

# Altova DiffDog 2023 Enterprise Edition



## User & Reference Manual

# **Altova DiffDog 2023 Enterprise Edition User & Reference Manual**

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# 1 Introduction

**Altova website:**  [Diff tool](#)

**Altova DiffDog 2023 Enterprise Edition** is a powerful differencing application that intelligently finds differences between pairs of directories and between pairs of files. Three-way comparisons of files are also supported. In addition, you can compare Microsoft Word documents, the structure of XML schemas or database schemas, as well as data from databases or CSV files. Comparisons between CSV files and databases, or between databases of different kinds, are also possible. Data can be compared on different bases and according to a variety of options that you can change quickly in the graphical user interface. In addition, DiffDog allows you to merge file differences, synchronize the content of two directories, generate XSLT stylesheets and MapForce® mappings for XML Schemas, merge the structure or data of database tables, and copy or delete changed files with a mouse click.



DiffDog is a 32/64-bit Windows application that runs on Windows 7 SP1 with Platform Update, Windows 8, Windows 10, Windows 11, and on Windows Server 2008 R2 SP1 with Platform Update or newer, see also [Support Notes](#)<sup>12</sup>.

*Last updated: 7 October 2022*

## 1.1 Support Notes

DiffDog runs on the following operating systems:

- Windows 7 SP1 with Platform Update, Windows 8, Windows 10, Windows 11
- Windows Server 2008 R2 SP1 with Platform Update or newer

Both the 32-bit and 64-bit platforms are supported.

DiffDog integrates with Microsoft Office products as follows:

- It can be used to compare Access databases. For supported versions, see [Supported Databases](#)<sup>13</sup>.
- It can be used to compare Word 2003 or later documents, see [Comparing Microsoft Word Documents](#)<sup>90</sup>.

## 1.2 Supported Databases

The table below lists all the supported databases. While Altova endeavors to support other databases, successful connection and data processing have only been tested with the databases listed below. If your Altova application is a 64-bit version, ensure that you have access to the 64-bit database drivers needed for the specific database you are connecting to.

Database	Notes
Firebird 2.x, 3.x	
IBM DB2 8.x, 9.x, 10.x, 11.x	
IBM Db2 for i 6.x, 7.4	Logical files are supported and shown as views.
IBM Informix 11.70 and later	
MariaDB 10 and later	
Microsoft Access 2003 and later	At the time of writing (early September 2019), there is no Microsoft Access Runtime available for Access 2019. You can connect to an Access 2019 database from Altova products only if Microsoft Access 2016 Runtime is installed and only if the database does not use the "Large Number" data type.
Microsoft Azure SQL Database	SQL Server 2016 codebase
Microsoft SQL Server 2005 and later Microsoft SQL Server on Linux	
MySQL 5 and later	
Oracle 9i and later	
PostgreSQL 8 and later	PostgreSQL connections are supported both as native connections and driver-based connections through interfaces (drivers) such as ODBC or JDBC. Native connections do not require any drivers.
Progress OpenEdge 11.6	
SQLite 3.x	SQLite connections are supported as native, direct connections to the SQLite database file. No separate drivers are required.
Sybase ASE 15, 16	
Teradata 16	

## 1.3 Product Features

DiffDog provides the following main features.

### File Comparison

A [file comparison](#)<sup>26</sup> in DiffDog is made in a File Comparison window. Files to be compared are opened in separate panes of a File Comparison window by browsing in Windows Explorer-type windows or from drop-down lists of previously opened files. DiffDog remembers file comparison pairs, and, when you select a file for comparison, can provide a list of files with which the selected file was [previously compared](#)<sup>250</sup>.

Files can be compared as text or as structured XML. You can also compare binary files, however DiffDog cannot—with the exception of Microsoft Word (\*.doc or \*.docx) documents—display the changes within binary files, it can only detect whether or not a pair of binary files is equal. A large range of [navigation controls](#)<sup>241</sup> enables you to move easily among differences.

A wide range of [comparison options](#)<sup>39</sup> are available, thus allowing you to define what aspects of files to compare and what aspects to ignore. Comparison options include settings for how whitespace and blank lines should be treated, whether case-sensitivity should be considered or not, whether differences should be indicated by line or character, whether certain node types, namespaces, and the order of attributes and/or elements should be ignored, whether entities should be resolved, etc.

If a file is modified outside DiffDog while it is open in a File Comparison window, DiffDog can watch for changes and reload the file if required.

Differences within files are indicated with background colors, and corresponding differences in the two panes are joined with lines, thus making visual analysis easier. Note that this does not apply to binary files. Vertical and horizontal scrolling of the two files in Comparison windows can be synchronized. This enables corresponding differences always to be displayed simultaneously.

With DiffDog Enterprise Edition, you can also perform three-way file comparisons (this is not applicable to Word files). Such comparisons can be used to merge differences from two files into a third one, see [Three-Way Comparisons](#)<sup>34</sup>.

### File Editing and Merging in File Comparison Windows

After you have compared a file pair, files can be [edited](#)<sup>59</sup> and [saved](#)<sup>70</sup> directly within File Comparison windows and you can specify whether and how [backups of files](#)<sup>255</sup> you edit should be kept. Comparisons can be done dynamically [as you edit](#)<sup>249</sup>.

DiffDog provides high-level find-and-replace functionality, which also includes support for regular expressions. Differences between files can be [merged](#)<sup>242</sup>, i.e. a different block in one file can be copied to replace the corresponding block in the other file. Editing and merging changes in either file can be undone an unlimited number of times.

### Directory Comparison

A [directory comparison](#)<sup>71</sup> in DiffDog is made in a Directory Comparison window. The directories to be compared are opened in separate panes of a Directory Comparison window. DiffDog provides a drop-down list of recently compared directories from which to select. Additionally, once a directory is selected to be opened in one pane, DiffDog can provide a list of directories with which that directory was [previously compared](#)<sup>250</sup>; as a

result previously compared pairs can quickly be opened in a Directory Comparison window. You can [define filters](#)<sup>259</sup> to specify what file types to compare and what file types to ignore in a directory comparison.

Directories can be compared on the basis of the sizes and timestamps of files within them (Quick Comparison Mode), or on the basis of the contents of files. The compared directories are displayed as expandable/collapsible trees and show details such as file size and last modification date. The view of the compared directories can be [configured](#)<sup>79</sup> on the basis of the comparison results. For example, equal directories and files can be hidden, and only non-equal folders and files shown. Differences between directories and files are [indicated](#)<sup>81</sup> with color-coding and easy-to-identify icons.

If a directory is modified outside DiffDog while it is open in a Directory Comparison window, DiffDog can watch for changes and reload the directory if required. Non-equal directories and files can be copied from one pane (directory) to the other. You can also [synchronize](#)<sup>84</sup> the directories, that is, copy all missing or updated files from one directory to the other or delete unneeded files. [File comparisons can be started](#)<sup>83</sup> directly from within a Directory Comparison window by double-clicking a file in a directory.

### Microsoft Word document comparison

A [comparison of Microsoft Word documents](#)<sup>90</sup> is made in a Word Comparison window. Please note that Microsoft Word must be installed on your computer and that you cannot run a 64-bit version of DiffDog together with a 32-bit version of Microsoft Word, or vice versa, if you want to compare Microsoft Word documents in DiffDog. DiffDog opens two instances of Microsoft Word side by side and displays an empty document in both of them. Documents are opened separately in the left and right pane by clicking the **Open** button in the respective toolbar or choosing a previously compared document from the drop-down list box.

### XML Schema comparison

An [XML schema comparison](#)<sup>101</sup> is made in an XML Schema Comparison window. The XML schemas to be compared are opened in two components of the XML Schema Comparison window. Occasionally, you will have to [set a root element](#)<sup>105</sup> for the comparison. The root elements on both sides are mapped and DiffDog tries to find and map corresponding (child) elements. The mappings can be changed manually at any time.

You can [save](#)<sup>113</sup> the mapping and the settings of an XML Schema comparison in a file. If such an XML Schema comparison file is modified outside DiffDog while it is open in an XML Schema Comparison window, DiffDog can watch for changes and reload the file if required. DiffDog also allows you to generate [XSLT Stylesheets](#)<sup>116</sup> and [MapForce Mappings](#)<sup>117</sup> for the compared XML Schemas. The XSLT Stylesheet or MapForce Mapping, respectively, can then be saved or, for XSLT Stylesheets, opened in XMLSpy®.

### Database schema comparison

A database schema comparison enables you to compare objects of two different database schemas, in terms of their structure or size. Database objects that can be compared include tables, columns, views, functions, and stored procedures. Comparison works differently for tables, as opposed to views, functions, or stored procedures. Namely, in case of tables, the comparison results report the structural differences (such as different columns, constraints, data types, and so on). In case of views, functions, and stored procedures, the comparison results inform you if the size of the object is the same or different in database A (left-side of comparison) as compared to database B (right-side of comparison). For more information, see [Comparing Database Schemas](#)<sup>144</sup>.

### Database data comparison

You can compare data from two or more tables or columns side-by-side. The objects to be compared can either belong to the same database, or reside in two different databases. A database comparison is similar to

file comparisons; that is, it involves a "left" component and a "right" one. A "component" is just a representation of the database structure from where you can conveniently select the tables or columns that are to be compared.

After comparing database data, you can optionally merge differences either from left to right, or from right to left. It is possible to merge all differences as one batch, or you can display the differences for each table in a data grid, and then review and merge each difference individually at row level. For more information, see [Comparing Database Data](#)<sup>119</sup>.

## Interface

Multiple comparison windows (directory, file, XML Schema, database schema, and database data) can be opened in DiffDog at a time. [Directory synchronization](#)<sup>84</sup> is done in a dialog box that can be opened from the Directory Comparison window after you have run a directory comparison, and which allows you to customize the default synchronization settings according to your needs.

The GUI has user-friendly menu layouts, intuitive toolbar icons, right-click quick menus, and a status bar that summarizes the results of comparisons. You can customize the look of Directory Comparison windows, File Comparison windows, XML Schema Comparison windows, Database Schema Comparison windows, and Database Data Comparison windows, including the [background colors](#)<sup>255</sup> that are used to highlight differences. Files can be viewed in [Text View](#)<sup>51</sup> or Altova's [Grid View](#)<sup>55</sup>.

The Text View of documents in File Comparison windows provides line-numbering, source-folding (i.e. expandable and collapsible elements), indentation guides, bookmarking, syntax coloring, and whitespace and linefeed indicators. [Syntax coloring](#)<sup>264</sup> can be adjusted according to file type.

Grid View displays structured documents, such as XML documents, in a tabular grid. This enables you to carry out large-scale changes easily (for example, inserting a column would insert the node represented by the column in all the nodes represented by the rows of the grid).

## Command Line

DiffDog can be [called from the command line](#)<sup>326</sup>. The application can be integrated with any source control system which provides the possibility to set up a path to the DiffDog executable.

## 1.4 DiffDog Terminology

Terms used in this documentation are defined below.

### Comparisons

DiffDog enables you to make the following kinds of comparisons: File Comparisons, Directory Comparisons, Microsoft Word document Comparisons, XML Schema Comparisons, Database Schema Comparisons, and Database Data Comparisons.

### File comparison

A file comparison is the process of comparing two files. The term is also used to refer to the display of results of the comparison.

### File Comparison window

Each file comparison is displayed in a File Comparison window. Multiple file comparisons can be open in DiffDog at a time, but only one may be active at any given time.

### Microsoft Word document comparison

A Microsoft Word document comparison is the process of comparing two Microsoft Word (\*.doc or \*.docx) files. The term is also used to refer to the display of results of the comparison.

### Word Comparison window

Each Microsoft Word document comparison is displayed in a Word Comparison window. Multiple Microsoft Word document comparisons can be open in DiffDog at a time, but only one may be active at any given time.

### Directory comparison

A directory comparison is the process of comparing two directories. The term is also used to refer to the display of the results of the comparison.

### Directory Comparison window

Each directory comparison is displayed in a Directory Comparison window. Multiple directory comparisons can be open in DiffDog at a time, but only one may be active at any given time.

### Database Data comparison

A database data comparison is the process of comparing the content of tables contained in two databases.

### Database Data Comparison window

Each database data comparison is displayed in a Database Data Comparison window. Multiple database data comparisons can be open in DiffDog at a time, but only one may be active at any given time.

## Database Schema comparison

A database schema comparison is the process of comparing the structure of tables contained in two database schemas.

## Database Schema Comparison window

Each database schema comparison is displayed in a Database Schema Comparison window. Multiple database schema comparisons can be open in DiffDog at a time, but only one may be active at any given time.

## XML Schema comparison

An XML schema comparison is the process of comparing two XML schemas. The term is also used to refer to the display of results of the comparison.

## XML Schema Comparison window

Each XML schema comparison is displayed in an XML Schema Comparison window. Multiple XML schema comparisons can be open in DiffDog at a time, but only one may be active at any given time.

## Component

In Database Data comparisons, Database Structure comparisons, and XML Schema comparisons, the items to be compared are contained in two components within the respective comparison window. The components are used to select and map the items of the comparison and provide several context menu options.

## Data source

The database that hosts the tables compared in a database data or database schema comparison is referred to as data source. You need a connection to a data source in order to start a database data or database schema comparison in DiffDog.

## Database Data Comparison Result window

In contrast to file and directory comparisons, the results of a database data comparison are not displayed directly in the Database Data Comparison window but in a separate window which is called the Database Data Comparison Result window. The Database Data Comparison window itself provides only a short overview stating whether or not the data in the two tables is equal and how many rows are different or exist only on one side of the comparison.

## Directories and Folders

These two terms are used interchangeably.

## Difference

Six types of differences are distinguished: (1) differences between two compared files, (2) differences between two compared directories, (3) differences between two compared Microsoft Word documents, (4) differences between the data in tables of two compared databases, (5) differences between the structure in schemas of two compared databases, and (6) differences between two compared XML Schemas.

1. A difference between two files that are compared as text denotes a line of text in a file that is different from the corresponding line (if any) in the compared file. Note that the entire line is considered to be a single difference—even if the option to show differences within lines is selected. (This is significant when merging differences because the entire line will be merged; merges are not carried out at the character level.) A line of text is considered to be different from its corresponding line if one or more characters of text in it are different, if text is missing, or if a line is present for which there is no corresponding line in the compared file. A difference between two files that are compared as XML denotes a node that is different from the corresponding node in the compared file. In general, nodes are considered different if the corresponding text values do not match. What constitutes a difference can be [further refined](#)<sup>39</sup> in the Comparison Options dialog box.
2. Differences between two compared directories are determined by comparing corresponding files within the two compared directories. In Quick Comparison Mode, the file sizes and timestamps of the corresponding files are compared. If one of these is different, the files are said to be different. Alternatively, corresponding files within directories are compared on the basis of their contents. Such comparisons are carried out as normal DiffDog file comparisons, and a difference causes the files to be flagged as different. Also see the definition of [Equal Files](#)<sup>19</sup> and [Non-Equal Files](#)<sup>19</sup>.
3. A difference between two Microsoft Word documents denotes a sentence or a paragraph (depending on the settings you have defined in the [Word comparison options](#)<sup>94</sup>) that is different from the corresponding sentence/paragraph (if any) in the compared document. Note that the entire sentence/paragraph is considered to be a single difference—even if the option to show differences within lines is selected. (This is significant when merging differences because the entire sentence/paragraph will be merged; merges are not carried out at the character level.) A sentence/paragraph is considered to be different from its corresponding sentence/paragraph if one or more characters of text in it are different, if text is missing, or if a sentence/paragraph is present for which there is no corresponding line in the compared file.
4. A difference between tables in two databases when strings are compared occurs when the string representation of the data contained in a field is different between the two tables. A difference between tables in two databases when the content of a database is compared using the database's internal data types (native comparison) occurs when the content of a field itself (and not its string representation which might be different for the same content in different databases) in the first table does not match the content of the corresponding field in the second table.
5. A difference between the structure of schemas in two compared databases occurs when the name or data type of a database item is different or when a database item exists in one schema that is missing in the other schema.
6. A difference between two compared XML Schemas occurs when items exist in one XML Schema that are missing in the other XML Schema or when the names of items are different.

## Equal Files

In directory comparisons, files that are identical according to the comparison options, are said to be equal.

## Non-equal Files

In directory comparisons, there are two types of non-equal files: (1) a different file (see definition of [Difference](#)<sup>18</sup> above), and (2) a file that is present in one directory but not in the other. Note that a non-equal file is not necessarily a different file.

## Mapping

In database data, database schema, and XML Schema comparisons, each table, column, or item, respectively, in the left comparison component has to be assigned a table, column, or item, respectively, in the right comparison component to be compared with. This process is called mapping in DiffDog and can be done either

automatically by the application based on column name and/or data type, or manually by the user using the mouse.

## Merging

Differences found in a file, database data, or database schema comparison can be merged, that is, copied from one file or table, respectively, to the other. The block that is copied overwrites the corresponding block or space in the compared file/database. In file comparisons, merges are performed for the active (current) difference, and can be performed in either direction. In database comparisons, merges are performed either for all or for the selected items. Note that non-equal files in a Directory Comparison can also be copied from one pane (directory) to the other and that rows that exist only on one side of a database data comparison can be copied to the other side.

## Synchronizing

Two directories that are different are synchronized by copying or deleting, respectively, all non-equal files and sub-folders from one directory to the other, or by deleting files that are present in one directory but not in the other. The default synchronization options are displayed in the Synchronize directories dialog box where they can be changed for the entire directory. Additionally, you can also edit the synchronization actions for individual files or sub-folders.

## 1.5 Comparison Modes

Files, directories, and database data can be compared in DiffDog in several ways. The comparison mode is indicated by the icons in the Comparison Mode and Database Data Comparison Mode toolbars. You can change the comparison mode either by clicking a different toolbar icon or by selecting the desired mode from the **Diff and Merge** menu.

The available comparison modes are described below.

### File comparison

When a [File Comparison](#)<sup>26</sup> window is active, or when Quick Comparison Mode is toggled off in a Directory Comparison window, you can select from among the following four file comparison modes:

-  Text: Compares files as text files; compares directories with contents treated as text files.
-  XML: Compares files as XML files; compares directories with contents treated as XML files.
-  Binary: Compares files as binary files; compares directories with contents treated as binary files.
-  File extension: Compares files as text or XML according to settings for file extensions, which you can make in the [File Types](#)<sup>264</sup> tab of the DiffDog Options dialog (**Tools | DiffDog Options**); compares directories with contents treated as text files, XML files, Microsoft Word files, or binary files according to file extension.

### Directory comparison

When a [Directory Comparison](#)<sup>71</sup> window is active, you can choose between Quick Comparison Mode and one of the four file comparison modes described in the File comparison section above.

-  Quick comparison: Compares files within directories and sub-directories by size and date modified. This mode is either toggled on or off. When toggled off, the four file comparison modes become available. Selecting one of the file comparison modes causes directories to be compared in terms of their contents as text, XML, or binary files.

### Database data comparison

When a [Databases Data Comparison](#)<sup>119</sup> window is active, you can select either string comparison or native comparison.

-  String: Compares the content of database tables as strings with no regard to how the content is stored in the database.
-  Native: Considers the data type of a database column when comparing tables. The same data, for example, can be considered different when it is stored in two columns using different data types.
-  XML Native: Treats the content of XML columns as XML files. This comparison mode is only available together with the Native comparison mode.

## Current Comparison Mode

DiffDog uses the concept of the *current comparison mode*. This is the comparison mode that is current at any given time. For each type of comparison window (file, directory, and database data), a separate current comparison mode exists at all times. The current comparison mode for each type of comparison window is that comparison mode most recently selected by you in any of the open comparison windows of that type. When the application is started, the current comparison modes are the comparison modes that were current at the time the application was last closed.

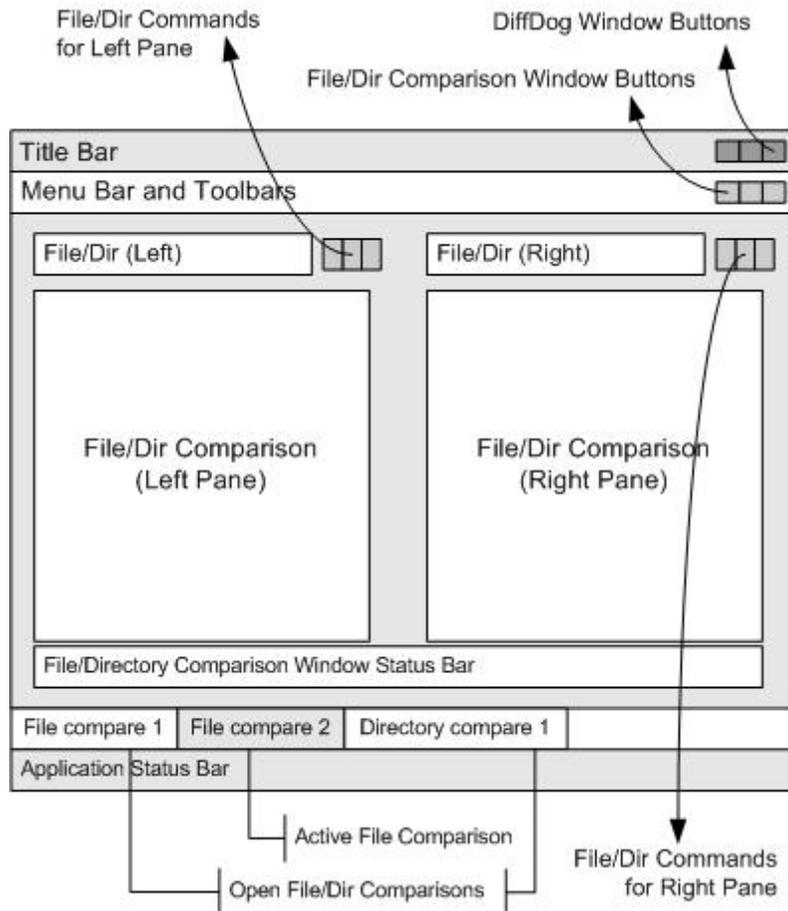
Every File Comparison window, Directory Comparison window, and Database Data Comparison window has a comparison mode.

When new comparison windows (file, directory, or database data) are opened, they have the current comparison mode for that type of comparison window (file, directory, or database data). Note that the current comparison mode for file comparisons applies to new directory comparison windows if Quick Comparison Mode is not the current comparison mode for directory comparisons.

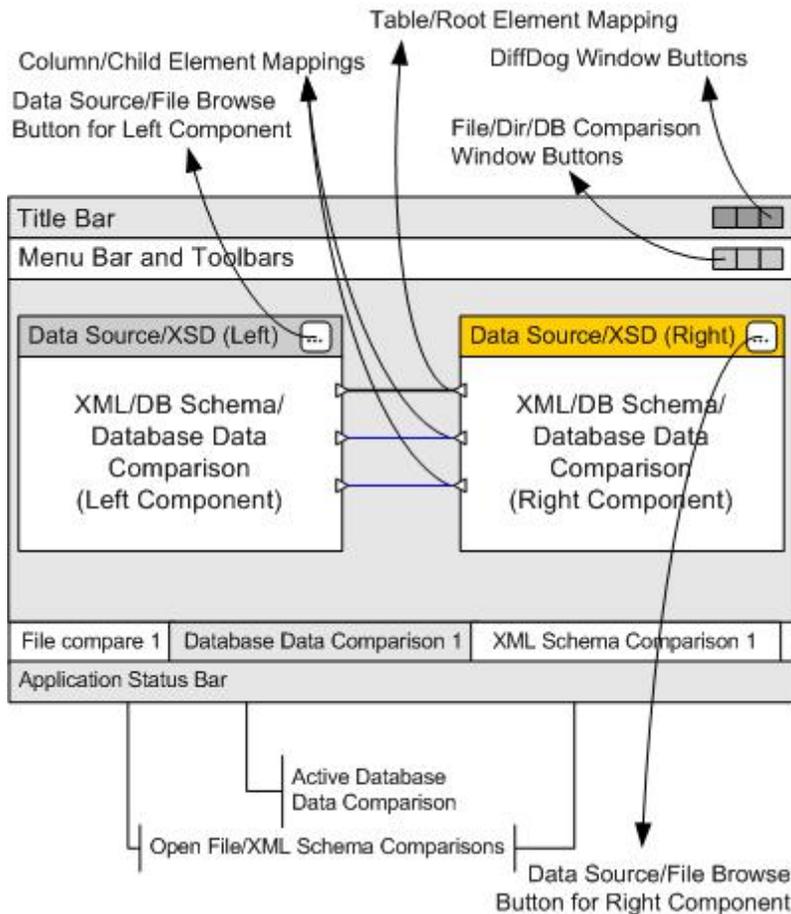
If you change the comparison mode of a comparison window, then that comparison mode applies to that particular comparison window. The comparison mode of other open comparison windows is not affected. However, the newly selected comparison mode becomes the current comparison mode and is applied to all comparison windows that are opened subsequently.

## 1.6 The DiffDog Interface

The DiffDog interface displays multiple File Comparison windows, Directory Comparison windows, Word Comparison Windows, Database Data Comparison windows, Database Schema Comparison windows, and XML Schema Comparison windows within the DiffDog application window. The schematic diagrams below illustrate the main parts of the interface. They are accompanied by a brief description of the various interface parts.



The Database Data, Database Schema, and XML Schema Comparison windows look slightly different than the File Comparison and Directory Comparison windows. They consist of only one pane which has a left and a right component that serve for the selection of the data sources and tables for the database or XML Schema comparison.



## Title Bar

The Title Bar displays the application name (i.e., DiffDog) followed by the name of the active File Comparison window, Directory Comparison window, Word Comparison window, XML Schema Comparison window, Database Schema Comparison window, or Database Data Comparison window. At the right-hand side are buttons to minimize, reduce or maximize, and close the DiffDog application window.

## Menu Bar and Toolbars

The Menu Bar displays the menus. Each toolbar displays a group of icons for DiffDog commands. You can reposition the menu bar and toolbars by dragging their handles to the desired locations. At the right-hand side are buttons to minimize, reduce or maximize, and close the active comparison window.

## File/Directory/Microsoft Word/XML Schema/Database Schema/Database Data Comparison Window

Multiple File Comparison windows and/or Directory Comparison windows and/or Word Comparison windows and/or Database Data Comparison windows and/or Database Schema Comparison windows and/or XML Schema Comparison windows can be open at a time, but only one of them is active. The name of the active comparison window appears in the title bar and its name tab (at the bottom of the DiffDog application window)

is highlighted and the name itself is displayed in bold; the name tabs of the other open comparison windows are grayed out and the names are displayed in normal font. To make another comparison window the active comparison window, click its name tab.

Each comparison window (file/Microsoft Word or directory) has two panes of equal width arranged side-by-side and a status bar for that comparison window below the two panes. Above each pane is a file/directory selection area. This consists of a combo box, where you can enter the name of the file/directory to be compared, or select a previously opened file or directory from the drop-down menu. The buttons to the right of this area allow you to browse for files or directories, and to open files, save files and refresh files. The file and directory that is opened in each pane can therefore be opened independently of the file or directory in the other pane. Once a file/directory has been opened in both panes of a comparison window, a comparison can be made.

In Directory Comparison windows, directories are displayed as trees, the levels of which can be expanded/collapsed by double-clicking on a directory-level. Additionally, the width of individual columns can be adjusted by dragging borders to the desired width. In File Comparison windows, the view of the document can be customized using commands in the **View** and **Text View** menus.

In XML Schema Comparison windows, XML Schemas are selected in two components that are displayed in one pane of the comparison window. Each component has a title bar displaying the file name of the XML Schema that is currently loaded into the component, and a browse button that opens the Windows Open dialog box where the XML Schemas for the left and right comparison component can be selected or changed. The width of a component can be adjusted by dragging the handle in the lower right corner of the component. The elements inside a component are displayed as trees. By double-clicking on an element or clicking the plus symbol next to an element name, the element can be expanded to show the child elements. Elements that are mapped to their respective counterparts in the other components are connected by connector lines. These mappings can be selected, deleted, or dragged to other tables/columns using the mouse.

In database comparison windows (schema or data), data sources and tables are selected in two components that are displayed in one pane of the comparison window. Each component has a title bar displaying the data source the component is currently connected to, and a browse button that opens the Select Tables for Data Comparison dialog box where the data sources and tables for the left and right comparison component can be selected or changed. The width of a component can be adjusted by dragging the handle in the lower right corner of the component. The tables and columns inside a component are displayed as trees. By double-clicking on a table or clicking the plus symbol next to a table name, the table can be expanded to show the table columns. Tables and columns that are mapped to their respective counterparts in the other components are connected by connector lines. These mappings can be selected, deleted, or dragged to other tables/columns using the mouse.

## Comparison Window Status Bar

The status bar of a file/Microsoft Word or directory comparison window indicates the status of that comparison. If files or directories have not been opened, this is indicated. If a comparison has been made, the type of comparison is reported along with the result of the comparison. The comparison window status bar is not available in XML Schema comparison windows, database data comparison windows, database data comparison windows, and should not be confused with the application status bar.

## Application Status Bar

The application status bar appears at the bottom of the application window, and shows application-level information. The most useful of this information are the tooltips that are displayed here when you mouseover a toolbar icon. The application status bar should not be confused with the comparison window status bar. If you are using the 64-bit version of DiffDog, this is indicated in the status bar with the suffix (x64) after the application name. There is no suffix for the 32-bit version.

## 2 File Comparison

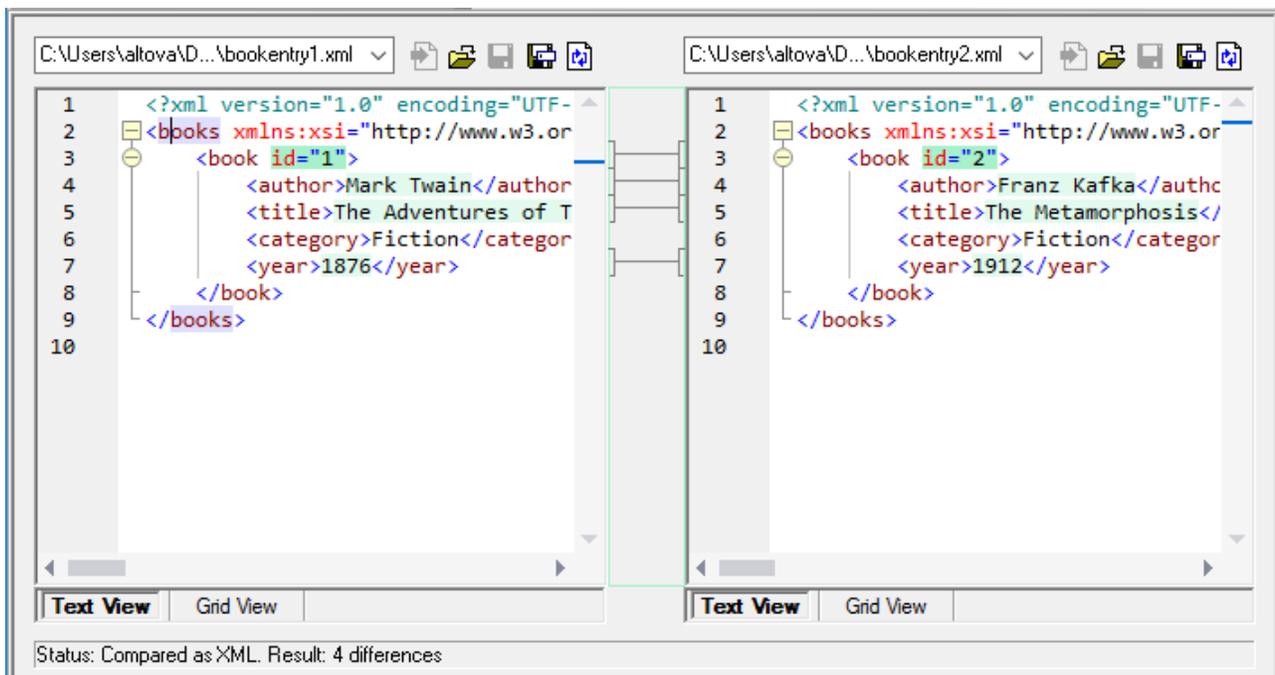
Altova website: [File compare tool](#)

This chapter provides instructions on how compare two files with DiffDog. The information enclosed here is applicable to most file types. However, if you intend to compare Microsoft Word documents and XML schemas, see also the following sections:

- [Comparing XML Schemas](#) <sup>101</sup>
- [Comparing Microsoft Word Documents](#) <sup>90</sup>

**Note:** To compare ZIP-conformant files and Office Open XML (OOXML) files, run a directory comparison instead of a file comparison (since ZIP and OOXML files contain multiple files). Otherwise, if you attempt to compare ZIP-conformant files using a file comparison, DiffDog will prompt you to run a directory comparison instead. For more information, see [Comparing Directories](#) <sup>71</sup>.

A file comparison in DiffDog involves adding the files to the File Comparison window. The File Comparison window enables you to view file differences side by side. For step-by-step instructions, see [Running a File Comparison](#) <sup>28</sup>.



*File Comparison window*

As illustrated above, the File Comparison window consists of two panes called Text View and Grid View. The Text View is the default editor for most file types. It displays the content of the file, while offering multiple navigation aids, such as word wrapping, code folding, line numbering, syntax highlighting for numerous file types, as well as the ability to find and replace text or search by regular expressions. In case of XML files, the Text View offers even more capabilities, such as automatic highlighting of start and end tags, and pretty-printing. For more information, see [Text View](#) <sup>51</sup>.

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The Grid View is applicable to well-formed files, typically XML documents. It is particularly useful if you want to see the structure of the document at a glance, easily expand or collapse specific sections, or modify content in table-like manner, without accidentally changing the XML tags. For more information, see [Grid View](#)<sup>55</sup>.

If necessary, you can edit files directly in either the Text View or the Grid View (see [Editing Files](#)<sup>59</sup>). Changes can be saved back to the original file, or reverted (either using Undo, or by reloading the original file from the disk). For information about merging differences from one file to another, see [Merging Differences](#)<sup>242</sup>.

If you are frequently comparing the same or similar sets of files, you can save the comparison as a file and open it at a later time (see [Saving and Loading Comparisons](#)<sup>246</sup>).

Various comparison options can be customized (see [Modifying the File Comparison Options](#)<sup>39</sup>).

## 2.1 Running a File Comparison

There are two ways to start a file comparison in DiffDog:

1. From the DiffDog graphical user interface
2. From Windows Explorer, by right-clicking a file and using the **Compare with DiffDog** context menu command.

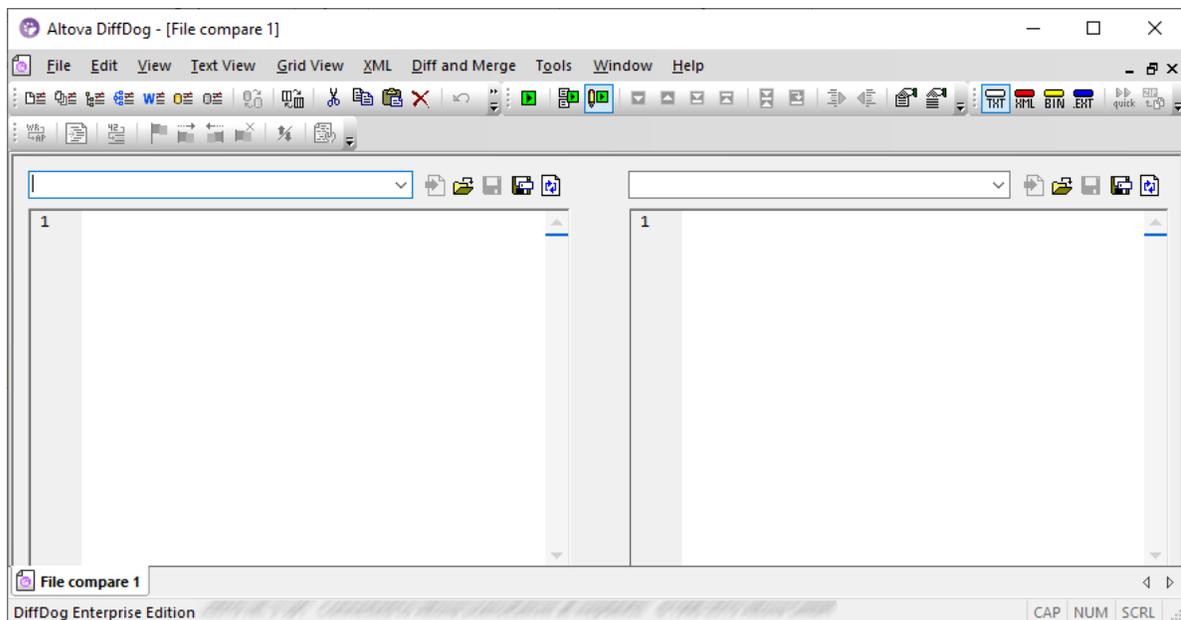
Depending on your preferences, comparisons may occur automatically immediately after you open both files. You can also choose to initiate comparisons only explicitly, with a button click.

All these subjects are described in more detail below.

### Starting a comparison from DiffDog

To run a file comparison with DiffDog:

1. Select the menu option **File | Compare Files** or click the **Compare files**  toolbar button.



2. Choose a comparison mode that is appropriate for the file types being compared (binary, text, XML, or extension-based). For more information, see [Comparison Modes](#) <sup>21</sup>.
3. Select the files to be compared. There are various ways to do this, as follows:
  - In the left pane of an existing File Comparison window, click the **Open**  button and select a file in the Windows Open dialog box. You can also open a file from a URL (see [Opening Files from URLs](#) <sup>30</sup>).
  - Enter the full path to a file and click the **Apply**  button.



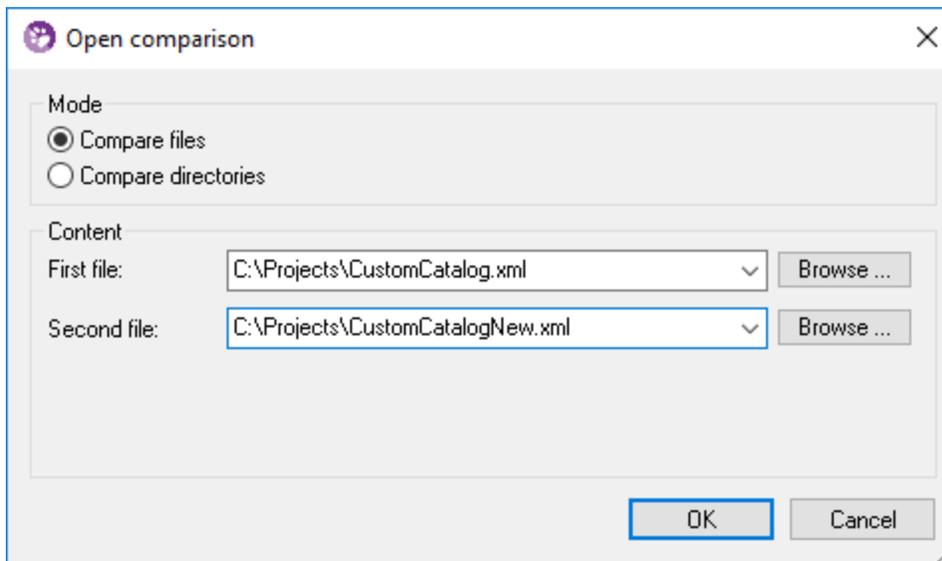
- Drag a file from the Windows Explorer into the pane.
- Select a previously compared file from the drop-down list.



4. Repeat any of the steps described in step 3 for the right pane.

Alternatively, you can run a file comparison as follows:

1. On the **File** menu, click **Open** (alternatively, press **Ctrl+O**).



2. In the Open comparison dialog box, select **Compare files**.
3. Browse for the files to be compared and click OK.

## Starting a file comparison from Windows Explorer

Another way to run a file comparison is as follows:

1. In Windows Explorer, select the two files to be compared. To select multiple files in Windows Explorer, hold the **Ctrl** key pressed while selecting a file.
2. Right-click one of the files, and select **Compare with Altova DiffDog** from the context menu.

You can also use this approach with SQLite and Microsoft Access databases, see [Quick Comparison of SQLite and Access Databases](#) <sup>128</sup>.

## Automatic comparison

By default, when the two documents to be compared are loaded into the comparison window, a comparison is automatically carried out. To enable or disable automatic comparison, do one of the following:

- On the **Diff and Merge** menu, select the **Autostart Comparison** menu command.
- Click the **Autostart Comparison**  toolbar button.

In addition, comparisons can be explicitly started any number of times. To start a comparison explicitly, do one of the following:

- On the **Diff and Merge** menu, select the **Start Comparison** command.
- Click the **Start Comparison**  toolbar button.

When editing documents, they are compared dynamically as you type if the **Compare while Editing** command is toggled on. To toggle this option on or off, do one of the following:

- On the **Diff and Merge** menu, select the **Compare while Editing** command.
- Click the **Compare while Editing**  toolbar button.

If the **Show Options Before Comparison** command is toggled on, then the **Comparison Options** dialog box is displayed each time before the comparison is run (except when it is run dynamically by DiffDog while you edit). This is useful if you wish to run comparisons with different options. To toggle this option on or off, do the following:

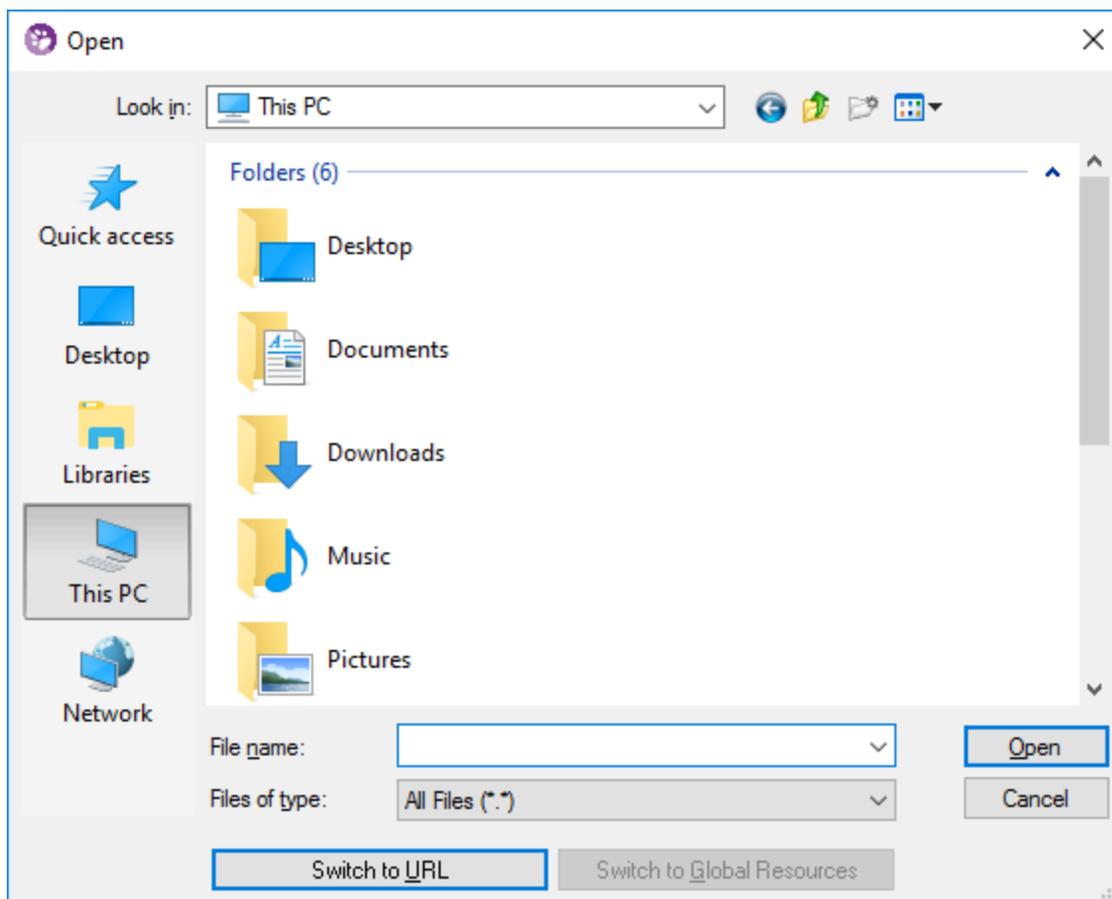
- On the **Diff and Merge** menu, select the **Show Options Before Comparison** command.

## 2.1.1 Opening Files from URLs

In addition to opening local files, you can also open files from a URL. The supported protocols are HTTP, HTTPS, and FTP. Note that files loaded from URLs cannot be saved back to their original location (in other words, access to the file is read-only), unless they are checked out from a Microsoft® SharePoint® Server, as shown below.

### To open a file from a URL:

1. On the **Open** dialog box, click **Switch to URL**.



2. Enter the URL of the file in the **File URL** text box, and click **Open**.

The screenshot shows the 'Open' dialog box in DiffDog. The 'File URL' field is set to 'http://example.org/document.xml'. The 'File load' section has the 'Reload' option selected. The 'Identification' section has empty 'User:' and 'Password:' fields, and the 'Remember password between application starts' checkbox is unchecked. The 'Available files' section has an empty 'Server URL' dropdown and a 'Browse' button. The 'This is a Microsoft® SharePoint® Server' checkbox is unchecked. At the bottom, there are buttons for 'Switch to File Dialog', 'Switch to Global Resources', 'Open', and 'Cancel'.

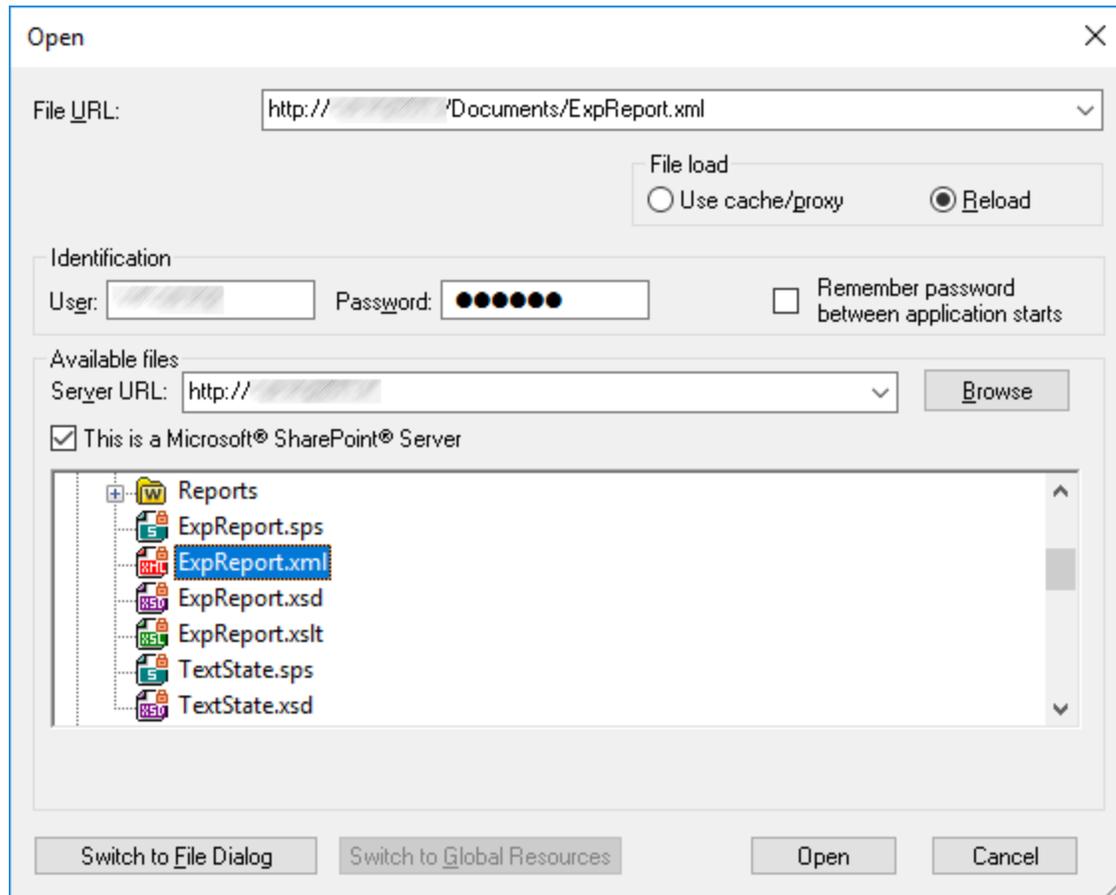
If the server requires password authentication, you will be prompted to enter the user name and password. If you want the user name and password to be remembered next time you start DiffDog, enter them in the Open dialog box and select the **Remember password between application starts** check box.

If the file you are loading is not likely to change, select the **Use cache/proxy** option to cache data and speed up loading the file. Otherwise, if you want the file to be reloaded each time when you open DiffDog, select **Reload**.

For servers with Web Distributed Authoring and Versioning (WebDAV) support, you can browse files after entering the server URL in the **Server URL** text box and clicking **Browse**.

**Note:** The **Browse** function is only available on servers which support WebDAV and on Microsoft SharePoint Servers.

If the server is a Microsoft® SharePoint® Server, select the **This is a Microsoft® SharePoint® Server** check box. Doing so displays the check-in or check-out state of the file in the preview area.



The state of the file can be one of the following:

	Checked in. Available for check-out.
	Checked out by another user. Not available for check-out.
	Checked out locally. Can be edited and checked-in.

To be able to modify the file in DiffDog, right-click the file and select **Check Out**. When a file is checked out from Microsoft® SharePoint®, saving the file in DiffDog sends the changes back to the server. To check in the file back to the server, right-click the file in the dialog box above, and select **Check In** from the context menu (alternatively, log on to the server and perform this operation directly from the browser). To discard the changes made to the file since it was checked out, right-click the file, and select **Undo Check Out** (or perform this operation from the browser).

Note the following:

- When a file is already checked out by another user, it is not available for check out.
- If you check out a file in one Altova application, you cannot check it out in another Altova application. The file is considered to be already checked out to you.

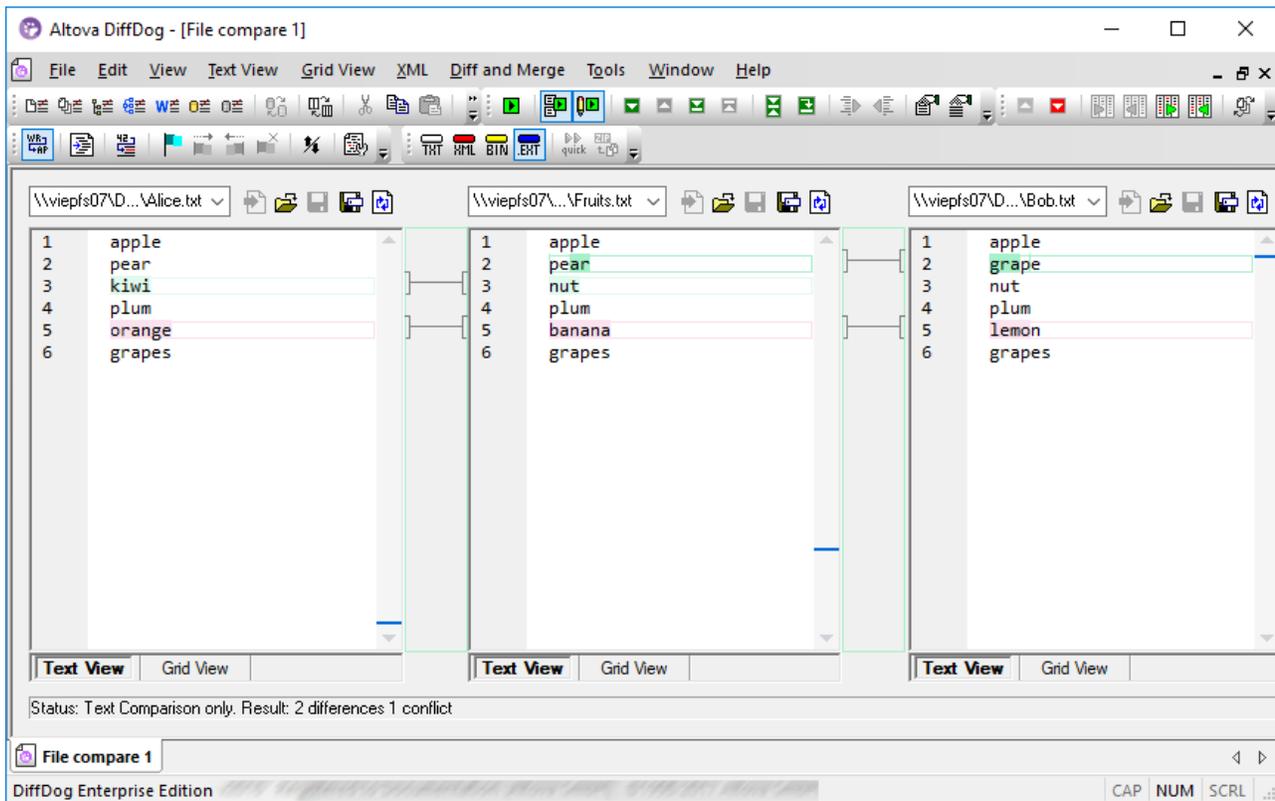
## 2.2 Three-Way Comparisons

With DiffDog, you can compare not only pairs of files, but also three files in a side-by-side manner. This kind of comparison is particularly useful to compare two files against a base copy from which both files originate. For example, let's assume that two people, Alice and Bob, created their own copies of an original file (let's call it "the common ancestor file", or "the base file"). If both Alice and Bob subsequently made edits to their copy, you can open all three files and compare them side-by-side in DiffDog.



A triple way comparison would help you display all changes made by both Alice and Bob compared to the common ancestor file, and navigate all the differences. For each encountered difference, you can decide whose change ("left", "right", or "middle") should be kept. The chevrons in the diagram above show the directions in which you can merge a particular change (for example, from Alice's file into the base file, or from the base file into Bob's file).

Importantly, it might be the case that both Alice and Bob edited the same line of text, in which case a conflict occurs. All the conflicts are identified and highlighted by DiffDog, and you can resolve them by accepting either Alice's or Bob's change into the final version. A conflict essentially means that the program cannot reasonably determine which change ("left", "middle", or "right") is the one you want to keep in the final version. To resolve the conflict, you must explicitly instruct DiffDog to merge text either from Alice's file into the base file (or the other way round), or from Bob's file into the base file (or the other way round).



### Three way comparison

In the image above, the middle pane displays the common ancestor file; the left pane displays Alice's version, and the right pane displays Bob's version. After you run a three way comparison, DiffDog highlights any differences and conflicts as follows:

- Differences between the "left" file and the "middle" file. For example, Alice changed line 3 which is highlighted as a change.
- Differences between the "right" file and the "middle" file. For example, Bob changed line 2 which is highlighted as a change.
- If any conflicts are detected between the three files, they are highlighted as well. For example, both Alice and Bob changed line 5, which is highlighted as a conflict.

### To run a three-way comparison:

1. On the **File** menu, click **Compare Files 3-way**. (Alternatively, click the **Toggle 2-way/3-way Comparison**  toolbar button. You can also select three files in Windows Explorer, right-click and select **Compare with Altova DiffDog** from the context menu.)
2. At the top-right corner of each comparison pane, click **Open**  to add the required files to the comparison. You can also drag files from Windows Explorer into each of the three panes.

**Note:** The file into which you want to merge changes from both versions must be opened in the middle pane (because merging is possible, for example, from right to middle, or left to middle, but not from right to left, or left to right). See also [Swapping Panes](#) <sup>37</sup>.

- On the **Diff and Merge** menu, click **Start Comparison** (alternatively, click **Compare**  or press **F5**). This step is not necessary if [Autostart Comparison](#) <sup>303</sup>  option is enabled.

**To switch from a two-way comparison to a three-way comparison, and vice versa:**

- On the **View** menu, click **Toggle 2-way/3-way Comparison** (or click **Toggle 2-way/3-way Comparison**  toolbar button). The file comparison window now includes three panes instead of two.

After you run a three-way comparison, the total number of differences and conflicts is visible at all times in the status bar. The color used by DiffDog to highlight differences and conflicts can be adjusted from **Tools | DiffDog Options | File Comparison** <sup>255</sup> tab.

Three-way comparison works in a similar way for other file types, including XML files. Note that, with XML files, you can view the differences in the [Grid View](#) <sup>55</sup>, in addition to the Text View.

**Note:** Three-way comparisons are not supported for Word documents or directories.

Three-way comparisons can be saved to a .filedif file and re-opened later just like two-way comparisons, see [Saving and Loading Comparisons](#) <sup>246</sup>.

## 2.2.1 Navigating and Merging Three-Way Differences

With three-way comparisons, you can navigate differences between the three panes in a similar way as with two-way comparisons, from the **Diff and Merge** menu and toolbar. For example, you can run the **Next difference (Alt+Down)**  command to navigate to the next difference and **Previous difference (Alt+Down)**  to navigate in the opposite direction, see also [Navigating Differences](#) <sup>241</sup>.

Unlike two-way comparisons, three-way comparisons may result in conflicts and also require special merging commands (for example, to copy a difference from left to middle pane, or from middle to right). All the commands specific to three-way comparisons are available in the 3-Way Comparison toolbar. This toolbar appears automatically when a 3-way comparison is toggled on. You can also explicitly show or hide it from **Tools | Customize | Toolbars** tab.



3-Way Comparison Toolbar

The 3-Way Comparison toolbar contains the following commands:

	<b>Previous Conflict</b>	Jump to the previous conflict.
	<b>Next Conflict</b>	Jump to the next conflict.
	<b>Copy from left to middle</b>	Copy (merge) the current difference from the left pane to the middle pane.

	<b>Copy from middle to left</b>	Copy (merge) the current difference from the middle pane into the left pane.
	<b>Copy from middle to right</b>	Copy (merge) the current difference from the middle pane to the right pane.
	<b>Copy from right to middle</b>	Copy (merge) the current difference from the right pane to the middle pane.
	<b>Change document order (Swap panes)</b>	Enables you to swap the left or right pane with the middle one, see <a href="#">Swapping Panes</a> <sup>37</sup> .

Note the following:

- The commands above are enabled only if they are meaningful for the current difference or conflict. For example, the commands "Copy from left to middle" and "Copy from middle to left" are disabled if the current difference is between the middle and right panes (but not the left one).

Other commands that can be issued in the context of three-way merges are the same as for two-way merges, namely:

- To undo a merge change, first click inside the pane where you want to undo the change, and then run the **Edit | Undo** menu command (or **Ctrl+Z** keyboard shortcut). The same applies for the **Edit | Redo** menu command (and its respective **Ctrl+Y** keyboard shortcut).
- To save any merges made from DiffDog to a file, click the **Save**  or **Save As**  buttons at the top-right corner of each pane. To reload the file content from the disk (and thus lose any unsaved changes made from DiffDog), click **Refresh** . See also [Editing Files](#) <sup>59</sup> and [Saving Files](#) <sup>70</sup>.
- Differences resulting from three-way comparisons can be exported to an XML or text file, see [Exporting Differences](#) <sup>245</sup>.

## 2.2.2 Swapping Panes

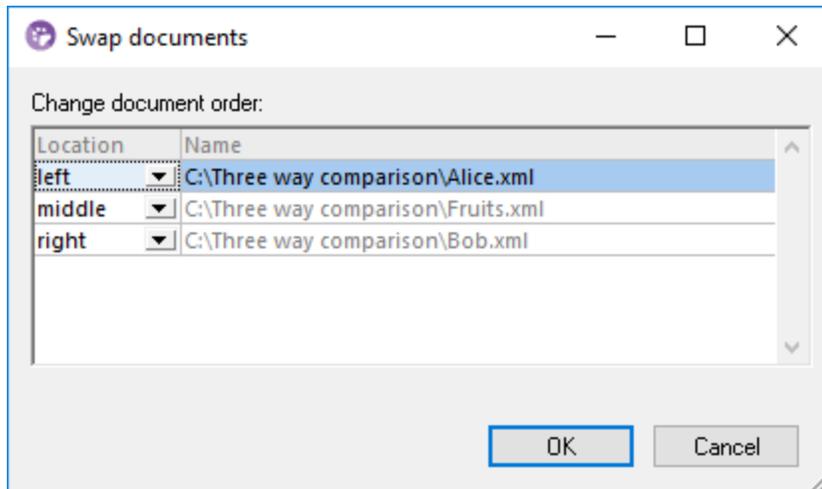
By default, when you open three files for comparison, the one from the middle pane is treated as the "common ancestor", or base file (that is, the one into which you want to merge changes from two sources). Using the previous example, if you want to merge Bob's or Alice's version into the common ancestor file, then this file must be opened in the middle pane. This would enable you to merge changes from both the left and right panes into it.



However, it is also possible to swap the panes if necessary. For example, you may decide that you want to keep Alice's version. In this case, you can swap Alice's version with the base file (so that Alice's file is in the middle pane). This way, you can merge into Alice's file changes from both the base file and Bob's file. Swapping may also be necessary if you opened three files by right-clicking them in Windows Explorer.

#### To swap panes:

1. Click the **Change Document Order**  button on the 3-Way Comparison Toolbar. A dialog box appears.



2. Select the desired target pane (middle, right, left) next to each file, and click **OK**.

## 2.3 Modifying the File Comparison Options

The options of a file comparison can be changed in the Comparison Options dialog box. This dialog box provides separate tabs for text and XML comparison. To open the Comparison Options dialog box:

- On the **Tools** menu, click **Comparison Options**.

