This script checks that notifications are valid for the day/time and if valid sends a notification.
ws_mon_refresh_nnn.sh	This script refreshes the scripts and command files stored in the mon/db directory. These scripts and command files are used to ascertain the action should the database be unavailable.
ws_mon_jobs_nnn.sh	This script performs the checking of jobs for which monitoring is defined. If a job has a notification required then this script will issue the notification.
ws_mon_start_nnn.sh	This script starts the monitor process
ws_mon_check_nnn.sh	This script checks that the monitor process is running. If not running the script will start the monitor process. This script is normally called via cron every 30 minutes.

4. Set permissions

Change the permissions on the copied scripts so that they are executable. (e.g. chmod 750 $HOME/wsl/bin/*.sh)

5. Create an environment file (see below for relevant Oracle, Teradata or DB2 environment file instructions)



Using the **environment file (oraenv)** as a template and adhering to the variable names within, create an environment file for the database environment and user under which the scheduler is to run.
This file should be located in the $HOME directory. It may be called anything but a meaningful name may be oraenv_SID_user for a given Oracle scheduler.
Check the users .profile and database environment file to see the normal settings. For oracle, check to see if the TNS_ADMIN variable is in use and if so, include it in the environment file.

Make the following replacements in the environment file:

- Replace all occurrences of *_HOME_* with the full pathname of your home directory
- Replace *_USER_* with the data warehouse database user name
- Replace *_PASSWORD_* with the data warehouse database user password.
- Replace all occurrences of *_SID_* with the sid of the data warehouse database
- Replace all occurrences of *_ORAHOME_* with the full pathname of the Oracle home directory

Using the **environment file (tdenv)** as a template and adhering to the variable names within, create an environment file for the database environment and user under which the scheduler is to run.
The environment file must be copied to the $HOME directory of the user selected in Step (1). It may be called anything but a meaningful name may be tdenv_TDPID_user for a given Teradata scheduler.
Check the users .profile and database environment file to see the normal settings.

Make the following replacements in the environment file:

- Replace all occurrences of *_HOME_* with the full pathname of your home directory
- Replace all occurrences of *_TDPID_* with the host name of the data warehouse database server, used by the scheduler as the database server name for Teradata load and unload utilities
- Replace all occurrences of *_BTEQDB_* with the host name or ip address of the data warehouse database server, used by the scheduler as the database server name/address for reading and writing WhereScape RED Metadata in Teradata (may be set to the same value as *_TDPID_*)
- Replace *_USER_* with the data warehouse database user name
- Replace *_PASSWORD_* with the data warehouse database user password
- If using a Teradata Wallet String, comment out the first Password line and comment back in the second line containing *_WALLETSTRING_*. Replace all occurrences of *_WALLETSTRING_* with the data warehouse user wallet string.
- Replace all occurrences of *_METABASE_* with the user or database where the metadata resides
- Replace all occurrences of *_WORKDIR_* with the name of the directory that will be used as the work directory by default (e.g. /tmp/)

Using the **environment file (dbenv)** as a template and adhering to the variable names within, create an environment file for the database environment and user under which the scheduler is to run.
This file should be located in the $HOME directory. It may be called anything but a meaningful name may be dbenv_SID_user for a given DB2 scheduler.
Check the users .profile and database environment file to see the normal settings.

Make the following replacements in the environment file:

- Replace all occurrences of *_HOME_* with the full pathname of your home directory
- Replace *_USER_* with the data warehouse database user name
- Replace *_PASSWORD_* with the data warehouse database user password.
- Replace all occurrences of *_DBID_* with the database id of the data warehouse database
- Replace all occurrences of *_SCHEMA_* with the schema where the metadata resides

6. Setup crontab

Ascertain if there are any existing crontab entries, and if so save them to a file for re-inclusion later. (e.g. crontab –l crontab –l >/tmp/my_crontab)

Edit the crontab file and perform the following changes. Also check all entries and make sure you are happy with the times and actions:

- Change all occurrences of *_HOME_* with the full pathname of the Unix users home directory.
- Change all occurrences of the environment file name (oraenv, dbenv or tdenv) to the name of the file created in step (4).
- Remove comment markers from the beginning of the second line of code (the line containing this: ws_sched_check_nnn.sh)
- Include any existing crontab entries as recorded above.

7. Initialize crontab entries

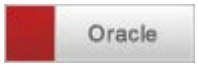
- Load the crontab file into cron (e.g. crontab crontab).
- Perform a crontab list to ensure it all looks OK (e.g. crontab –l)

8. Start Scheduler

Manually start the scheduler by issuing the ws_sched_check_**nnn**.sh script with the environment file name from step (4) as the parameter (e.g. ws_sched_check_010.sh oraenv) / (e.g. ws_sched_check_600.sh tdenv) / .

If the scheduler is not running it will be started. Execute the script a few more times to ensure that only one copy of the scheduler is started. Check that the scheduler is running by executing a 'ps –ef' statement and checking that the ws_sched_nnn.sh process is present.

9. Start the Monitor process



Oracle only. Manually start the monitor by issuing the ws_mon_check_010.sh script with the environment file name from step (4) as the parameter (e.g. ws_mon_check_010.sh oraenv). If the monitor is not running it will be started. Execute the script a few more times to ensure that only one copy of the scheduler is started. Check that the monitor is running by executing a 'ps –ef' statement and checking that the ws_mon_010.sh process is present.

10. Test the Scheduler

Run a job from WhereScape RED and ensure that it works. In the event of the job not starting or going into and remaining in a pending state then the following investigations should be undertaken:

- Ensure all WhereScape procedures are compiled. Use the Validate metadata option in the Setup Administrator to confirm that all procedures are valid.
- Review the job logs in $HOME/wsl/sched/joblog.
- Review the logs in $HOME/wsl/sched/log.
- Isolate the name of the job and locate the relevant files for this job in $HOME/wsl/sched/job and $HOME/wsl/sched/joblog if they exist. Mail these files together with the files in $HOME/wsl/sched/log to support@wherescape.com. It may be necessary to remove password references from the file(s) in $HOME/wsl/sched/job.

NOTE: It is possible to stop a Linux/UNIX Scheduler from within WhereScape RED. See the WhereScape RED User Guide or See the Teradata WhereScape RED User Guide for further details.