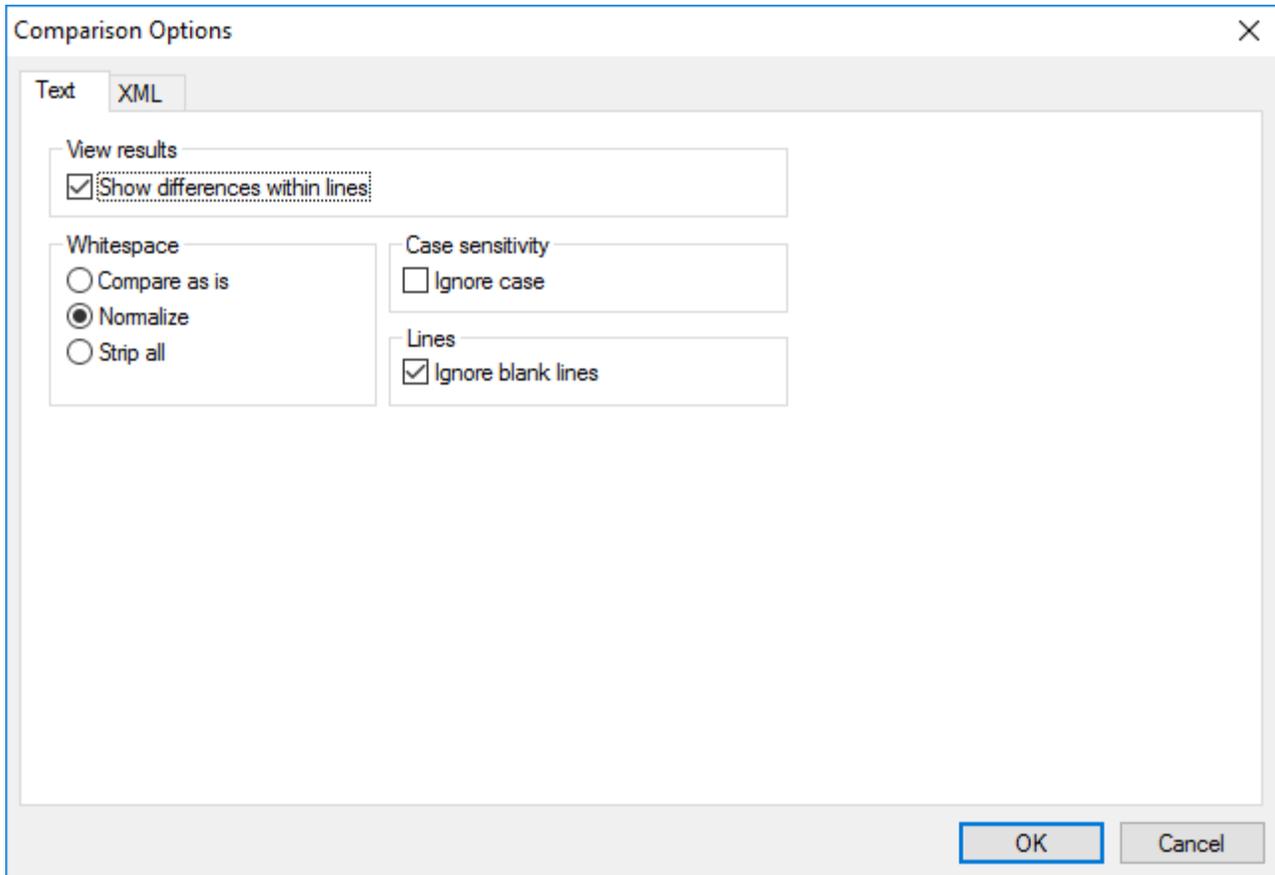
In addition, the **Diff and Merge** menu offers several toggle commands which can be switched on or off via the menu:

- [Show Options Before Comparison](#) <sup>249</sup>
- [Autostart Comparison](#) <sup>249</sup>
- [Compare while Editing](#) <sup>249</sup>
- [Support Recently Compared Pairs](#) <sup>250</sup>

General options for the comparison of files are furthermore available in the [File comparison](#) <sup>255</sup> tab of the DiffDog Options dialog box.

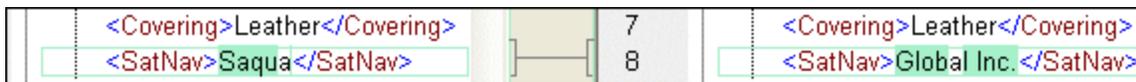
## 2.3.1 Options for Text Comparison

The Text tab of the Comparison Options dialog box displays the options that are used for text comparison.



### View results

By selecting the **Show differences within lines** check box, you can display the differences on character level. Note that the **Compare as Text**  button must be active in order to display differences within lines (see [Comparison Modes](#) <sup>21</sup>).



If the check box is deactivated, differences are displayed only on line level, that is, character level differences are not highlighted. Only the line, as a whole, is indicated as being different.



## Whitespace

See [Comparison Options for Whitespace Characters](#) <sup>49</sup>.

## Case sensitivity

Activate the **Ignore case** check box if upper and lower casing should be ignored when checking for differences.

## Lines

Here you define whether blank lines should be ignored.

## 2.3.2 Options for XML Comparison

The XML tab of the Comparison Options dialog box displays the options that are used for XML-based comparison.

The screenshot shows the 'Comparison Options' dialog box with the 'XML' tab selected. The dialog is divided into several sections:

- View results:**  Detailed differencing
- Whitespace:**  Compare as is,  Normalize,  Strip all
- Case sensitivity:**  Ignore case,  Do not ignore case in node names
- Ignore node types:**  Attributes,  CData,  Comments,  Processing instruction,  DOCTYPE,  XML declaration. Buttons: Set all, Clear all.
- Namespace/Prefix:**  Ignore namespace,  Ignore prefixes
- Order:**  Ignore order of child nodes. Add attributes as comparison criteria:  None,  All attributes,  Specific attributes (dropdown),  Add element text as comparison criteria.  Ignore order of attributes. Note: These options will also impact merge functionality.
- Entities:**  Resolve entities
- Text:**  Ignore text
- Depth:**  Ignore node depth
- Filter out specific elements/attributes:** No Filtering (dropdown)

Buttons: OK, Cancel

## View results

The **Detailed differencing** option enables you to show differences in detail or reduce the number of differences (so that navigation is faster). With detailed differencing toggled off, consecutive nodes that are different are displayed as a single node. This applies also to consecutive nodes on different hierarchical levels, such as an element node and its child attribute node. Please note that detailed differencing must be checked to enable merging and exporting differences.

This setting is not applicable when performing database data comparisons and the column data type is XML.

## Whitespace

See [Comparison Options for Whitespace Characters](#) <sup>49</sup>.

## Namespace/Prefix

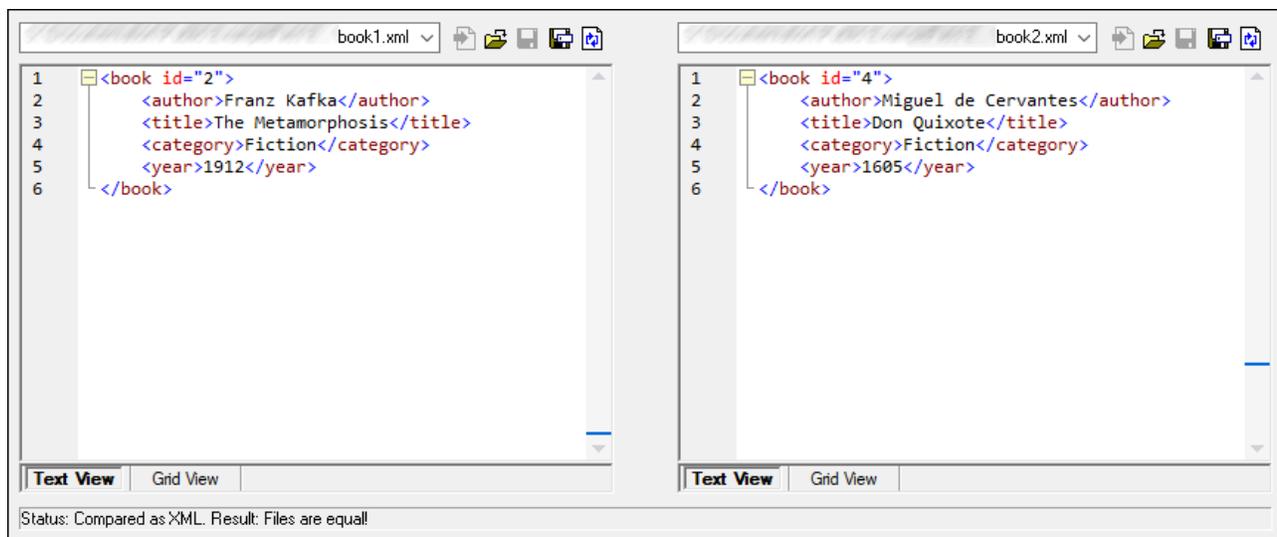
These are options for ignoring namespaces and prefixes when searching for differences.

## Entities

If **Resolve entities** is selected, then all entities in the document are resolved. Otherwise the files are compared with the entities as is.

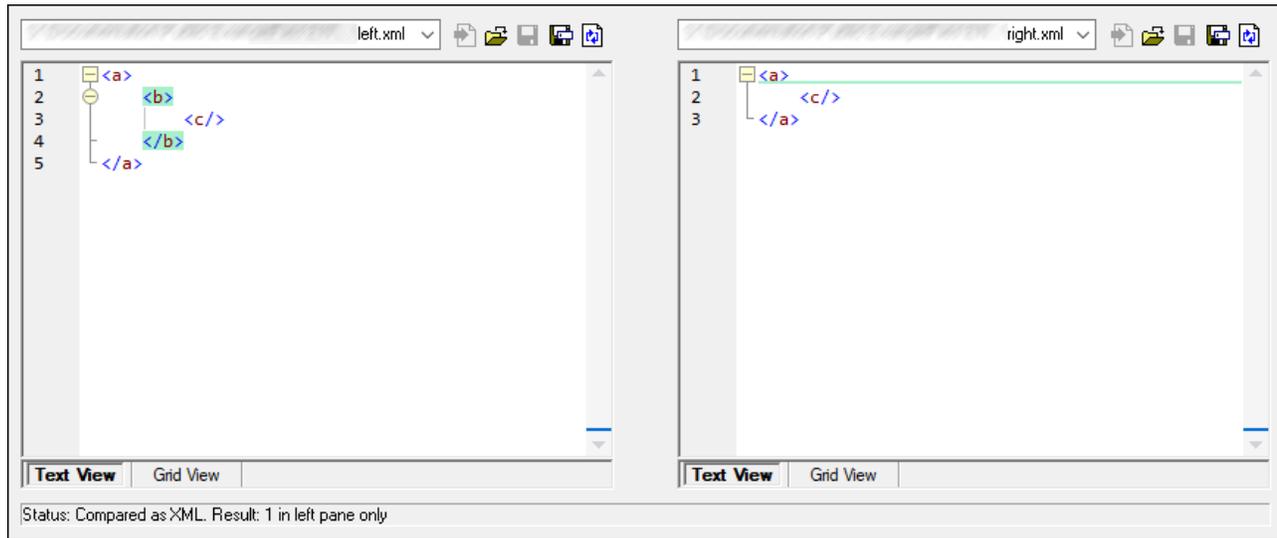
## Text

If **Ignore text** is selected, then differences in corresponding text nodes are not reported. Only the XML structure is compared but not the text content. This is useful when you want to compare two XML structures and disregard the actual content. For example, let's assume that the **Ignore text** check box is selected. In this case, the following two XML files are equal (even though their content differs).



## Depth

If **Ignore node depth** is selected, then elements are treated as equal without regard to their depth. For example, let's assume that the check box **Ignore node depth** is selected. In this case, in a comparison like the one below, element `<c>` is equal on both sides, even though it is nested deeper on the right side.



**Note:** When the **Ignore node depth** check box is selected, merging and exporting differences are not possible.

## Case sensitivity

If the **Ignore case** check box is checked, then case is ignored, and you have the option of ignoring or not ignoring case in node names.

## Order

If **Ignore order of child nodes** is selected, then the relative position of the child nodes of an element is ignored, provided that the individual nodes within a node level have unique node names. As long as an element node with the same name exists in each of the two sets of sibling nodes, the two sets are considered to be equal. In the following example, the order of the `<Name>` and `<FirstName>` nodes is different in the left and right file and is marked as different if the **Ignore order of child nodes** option is deactivated.



Checking the **Ignore order of child nodes** option will ignore this difference in the comparison window.



Note, however, that DiffDog can ignore the order of child nodes only if the node names on a certain node level are unique. If several occurrences of a node appear, e.g. with different attributes assigned, a node, if appearing in a different order, will always be considered unequal to an element with the same name and attribute in the compared sibling set—even if the **Ignore order of child nodes** is selected. If we add different attributes to the <Phone> node of our example, then the difference in order of the three occurrences of the <Phone> node will appear in the comparison window although the **Ignore order of child nodes** check box is selected.

4	<FirstName>John</FirstName>	4	<Name>Smith</Name>
5	<Phone type="office">+3375456i	5	<Phone type="office">+3375456i
6	<Phone type="mobile">+331894	6	<Phone type="home">+3375584
7	<Phone type="home">+3375584	7	<Phone type="mobile">+331894

In order to ignore the order of several occurrences of child nodes that have different attributes assigned, you can add these attributes as comparison criteria. DiffDog provides two options: (i) add all attributes and (ii) define a list of specific attributes, which in our example will both result in the <Phone> nodes being displayed as equal. However, if you select the **Specific attributes** option, you will first have to [define an attribute group](#)<sup>45</sup> accordingly.

4	<FirstName>John</FirstName>	4	<Name>Smith</Name>
5	<Phone type="office">+3375456i	5	<Phone type="office">+3375456i
6	<Phone type="mobile">+331894	6	<Phone type="home">+3375584
7	<Phone type="home">+3375584	7	<Phone type="mobile">+331894

It may happen that several occurrences of child nodes appear that have also the same attribute assigned (e.g. a person with more than one mobile phone number in our example). In the image below, the **All attributes** radio button has been selected, however differences are still reported since two mobile phone numbers are listed.

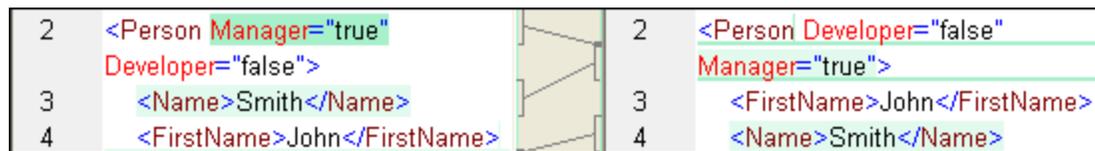
4	tName>John</FirstName>	4	ne>Smith</Name>
5	ne type="office">+3375456687456<	5	ne type="office">+3375456687456<
6	ne type="mobile">+331894786914<	6	ne type="home">+337558458935<
7	ne type="home">+337558458935<	7	ne type="mobile">+331894786924<
8	ne type="mobile">+331894786924<	8	ne type="mobile">+331894786914<

In DiffDog you can cope also with this scenario by activating the **Add element text as comparison criteria** check box. If element text, attribute value, and node name are identical and only the order of the nodes is different, no differences will be reported.

4	tName>John</FirstName>	4	ne>Smith</Name>
5	ne type="office">+3375456687456<	5	ne type="office">+3375456687456<
6	ne type="mobile">+331894786914<	6	ne type="home">+337558458935<
7	ne type="home">+337558458935<	7	ne type="mobile">+331894786924<
8	ne type="mobile">+331894786924<	8	ne type="mobile">+331894786914<

Note that, if the Ignore Order option is specified, then the merge functionality also ignores the order. If **Ignore order of child nodes** is unselected, then differences in order are represented as differences.

The option of ignoring the order of attributes is also available, and applies to the order of attributes of a single element. In the above example, the **Ignore order of attributes** option has been checked and DiffDog, therefore, has ignored the order of the attributes of the <Person> node. Note that the order of attributes will always be ignored, if the **Ignore order or child nodes** check box is activated. In the screenshot below, both the **Ignore order of child nodes** and the **Ignore order of attributes** check box are deactivated.



## Ignore node types

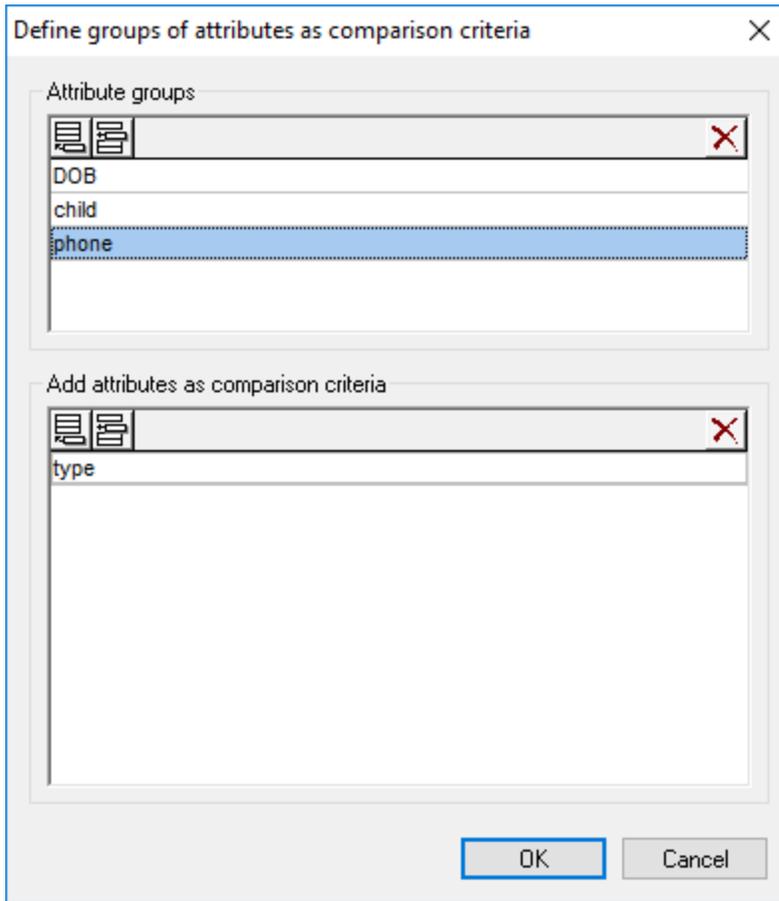
Check the node types that will not be compared in the Compare session. Node types that may be ignored are Attributes, CDATA, Comments, Processing Instructions, DOCTYPE statements, and XML declarations.

## Filter out specific elements/attributes

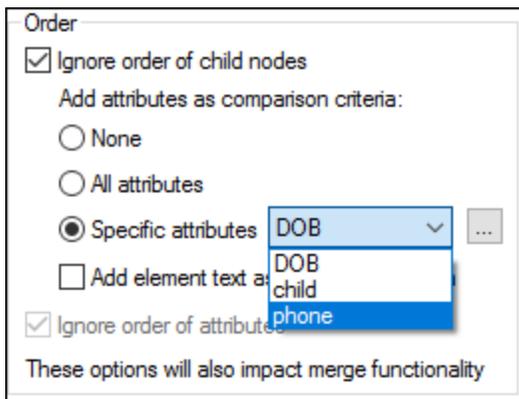
Enables you to [define filters](#)<sup>47</sup> to set what elements and/or attributes should not be considered for comparison. A filter is defined at the application level, which means that once a filter is defined, it is available for every comparison. More than one filter can be defined, and, for every comparison, the filter to be used is selected in the drop-down list in the Filter out specific elements/attributes group box.

### 2.3.2.1 Defining Groups of Attributes

If you choose the **Specific attributes** radio button in the Order group box, the Define groups of attributes as comparison criteria dialog box opens where you can create different lists of attributes that shall be used as comparison criteria.



Attributes to be considered as comparison criteria are organized in attribute groups, that is, you first have to define an attribute group and then add the relevant attributes to the group. You can select the attribute group to be used from the **Specific attributes** drop-down list in the Comparison Options dialog box.

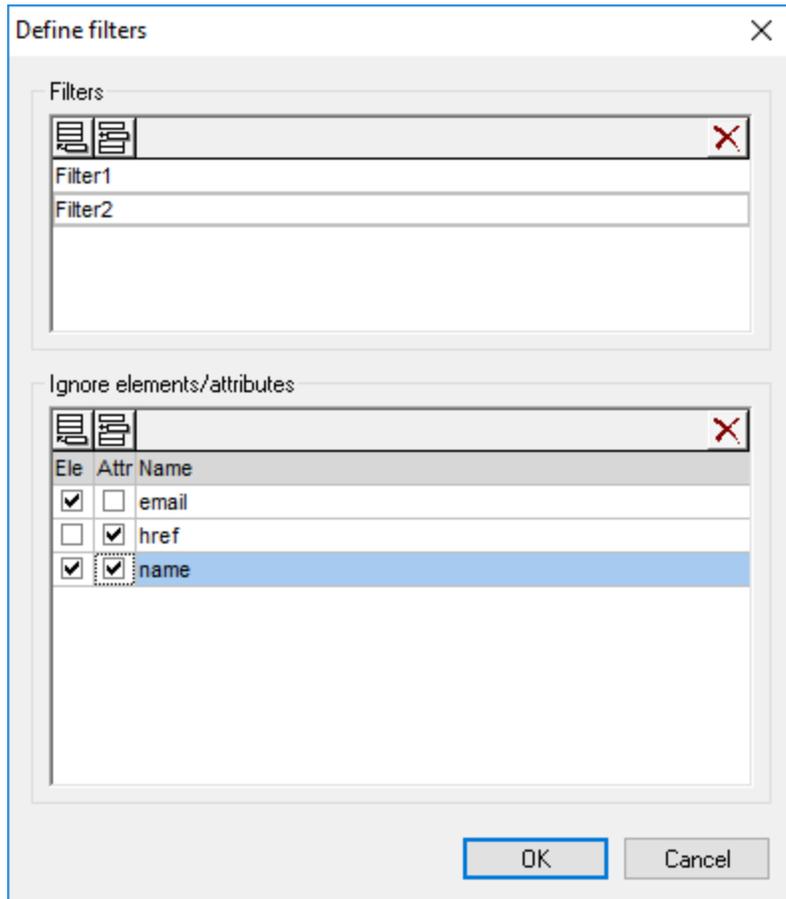


**To define groups of attributes to be considered as comparison criteria:**

1. Select the menu option **Tools | Comparison Options...** or click the **Comparison Options**  button in the Diff and Merge toolbar, and change to the XML tab.
2. In the "Order" group box, activate the radio button **Specific attributes** and click the **Browse**  button next to the drop-down list to open the Define groups of attributes as comparison criteria dialog box.
3. In the "Attribute groups" group box, click the respective icon to append  or insert  a group to the list of groups and give it a name. Always define a group before specifying attributes. Do not enter the attributes in the "Attribute groups" group box.
4. With the attribute group selected, in the "Add attributes as comparison" group box, click the respective icon to append  or insert  elements to the list and enter the name of the attribute that should be considered. Add an extra list element for each attribute.
5. When done with defining attribute groups, click **OK**. The defined attribute groups are now available in the combo box in the Comparison Options dialog box.

### 2.3.2.2 Defining a Filter to Ignore Elements or Attributes for Comparison

Filters are defined by clicking the **Define Filters**  button in the Comparison Options dialog box, which pops up the Define Filters dialog box.



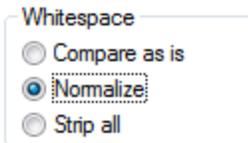
In the image above, two filters (`Filter1` and `Filter2`) have been defined. `Filter1` specifies that the elements `email` and `name`, and the attributes `href` and `name`, are to be ignored for comparison.

#### To create a filter for ignoring element/attributes for comparison:

1. Select the menu option **Tools | Comparison Options...** or click the **Comparison Options**  button in the Diff and Merge toolbar, and change to the XML tab.
2. In the Filter out specific elements/attributes group box, click the **Define Filters**  button to open the Define filters dialog box.
3. In the Filters group box, click the respective icon to append  or insert  a filter to the list of filters and give it a name.
4. With the filter selected, in the Ignore Elements/Attributes group box, click the respective icon to append  or insert  elements and filters to the list. The **Ele** check box is activated by default.
5. Deactivate the **Ele** check box and/or activate the **Att** check box, if required, and enter a name for the element/attribute.
6. Optionally, repeat steps 4 and 5 for additional elements/attributes.
7. When done with defining a filter, click **OK**. The defined filters are now available in the combo box in the Comparison Options dialog box.

### 2.3.3 Comparison Options for Whitespace Characters

Whitespace characters are any of the following: space, tab, carriage return, and line feed. You can change the comparison options for whitespace characters from the **Tools | Comparison Options** menu.



When the **Compare as is** option is enabled, Text A is considered equal to Text B if characters in Text A (including whitespace characters) correspond to those in Text B. The whitespace characters are relevant for comparison.

When the **Normalize** option is enabled, Text A is equal to Text B if, after normalization, characters in Text A correspond to those in Text B. "Normalization" means that multiple consecutive occurrences of whitespace characters are replaced by a single space character. Also, the leading and trailing whitespace characters are trimmed for each line of text.

**Note:** In case of XML (  ) comparison, the leading and trailing whitespace characters in element and attribute values are trimmed.

When the **Strip all** option is enabled, Text A is considered equal to Text B if, after stripping whitespace characters, characters in Text A correspond to those in Text B. In other words, any whitespace characters are stripped from the text and considered not relevant for comparison.

**Note:** In case of XML comparison (  ), whitespace characters that are outside attribute or element values are disregarded for comparison. This is true for any of the whitespace options above.

The following table illustrates differences when comparing text with each option, using text (  ) or Word comparison.

Text A	Text B	As is	Normalize	Strip
"a"	"a "	not equal	equal	equal
"a"	" a"	not equal	equal	equal
"a a"	"a a"	not equal	equal	equal

The following table illustrates differences when comparing text with each option, using XML (  ) comparison.

Text A	Text B	As is	Normaliz e	Strip
<?xml version="1.0"	<?xml version="1.0"	equal	equal	equal
<book id="1">	<book id=" 1 ">	not equal	equal	equal

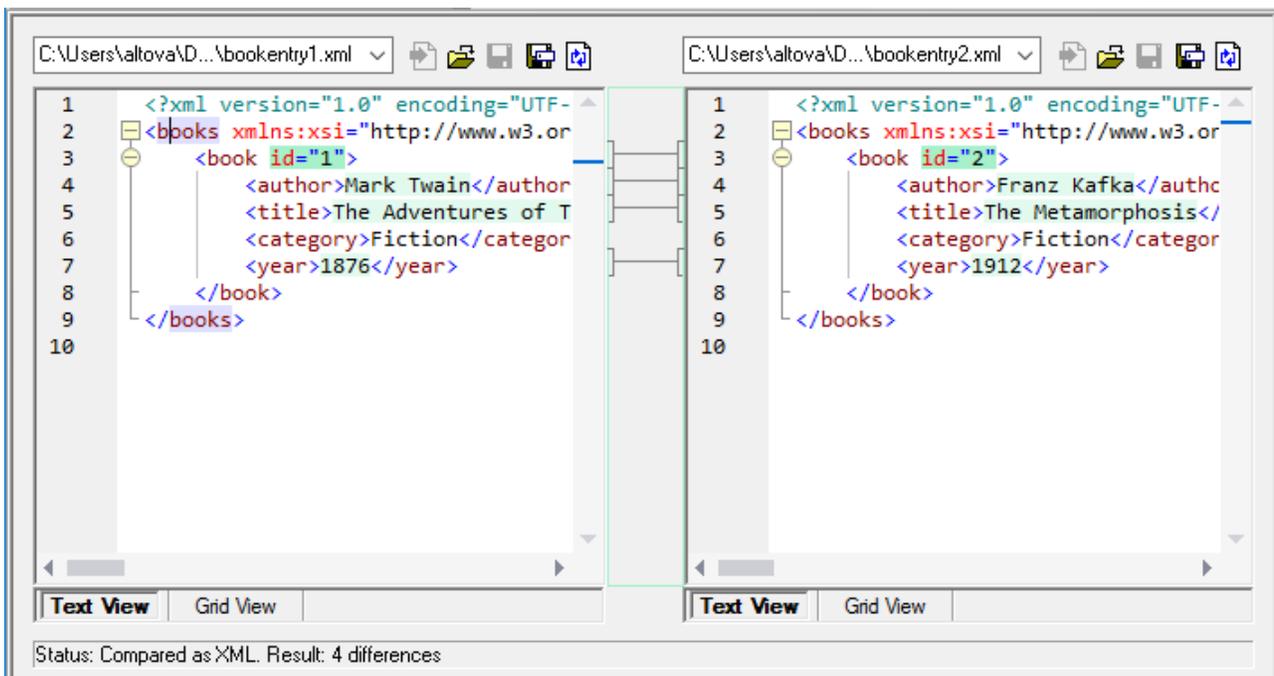
Text A	Text B	As is	Normaliz e	Strip
<author>Mark Twain</author>	<author>Mark Twain</author>	not equal	equal	equal

## 2.4 Displaying Differences in Files

After you start a comparison, the differences between the two files are displayed as blocks of highlighted text and the results of the comparison are reported in the Comparison Window Status Bar. Normally, [Text View](#)<sup>51</sup> is used for displaying differences, however if you compare well-formed files, you can also switch to [Grid View](#)<sup>55</sup>.

### 2.4.1 Text View

Text View is the standard display mode for any file pair being compared in DiffDog. Notice that the corresponding differences in the two documents are linked for easier identification and analysis. When [synchronized scrolling](#)<sup>282</sup> is toggled on, both documents scroll so that corresponding differences are always in view simultaneously.



The current difference is highlighted in a different color than the other differences. In the screenshot above the current difference is displayed in a darker green. These colors can be changed in the [DiffDog Options](#)<sup>255</sup>. It is important to know which difference is the current difference because [merging](#)<sup>242</sup> is always done for the current difference only. You can [navigate](#)<sup>241</sup> among the differences with the navigation commands that are available in the **Diff and Merge** menu and as toolbar icons.

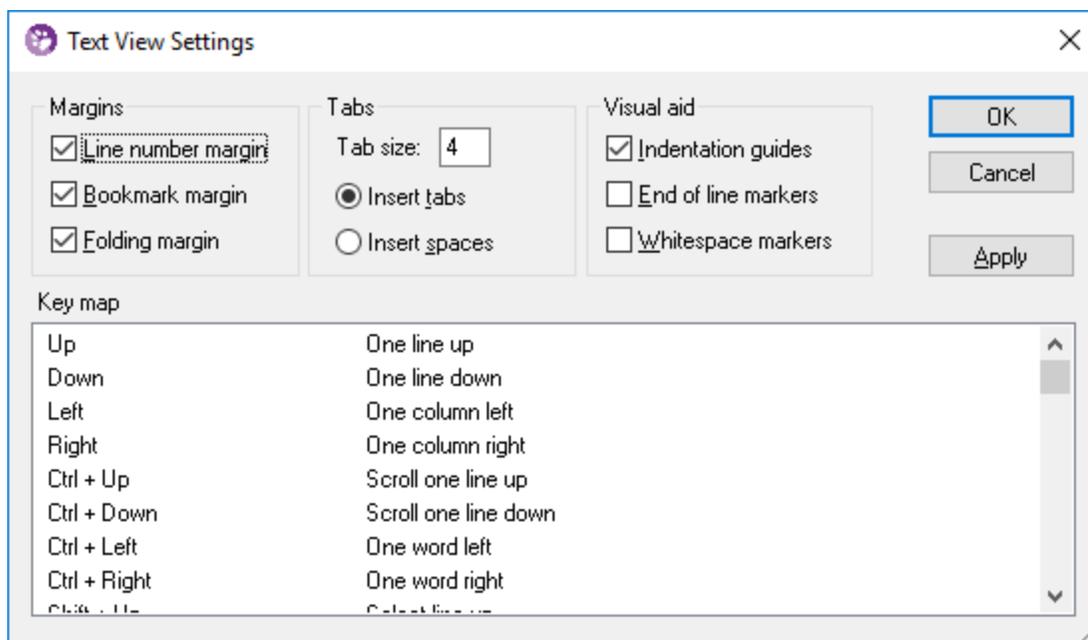
#### 2.4.1.1 Using Visual Aids in Text View

Text View has multiple visual aids to make the display and editing of text easier. These include:

- [Line Numbers](#)<sup>53</sup>
- [Syntax Coloring](#)<sup>53</sup>

- [Bookmarks](#) <sup>53</sup>
- [Source Folding](#) <sup>53</sup>
- [Indentation Guides](#) <sup>54</sup>
- [End-of-Line and Whitespace Markers](#) <sup>54</sup>
- [Zooming](#) <sup>54</sup>
- [Go-to-Line/Character](#) <sup>51</sup>
- [Pretty-printing](#) <sup>55</sup>
- [Word wrapping](#) <sup>55</sup>
- [Start and end tag matching](#) <sup>55</sup>
- [Text highlighting](#) <sup>55</sup>

Where applicable, you can toggle or customize the features above from the Text View Settings dialog box. Settings in the Text View Settings dialog box apply to the entire application—not only to the active document.



*Text View Settings dialog box*

To open the **Text View settings** dialog box, do one of the following:

- On the **Text View** menu, select **Text View Settings**.
- Click the **Text View Settings** button in the Text toolbar.

Some of the navigation aids can also be toggled from the Text toolbar, the application menu, or keyboard shortcuts.



*Text toolbar*

For reference to all shortcuts applicable in the File Comparison window, see the "Key Map" section of the **Text View Settings** dialog box illustrated above.

## Line numbers

Line numbers are displayed in the line numbers margin, which can be toggled on and off in the Text View Settings dialog box. When a section of text is collapsed, the line numbers of the collapsed text are also hidden. A related command is the [Go-to-Line/Character](#)<sup>54</sup> command.

## Syntax coloring

Syntax coloring is applied according to the semantic value of the text. For example, in XML documents, depending on whether the XML node is an element, attribute, content, CDATA section, comment, or processing instruction, the node name (and in some cases the node's content) is colored differently. You can enable or disable syntax coloring for various file extensions (including custom extensions) from the **Tools | DiffDog Options** menu, [File Types](#)<sup>264</sup> tab.

## Bookmarks

Lines in the document can be separately bookmarked for quick reference and access. If the bookmarks margin is toggled on, bookmarks are displayed in the bookmarks margin; otherwise, bookmarked lines are highlighted in cyan.

The bookmarks margin can be toggled on or off in the Text View Settings dialog box.

You can edit and navigate bookmarks using commands in the **Text View** menu and Text toolbar. Bookmarks can be inserted with the **Text View | Insert/Remove Bookmark** command, enabling you to mark a line in the document for reference. A bookmark can be removed by selecting the bookmarked line and then selecting the **Text View | Insert/Remove Bookmark** command. To navigate through the bookmarks in a document, use the **Text View | Next Bookmark** and **Text View | Previous Bookmark** commands. These bookmark commands are also available as icons in the Text toolbar.

## Source folding

Source folding refers to the ability to expand and collapse nodes and is displayed in the source folding margin. The margin can be toggled on and off in the Text View Settings dialog box. To expand or collapse portions of text, click the "+" and "-" nodes at the left side of the window. Any portions of collapsed code are displayed with an ellipsis symbol. To preview the collapsed code without expanding it, move the mouse cursor over the ellipsis. This opens a tooltip that displays the code being previewed, as shown in the image below. Note that, if the previewed text is too big to fit in the tooltip, an additional ellipsis appears at the end of the tooltip.

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <!-- edited with XMLSPY v2004 U (http://www.xmlspy.com) by Mr. Nobody (Altova
   GmbH) -->
3  <Customers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:noNamespaceSchemaLocation="Customers.xsd">
4  <Customer>
5      <Number>1</Number>
6      <FirstName>Fred</FirstName>
7      <LastName>Landis</LastName>
8      <Address>...</Address>
14 </Customer>
15 <Customer>
16     <Number>2<
17     <FirstName>
18     <LastName>Butter</Lastname>

```

The **Toggle All Folds** command in the Text toolbar toggles all nodes together to their expanded or collapsed forms.

### Indentation guides

Indentation guides are vertical dotted lines that indicate the extent of a line's indentation (see *screenshot above*). They can be toggled on and off in the Text View Settings dialog box.

### End-of-line markers, whitespace markers

End-of-line (EOL) markers and whitespace markers can be toggled on in the Text View Settings dialog box. The screenshot below shows these markers in the document display; each dot represents a whitespace.

```

12 .....<Person Manager="true" Degree="BA" Programmer="false"> CR
13 .....<First>Fred</First> CR
14 .....<Last>Smith</Last> CR
15 .....<PhoneExt>22</PhoneExt> CR
16 .....<Email>Smith@work.com</Email> CR
17 .....</Person> CR

```

### Zooming in and out

You can zoom in and out of Text View by scrolling (with the scroll-wheel of the mouse) while keeping the **Ctrl** key pressed. This enables you to magnify and reduce the size of text in Text View. If you wish to increase the size of fonts, do this in the [DiffDog Options](#) <sup>256</sup> dialog box.

### Go to line/character

This command in the **View** menu and Text toolbar enables you to go to a specific line and character in the document text.

## Pretty-printing

The **Pretty-Print XML Text** command reformats the active XML document in Text View to give a structured display of the document. Each child node is offset from its parent by four space characters.

To pretty-print an XML document, select the **Text View | Pretty-Print XML Text** menu command, or click the  button in the Text toolbar

**Note:** The Pretty-Print XML Text command is not a toggle command. Once the command is executed, the pretty-printed format cannot be undone by clicking the Pretty-Print XML Text command again. To undo the pretty-printed format, use the **Undo** <sup>278</sup> (**Ctrl+Z** or **Alt+Backspace**) command.

## Word wrapping

To toggle word wrapping in the currently active document, select the **Text View | Word Wrap** menu command, or click the  button in the Text toolbar.

## Start and end tag matching

When you place the cursor inside a start or end tag of a markup element, the corresponding start or end tag is highlighted as well. When you edit the name of an element in a start tag, then the end tag will be automatically edited as well.

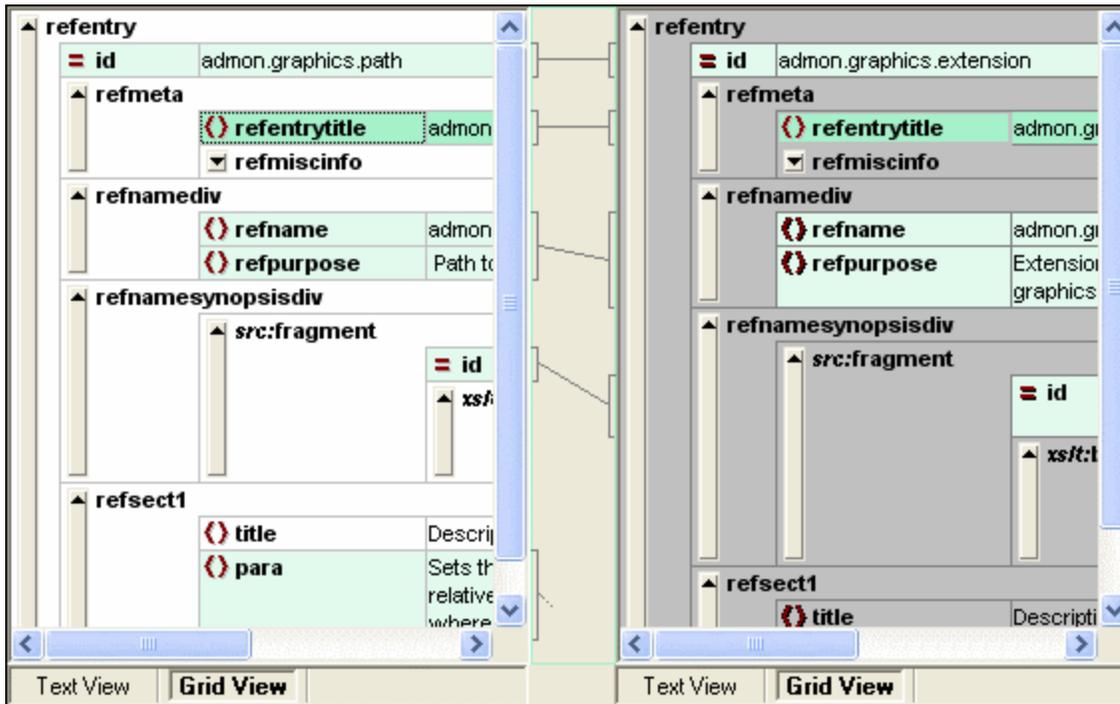
## Text highlighting

When you select text, all matches in the document of the text selection that you make are highlighted automatically. The selection is highlighted in pale blue, and matches are highlighted in pale orange. The selection and its matches are indicated in the scroll bar by gray marker-squares. The current cursor position is given by the blue cursor-marker in the scroll bar.

## 2.4.2 Grid View

**Altova website:**  [xml diff](#)

Grid View can be used to display files that are well-formed, typically XML files. In Grid View, each node is displayed as a row in a grid. This enables you to see the hierarchy in a graphical view, to navigate through the document more easily, and to manipulate the structure of the document using graphical mechanisms such as drag-and-drop.



Note the following points, all of which can be seen in the screenshot above:

- Node names are displayed in bold, their contents in normal font.
- Different node types are indicated with different symbols. For example, attributes are indicated with a red = symbol, elements with red angular brackets.
- Nodes that are different from one document to the other are highlighted, with the current difference being highlighted in a different color.
- Corresponding differences in the two documents are joined with a line.

Nodes (rows) can be expanded and collapsed by clicking on the upward arrow button at the extreme left of a grid row. To edit a node name or node contents, double-click the location where you wish to insert the cursor.

Grid rows can be dragged to new locations by selecting the row and dragging it to the desired location. Multiple nodes that are contiguously located can be selected for this operation. Individual nodes can also be [moved left](#)<sup>299</sup> or [moved right](#)<sup>300</sup> using the respective **Grid View** menu commands (or their toolbar icons). This changes the position of the node in the document hierarchy. Graphical manipulation of structure and contents is further enhanced in [Table View](#)<sup>57</sup>, which is another mode of Grid View.

Columns can be resized by dragging their borders left or right.

### 2.4.2.1 Displaying Repeating Elements as Table

In normal Grid View, each node has a grid row to itself, as shown in the screenshot below.

▲ member	name	USA
	pop	290
▲ member	name	UK
	pop	80
▲ member	name	FRA
	pop	82
▲ member	name	GER
	pop	88
▲ member	name	AUT
	pop	9

When an element occurs multiple times at the same hierarchical level (as is the case with the member element in the screenshot above), it can be displayed as a table in which each occurrence of the element created as a table is represented as a row. The table element's child nodes (attributes, elements, etc) are displayed as columns of the table.

▲ member (5)		
	name	pop
1	USA	290
2	UK	80
3	FRA	82
4	GER	88
5	AUT	9

#### To display multiple elements as table:

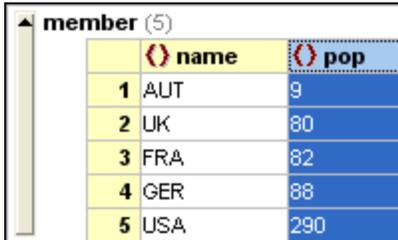
1. Select one of the occurrences of the element to be created as a table.
2. Select the menu option **Grid View | Table | Display as Table** or click the **Display as Table**  button in the Grid toolbar.

#### To switch from Table View to the normal Grid View:

- Select the table or any of its rows (not a column or cell), and click the **Display as Table**  toolbar icon.  
The table element switches to normal Grid View.

## Editing the table

The structure and contents of the table can also be edited using table mechanisms. For example, rows (new table element occurrences) and columns (new child nodes for all table element occurrences) can be inserted into the table, and the table can be sorted on one of its columns.



The screenshot shows a table with the title "member (5)". The table has two columns: "name" and "pop". The rows are numbered 1 through 5. The "name" column contains country codes: AUT, UK, FRA, GER, and USA. The "pop" column contains population values: 9, 80, 82, 88, and 290. The table is sorted by the "pop" column in ascending order.

	name	pop
1	AUT	9
2	UK	80
3	FRA	82
4	GER	88
5	USA	290

In the screenshot above, the table (for member elements) is sorted on the pop column. (This was done by selecting the pop column and then clicking the command **Grid View | Table | Ascending Sort.**)

## 2.5 Editing Files

After you have [run a comparison](#)<sup>28</sup> and [investigated the differences](#)<sup>51</sup> of the two files, you can edit the content of the files directly in DiffDog. The available editing features differ for text-based and XML-based files.

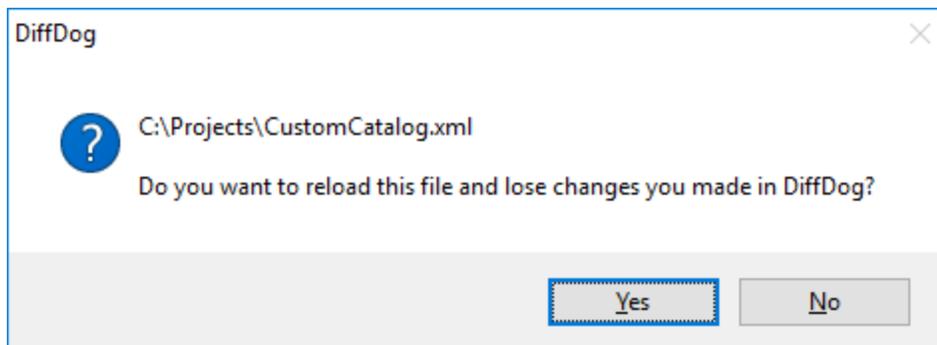
[Changes to the content](#)<sup>59</sup> of both text-based and XML-based files are made in Text View. When comparing well-formed XML-based files, DiffDog's Grid View allows you to also [change the document structure](#)<sup>60</sup> of the files.

### Reloading files

You can always undo all changes you have made to a document since you last saved it, and reload the file into DiffDog. A warning message will be displayed if you are about to lose changes.

#### To reload a file into DiffDog:

1. In the respective pane of a comparison window, click the **Reload**  button.
2. If the file has changed since you last saved it, a warning message is displayed.



3. Click **Yes** if you want to reload, or **No** if you want to cancel the operation.

### 2.5.1 Changing the Content

In Text View, DiffDog provides syntax coloring and other visual aids such as line numbering, indentation, and bookmarking, as well as powerful Find and Replace functionality that can help with editing (see [Using Visual Aids in Text View](#)<sup>51</sup>). A history of changes is maintained for each file separately, and unlimited Undos are allowed.

If you have the **Compare while Editing**  option activated in the **Diff and Merge** menu, the comparison of the files is refreshed continuously as you type.

#### To edit files:

- Type in your changes in the respective pane of the File Comparison window.

To undo changes made in a pane:

- Place the cursor in the pane and click **Edit | Undo** or press **Ctrl+Z**.

## 2.5.2 Changing the Structure

The Grid View shows the hierarchical structure of well-formed, XML-based documents through a set of nested containers, that can be easily expanded and collapsed to get a clear picture of the document's structure. In Grid View contents and structure can both be easily manipulated. For example, you can insert or append new elements or attributes, edit the content of the file, or drag the individual elements to a different location in the document.

To modify the file structure in Grid View:

1. Click to select the element or attribute where you want to make the change.
2. Use the commands available in the **Grid View** menu (for example, **GridView | Insert | New Element**). Alternatively, right-click an element and select the appropriate context menu commands.

## 2.6 Finding and Replacing Text

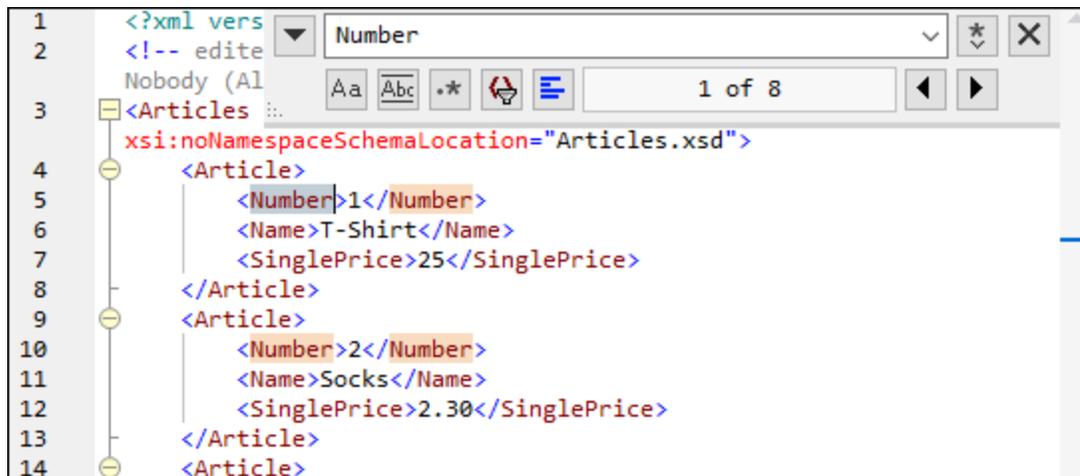
DiffDog offers powerful Find and Replace functionality that can help with editing. Please note that the scope of the **Find**, **Find next**, and **Replace** commands is the active document, and not both documents of a file comparison.

The Find and Replace options are different for Text View and Grid View. See [Finding and Replacing in Text View](#)<sup>61</sup> and [Finding and Replacing in Grid View](#)<sup>65</sup>, respectively.

### 2.6.1 Finding and Replacing in Text View

You can search for a term in the entire document or within a text selection. To start a search in Text View mode, press **Ctrl+F** or select the menu command **Edit | Find**. You can enter a string or use the combo box to select a string from one of the last 10 strings. When you enter or select a string, all matches are highlighted, and the positions of the matches are indicated by orange markers in the scroll bar (see *screenshot below*). The position of the currently selected match (highlighted in gray) depends on where the cursor was last located.

You can see the total number of matches and the index position of the currently selected match. Use the  (**Previous**) and  (**Next**) buttons to switch between the matches. To switch between the **Find** and **Replace** modes, click the  button.



#### Find options

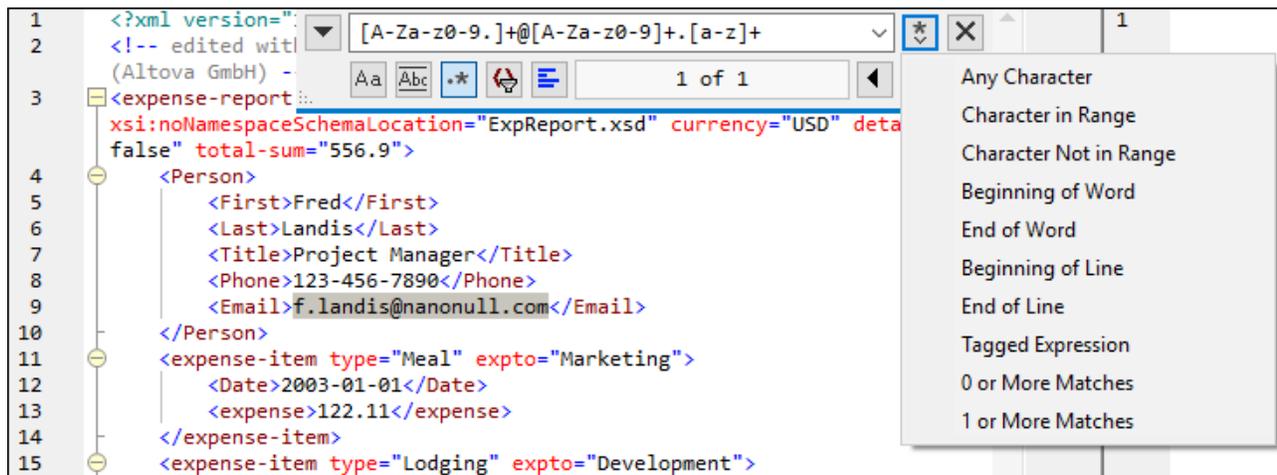
You can specify find criteria with the help of the buttons located under the search field. The list of the available options is given in the table below.

Option	Icon	Description
Match case		Does a case-sensitive search: e.g., <i>Address</i> is not the same as <i>address</i> .

Option	Icon	Description
Match whole word		Only identical words will match.
Use regular expression		If this option is toggled on, the search term will be read as a regular expression. See <i>Regular expressions</i> below.
Find anchor		The position of an anchor depends on the place where the cursor was last located. Clicking the <b>Previous</b> and <b>Next</b> buttons does not change the position of the anchor.
Find in selection		A selection is a marked piece of text. To find a term within a selection, mark a piece of text, press <b>Ctrl+F</b> , make sure the <b>Find in selection</b> button is pressed, and type the term in the search field.

## Regular expressions

You can use regular expressions to find a text string. To do this, switch on the **Use regular expressions** option (see *table above*). Then enter a regular expression in the search field. Clicking (**Regular Expression Builder**) gives you a list of sample regular expressions (see *below*). The screenshot below shows a regular expression that helps find email addresses.



### Regular expression metacharacters

The table below shows metacharacters that you can use to find and replace text. All the metacharacters except for the last two correspond to the menu items in **Regular Expression Builder** (see *above*).

Menu item	Metacharacters	Description
Any Character	.	Matches any character. This is a placeholder for a single character.
Character in Range	[ . . . ]	Matches any characters in this set. For example, [abc] matches any of the characters a, b or c. You can also use ranges: e.g., [a-z] for lower case character.
Character Not in	[ ^ . . . ]	Matches any characters not in this set. For example, [^A-Za-z]

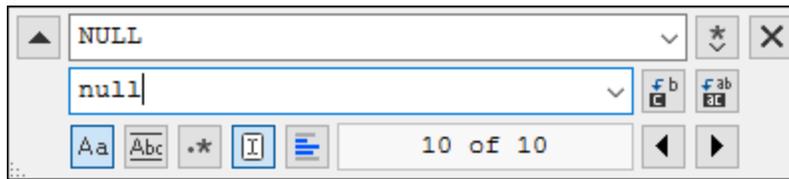
Menu item	Metacharacters	Description
Range		matches any character except an alphabetic character.
Beginning of Word	\<	Matches the beginning of a word.
End of Word	\>	Matches the end of a word.
Beginning of Line	^	Matches the beginning of a line unless it is used inside a set (see above).
End of Line	\$	Matches the end of a line. For example, <b>A+\$</b> matches one or more A's at the end of a line.
Tagged Expression	(abc)	<p>The parentheses mark the start and end of a tagged expression. Tagged expressions may be useful when you need to tag ("remember") a matched region to refer to it later. Up to nine sub-expressions can be tagged and then back-referenced later.</p> <p>For example, <b>(the) \1</b> matches the string <code>the the</code>. This expression can be explained as follows: Match the string <code>the</code> and remember it as a tagged region; the expression must be followed by a space character and a back-reference to the tagged region matched previously.</p>
0 or More Matches	*	Matches zero or more matches of the preceding expression. For example, <b>sa*m</b> matches <code>Sm, Sam, Saam, Saaam</code> and so on.
1 or More Matches	+	Matches one or more occurrences of the preceding expression. For example, <b>sa+m</b> matches <code>Sam, Saam, Saaam</code> and so on.
	\n	Where <i>n</i> is 1 through 9, <i>n</i> refers to the first through ninth tagged region (see above). For example, if the search string is <b>Fred\([1-9]\)XXX</b> and the replace string is <b>Sam\1YYY</b> , when applied to <b>Fred2XXX</b> , this will generate <b>Sam2YYY</b> .
	\x	Allows using a character <i>x</i> , which would otherwise have a special meaning. For example, <b>\[</b> would be interpreted as <code>[</code> and not as the start of a character set.

See also [Example: Replacing Text Using Regular Expressions](#) <sup>66</sup>.

## Replace text

To replace text, follow the instructions below:

1. Open the **Replace** dialog: Press **Ctrl+H** or select the menu command **Edit | Replace**. Alternatively, you can switch to **Replace** mode of the **Find/Replace** dialog by clicking the  button in the top left corner of the dialog.



2. Enter the string you would like to replace in the **Find** field and enter the new string in the **Replace** field.
3. The **Replace Next** and **Replace All** buttons are located to the right of the **Replace** field. If you click **Replace Next**, one of the following happens: (i) If the cursor is located near a match or inside a match, the match is replaced; (ii) if the cursor is located outside a match, the cursor jumps to the next match. Click **Replace All** to replace all matches.

### Replace text within a selection

To replace text within a selection, take the steps below:

1. Mark a piece of text.
2. Toggle on the **Find in selection** option.
3. Enter the **Find** and **Replace** text strings.
4. Click **Replace Next** or **Replace All** as required.

To undo the replace action, press **Ctrl+Z** or select **Edit | Undo**.

### Find and replace special characters

If the **Use regular expressions** option is enabled, you can search for any of the following special characters within the text:

- \t (Tab)
- \r (Carriage Return)
- \n (New line)
- \\ (Backslash)

For example, to find a tab character, press **Ctrl + F**, select the **Use regular expressions** option, and enter `\t` in the **Find** dialog box.

The special characters above can also be used as replacement text. For example, to replace all occurrences of semi-colons by carriage returns within the text `A;B;C;D`, use the following find and replace options:



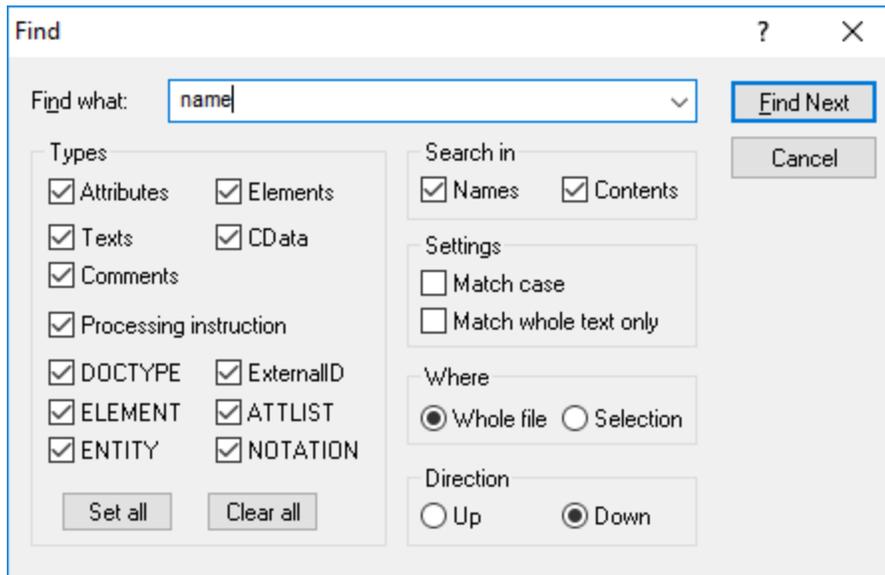
The outcome is shown below:

A  
B  
C  
D

## 2.6.2 Finding and Replacing in Grid View

### To search for text in Grid View:

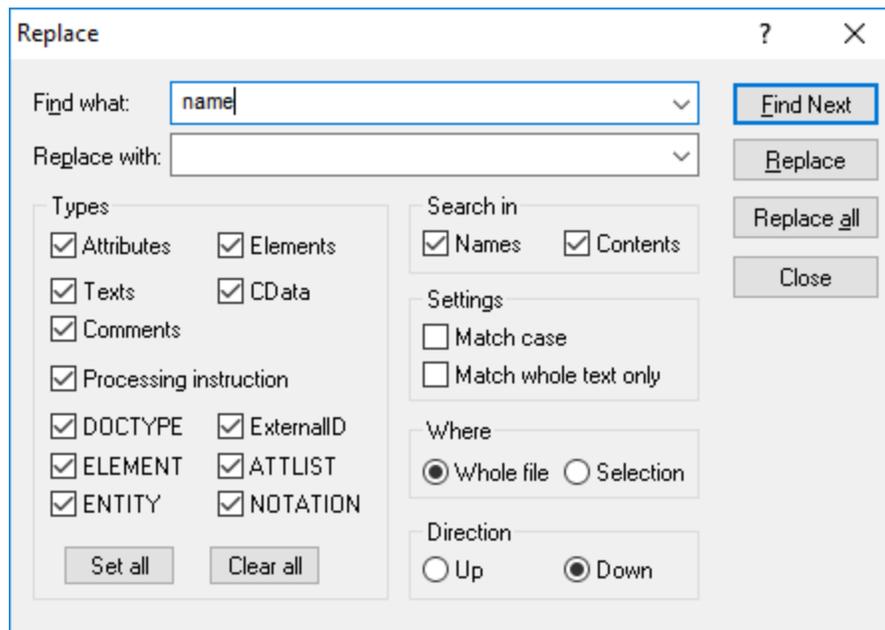
1. Place the cursor into the pane in which you want to search for text.
2. Select the menu option **Edit | Find** or press **Ctrl+F**.



3. Enter the text you want to search for into the **Find what** field.
4. To restrict your search, select the required XML node type or DTD declarations to be searched in the [Types](#)<sup>66</sup> group box.
5. Click **Find Next**.
6. To jump to the next found occurrence, press **F3**.

### To replace text in Grid View:

1. Place the cursor into the pane in which you want to search for text.
2. Select the menu option **Edit | Replace** or press **Ctrl+H**.



## Types

In the Types group box, you can select or deselect various XML node type or DTD declarations to be searched. The **Set all** and **Clear all** buttons enable you to check or uncheck all options with a single click.

## Search in

You can search only the names and/or the contents of nodes by activating the respective check boxes in the Search in group box.

## Settings

**Match case** finds the text string only if the casing in the document is the same as that in the entry. **Match whole text only** finds the text string only if, in the document, it is delimited by spaces.

## Where

The scope of the search can be restricted to the current selection or the whole file can be searched.

## Direction

The **Up** and **Down** options define whether the search should progress upwards or downwards from the current selection or cursor location.

## 2.6.3 Example: Replacing Text Using Regular Expressions

This example illustrates how to find and replace text using regular expressions. In many cases, finding and replacing text is straightforward and does not require regular expressions at all. However, there may be instances where you need to manipulate text in a way that cannot be done with a standard find and replace

operation. Consider, for example, that you have an XML file of several thousand lines where you need to rename certain elements in one operation, without affecting the content enclosed within them. Another example: you need to change the order of multiple attributes of an element. This is where regular expressions can help you, by eliminating a lot of work which would otherwise need to be done manually.

### Example 1: Renaming elements

The sample XML code listing below contains a list of books. Let's suppose your goal is to replace the <Category> element of each book to <Genre>. One of the ways to achieve this goal is by using regular expressions.

```
<?xml version="1.0" encoding="UTF-8"?>
<books xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="books.xsd">
  <book id="1">
    <author>Mark Twain</author>
    <title>The Adventures of Tom Sawyer</title>
    <category>Fiction</category>
    <year>1876</year>
  </book>
  <book id="2">
    <author>Franz Kafka</author>
    <title>The Metamorphosis</title>
    <category>Fiction</category>
    <year>1912</year>
  </book>
  <book id="3">
    <author>Herman Melville</author>
    <title>Moby Dick</title>
    <category>Fiction</category>
    <year>1851</year>
  </book>
</books>
```

To solve the requirement, follow the steps below:

1. Press **Ctrl+H** to open the Find and Replace dialog box.
2. Click **Use regular expressions**  **.\***.
3. In the Find field, enter the following text: `<category>(.*?)</category>`. This regular expression matches all `category` elements, and they become highlighted.

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <books xmlns:xsi="http://www.w3.org/2001/XMLSchema"
3  books.xsd">
4      <book id="1">
5          <author>Mark Twain</author>
6          <title>The Adventures of Tom Sawyer</title>
7          <category>Fiction</category>
8          <year>1876</year>
9      </book>
10     <book id="2">
11         <author>Franz Kafka</author>
12         <title>The Metamorphosis</title>
13         <category>Fiction</category>
14         <year>1912</year>
15     </book>
16     <book id="3">
17         <author>Herman Melville</author>
18         <title>Moby Dick</title>
19         <category>Fiction</category>
20         <year>1851</year>
21     </book>
22 </books>

```

To match the inner text of each element (which is not known in advance), we used the tagged expression `(.+)`. The tagged expression `(.+)` means "match one or more occurrences of any character, that is `.`, and remember this match". As shown in the next step, we will need the reference to the tagged expression later.

- In the Replace field, enter the following text: `<genre>\1</genre>`. This regular expression defines the replacement text. Notice it uses a back-reference `\1` to the previously tagged expression from the Find field. In other words, `\1` in this context means "the inner text of the currently matched `<category>` element".
- Click **Replace All** and observe the results. All `category` elements have now been renamed to `genre`, which was the intended goal.

## Example 2: Changing the order of attributes

The sample XML code listing below contains a list of products. Each product element has two attributes: `id` and a `size`. Let's suppose your goal is to change the order of `id` and `size` attributes in each `product` element (in other words, the `size` attribute should come before `id`). One of the ways to solve this requirement is by using regular expressions.

```

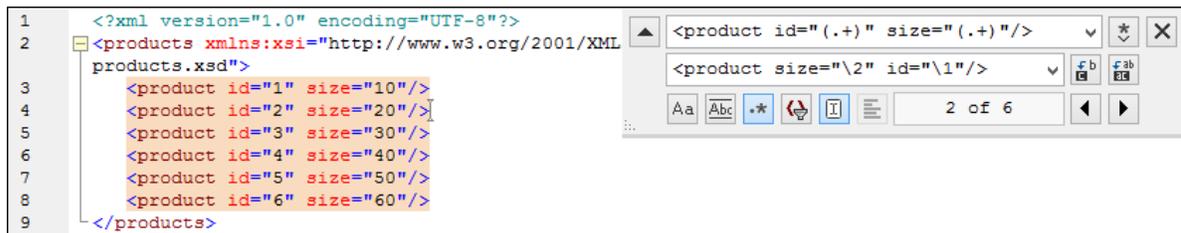
<?xml version="1.0" encoding="UTF-8"?>
<products xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="products.xsd">
  <product id="1" size="10"/>
  <product id="2" size="20"/>
  <product id="3" size="30"/>
  <product id="4" size="40"/>
  <product id="5" size="50"/>
  <product id="6" size="60"/>
</products>

```

To solve the requirement, follow the steps below:

- Press **Ctrl+H** to open the Find and Replace dialog box.

2. Click **Use regular expressions** .
3. In the Find field, enter the following: `<product id="(.)" size="(.)"/>`. This regular expression matches a product element in the XML document. Notice that, in order to match the value of each attribute (which is not known in advance), a tagged expression `(.)` is used twice. The tagged expression `(.)` matches the value of each attribute (assumed to be one or more occurrences of any character, that is `.+`).
4. In the Replace field, enter the following: `<product size="\2" id="\1"/>`. This regular expression contains the replacement text for each matched product element. Notice that it uses two references `\1` and `\2`. These correspond to the tagged expressions from the Find field. In other words, `\1` means "the value of attribute `id`" and `\2` means "the value of attribute `size`".



```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <products xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  products.xsd">
3   <product id="1" size="10"/>
4   <product id="2" size="20"/>
5   <product id="3" size="30"/>
6   <product id="4" size="40"/>
7   <product id="5" size="50"/>
8   <product id="6" size="60"/>
9 </products>
```

6. Click **Replace All**  and observe the results. All `product` elements have now been updated so that attribute `size` comes before attribute `id`.

## 2.7 Saving Files

To save a document you have edited in DiffDog, use the **Save**  or **Save As**  buttons in the respective panes of the comparison window. Files can also be saved using the **Close** , **Close All** , and **Save**  commands in the **File** menu.

In the **File comparison**  tab of the DiffDog Options dialog box, you can also specify whether and how backup files should be saved.

### To save a file:

Do one of the following:

- To save an individual file, click the **Save**  button in its pane of the comparison window.
- To save an individual file under a new name or path, click the **Save As**  button in its pane of the comparison window. The Windows Save As dialog box appears where you can specify the new name or path for the file.
- To save both files of a comparison, select the menu option **File | Save**. The Save files dialog box appears where you can select the files to be saved or choose to discharge the changes.

### To save and close the files of a comparison:

1. Click the tab of the comparison window that contains the files you want to save and close.
2. Select the menu option **File | Close**.
3. If a file contains unsaved changes, the Save files dialog box appears. Make sure that the file's check box is selected and click **Save selected**. The file is saved and the comparison window is closed.

### To save and close the files of all comparisons:

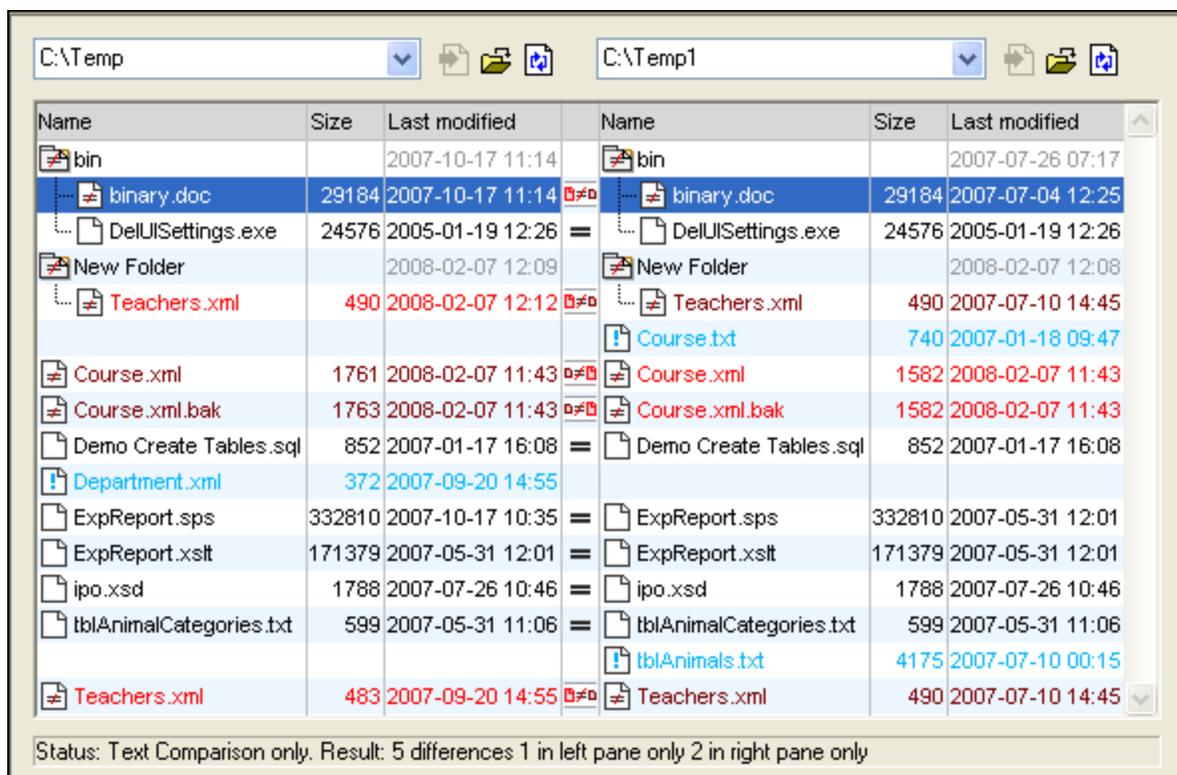
1. Select the menu option **File | Close all**.
2. For every comparison window that contains a file with unsaved changes, the Save files dialog box appears. Make sure that the file's check box is selected and click **Save selected**. The file is saved and the comparison window is closed.

### 3 Directory Comparison

Altova website: [Folder compare tool](#)

In DiffDog, directories and, optionally, their sub-directories are compared in Directory Comparison windows. Here you can [compare](#)<sup>78</sup>, [merge](#)<sup>242</sup>, or [synchronize](#)<sup>84</sup> directories. There are two ways in which DiffDog compares directories:

- By comparing the sizes and timestamps of files in the directories. This [comparison mode](#)<sup>21</sup> is called Quick Comparison Mode.
- By comparing the contents of files in directories. This comparison mode is Text Comparison Mode, or XML Comparison Mode, or Binary Comparison Mode, or Extensions Comparison Mode.



To start a directory comparison in DiffDog, you can either [directly choose two directories to compare](#)<sup>75</sup> or first open an empty Directory Comparison window and then [select the directories to be compared](#)<sup>75</sup>. Alternatively, you can also [select two directories in Windows Explorer](#)<sup>75</sup>, right-click and select **Compare with Altova DiffDog** from the context menu. This will open a new instance of DiffDog and display the selected folders in a Directory Comparison Window.

The comparison will start automatically unless you have deactivated the **Autostart Comparison** option in the **Diff and Merge** menu. You can change the [comparison mode](#)<sup>21</sup> as desired and restart the comparison. In addition, to eliminate differences, DiffDog allows you to [copy files from one pane to the other](#)<sup>242</sup>.

**To open a directory comparison window:**

Do one of the following:

- Select the menu option **File | Open** or press **Ctrl+O**. Then do the following:
  1. Select Compare directories in the Open comparison dialog box.
  2. Choose the directories to be compared in the Content group box.
  3. Optionally, select a filter from the File/directory filter drop-down list.
  4. Optionally, activate the Include subdirectories check box.
  5. Click **OK**.

A new Directory Comparison window containing the selected directories is opened.

- Select the menu option **File | Compare Directories** or click the **Compare directories**  icon in the Standard toolbar. An empty Directory Comparison window is opened.

## ZIP and OOXML files

ZIP-conformant files are regarded as directories if the ZIP conformant file option is selected as the default file comparison mode for \*.zip files on the [File types tab](#) <sup>264</sup> of the DiffDog Options dialog (this is the default setting). You can then select a ZIP file as one of the directories in a directory comparison, show the content of a ZIP file if it appears as a file in a directory comparison, and also copy and merge files that are contained in the ZIP file.

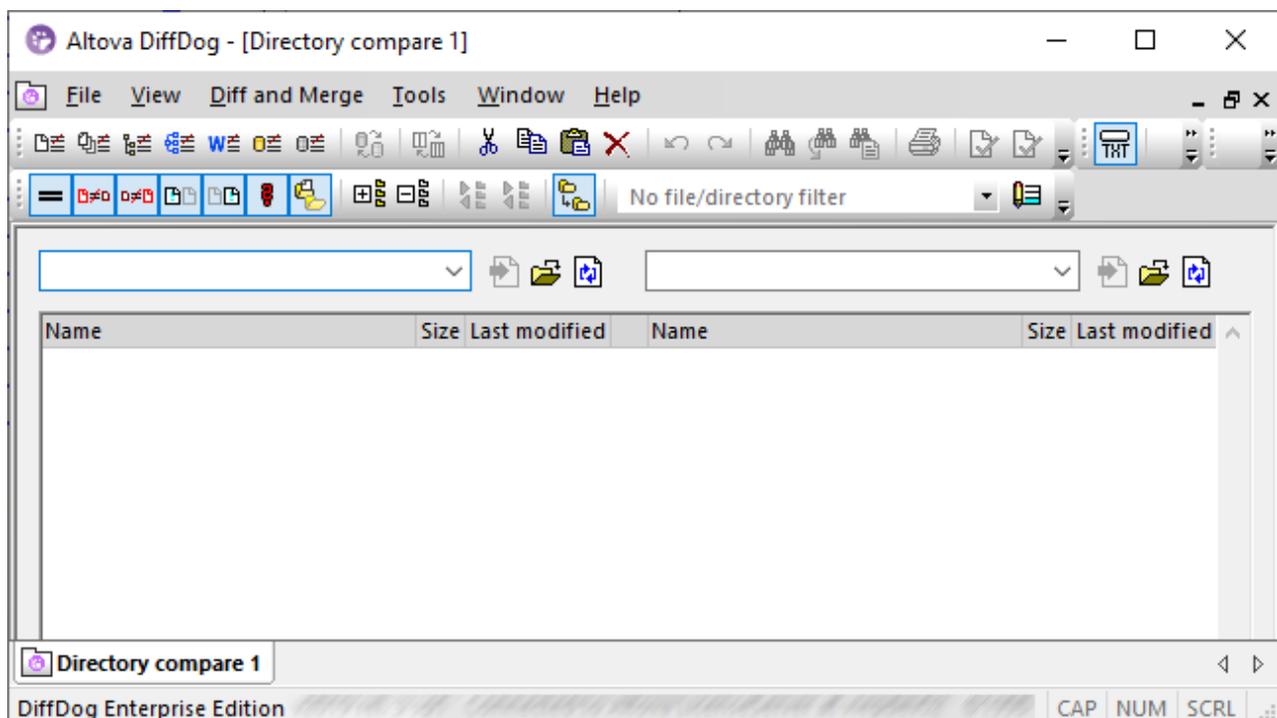
Office Open XML (OOXML) files—which can be thought of as a specialized form of ZIP archives—are also opened for comparison in directory comparison windows. After the content of the OOXML file is displayed in the directory comparison window, you can browse for the document.xml file and [open it in a file comparison](#) <sup>83</sup> window.

Name	Size	Last modified		Name	Size	Last modified
_rels				_rels		
docProps				docProps		
app.xml	Int64d	1980-01-01 00:00	≠	app.xml	Int64d	1980-01-01 00:00
core.xml	Int64d	1980-01-01 00:00	≠	core.xml	Int64d	1980-01-01 00:00
word				word		
_rels				_rels		
theme				theme		
theme1.xml	Int64d	1980-01-01 00:00	=	theme1.xml	Int64d	1980-01-01 00:00
document.xml	Int64d	1980-01-01 00:00	≠	document.xml	Int64d	1980-01-01 00:00
fontTable.xml	Int64d	1980-01-01 00:00	≠	fontTable.xml	Int64d	1980-01-01 00:00
settings.xml	Int64d	1980-01-01 00:00	≠	settings.xml	Int64d	1980-01-01 00:00
styles.xml	Int64d	1980-01-01 00:00	=	styles.xml	Int64d	1980-01-01 00:00
webSettings.xml	Int64d	1980-01-01 00:00	=	webSettings.xml	Int64d	1980-01-01 00:00
[Content_Types].xml	Int64d	1980-01-01 00:00	=	[Content_Types].xml	Int64d	1980-01-01 00:00

Status: Compared as XML. Result: 5 differences

## 3.1 Opening a Directory Comparison Window

When opening a new Directory Comparison window, the Directory Comparison is given a name of the form Directory compare X, where X is an integer indicating that directory comparison's position in the sequence of directory comparisons opened in the current DiffDog session. This name appears in a tab at the bottom of the window.



Note that the **Compare Directories** command opens only the Directory Comparison window; it does not open any directory within the window. The two directories to be compared must be [opened](#)<sup>75</sup> subsequently in the panes of the comparison window, one in each pane.

### To open an empty Directory Comparison window:

- Select the menu option **File | Compare Directories** or click the **Compare directories**  button in the Standard toolbar.

## 3.2 Selecting Directories for Comparison

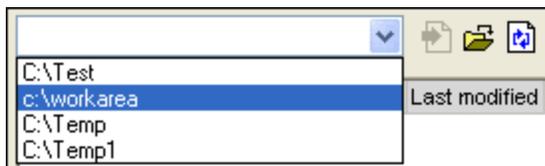
Directories can be selected for comparison in various ways. You can open the directories in a new Directory Comparison window, [re-open a previous comparison](#)<sup>250</sup>, or change the directories in the currently open Directory Comparison window.

### To open directories in a new Directory Comparison window:

1. Select the menu option File | Open or press **Ctrl+O**.
2. Select **Compare directories**.
3. Enter the path to the first and the second directory, or click **Browse** and select a folder from the system. You can also open a directory from a URL through FTP, HTTP, or HTTPS. The connectivity instructions are the same as for files, see [Opening Files from URLs](#)<sup>30</sup>.
4. Optionally, choose a filter from the **File/Directory filter** drop-down list if you want to restrict the displayed content of the directories to certain file types.
5. If required, select the **Include subdirectories** check box.
6. Click **OK**. The selected directories are opened in a new Directory Comparison window.

### To select directories in the active Directory Comparison window:

1. In the left or right pane of an existing Directory Comparison window, do one of the following:
  - Click the **Open**  icon and select a directory in the Windows Open dialog box.
  - Enter the full path of a directory and click the **Apply**  button.
  - Select a previously compared directory from the drop-down list.



### To start a directory comparison from Windows Explorer:

1. Select two directories in Windows Explorer.
2. Right-click and choose **Compare with Altova DiffDog** from the context menu.

A new instance to DiffDog is opened, the selected folders are displayed in a Directory Comparison window, and the comparison is started automatically.

### To open directories from a URL:

1. In the left or right pane of the Directory Comparison window, click **Open** . The Browse for Folder dialog box appears.

2. Click **Switch to URL** and connect to a server which supports directory browsing, including WebDAV or Microsoft® SharePoint® Servers. The connectivity instructions are the same as for files, see [Opening Files from URLs](#) <sup>30</sup>.

### 3.3 Modifying the Directory Comparison Options

When comparing directories, the [comparison mode](#)<sup>21</sup> you choose determines how the content of the directories in the left and right pane of the Directory Comparison window are compared. The basic comparison mode switch is the Quick Comparison toggle. In order to access Text Comparison Mode, or XML Comparison Mode, or Binary Comparison Mode, or Extensions Comparison Mode, Quick Comparison **must first be toggled off**.

You can also define which types of files will be displayed in the Directory Comparison window by [applying a filter](#)<sup>78</sup>. In addition, the **Diff and Merge** menu offers several toggle commands which can be switched on or off via the menu:

- [Show Options Before Comparison](#)<sup>249</sup>
- [Autostart Comparison](#)<sup>249</sup>
- [Compare while Editing](#)<sup>249</sup>
- [Support Recently Compared Pairs](#)<sup>250</sup>

General options for the comparison of directories are furthermore available in the [Directory comparison](#)<sup>257</sup> tab of the DiffDog Options dialog box.

**Note:** If a new Directory Comparison window is opened, it assumes the comparison options of the last comparison window (file or directory) to have had any of its comparison options modified.

#### To change the mode for directory comparison:

Do one of the following:

- To use Quick Comparison Mode, toggle on Quick Comparison by selecting the menu option **Diff and Merge | Compare only Size and Modification Date** or activating the **Quick Comparison**  icon in the Comparison Mode toolbar.
- Make sure that Quick Comparison is toggled off and select one of the following comparison modes from the **Diff and Merge** menu or activate its corresponding icon in the Comparison Mode toolbar:
  - **Textual Comparison Only** 
  - **Compare as XML** 
  - **Compare as Binary** 
  - **Compare According to File Extension Settings** 

## 3.4 Running a Directory Comparison

When the two directories to be compared are loaded into the Directory Comparison window, a comparison is [automatically carried out](#)<sup>303</sup> if the **Autostart Comparison** command is toggled on (which is the default setting) or if you have selected directories in Windows Explorer and used the **Compare with Altova DiffDog** context menu command. In addition, comparisons can be [explicitly started](#)<sup>302</sup> any number of times with the **Start Comparison** command.

If you [double-click a file](#)<sup>83</sup> in the Directory Comparison window, this file and the corresponding file in the compared directory are opened in a new File Comparison window and compared immediately.

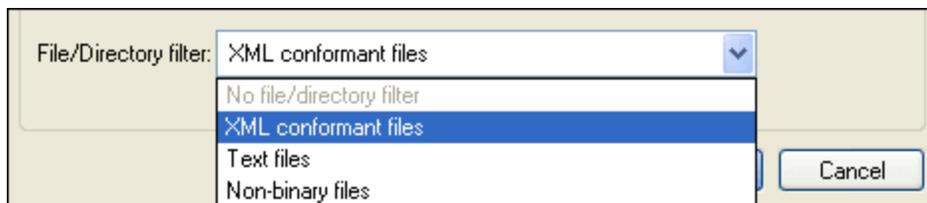
### Filtering the content of compared directories

The Directory content toolbar contains a drop-down list from which you can select a [filter](#)<sup>259</sup> to be applied to the Directory Comparison window. You can change this filter at any time prior to or after a comparison, or change the definition of a filter as well as add a new filter.

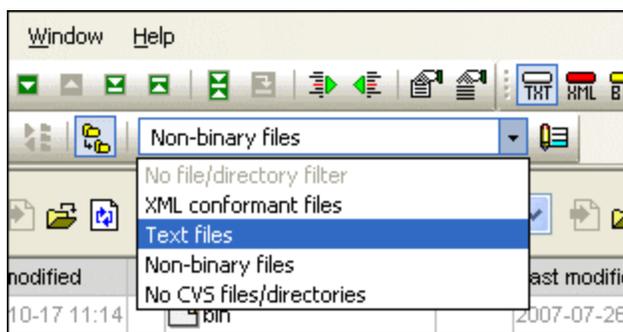
#### To run a filtered directory comparison:

Do one of the following:

- When selecting directories for comparison using the **File | Open** menu option, select a filter from the File/Directory filter drop-down list in the Open Comparison dialog box.



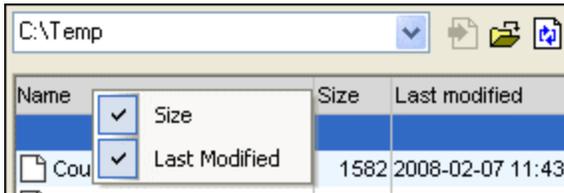
- If you have already opened a Directory Comparison window, select a filter from the drop-down list that is available in the Directory content toolbar.



The content in the Directory Comparison window is updated and a comparison is started immediately.

## 3.5 Configuring the View

In Directory Comparison windows, you can toggle on and off the display of the Size and Last Modified columns by right-clicking the Header of either pane and then clicking **Size** and/or **Last Modified**.



The column width can also be changed by dragging column borders to the desired location.

### Controlling what files are displayed

You can configure the view of individual Directory Comparison windows to display files on the basis of their compared status. For example, you can opt to not display all equal files, or to not display non-comparable files, or to display files that are unequal and newer in the left pane but to not display files that are unequal and newer in the right pane. To do this, you use a set of simple toggle commands that are available as toolbar icons. Note that the toggle is on when the icon has a border around it (as depicted below).

-  **Show/Hide equal:** Shows or hides files and sub-directories that are equal in the left and right pane.
-  **Show/Hide left newer:** Shows or hides files that are unequal, and where the newer version of the file is located in the left pane.
-  **Show/Hide right newer:** Shows or hides files that are unequal, and where the newer version of the file is located in the right pane.
-  **Show/Hide left only:** Toggles on and off the display of subdirectories and files that are present in the left pane only.
-  **Show/Hide right only:** Toggles on and off the display of subdirectories and files that are present in the right pane only.
-  **Show/Hide not comparable:** Toggles on and off the display of files that are not comparable. Files are considered to be non-comparable if they cannot be compared in the selected [Comparison Mode](#)<sup>21</sup>. For example, in XML Comparison Mode, file types that have been [specified as not being XML-conformant](#)<sup>264</sup> are considered to be not comparable.
-  **Show/Hide empty directories:** Toggles on and off the display of empty directories.

### Displaying sub-directories

If, during opening the directories using the **File | Open** menu option, you have decided to not show sub-directories in the Directory Comparison window, you can nevertheless activate this option in any stage of the

comparison by clicking the **Include Subdirectories**  button in the Directory content toolbar. Clicking the button again will toggle the display of sub-directories off again. With the button toggled on, you can use the following buttons to customize the display of sub-directories:

-  **Collapse:** Collapses all directories that have subdirectories. Note that this command will collapse all sub-directories in both panes. To collapse a single sub-directory, double-click on it.
-  **Expand:** Expands all directories that have subdirectories.

### 3.6 Displaying Differences in Directories

The directory comparison results are displayed as trees in both panes. If sub-directories are displayed, they can be collapsed and expanded by double-clicking the icons for them. The comparison results are indicated with colors and icons as described below.

Name	Size	Last modified		Name	Size	Last modified
bin		2007-10-17 11:14		bin		2007-07-26 07:17
binary.doc	29184	2007-10-17 11:14		binary.doc	29184	2007-07-04 12:25
DelUISettings.exe	24576	2005-01-19 12:26		DelUISettings.exe	24576	2005-01-19 12:26
Expenses		2008-02-20 12:44		Expenses		2008-02-20 12:44
New Folder		2008-02-20 12:15		New Folder		2008-02-07 12:08
Classes.csv	26	2008-02-20 12:17		Teachers.xml	490	2007-07-10 14:45
Teachers.xml	490	2008-02-07 12:12		Text		2008-02-20 14:55
				introduction.txt	0	2008-02-20 12:18
				Course.txt	740	2007-01-18 09:47
Course.xml	1582	2008-02-07 11:43		Course.xml	1582	2008-02-07 11:43

The colors in which file names are displayed are significant. DiffDog displays the individual files in a Directory Comparison window in the following colors:

- **Black:** The file is equal in the selected comparison mode.

ExpReport.xls	171379	2007-05-31 12:01		ExpReport.xls	171379	2007-05-31 12:01
---------------	--------	------------------	--	---------------	--------	------------------

Names of files that cannot be compared in the selected comparison mode are also displayed in black.

Create Tables.sql	852	2007-01-17 16:08		Create Tables.sql	852	2007-01-17 16:08
-------------------	-----	------------------	--	-------------------	-----	------------------

- **Blue:** The file is present in the directory in which it is displayed, but not in the other directory.

				Course.txt	740	2007-01-18 09:47
--	--	--	--	------------	-----	------------------

- **Red:** The file is present in both directories, but is not equal in the selected comparison mode. Note that the newer file is colored a brighter red.

Course.xml.bak	1763	2008-02-07 11:43		Course.xml.bak	1582	2008-02-07 11:43
----------------	------	------------------	--	----------------	------	------------------

Sub-directory names are always displayed in black.

#### Folder icons

The following icons are used for directories in Directory Comparison windows. Note that expanded directories are shown with their top right corners turned down (left icon):

- Directories that contain files that are equal in the selected comparison mode are indicated with a blank body.

-   Directories that contain different files in the selected comparison mode are indicated with a not-equal sign.
-   Directories that contain files that are not present in the corresponding directory in the other pane are indicated with a blue exclamation mark.
-   Directories that have both extra files and different files are indicated with an exclamation mark and a not-equal sign.

## ZIP and OOXML icons

The following icons for ZIP and OOXML files are used for directories in Directory Comparison windows:

-  If the ZIP archives/OOXML files contain files that are equal in both panes, the ZIP symbol displays two blank file icons.
-  ZIP archives/OOXML files that contain different files are indicated with a not-equal sign.
-  ZIP archives/OOXML files that contain files that are not present in the corresponding ZIP in the other pane are indicated with a blue exclamation mark. Note that the exclamation mark is displayed in the pane where the additional file is located.
-  ZIP archives/OOXML files that have both extra files and different files are indicated with an exclamation mark and a not-equal sign.

## File icons

The following file icons are displayed in Directory Comparison windows:

-  Files that are equal in the selected comparison mode are displayed with a blank body.
-  Files that are non-equal in the selected comparison mode are displayed with a not-equal sign.
-  Files that are not present in the other pane are displayed with a blue exclamation mark.

## Comparison symbols

The following symbols appear in the column between the two panes and indicate the results of the directory comparison, specifically the relationship between the files on either side of the symbol. Note that these symbols are only displayed for files and not for subdirectories.

-  Files are equal in the selected comparison mode.
-  Files are different in the selected comparison mode.
-  Files cannot be compared in the selected comparison mode.

## 3.7 Comparing Files from within a Directory Comparison

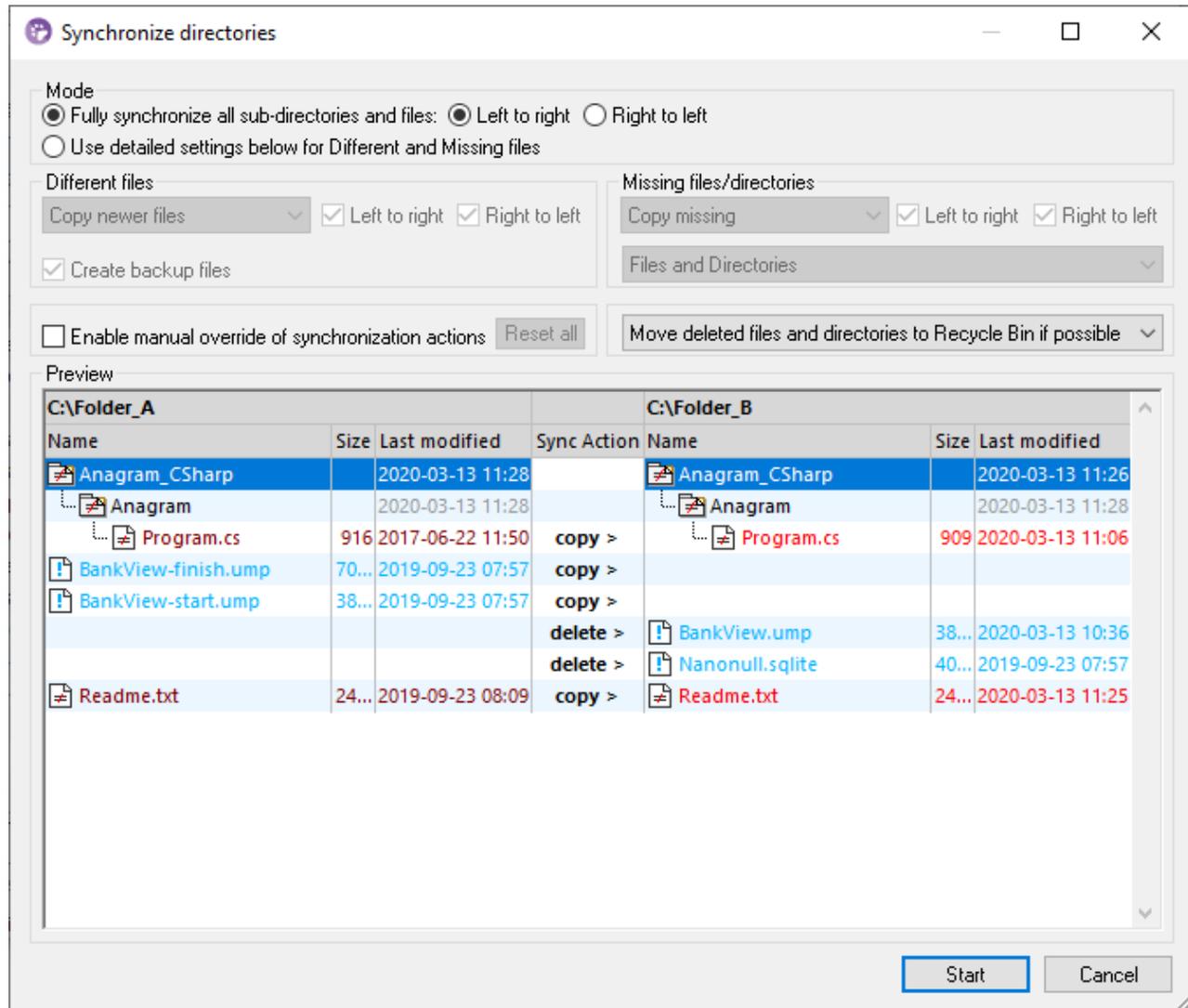
Double-clicking a file in either the left or right pane of the **Directory Comparison** window opens that file and its corresponding sibling in a new **File Comparison** window. This is applicable only for files that have a sibling on the left or right side; otherwise, only the left or right pane of the **File Comparison** window is populated.

The new file comparison is opened in the [current comparison mode](#)<sup>22</sup> of the directory comparison or—if Quick Comparison is the comparison mode of the directory comparison—in the comparison mode that was the current file comparison mode (Text, XML, Binary, or Extensions) when the directory comparison was opened, respectively.

You can continue to work in the File Comparison window as in a [regular file comparison session](#)<sup>26</sup>.

## 3.8 Synchronizing Directories

In addition to the merging functionality, which allows you to copy individual files from one pane to the other, DiffDog in the **Diff and Merge** menu also provides the **Synchronize directories** option. This option allows you to synchronize the content of the two directories in one single step.



The Synchronize directories dialog box can be opened exclusively from a Directory Comparison window, that is, there is no independent menu option available and you have to [open a Directory Comparison window](#)<sup>75</sup> first. After two directories have been [compared](#)<sup>78</sup> in a Directory Comparison window, you have the following options:

- Synchronizing the currently displayed directories including their sub-directories
- Selecting a single sub-directory in the Directory Comparison window and synchronizing only that particular sub-directory

You can further choose from two options: (i) [Fully synchronize](#)<sup>85</sup> all sub-directories and files (left to right or right to left), or (ii) change the [synchronization settings](#)<sup>85</sup>. You can also manually override the synchronizations actions (such as "copy", "delete", "ignore") for individual files or sub-directories.

#### To open the Synchronize directories dialog box:

1. Make sure that the two directories that you want to synchronize are displayed in a Directory Comparison window and that you have compared them.
2. Do one of the following:
  - To synchronize the currently displayed directories including their sub-directories, select the menu option **Diff and Merge | Synchronize directories** or click the **Synchronize**  button in the Directory content toolbar.
  - To synchronize only the sub-directory that is selected in the Directory Comparison window, select the menu option **Diff and Merge | Synchronize selected directory** or click the **Synchronize selected**  button in the Directory content toolbar.

### 3.8.1 Full Synchronization

If you have selected the **Fully synchronize all sub-directories and files** check box, you can choose the synchronization direction either from left to right or from right to left, by selecting the corresponding radio button. Therefore, the source and target directories are either on the left or on the right, depending on your choice.

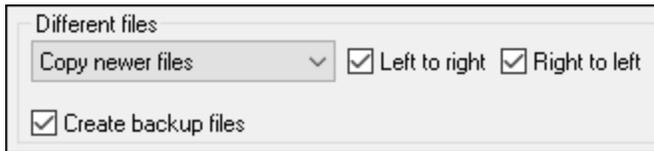
A full synchronization will perform the following actions:

- Files that are different in the source and target directories will be overwritten so that they become equal. For example, if you synchronize from left to right, the file on the left will overwrite the one on the right.
- Files that exist only in the source directory will be copied to the target directory.
- Files that exist in the target directory but don't exist in the source directory will be deleted permanently (or moved to the recycle bin, if possible). For example, if a file is missing on the left side of the comparison, and if you synchronize from left to right, the right file will be deleted.
- No backup files will be created.

### 3.8.2 Changing the Synchronization Settings

Within a running session of DiffDog, the Synchronize directories dialog box opens with the previously saved settings for directory synchronization and displays them in the upper part of the dialog. When a new DiffDog instance (or session) is opened, the Synchronize directories dialog box opens for the first time with the default settings. Using the drop-down lists and check boxes, you can adapt those settings so as to meet the requirements for synchronizing the currently displayed directories.

The options grouped under **Different files** let you define which files are to be copied, that is, whether older or newer files are to be kept, and whether they should be copied to the right, or left directory, or to both directories. The default option copies newer files to the opposite side so that only the newer version of the file will be kept.



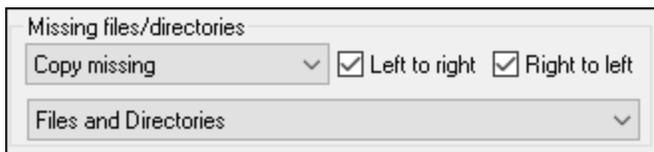
You can choose from among the following options:

- **No action:** This option ignores different files.
- **Copy newer files:** This option copies the newer version of a file to the opposite directory. You can use the Left to right and Right to left check boxes to limit the update to one particular directory. Check both boxes to copy the newer files to the opposite directory and thus update both directories.
- **Copy older files:** This option copies the older version of a file to the opposite directory. You can use the Left to right and Right to left check boxes to limit the update to one particular directory. Check both boxes to copy the older files to the opposite directory and thus update both directories.

The **Create backup files** check box allows you to keep a backup of a file's previous version in the directory. If activated, the previous version is saved with a .BAK extension before the updated version is copied to the directory.

The **Enable manual override of synchronization actions** check box enables you to fine-tune your synchronization actions for one or more files or sub-directories, see [Overriding the Synchronization Actions](#)<sup>86</sup>.

The options grouped under **Missing files/directories** determine how missing files and/or directories are to be handled when directories are synchronized. You can choose whether these options are to be applied to files and directories or to directories (when copying) or files (when deleting) only. Furthermore, you can define whether deleted items should be moved to the Recycle Bin if possible or be deleted permanently.



The following options are available for missing files and directories:

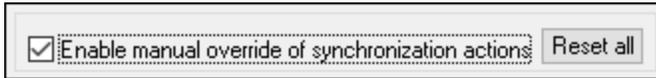
- **No action:** No synchronization for files that are present in only one of the directories.
- **Copy missing:** Missing files are copied to the opposite directory. You can use the Left to right and Right to left check boxes to limit the update to one particular directory. Check both boxes to copy missing files to the opposite directory and thus update both directories.
- **Delete missing:** Missing files are deleted from the opposite side. You can use the Left only and Right only check boxes to restrict the deletion to one particular directory. Check both boxes to delete missing files from the opposite directory and thus delete missing files from both directories.

### 3.8.3 Overriding the Synchronization Actions

When you perform a [full synchronization](#)<sup>85</sup>, synchronization actions (such as "ignore", "copy", or "delete") are determined based on the direction of the synchronization. For example, if a file is missing on the left side of the comparison, and if you synchronize from left to right, the default synchronization action for that file is "delete".

On the other hand, if you [changed synchronization settings](#)<sup>85</sup> at directory level, those will apply instead when you run a directory synchronization.

If you need even more control, you can override the synchronization actions for one or more individual files or sub-directories manually. To do this, select the **Enable manual override of synchronization actions** check box.



If this check box is selected, the "Sync Action" column provides a drop-down list where you can choose a synchronization action for an individual file or sub-directory and thus override the settings that have been defined on directory level.

C:\Folder_A				C:\Folder_B		
Name	Size	Last modified	Sync Action	Name	Size	Last modified
Anagram_CSharp		2020-03-13 11:04		Anagram_CSharp		2020-03-13 12:20
Anagram		2020-03-13 12:20		Anagram		2020-03-13 12:20
Program.cs	916	2017-06-22 11:50	copy >	Program.cs	909	2020-03-13 11:06
BankView-finish.ump	70...	2019-09-23 07:57	< delete			
BankView-start.ump	38...	2019-09-23 07:57	< delete			
			delete >	BankView.ump	38...	2020-03-13 10:36
			delete >	Nanonull.sqlite	40...	2019-09-23 07:57
Readme.txt	24...	2019-09-23 08:09	copy >	Readme.txt	24...	2020-03-13 11:25

#### Warning:

Synchronization actions that were overridden manually take precedence over other synchronization options.

#### To define synchronization actions manually for individual files or sub-directories:

1. Make sure that the **Enable manual override of synchronization actions** check box is selected.
2. Optionally, change the default synchronization options for the directories, see [Changing the Synchronization Settings](#)<sup>85</sup>.
3. Select one of the following options from the "Sync Action" column:
  - **<blank>**: No synchronization for this file or sub-directory.
  - **copy >**: The file or sub-directory will be copied from the left side to the right side without considering which file is newer.
  - **< copy**: The file or sub-directory will be copied from the right side to the left side without considering which file is newer.
  - **delete >**: The file or sub-directory will be deleted on the right side.
  - **< delete**: The file or sub-directory will be deleted on the left side.
  - **< delete >**: The file or sub-directory will be deleted on both sides.

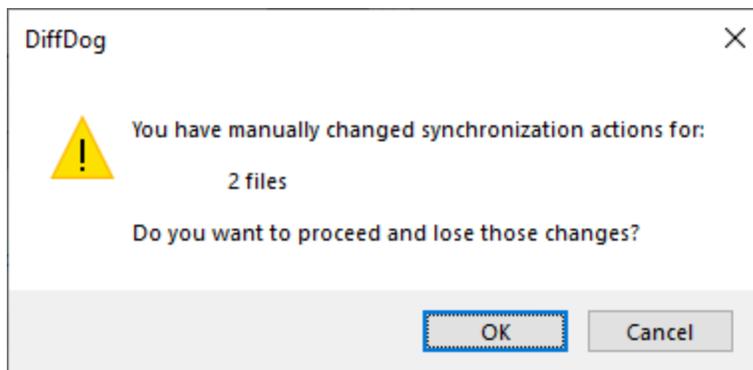
**Warning:**

If you apply a delete action to a sub-directory, all files that are contained in this directory will be deleted also, on the chosen side. Since equal files are not displayed in the Synchronize directories dialog, DiffDog displays a warning so as to alert you to this fact.

4. Click **OK**. The synchronization action is indicated with a different background color. If you later on change the overall settings for the directories and the settings happen to match the manually changed action, the background color will be removed again.

**To reset manual synchronization actions:**

1. Do one of the following:
  - Click the **Reset all** button.
  - Clear the **Enable manual override of synchronization actions** check box.
2. Click **OK** in the message box that appears.

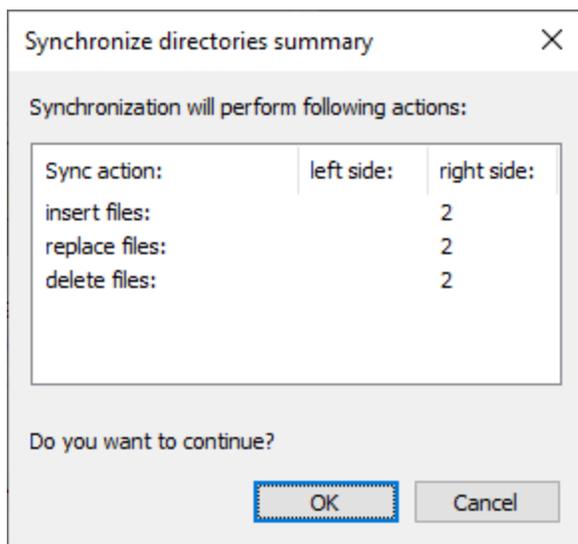


### 3.8.4 Running a Directory Synchronization

After you have configured the [synchronization settings](#)<sup>85</sup> and, if applicable, any [manual overrides](#)<sup>86</sup>, you can run a directory synchronization.

**To run a directory synchronization:**

1. [Open](#)<sup>75</sup> a Directory Comparison window and [run](#)<sup>78</sup> the comparison.
2. On the **Diff and Merge** menu, click **Synchronize directories**.
3. Choose either [full synchronization](#)<sup>85</sup> or define [detailed settings](#)<sup>85</sup> for different and missing files.
4. Optionally, [override the synchronization actions](#)<sup>86</sup> for individual files or sub-directories.
5. Click **Start**. DiffDog displays a summary that lists actions that will be performed during the synchronization.



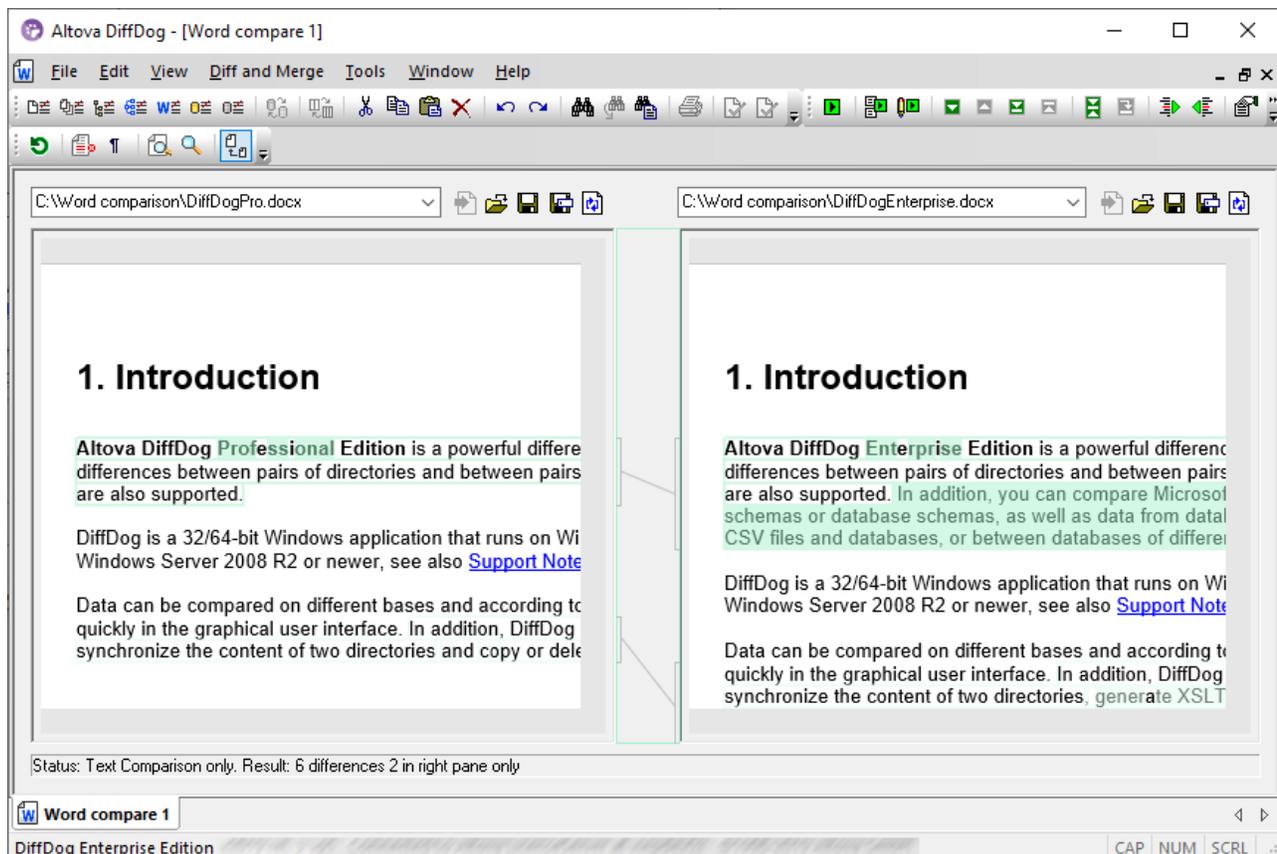
6. Click **OK** to commit the changes. If you choose not to run the synchronization and discard the synchronization settings, click **Cancel** to return to the Directory Comparison window.

## 4 MS Word Comparison

Microsoft Word Document Comparison integrates Microsoft Word into the DiffDog GUI and uses some Microsoft Word functions such as Find, Replace, Copy, Cut, Paste, Undo, Redo, and Clear in the context of DiffDog. This allows you to use Microsoft Word's formatting and editing features together with DiffDog's powerful comparison engine. Please note that whenever the focus is on a Microsoft Word document and you press a keyboard shortcut in DiffDog, this will call the corresponding Microsoft Word function (e.g., if in a Word Comparison window you press **F5** to start a comparison, this will open Microsoft Word's Find and Replace dialog box instead).

When you compare MS Word (\*.doc or \*.docx) documents, two instances of MS Word are opened side by side in DiffDog.

Microsoft Word 2003 or later must be installed on your computer and for both programs (i.e., DiffDog and Microsoft Word) either the 32-bit version or the 64-bit version must be installed, that is, DiffDog x64 requires Microsoft Word x64, while DiffDog x32 requires Microsoft Word x32.



To start a Microsoft Word comparison in DiffDog, you must first open an empty Word Comparison window and then [select the Microsoft Word documents to be compared](#)<sup>93</sup> or simply drag them from Windows Explorer into the Word Comparison window. Alternatively, you can also [select two documents in Windows Explorer](#)<sup>93</sup>,

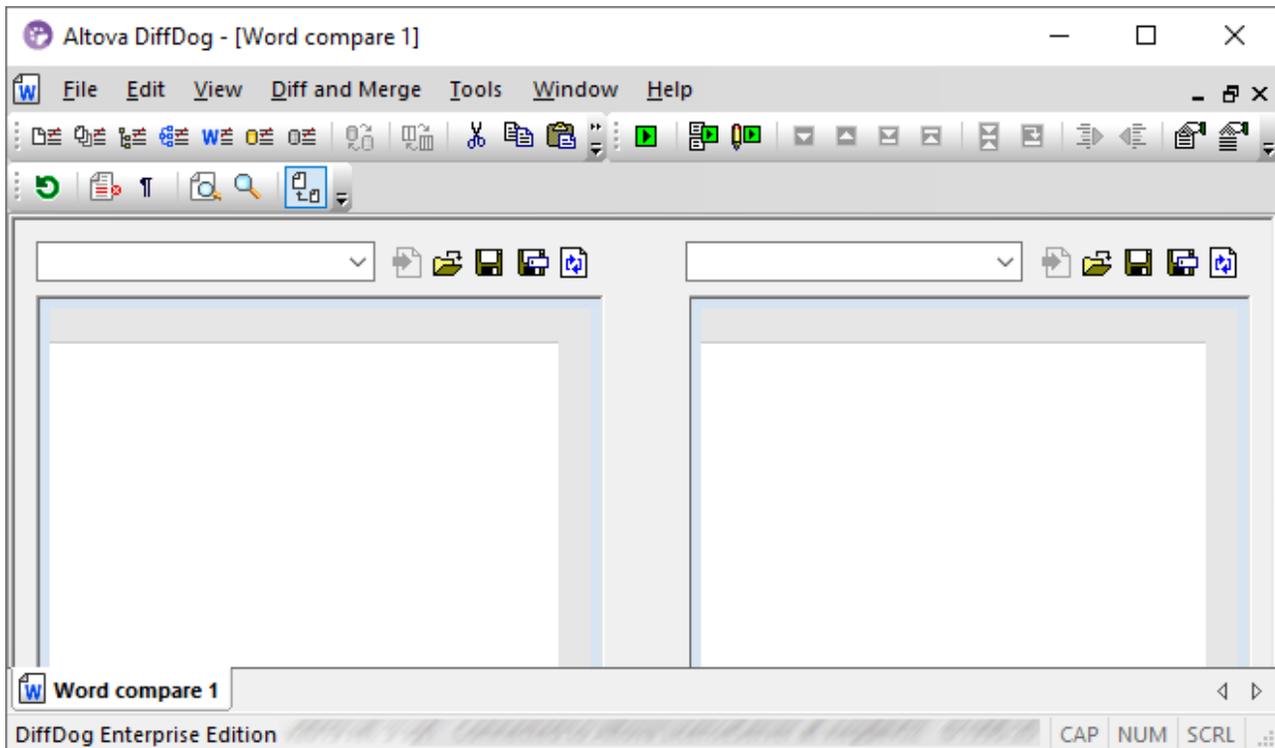
right-click and select **Compare with Altova DiffDog** from the context menu . This will open a new instance of DiffDog and display the selected Microsoft Word documents in a Comparison Window.

The comparison will start automatically unless you have deactivated the **Autostart Comparison** option in the **Diff and Merge** menu. To eliminate differences, DiffDog allows you to [edit the content](#)<sup>99</sup> of the Microsoft Word documents directly in the comparison window and [copy content from one pane to the other](#)<sup>242</sup>.

Microsoft Word documents that have been saved in the \*.docx format can also be considered and compared as [ZIP-conformant files and Office Open XML \(OOXML\) files](#)<sup>72</sup> in DiffDog. Note that, in this case, the comparison has to be started as a [directory comparison](#)<sup>71</sup> and that you have to define \*.docx files as ZIP-conformant in the [File Types](#)<sup>264</sup> tab of the DiffDog Options dialog box.

## 4.1 Opening a Word Comparison Window

When opening a new Word Comparison window, the Microsoft Word document comparison is given a name of the form MS Word compare X, where X is an integer indicating that Microsoft Word document comparison's position in the sequence of Microsoft Word document comparisons opened in the current DiffDog session. This name appears in a tab at the bottom of the window.



Note that the **Compare Microsoft Word Files** command opens the Microsoft Word Comparison window with two new and empty Word documents; it does not open any particular Microsoft Word document within the window. The two documents to be compared must be [opened](#)<sup>93</sup> subsequently in the panes of the comparison window, one in each pane.

### To open an empty Word Comparison window:

- Select the menu option **File | Compare Microsoft Word Files** or click the **Compare Microsoft Word files**  button in the Standard toolbar.

## 4.2 Selecting Microsoft Word Documents for Comparison

Microsoft Word documents can be selected for comparison in various ways. You can [open](#)<sup>92</sup> a new Word Comparison window and select documents, [re-open a previous comparison](#)<sup>250</sup>, or change the documents in the currently open Word Comparison window. In addition, you can select a pair of documents in Windows Explorer and use a context menu option to start a comparison in DiffDog.

### Dragging documents into a DiffDog Word Comparison window

If you drag and drop files from the Windows Explorer into the respective panes of a Word Comparison window, the documents will be opened for comparison. However, you can deactivate the **Open/Insert document on drop** button so as to insert the document as text box in the Word document that is currently open in the Word Comparison window (this is the default behavior for drag and drop in Microsoft Word). Note that the content of text boxes cannot be compared in DiffDog. Therefore, the **Open/Insert document on drop** button is by default activated in DiffDog.

#### To select Microsoft Word documents in the active Word Comparison window:

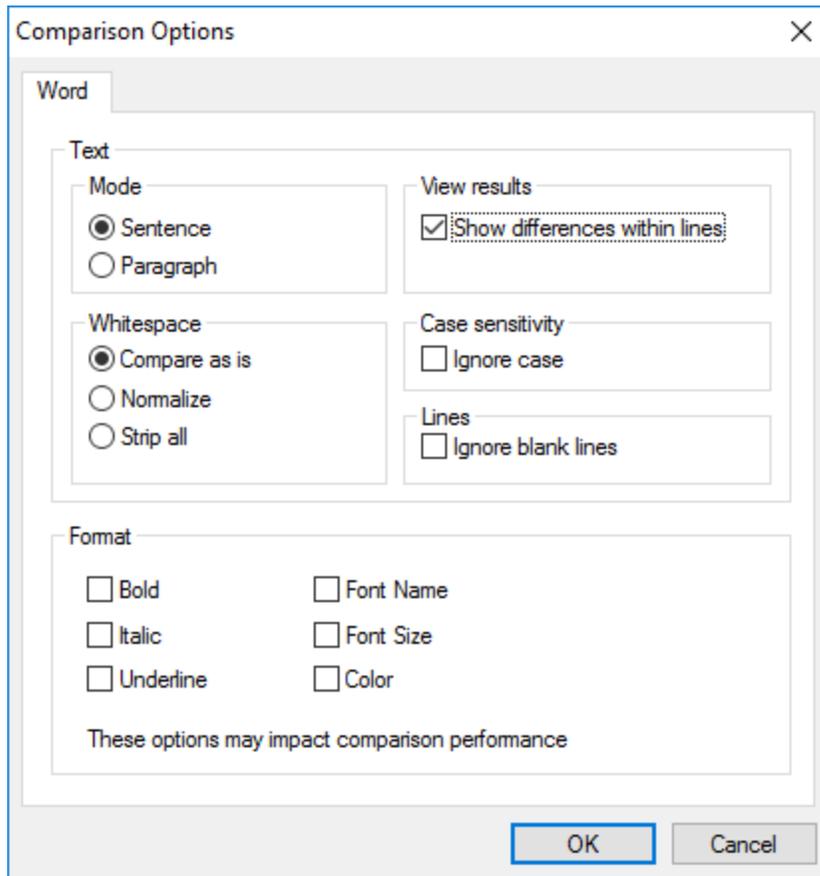
1. In the left pane of an existing Word Comparison window, do one of the following:
  - Click the **Open**  icon and select a file in the Windows Open dialog box.
  - Enter the full path to a file and click the **Apply**  button.
  - Drag a file from the Windows Explorer into the pane.
  - Select a previously compared file from the drop-down list.
2. Repeat any of the steps described in step 1 for the right pane.

#### To start a Microsoft Word document comparison from Windows Explorer:

1. Select two Microsoft Word documents in Windows Explorer.
2. Right-click and choose **Compare with Altova DiffDog** from the context menu. A new instance to DiffDog is opened, the selected files are displayed in a Word Comparison window, and the comparison is started automatically.

## 4.3 Modifying the Microsoft Word Comparison Options

The Word tab of the Comparison Options dialog box displays the options that are used for the comparison of Microsoft Word documents.

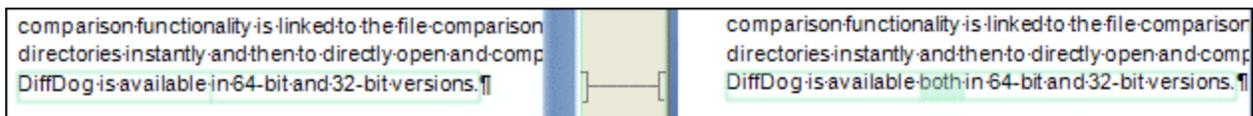


### Mode

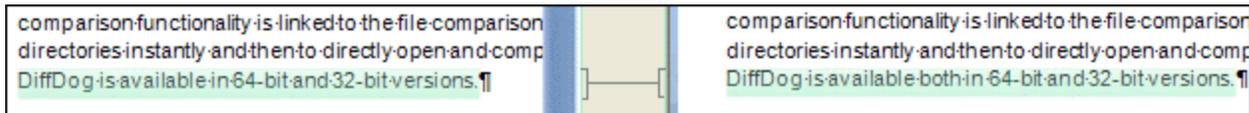
DiffDog can compare the documents either on sentence level or at paragraph level.

### View results

By activating the Show differences within lines check box, you can display the differences on character level.



If the check box is deactivated, differences are displayed only on sentence/paragraph level, that is, character level differences are not highlighted. Only the sentence/paragraph, as a whole, is indicated as being different.



## Whitespace

See [Comparison Options for Whitespace Characters](#) <sup>49</sup>.

## Case sensitivity

Activate the **Ignore case check** box if upper and lower casing should be ignored when checking for differences.

## Lines

Here you define whether blank lines should be ignored.

## Format

You can specify which type of formatting should be considered when comparing documents. If differences in formatting are found, the entire sentence that contains the difference is marked as not equal.



## 4.4 Running a Microsoft Word Document Comparison

When the two documents to be compared are loaded into the comparison window, a comparison is [automatically carried out](#)<sup>303</sup> if the **Autostart Comparison** command is toggled on (which is the default setting). In addition, comparisons can be [explicitly started](#)<sup>302</sup> any number of times with the **Start Comparison** command.

When editing documents, they are compared dynamically [as you type](#)<sup>303</sup> if the **Compare while Editing** command is toggled on.

You can run file comparisons using all three of the methods listed above; these methods are not mutually exclusive. If the [Show Options Before Comparison](#)<sup>303</sup> command is toggled on, then the Comparison Options dialog box is displayed each time before the comparison is run (except when it is run dynamically by DiffDog while you edit). This is useful if you wish to run comparisons with different options.

## 4.5 Configuring the Word Comparison Window

The Word Comparison window provides a toolbar which enables you to configure the view of the documents that are displayed in the comparison window, and refresh the screen after comparisons.

### Configuring the view

Since DiffDog runs Microsoft Word inside the Word Comparison window, some Microsoft Word functions are available in DiffDog and you can use the buttons of the toolbar to switch them on or off.

-  **Show/Hide Revisions and Comments:** Revision marks and comments that have been added to a Microsoft Word document are hidden by default when the document is displayed in DiffDog. Activate the Show/Hide Revisions and Comments toggle to view them in the Word Comparison window. Please note that this setting also influences the result of a comparison: hidden revisions and comments will not be considered during a comparison.
-  **Show/Hide formatting symbols:** Shows or hides non-printing formatting characters such as blanks, paragraph marks, tabs, etc.

### Zooming

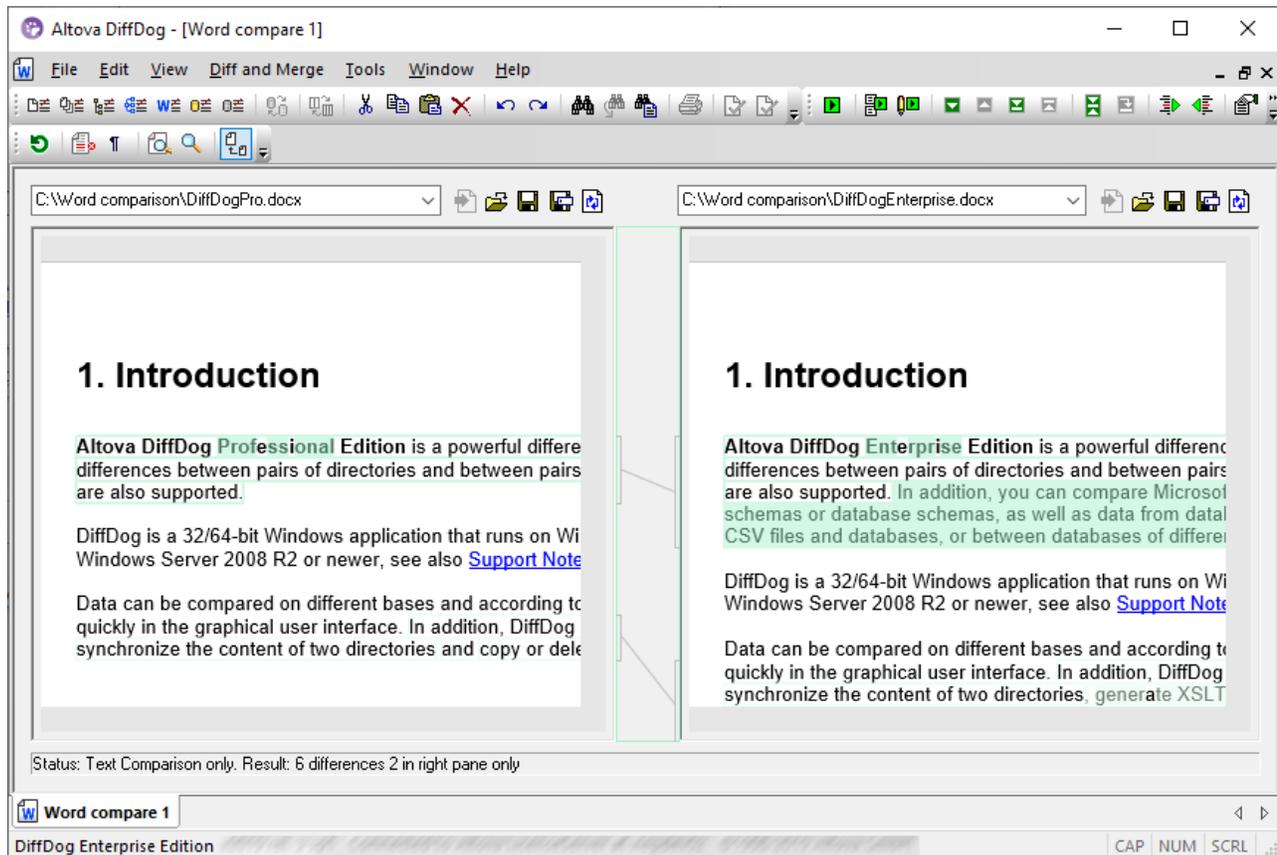
-  **Zoom to Fit Page:** Sizes both documents so that an entire page is displayed in each pane of the Word Comparison window.
-  **Zoom 100%:** Zooms the documents in the panes to 100%. You will have to use the scrollbars to navigate through the documents.

### Refreshing the display

-  **Refresh GUI:** After you have edited a document in DiffDog, you can refresh the display by clicking this button. Note that this does not reload the documents.