17.3.1 UNIX SCHEDULER SETUP FOR HADOOP LOADS USING ORACLE'S BIG DATA CONNECTORS

To set up the UNIX scheduler for Oracle loads from Hadoop using Oracle's Big Data connectors with OSCH and OLH, the following environment variables need to be edited in oraenv:

Example

```
export JAVA_HOME=/usr/lib/jvm/java-openjdk
export HADOOP_HOME=/home/oracle/hadoop-2.4.1

export PATH=$ORACLE_HOME/bin:$HADOOP_HOME/bin:$PATH
export JAVA_LIBRARY_PATH=$HADOOP_HOME/lib/native:$JAVA_LIBRARY_PATH

export HADOOP_COMMON_LIB_NATIVE_DIR=$HADOOP_HOME/lib/native
export HADOOP_OPTS="$HADOOP_OPTS -Djava.library.path=$HADOOP_HOME/lib/native"
```

For either OSCH or OLH, add one of the following to oraenv:

```
#OSCH
export OSCH_HOME=/home/oracle/orahdfs-3.1.0
export PATH=$OSCH_HOME/bin:$PATH
export HADOOP_CLASSPATH=$OSCH_HOME/jlib/*:$HADOOP_CLASSPATH

#OLH
export OLH_HOME=/home/oracle/oraloader-3.2.0-h2
export HADOOP_CLASSPATH=$OLH_HOME/jlib/*:$HADOOP_CLASSPATH
```

NOTE1: Please restart the scheduler after you modified environment variables in oraenv.

NOTE2: The following Oracle directory objects will need to be created with certain privileges:

OSCH

OSCH directory objects
OSCH bin Directory
OSCH External Tables Directory
OSCH Log Directory

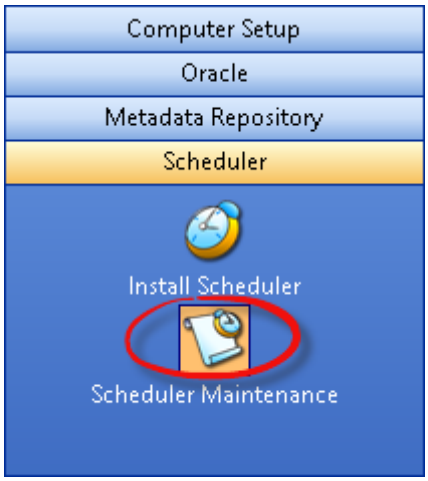
Example

```
CREATE DIRECTORY osch_bin_path AS '/opt/orahdfs-3.1.0/bin';
GRANT EXECUTE ON DIRECTORY osch_bin_path TO c##oschuser;
GRANT READ ON DIRECTORY osch_bin_path TO c##oschuser;
CREATE DIRECTORY exttab_default_directory AS '/home/oracle/exttab';
GRANT READ ON DIRECTORY     exttab_default_directory TO c##oschuser;
GRANT WRITE ON DIRECTORY exttab_default_directory TO c##oschuser;
CREATE DIRECTORY osch_log_path AS '/home/oracle/temp'
GRANT READ ON DIRECTORY osch_log_path TO c##oschuser;
GRANT WRITE ON DIRECTORY osch_log_path TO c##oschuser;
```

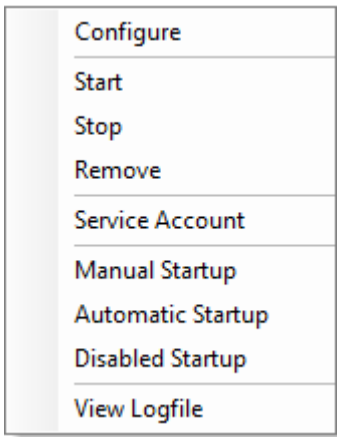
17.4 MAINTAINING THE WINDOWS SCHEDULER

1 To maintain the Windows scheduler, click on the **Scheduler** tab.

- Then click on the **Scheduler Maintenance** icon.



2 This option lists all currently active WhereScape schedulers.
By using the right-click menu when positioned over a scheduler name it is possible to start, stop, remove, change the settings, or view the log of a scheduler.
The menu is as follows:



3 The options are:

Option	Description
Configure	Allows the alteration of the service configuration. You can change the level of logging. The default is 2. Level 0 provides no log information and level 9 provides full debug. See **Scheduler Creation** for more detail.
Start	Starts a stopped scheduler. This action requires service control manager (SCM) privileges on the PC.
Stop	Stop a running scheduler. SCM privilege required.
Remove	Removes and deletes the scheduler. SCM required.
Service Account	By default the scheduler will start in the system account. If you wish to change this you can specify an account and password. However, you may have to remove the service and enter the account information when creating a new scheduler.
Manual Startup	Changes the startup profile (on PC startup) of the scheduler. The scheduler will not be automatically started when the PC starts and must be started manually. SCM required.
Automatic Startup	Sets the scheduler to start automatically when the PC starts. SCM required.
Disabled Startup	Sets the scheduler startup profile to disabled. No startup will occur unless the profile is changed to either Manual or Automatic. SCM required.
View Logfile	Displays the scheduler service log file. The level of logging is defined in the configuration of the scheduler.

NOTE: If an error occurs while a scheduled job is running, you should check the following:

- the audit log of the failed task, for any messages of type E or F.

- the audit log of the failed job, for any messages of type E or F.

- the scheduler log file for any error messages.

- the windows event logs, specifically the **Application** and **System** event logs, for any Error or Warning messages at the time of the job failure.

How to view and manage event logs depends on which version of Windows you are using. If you need further assistance, please contact support at support@wherescape.com.

18. BDA

BDA Overview

WhereScape Big Data Adpater (BDA) is designed as an adapter to RED, focused on executing ELT related processing within the Hadoop/Hive eco-system.
This chapter attempts to guide users through the initial BDA setup, providing an overview of BDA, the prerequisites to operate it, step-by-step instructions to set up BDA. The set up of required connections and BDA operations is described in the WhereScape RED and Teradata RED User Guides.

BDA is a java application and runs as a Tomcat webapp, with REST endpoints. BDA is simple to install, users only need to install RED, copy and extract the **bda.tar.gz** file from the Linux folder in RED's installation directory into the Linux system and execute the script. Before running the script there are also other configuration settings that will need to be completed.