## 4.6 Displaying Differences in Microsoft Word Documents

After you start a comparison, the differences between the two files are displayed as blocks of highlighted text (which can be a sentence or a paragraph, depending on the setting in the [Word Comparison Options](#)<sup>94</sup>) and the results of the comparison are reported in the Comparison Window Status Bar. Notice that the corresponding differences in the two documents are linked for easier identification and analysis.



The current difference is highlighted in a different color than the other differences. In the screenshot above the current difference is displayed in a darker green. These colors can be changed in the [DiffDog Options](#)<sup>255</sup>. It is important to know which difference is the current difference because [merging](#)<sup>242</sup> is always done for the current difference only. You can [navigate](#)<sup>241</sup> among the differences with the navigation commands that are available in the **Diff and Merge** menu and as toolbar icons.

### Zooming into the documents

Since each pane of the Word Comparison window hosts an instance of Microsoft Word, you might want to change the zoom of the documents. The **Word Comparison** toolbar provides two options for this: **Zoom 100%** to view the details of the document and edit them, and **Zoom to Fit Page** to display the entire page for a better overview. You can also change the zoom of an individual pane by clicking into it and changing the zoom with the mouse wheel while holding the **Ctrl** key pressed.

## 4.7 Editing Microsoft Word Documents in DiffDog

After you have [run a comparison](#) <sup>96</sup> and [investigated the differences](#) <sup>98</sup> of the two files, you can edit the content of the files directly in DiffDog. You can use all the features of Microsoft Word that are available via the context menu or keyboard shortcuts.

### Finding and replacing text

In Word Comparison windows, DiffDog does not use its own Find and Replace functionality but gives you access to Microsoft Word's Find and Replace dialog box instead.

#### To call Microsoft Word's Find and Replace dialog box:

- Place the cursor into the pane in which you want to search for text and press **Ctrl+F**, or click the **Find**  button in the Standard toolbar.

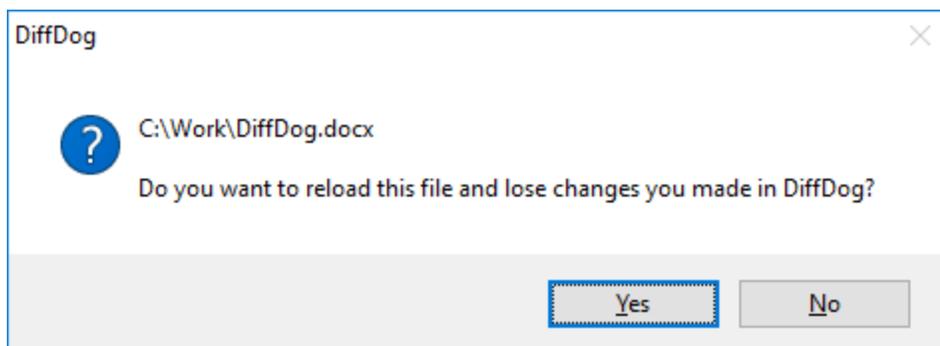
For details on Microsoft Word's find and replace functionality please consult the relevant Microsoft Word help pages.

### Reloading documents

You can always undo all changes you have made to a document since you last saved it, and reload the file into DiffDog. A warning message will be displayed if you are about to lose changes.

#### To reload a file into DiffDog:

- In the respective pane of a comparison window, click the Reload  button.
- If the file has changed since you last saved it, a warning message is displayed.



- Click Yes if you want to reload, or No if you want to cancel the operation.

## 4.8 Saving Microsoft Word Documents

To save a document you have edited in DiffDog, use the **Save**  or **Save As**  buttons in the respective panes of the comparison window. Files can also be saved using the **Close** , **Close All** , and **Save**  commands in the **File** menu.

### To save a file:

Do one of the following:

- To save an individual file, click the **Save**  button in its pane of the comparison window.
- To save an individual file under a new name or path, click the **Save As**  button in its pane of the comparison window. The Windows Save As dialog box appears where you can specify the new name or path for the file.
- To save both files of a comparison, select the menu option **File | Save**. The Save files dialog box appears where you can select the files to be saved or choose to discharge the changes.

### To save and close the files of a comparison:

1. Click the tab of the comparison window that contains the files you want to save and close.
2. Select the menu option **File | Close**.
3. If a file contains unsaved changes, the Save files dialog box appears. Make sure that the file's check box is selected and click **Save selected**. The file is saved and the comparison window is closed.

### To save and close the files of all comparisons:

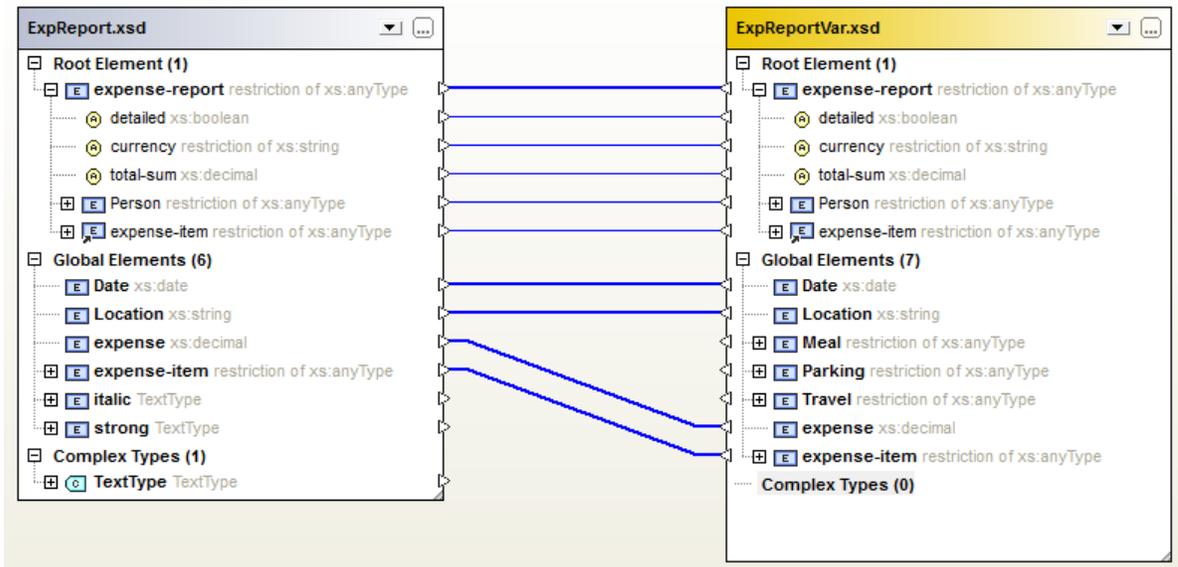
1. Select the menu option **File | Close all**.
2. For every comparison window that contains a file with unsaved changes, the Save files dialog box appears. Make sure that the file's check box is selected and click **Save selected**. The file is saved and the comparison window is closed.

## 5 XML Schema Comparison

Altova website: [Compare XML](#)

The comparing XML Schemas mechanism works as follows:

1. You load the two XML Schemas to compare. If an XML Schema has more than one global element, DiffDog prompts you to select one of these as the root element. The other global components (global elements and global types) will be loaded in the schema box and listed below the Root Element.



DiffDog displays in the schema box any of the following items, if they are declared in the schema.

Icon	Description
	An element declaration.
	A reference to an element declaration.
	An attribute declaration.
	A named complex type.

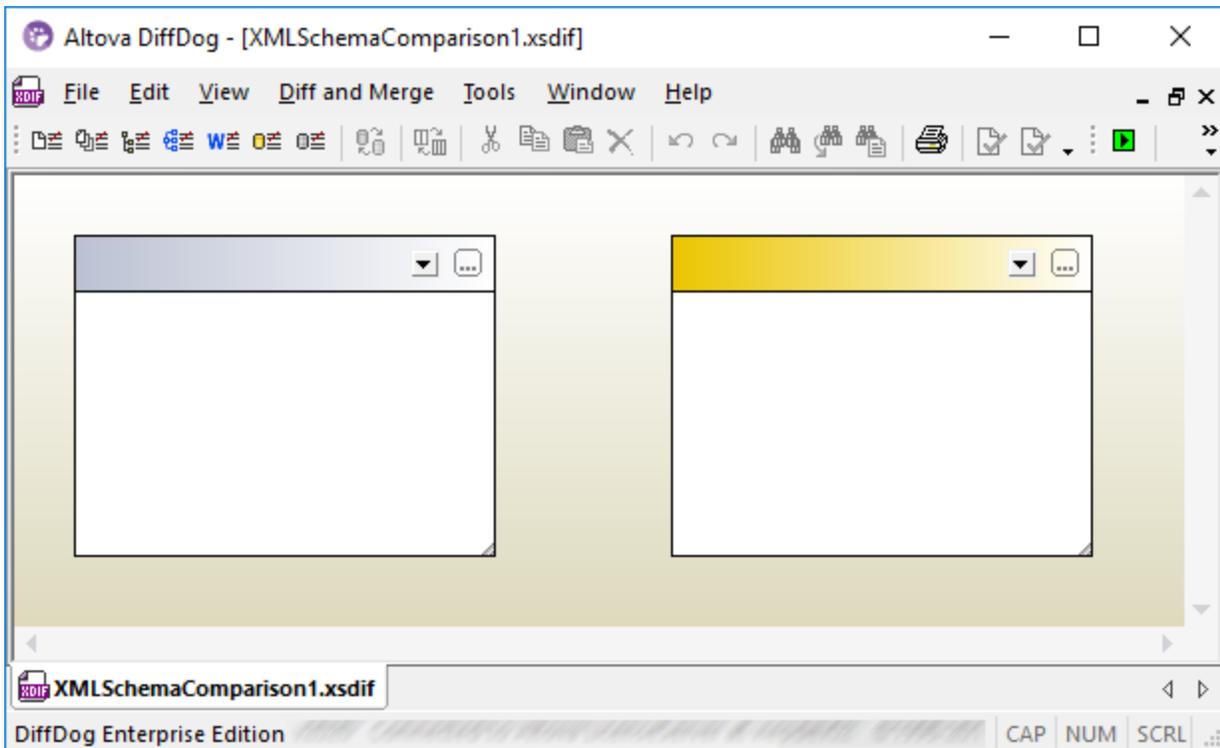
2. DiffDog will automatically map elements in one schema to elements in the other. The mappings are indicated with lines joining pairs of mapped elements (see screenshot above). Comparing XML Schemas results in this mapping. You can [modify mappings](#)<sup>111</sup> if you like. If you [run a schema comparison](#)<sup>114</sup>, however, the automatic mapping is returned.
3. After the mappings have been made, by running the XML Schema comparison (and modifying the mapping if required), you can generate an [XSLT stylesheet](#)<sup>116</sup> or a [MapForce mapping](#)<sup>117</sup>.

**Note:** Although you can right-click two XML Schemas in Windows Explorer and select **Compare with Altova DiffDog** from the context menu, the selected XML Schemas will be compared as files in this case.

XML Schema comparisons can be [saved](#)<sup>113</sup> to an \*.xsdif file. These files can later be reopened in DiffDog using the menu command **File | Open Comparison File....**

## 5.1 Opening an XML Schema Comparison Window

When opening a new XML Schema Comparison window, the XML Schema comparison is given a name of the form XMLSchemaComparisonX, where X is an integer indicating that XML Schema comparison's position in the sequence of XML Schema comparisons opened in the current DiffDog session. This name appears in a tab at the bottom of the window.



Note that the **Compare XML Schemas** command opens only the XML Schema Comparison window; it does not open any XML Schema within the window. The two XML Schemas to be compared must be [opened](#)<sup>104</sup> subsequently in the components of the comparison window, one in each component.

**To open an empty XML Schema Comparison window:**

- Select the menu option **File | Compare XML Schemas** or click the **Compare XML Schemas**  button in the Standard toolbar.

## 5.2 Selecting XML Schemas for Comparison

XML Schemas can be selected for comparison in various ways. You can open the XML Schemas in a new XML Schema Comparison window, open an XML Schema comparison document (\*.xsdif) from the file system, or change the XML Schemas in the currently open XML Schema Comparison window. XML Schemas that have already been compared before are available in a drop-down list in the title bar of each component. Note that you can select only one schema per component.

### To select XML Schemas in the active XML Schema Comparison window:

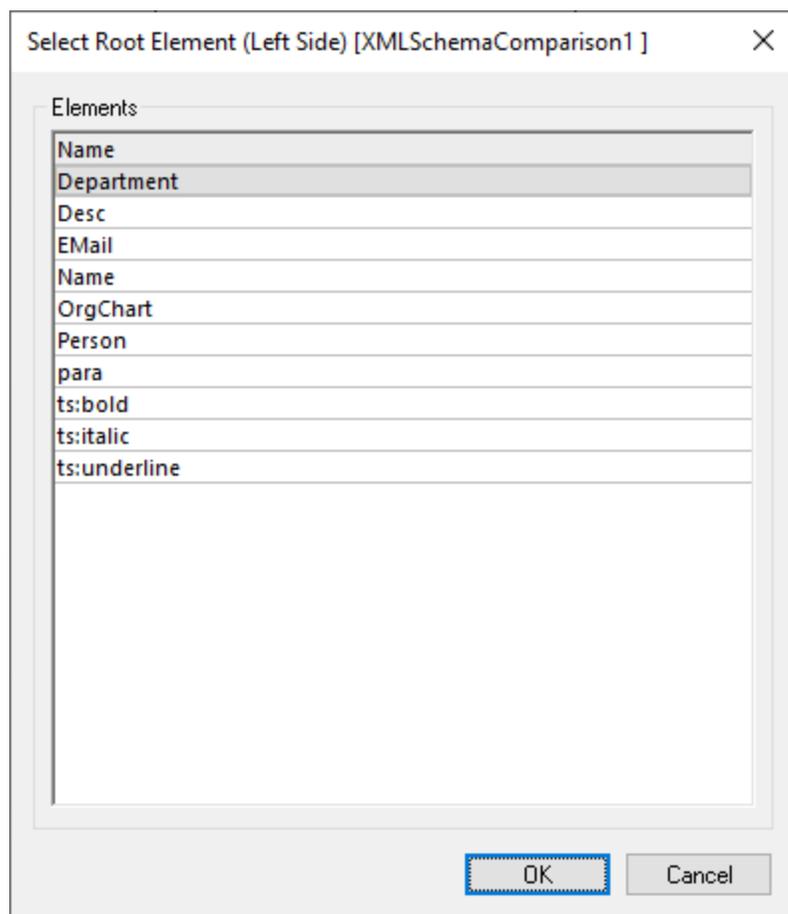
1. In the left component of an existing XML Schema Comparison window, do one of the following:
  - Click the **Browse**  icon and select a file in the Windows Open dialog box.
  - Double-click the title bar, enter the path to a file and press **Enter**.
  - Click the  button and select a previously compared XML Schema from the drop-down list.
2. Repeat step 1 for the right component.

### To open an XML Schema comparison document:

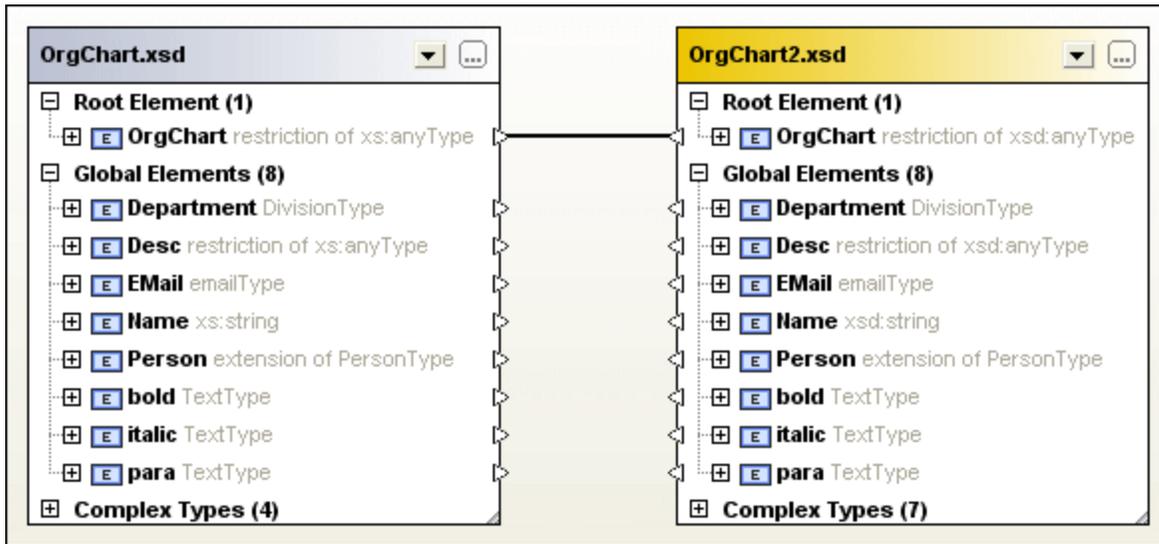
- Select the menu option **File | Open Comparison File...** and choose an \*.xsdif file from the file system. The comparison is opened in a new XML Schema Comparison window with the name of the comparison document appearing in the comparison window tab.

## 5.3 Setting the Active Root Element

A structural comparison of XML Schemas in DiffDog is done between two top-level global elements, called Root Elements. If a schema has more than one global element, then you are prompted, in the Select Root Element dialog (*screenshot below*), to select one of the global elements as the root element.



The selected global element is shown in the schema boxes (*see screenshot below*) as the respective Root Element, and the other global elements are listed under the Global Elements item. The active root element is mapped automatically and cannot be unmapped.



When an XML Schema has already been loaded into a comparison component, you have several options for changing the active root element:

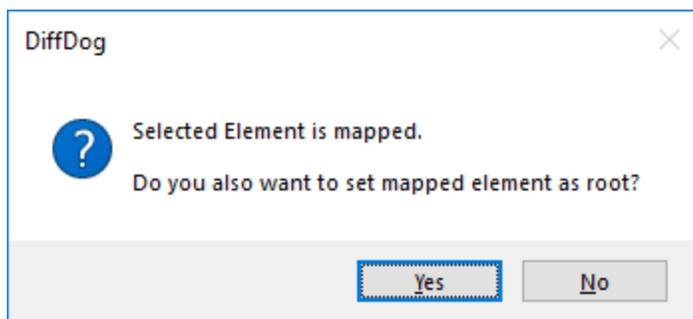
- Manually map two unmapped elements and set one of them as active root element; the mapped element in the opposite component can also be set as active root element, or you can leave the opposite root element unchanged.
- Activate an unmapped root element in one component; this element will be automatically mapped to the active root element on the other side of the comparison.

If a warning dialog box is displayed, you can always abort the operation by clicking the **No** button in the dialog box. The root element is displayed in a separate section on top of the comparison component.

#### To set the active root element:

Do one of the following:

- When opening an XML Schema Comparison window and selecting the XML Schemas for comparison, choose the active root element in the Select Root Element dialog box that pops up after you have selected an XML Schema containing more than one global element.
- Right-click a mapped global element in one of the components and select **Set as active root element** from the context menu. A dialog box appears where you can decide whether or not the corresponding element on the opposite side should also be set as the active root element.



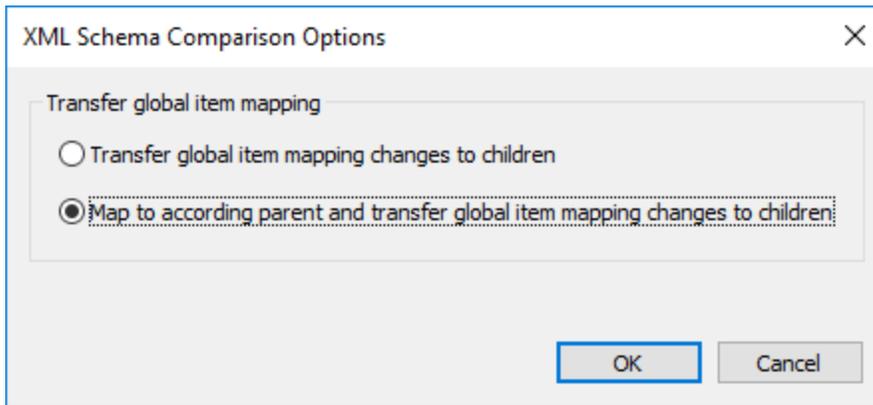
If you click **No**, the selected element will be mapped to the current root element of the opposite component.

- Right-click an unmapped global element in one of the components and select **Set as active root element** from the context menu. The element is moved to the Root Element section and mapped to the respective root element in the opposite component.

## 5.4 Modifying the XML Schema Comparison Options

The XML Schema Comparison options can be changed in the XML Schema Comparison Options dialog box, which is called by clicking the Comparison Options  icon in the Diff and Merge toolbar of an XML Schema Comparison window or via the **Tools** menu when the active comparison window is an XML Schema Comparison window.

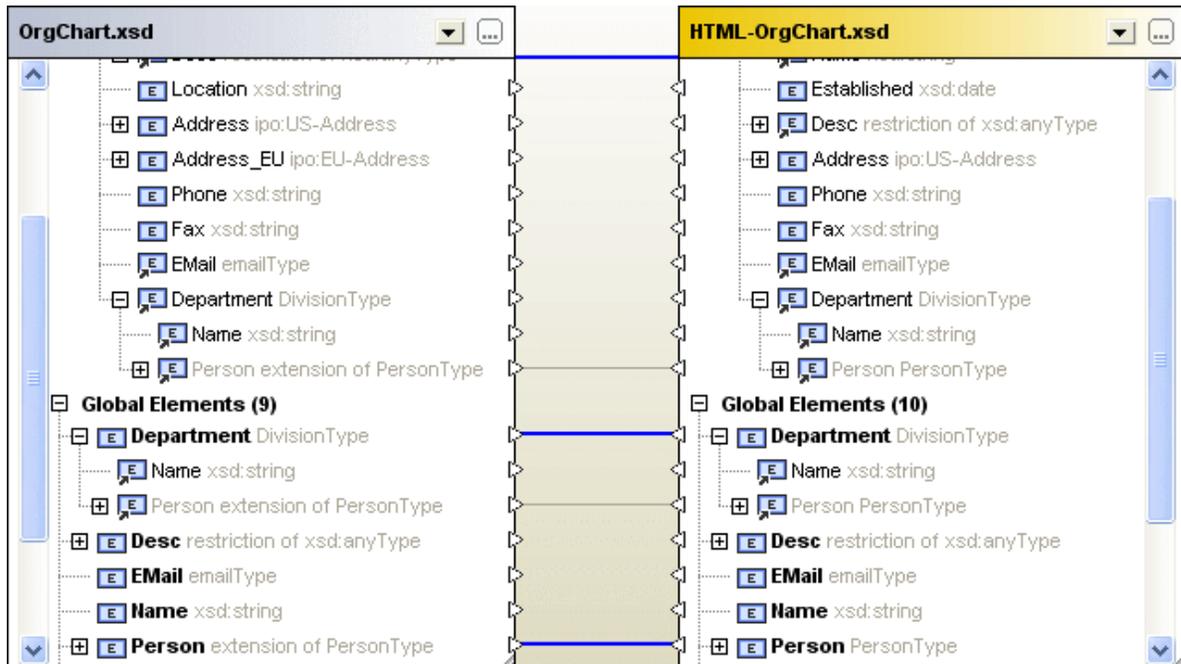
You can also define whether or not DiffDog should start an [automatic mapping](#)<sup>251</sup> when XML Schemas are loaded.



You define how DiffDog should transfer the changes in mapping of a global item to its children. Two options are available:

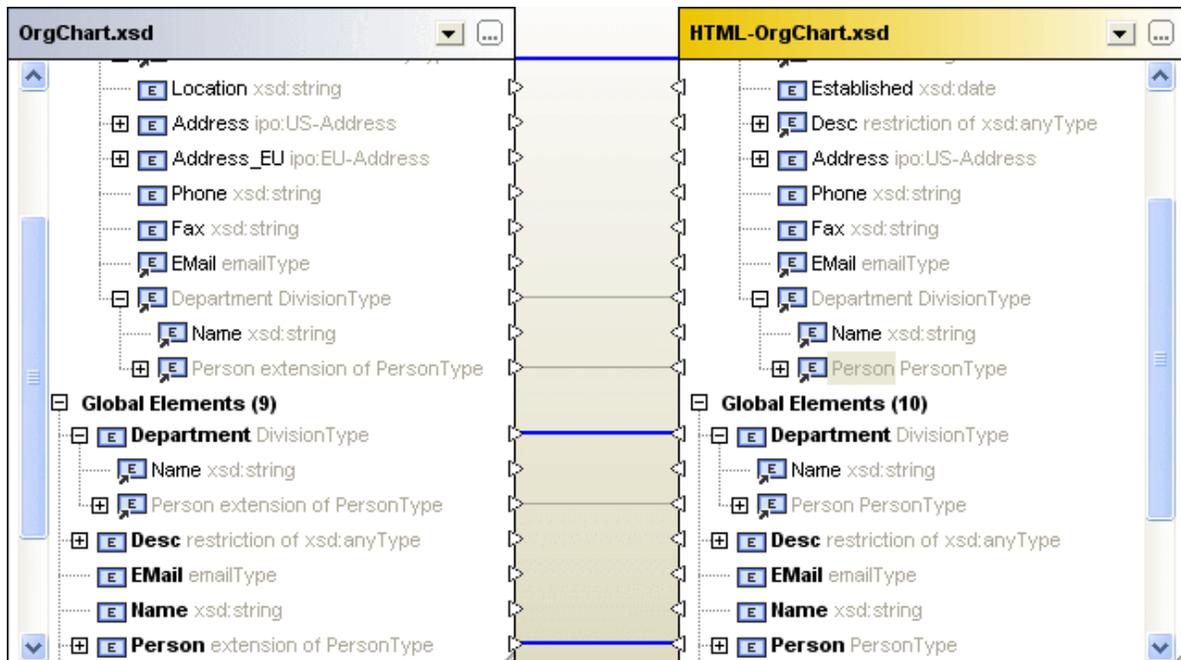
- **Transfer global item mapping changes to children**

This option transfers the mapping of global items if these items appear as children of other items but does not map the respective parent. In the screenshot below, the mapping of global item "Person" is transferred only when it appears as child of global item "Department", whereas the mapping of parent "Department" is not transferred.



- **Map to according parent and transfer global item mapping changes to children**

This option transfers the mapping of global items even if they do not appear as children. In the screenshot below, the mapping of both child "Person" and its parent "Department" is transferred.



**To modify the XML Schema comparison options:**

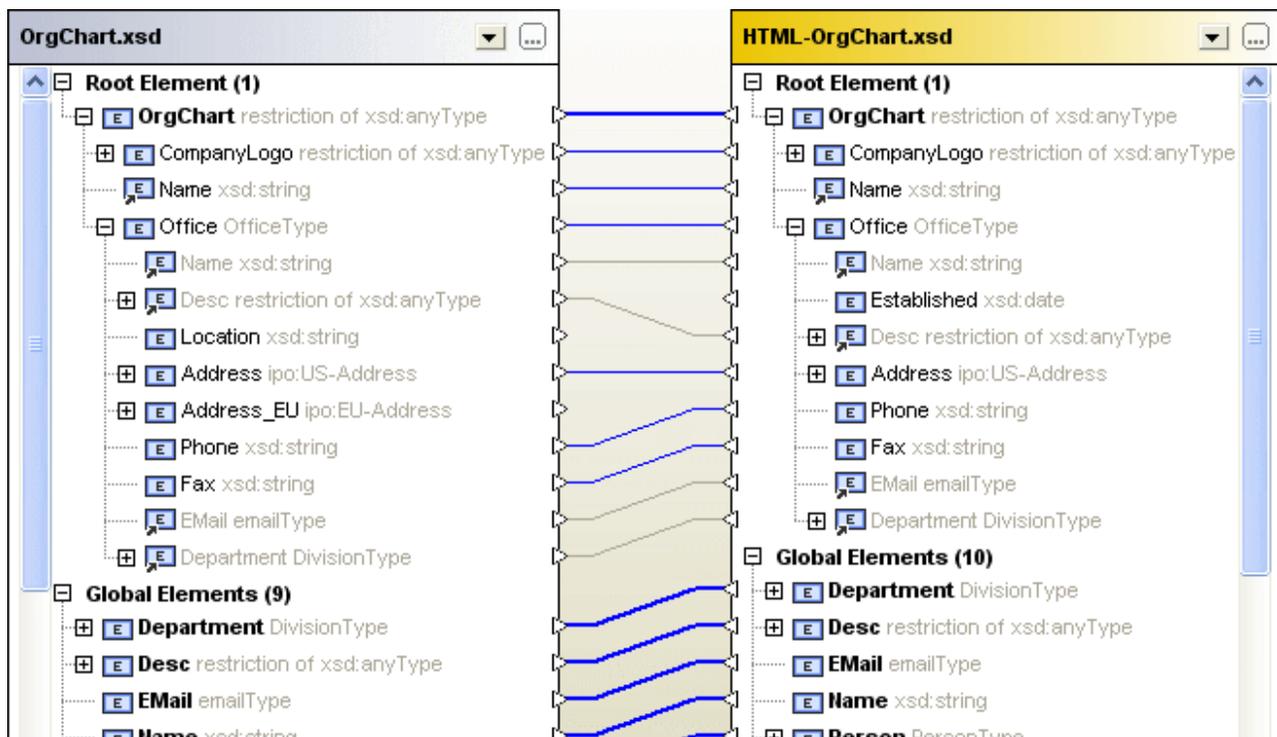
1. Do one of the following:
  - Select the menu option **Tools | Comparison Options...**
  - Click the **Comparison Options**  icon in the Diff and Merge toolbar.
2. Change the settings in the XML Schema Comparison Options dialog box as required

## 5.5 Mapping Elements

When you [select](#)<sup>104</sup> two XML Schemas for comparison, their respective root elements will automatically be mapped when the XML Schemas are loaded into the comparison components of the XML Schema Comparison window. You will have to [select the active root element](#)<sup>105</sup> if an XML Schema contains more than one element on root level.

The remaining elements as well as any child elements of the (active) root element will be mapped automatically by DiffDog when you [start](#)<sup>114</sup> the comparison. If you are not satisfied with the proposed mappings, you can manually change a mapping and re-run the comparison. Note that the mapping of the root element cannot be changed! If the mapping of the root elements is incorrect, you have to [replace](#)<sup>105</sup> one (or both) of the root elements to change the mapping.

If elements are referencing other elements, this is indicated with an icon. When such a referenced element is mapped, DiffDog also maps all references to this element in the same way. These references are indicated with an icon next to the element name (at the location where the reference occurs), and the mapping itself is displayed with gray lines (see screenshot below).



You can still change these automatic mapping by drawing a new mapping connection; such manual mappings will then be displayed with blue connector lines. A context menu option is also available allowing you to re-apply the mapping of the global item to a referenced item.

### To change or delete a mapping:

- To delete a mapping, right-click the element in either component or the line that connects two elements, respectively, and choose **Unmap selected** from the context menu or hit the **Del** key.

- To change an existing mapping, click the triangle next to the element name in one component and, keeping the mouse button pressed, draw a line to the corresponding triangle in the opposite component. Release the mouse button when the mouse cursor changes its shape.

**To unmap all elements:**

- Right-click into the title bar of either component and choose **Unmap items** from the context menu. Note that the active root element cannot be unmapped.

## 5.6 Saving XML Schema Comparison Files

After you have [selected](#)<sup>104</sup> XML Schemas for comparison and defined the appropriate [comparison options](#)<sup>108</sup>, you can save the comparison to an XML Schema comparison file. This is either done via the **File | Save As...** command or by right-clicking the tab of an XML Schema Comparison window and choosing **Save** from the context menu. If you do a particular comparison on a regular basis, the use of an XML Schema comparison file which can be opened directly may save you a considerable amount of working time.

## 5.7 Running a Schema Comparison

After you have [selected a root element](#)<sup>114</sup>, you can start a comparison. All global elements as well as their child elements will be mapped automatically.

**Note:** When comparing XML Schemas, DiffDog tries to find matching pairs of elements on both sides of the comparison rather than detecting or indicating differences between the two files. So, XML Schema comparison is about finding and indicating the parts that are equal in two XML Schemas. This approach is different from comparing files, directories, database schemas, or database data!

### To start a comparison:

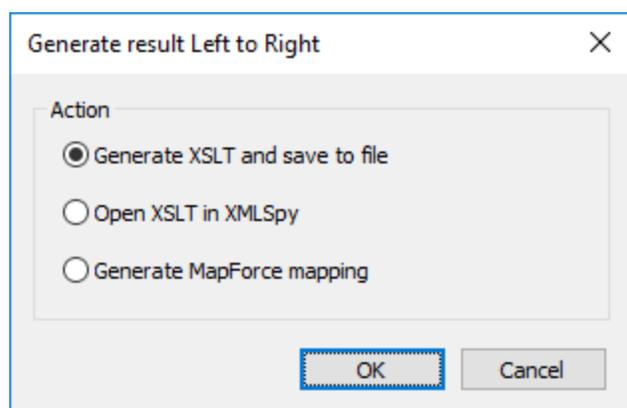
Do one of the following:

- Select the menu option **Diff and Merge | Start XML Schema mapping** or press **F5**.
- Right-click the title bar or any element of either component and choose **Start XML Schema mapping** from the context menu.
- Right-click anywhere into the XML Schema Comparison window and choose **Start XML Schema mapping** from the context menu.
- Right-click the tab of the XML Schema Comparison window and choose **Start Comparison** from the context menu.

## 5.8 Merging Differences in XML Schemas

If differences occur in compared XML Schemas, DiffDog does not merge the differences in the two compared XML Schemas but provides [XSLT Stylesheets](#)<sup>116</sup> or [MapForce Mappings](#)<sup>117</sup> so that you are able to update the XML files that have been generated with the compared XML Schemas. The respective commands are available as menu options in the **Diff and Merge** menu, as context menu commands, or they can be called by clicking the  and  toolbar options in the Diff and Merge toolbar.

If you click the **Generate Result Left to Right**  or the **Generate Result Right to Left**  button in the Diff and Merge toolbar, a dialog box is displayed, where you can choose which result is to be generated.



Choose the required option and click **OK**.

## 5.9 Generating an XSLT Stylesheet

After you have [compared](#)<sup>114</sup> two XML Schemas in DiffDog, you can generate an XSLT stylesheet which can later be executed on existing XML files so as to reflect the changes in the XML Schema in the XML files that have previously been generated using this schema.

You can either save the XSLT or open it in XMLSpy® if you have XMLSpy installed on your computer. The relevant commands are included in the context menu.

### To generate an XSLT Stylesheet:

Do one of the following:

- Right-click the title bar of either component or anywhere into the XML Schema Comparison window and select **Generate XSLT Left to Right...** or press **Alt+Right**. Alternatively, click the **Generate Result Left to Right**  button in the Diff and Merge toolbar and select the Generate XSLT and save to file radio button in the Generate result Left to Right dialog box.
- Right-click the title bar of either component or anywhere into the XML Schema Comparison window and select **Generate XSLT Right to Left...** or press **Alt+Left**. Alternatively, click the **Generate Result Right to Left**  button in the Diff and Merge toolbar and select the Generate XSLT and save to file radio button in the Generate result Right to Left dialog box.

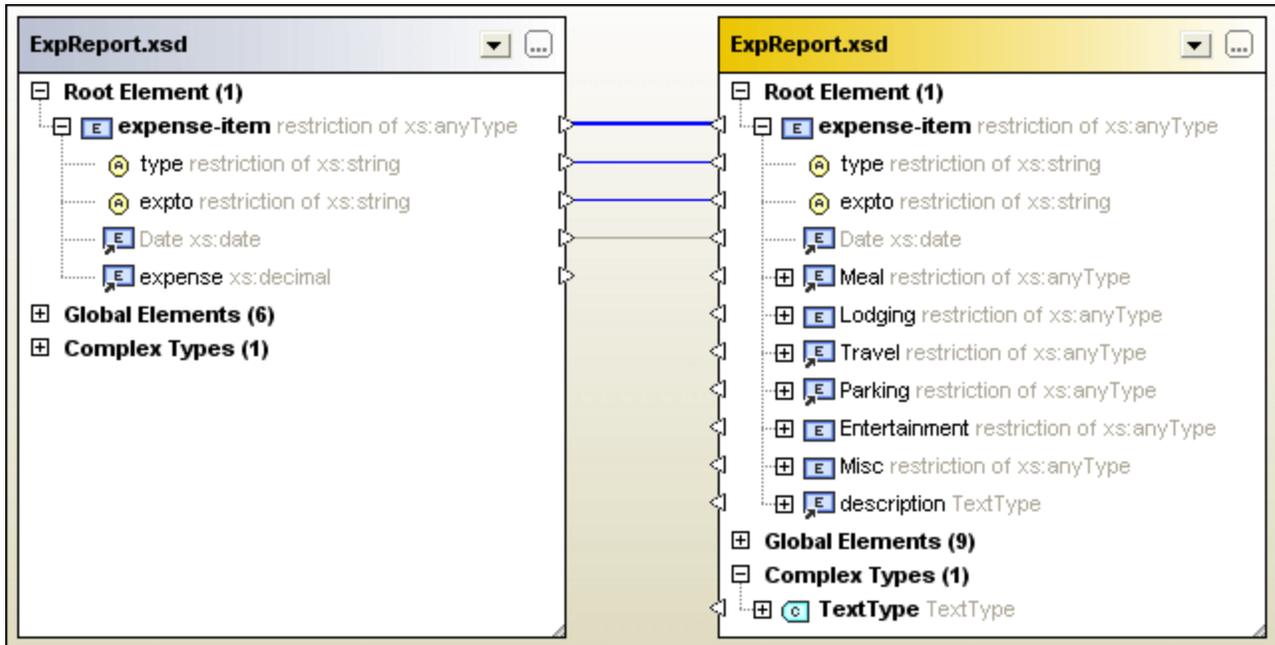
### To display an XSLT Stylesheet in XMLSpy:

Do one of the following:

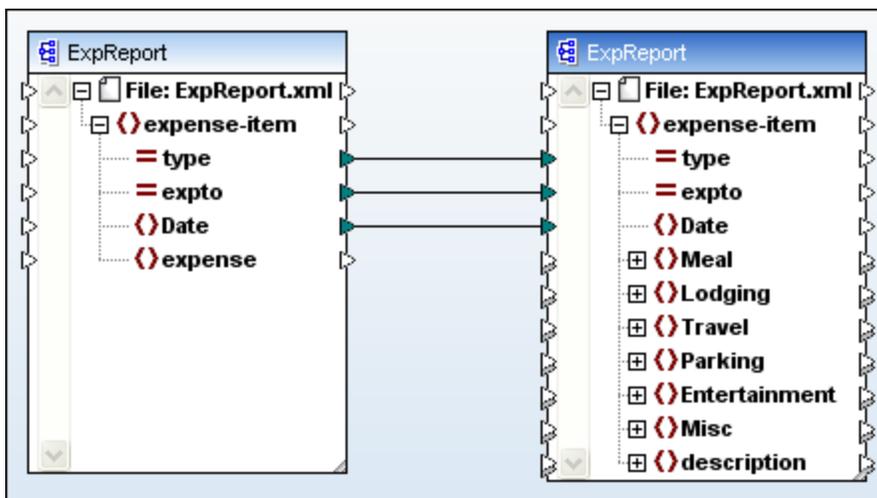
- Right-click the title bar of either component or anywhere into the XML Schema Comparison window and select **Open XSLT Left to Right in XMLSpy**. Alternatively, click the **Generate Result Left to Right**  button in the Diff and Merge toolbar and select the Open XSLT in XMLSpy radio button in the Generate result Left to Right dialog box.
- Right-click the title bar of either component or anywhere into the XML Schema Comparison window and select **Open XSLT Right to Left in XMLSpy**. Alternatively, click the **Generate Result Right to Left**  button in the Diff and Merge toolbar and select the Open XSLT in XMLSpy radio button in the Generate result Right to Left dialog box.

## 5.10 Generating a MapForce Mapping

If you have MapForce® installed on your computer, you can create a MapForce Mapping for the compared root element from within DiffDog and display it in a new instance of MapForce. Depending on whether you choose the Left to Right or the Right to Left command, you can determine which file is used as source or target, respectively.



If you choose the **Generate MapForce mapping Left to Right** command in the XML Schema Comparison above, you will get the following mapping in MapForce:



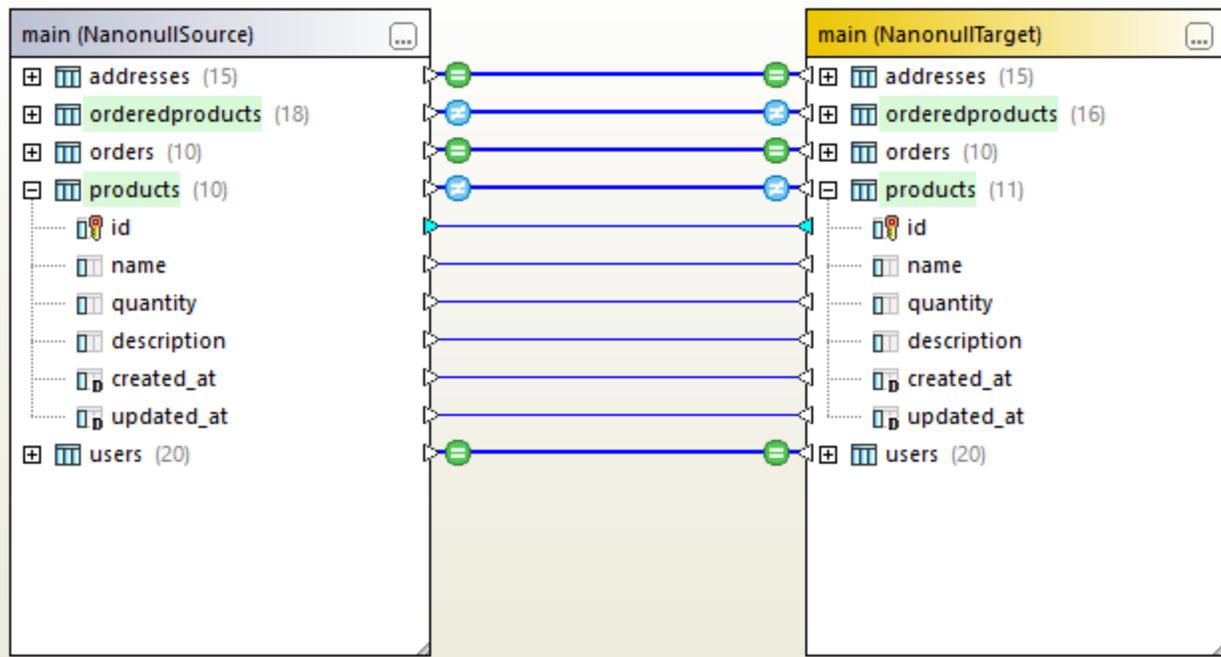
**To generate a MapForce mapping:**

1. [Define the root element](#)<sup>106</sup> for which you want to generate the MapForce mapping.
2. [Run](#)<sup>114</sup> an XML Schema comparison.
3. Right-click the title bar of either component or anywhere into the XML Schema Comparison window and select **Generate MapForce mapping Left to Right** or **Generate MapForce mapping Right to Left**. The mapping opens in a new MapForce instance. Alternatively, click the **Generate Result Left to Right**  or **Generate Result Right to Left**  button in the Diff and Merge toolbar and select the Generate MapForce Mapping radio button in the Generate result dialog box.

## 6 CSV and Database Data Comparison

You can compare data from CSV files or databases side-by-side. You can also perform mixed comparisons; for example, you can compare data from a CSV file with data from a database table. When comparing two databases, the objects to be compared can either belong to the same database, or reside in two different databases.

A database or CSV comparison is similar to file comparisons; that is, it involves a "left" component and a "right" one. A "component" is just a representation of the database structure from where you can conveniently select the tables or columns that are to be compared.



Database data comparison

In case of CSV files, the component includes only one table that represents the CSV file content. Each column corresponds to a CSV field. The column names correspond to header fields if the source CSV has a header row, and if you selected the **First row is header row** option when connecting to the CSV data source. If the CSV has no header row, columns are named automatically, for example, "c1", "c2", and so on.

After comparing data, you can optionally merge differences either from left to right, or from right to left. It is possible to merge all differences as one batch, or you can display the differences for each table in a data grid, and then review and merge each difference individually at row level. For more information, see [Viewing Differences Between Tables](#)<sup>135</sup> and [Merging CSV and Database Differences](#)<sup>138</sup>.

If you perform the same data comparison frequently, you can save it to a database data comparison (.dbdif) file, see [Saving Comparison Files](#)<sup>134</sup>.

## Prerequisites

- An active connection to a data source must exist in your project for each database table or file that is to be compared side-by-side. This data populates the "left" and "right" components, respectively. For more information, see [Connecting to a Data Source](#)<sup>152</sup>. For CSV files, see [Adding CSV Files as Data Source](#)<sup>186</sup>.
- If you are comparing tables, each table must have a primary key column. DiffDog requires the primary key column to sort the table rows before performing the actual comparison.

## Limitations

- When comparing CSV files, the first column of each row is always considered the primary key column.
- If the primary key column is non-numeric, and if a change occurs in the key column, the entire row is treated as a new row. This applies both to CSV files and to database comparisons. Consider the following example:

	FirstName	FirstName	LastName	LastName	Address	Address
1	Annette	Annette	Bearhug	Bearhug	451 Capybara Lane	451 Capybara Lane
2	Bob	/	Barker	/	68 Cage Boulevard	/
3	/	Bobby	/	Barker	/	68 Cage Boulevard
4	Jenny	Jenny	Lionheart	Lionheart	276 Cheetah Street	276 Cheetah Street
5	Oliver	Oliver	Birdsong	Beardsong	987 Flamingo Avenue	987 Flamingo Avenue

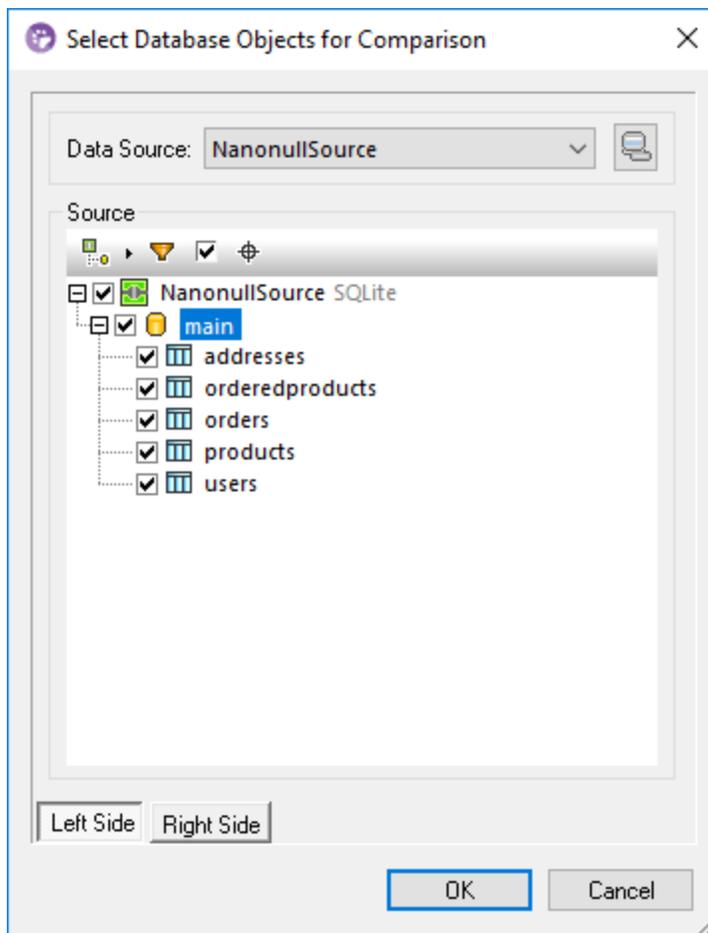
The comparison result illustrated above was obtained by comparing two CSV files. As mentioned before, the first column in CSV files is always the primary key. For this reason, even though value "Bob" has been renamed to "Bobby", this change is reported as a new row (rather than a difference in that particular column). On the other hand, the difference between "Birdsong" to "Beardsong" is displayed as a difference in the same row, because that column is not a primary key.

## 6.1 Running a Database Data Comparison

A database data comparison in DiffDog consists of the following steps.

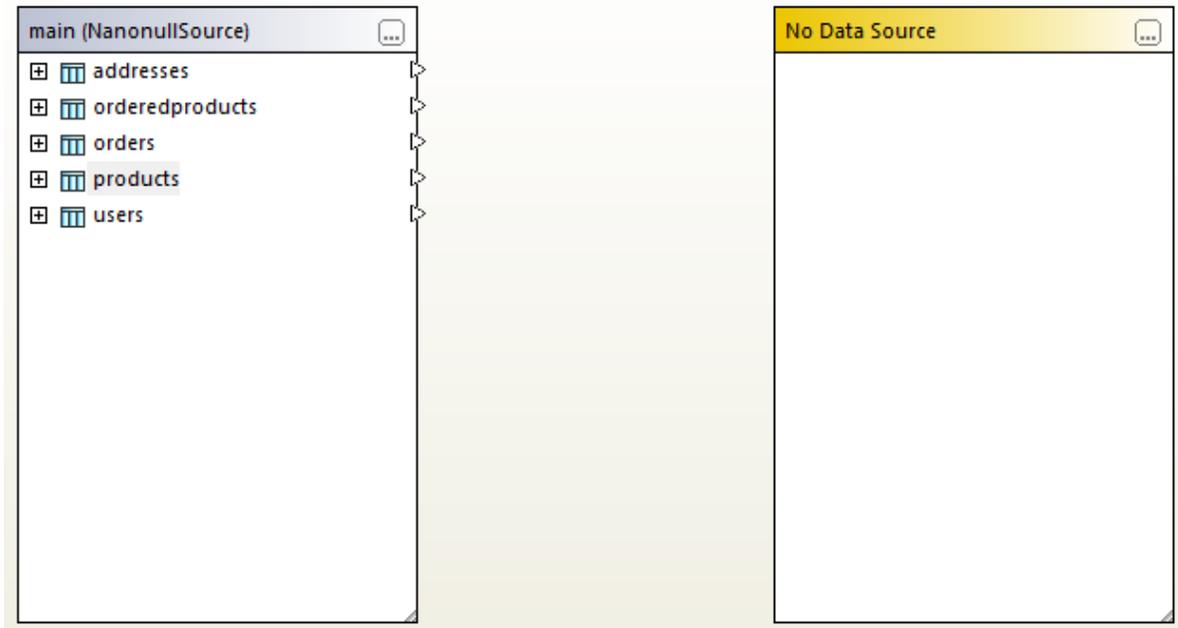
### Step 1: Connect to the "left" and "right" databases

1. On the **File** menu, click **Compare Database Data**. (Alternatively, click the **Data Comparison** ) Follow the database wizard steps to connect to the database (see [Connecting to a Database](#) <sup>152</sup>).
2. When prompted to select database objects for comparison, first choose a data source from the Data Source list, and then select the check boxes next to the objects you want to include for comparison. The Data Source list displays any active data sources that you've connected since starting DiffDog.



**Note:** From the dialog box above, you can optionally group, filter, or navigate database objects using the buttons above the database tree structure. For more information, see [Navigating Database Objects](#) <sup>124</sup>.

3. Click either **Left Side** or **Right Side** to add the data source to the left or right side of the comparison, respectively, and then click OK. Be patient while DiffDog adds the selected objects to the comparison; this may take a while for large databases. At this stage, only one of the comparison components has an assigned data source (right or left, depending on what you selected).



4. Click the **Browse**  button of the empty component, and choose the second data source from the Data Source list, if one is available. Otherwise, click **Quick Connect**  and follow the wizard steps to connect to the second data source.
5. Select the check boxes next to the tables you want to compare.

If the databases to be compared are SQLite or Access, you can also perform this step from Windows Explorer, see [Quick Comparison of SQLite and Access Databases](#) <sup>128</sup>.

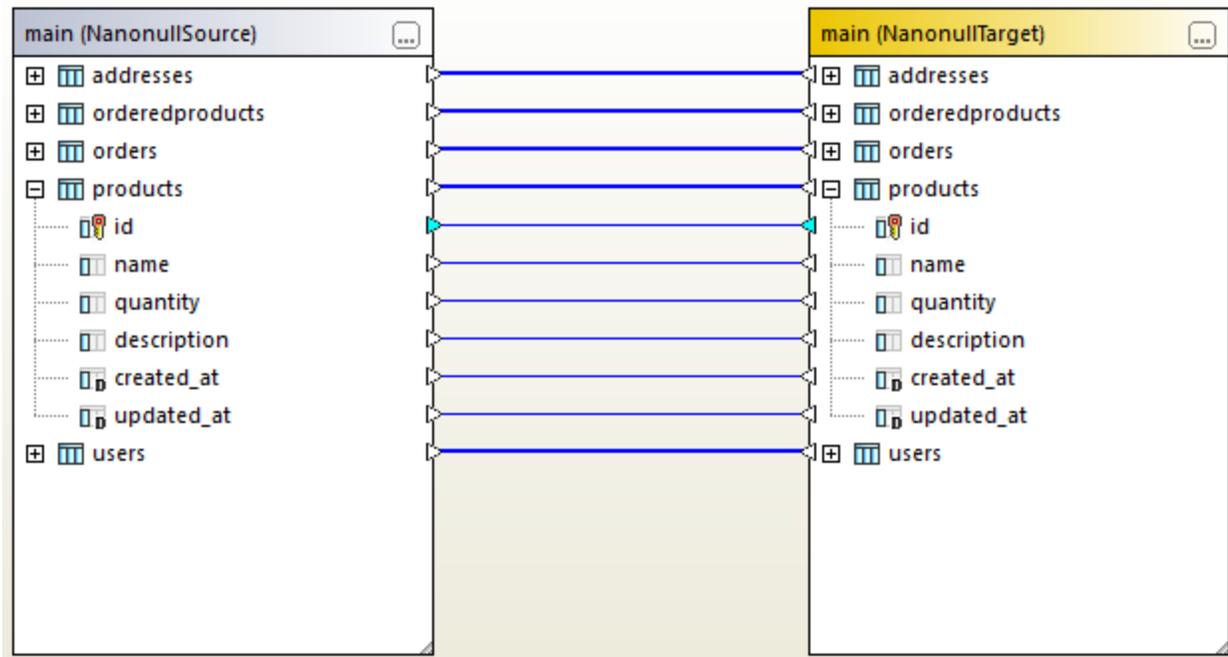
## Step 2: Map the objects to be compared (if applicable)

To perform a comparison, the objects on the left and right side of the comparison must be connected by a line (a "mapping"). The mapping instructs DiffDog to compare these two objects specifically. By default, DiffDog will attempt to match automatically the objects to be compared by their name, and thus create the corresponding mappings. The mapping options can be adjusted from **Tools | DiffDog Options | Database Comparison**.

When necessary, you can create mappings manually, or adjust the existing ones. For example, you may need to create a mapping manually between two objects if the object names are different in the "left" as opposed to the "right" database.

To create a mapping, click the triangle on the left component and, holding the left mouse button pressed, drag it to a target triangle on the right component. To delete all mappings of a comparison, right-click the title bar of either component and choose **Unmap items** from the context menu. To delete a single mapping, right-click the appropriate object and choose **Unmap selected** from the context menu. Alternatively, click the connection line between two mapped objects and press **Delete**.

**Note:** Unmapping a table will also unmap all columns of that table.



*Mappings in a data comparison*

### Step 3: Run the comparison

Once the mappings between objects are created, you can run the comparison as follows:

- On the **Diff and Merge** menu, click **Start Comparison**. (Alternatively, click the **Start Comparison**  toolbar button, or press **F5**.)

At this stage, you can either explore the comparison results in more detail (see [Viewing Differences Between Tables](#) <sup>135</sup>), or generate the merge script ([Merging CSV and Database Differences](#) <sup>138</sup>).

### Sorting, collapsing, and expanding tables

To simplify navigation through huge schemas which contain a lot of objects, you can collapse and expand individual tables when you are examining the differences. If you double-click a table in the left component, the same table is also collapsed or expanded in the right component, respectively (provided that a mapping exists between the two tables). To collapse all tables in both components, do one of the following:

- On the **Diff and Merge** menu, click **Collapse items**.
- Right-click the title bar of a component, and select **Collapse tables** from the context menu.

You can also sort tables in ascending or descending order, as follows:

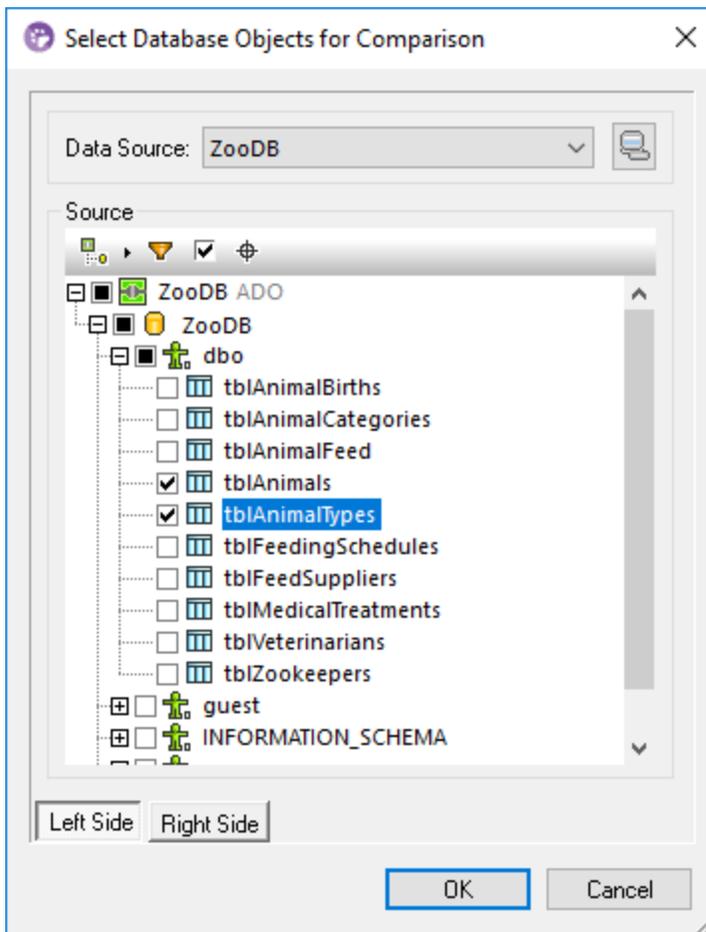
- Right-click the empty area and select **Sort tables | Ascending** or **Sort Tables | Descending** from the context menu. The options **Ascending mapped first** and **Descending mapped first** will give priority to tables that have mappings over those that don't.

## Adding or removing tables from a comparison

To add more tables to the comparison, or remove existing one from the comparison, click the **Browse**  button in the upper-right corner of the database component and then select or clear the required check boxes.

### 6.1.1 Navigating Database Objects

When selecting tables or columns for comparison, you can customize the way the database objects are displayed in the "Select Database Objects for Comparison" dialog box. You can also apply miscellaneous filters to quickly find specific database objects.



The dialog box illustrated above includes the following buttons in its toolbar:

- **Layout** 
- **Filter folder contents** 
- **Show checked objects only** 
- **Object locator** 

## Layout

The **Layout**  button controls how various database objects are displayed in the **Select Database Objects for Comparison** dialog box. Note that this button changes the appearance based on the layout that is currently selected. You can select from among the following predefined layouts:

	<b>Folders</b>	Organizes database objects into folders based on object type in a hierarchical tree (for example, "Schemas", "Tables", and others). This is the default setting in DiffDog.
	<b>No Schemas</b>	This layout is similar to the <b>Folders</b> layout, except that there are no schema folders; tables are therefore not categorized by schema.
	<b>Table Dependencies</b>	Categorizes tables according to their relationships with other tables. The categories include tables with foreign keys, tables referenced by foreign keys, tables without relations, and tables with self-referencing foreign keys.

For some databases such as SQL Server, you can optionally display user tables and system tables into separate folders, as follows:

- Right-click the "Tables" folder and select **Sort into User and System Tables** from the context menu.

Note that this function is available only when using the following layouts:

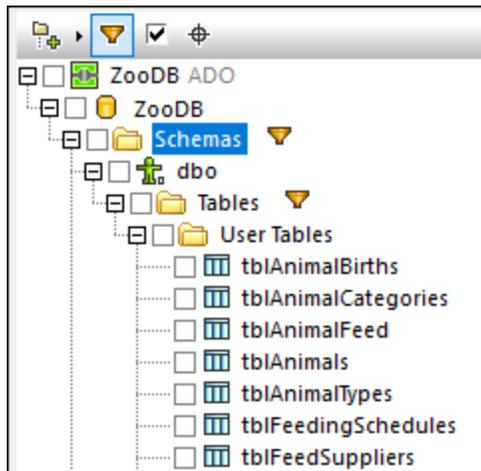
- Folders 
- No Schemas 

## Filter folder contents

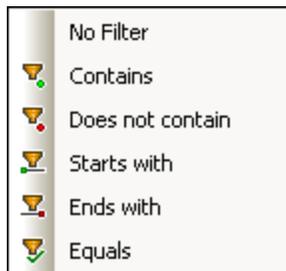
Use the **Filter**  tool to filter database objects by name or part of a name. Objects are filtered as you type in the name.

### To filter objects:

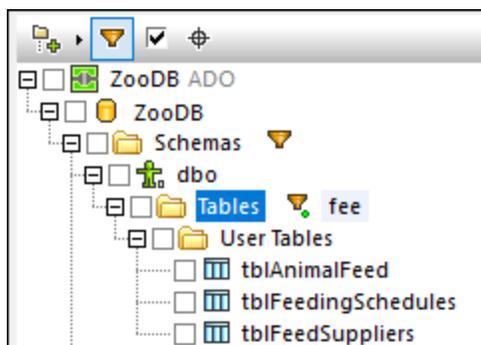
1. Click the **Filter folder contents**  button. Alternatively, select a database object and press **Ctrl+Alt+F** to activate filtering. Notice that filter icons appear next to folders.



2. Click the filter icon next to the folder you want to filter and select the desired filtering option, for example, "Contains".



3. Start typing the filter text next to the  icon. The results are adjusted as you type.



### Show checked objects only

Click **Show checked objects only**  to display only selected items. When you do this, all unselected items are hidden and only the items that have been selected for comparison are displayed.

### Object locator

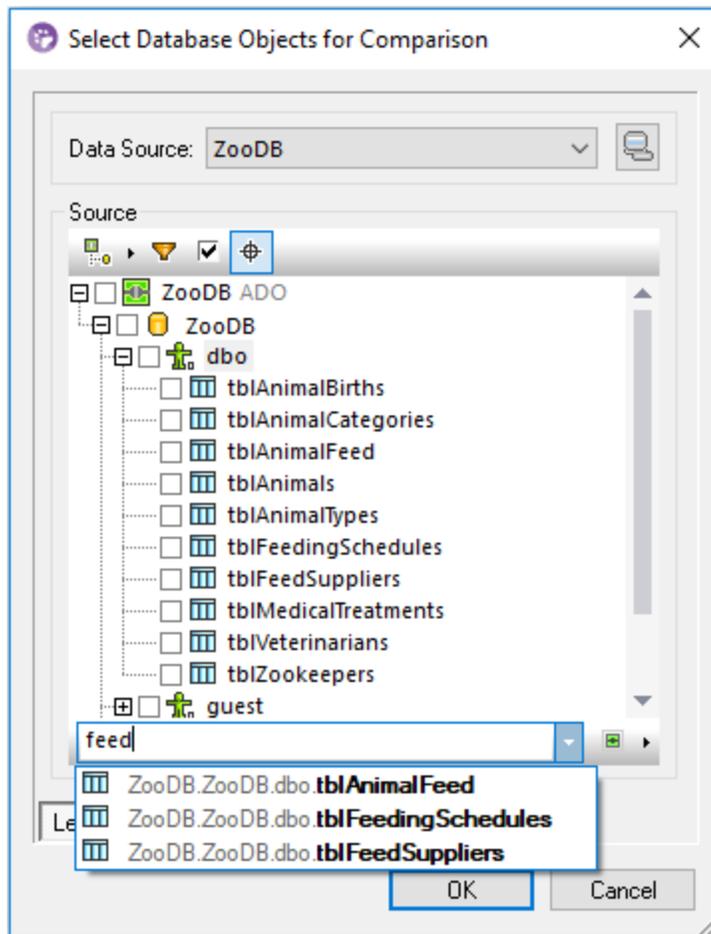
The **Object Locator**  tool lets you find and filter database objects by any part of their name.

**To find database objects using the Object Locator:**

1. Click the **Object Locator**  button or press **Ctrl+L**. A combo box appears at the base of the dialog box.
2. Optionally, change the Object Locator context by clicking the arrow icon  next to the combo box. You can restrict the display of objects as follows:

<b>From current Data Source</b>	Displays only objects from the currently selected data source.
<b>From Focused Item</b>	Displays only objects nested under the folder or object that is currently selected.
<b>All</b>	Displays all objects from all data sources that are currently connected.

3. Optionally, enter the string you want to look for (for example, "feed"). The drop-down list displays all elements that contain that string.



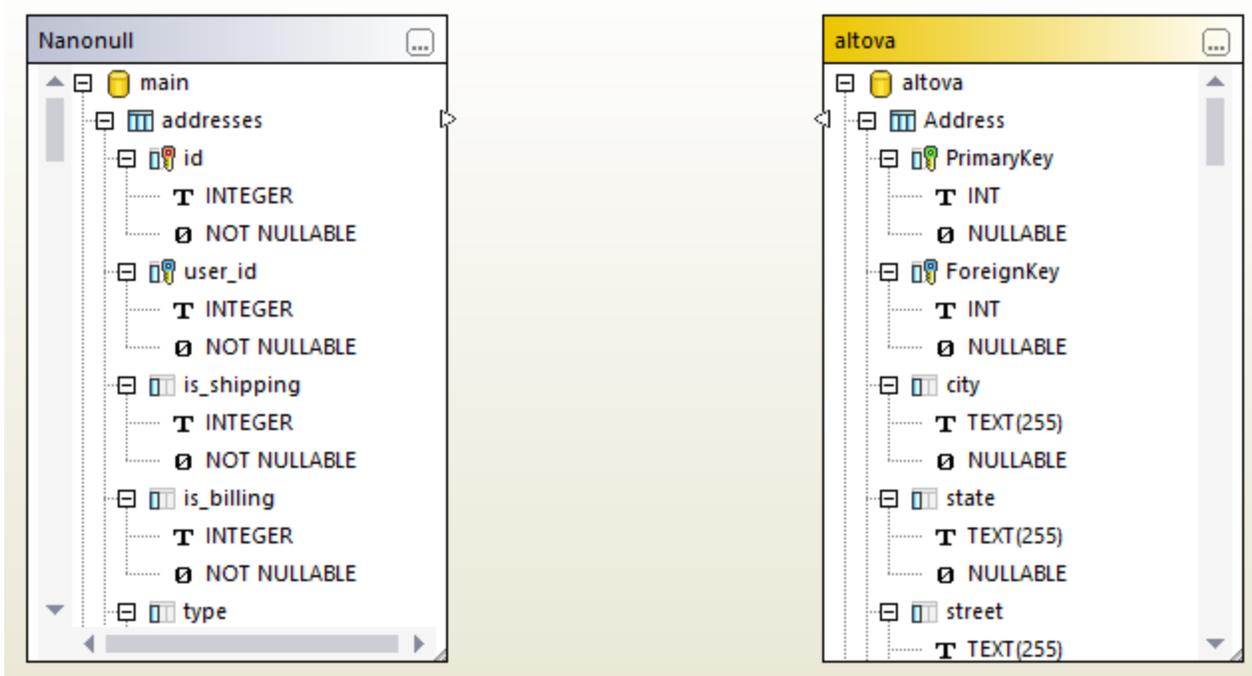
## 6.2 Quick Comparison of SQLite and Access Databases

When SQLite or Access databases are involved in the comparison, you can easily start the comparison directly from Windows Explorer. Starting database comparisons from Windows Explorer is applicable only to SQLite and Access databases, since they are file-based. This is an easier alternative to starting the comparison from DiffDog, as described in [Running a Database Data Comparison](#)<sup>121</sup> and [Running a Database Schema Comparison](#)<sup>146</sup>.

For example, when the two database files to be compared are SQLite or Access, you can quickly start the comparison as follows:

- Having selected the two database files in Windows Explorer, right-click any of them, and then select **Compare with DiffDog** from the context menu.

This action opens a database schema comparison and populates both sides of the comparison, for example:



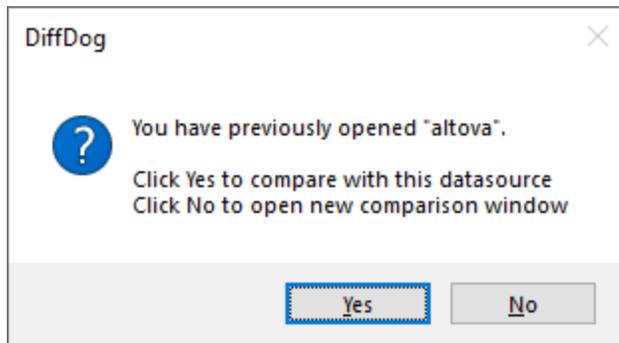
Note that the left side may be a SQLite file and the right side may be an Access file, or vice versa.

You can also start a database comparison by selecting just one database file, for example:

- Right-click the SQLite or Access database file in Windows Explorer, and then select **Compare with DiffDog** from the context menu.

If DiffDog is not running already, this action opens a database *schema comparison*, and populates the left side of the comparison with the selected database file. If DiffDog is already running, then the outcome is one of the following:

- If a *data comparison* window is open, in focus, and one of the sides already contains a database, then DiffDog shows a dialog box similar to the one below:



Click **Yes** to add the new file to the current data comparison, or otherwise **No** to open a new comparison window.

- If a *schema comparison* window is open, in focus, and one of the sides already contains a database, then DiffDog shows a dialog box asking you to add the new database to the current schema comparison.
- If no data or schema comparison is active, or if both sides already contain databases, DiffDog opens a new database schema comparison.

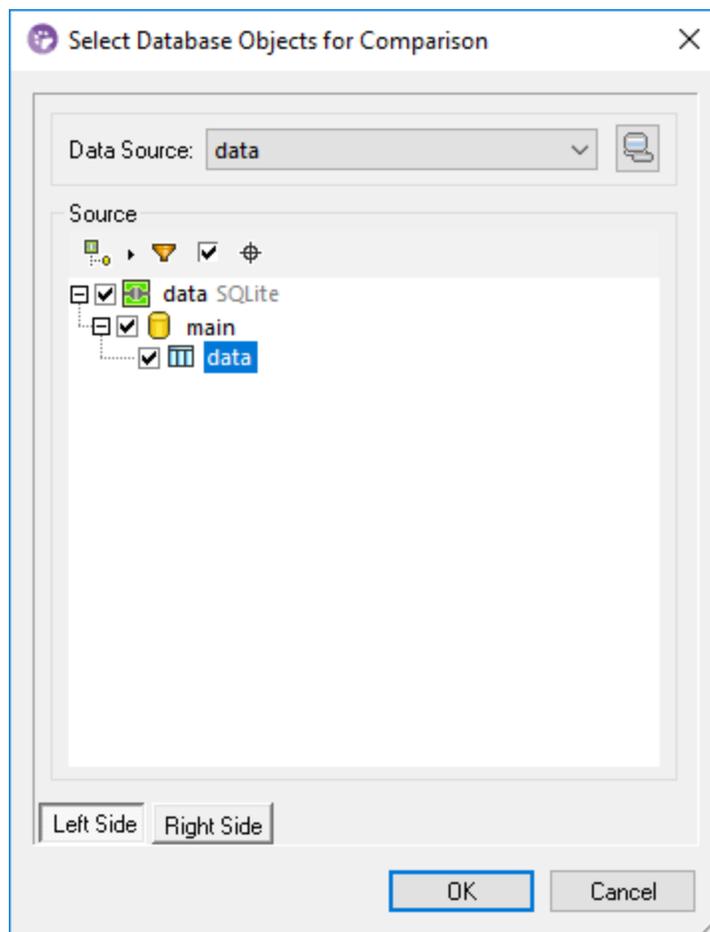
To turn a *schema comparison* into a *data comparison*, right-click an empty area in the comparison window and then select the **Open in new Data Comparison** from the context menu. A similar menu command is available in a schema comparison window, for turning a data comparison into a schema comparison.

## 6.3 Comparing CSV Files

CSV file comparisons are very similar to database data comparisons. CSV files are treated just as any other data source, and you can connect to them using the same connection wizard used with databases. This example describes how to compare two CSV files; however, you can also add a database on either side of the comparison.

### Step 1: Add the "left" and "right" data source

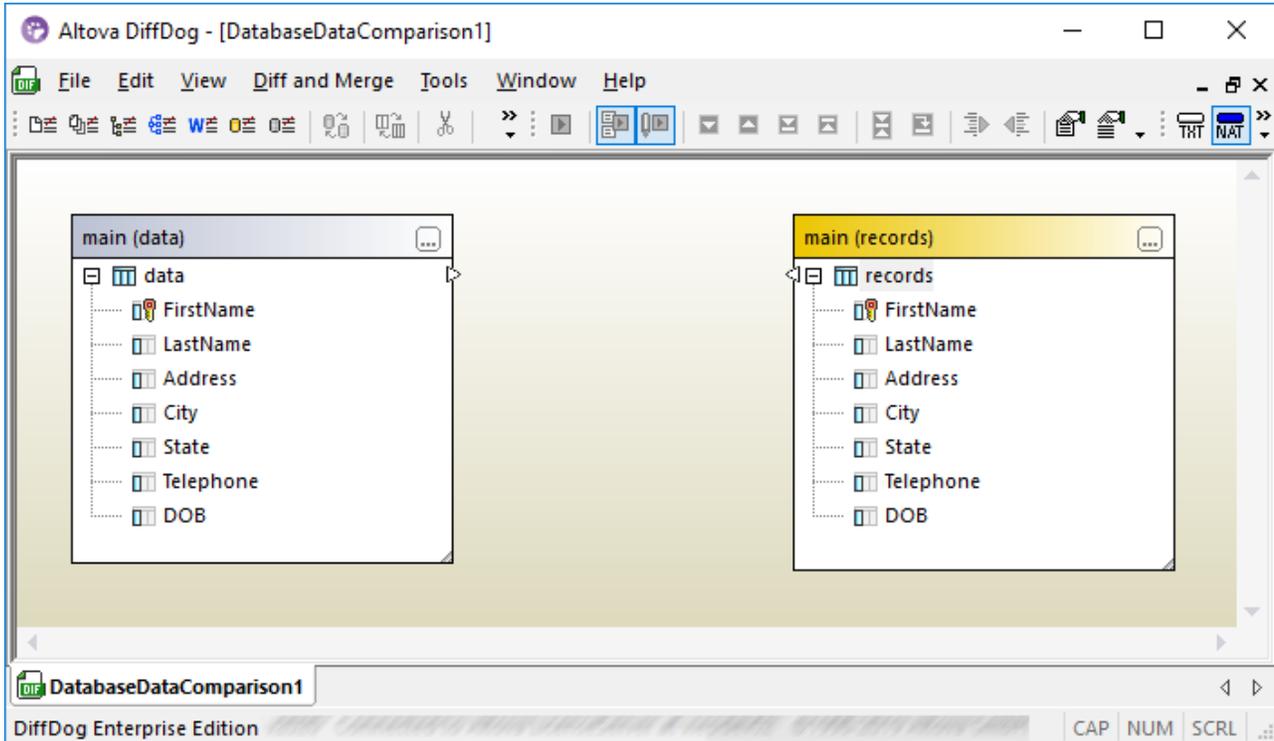
1. On the **File** menu, click **Compare Database Data**. Alternatively, click the **Data Comparison**  toolbar button. Follow the wizard steps and browse for the CSV file. Make sure to select the correct separator (comma, semicolon, or tab) and to indicate whether the first row of the CSV file is a header row. For more information, see [Adding CSV Files as Data Source](#)<sup>186</sup>.
2. When prompted to give a name to the data source, type a descriptive name to easily identify this CSV file, and click **OK**.
3. Select the check box next to the CSV table ("data", in this example), and then click either **Left Side** or **Right Side** to designate this CSV as the left or the right side of the comparison.



4. So far, you have added only the first data source. To add the second one, click the **Browse**  button of the empty component, and choose the second data source from the Data Source list, if one is

available. Otherwise, click **Quick Connect**  and follow the wizard steps to connect to the second data source.

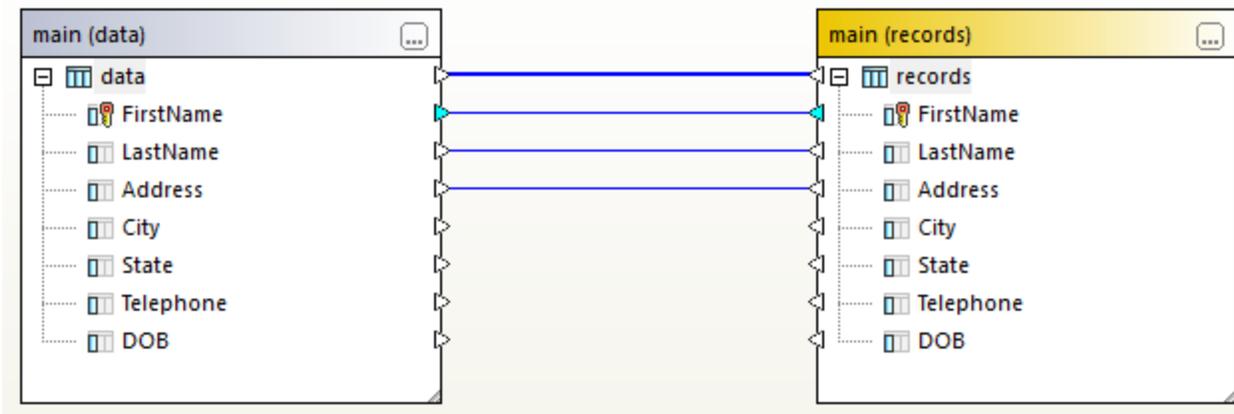
At this stage, you should have at least one object displayed on each side of the comparison, for example:



In CSV files, the column names shown in the components above are the ones that appear on the first row of the CSV file. This assumes that you have selected the **Treat first row as header** option while adding the CSV data source. Otherwise, columns are displayed as **c1**, **c2**, **c3**, and so on, according to their ordinal number, starting with 1.

### Step 2: Map column pairs

You can now indicate the column pairs that are to be included in the comparison by drawing mapping connections between them, for example:



To create a mapping, click the triangle on the left component and, holding the left mouse button pressed, drag it to a target triangle on the right component. To delete all mappings of a comparison, right-click the title bar of either component and choose **Unmap items** from the context menu. To delete a single mapping, right-click the appropriate object and choose **Unmap selected** from the context menu. Alternatively, click the connection line between two mapped objects and press **Delete**.

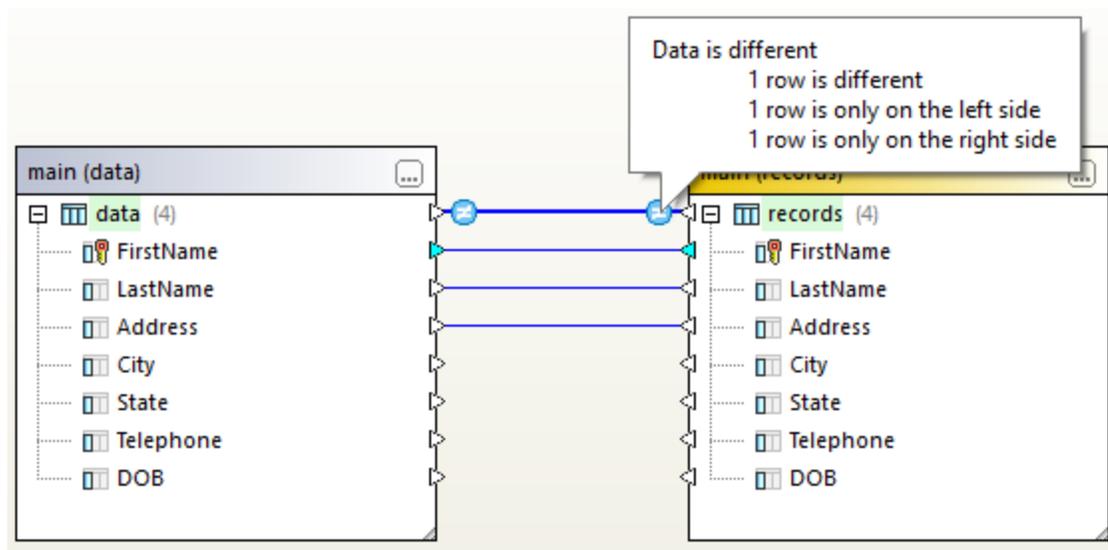
**Note:** Unmapping a table will also unmap all columns of that table.

### Step 3: Run the comparison

Now that the mappings are created, you can run the comparison as follows:

- On the **Diff and Merge** menu, click **Start Comparison**. (Alternatively, click the **Start Comparison**  toolbar button, or press **F5**.)

At this stage, the  icon appears on the mapping line if the compared data is not equal. Move the mouse cursor over this icon to view a quick summary, for example:



For information about exploring the comparison results in more detail, see [Viewing Differences Between Tables](#) <sup>135</sup>.

Optionally, you can also merge data between two CSV files, or between a CSV file and a database, in either direction, see [Merging CSV and Database Differences](#) <sup>138</sup>.

## 6.4 Saving Comparisons

After running a CSV or database data comparison, you can save it to a file. This will save you time in future, whenever you want to compare the same data sources. Database data comparison (.dbdif) files store the connection details of the databases or CSV files involved in comparison, as well as the database objects selected for comparison. Passwords are stored in encrypted form inside comparisons files.

### To save a data comparison to a file:

1. Run a comparison.
2. On the **File** menu, click **Save As**, and select "Altova Database Data Comparison (.dbdif)" as file type.

### To open a data comparison file:

- On the **File** menu, click **Open Comparison File**, and browse for the .dbdif file.

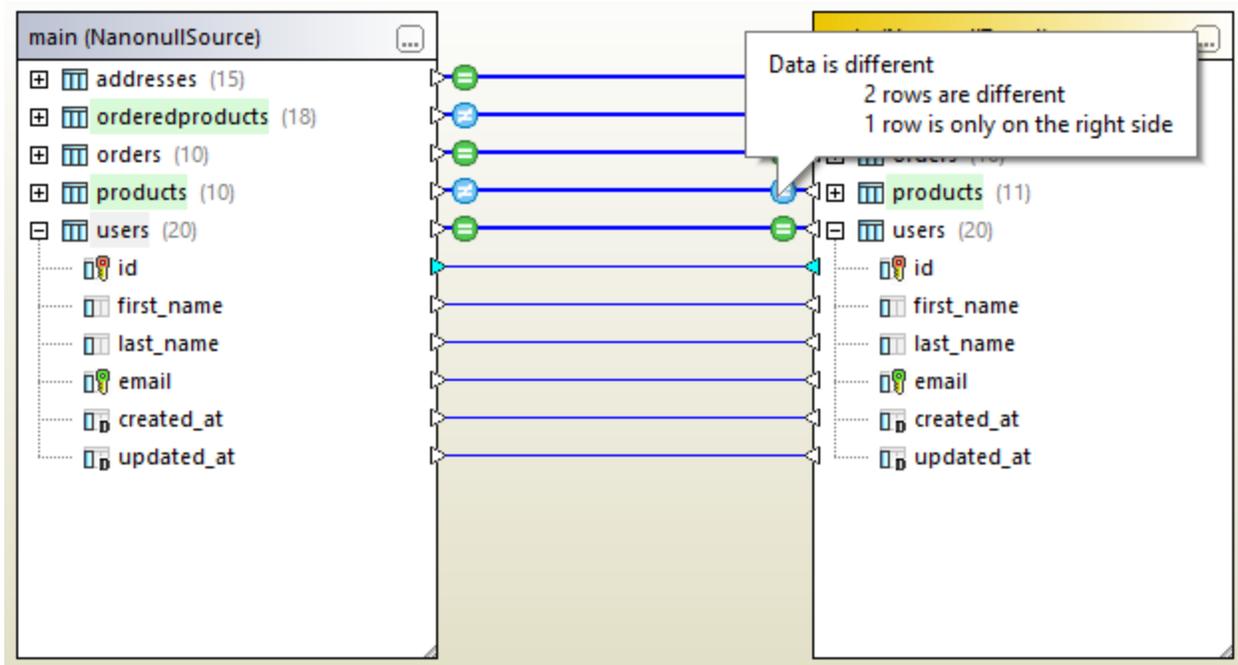
With DiffDog Server, you can run database data comparisons (.dbdif files) on Linux, macOS or Windows operating systems. For more information, see [Automation with DiffDog Server](#)<sup>143</sup>.

## 6.5 Viewing Differences Between Tables

Every time after you run a [data comparison](#)<sup>121</sup> or a [CSV comparison](#)<sup>130</sup>, the high-level results are displayed directly in the Data Comparison window. Namely, the result of a comparison is indicated by the following icons:

-  The compared objects are equal in both components
-  Differences exist between the objects in the left and right components

Objects that are different are highlighted with green color. A balloon tip with additional information appears if you move the mouse cursor over a comparison icon.



To view a more detailed comparison result, do one of the following:

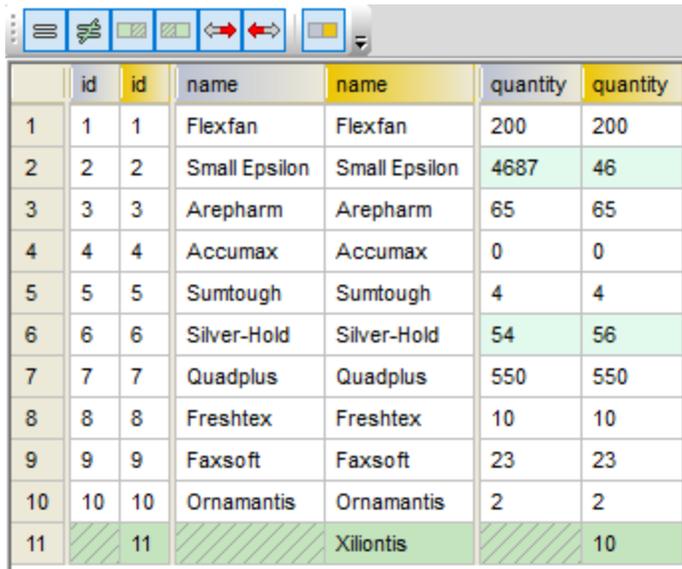
- Click the comparison result icon  for a given table.
- Right-click a table where differences exist, and select **Show selected results** from the context menu.
- Right-click an empty area in the comparison window, and select **Show results** from the context menu.

This opens a grid where differences between each column are displayed side-by-side, called the "Comparison Result View", as further described below.

**Note:** If a dialog box appears with the following text: "Data is equal, do you want to open content?", this indicates that the command above was run for a selection of tables where there are no differences.

## Comparison Result View

This view displays differences between a given table pair. As illustrated below, each column is displayed twice (as it stands in the "left" table as opposed to the "right" table). In the example below, the column `quantity` was changed in two occurrences; also, a new row (`id = 11`) exists only in the "right" table.



	id	id	name	name	quantity	quantity
1	1	1	Flexfan	Flexfan	200	200
2	2	2	Small Epsilon	Small Epsilon	4687	46
3	3	3	Arepharm	Arepharm	65	65
4	4	4	Accumax	Accumax	0	0
5	5	5	Sumtough	Sumtough	4	4
6	6	6	Silver-Hold	Silver-Hold	54	56
7	7	7	Quadplus	Quadplus	550	550
8	8	8	Freshtex	Freshtex	10	10
9	9	9	Faxsoft	Faxsoft	23	23
10	10	10	Ornamantis	Ornamantis	2	2
11		11		Xiliontis		10

Use the toolbar buttons to customize which rows should be displayed in this view, or to navigate differences.

Icon	Command	Description
	<b>Show/Hide all equal rows</b>	Shows or hides rows that are equal in the left and right component.
	<b>Show/Hide all different rows</b>	Shows or hides rows that are different in the left and right component.
	<b>Show/Hide rows that are only on the left</b>	Shows or hides rows that exist only in the table that is contained in the left component.
	<b>Show/Hide rows that are only on the right</b>	Shows or hides rows that exist only in the table that is contained in the right component.
	<b>Show/Hide rows that cannot be merged from left to right</b>	Shows or hides rows that are different in the left and right component and can be merged only from the right to the left side and not from the left to the right side.
	<b>Show/Hide rows that cannot be merged from right to left</b>	Shows or hides rows that are different in the left and right component and can be merged only from the left to the right side and not from the right to the left side.
	<b>Show/Hide columns which don't have any differences</b>	Shows or hides columns where no differences exist.

Icon	Command	Description
	<b>Next difference (Alt+Down)</b>	Selects the next difference as the current difference. If this command is disabled, click any difference on the grid first.
	<b>Previous difference (Alt+Up)</b>	Selects the previous difference as the current difference.
	<b>Last difference (Alt+End)</b>	Selects the last difference in the document as the current difference.
	<b>First difference (Alt+Home)</b>	Selects the first difference in the document as the current difference.
	<b>Copy from left to right</b>	Displays a dialog box where you can merge differences from the left to the right database or CSV file, see also <a href="#">Merging CSV and Database Differences</a> <sup>138</sup> .  If this command is disabled, click any difference on the grid first.
	<b>Copy from right to left</b>	Displays a dialog box where you can merge differences from the right to the left database or CSV file.

It is possible to customize the appearance of the Comparison Result View, see [Database Data Comparison Options](#) <sup>140</sup>.

## 6.6 Merging CSV and Database Differences

After performing a CSV or database data comparison, you can optionally merge differences either from the left to the right database or CSV file, or vice versa. Differences can be merged either in batch for the entire database, or individually at table or even row level.

By default, database transactions as well as rollback on error is enabled on data merging (assuming the database supports this), see [Database Data Comparison Options](#)<sup>140</sup>.

Notes:

- When merging data to CSV files, transactions and rollback on error is not supported.
- It is not possible to merge columns that have an incompatible data type (for example, string to numeric type). Also, sometimes a merge is possible only in one direction (for example, a numeric type may be converted to a string type, but not the opposite).

### Warning

In case of CSV comparisons, if the first column of the file is *not* unique, it is not recommended to do a merge. When there is no row uniqueness, then multiple unrelated rows might be affected by DELETE and UPDATE statements.

DiffDog will ignore incompatible merges and will notify you, before merging, if such occurrences exist. In the Comparison Result view, merges that are only possible only in one direction are marked with a small red arrow joined with a green arrow. The direction of the green arrow indicates the direction where the merge is possible. For example, in the image below, the `description` column (of type "text") cannot be mapped to the `quantity` column because the latter is numeric. However, the `quantity` column can be mapped to the `description` column.

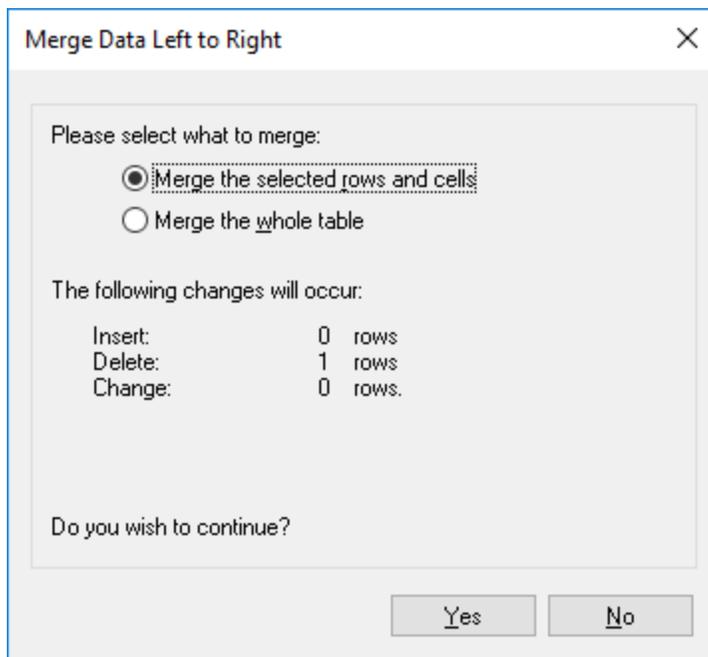
	id	id	name	name	description	quantity
1	1	1	Flexfan	Flexfan	[NULL]	200
2	2	2	Small Epsilon	Small Epsilon	[NULL]	46
3	3	3	Arepharm	Arepharm	[NULL]	65
4	4	4	Accumax	Accumax	[NULL]	0
5	5	5	Sumtough	Sumtough	[NULL]	4
6	6	6	Silver-Hold	Silver-Hold	[NULL]	56
7	7	7	Quadplus	Quadplus	[NULL]	550
8	8	8	Freshtex	Freshtex	[NULL]	10
9	9	9	Faxsoft	Faxsoft	[NULL]	23
10	10	10	Ornamantis	Ornamantis	[NULL]	2
11		11		Xiliontis		10

Comparison Result View

### Executing the merge

After performing a CSV or database data comparison, you can merge the changes in any of the following ways:

- To merge differences at CSV file or database level, right-click an empty area in the Comparison window and select **Merge all Left to Right**.
- To merge differences at table level, right-click the table in the Comparison window and select **Merge Selected Left to Right**. For CSV files, this option is equivalent to the previous one, because CSV files contain only one table.
- To merge differences at row or cell level, first display the Comparison Result view, as described in [Viewing Differences Between Tables](#)<sup>135</sup>. Next, right-click a row (or the affected cells) in the Comparison Result View, and then select  **Copy from left to right** from the context menu.



## 6.7 Database Data Comparison Options

There are several groups of options which affect database data comparison, and they can be categorized as follows:

Option group	How to access
General database data comparison options, including options for database transactions, rollback, and memory usage	<ol style="list-style-type: none"> <li>1. Open a new database data comparison window (see <a href="#">Running a Database Data Comparison</a><sup>121</sup>).</li> <li>2. On the <b>Tools</b> menu, click <b>Comparison Options</b>.</li> <li>3. Click the <b>Database Data</b> tab.</li> </ol> <p>Note that a database comparison window must be in focus for the <b>Database Data</b> tab to appear.</p> <p>For more information, see <a href="#">General Options</a><sup>140</sup>.</p>
Options for comparing XML fields. These are applicable only if native (not string) comparison is enabled and the database supports and contains XML fields	<ol style="list-style-type: none"> <li>1. On the <b>Tools</b> menu, click <b>Comparison Options</b>.</li> <li>2. Click the <b>XML</b> tab.</li> </ol> <p>For more information, see <a href="#">XML Comparison Options</a><sup>41</sup>.</p>
Options that control automatic mapping of tables and columns, as well as the appearance of tables in the comparison window	<ol style="list-style-type: none"> <li>1. On the <b>Tools</b> menu, click <b>DiffDog Options</b>.</li> <li>2. Click the <b>Database Comparison</b> tab.</li> </ol> <p>For more information, see <a href="#">Database Comparison</a><sup>261</sup>.</p>
Options for configuring the appearance of the Comparison Result View	<ol style="list-style-type: none"> <li>1. On the <b>Tools</b> menu, click <b>DiffDog Options</b>.</li> <li>2. Click the <b>Database Data Result View</b> tab.</li> </ol> <p>For more information, see <a href="#">Database Data Result View</a><sup>263</sup>.</p>

### 6.7.1 General Options

The general database data comparison options are listed below. You can access these options as follows:

1. Open a new database data comparison window (see [Running a Database Data Comparison](#)<sup>121</sup>).
2. On the **Tools** menu, click **Comparison Options**.
3. Click the **Database Data** tab.

Note that a database comparison window must be in focus for the **Database Data** tab to appear.

The screenshot shows a dialog box titled "Comparison Options" with a close button (X) in the top right corner. It features three tabs: "XML", "Database Data" (which is selected), and "Word". The dialog is organized into several sections, each with a title and a list of options:

- Comparison Mode:** Two radio buttons. The first, "Use native type for comparison", is selected. The second is "Use string-representation for comparison".
- Comparison Options:** Three checkboxes. "Ignore case in comparison" is checked. "Ignore whitespaces in comparison" and "Treat [NULL] as empty string" are unchecked.
- Numeric Options:** One checkbox, "Append trailing zeros to floating point numbers", which is unchecked.
- Optimization Options:** One checkbox, "Keep only different rows in memory", which is unchecked.
- Execution Options:** Two radio buttons and two checkboxes. "Process comparison sequentially" is selected. "Process comparison in parallel" is unselected. "Use transaction when committing" and "Rollback on errors" are both checked.

At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

## Comparison Mode

You can choose from among two comparison modes: native type or as string. The native type considers the data type of the column that is compared, whereas everything will be converted into strings before comparison if you use the string representation type.

## Comparison Options

Clear the **Ignore case in comparison** check box if upper and lower casing should not be ignored when checking for differences. Select the **Ignore whitespaces in comparison** option if you do not want to consider whitespaces when comparing database data. Whitespace characters are space, tab, carriage return, and line feed. If you do not want to make a difference between an empty field and a field containing the NULL value, select the **Treat [NULL] as empty string** check box.

## Numeric Options

Floating point numbers can be filled up with trailing zeros by selecting the **Append trailing zeros to floating point numbers** check box.

### Optimization Options

If you do not care to see rows that are equal in both tables of a comparison, select the **Keep only different rows in memory** check box. In this case, only different rows are retrieved and displayed in the Result window.

### Execution Options

You can define whether you want to process comparison of multiple tables sequentially or parallel. Changes can be committed with or without the use of transactions and you can decide whether or not you want to rollback on errors.

## 6.8 Automation with DiffDog Server

DiffDog Server is a cross-platform differencing tool which supports, among other comparison kinds, the comparison of CSV and database data. DiffDog Server provides a command line for automated execution of comparisons. With DiffDog Server, you can either set up the comparisons jobs directly on the server, or, alternatively, run `.dbdif` files created with DiffDog, as described in [Saving Comparison Files](#)<sup>134</sup>.

To run a `.dbdif` comparison file with DiffDog Server, supply the file path as argument to the run command, for example:

```
diffdogserver run path\to\comparison.dbdif
```

where `diffdogserver` is the path to the DiffDog Server executable on the Linux, macOS, or Windows machine.

Running `*.dbdif` files with DiffDog Server is most convenient if DiffDog Server runs either on the same computer as DiffDog desktop, or on a Windows machine. If DiffDog Server runs on a different machine or operating system, the following limitations apply:

- If the comparison involves CSV files, running `.dbdif` files is supported only on Windows servers. For the comparison to be successful, all the CSV file paths that were valid on the desktop machine must be valid on the server machine.
- If database connections are involved, the server machine must be configured and capable to handle the database connection. Namely, the database drivers and any other prerequisites required by the connection must be present on the target operating system as well. For example, if the `.dbdif` file includes a connection that requires an ODBC driver from the database vendor, that driver must be installed on the server machine as well. Note that some database connection methods supported on Windows are not supported on Linux and macOS. For more information, see the DiffDog Server documentation.

If you set up comparison jobs directly in DiffDog Server (as opposed to using `*.dbdif` files), you can run them regardless of the platform.

DiffDog Server reports the comparison outcome by means of the exit code ("0" means equal data, "1" means there are differences, and "2" indicates an error). The detailed comparison results are shown by default at the command line, but you can also get them as a file in XML, text, or SQL format. The latter format is applicable if the right side of the comparison is a database, and it consists of SQL statements that merge data from the left to the right side.

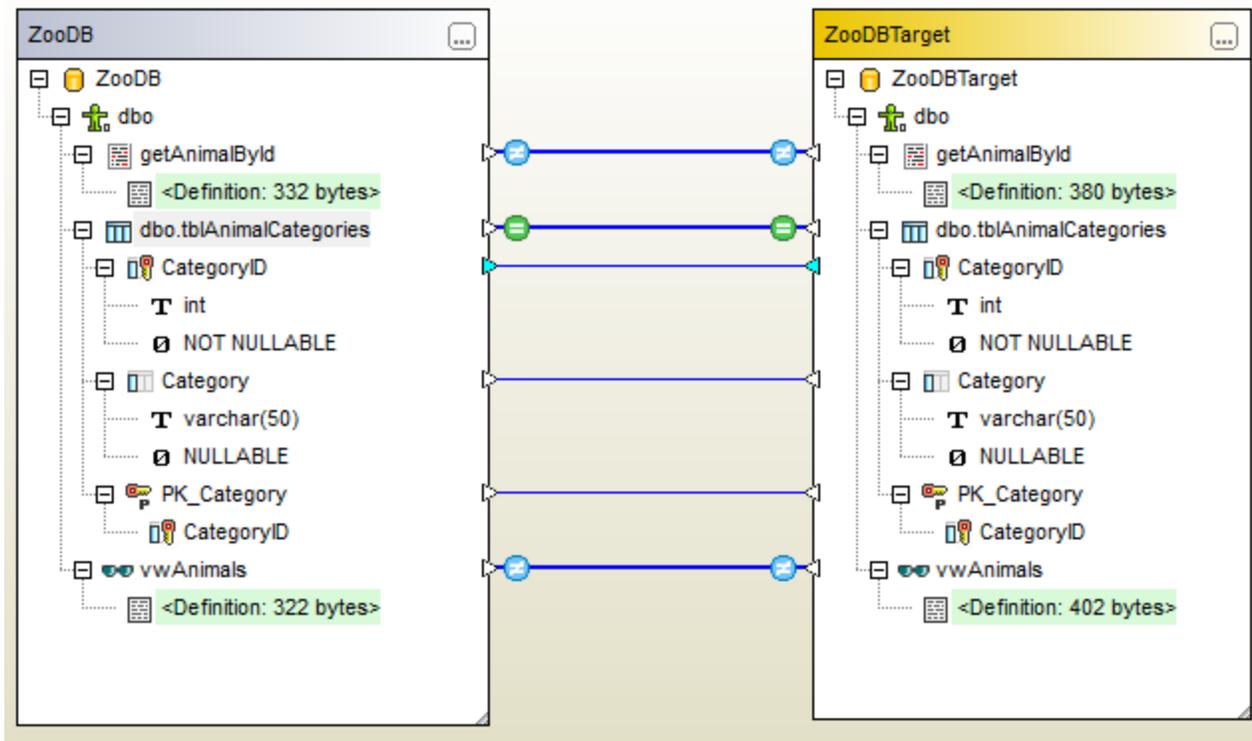
For more information about DiffDog Server, see [the Altova website](#).

## 7 Database Schema Comparison

A database schema comparison enables you to compare objects of two different database schemas, in terms of their structure or size. Database objects that can be compared include tables, columns, views, functions, and stored procedures. Comparison works differently for tables, as opposed to views, functions, or stored procedures. Namely, in case of tables, the comparison results report the structural differences (such as different columns, constraints, data types, and so on). In case of views, functions, and stored procedures, the comparison results inform you if the size of the object is the same or different in database A (left-side of comparison) as compared to database B (right-side of comparison).

**Note:** Line-by-line text comparison of database object definitions is not supported. To compare two object definitions (for example, database views) line-by-line, first save the definitions to files and then open both files in the file comparison view.

To start a database schema comparison, click the **Schema Comparison**  toolbar button. Two database components are displayed side by side (a "left" component and a "right" component). Before running the actual comparison, you need to assign a data source to each of the left and right components. Then you can select for comparison either all objects of a schema, or specific schema objects. To change the objects included in comparison, click the **Browse**  button on the right or left component, and select or clear the required check boxes. For more information, see [Running a Database Schema Comparison](#) <sup>146</sup>.



Sample database schema comparison

The sample database schema comparison above illustrates the result of comparing a stored procedure, a table, and a view between two SQL Server databases, "ZooDB" and "ZooDBTarget". The table definitions are equal in

both the source and target schema (which is indicated by the  sign), while the stored procedure and view definition is different (which is indicated by the  sign).

A database schema comparison can be saved as a file. Database schema comparison files have the **.dbsdif** extension. A comparison file stores the connection details of the database(s) involved in comparison, the database objects selected for comparison, as well as any configuration options you have defined in the "Properties" window (see also [Database Schema Comparison Files](#)<sup>148</sup>).

Various database comparison options are configurable. For example, you can have DatabaseSpy automatically match the tables or columns to be compared (by name, data type, or both), or perform the mapping manually. The comparison options can be adjusted from **Tools | DiffDog Options | Database Comparison**.

After running a database schema comparison, you can generate a merge script to update either the left or the right database. You can review and execute the merge script directly in DiffDog, open it with DatabaseSpy, or save it to a file. It is also possible to select specific objects to be included in the merge script (for example, one or several columns of a table). For more information, see [Merging Database Schemas](#)<sup>149</sup>.

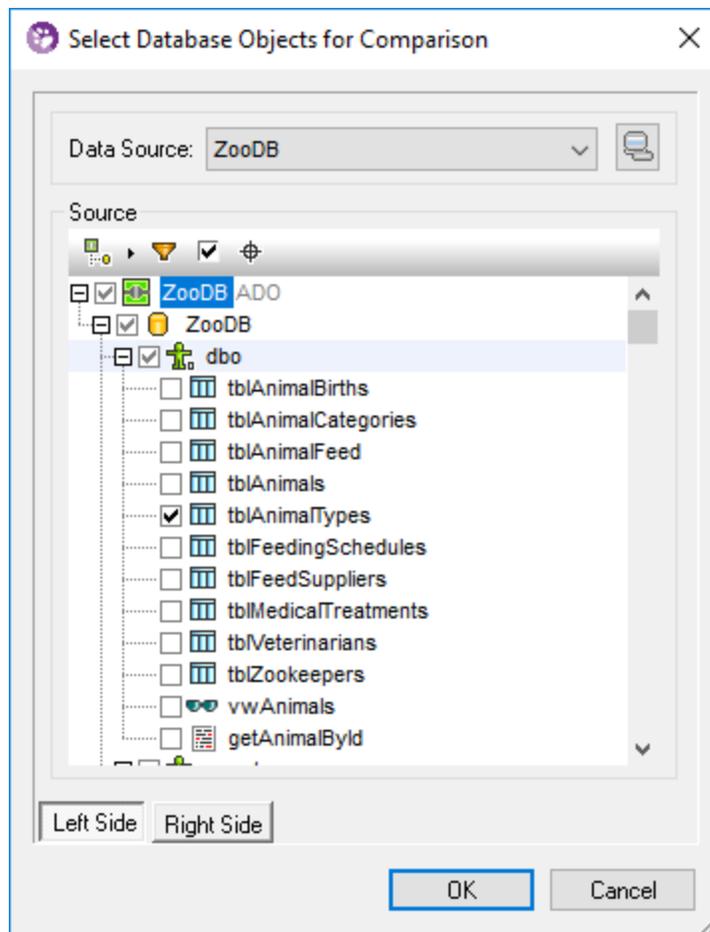
**Note:** The merge script synchronizes only differences resulting after comparing structure of tables (this includes changes to columns, keys, or constraints). Merging differences between other object types (such as stored procedures, functions, and views) is not supported.

## 7.1 Running a Database Schema Comparison

A database schema comparison in DiffDog involves the steps shown below.

### Step 1: Connect to the databases that are to be compared

1. On the **File** menu, click **Compare Database Schemas**. (Alternatively, click the **Schema Comparison**  toolbar button.) At this stage, you may be prompted to add a new data source, if no connected data source already exists. In this case, click **Yes** and follow the wizard steps to create a new data source (see [Connecting to a Database](#) <sup>152</sup>).
2. When prompted to select database objects for comparison, first choose a data source from the Data Source list, and then select the check boxes next to the objects you want to include for comparison. The Data Source list displays any active data sources that you've connected since starting DiffDog.



**Note:** From the dialog box above, you can optionally group, filter, or navigate database objects using the buttons above the database tree structure. For more information, see [Navigating Database Objects](#) <sup>124</sup>.

3. Click either **Left Side** or **Right Side** to add the data source to the left or right side of the comparison, respectively, and then click **OK**. Be patient while DiffDog adds the selected objects to the comparison. At this stage, only one of the comparison components (right or left, depending on what you selected) has an assigned data source.

4. Click the **Browse**  button of the empty component, and choose the second data source from the Data Source list, if one is available. Otherwise, click **Quick Connect** , and follow the wizard steps to connect to the second data source.
5. Select the check boxes next to the objects you want to compare, and then click **Left Side** (or **Right Side**, depending on the case).

If the databases to be compared are SQLite or Access, you can also perform this step from Windows Explorer, see [Quick Comparison of SQLite and Access Databases](#)<sup>128</sup>.

## Step 2: Map the objects to be compared (if applicable)

To perform a comparison, the objects on the left and right side of the comparison must be connected by a line (a "mapping"). The mapping instructs DiffDog to compare these two objects specifically. By default, DiffDog will attempt to match automatically the objects to be compared by their name, and thus create the corresponding mappings. The mapping options can be adjusted from **Tools | DiffDog Options | Database Comparison**. When necessary, you can create mappings manually, or adjust the existing ones. For example, you may need to create a mapping manually between two objects if the object names are different in the "left" as opposed to the "right" database. To create a mapping, click the triangle on the left component and, holding the left mouse button pressed, drag it to a target triangle on the right component.

To delete all mappings of a comparison, right-click the title bar of either component and choose **Unmap items** from the context menu. To delete a single mapping, right-click the appropriate object and choose **Unmap selected** from the context menu. Alternatively, click the connection line between two mapped objects and press **Delete**.

**Note:** Unmapping a table will also unmap all columns of that table.

## Step 3: Run the comparison

Once the mappings between objects are created, you can run the comparison:

- On the **Diff and Merge** menu, click **Start Comparison**. (Alternatively, click the **Start Comparison**  toolbar button, or press **F5**.)

The result of a comparison is indicated by the following icons:



The compared objects are equal in both components



Differences exist between the objects in the left and right components



A corresponding item is missing in the opposite component

Schema objects that are different are highlighted with green colour.

To simplify navigation through huge schemas which contain a lot of objects, you can collapse and expand individual objects when you are examining the differences. If you double-click an item in one component, both versions of the item are collapsed or expanded, respectively, simultaneously in both components. To collapse all items in both components, do one of the following:

- On the **Diff and Merge** menu, click **Collapse items**.
- Right-click the title bar of a component, and select **Collapse items** from the context menu.

## 7.2 Database Schema Comparison Files

After running a database schema comparison, you can save it to a file. This will save you time in future, whenever you want to compare the same database schemas. Database schema comparison (.dbsdif) files store the connection details of the databases involved in comparison, the database objects selected for comparison, as well as any configuration options you have defined in the "Properties" window. (Note that passwords stored in database schema comparison files are encrypted.)

### To save a schema comparison to a file:

1. Run a comparison (see [Running a Database Schema Comparison](#)<sup>146</sup>).
2. On the **File** menu, click **Save As**, and select "Altova Database Schema Comparison (.dbsdif)" as file type.

### To open a schema comparison file:

- On the **File** menu, click **Open Comparison File**, and browse for the .dbsdif file.

## 7.3 Merging Database Schemas

After running a schema comparison between two database schemas (the "left" and the "right" one), table differences can be synchronized (merged) between the two databases. Since the merge operation affects the structure of the database, it is not applied directly. Instead, DiffDog generates a merge script. The generated merge script can apply changes either from the "left" database to "right", or the other way round, from "right" to "left".

**Note:** The merge script synchronizes only differences resulting after comparing structure of tables (this includes changes to columns, keys, or constraints). Merging differences between other object types (such as stored procedures, functions, and views) is not supported.

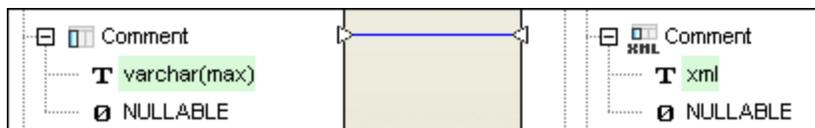
Once the merge script is generated, you can choose to execute the merge script directly in DiffDog, open it with DatabaseSpy for execution, or save it to a file for later execution.

Before executing the merge script against the database, it is always recommended to review it. If the structural differences between database schemas are numerous, the generated merge script will be equally big. To avoid a potentially dangerous update of multiple items in the target database through a big script, you could generate smaller scripts and apply them progressively. For example, you can select specific items (columns, constraints) that should be included in the merge, and then generate the script only for selected objects.

### To generate and execute a merge script:

1. Run a database schema comparison (see [Running a Database Schema Comparison](#)<sup>146</sup>).
2. Optionally, if you want to merge only specific items, select these items in a component using **Ctrl+Click**. Note that it has no influence on the direction of the merge whether you select the items in the left or in the right component (for example, you can select items in the right component and still choose to merge from left to right).

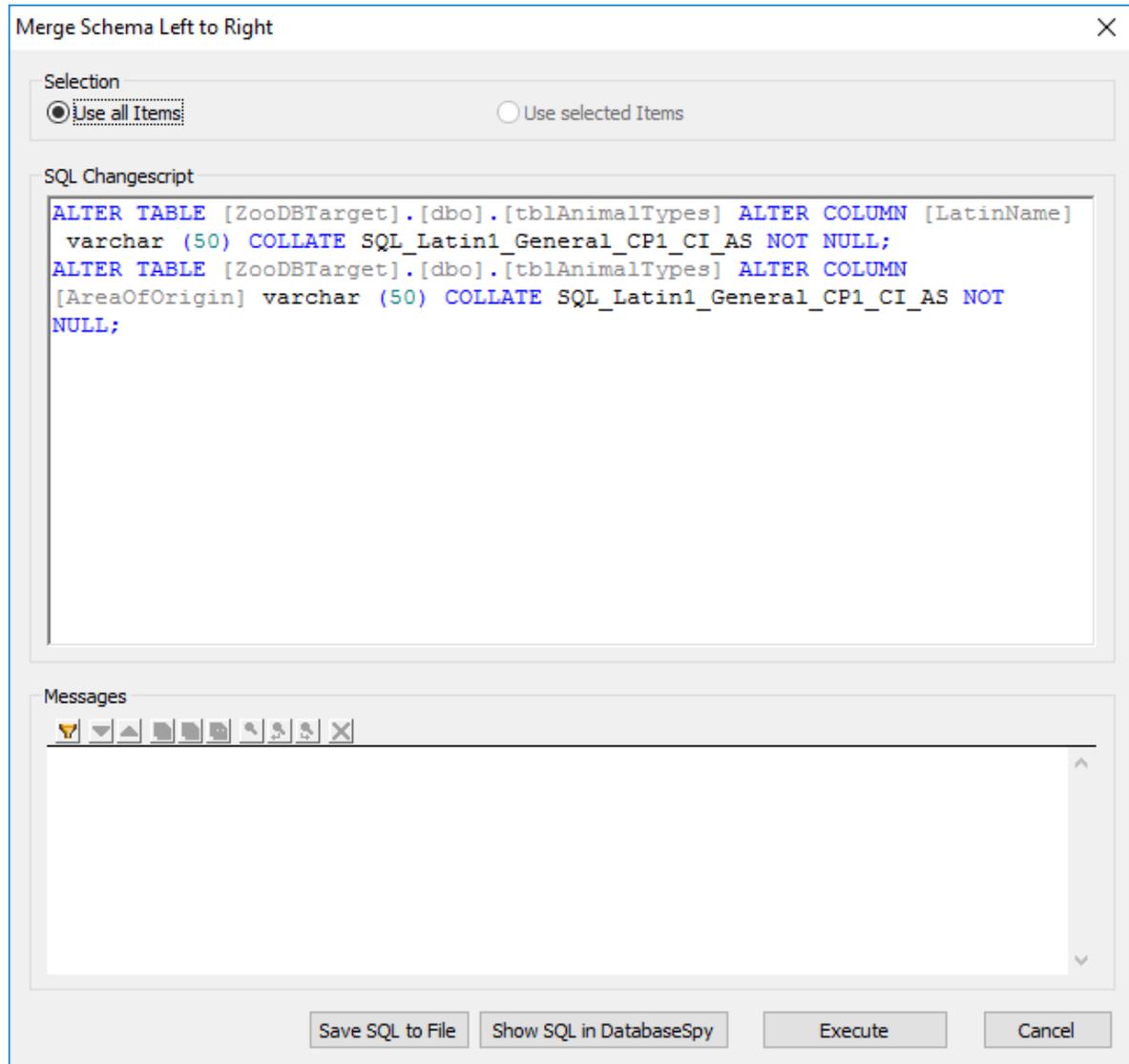
**Important:** Child elements of a table or column are not automatically included in the merge if you select just the parent. For this reason, when selecting a parent object (for example, a table), make sure to select also any child items that should be merged (such as columns or constraints). For example, if the column name is equal but the data type is different (as shown in the image below), you must select the data type item to create a valid merge script.



3. Do one of the following:
  - On the **Diff and Merge** menu, select **Copy from Left to Right**.
  - Click the **Copy from left to right**  toolbar button.

The commands above assume you want to merge the database structure from left to right. Otherwise, use the corresponding reverse (right to left) commands.

The SQL merge script is displayed in the "Merge Schema" dialog box. If no items have been selected before the merge was started (step 2 above), the **Use all Items** option is selected and the "global" merge script is displayed in the comparison window. The **Use selected Items** option is active if one or more items have been selected for merging. In this case, you can still decide to merge all items by selecting the **Use all Items** option.



4. Review the merge script, and click **Execute**.

If the merge script should be incorrect, you can cancel the operation, save the SQL merge script to a file and edit it with an external editor, or show and edit the SQL merge script in DatabaseSpy, if installed.

#### To execute the merge script in DatabaseSpy:

1. Right-click either a component header or one of the selected items, and select **Show merge script: Left to Right in DatabaseSpy** from the context menu (or, depending on the case, **Show merge script: Right to Left in DatabaseSpy**). This opens DatabaseSpy, creates a new project and adds a

data source connection to the target database (that is, the database where the changes will occur). If a project is already open in DatabaseSpy, a new data source connection is added to the project and you may be asked to define a name for that data source. The merge script is displayed in an SQL Editor window, where you can check the script and edit it if required.

2. Connect to the data source, click the **Execute**  button or press **F5** to execute the change script and commit the schema changes to the database.

**To save the merge script to a file:**

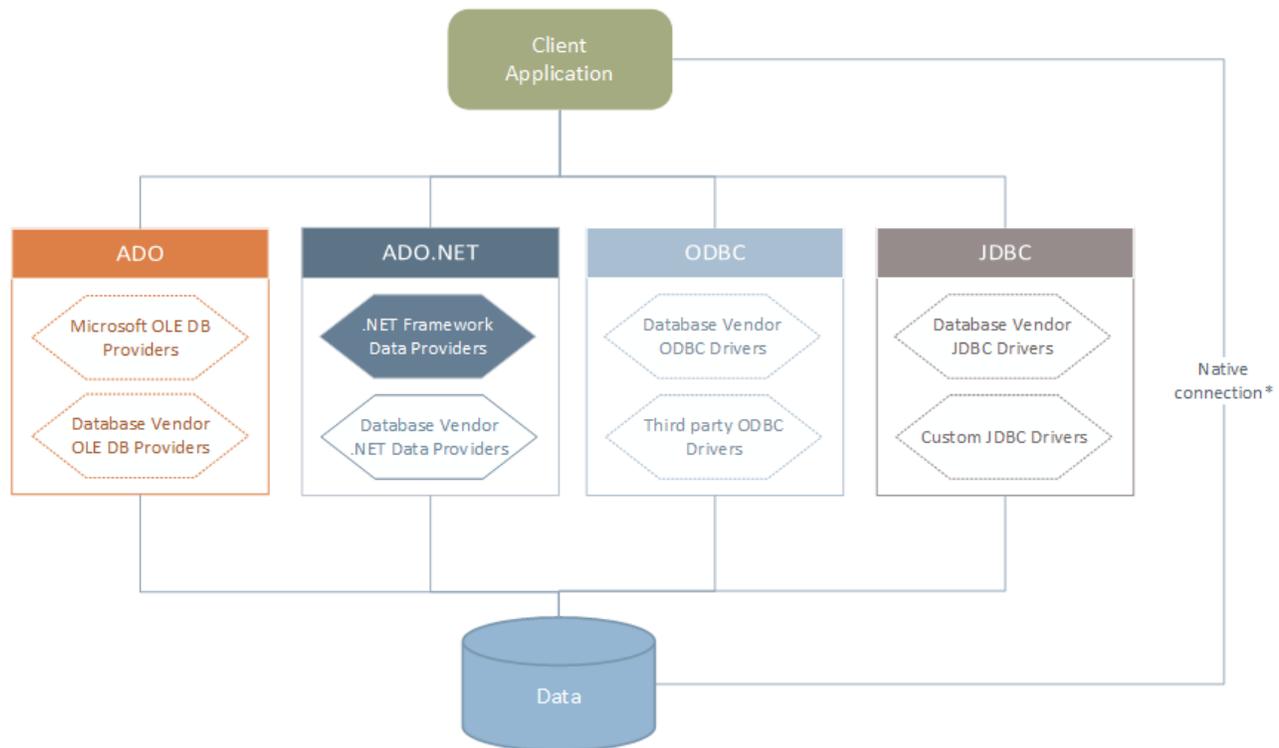
- Right-click either a component header or one of the selected items, and select **Save merge script: Left to Right...** from the context menu (or, depending on the case, **Save merge script: Right to Left...**).

## 8 Connecting to a Data Source

In the most simple case, a database can be a local file such as a Microsoft Access or SQLite database file. In a more advanced scenario, a database may reside on a remote or network database server which does not necessarily use the same operating system as the application that connects to it and consumes data. For example, while DiffDog runs on a Windows operating system, the database from which you want to access data (for example, MySQL) might run on a Linux machine.

To interact with various database types, both remote and local, DiffDog relies on the data connection interfaces and database drivers that are already available on your operating system or released periodically by the major database vendors. In the constantly evolving landscape of database technologies, this approach caters for better cross-platform flexibility and interoperability.

The following diagram illustrates, in a simplified way, data connectivity options available between DiffDog (illustrated as a generic client application) and a data store (which may be a database server or database file).



\* Direct native connections are supported for SQLite, PostgreSQL, CouchDB and MongoDB databases. To connect to such databases, no additional drivers are required to be installed on your system.

As shown in the diagram above, DiffDog can access any of the major database types through the following data access technologies:

- ADO (Microsoft® ActiveX® Data Objects), which, in its turn, uses an underlying OLE DB (Object Linking and Embedding, Database) provider
- ADO.NET (A set of libraries available in the Microsoft .NET Framework that enable interaction with data)

- JDBC (Java Database Connectivity)
- ODBC (Open Database Connectivity)

**Note:** Some ADO.NET providers are not supported or have limited support. See [ADO.NET Support Notes](#)<sup>171</sup>.

### About data access technologies

The data connection interface you should choose largely depends on your existing software infrastructure. You will typically choose the data access technology and the database driver which integrates tighter with the database system to which you want to connect. For example, to connect to a Microsoft Access 2013 database, you would build an ADO connection string that uses a native provider such as the **Microsoft Office Access Database Engine OLE DB Provider**. To connect to Oracle, on the other hand, you may want to download and install the latest JDBC, ODBC, or ADO.NET interfaces from the Oracle website.

While drivers for Windows products (such as Microsoft Access or SQL Server) may already be available on your Windows operating system, they may not be available for other database types. Major database vendors routinely release publicly available database client software and drivers which provide cross-platform access to the respective database through any combination of ADO, ADO.NET, ODBC, or JDBC. In addition to this, several third party drivers may be available for any of the above technologies. In most cases, there is more than one way to connect to the required database from your operating system, and, consequently, from DiffDog. The available features, performance parameters, and the known issues will typically vary based on the data access technology or drivers used.

## 8.1 Start Database Connection Wizard

DiffDog provides a Database Connection Wizard that guides you through the steps required to set up a connection to a data source. Before you go through the wizard steps, be aware that for some database types it is necessary to install and separately configure several database prerequisites, such as a database driver or database client software. These are normally provided by the respective database vendors, and include documentation tailored to your specific Windows version. For a list of database drivers grouped by database type, see [Database Drivers Overview](#)<sup>157</sup>.