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18.1 PREREQUISITES

To operate BDA, users must have the following prerequisites:

RED Environment

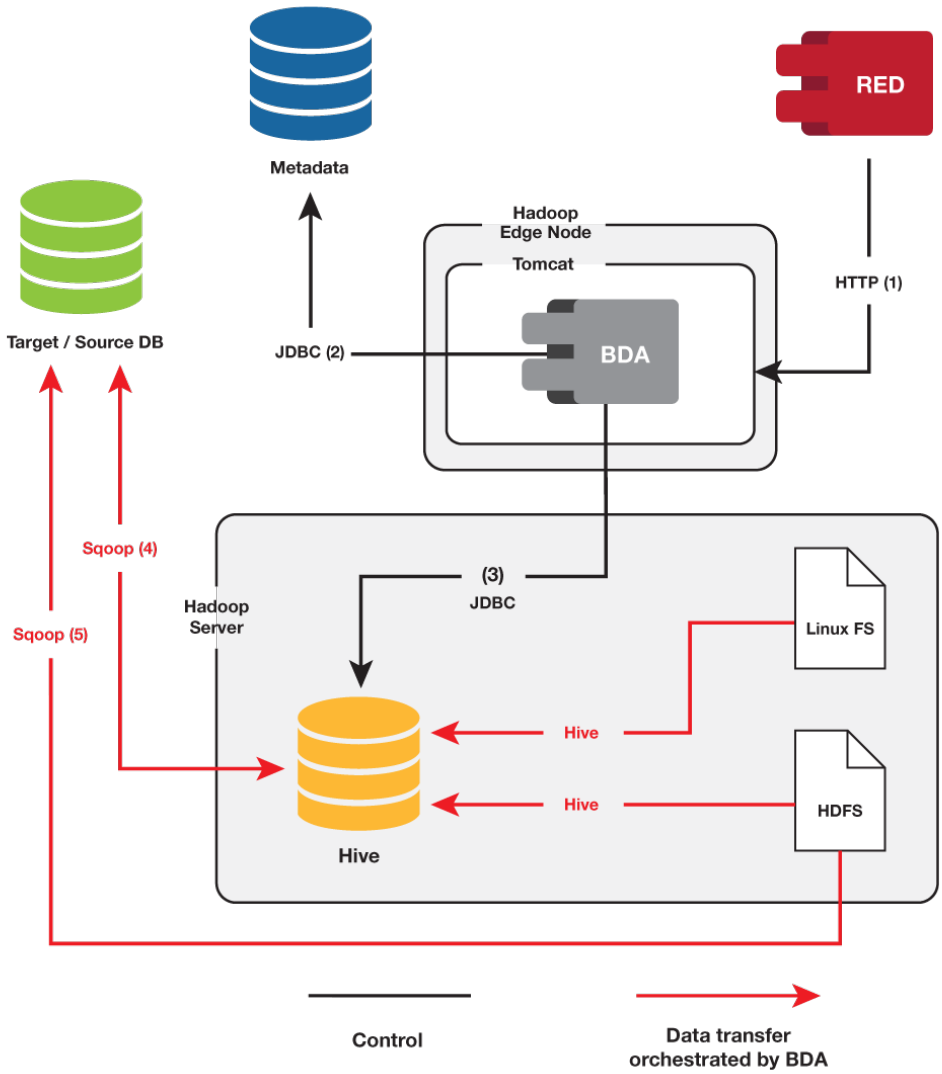
- Matching RED version
- **bda.tar.gz** file
- 32-bit Hive ODBC Driver (this is only required for accessing Hive tables)

BDA Environment

- Database specific JDBC drivers (see Adding JDBC drivers for more details about the specific JDBC drivers required for each database type)
- Hadoop 2.7.1
- Sqoop 1.4.5
- Hive 1.1.0
- OpenSSL available on the Linux scheduler machine

18.2 BDA DIAGRAM OVERVIEW

This Diagram displays the operations performed by BDA and RED to integrate with Hive and Hadoop sources and using Sqoop to load to and from Target Databases.



(1) Configured in RED
Hive Connection object
BDA host and adapter

(2) Configured in bda.xml
jdbc/REDMeta property

(3) Configured in RED
Hive Connection object
JDBC Connection string

(4) Configured in RED
Source DB Connection object
JDBC Connection string

(5) Configured in RED
Target DB Connection Object
JDBC Connection String

18.3 HOW TO SET UP BDA

Step-by-step instructions to set up BDA

Below is a sample step by step instruction on how to set up BDA, please note that you may have or you may chose to have different settings than the ones on the examples below.

1. From your WhereScape RED directory, go to the Linux folder and copy the bda.tar.gz file into your Linux system.
2. In your Linux system, create a folder to install BDA, in this example we are installing it the $HOME/bda folder.
3. Unzip the bda.tar.gz file to $HOME/bda folder.
4. Copy $HOME/bda/conf/bdaenv to $HOME and edit it according to your environment. In the example below, the file is configured for a SQL Server environment.

```
# WS_BDA_HTTP_PORT
#
# The TCP port number on which the BDA server wil listen. This must be
# set to a port that is unused on this host and must match the BDA
# Server configuration in RED.
WS_BDA_HTTP_PORT=8080

# WS_BDA_JOB_WORKDIR
#
# The directory to write temporary scripts and other working files
# needed while executing tasks. If this directory exists, it must be
# writable by the user running the BDA Server; it will be created if
# it doesn't exist. Each running BDA Server environment requires a
# unique work directory; the use of $env_name in the default value for
# this variable ensures this.
WS_BDA_JOB_WORKDIR=$WS_BDA_ROOT_DIR/work/$env_name

# WS_BDA_REPOSITORY_TYPE
#
# The type of RDBMS used to host the metadata repository. Must be one
# of the following:
#
# SQLServer
# Oracle
# Teradata
# DB2

# WS_BDA_REPOSITORY_DRIVER
# WS_BDA_REPOSITORY_URL
# WS_BDA_REPOSITORY_USER
# WS_BDA_REPOSITORY_PWD
#
# These define the JDBC connection parameters used to connect to the
# RED metadata repository.

# Example for SQL Server metadata repository
 WS_BDA_REPOSITORY_TYPE=SQLServer
 WS_BDA_REPOSITORY_DRIVER=com.microsoft.sqlserver.jdbc.SQLServerDriver
 WS_BDA_REPOSITORY_URL="jdbc:sqlserver://192.168.60.101:1433;databaseName=wsldemo"
 WS_BDA_REPOSITORY_USER=demo_user
 WS_BDA_REPOSITORY_PWD=password

# Example for Teradata metadata repository
# WS_BDA_REPOSITORY_TYPE=Teradata
# WS_BDA_REPOSITORY_DRIVER=com.teradata.jdbc.TeraDriver
# WS_BDA_REPOSITORY_URL="jdbc:teradata://10.10.10.10/DATABASE=DW,DBS_PORT=1025"
# WS_BDA_REPOSITORY_USER=
# WS_BDA_REPOSITORY_PWD=

# Example for Oracle metadata repository
# WS_BDA_REPOSITORY_TYPE=Oracle
# WS_BDA_REPOSITORY_DRIVER=oracle.jdbc.driver.OracleDriver
# WS_BDA_REPOSITORY_URL="jdbc:oracle:thin:@10.10.10.10:1521:orcl"
# WS_BDA_REPOSITORY_USER=
# WS_BDA_REPOSITORY_PWD=
```