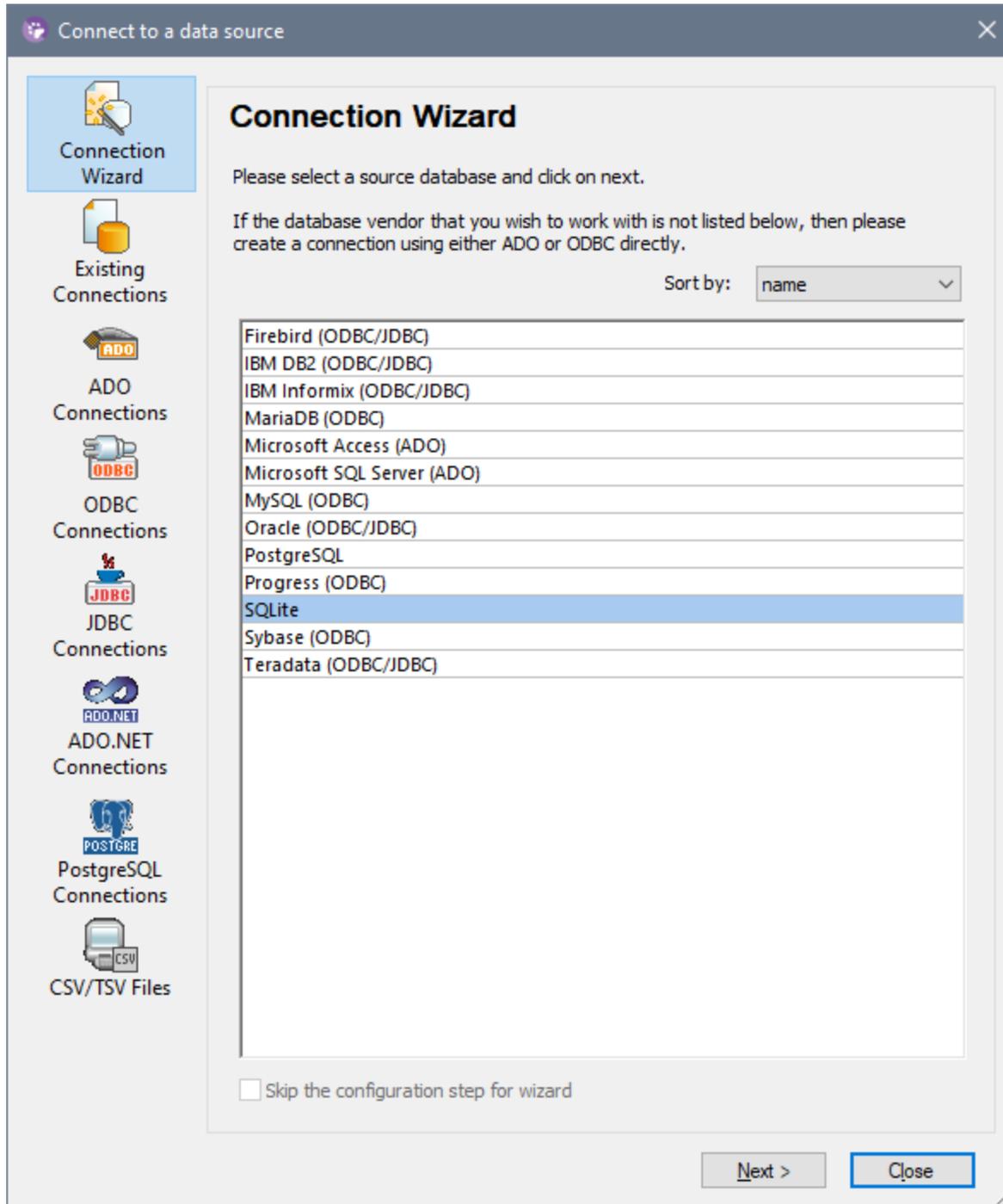
To start the Database Connection Wizard (see *screenshot below*), do the following:

- On the **File** menu, click **Compare Database Schemas** or **Compare Database Data**.

The Database Connection Wizard (*screenshot below*) is started. On the left hand side of the window, you can select the most suitable from the following ways to connect to your database:

- Connection Wizard, which prompts you to choose your database type and then guides you through the steps for connecting to a database of that type
- Select an existing connection
- Select a data access technology: ADO, ADO.NET, ODBC, or JDBC
- A native PostgreSQL connection
- CSV/TSV files

In the Connection Wizard pane (see *screenshot below*) databases can be sorted alphabetically by the name of the database type or by recent usage. Select the option you want in the *Sort By* combo box. After you have selected the database type to which you want to connect, click **Next**.



The wizard will take you through the next steps according to the database type, connection technology (ADO, ADO.NET, ODBC, JDBC), and driver that will be used. For examples applicable to each database type, see [Database Connection Examples](#)<sup>187</sup>.

Alternatively to using Connection Wizard, you can use one of the following database access technologies:

- [Setting up an ADO Connection](#) <sup>160</sup>
- [Setting up an ADO.NET Connection](#) <sup>166</sup>
- [Setting up an ODBC Connection](#) <sup>173</sup>
- [Setting up a JDBC Connection](#) <sup>176</sup>

## 8.2 Database Drivers Overview

The following table lists common database drivers you can use to connect to a particular database through a particular data access technology. Note that this list does not aim to be either exhaustive or prescriptive; you can use other native or third party alternatives in addition to the drivers shown below.

Even though a number of database drivers might be already available on your Windows operating system, you may still need to download an alternative driver. For some databases, the latest driver supplied by the database vendor is likely to perform better than the driver that shipped with the operating system.

Database vendors may provide drivers either as separate downloadable packages, or bundled with database client software. In the latter case, the database client software normally includes any required database drivers, or provides you with an option during installation to select the drivers and components you wish to install. Database client software typically consists of administration and configuration utilities used to simplify database administration and connectivity, as well as documentation on how to install and configure the database client and any of its components.

Configuring the database client correctly is crucial for establishing a successful connection to the database. Before installing and using the database client software, it is strongly recommended to read carefully the installation and configuration instructions of the database client; these may vary for each database version and for each Windows version.

To understand the capabilities and limitations of each data access technology with respect to each database type, refer to the documentation of that particular database product and also test the connection against your specific environment. To avoid common connectivity issues, note the following:

- Some ADO.NET providers are not supported or have limited support. See [ADO.NET Support Notes](#)<sup>171</sup>.
- When installing a database driver, it is recommended that it has the same platform as the Altova application (32-bit or 64-bit). For example, if you are using a 32-bit Altova application on a 64-bit operating system, install the 32-bit driver, and set up your database connection using the 32-bit driver, see also [Viewing the Available ODBC Drivers](#)<sup>175</sup>.
- When setting up an ODBC data source, it is recommended to create the data source name (DSN) as System DSN instead of User DSN. For more information, see [Setting up an ODBC Connection](#)<sup>173</sup>.
- When setting up a JDBC data source, ensure that JRE (Java Runtime Environment) or Java Development Kit (JDK) is installed and that the CLASSPATH environment variable of the operating system is configured. For more information, see [Setting up a JDBC Connection](#)<sup>176</sup>.
- For the installation instructions and support details of any drivers or database client software that you install from a database vendor, check the documentation provided with the installation package.

Database	Interface	Drivers
Firebird	ADO.NET	Firebird ADO.NET Data Provider ( <a href="https://www.firebirdsql.org/en/additional-downloads/">https://www.firebirdsql.org/en/additional-downloads/</a> )
	JDBC	Firebird JDBC driver ( <a href="https://www.firebirdsql.org/en/jdbc-driver/">https://www.firebirdsql.org/en/jdbc-driver/</a> )
	ODBC	Firebird ODBC driver ( <a href="https://www.firebirdsql.org/en/odbc-driver/">https://www.firebirdsql.org/en/odbc-driver/</a> )
IBM DB2	ADO	IBM OLE DB Provider for DB2
	ADO.NET	IBM Data Server Provider for .NET

Database	Interface	Drivers
	JDBC	IBM Data Server Driver for JDBC and SQLJ
	ODBC	IBM DB2 ODBC Driver
IBM DB2 for i	ADO	<ul style="list-style-type: none"> <li>• IBM DB2 for i5/OS IBMDA400 OLE DB Provider</li> <li>• IBM DB2 for i5/OS IBMDARLA OLE DB Provider</li> <li>• IBM DB2 for i5/OS IBMDASQL OLE DB Provider</li> </ul>
	ADO.NET	.NET Framework Data Provider for IBM i
	JDBC	IBM Toolbox for Java JDBC Driver
	ODBC	iSeries Access ODBC Driver
IBM Informix	ADO	IBM Informix OLE DB Provider
	JDBC	IBM Informix JDBC Driver
	ODBC	IBM Informix ODBC Driver
Microsoft Access	ADO	<ul style="list-style-type: none"> <li>• Microsoft Jet OLE DB Provider</li> <li>• Microsoft Access Database Engine OLE DB Provider</li> </ul>
	ADO.NET	.NET Framework Data Provider for OLE DB
	ODBC	<ul style="list-style-type: none"> <li>• Microsoft Access Driver</li> </ul>
MariaDB	ADO.NET	In the absence of a dedicated .NET connector for MariaDB, use <b>Connector/.NET</b> for MySQL ( <a href="https://dev.mysql.com/downloads/connector/net/">https://dev.mysql.com/downloads/connector/net/</a> ).
	JDBC	MariaDB Connector/J ( <a href="https://downloads.mariadb.org/">https://downloads.mariadb.org/</a> )
	ODBC	MariaDB Connector/ODBC ( <a href="https://downloads.mariadb.org/">https://downloads.mariadb.org/</a> )
Microsoft SQL Server	ADO	<ul style="list-style-type: none"> <li>• <a href="#">Microsoft OLE DB Driver for SQL Server</a> (MSOLEDBSQL)</li> <li>• Microsoft OLE DB Provider for SQL Server (SQLOLEDB)</li> <li>• SQL Server Native Client (SQLNCLI)</li> </ul>
	ADO.NET	<ul style="list-style-type: none"> <li>• .NET Framework Data Provider for SQL Server</li> <li>• .NET Framework Data Provider for OLE DB</li> </ul>
	JDBC	<ul style="list-style-type: none"> <li>• Microsoft JDBC Driver for SQL Server ( <a href="https://docs.microsoft.com/en-us/sql/connect/jdbc/microsoft-jdbc-driver-for-sql-server">https://docs.microsoft.com/en-us/sql/connect/jdbc/microsoft-jdbc-driver-for-sql-server</a> )</li> </ul>
	ODBC	<ul style="list-style-type: none"> <li>• ODBC Driver for Microsoft SQL Server ( <a href="https://docs.microsoft.com/en-us/SQL/connect/odbc/download-odbc-driver-for-sql-server">https://docs.microsoft.com/en-us/SQL/connect/odbc/download-odbc-driver-for-sql-server</a> )</li> </ul>
MySQL	ADO.NET	<ul style="list-style-type: none"> <li>• Connector/.NET (<a href="https://dev.mysql.com/downloads/connector/net/">https://dev.mysql.com/downloads/connector/net/</a>)</li> </ul>
	JDBC	Connector/J ( <a href="https://dev.mysql.com/downloads/connector/j/">https://dev.mysql.com/downloads/connector/j/</a> )
	ODBC	Connector/ODBC ( <a href="https://dev.mysql.com/downloads/connector/odbc/">https://dev.mysql.com/downloads/connector/odbc/</a> )

Database	Interface	Drivers
Oracle	ADO	<ul style="list-style-type: none"> <li>• Oracle Provider for OLE DB</li> <li>• Microsoft OLE DB Provider for Oracle</li> </ul>
	ADO.NET	Oracle Data Provider for .NET ( <a href="http://www.oracle.com/technetwork/topics/dotnet/index-085163.html">http://www.oracle.com/technetwork/topics/dotnet/index-085163.html</a> )
	JDBC	<ul style="list-style-type: none"> <li>• JDBC Thin Driver</li> <li>• JDBC Oracle Call Interface (OCI) Driver</li> </ul> These drivers are typically installed during the installation of your Oracle database client. Connect through the OCI Driver (not the Thin Driver) if you are using the Oracle XML DB component.
	ODBC	<ul style="list-style-type: none"> <li>• Microsoft ODBC for Oracle</li> <li>• Oracle ODBC Driver (typically installed during the installation of your Oracle database client)</li> </ul>
PostgreSQL	JDBC	PostgreSQL JDBC Driver ( <a href="https://jdbc.postgresql.org/download.html">https://jdbc.postgresql.org/download.html</a> )
	ODBC	psqlODBC ( <a href="https://odbc.postgresql.org/">https://odbc.postgresql.org/</a> )
	Native Connection	Available. There is no need to install any drivers if using native connection.
Progress OpenEdge	JDBC	JDBC Connector ( <a href="https://www.progress.com/jdbc/openedge">https://www.progress.com/jdbc/openedge</a> )
	ODBC	ODBC Connector ( <a href="https://www.progress.com/odbc/openedge">https://www.progress.com/odbc/openedge</a> )
SQLite	Native Connection	Available. There is no need to install any drivers if using native connection.
Sybase	ADO	Sybase ASE OLE DB Provider
	JDBC	jConnect™ for JDBC
	ODBC	Sybase ASE ODBC Driver
Teradata	ADO.NET	.NET Data Provider for Teradata ( <a href="https://downloads.teradata.com/download/connectivity/net-data-provider-for-teradata">https://downloads.teradata.com/download/connectivity/net-data-provider-for-teradata</a> )
	JDBC	Teradata JDBC Driver ( <a href="https://downloads.teradata.com/download/connectivity/jdbc-driver">https://downloads.teradata.com/download/connectivity/jdbc-driver</a> )
	ODBC	Teradata ODBC Driver for Windows ( <a href="https://downloads.teradata.com/download/connectivity/odbc-driver/windows">https://downloads.teradata.com/download/connectivity/odbc-driver/windows</a> )

## 8.3 ADO Connection

Microsoft ActiveX Data Objects (ADO) is a data access technology that enables you to connect to a variety of data sources through OLE DB. OLE DB is an alternative interface to ODBC or JDBC; it provides uniform access to data in a COM (Component Object Model) environment. ADO is a precursor of the newer [ADO.NET](#)<sup>166</sup> and is still one of the possible ways to connect to Microsoft native databases such as Microsoft Access or SQL Server, although you can also use it for other data sources.

Importantly, you can choose between multiple ADO providers, and some of them must be downloaded and installed on your workstation before you can use them. For example, for connecting to SQL Server, the following ADO providers are available:

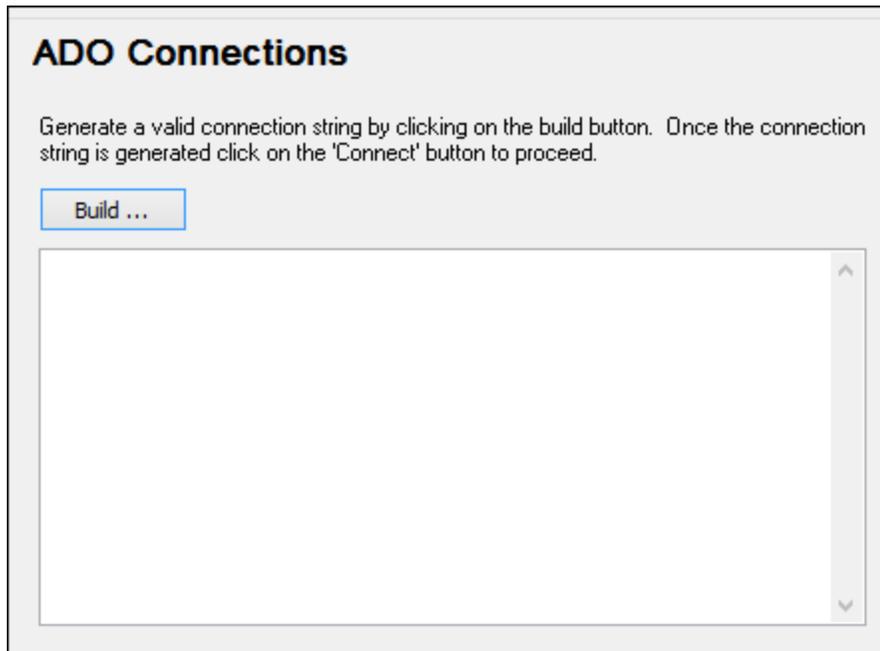
- Microsoft OLE DB *Driver* for SQL Server (MSOLEDBSQL)
- Microsoft OLE DB *Provider* for SQL Server (SQLOLEDB)
- SQL Server Native Client (SQLNCLI)

From the providers listed above, the recommended one is MSOLEDBSQL; you can download it from <https://docs.microsoft.com/en-us/sql/connect/oledb/download-oledb-driver-for-sql-server?view=sql-server-ver15>. Note that it must match the platform of DiffDog (32-bit or 64-bit). The SQLOLEDB and SQLNCLI providers are considered deprecated and thus are not recommended.

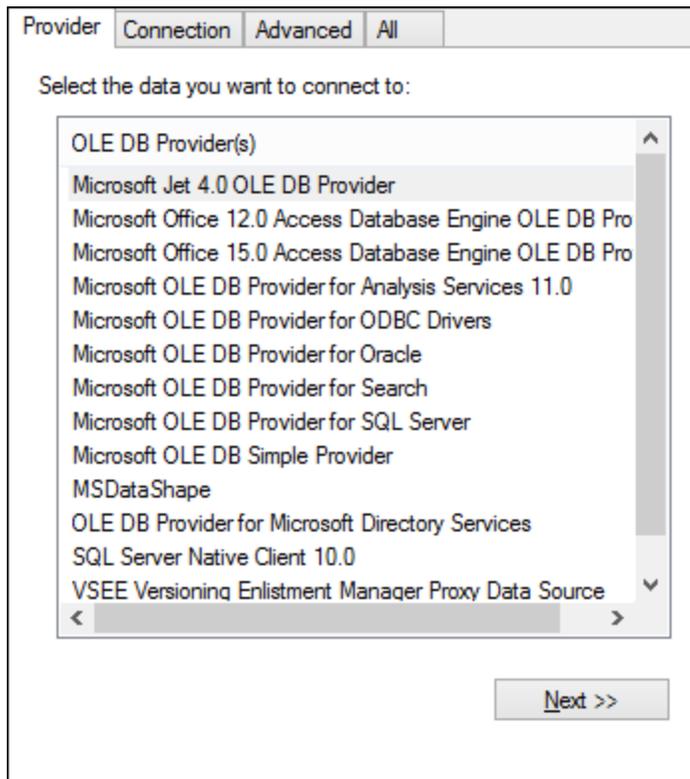
The **Microsoft OLE DB Provider for SQL Server (SQLOLEDB)** is known to have issues with parameter binding of complex queries like Common Table Expressions (CTE) and nested SELECT statements.

**To set up an ADO connection:**

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ADO Connections**.



3. Click **Build**.



4. Select the data provider through which you want to connect. The table below lists a few common scenarios.

To connect to this database...	Use this provider...
Microsoft Access	<ul style="list-style-type: none"> <li>• <b>Microsoft Office Access Database Engine OLE DB Provider</b> (recommended)</li> <li>• <b>Microsoft Jet OLE DB Provider</b></li> </ul> <p>If the <b>Microsoft Office Access Database Engine OLE DB Provider</b> is not available in the list, make sure that you have installed either Microsoft Access or the Microsoft Access Database Engine Redistributable (<a href="https://www.microsoft.com/en-us/download/details.aspx?id=54920">https://www.microsoft.com/en-us/download/details.aspx?id=54920</a>) on your computer.</p>
SQL Server	<ul style="list-style-type: none"> <li>• <b>Microsoft OLE DB Driver for SQL Server (MSOLEDBSQL)</b> - this is the recommended OLE DB provider. In order for this provider to appear in the list, it must be downloaded from <a href="https://docs.microsoft.com/en-us/sql/connect/oledb/download-oledb-driver-for-sql-server?view=sql-server-ver15">https://docs.microsoft.com/en-us/sql/connect/oledb/download-oledb-driver-for-sql-server?view=sql-server-ver15</a> and installed.</li> <li>• <b>Microsoft OLE DB Provider for SQL Server (OLEDBSQL)</b></li> <li>• <b>SQL Server Native Client (SQLNCLI)</b></li> </ul>
Other database	<p>Select the provider applicable to your database.</p> <p>If an OLE DB provider to your database is not available, install the required driver from the database vendor (see <a href="#">Database Drivers Overview</a><sup>157</sup>). Alternatively, set up an ADO.NET, ODBC, or JDBC connection.</p> <p>If the operating system has an ODBC driver to the required database, you could also use the <b>Microsoft OLE DB Provider for ODBC Drivers</b>, or preferably opt for an <a href="#">ODBC connection</a><sup>173</sup>.</p>

5. Having selected the provider of choice, click **Next** and complete the wizard.

The subsequent wizard steps are specific to the provider you chose. For SQL Server, you will need to provide or select the host name of the database server, the authentication method, the database name, as well as the database username and password. For an example, see [Connecting to Microsoft SQL Server \(ADO\)](#)<sup>208</sup>. For Microsoft Access, you will be asked to browse for or provide the path to the database file. For an example, see [Connecting to Microsoft Access \(ADO\)](#)<sup>206</sup>.

The complete list of initialization properties (connection parameters) is available in the **All** tab of the connection dialog box—these properties vary depending on the chosen provider and may need to be set explicitly in order for the connection to be possible. The following sections provide guidance on configuring the basic initialization properties for Microsoft Access and SQL Server databases:

- [Setting up the SQL Server Data Link Properties](#)<sup>163</sup>
- [Setting up the Microsoft Access Data Link Properties](#)<sup>164</sup>

### 8.3.1 Connecting to an Existing Microsoft Access Database

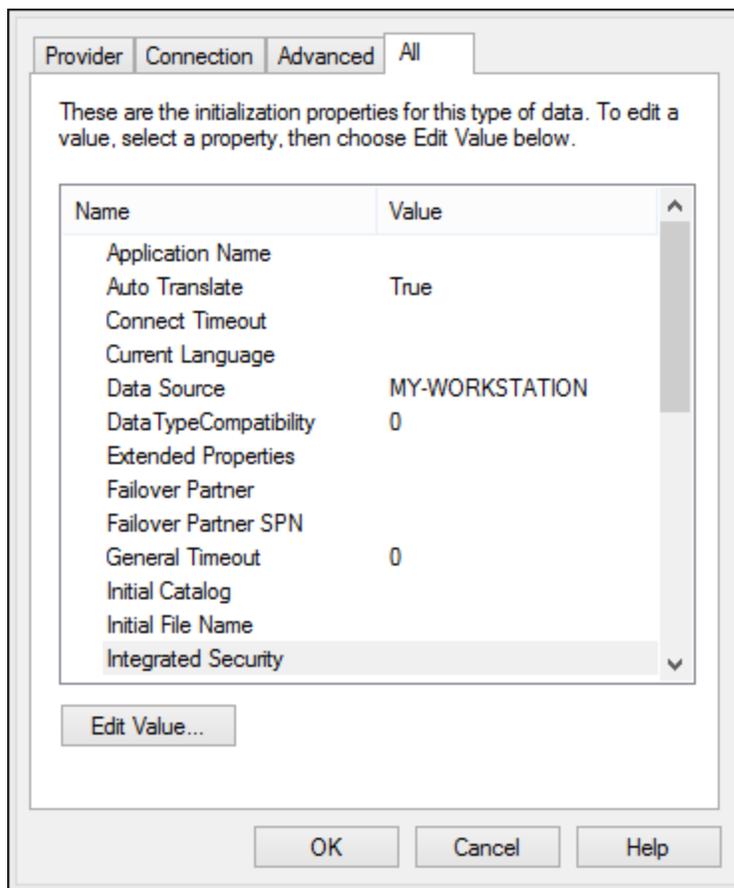
This approach is suitable when you want to connect to a Microsoft Access database which is not password-protected. If the database is password-protected, set up the database password as shown in [Connecting to Microsoft Access \(ADO\)](#)<sup>206</sup>.

To connect to an existing Microsoft Access database:

1. Run the database connection wizard (see [Starting the Database Connection Wizard](#)<sup>154</sup>).
2. Select **Microsoft Access (ADO)**, and then click **Next**.
3. Browse for the database file, or enter the path to it (either relative or absolute).
4. Click **Connect**.

### 8.3.2 Setting up the SQL Server Data Link Properties

When you connect to a Microsoft SQL Server database through [ADO](#)<sup>160</sup>, you may need to set the following connection properties in the **All** tab of the Data Link Properties dialog box.

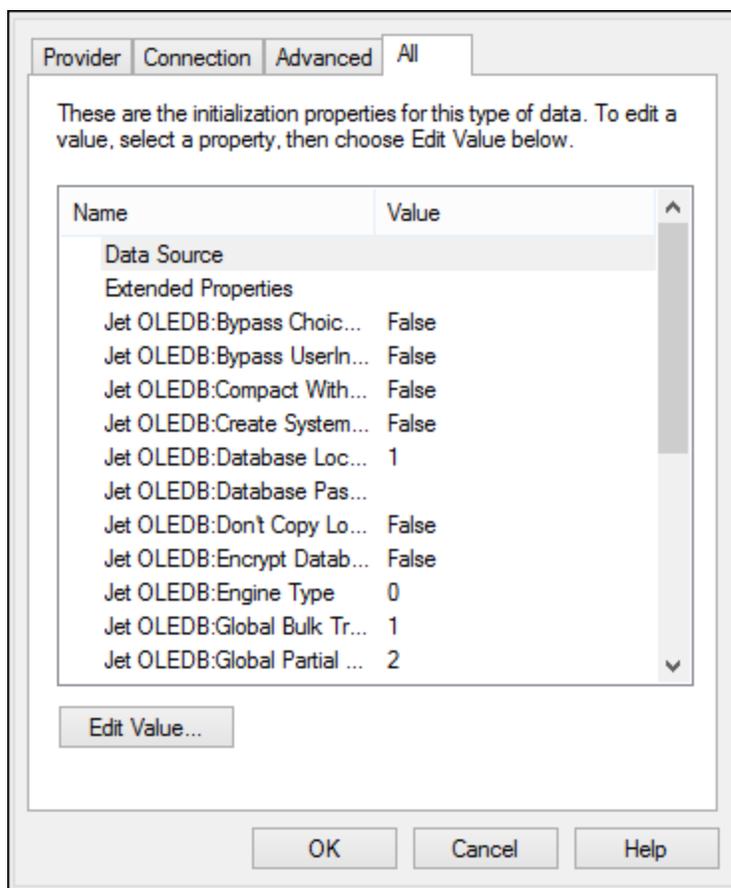


Data Link Properties dialog box

Property	Notes
<b>Integrated Security</b>	If you selected the <b>SQL Server Native Client</b> data provider on the <b>Provider</b> tab, set this property to a space character.
<b>Persist Security Info</b>	Set this property to <b>True</b> .

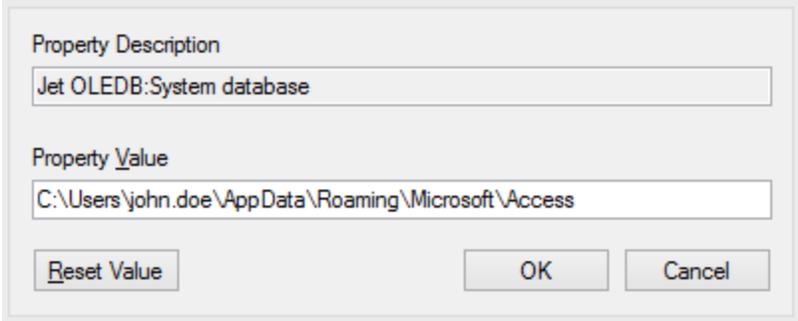
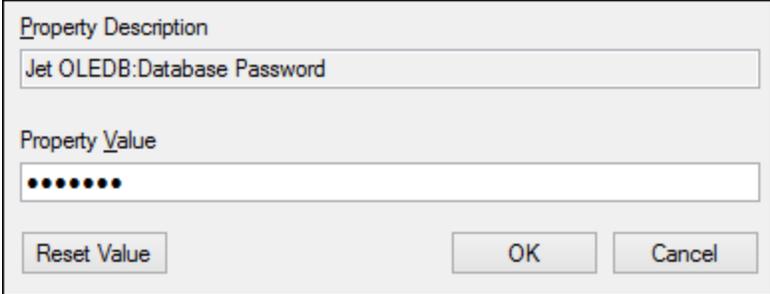
### 8.3.3 Setting up the Microsoft Access Data Link Properties

When you connect to a Microsoft Access database through [ADO](#)<sup>160</sup>, you may need to set the following connection properties in the **All** tab of the Data Link Properties dialog box.



Data Link Properties dialog box

Property	Notes
<b>Data Source</b>	This property stores the path to the Microsoft Access database file. To avoid database connectivity issues, it is recommended to use the UNC (Universal Naming Convention) path format, for example:  <code>\\anyserver\share\$\filepath</code>

Property	Notes
<p><b>Jet OLEDB:System Database</b></p>	<p>This property stores the path to the workgroup information file. You may need to explicitly set the value of this property before you can connect to a Microsoft Access database.</p> <p>If you cannot connect due to a "workgroup information file" error, locate the workgroup information file (<b>System.MDW</b>) applicable to your user profile, and set the property value to the path of the <b>System.MDW</b> file.</p> 
<p><b>Jet OLEDB:Database Password</b></p>	<p>If the database is password-protected, set the value of this property to the database password.</p> 

## 8.4 ADO.NET Connection

ADO.NET is a set of Microsoft .NET Framework libraries designed to interact with data, including data from databases. To connect to a database from DiffDog through ADO.NET, Microsoft .NET Framework 4 or later is required. As shown below, you connect to a database through ADO.NET by selecting a .NET provider and supplying a connection string.

A .NET data provider is a collection of classes that enables connecting to a particular type of data source (for example, a SQL Server, or an Oracle database), executing commands against it, and fetching data from it. In other words, with ADO.NET, an application such as DiffDog interacts with a database through a data provider. Each data provider is optimized to work with the specific type of data source that it is designed for. There are two types of .NET providers:

1. Supplied by default with Microsoft .NET Framework.
2. Supplied by major database vendors, as an extension to the .NET Framework. Such ADO.NET providers must be installed separately and can typically be downloaded from the website of the respective database vendor.

**Note:** Certain ADO.NET providers are not supported or have limited support. See [ADO.NET Support Notes](#) <sup>171</sup>.

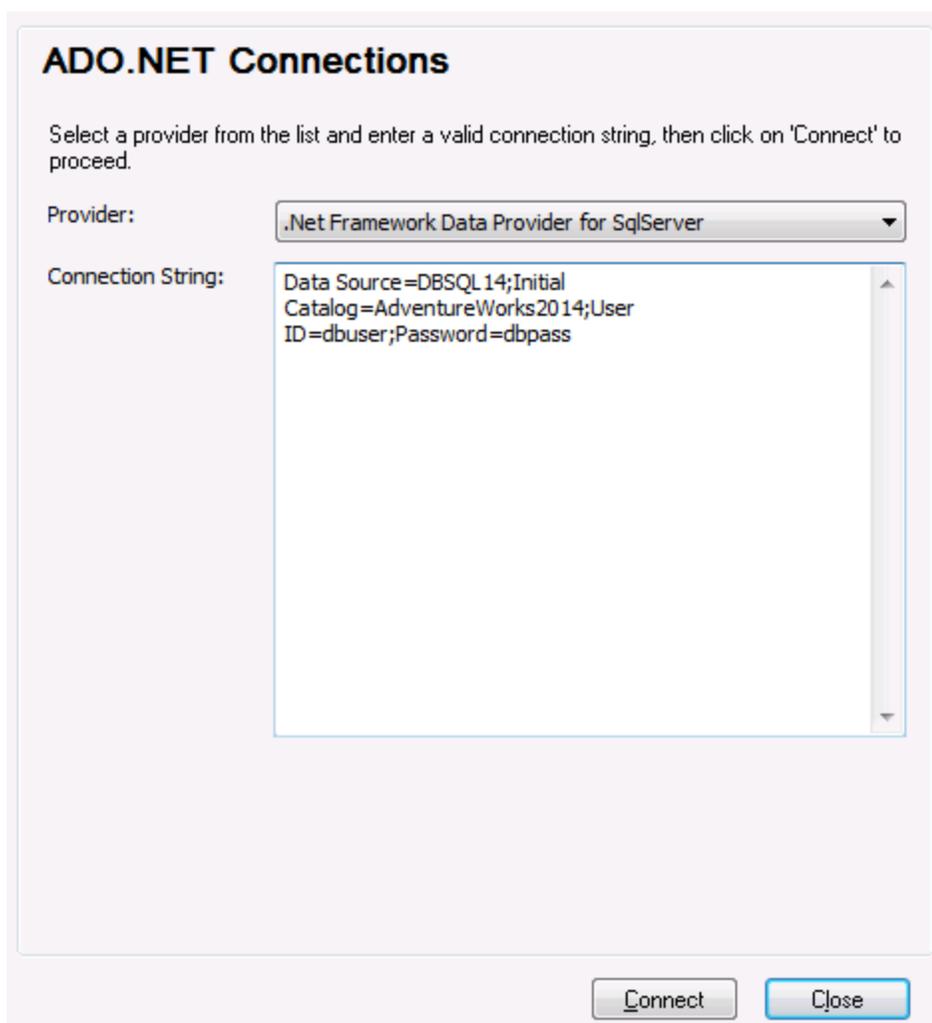
To set up an ADO.NET connection:

1. [Start the database connection wizard](#) <sup>154</sup>.
2. Click **ADO.NET Connections**.
3. Select a .NET data provider from the list.

The list of providers available by default with the .NET Framework appears in the "Provider" list. Vendor-specific .NET data providers are available in the list only if they are already installed on your system. To become available, vendor-specific .NET providers must be installed into the GAC (Global Assembly Cache), by running the .msi or .exe file supplied by the database vendor.

4. Enter a database connection string. A connection string defines the database connection information, as semicolon-delimited key/value pairs of connection parameters. For example, a connection string such as `Data Source=DBSQLSERV;Initial Catalog=ProductsDB;User ID=dbuser;Password=dbpass` connects to the SQL Server database `ProductsDB` on server `DBSQLSERV`, with the user name `dbuser` and password `dbpass`. You can create a connection string by typing the key/value pairs directly into the "Connection String" dialog box. Another option is to create it with Visual Studio (see [Creating a Connection String in Visual Studio](#) <sup>167</sup>).

The syntax of the connection string depends on the provider selected from the "Provider" list. For examples, see [Sample ADO.NET Connection Strings](#) <sup>170</sup>.



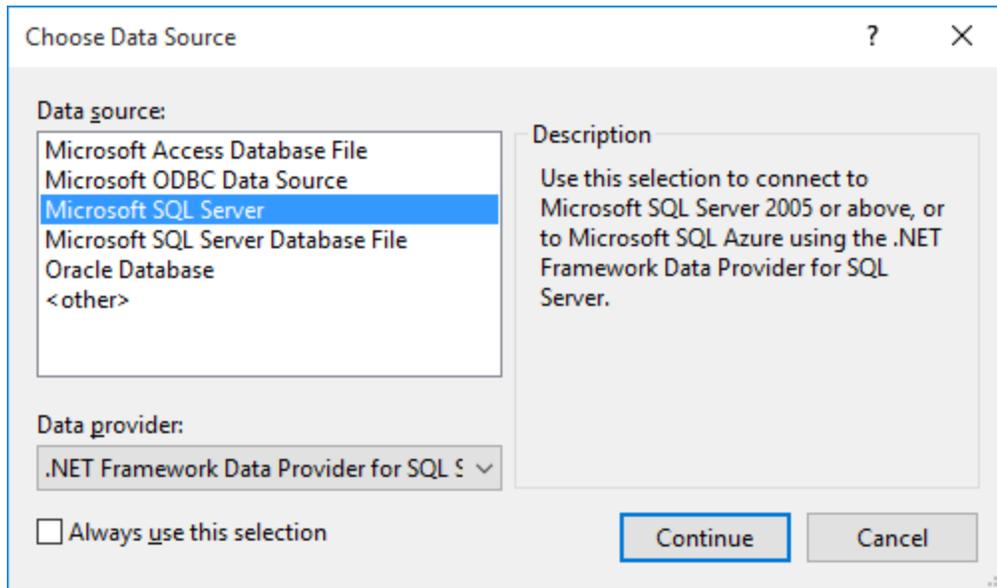
5. Click **Connect**.

## 8.4.1 Creating a Connection String in Visual Studio

In order to connect to a data source using ADO.NET, a valid database connection string is required. The following instructions show you how to create a connection string from Visual Studio.

**To create a connection string in Visual Studio:**

1. On the **Tools** menu, click **Connect to Database**.
2. Select a data source from the list (in this example, Microsoft SQL Server). The Data Provider is filled automatically based on your choice.



3. Click **Continue**.

Modify Connection

Enter information to connect to the selected data source or click "Change" to choose a different data source and/or provider.

Data source:  
Microsoft SQL Server (SqlClient) Change...

Server name:  
DBSQLSERV Refresh

Log on to the server

Use Windows Authentication

Use SQL Server Authentication

User name: dbuser

Password: ●●●●●●

Save my password

Connect to a database

Select or enter a database name:  
ProductsDB

Attach a database file:  
Browse...

Logical name:

Advanced...

Test Connection OK Cancel

4. Enter the server host name and the user name and password to the database. In this example, we are connecting to the database `ProductsDB` on server `DBSQLSERV`, using SQL Server authentication.
5. Click **OK**.

If the database connection is successful, it appears in the Server Explorer window. You can display the Server Explorer window using the menu command **View | Server Explorer**. To obtain the database connection string, right-click the connection in the Server Explorer window, and select **Properties**. The connection string is now displayed in the Properties window of Visual Studio. Note that, before pasting the string into the "Connection String" box of DiffDog, you will need to replace the asterisk ( \* ) characters with the actual password.

## 8.4.2 Sample ADO.NET Connection Strings

To set up an ADO.NET connection, you need to select an ADO.NET provider from the database connection dialog box and enter a connection string (see also [Setting up an ADO.NET Connection](#)<sup>166</sup>). Sample ADO.NET connection strings for various databases are listed below under the .NET provider where they apply.

### .NET Data Provider for Teradata

This provider can be downloaded from Teradata website (<https://downloads.teradata.com/download/connectivity/net-data-provider-for-teradata>). A sample connection string looks as follows:

```
Data Source=ServerAddress;User Id=USER;Password=password;
```

### .NET Framework Data Provider for IBM i

This provider is installed as part of *IBM i Access Client Solutions - Windows Application Package*. A sample connection string looks as follows:

```
DataSource=ServerAddress;UserID=user;Password=password;DataCompression=True;
```

For more information, see the ".NET Provider Technical Reference" help file included in the installation package above.

### .NET Framework Data Provider for MySQL

This provider can be downloaded from MySQL website (<https://dev.mysql.com/downloads/connector/net/>). A sample connection string looks as follows:

```
Server=127.0.0.1;Uid=root;Pwd=12345;Database=test;
```

See also: <https://dev.mysql.com/doc/connector-net/en/connector-net-programming-connecting-connection-string.html>

### .NET Framework Data Provider for SQL Server

A sample connection string looks as follows:

```
Data Source=DBSQLSERV;Initial Catalog=ProductsDB;User ID=dbuser;Password=dbpass
```

See also: [https://msdn.microsoft.com/en-us/library/ms254500\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/ms254500(v=vs.110).aspx)

### IBM DB2 Data Provider 10.1.2 for .NET Framework 4.0

```
Database=PRODUCTS;UID=user;Password=password;Server=localhost:50000;
```

**Note:** This provider is typically installed with the IBM DB2 Data Server Client package. If the provider is missing from the list of ADO.NET providers after installing IBM DB2 Data Server Client package, refer to the following technical note: <https://www-01.ibm.com/support/docview.wss?uid=swg21429586>.

See also:

[https://www.ibm.com/support/knowledgecenter/en/SSEPGG\\_10.1.0/com.ibm.swg.im.dbclient.adonet.ref.doc/doc/DB2ConnectionClassConnectionStringProperty.html](https://www.ibm.com/support/knowledgecenter/en/SSEPGG_10.1.0/com.ibm.swg.im.dbclient.adonet.ref.doc/doc/DB2ConnectionClassConnectionStringProperty.html)

### Oracle Data Provider for .NET (ODP.NET)

The installation package which includes the ODP.NET provider can be downloaded from the Oracle website (see <http://www.oracle.com/technetwork/topics/dotnet/downloads/index.html>). A sample connection string looks as follows:

```
Data Source=DSORCL;User Id=user;Password=password;
```

Where DSORCL is the name of the data source which points to an Oracle service name defined in the **tnsnames.ora** file, as described in [Connecting to Oracle \(ODBC\)](#)<sup>221</sup>.

To connect without configuring a service name in the **tnsnames.ora** file, use a string such as:

```
Data Source=(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=host)(PORT=port)))
(CONNECT_DATA=(SERVER=DEDICATED)(SERVICE_NAME=MyOracleSID)));User
Id=user;Password=password;
```

See also: [https://docs.oracle.com/cd/B28359\\_01/win.111/b28375/featConnecting.htm](https://docs.oracle.com/cd/B28359_01/win.111/b28375/featConnecting.htm)

## 8.4.3 ADO.NET Support Notes

The following table lists known ADO.NET database drivers that are currently not supported or have limited support in DiffDog.

Database	Driver	Support notes
All databases	<b>.Net Framework Data Provider for ODBC</b>	Limited support. Known issues exist with Microsoft Access connections. It is recommended to use ODBC direct connections instead.
	<b>.Net Framework Data Provider for OleDb</b>	Limited support. Known issues exist with Microsoft Access connections. It is recommended to use ADO direct connections instead.
Firebird	<b>Firebird ADO.NET Data Provider</b>	Limited support. It is recommended to use ODBC or JDBC instead.
Informix	<b>IBM Informix Data Provider for</b>	Not supported. Use <b>DB2 Data Server</b>

Database	Driver	Support notes
	<b>.NET Framework 4.0</b>	<b>Provider</b> instead.
IBM DB2 for i (iSeries)	<b>.Net Framework Data Provider for i5/OS</b>	Not supported. Use <b>.Net Framework Data Provider for IBM i</b> instead, installed as part of the <i>IBM i Access Client Solutions - Windows Application Package</i> .
Oracle	<b>.Net Framework Data Provider for Oracle</b>	Limited support. Although this driver is provided with the .NET Framework, its usage is discouraged by Microsoft, because it is deprecated.
PostgreSQL	-	No ADO.NET drivers for this vendor are supported. Use a native connection instead.
Sybase	-	No ADO.NET drivers for this vendor are supported.

## 8.5 ODBC Connection

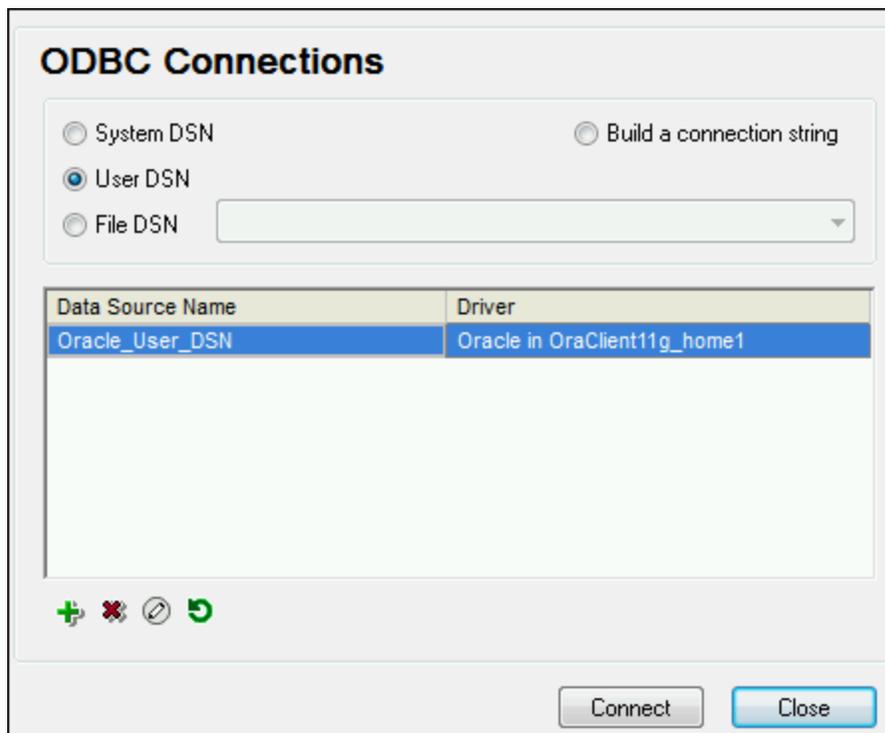
ODBC (Open Database Connectivity) is a widely used data access technology that enables you to connect to a database from DiffDog. It can be used either as primary means to connect to a database, or as an alternative to native, OLE DB, or JDBC-driven connections.

To connect to a database through ODBC, first you need to create an ODBC data source name (DSN) on the operating system. This step is not required if the DSN has already been created, perhaps by another user of the operating system. The DSN represents a uniform way to describe the database connection to any ODBC-aware client application on the operating system, including DiffDog. DSNs can be of the following types:

- System DSN
- User DSN
- File DSN

A *System* data source is accessible by all users with privileges on the operating system. A *User* data source is available to the user who created it. Finally, if you create a *File DSN*, the data source will be created as a file with the .dsn extension which you can share with other users, provided that they have installed the drivers used by the data source.

Any DSNs already available on your machine are listed by the database connection dialog box when you click **ODBC connections** on the ODBC connections dialog box.



*ODBC Connections dialog box*

If a DSN to the required database is not available, the DiffDog database connection wizard will assist you to create it; however, you can also create it directly on your Windows operating system. In either case, before you

proceed, ensure that the ODBC driver applicable for your database is in the list of ODBC drivers available to the operating system (see [Viewing the Available ODBC Drivers](#)<sup>175</sup>).

#### To connect by using a new DSN:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. On the database connection dialog box, click **ODBC Connections**.
3. Select a data source type (User DSN, System DSN, File DSN).

To create a System DSN, you need administrative rights on the operating system, and DiffDog must be run as administrator.

4. Click **Add** .
5. Select a driver, and then click **User DSN** or **System DSN** (depending on the type of the DSN you want to create). If the driver applicable to your database is not listed, download it from the database vendor and install it (see [Database Drivers Overview](#)<sup>157</sup>).
6. On the dialog box that pops up, fill in any driver specific connection information to complete the setup.

For the connection to be successful, you will need to provide the host name (or IP address) of the database server, as well as the database username and password. There may be other optional connection parameters—these parameters vary between database providers. For detailed information about the parameters specific to each connection method, consult the documentation of the driver provider. Once created, the DSN becomes available in the list of data source names. This enables you to reuse the database connection details any time you want to connect to the database. Note that User DSNs are added to the list of User DSNs whereas System DSNs are added to the list of System DSNs.

#### To connect by using an existing DSN:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ODBC Connections**.
3. Choose the type of the existing data source (User DSN, System DSN, File DSN).
4. Click the existing DSN record, and then click **Connect**.

#### To build a connection string based on an existing .dsn file:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ODBC Connections**.
3. Select **Build a connection string**, and then click **Build**.
4. If you want to build the connection string using a File DSN, click the **File Data Source** tab. Otherwise, click the **Machine Data Source** tab. (System DSNs and User DSNs are known as "Machine" data sources.)
5. Select the required .dsn file, and then click **OK**.

#### To connect by using a prepared connection string:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ODBC Connections**.

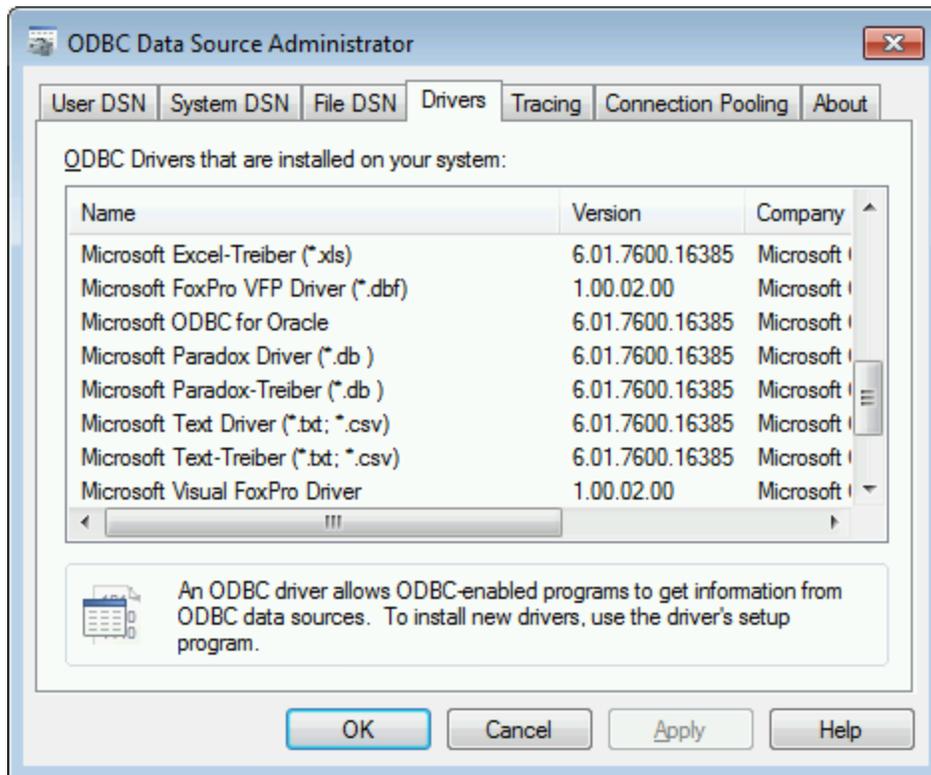
3. Select **Build a connection string**.
4. Paste the connection string into the provided box, and then click **Connect**.

## 8.5.1 Available ODBC Drivers

You can view the ODBC drivers available on your operating system in the ODBC Data Source Administrator. You can access the ODBC Data Source Administrator (**Odbcad32.exe**) from the Windows Control Panel, under **Administrative Tools**. On 64-bit operating systems, there are two versions of this executable:

- The 32-bit version of the **Odbcad32.exe** file is located in the **C:\Windows\SysWoW64** directory (assuming that **C:** is your system drive).
- The 64-bit version of the **Odbcad32.exe** file is located in the **C:\Windows\System32** directory.

Any installed 32-bit database drivers are visible in the 32-bit version of ODBC Data Source Administrator, while 64-bit drivers—in the 64-bit version. Therefore, ensure that you check the database drivers from the relevant version of ODBC Data Source Administrator.



*ODBC Data Source Administrator*

If the driver to your target database does not exist in the list, or if you want to add an alternative driver, you will need to download it from the database vendor (see [Database Drivers Overview](#)<sup>157</sup>). Once the ODBC driver is available on your system, you are ready to create ODBC connections with it (see [Setting up an ODBC Connection](#)<sup>173</sup>).

## 8.6 JDBC Connection

JDBC (Java Database Connectivity) is a database access interface which is part of the Java software platform from Oracle. JDBC connections are generally more resource-intensive than ODBC connections but may provide features not available through ODBC.

### Prerequisites

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The JDBC drivers from the database vendor must be installed. These may be JDBC drivers installed as part of a database client installation, or JDBC libraries (.jar files) downloaded separately, if available and supported by the database, see also [Database Connection Examples](#)<sup>187</sup>.
- The `CLASSPATH` environment variable must include the path to the JDBC driver (one or several .jar files) on your Windows operating system. When you install some database clients, the installer may configure this variable automatically. See also [Configuring the CLASSPATH](#)<sup>178</sup>.

### Connecting to SQL Server via JDBC with Windows credentials

If you connect to SQL Server through JDBC with Windows credentials (integrated security), note the following:

- The `sqljdbc_auth.dll` file included in the JDBC driver package must be copied to a directory that is on the system `PATH` environment variable. There are two such files, one for the x86 and one for x64 platform. Make sure that you add to the `PATH` the one that corresponds to your JDK platform.
- The JDBC connection string must include the property `integratedSecurity=true`.

For further information, refer to *Microsoft JDBC driver for SQL Server* documentation, <https://docs.microsoft.com/en-us/sql/connect/jdbc/building-the-connection-url>.

### Setting up a JDBC connection

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Optionally, enter a semicolon-separated list of .jar file paths in the "Classpaths" text box. The .jar libraries entered here will be loaded into the environment in addition to those already defined in the `CLASSPATH` environment variable. When you finish editing the "Classpaths" text box, any JDBC drivers found in the source .jar libraries are automatically added to the "Driver" list (see the next step).

Classpaths: C:\jdbc\instantclient\_12\_1\ojdbc7.jar

Driver: oracle.jdbc.driver.OracleDriver

Username: johndoe

Password: ●●●●●●●

Database URL: jdbc:oracle:thin:@//ora12c:1521/orcl12c

Connect Close

- Next to "Driver", select a JDBC driver from the list, or enter a Java class name. Note that this list contains any JDBC drivers configured through the `CLASSPATH` environment variable (see [Configuring the CLASSPATH](#)<sup>178</sup>), as well as those found in the "Classpaths" text box.

The JDBC driver paths defined in the `CLASSPATH` variable, as well as any `.jar` file paths entered directly in the database connection dialog box are all supplied to the Java Virtual Machine (JVM). The JVM then decides which drivers to use in order to establish a connection. It is recommended to keep track of Java classes loaded into the JVM so as not to create potential JDBC driver conflicts and avoid unexpected results when connecting to the database.

- Enter the username and password to the database in the corresponding boxes.
- In the Database URL text box, enter the JDBC connection URL (string) in the format specific to your database type. The following table describes the syntax of JDBC connection URLs (strings) for common database types.

Database	JDBC Connection URL
Firebird	jdbc:firebirdsql://<host>[:<port>]/<database path or alias>
IBM DB2	jdbc:db2://<hostName>:<port>/<databaseName>
IBM DB2 for i	jdbc:as400://<host>

Database	JDBC Connection URL
IBM Informix	jdbc:informix-sqli:// <b>hostName</b> : <b>port</b> / <b>databaseName</b> :INFORMIXSERVER= <b>myserver</b>
MariaDB	jdbc:mariadb:// <b>hostName</b> : <b>port</b> / <b>databaseName</b>
Microsoft SQL Server	jdbc:sqlserver:// <b>hostName</b> : <b>port</b> ; <b>databaseName</b> =name
MySQL	jdbc:mysql:// <b>hostName</b> : <b>port</b> / <b>databaseName</b>
Oracle	jdbc:oracle:thin:@ <b>hostName</b> : <b>port</b> : <b>SID</b> jdbc:oracle:thin:@// <b>hostName</b> : <b>port</b> / <b>service</b>
Oracle XML DB	jdbc:oracle:oci:@// <b>hostName</b> : <b>port</b> : <b>service</b>
PostgreSQL	jdbc:postgresql:// <b>hostName</b> : <b>port</b> / <b>databaseName</b>
Progress OpenEdge	jdbc:datadirect:openedge:// <b>host</b> : <b>port</b> ; <b>databaseName</b> = <b>db_name</b>
Sybase	jdbc:sybase:Tds: <b>hostName</b> : <b>port</b> / <b>databaseName</b>
Teradata	jdbc:teradata:// <b>databaseServerName</b>

**Note:** Syntax variations to the formats listed above are also possible (for example, the database URL may exclude the port or may include the username and password to the database). Check the documentation of the database vendor for further details.

- Click **Connect**.

## 8.6.1 Configuring the CLASSPATH

The `CLASSPATH` environment variable is used by the Java Runtime Environment (JRE) or the Java Development Kit (JDK) to locate Java classes and other resource files on your operating system. When you connect to a database through JDBC, this variable must be configured to include the path to the JDBC driver on your operating system, and, in some cases, the path to additional library files specific to the database type you are using.

The following table lists sample file paths that must be typically included in the `CLASSPATH` variable. Importantly, you may need to adjust this information based on the location of the JDBC driver on your system, the JDBC driver name, as well as the JRE/JDK version present on your operating system. To avoid connectivity problems, check the installation instructions and any pre-installation or post-installation configuration steps applicable to the JDBC driver installed on your operating system.

Database	Sample CLASSPATH entries
Firebird	C:\Program Files\Firebird\Jaybird-2.2.8-JDK_1.8\jaybird-full-2.2.8.jar
IBM DB2	C:\Program Files (x86)\IBM\SQLLIB\java\db2jcc.jar;C:\Program Files (x86)\IBM\SQLLIB\java\db2jcc_license_cu.jar;

Database	Sample CLASSPATH entries
IBM DB2 for i	C:\jt400\jt400.jar;
IBM Informix	C:\Informix_JDBC_Driver\lib\ifxjdbc.jar;
Microsoft SQL Server	C:\Program Files\Microsoft JDBC Driver 4.0 for SQL Server\sqljdbc_4.0\enu\sqljdbc.jar
MariaDB	<installation directory>\mariadb-java-client-2.2.0.jar
MySQL	<installation directory>\mysql-connector-java- <i>version</i> -bin.jar;
Oracle	ORACLE_HOME\jdbc\lib\ojdbc6.jar;
Oracle (with XML DB)	ORACLE_HOME\jdbc\lib\ojdbc6.jar; ORACLE_HOME\LIB\xmlparserv2.jar; ORACLE_HOME\RDBMS\jlib\xdb.jar;
PostgreSQL	<installation directory>\postgresql.jar
Progress OpenEdge	%DLC%\java\openedge.jar;%DLC%\java\pool.jar;  Note: Assuming the Progress OpenEdge SDK is installed on the machine, %DLC% is the directory where OpenEdge is installed.
Sybase	C:\sybase\jConnect-7_0\classes\jconn4.jar
Teradata	<installation directory>\tdgssconfig.jar; <installation directory>\terajdbc4.jar

- Changing the CLASSPATH variable may affect the behavior of Java applications on your machine. To understand possible implications before you proceed, refer to the Java documentation.
- Environment variables can be user or system. To change system environment variables, you need administrative rights on the operating system.
- After you change the environment variable, restart any running programs for settings to take effect. Alternatively, log off or restart your operating system.

### To configure the CLASSPATH on Windows 7:

1. Open the **Start** menu and right-click **Computer**.
2. Click **Properties**.
3. Click **Advanced system settings**.
4. In the **Advanced** tab, click **Environment Variables**.
5. Locate the CLASSPATH variable under user or system environment variables, and then click Edit. If the CLASSPATH variable does not exist, click **New** to create it.
6. Edit the variable value to include the path on your operating system where the JDBC driver is located. To separate the JDBC driver path from other paths that may already be in the CLASSPATH variable, use the semi-colon separator ( ; ).

**To configure the CLASSPATH on Windows 10:**

1. Press the Windows key and start typing "environment variables".
2. Click the suggestion **Edit the system environment variables**.
3. Click **Environment Variables**.
4. Locate the CLASSPATH variable under user or system environment variables, and then click **Edit**. If the CLASSPATH variable does not exist, click **New** to create it.
5. Edit the variable value to include the path on your operating system where the JDBC driver is located. To separate the JDBC driver path from other paths that may already be in the CLASSPATH variable, use the semi-colon separator ( ; ).

## 8.7 PostgreSQL Connection

Connections to PostgreSQL databases can be set up either as native connections, or connections via ODBC, JDBC, and other drivers. The advantage of setting up a native connection is that no drivers are required to be installed on your system.

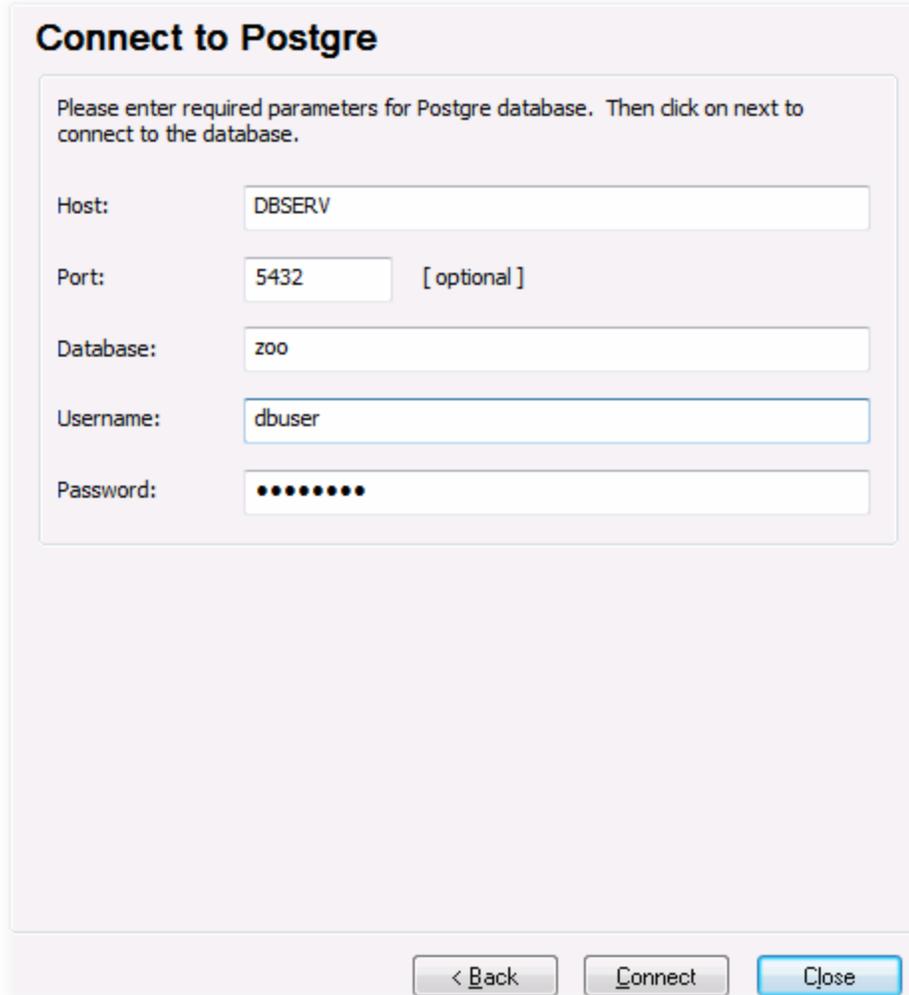
If you prefer to establish a connection by means of a non-native driver, see the following topics:

- [Setting up a JDBC Connection](#)<sup>176</sup>
- [Connecting to PostgreSQL \(ODBC\)](#)<sup>225</sup>

Otherwise, if you want to set up a native connection to PostgreSQL, follow the steps below. To proceed, you need the following prerequisites: host name, port, database name, username, and password.

**To set up a native PostgreSQL connection:**

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **PostgreSQL Connections**.
3. Enter the host (*localhost*, if PostgreSQL runs on the same machine), port (typically 5432, this is optional), the database name, username, and password in the corresponding boxes.



**Connect to Postgre**

Please enter required parameters for Postgre database. Then click on next to connect to the database.

Host:

Port:  [ optional ]

Database:

Username:

Password:

< Back    Connect    Close

4. Click **Connect**.

If the PostgreSQL database server is on a different machine, note the following:

- The PostgreSQL database server must be configured to accept connections from clients. Specifically, the **pg\_hba.conf** file must be configured to allow non-local connections. Secondly, the **postgresql.conf** file must be configured to listen on specified IP address(es) and port. For more information, check the PostgreSQL documentation (<https://www.postgresql.org/docs/9.5/static/client-authentication-problems.html>).
- The server machine must be configured to accept connections on the designated port (typically, 5432) through the firewall. For example, on a database server running on Windows, a rule may need to be created to allow connections on port 5432 through the firewall, from **Control Panel > Windows Firewall > Advanced Settings > Inbound Rules**.

## 8.8 SQLite Connection

[SQLite](#) is a file-based, self-contained database type, which makes it ideal in scenarios where portability and ease of configuration is important. Since SQLite databases are natively supported by DiffDog, you do not need to install any drivers to connect to them.

### SQLite database support notes

- On Linux, statement execution timeout for SQLite databases is not supported.
- Full text search tables are not supported.
- SQLite allows values of different data types in each row of a given table. All processed values must be compatible with the declared column type; therefore, unexpected values can be retrieved and run-time errors may occur if your SQLite database has row values which are not the same as the declared column type.