5 Copy any required JDBC driver JARs into bda/lib.

6 Start BDA by running:
`$HOME/bda/bin/ws_bda.sh start bdaenv`

7 To stop BDA run:
`$HOME/bda/bin/ws_bda.sh stop bdaenv`

8 To change configuration:

Edit `$HOME/bdaenv`
Run `$HOME/bda/bin/ws_bda.sh restart bdaenv`

9 To upgrade BDA

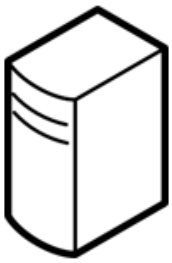
Stop BDA
Copy the new **bda.tar.gz** file to the Linux system and extract it to $HOME/bda folder
Start BDA

Sample BDA Setup

Teradata server: 192.168.60.100
Port:1521
Red Repository: wslrepo
Jdbc url: jdbc:teradata://192.168.60.100/DATABASE=wslrepo,DBS_PORT=1025

SQL server: 192.168.60.101
Port:1433
Red Repository: wsldemo
Jdbc url: jdbc:sqlserver://192.168.60.101:1433;databaseName=wsldemo

Oracle server: 192.168.60.102
Port: 1521
Tnsname: ORCL
Red Repository: wslrepo
Jdbc url: jdbc:oracle:thin:@192.168.60.102:1521:ORCL



Hadoop
Installed at: /opt/Hadoop
Port: 9000

hive
Installed at: /opt/hive
Port: 10000

sqoop
Installed at: /opt/sqoop

Linux server: 192.168.60.201

Sample Setup

18.4 ADDING JDBC DRIVERS

1 Download the required JDBC driver for your specific database type:
   - **ojdbc7.jar** for Oracle databases
   - **sqljdbc4.jar** for SQL Server databases
   - **terajdbc4.jar** and **tdgssconfig.jar** for Teradata databases

2 Add the required JDBC driver jar files to the relevant lib folders such as $HOME/bda/lib or sqoop/lib .

Example:
To load from either SQL, Oracle or Teradata, download the relevant JDBC driver(s) and copy the jar files to the bda/lib directory and Sqoop's lib directory.
On the Hortonworks sandbox and Cloudera quickstart virtual machines the sqoop library directory is /usr/lib/sqoop/lib.

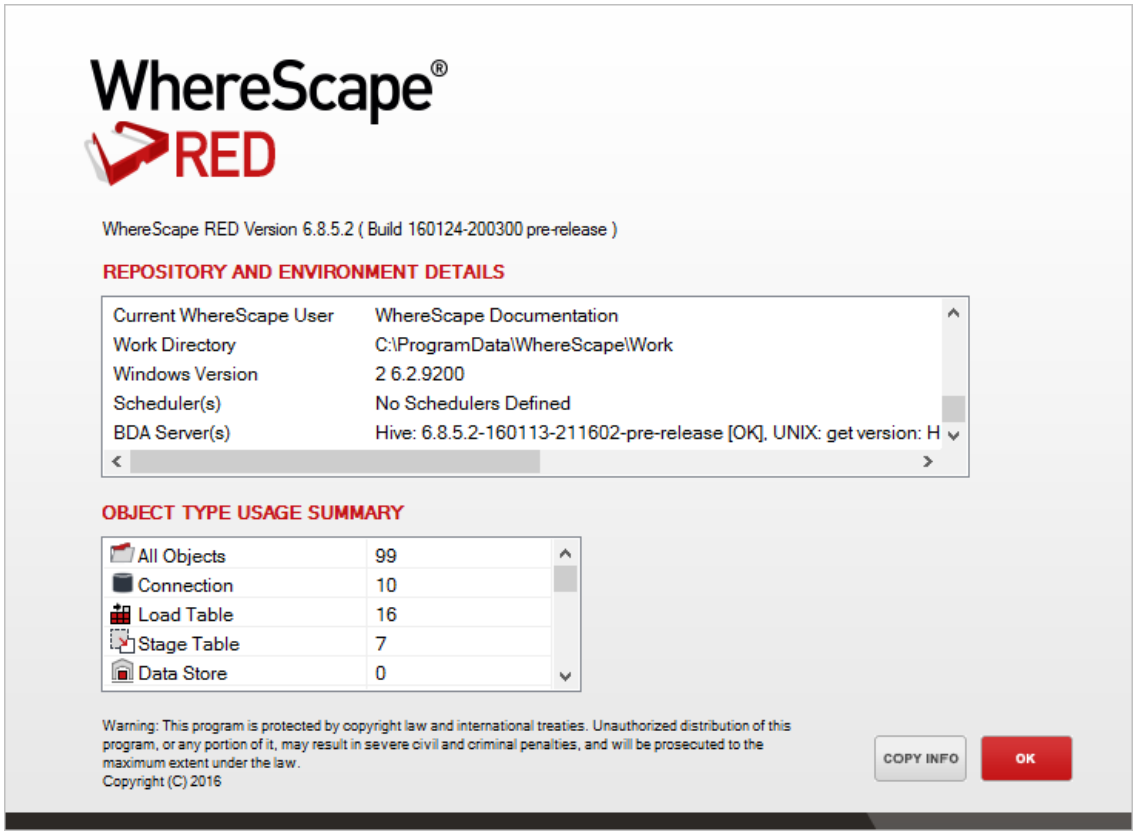
18.5 TESTING THE BDA SETUP

Type the bda URL in your browser, for example:
http://192.168.60.201:8080/bda/rest/v1/admin/version

- The test will confirm that BDA is installed and configured correctly if the message displayed on the browser is your BDA version.

Please note that this doesn't display properly when using Internet Explorer. Microsoft Edge, Chrome or Firefox all display this correctly.

After completing the Hive connection setup described in the Hive connection topics in the RED and Teradata RED User Guides, you can test the BDA connection from RED.
If the BDA server(s) are properly set up in RED, you can see the BDA Server versions configured in Hive connection objects by clicking in **Help->About WhereScape RED**.
If there are any messages displayed in this dialog, please see section **18.6 Troubleshooting**.

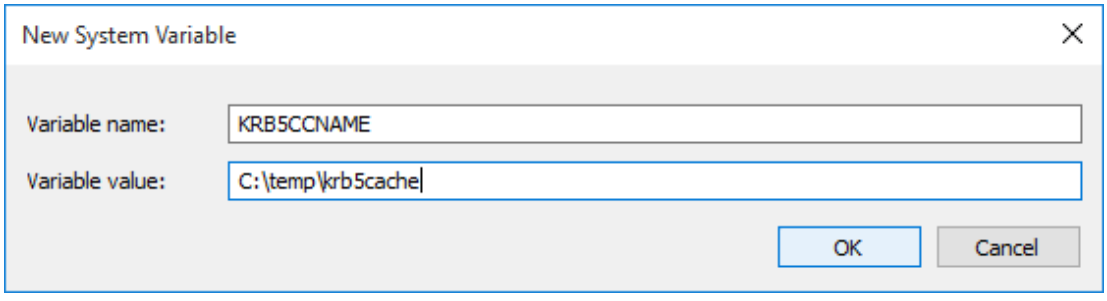


18.6 CONFIGURING KERBEROS FOR A SECURE USE WITH BDA

To configure Kerberos for use with BDA, users will need to take the following configuration steps:

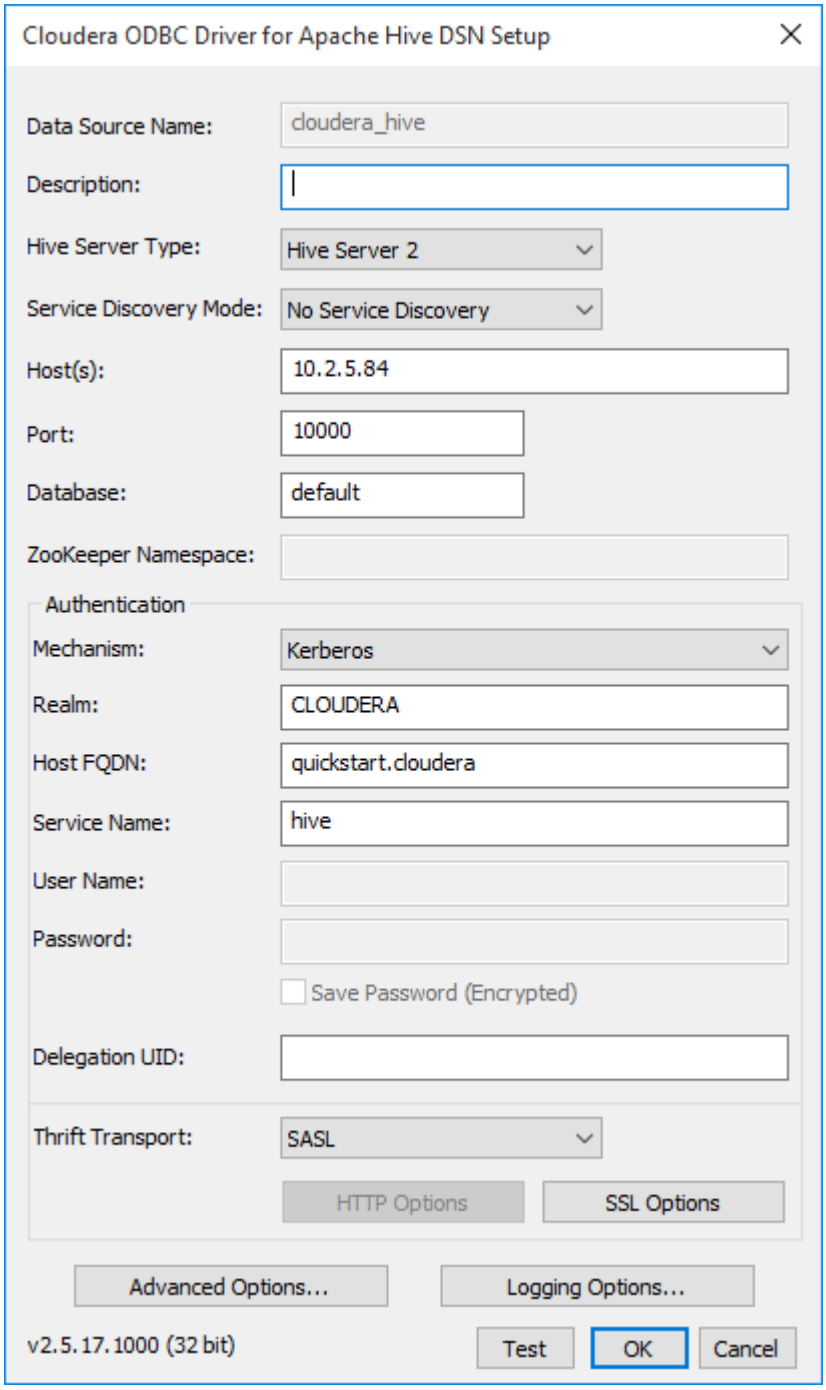
1 Download the Kerberos Windows client (http://web.mit.edu/kerberos/dist/) and configure it using the Kerberos KDC.
If necessary manual, changes for a Kerberos configuration in Windows can be made in the configuration file C:\ProgramData\MIT\Kerberos5\krb5.ini. In some installations, if this file is not found, please add the system variable KRB5_CONFIG=C:\ProgramData\MIT\Kerberos5\krb5.ini.

2 You will need to check your **KRB5CCNAME** environment variable, e.g. C:\temp\krb5cache.



NOTE: krb5cache is a regular file (not a directory) managed by the Kerberos software and should not be created by the user.
If you change this variable you will need to restart your computer to ensure MIT Kerberos for Windows uses this setting.

3 Configure your Hive ODBC connection by downloading a Hive ODBC client, e.g. HortonWorks or Cloudera, and configure it to use Kerberos authentication as shown in the picture below.