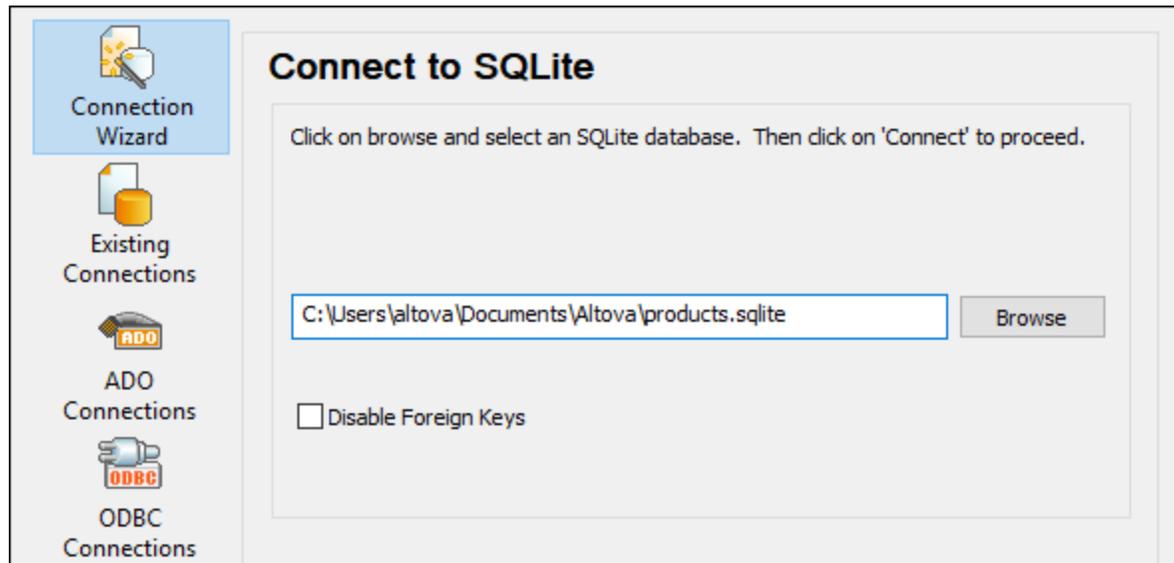
#### Important

It is recommended to create tables with the `STRICT` keyword to ensure more predictable behavior of your data. Otherwise, the data may not be read or written correctly when values of different types are mixed in one column. To find out more about STRICT tables, see the [SQLite documentation](#).

### 8.8.1 Connect to an Existing SQLite Database

#### To connect to an existing SQLite database:

1. Run the database connection wizard (see [Starting the Database Connection Wizard](#)<sup>154</sup>).
2. Select **SQLite**, and then click **Next**.
3. Browse for the SQLite database file, or enter the path (either relative or absolute) to the database. The **Connect** button becomes enabled once you enter the path to a SQLite database file.

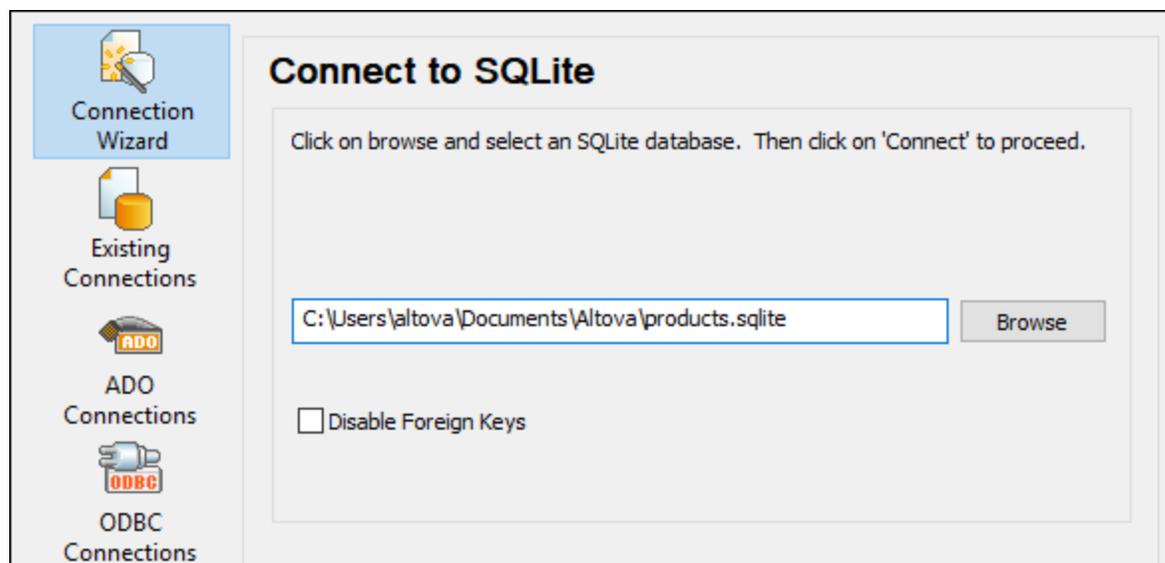


4. Optionally, select the **Disable Foreign Keys** check box, see [Foreign Key Constraints](#)<sup>184</sup>.
5. Click **Connect**.

## 8.8.2 Foreign Key Constraints

When you connect to an existing SQLite database from DiffDog, foreign key constraints are enabled by default. Foreign key constraints help preserve the integrity of data in your database. For example, when foreign keys are enabled, it is not possible to delete a record from a table if it has dependencies in another table.

In certain cases, you may want to temporarily override this behavior and disable foreign keys, perhaps, in order to update or insert multiple rows of data without getting data validation errors. To explicitly disable foreign keys before connecting to the SQLite database, select the **Disable Foreign Keys** option available on the database connection wizard.



*"Connect to SQLite" wizard page*

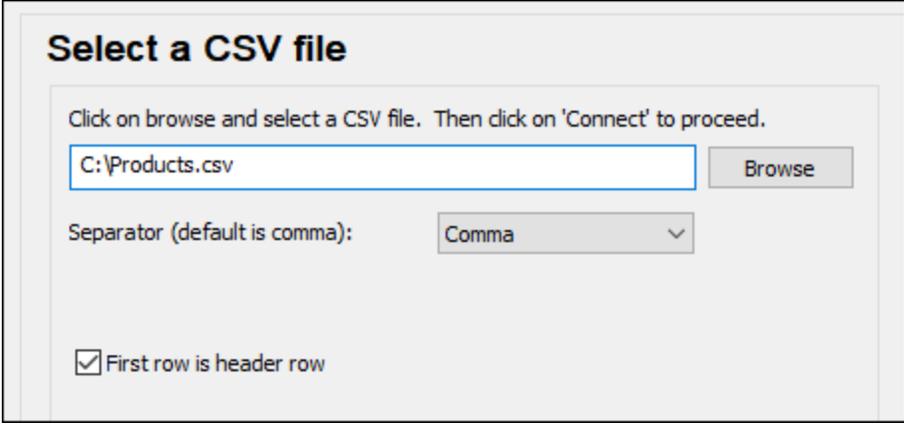
When foreign keys are disabled, you will be able to perform operations against data that would otherwise not be possible due to validation checks. At the same time, however, there is also the risk of introducing incorrect data into the database, or creating "orphaned" rows. (An example of an "orphaned" row would be an address in the "addresses" table not linked to any person in the "person" table, because the person was deleted but its associated address was not.)

## 8.9 CSV/TSV File as Data Source

In addition to databases, you can establish data connections to comma-separated values (CSV) or tab-separated values (TSV) files. In order for the CSV file to open correctly, the fields in each row must be separated by one of the following delimiters: comma, tab, or semicolon. Also, each line must contain the same number of fields throughout the file. The file extension is not important.

### To connect to a CSV or TSV file:

1. Run the database connection wizard (see [Starting the Database Connection Wizard](#)<sup>154</sup>).
2. Select **CSV/TSV files** from the left side of the dialog box.
3. Click **Browse** and select the source file, or enter the path to the file. The **Connect** button becomes enabled once you enter the path to a file.
4. Select the separator used in the source file (tab, comma, or semicolon).
5. To treat the first row as a header row, select the **First row is header row** check box.



**Select a CSV file**

Click on browse and select a CSV file. Then click on 'Connect' to proceed.

C:\Products.csv

Separator (default is comma):

First row is header row

6. Click **Connect**.

## 8.10 Database Connection Examples

This section includes examples for connecting to a database from DiffDog through ADO, ODBC, or JDBC. The ADO.NET connection examples are listed separately, see [Sample ADO.NET Connection Strings](#)<sup>170</sup>. For instructions about establishing a native connection to PostgreSQL and SQLite, see [Setting up a PostgreSQL Connection](#)<sup>181</sup> and [Setting up a SQLite Connection](#)<sup>183</sup>, respectively.

Note the following:

- The instructions may differ if your Windows configuration, network environment and the database client or server software are not the same as the ones described in each example.
- For most database types, it is possible to connect using more than one data access technology (ADO, ADO.NET, ODBC, JDBC) or driver. The performance of the database connection, as well as its features and limitations will depend on the selected driver, database client software (if applicable), and any additional connectivity parameters that you may have configured outside DiffDog.

### 8.10.1 Firebird (JDBC)

This example illustrates how to connect to a Firebird database server through JDBC.

#### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The Firebird JDBC driver must be available on your operating system (it takes the form of a .jar file which provides connectivity to the database). The driver can be downloaded from the Firebird website (<https://www.firebirdsql.org/>). This example uses *Jaybird 2.2.8*.
- You have the following database connection details: host, database path or alias, username, and password.

#### To connect to Firebird through JDBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the required .jar file is located at the following path: `C:\jdbc\firebird\jaybird-full-2.2.8.jar`. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the `CLASSPATH` environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **org.firebirdsql.jdbc.FBDriver**. Note that this entry is available if a valid .jar file path is found either in the "Classpath" text box, or in the operating system's `CLASSPATH` environment variable (see the previous step).

Classpaths: C:\jdbc\firebird\jaybird-full-2.2.8.jar

Driver: org.firebirdsql.jdbc.FBDriver

Username: prod\_admin

Password: ●●●●●●

Database URL: jdbc:firebirdsql://firebirdserv/COMPANY

Connect Close

5. Enter the username and password to the database in the corresponding text boxes.
6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted values with the ones applicable to your database server.

```
jdbc:firebirdsql://<host>[:<port>]/<database path or alias>
```

7. Click **Connect**.

## 8.10.2 Firebird (ODBC)

This example illustrates how to connect to a Firebird 2.5.4 database running on a Linux server.

### Prerequisites:

- The Firebird database server is configured to accept TCP/IP connections from clients.
- The Firebird ODBC driver must be installed on your operating system. This example uses the Firebird ODBC driver version 2.0.3.154 downloaded from the Firebird website ( <https://www.firebirdsql.org/> ).
- The Firebird client must be installed on your operating system. Note that there is no standalone installer available for the Firebird 2.5.4 client; the client is part of the Firebird server installation package. You can download the Firebird server installation package from the Firebird website ( <https://www.firebirdsql.org/> ), look for "Windows executable installer for full Superclassic/Classic or Superserver". To install only the client files, choose "**Minimum client install - no server, no tools**" when going through the wizard steps.

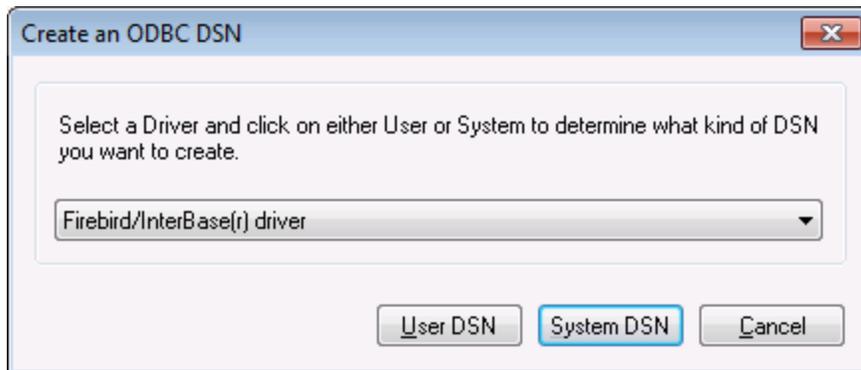
**Important:**

- The platform of both the Firebird ODBC driver and client (32-bit or 64-bit) must correspond to that of DiffDog.
- The version of the Firebird client must correspond to the version of Firebird server to which you are connecting.

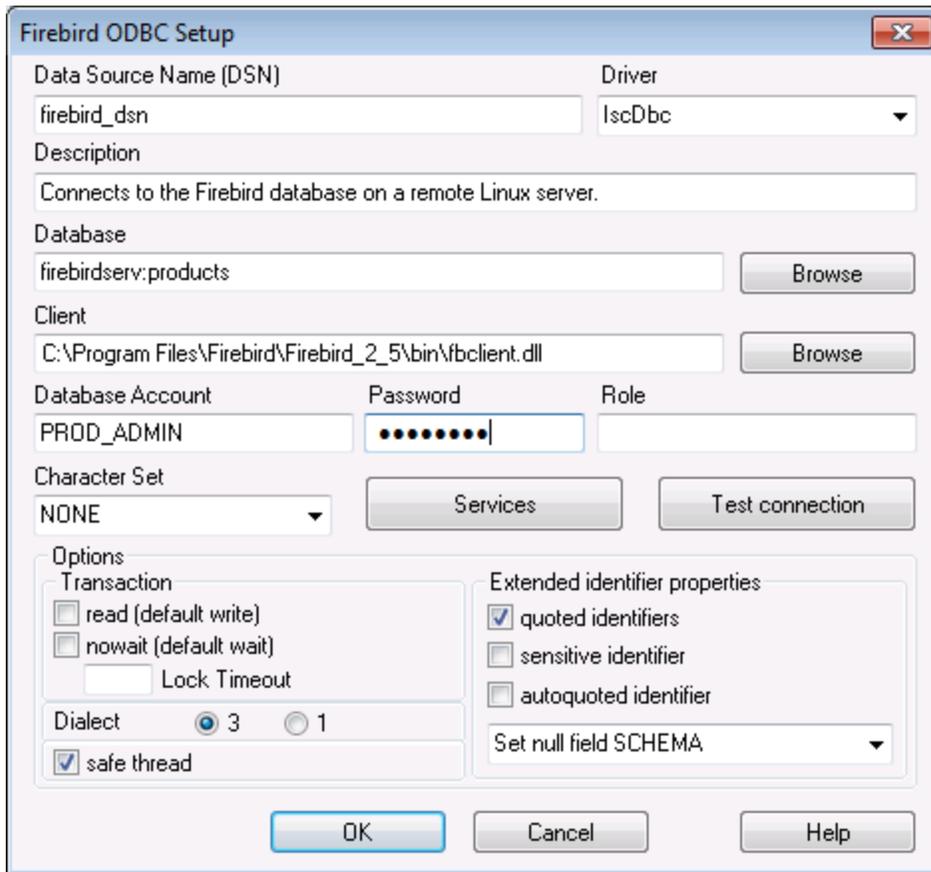
- You have the following database connection details: server host name or IP address, database path (or alias) on the server, user name, and password.

**To connect to Firebird via ODBC:**

1. [Start the database connection wizard](#) <sup>154</sup>.
2. Click **ODBC Connections**.
3. Select **User DSN** (or **System DSN**, if you have administrative privileges), and then click **Add** .



4. Select the Firebird driver, and then click **User DSN** (or **System DSN**, depending on what you selected in the previous step). If the Firebird driver is not available in the list, make sure that it is installed on your operating system (see also [Viewing the Available ODBC Drivers](#) <sup>175</sup>).



5. Enter the database connection details as follows:

<i>Data Source Name (DSN)</i>	Enter a descriptive name for the data source you are creating.
<i>Database</i>	<p>Enter the server host name or IP address, followed by a colon, followed by the database alias (or path). In this example, the host name is <code>firebirdserv</code>, and the database alias is <code>products</code>, as follows:</p> <pre>firebirdserv:products</pre> <p>Using a database alias assumes that, on the server side, the database administrator has configured the alias <i>products</i> to point to the actual Firebird (.fdb) database file on the server (see the Firebird documentation for more details).</p> <p>You can also use the server IP address instead of the host name, and a path instead of an alias; therefore, any of the following sample connection strings are valid:</p> <pre>firebirdserver:/var/Firebird/databases/butterflies.fdb 127.0.0.1:D:\Misc\Lenders.fdb</pre>

	If the database is on the local Windows machine, click <b>Browse</b> and select the Firebird (.fdb) database file directly.
<i>Client</i>	Enter the path to the <b>fbclient.dll</b> file. By default, this is the <code>bin</code> subdirectory of the Firebird installation directory.
<i>Database Account</i>	Enter the database user name supplied by the database administrator (in this example, <code>PROD_ADMIN</code> ).
<i>Password</i>	Enter the database password supplied by the database administrator.

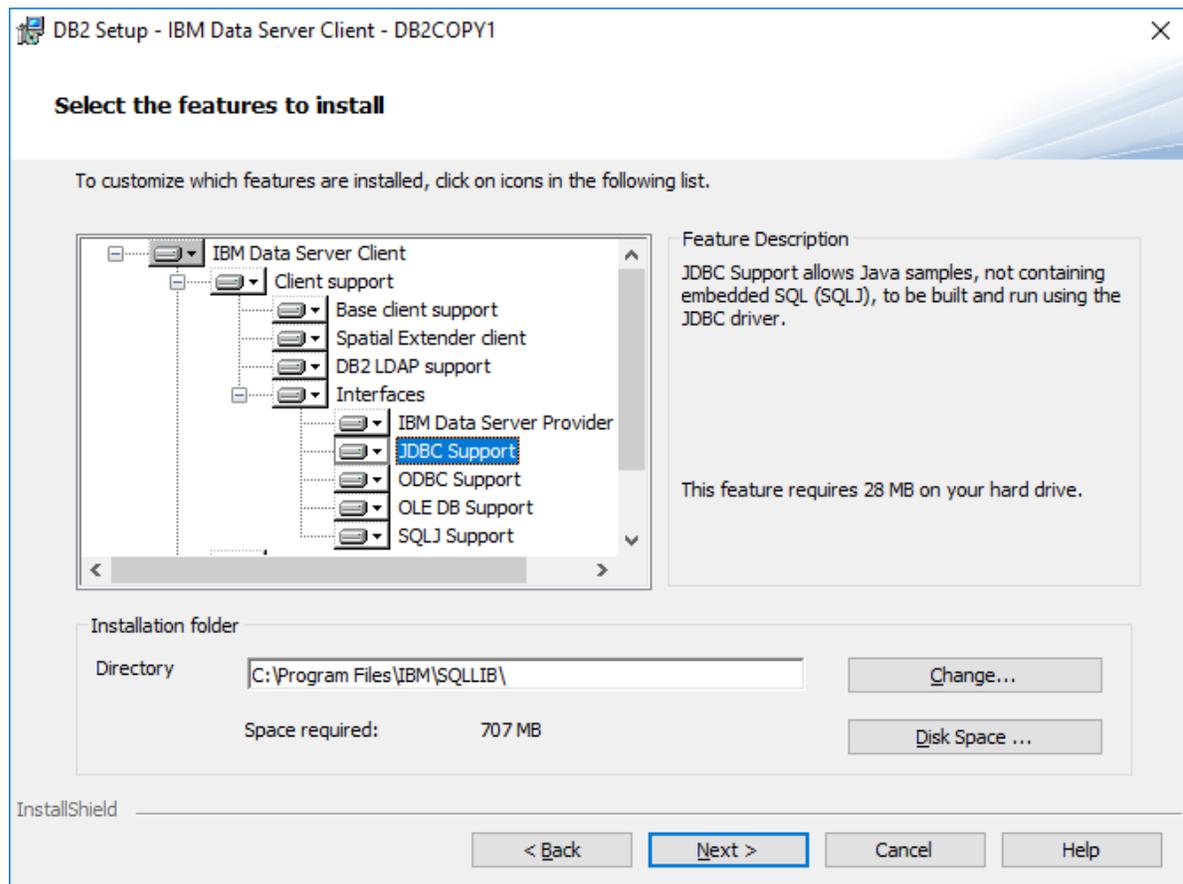
6. Click **OK**.

### 8.10.3 IBM DB2 (JDBC)

This example illustrates how to connect to an **IBM DB2** database server through JDBC.

#### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK. This example uses Oracle's OpenJDK 11.0 64-bit, and, consequently, the 64-bit version of DiffDog.
- The JDBC driver (one or several .jar files that provide connectivity to the database) must be available on your operating system. This example uses the JDBC driver available after installing the **IBM Data Server Client** version 10.1 (64-bit). For the JDBC drivers to be installed, choose a **Typical** installation, or select this option explicitly on the installation wizard.



If you did not change the default installation path, the required .jar files will be in the **C:\Program Files\IBM\SQLLIB\java** directory after installation.

- You need the following database connection details: host, port, database name, username, and password.

### To connect to IBM DB2 through JDBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. This examples refers to **C:\Program Files\IBM\SQLLIB\java\db2jcc.jar**. You may need to refer to the **db2jcc4.jar** driver, depending on the database server version. For driver compatibility, refer to IBM documentation (<http://www-01.ibm.com/support/docview.wss?uid=swg21363866>). Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **com.ibm.db2.jcc.DB2Driver**. This entry becomes available only if a valid .jar file path was found either in the "Classpaths" text box, or in the operating system's CLASSPATH environment variable (see the previous step).

Classpaths:	<input type="text" value="C:\Program Files\IBM\SQLLIB\java\db2jcc.jar"/>
Driver:	<input type="text" value="com.ibm.db2.jcc.DB2Driver"/>
Username:	<input type="text" value="username"/>
Password:	<input type="password" value="●●●●●●●●"/>
Database URL:	<input type="text" value="jdbc:db2://dbserver:50000/dbname"/>

5. Enter the username and password of the database user in the corresponding text boxes.
6. Enter the JDBC connection string in the **Database URL** text box. Make sure to replace the connection details with the ones applicable to your database server.

```
jdbc:db2://hostName:port/databaseName
```

7. Click **Connect**.

## 8.10.4 IBM DB2 (ODBC)

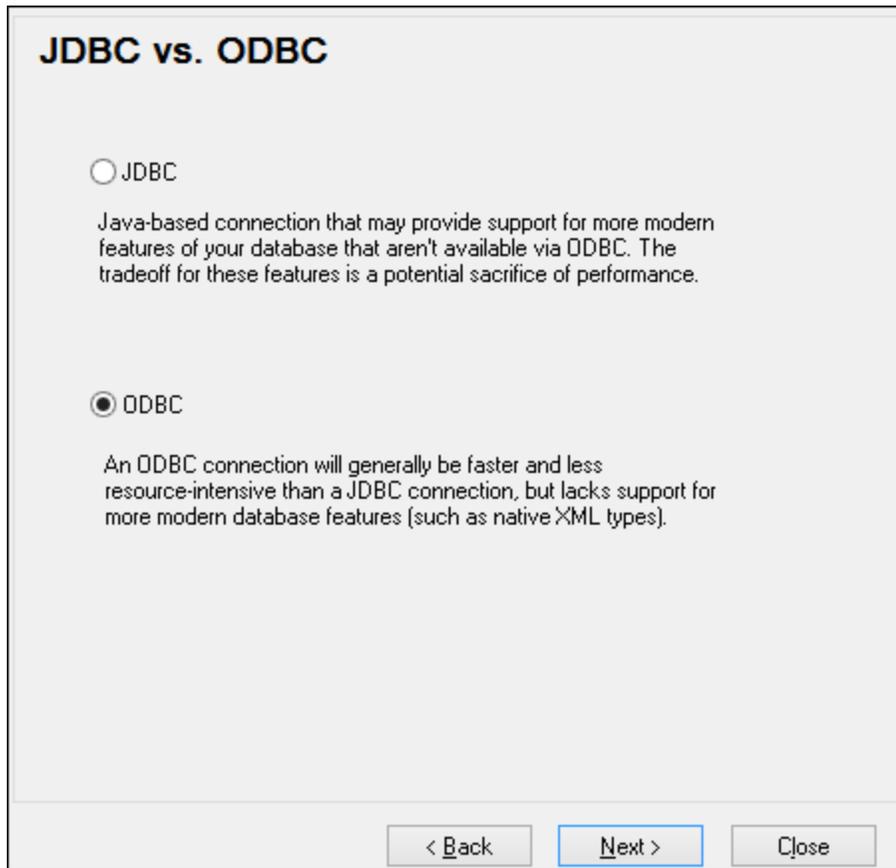
This example illustrates how to connect to an IBM DB2 database through ODBC.

### Prerequisites:

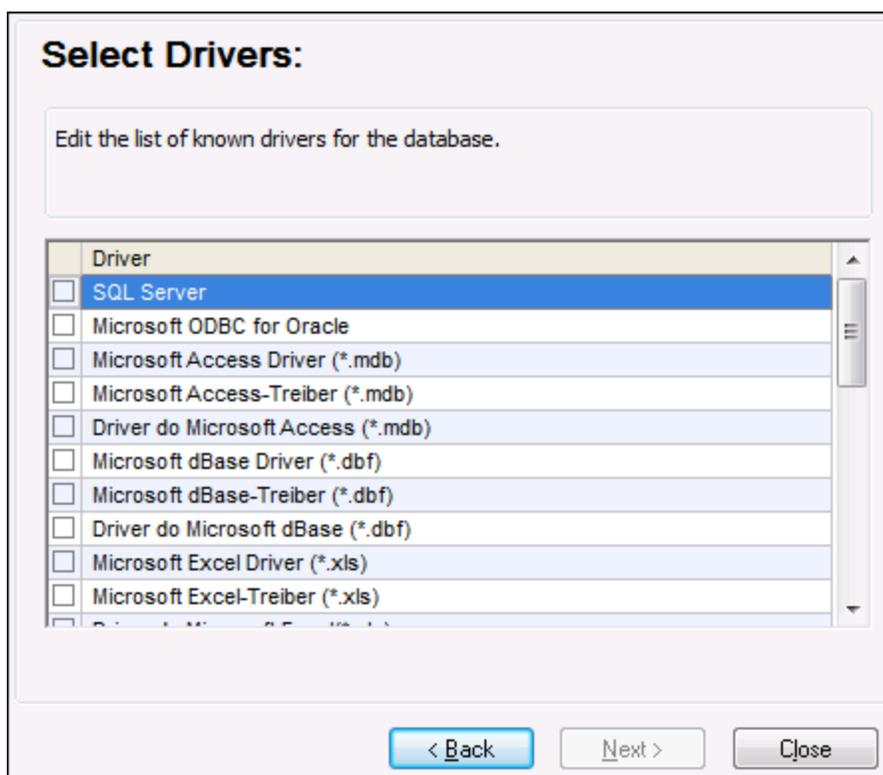
- IBM Data Server Client must be installed and configured on your operating system (this example uses IBM Data Server Client 9.7). For installation instructions, check the documentation supplied with your IBM DB2 software. After installing the IBM Data Server Client, check if the ODBC drivers are available on your machine (see [Viewing the Available ODBC Drivers](#)<sup>175</sup>).
- Create a database alias. There are several ways to do this:
  - From IBM DB2 Configuration Assistant
  - From IBM DB2 Command Line Processor
  - From the ODBC data source wizard (for this case, the instructions are shown below)
- You have the following database connection details: host, database, port, username, and password.

### To connect to IBM DB2:

1. [Start the database connection wizard](#)<sup>154</sup> and select **IBM DB2 (ODBC/JDBC)**.
2. Click **Next**.



3. Select **ODBC**, and click **Next**. If prompted to edit the list of known drivers for the database, select the database drivers applicable to IBM DB2 (see [Prerequisites](#)<sup>193</sup>), and click **Next**.



4. Select the IBM DB2 driver from the list, and then click **Connect**. (To edit the list of available drivers, click **Edit Drivers**, and then check or uncheck the IBM DB2 drivers you wish to add or remove, respectively.)

**Connecting to IBM DB2**

Where can I find IBM DB2 drivers?

Select an option how you wish to connect to the database and click Connect.

Create a new Data Source Name (DSN) with the driver:

IBM DB2 ODBC DRIVER

Use an existing Data Source Name:

User DSN     System DSN    Edit Drivers

Skip the configuration step for wizard

< Back    Connect    Close

5. Enter a data source name (in this example, **DB2DSN**), and then click **Add**.

Select the DB2 database alias you want to register for ODBC, or select Add to create a new alias. You may change the data source name and description, or accept the default.

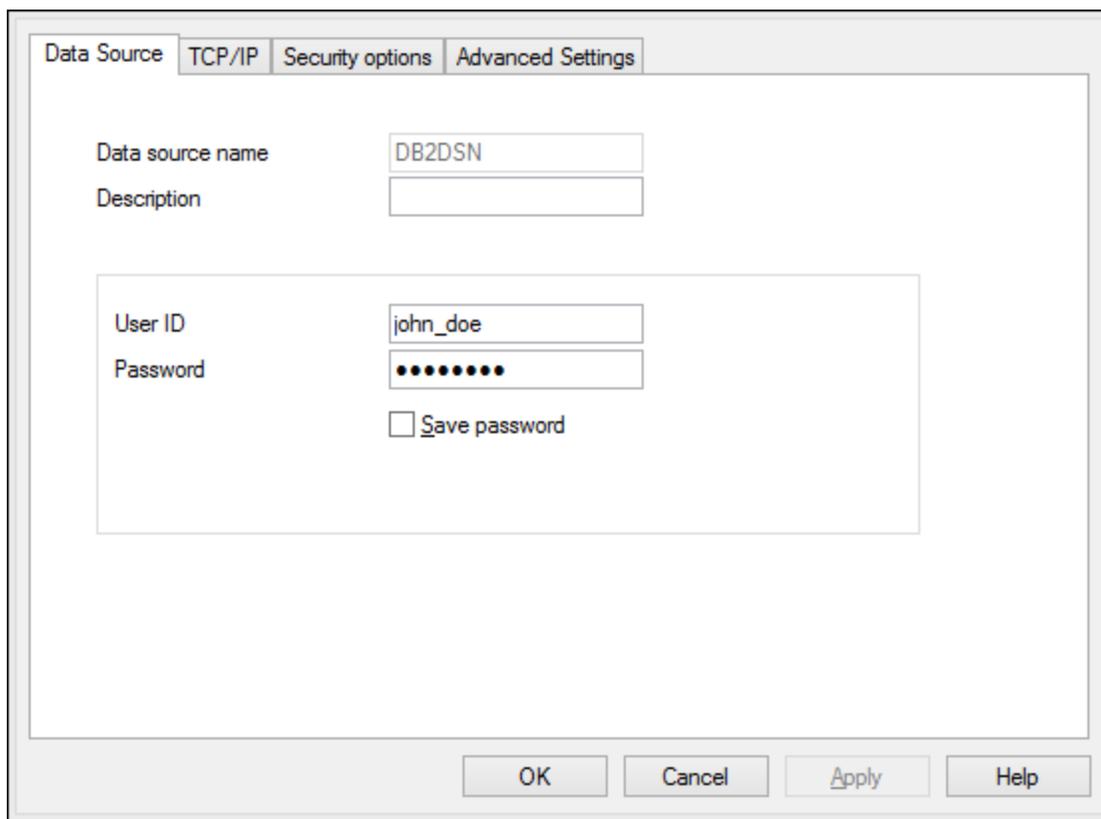
Data source name: DB2DSN

Database alias:    Add

Description:

OK    Cancel

6. On the **Data Source** tab, enter the user name and password to the database.



- 7. On the **TCP/IP** tab, enter the database name, a name for the alias, the host name and the port number, and then click OK.

8. Enter again the username and password, and then click **OK**.

## 8.10.5 IBM DB2 for i (JDBC)

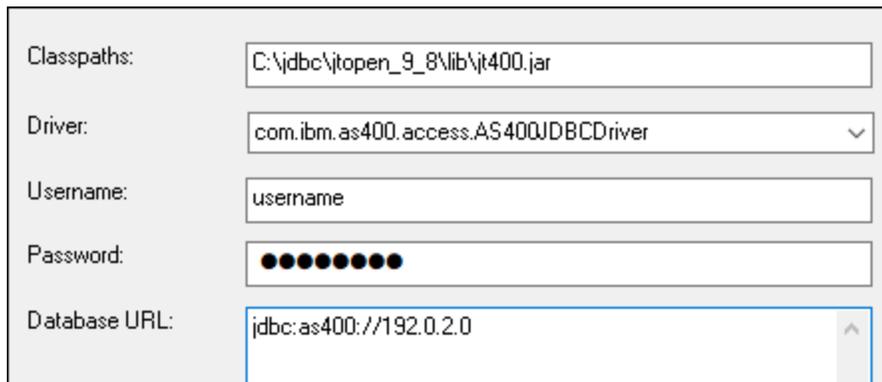
This example illustrates how to connect to an **IBM DB2 for i** database server through JDBC.

### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK. This example uses Oracle's OpenJDK 11.0 64-bit, and, consequently, the 64-bit version of DiffDog.
- The JDBC driver (one or several .jar files that provide connectivity to the database) must be available on your operating system. This example uses the open source **Toolbox for Java/JTOpen** version 9.8 (<http://jt400.sourceforge.net/>). After you download the package and unpack to a local directory, the required .jar files will be available in the **lib** subdirectory.
- You need the following database connection details: host, username, and password.

### To connect to IBM DB2 for i through JDBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. In this example, the required .jar file is at the following path: **C:\jdbc\jtopen\_9\_8\lib\jt400.jar**. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the `CLASSPATH` environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **com.ibm.as400.access.AS400JDBCdriver**. This entry becomes available only if a valid .jar file path was found either in the "Classpaths" text box, or in the operating system's `CLASSPATH` environment variable (see the previous step).



The screenshot shows a form with the following fields:

- Classpaths:** C:\jdbc\jtopen\_9\_8\lib\jt400.jar
- Driver:** com.ibm.as400.access.AS400JDBCdriver
- Username:** username
- Password:** (masked with 10 dots)
- Database URL:** jdbc:as400://192.0.2.0

5. Enter the username and password of the database user in the corresponding text boxes.
6. Enter the JDBC connection string in the **Database URL** text box. Make sure to replace **host** with the host name or IP address of your database server.

```
jdbc:as400://host
```

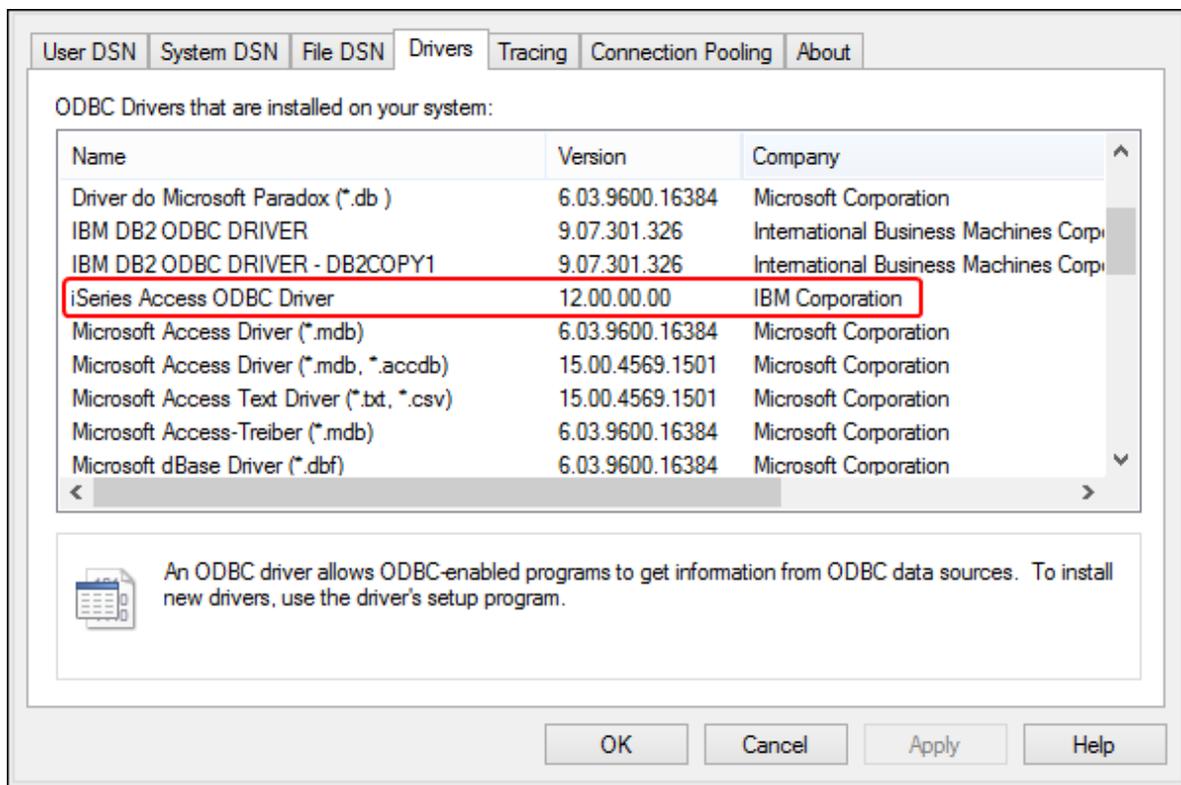
- Click **Connect**.

## 8.10.6 IBM DB2 for i (ODBC)

This example illustrates how to connect to an *IBM DB2 for i* database through ODBC.

### Prerequisites:

- IBM System i Access for Windows* must be installed on your operating system (this example uses *IBM System i Access for Windows V6R1M0*). For installation instructions, check the documentation supplied with your *IBM DB2 for i* software. After installation, check if the ODBC driver is available on your machine (see [Viewing the Available ODBC Drivers](#)<sup>175</sup>).

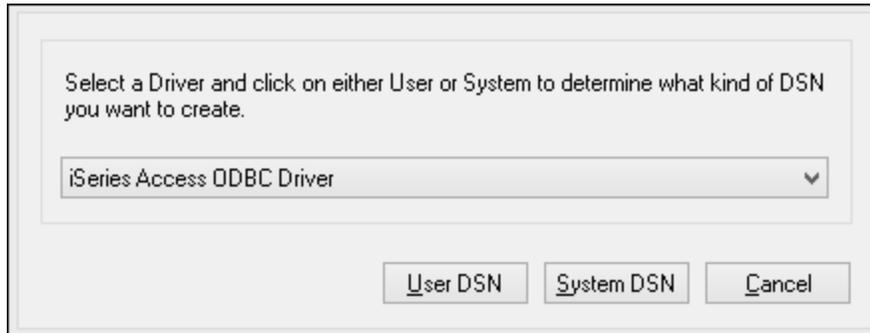


- You have the following database connection details: the I.P. address of the database server, database user name, and password.
- Run *System i Navigator* and follow the wizard to create a new connection. When prompted to specify a system, enter the I.P. address of the database server. After creating the connection, it is recommended to verify it (click on the connection, and select **File > Diagnostics > Verify Connection**). If you get connectivity errors, contact the database server administrator.

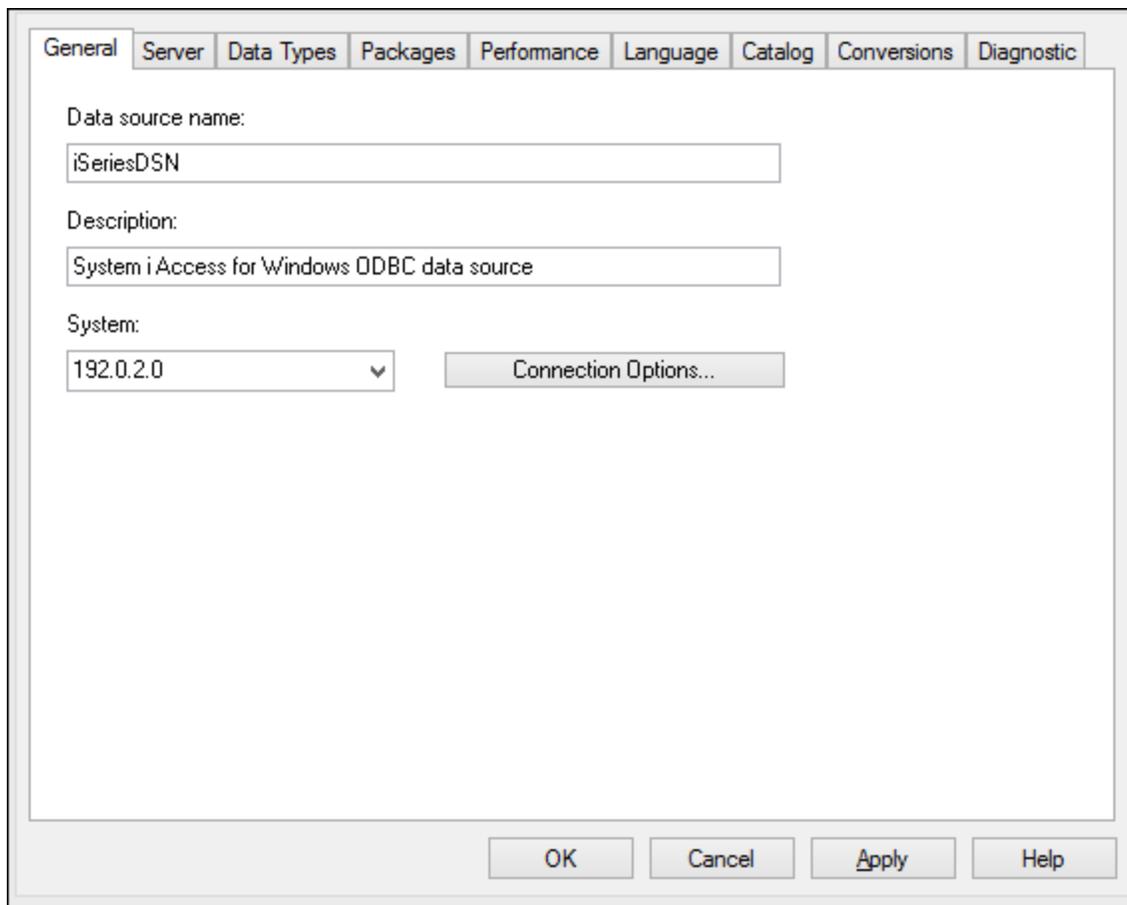
### To connect to IBM DB2 for i:

- [Start the database connection wizard](#)<sup>154</sup>.
- Click **ODBC connections**.

3. Click **User DSN** (alternatively, click **System DSN**, or **File DSN**, in which case the subsequent instructions will be similar).
4. Click **Add** .
5. Select the **iSeries Access ODBC Driver** from the list, and click **User DSN** (or **System DSN**, if applicable).



6. Enter a data source name and select the connection from the System combo box. In this example, the data source name is **iSeriesDSN** and the System is **192.0.2.0**.



7. Click **Connection Options**, select **Use the User ID specified below** and enter the name of the database user (in this example, **DBUSER**).

Default user ID

Use Windows user name

Use the user ID specified below

DBUSER

None

Use System i Navigator default

Use Kerberos principal

Signon dialog prompting

Prompt for SQLConnect if needed

Never prompt for SQLConnect

Security

Do not use Secured Sockets Layer (SSL)

Use Secured Sockets Layer (SSL)

Use same security as System i Navigator connection

OK Cancel Help

8. Click **OK**. The new data source becomes available in the list of DSNs.
9. Click **Connect**.
10. Enter the user name and password to the database when prompted, and then click **OK**.

### 8.10.7 IBM Informix (JDBC)

This example illustrates how to connect to an IBM Informix database server through JDBC.

#### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The JDBC driver (one or several .jar files that provide connectivity to the database) must be available on your operating system. In this example, IBM Informix JDBC driver version 3.70 is used. For the driver's installation instructions, see the documentation accompanying the driver or the "IBM Informix JDBC Driver Programmer's Guide").
- You have the following database connection details: host, name of the Informix server, database, port, username, and password.

**To connect to IBM Informix through JDBC:**

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the required .jar file is located at the following path: **C:\Informix\_JDBC\_Driver\lib\ifxjdbc.jar**. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>176</sup>).
4. In the "Driver" box, select **com.informix.jdbc.IfxDriver**. Note that this entry is available if a valid .jar file path is found either in the "Classpaths" text box, or in the operating system's CLASSPATH environment variable (see the previous step).

Classpaths: C:\jdbc\Informix\_JDBC\_Driver\lib\ifxjdbc.jar;

Driver: com.informix.jdbc.IfxDriver

Username: dbuser

Password: ●●●●●●

Database URL: jdbc:informix-sqli://host:port/MyDatabase:INFORMIXSERVER=MyServerName

Connect Close

5. Enter the username and password to the database in the corresponding text boxes.
6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted values with the ones applicable to your database server.

```
jdbc:informix-sqli://hostName:port/databaseName:INFORMIXSERVER=myserver;
```

7. Click **Connect**.

## 8.10.8 MariaDB (ODBC)

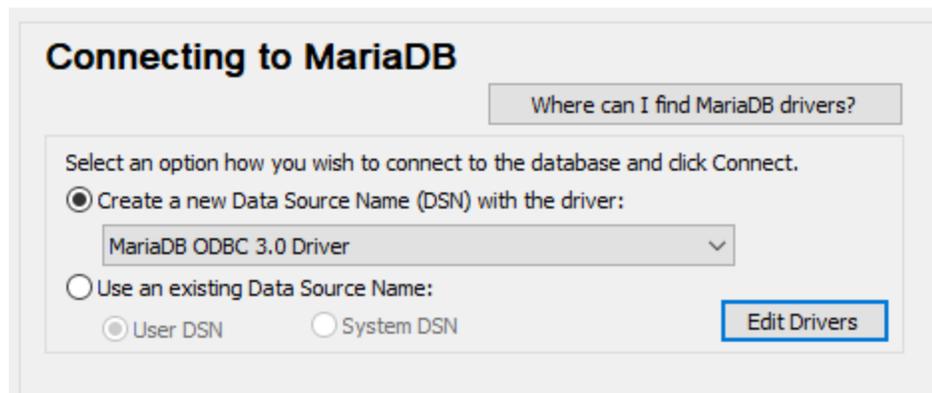
This example illustrates how to connect to a MariaDB database server through ODBC.

### Prerequisites:

- The MariaDB Connector/ODBC (<https://downloads.mariadb.org/connector-odbc/>) must be installed.
- You have the following database connection details: host, database, port, username, and password.

### To connect to MariaDB through ODBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Select **MariaDB (ODBC)**, and then click **Next**.



3. Select **Create a new Data Source Name (DSN) with the driver**, and choose **MariaDB ODBC 3.0 Driver**. If no such driver is available in the list, click **Edit Drivers**, and select any available MariaDB drivers (the list contains all ODBC drivers installed on your operating system).
4. Click **Connect**.

Create a new Data Source to MariaDB

Welcome to the MariaDB ODBC Data Source Wizard!

This wizard will help you to create an ODBC data source that you can use to connect to a MariaDB server.

What name do you want to use to refer to your data source ?

Name:

How do you want to describe the data source ?

Description:

< Previous    Next >    Cancel    Help

5. Enter name and, optionally, a description that will help you identify this ODBC data source in future.

Create a new Data Source to MariaDB

How do you want to connect to MariaDB

TCP/IP      Server Name:

Named Pipe      Port:

Please specify a user name and password to connect to MariaDB

User name:

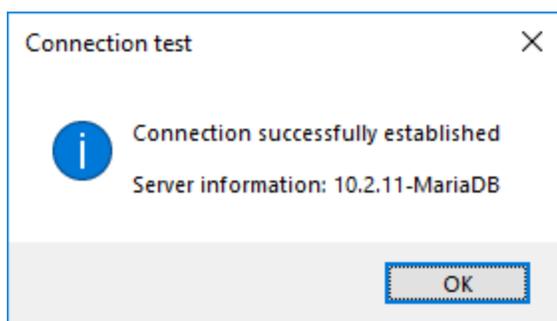
Password:

Please specify a user name and password to connect to MariaDB

Database:

< Previous    Next >    Cancel    Help

6. Fill in the database connection credentials (TCP/IP Server, User, Password), select a database, and then click **Test DSN**. Upon successful connection, a message box appears:



7. Click **Next** and complete the wizard. Other parameters may be required, depending on the case (for example, SSL certificates if you are connecting to MariaDB through a secure connection).

**Note:** If the database server is remote, it must be configured by the server administrator to accept remote connections from your machine's IP address.

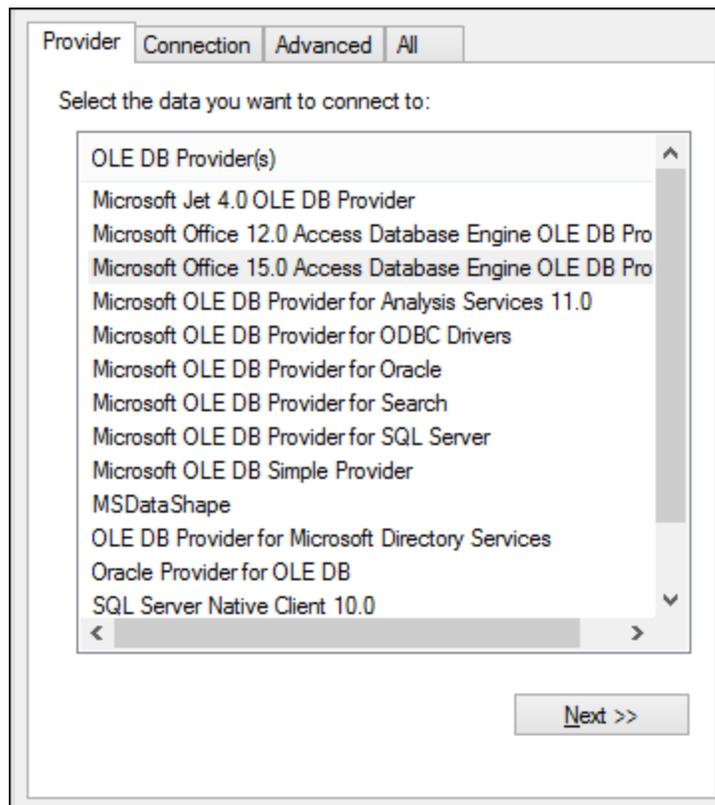
### 8.10.9 Microsoft Access (ADO)

A simple way to connect to a Microsoft Access database is to follow the wizard and browse for the database file, as shown in [Connecting to an Existing Microsoft Access Database](#)<sup>163</sup>. An alternative approach is to set up an ADO connection explicitly, as shown in this topic. This approach is useful if your database is password-protected.

It is also possible to connect to Microsoft Access through an ODBC connection, but it has limitations, so it is best to avoid it.

**To connect to a password-protected Microsoft Access database:**

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ADO Connections**.
3. Click **Build**.



4. Select the **Microsoft Office 15.0 Access Database Engine OLE DB Provider**, and then click **Next**.

5. In the Data Source box, enter the path to the Microsoft Access file in UNC format, for example, `\\myserver\mynetworkshare\Reports\Revenue.accdb`, where **myserver** is the name of the server and **mynetworkshare** is the name of the network share.
6. On the **All** tab, double click the **Jet OLEDB:Database Password** property and enter the database password as property value.

**Note:** If you are still unable to connect, locate the workgroup information file (**System.MDW**) applicable to your user profile, and set the value of the **Jet OLEDB: System database** property to the path of the **System.MDW** file.

### 8.10.10 Microsoft SQL Server (ADO)

This example illustrates how to connect to a SQL Server database through ADO. These instructions are applicable when you use the recommended **Microsoft OLE DB Driver for SQL Server (MSOLEDBSQL)**,

which is available for download at <https://docs.microsoft.com/en-us/sql/connect/oledb/download-oledb-driver-for-sql-server?view=sql-server-ver15>.

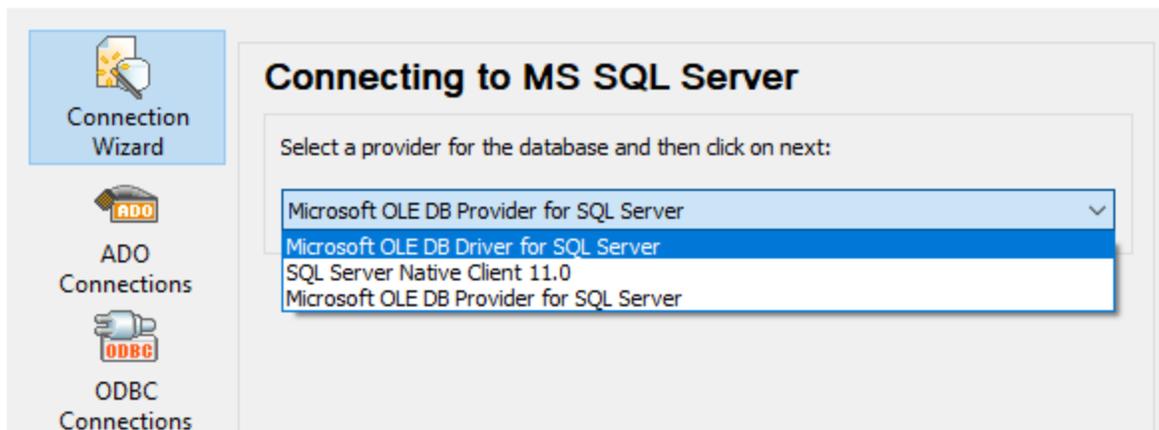
Before following these instructions, make sure that you have downloaded and installed the provider above on your workstation. The ADO provider must match the platform of DiffDog (32-bit or 64-bit).

If you would like to use other ADO providers such as **SQL Server Native Client (SQLNCLI)** or **Microsoft OLE DB Provider for SQL Server (SQLOLEDB)**, the instructions are similar, but these providers are deprecated and thus not recommended. Also, for the connection to be successful with a deprecated provider, you may need to set additional connection properties as described in [Setting up the SQL Server Data Link Properties](#) <sup>163</sup>.

The **Microsoft OLE DB Provider for SQL Server (SQLOLEDB)** is known to have issues with parameter binding of complex queries like Common Table Expressions (CTE) and nested SELECT statements.

#### To connect to SQL Server:

1. [Start the database connection wizard](#) <sup>154</sup>.
2. Select **Microsoft SQL Server (ADO)**, and then click **Next**. The list of available ADO providers is displayed. In this example, the **Microsoft OLE DB Driver for SQL Server** is used. If it's not in the list, make sure that it is installed on your computer, as mentioned above.



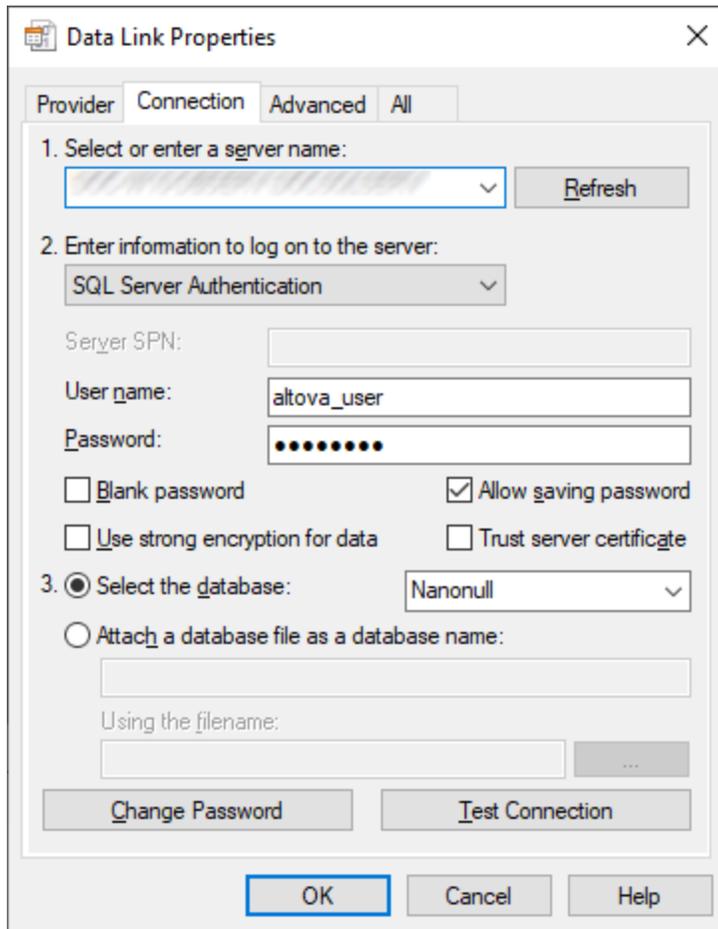
3. Click **Next**. The Data Link Properties dialog box appears.

The screenshot shows the 'Data Link Properties' dialog box with the 'Connection' tab selected. The dialog is divided into three sections:

- 1. Select or enter a server name:** A dropdown menu and a 'Refresh' button.
- 2. Enter information to log on to the server:** A dropdown menu for authentication type (currently 'SQL Server Authentication'), and text boxes for 'Server SPN:', 'User name:', and 'Password:'. There are also checkboxes for 'Blank password', 'Allow saving password', 'Use strong encryption for data', and 'Trust server certificate'.
- 3. Select the database:** A radio button selected for 'Select the database:' with a dropdown menu, and another radio button for 'Attach a database file as a database name:' with a text box and a 'Using the filename:' text box.

At the bottom, there are buttons for 'Change Password', 'Test Connection', 'OK', 'Cancel', and 'Help'.

4. Select or enter the name of the database server, for example, **SQLSERV01**. If you are connecting to a named SQL Server instance, the server name looks like **SQLSERV01\SOMEINSTANCE**.
5. If the database server was configured to allow connections from users authenticated on the Windows domain, select **Windows Authentication**. Otherwise, select **SQL Server Authentication**, clear the **Blank password** check box, and enter the database credentials in the relevant boxes.
6. Select the **Allow saving password** check box and the database to which you are connecting (in this example, "Nanonull").



7. To test the connection at this time, click **Test Connection**. This is an optional, recommended step.
8. Click **OK**.

### 8.10.11 Microsoft SQL Server (ODBC)

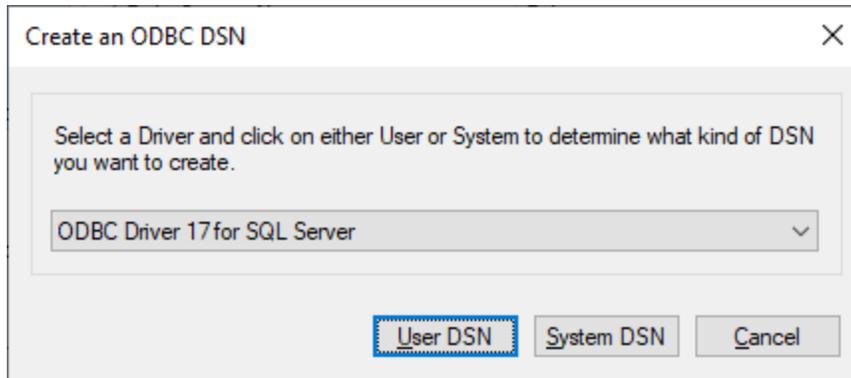
This example illustrates how to connect to a SQL Server database through ODBC.

#### Prerequisites:

- Download and install the **Microsoft ODBC Driver for SQL Server** from the Microsoft website, see <https://docs.microsoft.com/en-us/SQL/connect/odbc/download-odbc-driver-for-sql-server>. This example uses **Microsoft ODBC Driver 17 for SQL Server** to connect to a **SQL Server 2016** database. You might want to download a different ODBC driver version, depending on the version of SQL Server where you want to connect. For information about ODBC driver versions supported by your SQL Server database, refer to the driver's system requirements.

**To connect to SQL Server using ODBC:**

1. [Start the database connection wizard](#) <sup>154</sup>.
2. Click **ODBC Connections**.
3. Select **User DSN** (or **System DSN**, if you have administrative privileges), and then click **Add** .
4. Select the driver from the list. Note that the driver appears in the list only after it has been installed.



5. Click **User DSN** (or **System DSN** if you are creating a System DSN).

Creating a **System DSN** requires that DiffDog be run as an administrator. Therefore, in order to create a **System DSN**, cancel the wizard, make sure that you run DiffDog as an administrator, and perform the steps above again.

6. Enter a name and, optionally, a description to identify this connection, and then select from the list the SQL Server to which you are connecting (**SQLSERV01** in this example).

Microsoft SQL Server DSN Configuration

This wizard will help you create an ODBC data source that you can use to connect to SQL Server.

What name do you want to use to refer to the data source?

Name:

How do you want to describe the data source?

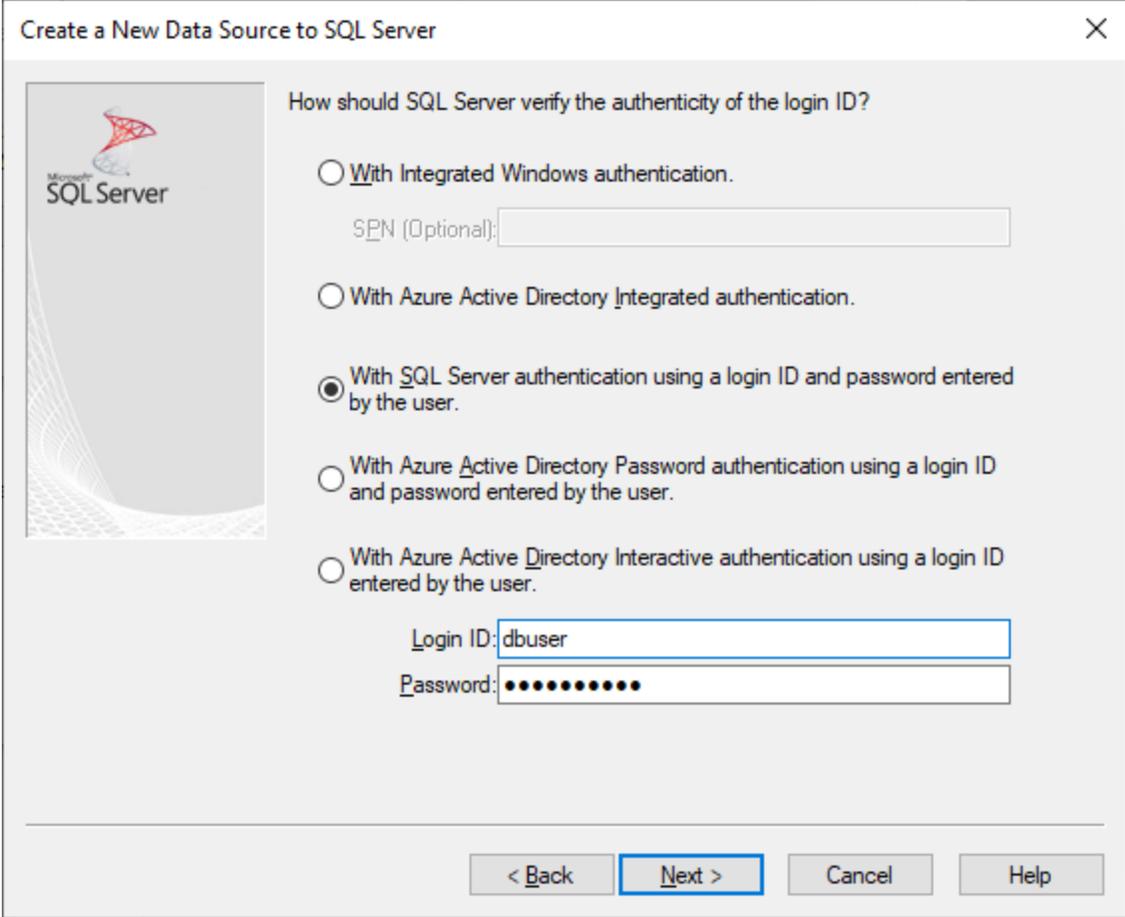
Description:

Which SQL Server do you want to connect to?