4 In RED, update your JDBC connection string for your relevant connections.
The JDBC connection string for WhereScape RED connections to a Hive database needs to be updated to reflect the secured server where the principal in the connection string must be the HiveServer2-Kerberos-Principal:

e.g.
jdbc:hive2://quickstart.cloudera:10000/default;principal=hive/quickstart.cloudera@CLOUDERA;

5 BDA will then need to be changed to connect to a Kerberos secured environment. The configuration parameters are the following options included in the bdaenv file:

```
########################################
# Kerberos Authentication
########################################

# Example configuration for a Kerberos-secured cluster
# WS_BDA_HADOOP_SECURITY_AUTHENTICATION=kerberos
# WS_BDA_HADOOP_SECURITY_PRINCIPAL=hive/quickstart.cloudera@CLOUDERA
# WS_BDA_HADOOP_SECURITY_KEYTAB=/etc/hive/conf/hive.keytab
```

6 Depending on the cluster configuration, there are two options with and without proxy users enabled.
The proxy option is the preferred option as this allows BDA to use any valid Kerberos principal instead of the hive super-user, in general hive/quickstart.cloudera@CLOUDERA. A sample configuration using a user defined principal is:

```
WS_BDA_HADOOP_SECURITY_AUTHENTICATION =kerberos
WS_BDA_HADOOP_SECURITY_PRINCIPAL =bda@CLOUDERA
WS_BDA_HADOOP_SECURITY_KEYTAB =/home/bda/bda.keytab
```

NOTE: For the above configuration you need to have the following configurations enabled in your Hadoop cluster:

hive-site.xml: hive.server2.enable.impersonation - true
core-site.xml: hadoop.proxyuser.hive.hosts - * (or a valid host list)
core-site.xml: hadoop.proxyuser.hive.groups - * (or a valid group list)

Please check these configuration options in the corresponding files or configuration managers, e.g. Cloudera Manager(Cloudera) or Ambari (Hortonworks).

If you need to access a cluster without proxy users enabled you can use following configuration:

```
WS_BDA_HADOOP_SECURITY_AUTHENTICATION =kerberos
WS_BDA_HADOOP_SECURITY_PRINCIPAL =hive/quickstart.cloudera@CLOUDERA
WS_BDA_HADOOP_SECURITY_KEYTAB =/etc/hive/conf/hive.keytab
```

NOTE2: The last option for the keytab file assumes that the file /etc/hive/conf/hive.keytab exists and is readable for the user running the Tomcat service. In a Cloudera cluster using Cloudera Manager, keytab files are generated and stored in several local directories. One way to find the keytab file is to use the find command on the command shell:

```
find / -name hive.keytab -print
```

and copy the corresponding file to the destination folder. Note also that you will need to repeat this step after each password change of the principal "hive" in the Cloudera Manager.

Hadoop on a UNIX shell

For browsing Hadoop HDFS and loading data from Hadoop HDFS, WhereScape RED establishes a connection to the Linux server via a secure shell. Although some ssh-clients allow ticket forwarding for Kerberos this option is not available for PuTTy psexec. The easiest method is to create a keytab file that is readable only for the session user and to add the kinit command to obtain a Kerberos ticket at log-on time.

e.g: add "kinit cloudera@CLOUDERA -k -t ~/cloudera.keytab" to /home/cloudera/.bashrc.

Secured Hadoop and Scheduler

Apart from ODBC loads into Hive tables, all Kerberos authentications are performed on the Hadoop server side and, therefore, are independent of the invocation method, interactive or scheduler.

For ODBC loads, the service user running the scheduler needs to provide a valid ticket for a Kerberos principal. As the ticket has to be renewed automatically, a keytab file for this user needs to be provided on the server running the WhereScape RED scheduler. For instance, the Dos-shell command "kinit" can be run periodically as a Windows scheduled task to renew a ticket without user interaction:

e.g.: kinit -k -t C:\Users\ServiceUser\cloudera.keytab cloudera@CLOUDERA

Note: The **keytab** file should be readable to the service user only.

18.7 TROUBLESHOOTING

BDA

If there are any issues with your setup, you can look into the log files.

- To check if BDA is working, enter the following URL on your browser: **http://192.168.60.201:8080/bda/rest/v1/admin/version** or log in to RED and check the **Help->About WhereScape RED->BDA Server(s).**

For some failed operations, the output in RED contains error messages. If you experience any further issues, please check if each of the components are working by executing the following commands below on the Linux server:

Hadoop

To check if HDFS is running, run the following command line on the Linux server.

```
wsldemo@suse-bda-1:~/bda> hdfs dfs -ls /user
```

Hive

To check if you can connect to Hive, run the following command line on the Linux server. Use the same JDBC connection string that has been defined in your Hive connection.

```
wsldemo@suse-bda-1:~/bda> beeline
Beeline version 1.2.1 by Apache Hive
beeline> !connect jdbc:hive2://localhost:10000
Connecting to jdbc:hive2://localhost:10000
Enter username for jdbc:hive2://localhost:10000: wsldemo
Enter password for jdbc:hive2://localhost:10000: ********
```

Sqoop

Using the following sqoop command line tool you can test if sqoop is working. Use the same JDBC connection string that has been defined in your connection.

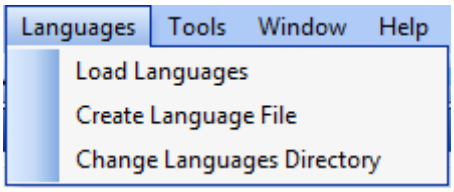
```
wsldemo@suse-bda-1:~/bda> sqoop eval --connect
'jdbc:teradata://192.168.60.100/DATABASE=wslrepo,DBS_PORT=1025' --driver
'com.teradata.jdbc.TeraDriver' --username 'wsldemo' --password 'password'
--query 'SELECT 1'
```

19. LANGUAGES

The Languages component of WhereScape's Setup Administrator allows you to create a Language file or to load a Language File into RED.

1 Click on the **Languages** menu item in the command bar at the top of the screen.

- Click on any of the options under this level to action them. The Languages menu is as follows:



The ***Load Languages*** (see "***19.1 Loading Languages***" on page 158) option will list the Language files that have been created. A file can then be selected and loaded into the target Metadata Repository.
The ***Create Language File*** (see "***19.2 Creating a Language File***" on page 159) option allows you to create a Language file for a particular Metadata Repository. A translator will then need to replace the English definitions in the file with the translations relevant to the chosen language.
The ***Change Languages Directory*** (see "***19.3 Changing the Languages Directory***" on page 160) option allows you to change the language directory.

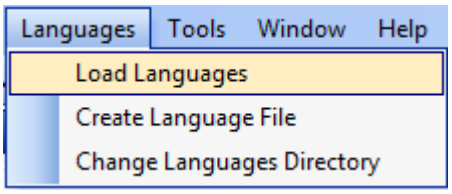
IN THIS CHAPTER

19.1 Loading Languages 158
19.2 Creating a Language File 159
19.3 Changing the Languages Directory 160

19.1 LOADING LANGUAGES

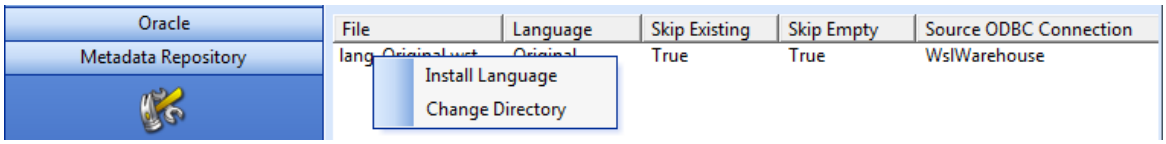
Note: Before you install a language, you will first need to logon to the repository in RED; go to **Tools/Language Options** and add the language.

1 Click on the **Languages** menu item in the command bar at the top of the screen, then choose **Load Languages**.



1 The **Load Languages** menu option will list the Language Files available.

- Right-click on a particular file and select **Install Language**.



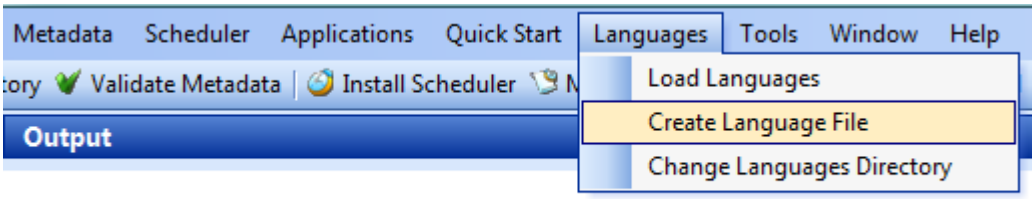
You will then be prompted to logon to the required metadata repository and to select the Language to be updated in RED.

The results will be shown in the middle pane.

19.2 CREATING A LANGUAGE FILE

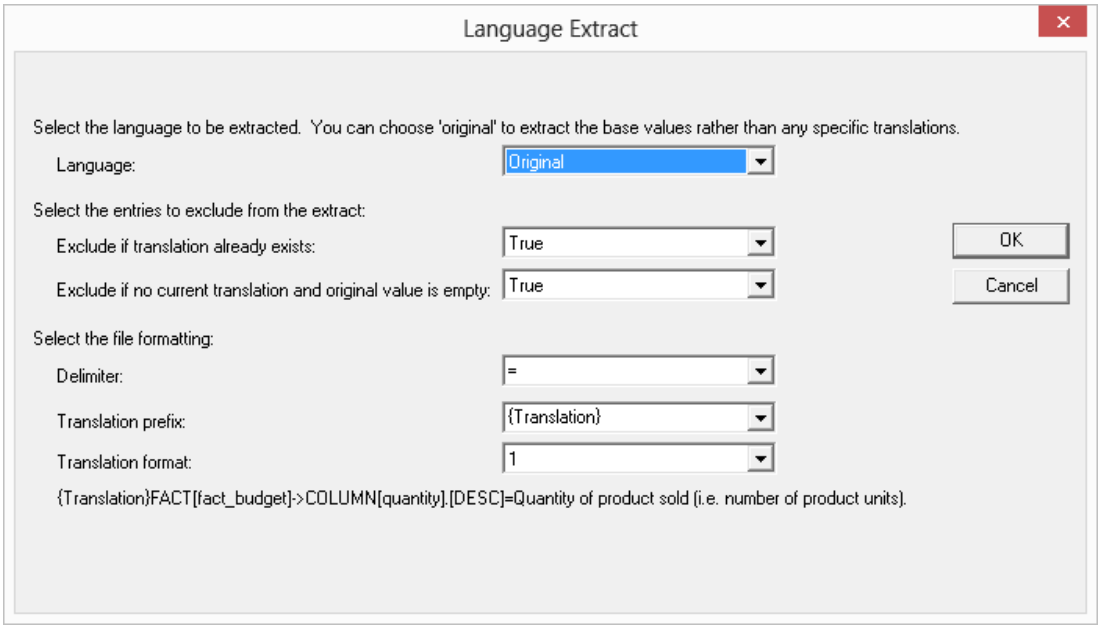
1 Click on the **Languages** menu item in the command bar at the top of the screen.

- Select the **Create Language File** option.



2 You will then be prompted to logon to the required metadata repository. Language Files are applied to a specific metadata repository.
Once logged on, you will be prompted for:

- The **Language** - select from the drop-down list. Select a Language or choose **Original** to create a Language file containing the original values.
- The **entries to exclude** from the extract.
- The file delimiter, translation prefix and translation format.
- The **file delimiter** provides an easy means of breaking up the file after extract.
- The **translation prefix** must be something that will NEVER appear in the data itself. This is used to identify the start/end of any given field translation.

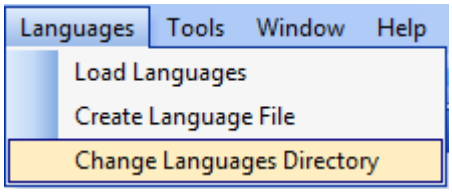


A Language extraction file will then be created and saved into **C:\ProgramData\RED\Language**

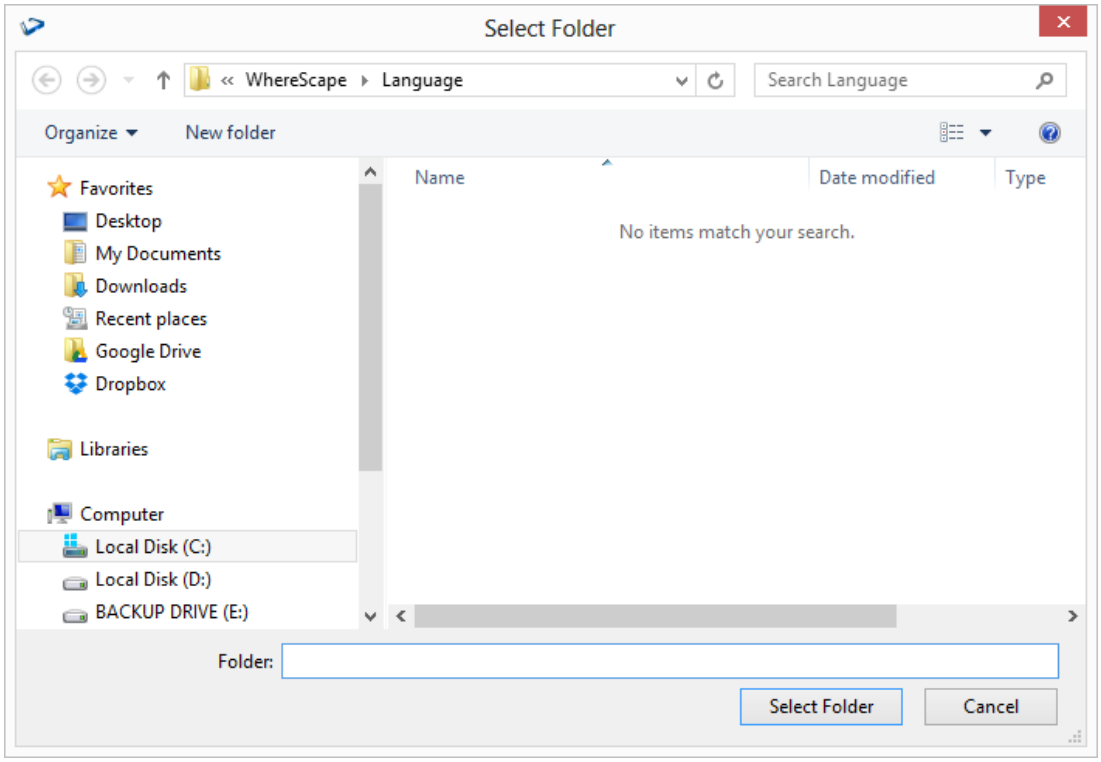
A translator will need to replace the English definitions in the file with the translations relevant to the chosen language.

19.3 CHANGING THE LANGUAGES DIRECTORY

1 Click on the **Languages** menu item in the command bar at the top of the screen and select **Change Languages Directory**.



2 A dialog will allow you to browse and select a new languages directory.



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20. TOOLS

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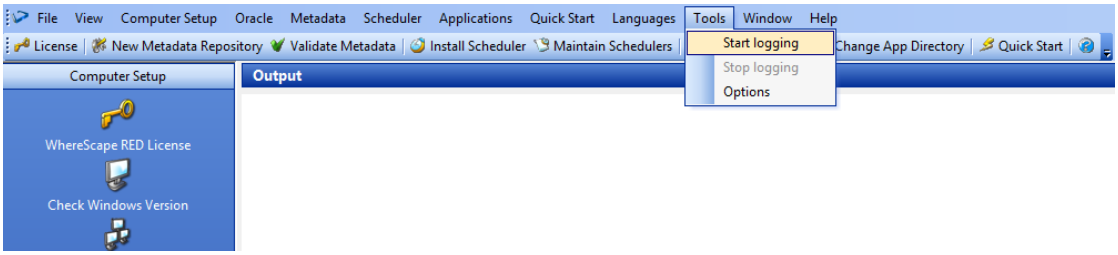
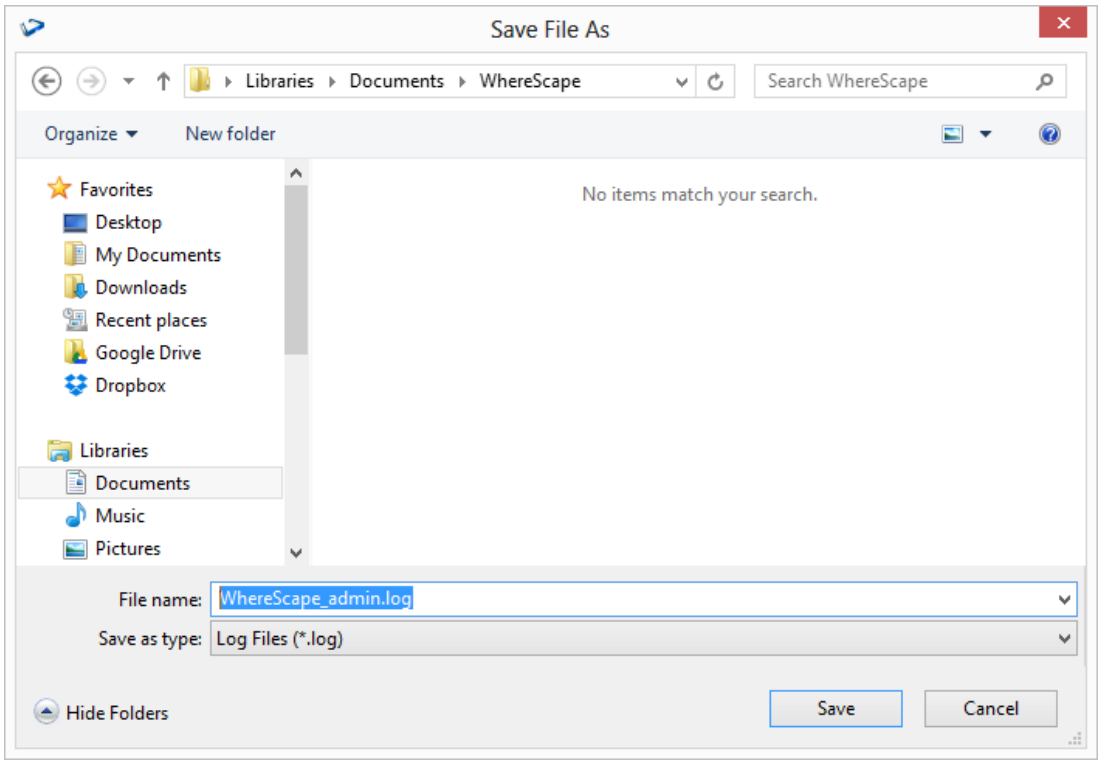
20.1 START/STOP LOGGING

In WhereScape Administrator, users have the option of logging all output to a file by selecting the **Start logging** function in the **Tools** menu.

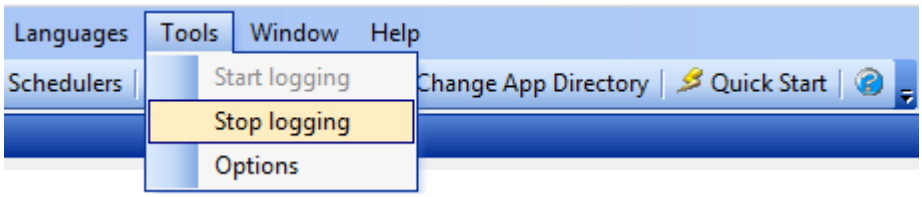
1 To starting logging output from WhereScape Administrator, click on **Tools>Start logging** in the top bar.



2 When this option is selected, users are prompted to create a file in a specified location. Once this is done, all the output from WhereScape Administrator starts getting logged to that file.



3 To cancel logging, click **Tools>Stop logging**.



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