Server:

Finish Next > Cancel Help

7. If the database server was configured to allow connections from users authenticated on the Windows domain, select **With Integrated Windows authentication**. Otherwise, select one of the other options, as applicable. This example uses **With SQL Server authentication...**, which requires that the user name and password be entered in the relevant boxes.



Microsoft SQL Server

How should SQL Server verify the authenticity of the login ID?

With Integrated Windows authentication.  
SPN (Optional):

With Azure Active Directory Integrated authentication.

With SQL Server authentication using a login ID and password entered by the user.

With Azure Active Directory Password authentication using a login ID and password entered by the user.

With Azure Active Directory Interactive authentication using a login ID entered by the user.

Login ID:

Password:

< Back   Next >   Cancel   Help

- Optionally, select the **Change the default database to** check box and enter the name of the database to which you are connecting (in this example, **Sandbox**).

Microsoft SQL Server

Change the default database to:  
Sandbox

Mirror server:  
SPN for mirror server (Optional):

Attach database filename:

Use ANSI quoted identifiers.  
 Use ANSI nulls, paddings and warnings.

Application intent:  
READWRITE

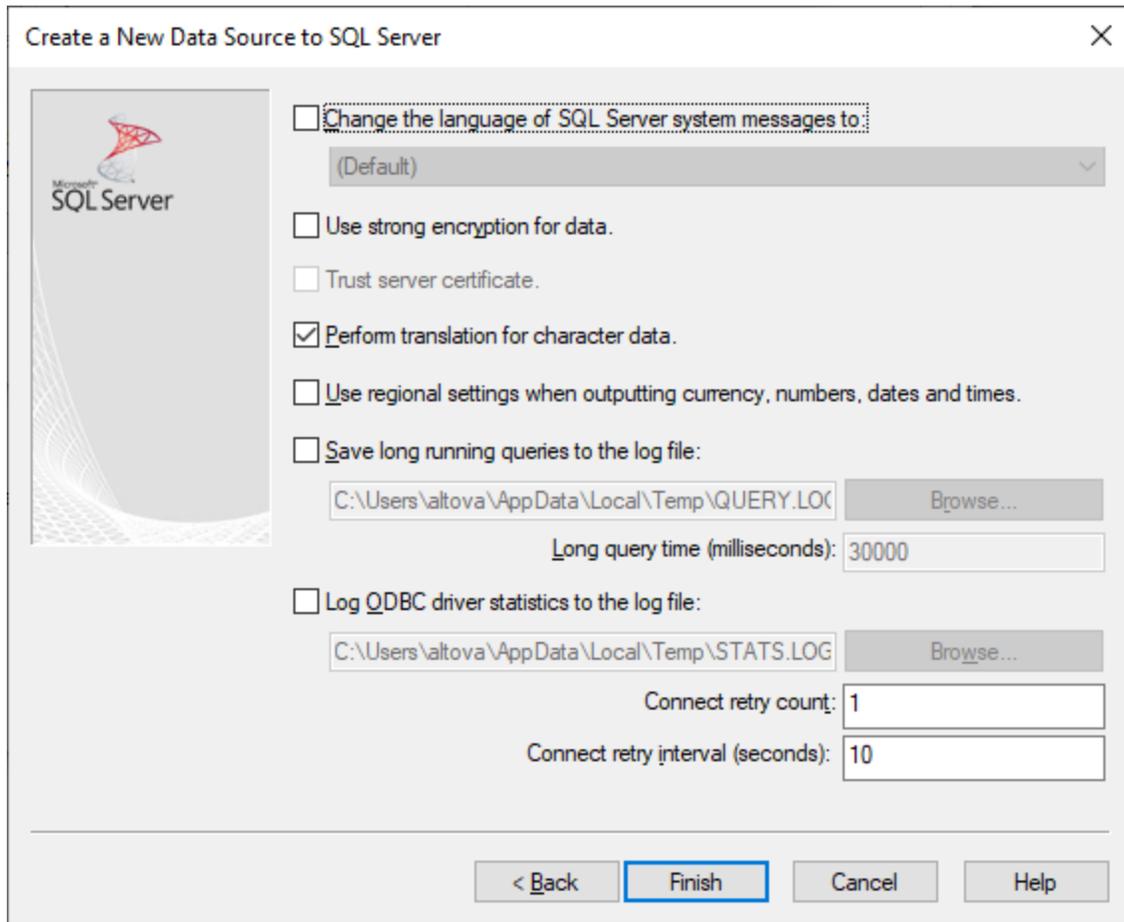
Multi-subnet failover.  
 Transparent Network IP Resolution.  
 Column Encryption.

Enclave Attestation Info:

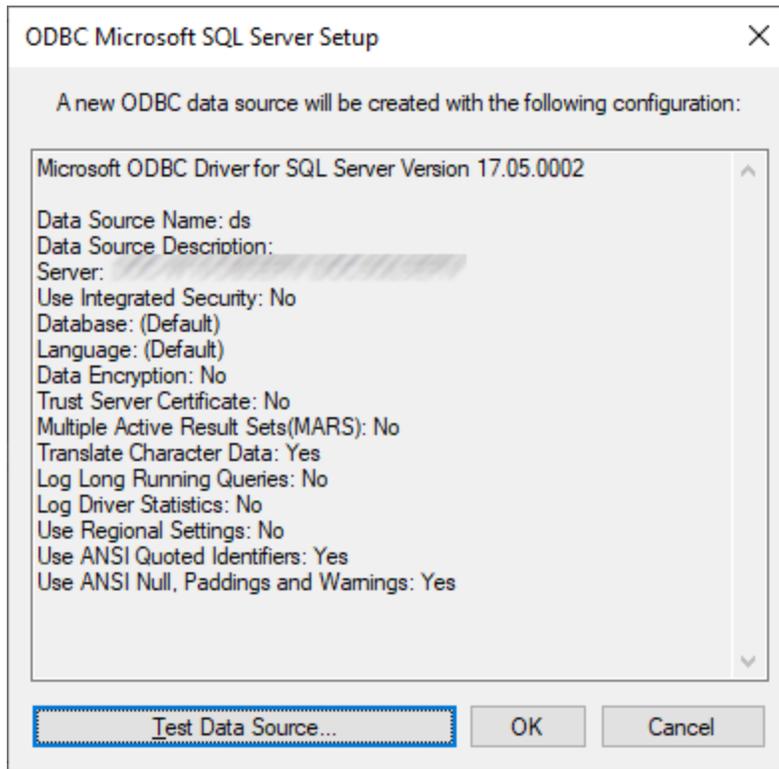
Use FMTONLY metadata discovery.

< Back   Next >   Cancel   Help

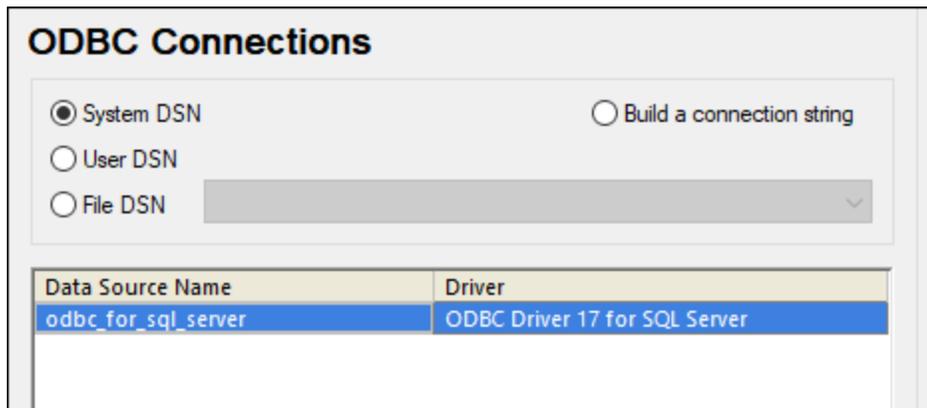
9. Click **Next** and, optionally, configure additional parameters for this connection.



10. Click **Finish**. A confirmation dialog box listing the connection details opens.



11. Click **OK**. The data source now appears in the list of **User** or **System** data sources, as configured, for example:



### 8.10.12 MySQL (ODBC)

This example illustrates how to connect to a MySQL database server from a Windows machine through the ODBC driver. The MySQL ODBC driver is not available on Windows, so it must be downloaded and installed separately. This example uses MySQL Connector/ODBC 8.0.

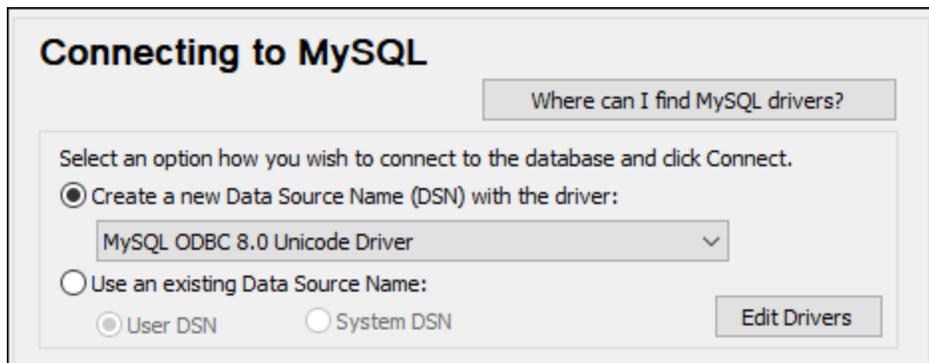
**Prerequisites:**

- MySQL ODBC driver must be installed on your operating system. Check the MySQL documentation for the driver version recommended for your database server version (see <https://dev.mysql.com/downloads/connector/odbc/>).
- You have the following database connection details: host, database, port, username, and password.

If you installed MySQL Connector/ODBC for 64-bit platform, make sure to install DiffDog for 64-bit platform as well.

**To connect to MySQL via ODBC:**

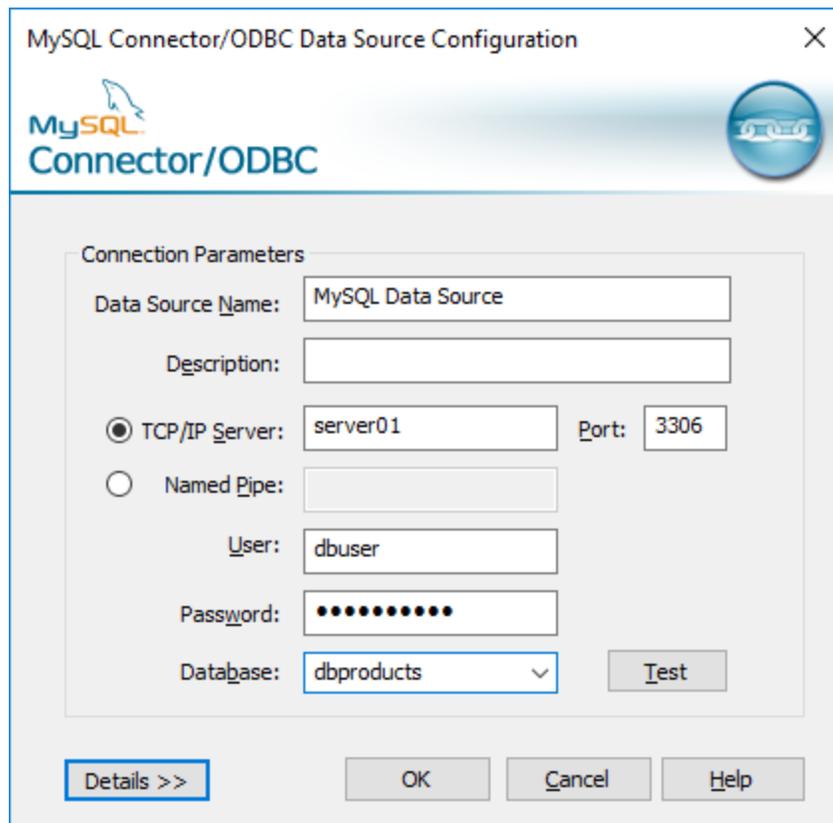
1. [Start the database connection wizard](#)<sup>154</sup>.
2. Select **MySQL (ODBC)**, and then click **Next**.



3. Select **Create a new Data Source Name (DSN) with the driver**, and select a MySQL driver. If no MySQL driver is available in the list, click **Edit Drivers**, and select any available MySQL drivers (the list contains all ODBC drivers installed on your operating system).

If you installed DiffDog 64-bit, then the 64-bit ODBC drivers are shown in the list. Otherwise, the 32-bit ODBC drivers are shown. See also [Viewing the Available ODBC Drivers](#)<sup>175</sup>.

4. Click **Connect**.



5. In the Data Source Name box, enter a descriptive name that will help you identify this ODBC data source in future.
6. Fill in the database connection credentials (TCP/IP Server, User, Password), select a database, and then click **OK**.

**Note:** If the database server is remote, it must be configured by the server administrator to accept remote connections from your machine's IP address. Also, if you click **Details>>**, there are several additional parameters available for configuration. Check the driver's documentation before changing their default values.

### 8.10.13 Oracle (JDBC)

This example shows you how to connect to an Oracle database server from a client machine, using the JDBC interface. The connection is created as a pure Java connection, using the **Oracle Instant Client Package (Basic)** available from the Oracle website. The advantage of this connection type is that it requires only the Java environment and the .jar libraries supplied by the Oracle Instant Client Package, saving you the effort to install and configure a more complex database client.

#### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you

may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.

- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The **Oracle Instant Client Package (Basic)** must be available on your operating system. The package can be downloaded from the official Oracle website. This example uses Oracle Instant Client Package version 12.1.0.2.0, for Windows 32-bit and, consequently, Oracle JDK 32-bit.
- You have the following database connection details: host, port, service name, username, and password.

#### To connect to Oracle through the Instant Client Package:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the required .jar file is located at the following path: **C:\jdbc\instantclient\_12\_1\ojdbc7.jar**. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select either **oracle.jdbc.OracleDriver** or **oracle.jdbc.driver.OracleDriver**. Note that these entries are available if a valid .jar file path is found either in the "Classpaths" text box, or in the operating system's CLASSPATH environment variable (see the previous step).
5. Enter the username and password to the database in the corresponding text boxes.

Classpaths: C:\jdbc\instantclient\_12\_1\ojdbc7.jar

Driver: oracle.jdbc.driver.OracleDriver

Username: johndoe

Password: ●●●●●●

Database URL: jdbc:oracle:thin:@//ora12c:1521/orcl12c

Connect Close

6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted values with the ones applicable to your database server.

```
jdbc:oracle:thin:@//host:port:service
```

7. Click **Connect**.

## 8.10.14 Oracle (ODBC)

This example illustrates a common scenario where you connect from DiffDog to an Oracle database server on a network machine, through an Oracle database client installed on the local operating system.

The example includes instructions for setting up an ODBC data source (DSN) using the database connection wizard in DiffDog. If you have already created a DSN, or if you prefer to create it directly from the **ODBC Data Source administrator** in Windows, you can do so, and then select it when prompted by the wizard. For more information about ODBC data sources, see [Setting up an ODBC Connection](#)<sup>173</sup>.

### Prerequisites:

- The Oracle database client (which includes the ODBC Oracle driver) must be installed and configured on your operating system. For instructions on how to install and configure an Oracle database client, refer to the documentation supplied with your Oracle software.
- The **tnsnames.ora** file located in Oracle home directory contains an entry that describes the database connection parameters, in a format similar to this:

```
ORCL =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = server01)(PORT = 1521))
    )
    (CONNECT_DATA =
      (SID = orcl)
      (SERVER = DEDICATED)
    )
  )
```

The path to the **tnsnames.ora** file depends on the location where Oracle home directory was installed. For Oracle database client 11.2.0, the default Oracle home directory path could be as follows:

```
C:\app\username\product\11.2.0\client_1\network\admin\tnsnames.ora
```

You can add new entries to the **tnsnames.ora** file either by pasting the connection details and saving the file, or by running the Oracle *Net Configuration Assistant* wizard (if available). If you want these values to appear in dropdown lists during the configuration process, then you may need to add the path to the admin folder as a **TNS\_ADMIN** environment variable.

### To connect to Oracle using ODBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Select **Oracle (ODBC / JDBC)**, and then click **Next**.

**JDBC vs. ODBC**

JDBC

Java-based connection that may provide support for more modern features of your database that aren't available via ODBC. The tradeoff for these features is a potential sacrifice of performance.

ODBC

An ODBC connection will generally be faster and less resource-intensive than a JDBC connection, but lacks support for more modern database features (such as native XML types).

< Back   Next >   Close

3. Select **ODBC**.

**Connecting to Oracle**

Where can I find Oracle drivers?

Select an option how you wish to connect to the database and click Connect.

Create a new Data Source Name (DSN) with the driver:  
Microsoft ODBC for Oracle

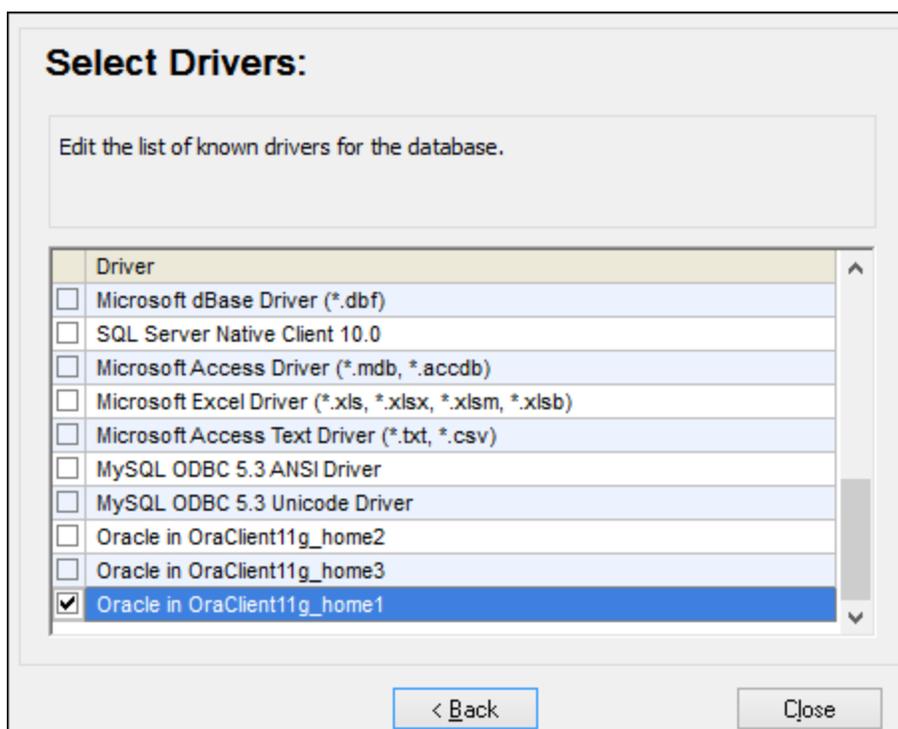
Use an existing Data Source Name:  
 User DSN    System DSN   Edit Drivers

Data Source Name

Skip the configuration step for wizard

< Back   Connect   Close

4. Click **Edit Drivers**.

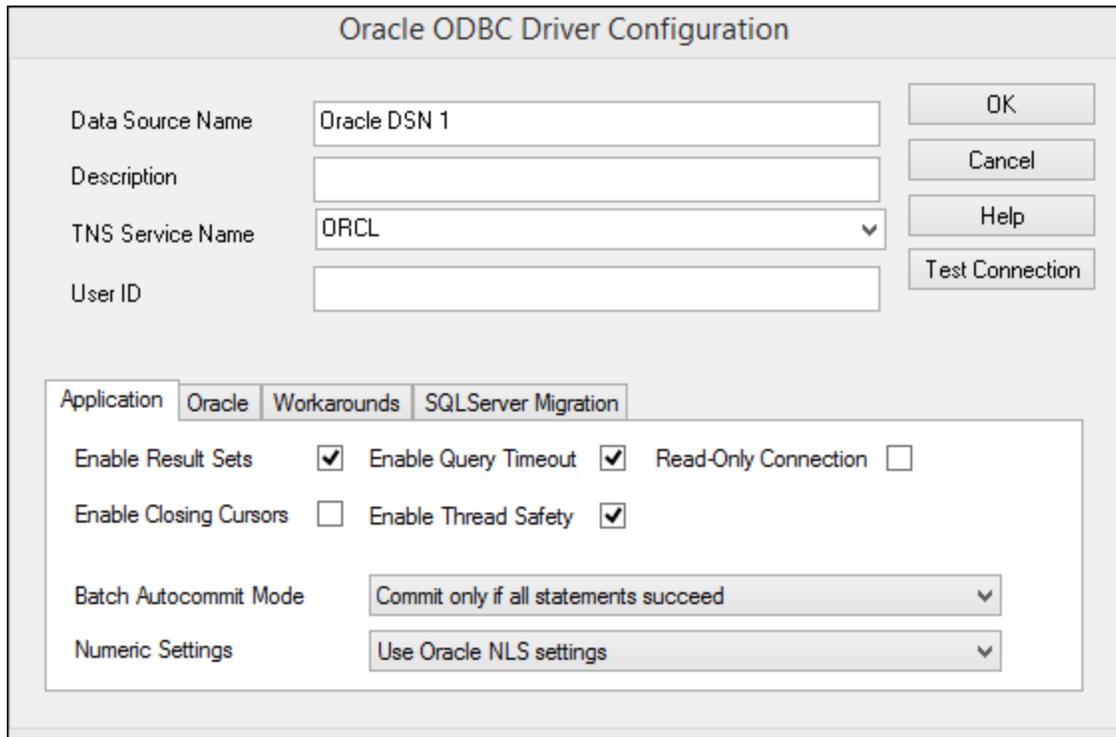


5. Select the Oracle drivers you wish to use (in this example, **Oracle in OraClient11g\_home1**). The list displays the Oracle drivers available on your system after installation of Oracle client.
6. Click **Back**.
7. Select **Create a new data source name (DSN) with the driver**, and then select the Oracle driver chosen in step 4.

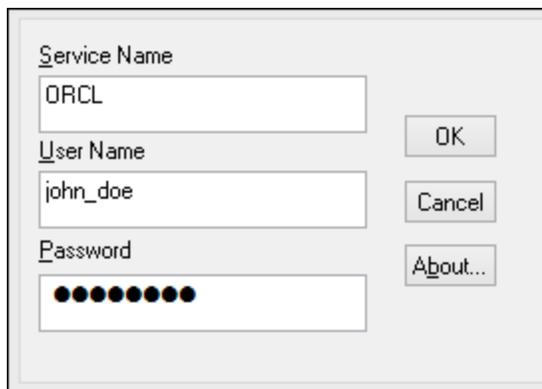
The screenshot shows a dialog box titled "Connecting to Oracle". At the top right, there is a button labeled "Where can I find Oracle drivers?". Below this, a text box says "Select an option how you wish to connect to the database and click Connect." There are two main radio button options: "Create a new Data Source Name (DSN) with the driver:" (which is selected) and "Use an existing Data Source Name:". Under the "Create a new DSN" option, there is a dropdown menu showing "Oracle in OraClient11g\_home1". Under the "Use an existing DSN" option, there are two sub-radio buttons: "User DSN" and "System DSN" (which is selected). To the right of these sub-radio buttons is an "Edit Drivers" button. At the bottom left, there is a checkbox labeled "Skip the configuration step for wizard". At the bottom right, there are three buttons: "< Back", "Connect", and "Close".

Avoid using the Microsoft-supplied driver called **Microsoft ODBC for Oracle** driver. Microsoft recommends using the ODBC driver provided by Oracle (see <http://msdn.microsoft.com/en-us/library/ms714756%28v=vs.85%29.aspx>)

8. Click **Connect**.



9. In the Data Source Name text box, enter a name to identify the data source (in this example, **Oracle DSN 1**).
10. In the TNS Service Name box, enter the connection name as it is defined in the **tnsnames.ora** file (see [prerequisites](#)<sup>221</sup>). In this example, the connection name is **ORCL**. *Note:* If you wish to have the dropdown list of the combo box populated with the values of the **tnsnames.ora** file, then you may need to add the path to the admin folder as a **TNS\_ADMIN** environment variable.
11. Click **OK**.



12. Enter the username and password to the database, and then click OK.

### 8.10.15 PostgreSQL (ODBC)

This example illustrates how to connect to a PostgreSQL database server from a Windows machine through the ODBC driver. The PostgreSQL ODBC driver is not available on Windows, so it must be downloaded and

installed separately. This example uses the psqLODBC driver (version 11.0) downloaded from the official website (see also [Database Drivers Overview](#)<sup>157</sup>).

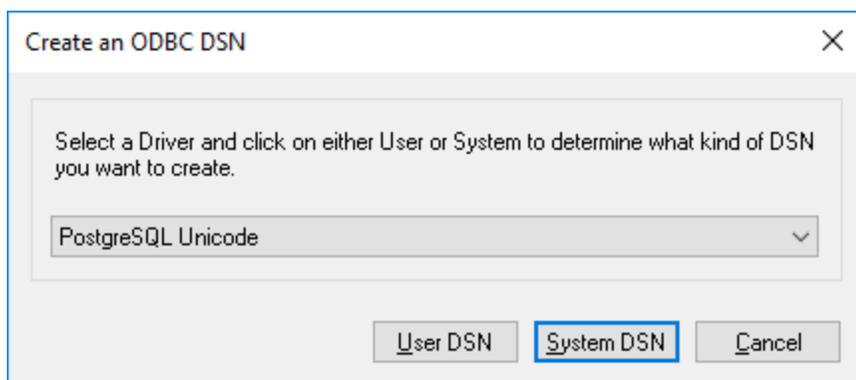
**Note:** You can also connect to a PostgreSQL database server directly (without the ODBC driver), see [Setting up a PostgreSQL Connection](#)<sup>181</sup>.

#### Prerequisites:

- *psqLODBC* driver must be installed on your operating system.
- You have the following database connection details: server, port, database, user name, and password.

#### To set up a connection to PostgreSQL using ODBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **ODBC Connections**.
3. Select the **User DSN** option.
4. Click **Create a new DSN**  and select the driver from the drop-down list. If no PostgreSQL driver is available in the list, make sure that the PostgreSQL ODBC driver is installed on your operating system, as mentioned in the prerequisites above.



5. Click **User DSN**.

PostgreSQL Unicode ODBC Driver (psqlODBC) Setup

Data Source: PostgreSQL35W      Description: [ ]

Database: zoodb      SSL Mode: allow

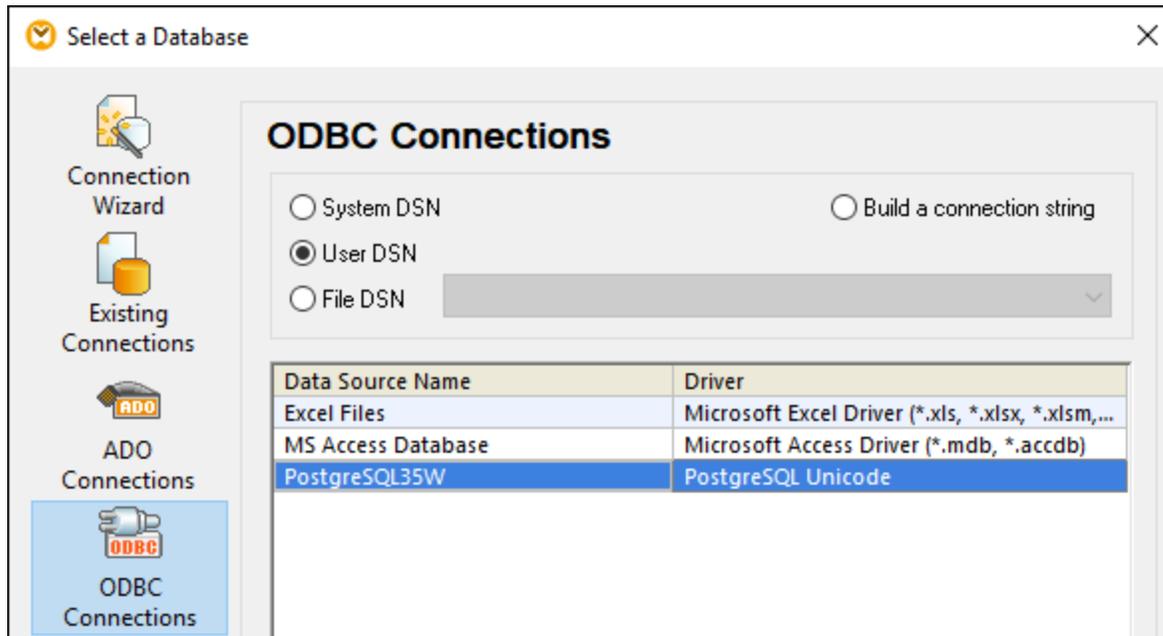
Server: my-postgresql-server      Port: 5432

User Name: dbs-user      Password: [ ]

Options: [ Datasource ] [ Global ] [ Manage DSN ] [ Test ] [ Save ] [ Cancel ]

6. Fill in the database connection credentials (these must be supplied by the database owner), and then click **Save**.

The connection is now available in the list of ODBC connections. To connect to the database, you can either double-click the connection or select it, and then click **Connect**.



## 8.10.16 Progress OpenEdge (JDBC)

This example illustrates how to connect to a Progress OpenEdge 11.6 database server through JDBC.

### Prerequisites

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The operating system's `PATH` environment variable must include the path to the `bin` directory of the JRE or JDK installation directory, for example `C:\Program Files (x86)\Java\jre1.8.0_51\bin`.
- The Progress OpenEdge JDBC driver must be available on your operating system. In this example, JDBC connectivity is provided by the **openedge.jar** and **pool.jar** driver component files available in **C:\Progress\OpenEdge\java** as part of the OpenEdge SDK installation.
- You have the following database connection details: host, port, database name, username, and password.

### Connecting to OpenEdge through JDBC

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the required .jar file paths are: `C:\Progress\OpenEdge\java\openedge.jar;C:\Progress\OpenEdge\java\pool.jar`. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **com.ddtek.jdbc.openedge.OpenEdgeDriver**. Note that this entry is available if a valid .jar file path is found either in the "Classpaths" text box, or in the operating system's CLASSPATH environment variable (see the previous step).

Classpaths: C:\Progress\OpenEdge\java\openedge.jar;C:\Progress\OpenEd;

Driver: com.ddtek.jdbc.openedge.OpenEdgeDriver

Username: dbuser

Password: ●●●●●●

Database URL: jdbc:datadirect:openedge://localhost:8910;databaseName=obpsdev

Connect Close

5. Enter the username and password to the database in the corresponding text boxes.
6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted values with the ones applicable to your database server.

```
jdbc:datadirect:openedge://host:port;databaseName=db_name
```

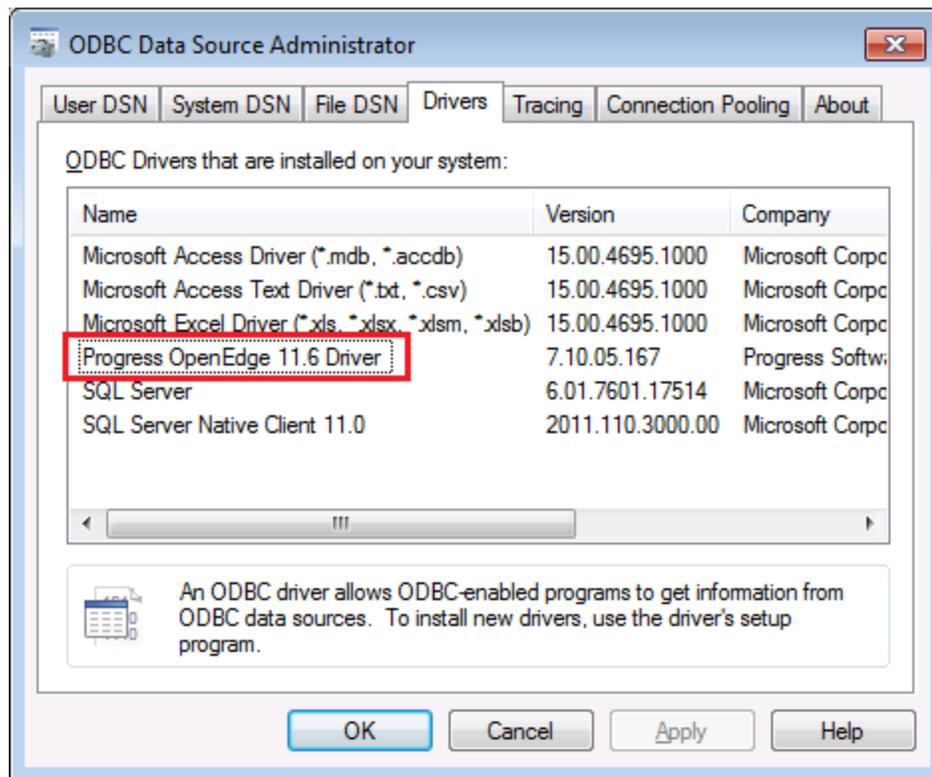
7. Click **Connect**.

## 8.10.17 Progress OpenEdge (ODBC)

This example illustrates how to connect to a Progress OpenEdge database server through the Progress OpenEdge 11.6 ODBC driver.

### Prerequisites:

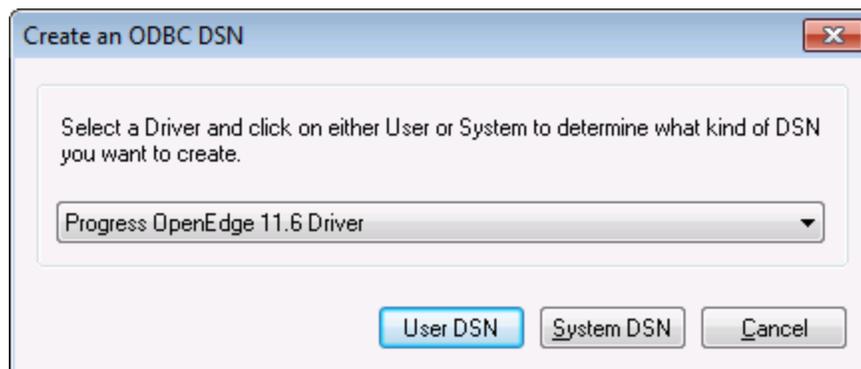
- The *ODBC Connector for Progress OpenEdge* driver must be installed on your operating system. The Progress OpenEdge ODBC driver can be downloaded from the vendor's website (see also [Database Drivers Overview](#)<sup>157</sup>). Make sure to download the 32-bit driver when running the 32-bit version of DiffDog, and the 64-bit driver when running the 64-bit version. After installation, check if the ODBC driver is available on your machine (see also [Viewing the Available ODBC Drivers](#)<sup>175</sup>).



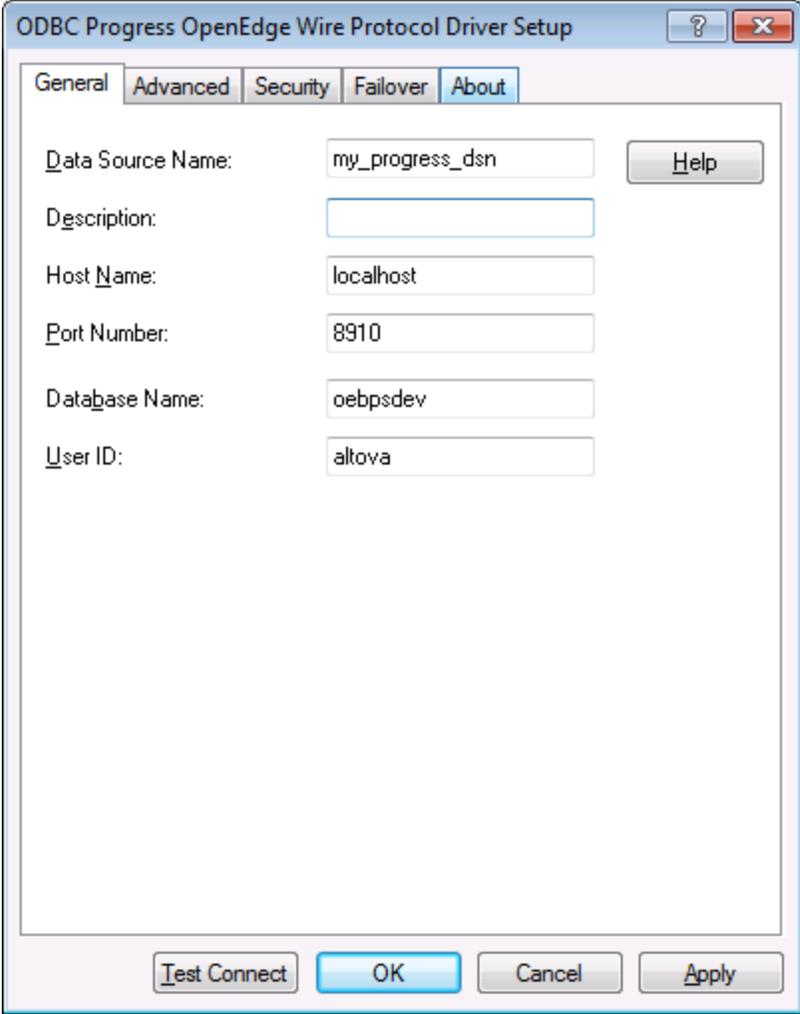
- You have the following database connection details: host name, port number, database name, user ID, and password.

### Connecting to Progress OpenEdge through ODBC

1. [Start the database connection wizard](#) <sup>154</sup>.
2. Click **ODBC Connections**.
3. Click **User DSN** (alternatively, click **System DSN**, or **File DSN**, in which case the subsequent instructions will be similar).
4. Click **Add** .
5. Select the **Progress OpenEdge Driver** from the list, and click **User DSN** (or **System DSN**, if applicable).



- Fill in the database connection credentials (Database, Server, Port, User Name, Password), and then click **OK**. To verify connectivity before saving the entered data, click **Test Connect**.

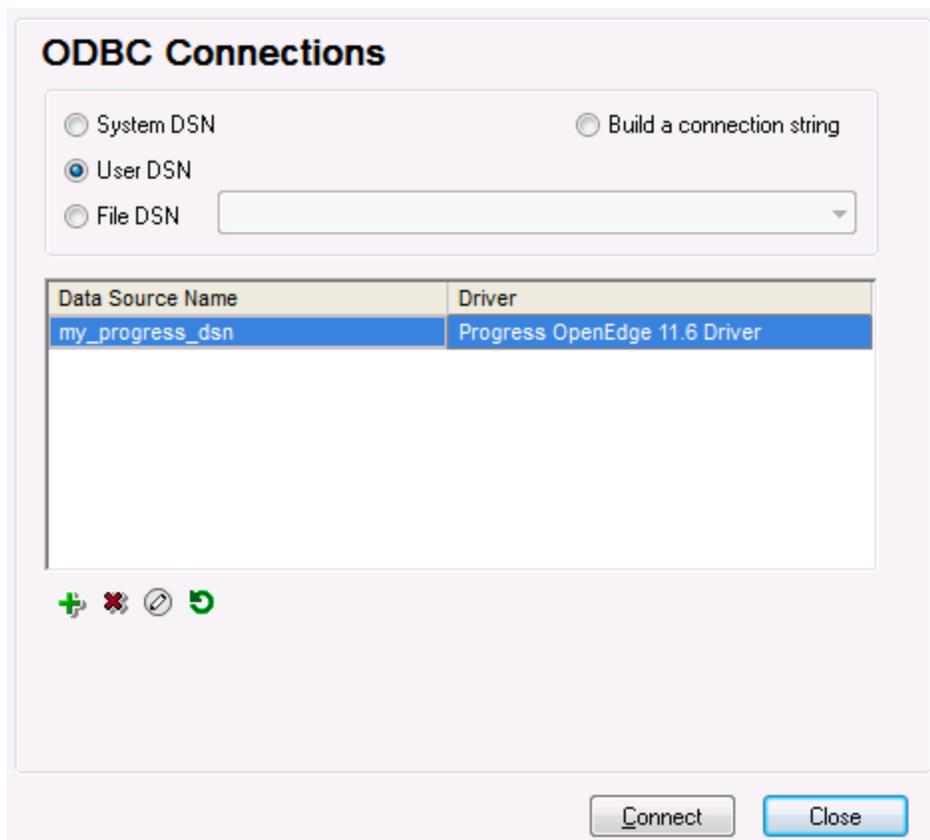


The screenshot shows a dialog box titled "ODBC Progress OpenEdge Wire Protocol Driver Setup". It has five tabs: "General", "Advanced", "Security", "Failover", and "About". The "General" tab is active. The fields are as follows:

Field	Value
Data Source Name:	my_progress_dsn
Description:	
Host Name:	localhost
Port Number:	8910
Database Name:	oebpsdev
User ID:	altova

Buttons at the bottom: Test Connect, OK, Cancel, Apply. A Help button is also present next to the Data Source Name field.

- Click OK. The new data source now appears in the list of ODBC data sources.



8. Click **Connect**.

### 8.10.18 Sybase (JDBC)

This example illustrates how to connect to a Sybase database server through JDBC.

#### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- Sybase *jConnect* component must be installed on your operating system (in this example, *jConnect 7.0* is used, installed as part of the *Sybase Adaptive Server Enterprise PC Client* installation). For the installation instructions of the database client, refer to Sybase documentation.
- You have the following database connection details: host, port, database name, username, and password.

**To connect to Sybase through JDBC:**

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the required .jar file path is: **C:\sybase\jConnect-7\_0\classes\jconn4.jar**. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **com.sybase.jdbc4.jdbc.SybDriver**. Note that this entry is available if a valid .jar file path is found either in the "Classpaths" text box, or in the operating system's CLASSPATH environment variable (see the previous step).

Classpaths: C:\sybase\jConnect-7\_0\classes\jconn4.jar;

Driver: com.sybase.jdbc4.jdbc.SybDriver

Username: dbuser

Password: ●●●●●●

Database URL: jdbc:sybase:Tds:SYBASE12:2048/PRODUCTSDB

Connect Close

5. Enter the username and password to the database in the corresponding text boxes.
6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted values with the ones applicable to your database server.

```
jdbc:sybase:Tds:hostName:port/databaseName
```

7. Click **Connect**.

## 8.10.19 Teradata (JDBC)

This example illustrates how to connect to a Teradata database server through JDBC.

### Prerequisites:

- JRE (Java Runtime Environment) or Java Development Kit (JDK) must be installed. This may be either Oracle JDK or an open source build such as Oracle OpenJDK. DiffDog will determine the path to the Java Virtual Machine (JVM) from the following locations, in this order: a) The custom JVM path you may have set in application **Options**, see [Java Settings](#)<sup>268</sup>; b) The JVM path found in the Windows registry; c) The `JAVA_HOME` environment variable.
- Make sure that the platform of DiffDog (32-bit, 64-bit) matches that of the JRE/JDK.
- The JDBC driver (one or more .jar files that provide connectivity to the database) must be available on your operating system. In this example, Teradata JDBC Driver 16.20.00.02 is used. For more information, see <https://downloads.teradata.com/download/connectivity/jdbc-driver>.
- You have the following database connection details: host, database, port, username, and password.

### To connect to Teradata through JDBC:

1. [Start the database connection wizard](#)<sup>154</sup>.
2. Click **JDBC Connections**.
3. Next to "Classpaths", enter the path to the .jar file which provides connectivity to the database. If necessary, you can also enter a semicolon-separated list of .jar file paths. In this example, the .jar files are located at the following path: `C:\jdbc\teradata\`. Note that you can leave the "Classpaths" text box empty if you have added the .jar file path(s) to the CLASSPATH environment variable of the operating system (see also [Configuring the CLASSPATH](#)<sup>178</sup>).
4. In the "Driver" box, select **com.teradata.jdbc.TeraDriver**. Note that this entry is available if a valid .jar file path is found either in the "Classpath" text box, or in the operating system's CLASSPATH environment variable (see the previous step).

**JDBC Connections**

Enter a connection string and select (or enter manually) a valid JDBC driver. Click on 'Connect' to proceed.

Classpaths: C:\jdbc\teradata\terajdbc4.jar;C:\jdbc\teradata\tdgssconfig.jar

Driver: com.teradata.jdbc.TeraDriver

Username: demouser

Password: ●●●●●●●●●●

Database URL: jdbc:teradata://demodatabase

Connect Close

5. Enter the username and password to the database in the corresponding text boxes.
6. Enter the connection string to the database server in the Database URL text box, by replacing the highlighted value with the one applicable to your database server.

```
jdbc:teradata://databaseServerName
```

7. Click **Connect**.

## 8.10.20 Teradata (ODBC)

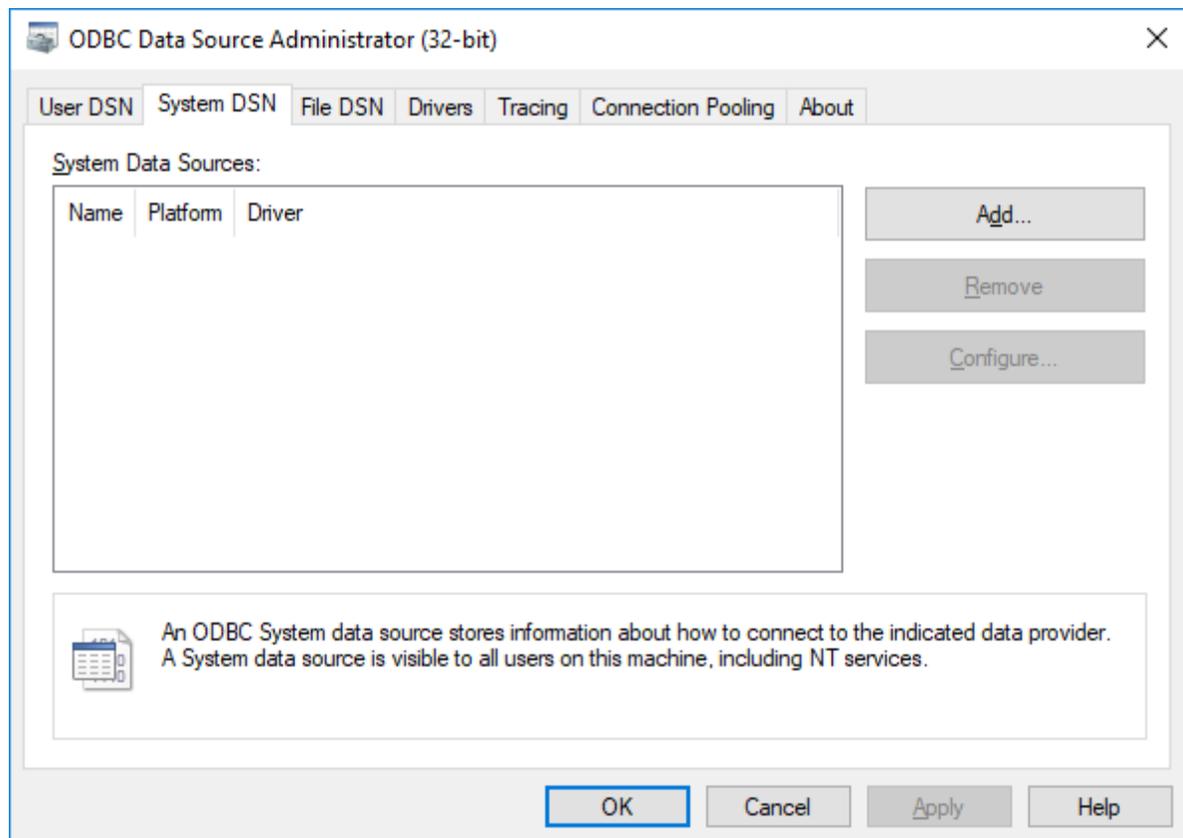
This example illustrates how to connect to a Teradata database server through ODBC.

### Prerequisites:

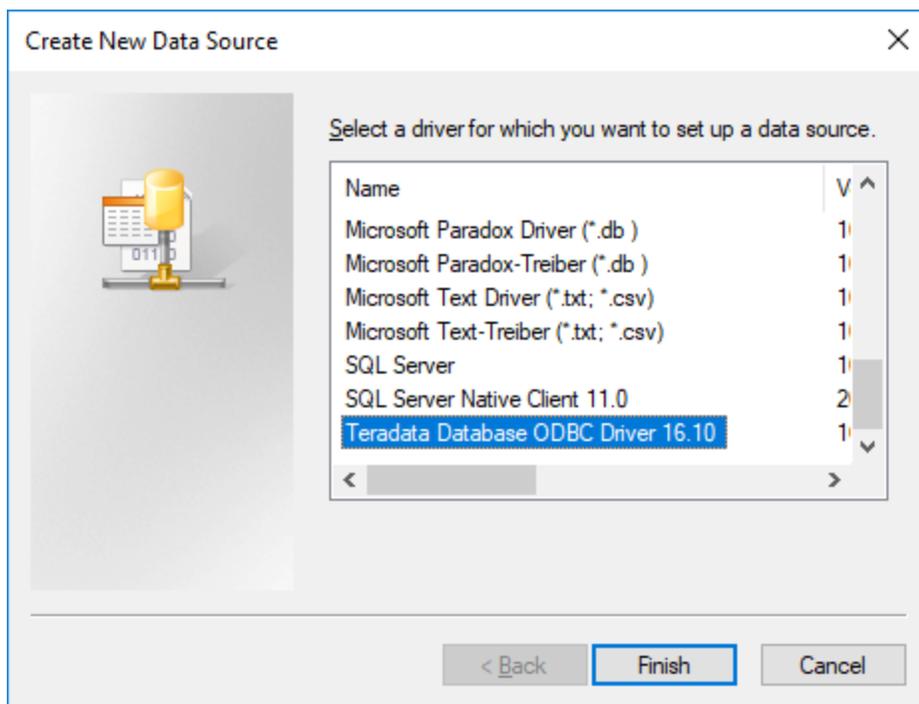
- The Teradata ODBC driver must be installed (see <https://downloads.teradata.com/download/connectivity/odbc-driver/windows>. This example uses Teradata ODBC Driver for Windows version 16.20.00.
- You have the following database connection details: host, username, and password.

### To connect to Teradata through ODBC:

1. Press the **Windows** key, start typing "ODBC", and select **Set up ODBC data sources (32-bit)** from the list of suggestions. If you have a 64-bit ODBC driver, select **Set up ODBC data sources (64-bit)** and use 64-bit DiffDog in the subsequent steps.



2. Click the **System DSN** tab, and then click **Add**.

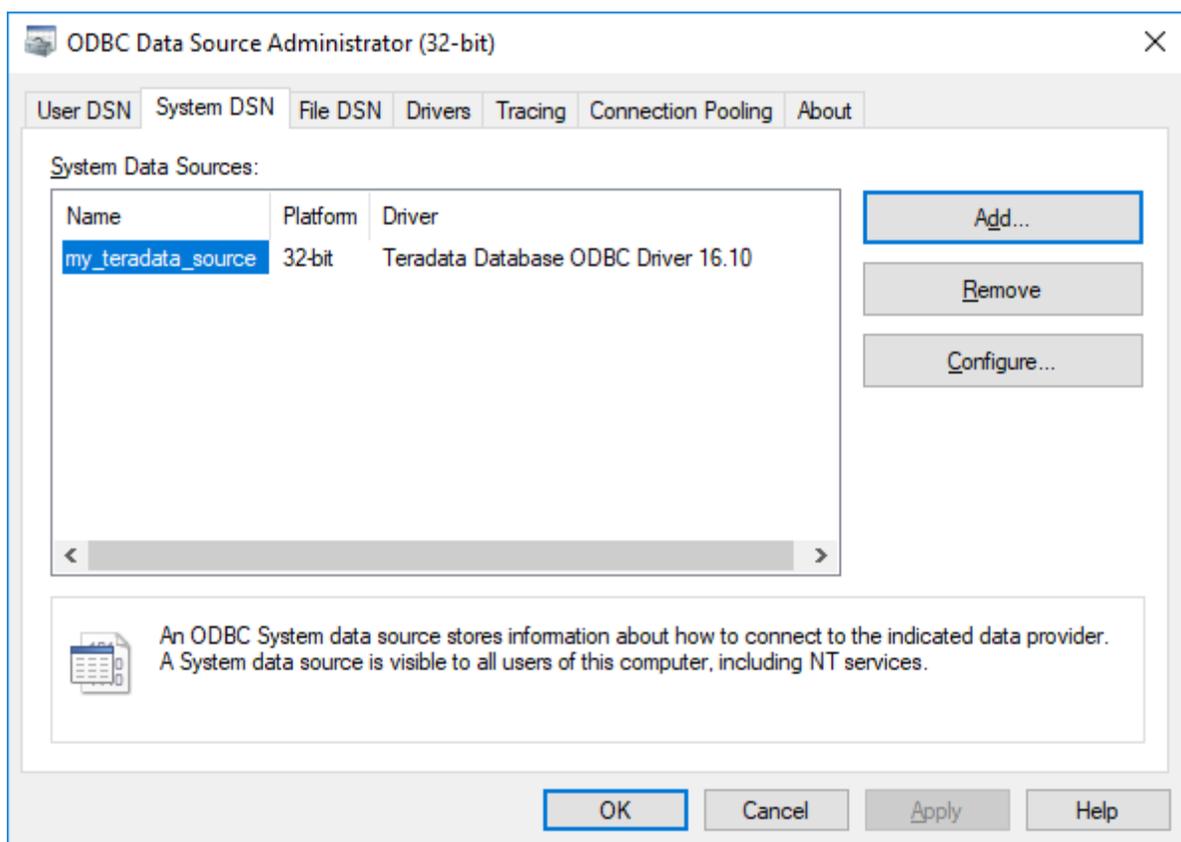


3. Select **Teradata Database ODBC Driver** and click **Finish**.

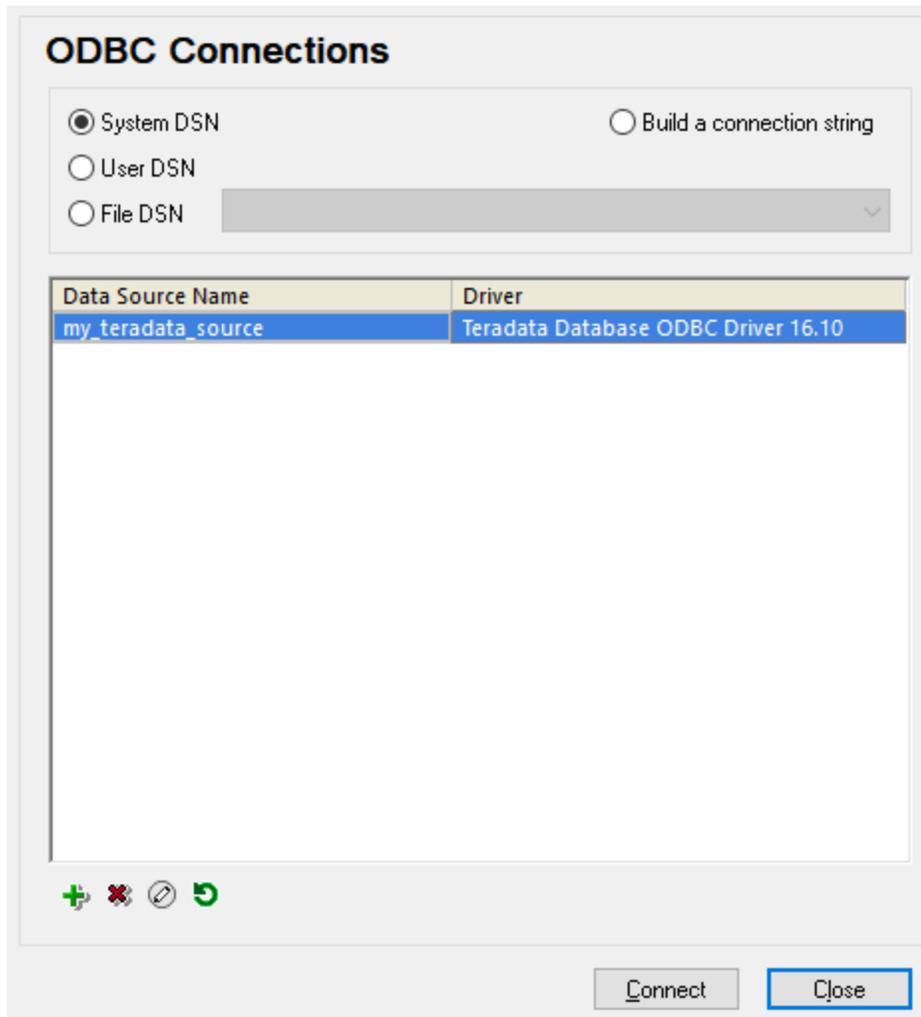
The screenshot shows the 'ODBC Driver Setup for Teradata Database' dialog box. It is divided into several sections:

- Data Source:** Contains a 'Name' field with the text 'my\_teradata\_source' and an empty 'Description' field. To the right are 'OK', 'Cancel', and 'Help' buttons.
- Teradata Server Info:** Contains a 'Name or IP address' dropdown menu with 'demoserver' selected.
- Authentication:** Features a 'Use Integrated Security' checkbox (unchecked). Below it is a 'Mechanism' dropdown menu. A 'Parameter' field is followed by a 'Change...' button. The 'Username' field contains 'demouser'. The 'Password' radio button is selected, with a masked password field. The 'Teradata Wallet String' radio button is unselected, with an empty text field.
- Optional:** Contains a 'Default Database' field and an 'Account String' field, followed by an 'Options >>' button.
- Session Character Set:** A dropdown menu with 'UTF8' selected.

4. Enter name and, optionally, a description that will help you identify this ODBC data source in future. Also, enter the database connection credentials (Database server, User, Password), and, optionally, select a database.
5. Click **OK**. The data source now appears in the list.



6. Run DiffDog and [start the database connection wizard](#)<sup>154</sup>.
7. Click **ODBC Connections**.



8. Click **System DSN**, select the data source created previously, and then click **Connect**.

Note: If you get the following error: "The driver returned invalid (or failed to return) SQL\_DRIVER\_ODBC\_VER: 03.80", make sure that the path to the ODBC client (for example, **C:\Program Files\Teradata\Client\16.10\bin**, if you installed it to this location) exists in your system's PATH environment variable. If this path is missing, add it manually.

## 9 Navigating Differences

When the results of a comparison are first displayed in File Comparisons, Word Comparisons, and Directory Comparisons, it is always the first difference that is the current difference. In Database Data Comparisons and Database Schema Comparisons as well as in XML Schema Comparisons, no difference is selected when the result window is first displayed. You can navigate through the differences by selecting other differences to be the current difference or move the selection of the current difference by using the following navigation commands in the **Diff and Merge** menu and toolbar:

-  **Next Difference (Alt+Down)**: Selects the next difference as the current difference.
-  **Previous Difference (Alt+Up)**: Selects the previous difference as the current difference.
-  **Last Difference (Alt+End)**: Selects the last difference in the document as the current difference.
-  **First Difference (Alt+Home)**: Selects the first difference in the document as the current difference.
-  **Display Current Difference (Ctrl+Enter)**: Scrolls through the document to display the current difference. This command is useful if you have scrolled to some point that causes the current difference to be outside the display area (document pane).
-  **Make Current Difference (Alt+Enter)**: Makes the selected difference the current difference, and sets it as the difference from which to navigate. The **Make Current Difference** command is useful if you wish to jump directly to a particular difference and navigate from there. In Database Data Comparisons and Database Schema Comparisons, clicking a difference will always make it the current difference, this command is therefore not available in Database Schema Comparison windows.

If the icons described above are **not** displayed in your toolbar, you can include them by checking the Diff and Merge option in the [Toolbars tab](#) <sup>309</sup> of the Customize dialog box.

**Note:** The navigation commands move the selection of the current difference in **both** documents/tables. If you wish to [edit](#) <sup>59</sup> highlighted text, you must place the cursor in the highlighted text (in the appropriate document).

### Current difference and editing

If, in a File Comparison window, you start typing into the document and the [Compare While Editing](#) <sup>303</sup>  toggle in the **Diff and Merge** menu is off, all difference highlighting disappears in both documents. If the **Compare While Editing** toggle is on, then if you type in something that results in a difference it is highlighted as the current difference; if you make a modification that removes a difference, the difference immediately following the cursor position is highlighted as the current difference.

#### To make a difference the current difference:

1. Place the cursor in the required difference (which could be anywhere in the document) or navigate to it using the **Next Difference**  or **Previous Difference**  navigation commands listed above.
2. If applicable, select the menu option **Diff and Merge | Make Current Difference** or press **Alt+Enter** or select the corresponding toolbar icon  from the Diff and Merge toolbar.

Note that, in Database Data Comparison Result windows, every difference that you select automatically becomes the current difference.

## 10 Merging Differences

After running a [file](#)<sup>28</sup>, [directory](#)<sup>78</sup>, [Microsoft Word document](#)<sup>96</sup>, [database data](#)<sup>121</sup>, or [database schema](#)<sup>144</sup> comparison in a comparison window, you can merge differences that exist between the directories/files/Microsoft Word documents/tables in the two panes or components, respectively.

In **File Comparison windows** and **Word Comparison windows**, a difference (that is, a text fragment for which there is no, or no identical, corresponding text fragment in the compared file) can be copied over from one file to the corresponding location in the other file. Note that in Microsoft Word document comparisons both **text and formatting** will be copied from the source to the target file.

In **Directory Comparison windows**, the selected non-equal file (a file for which no, or no equal, corresponding file exists in the compared directory) can be copied from one directory to the other directory.

In **Database Data Comparison windows**, data of (i) the selected table(s) or (ii) all tables can be copied from one component to the other component. In **Database Data Comparison Result windows**, non-equal data of the selected rows can be copied from one table to the other table. In both windows, a warning message providing details of the changes is displayed and has to be confirmed before the changes are committed to the database. The necessary database structure change scripts are generated and executed in the background.

In **Database Schema Comparison windows**, the structure of (i) the selected item(s) or (ii) all items can be copied from one component to the other component. Please note that the merge is not executed immediately; DiffDog always shows the database structure change script first and provides the options to save it to a file or display it in DatabaseSpy (if installed).

You use the following commands to merge a difference:



### Copy from Left to Right (Alt+Right)

- For the selected difference in a file comparison or Microsoft Word comparison, copies text from the document in the left pane to the document in the right pane.
- For the selected non-equal file in a directory comparison, copies the file from the (directory in the) left pane to the (directory in the) right pane.
- For the selected table in a database data comparison, copies the table's data from the (table in the) left component to the (table in the) right component.
- For the selected non-equal row in a database data comparison result, copies the data from the row in the left column to the row in the right column.
- For the selected non-equal item in a database schema comparison, opens the Merge Schema Left to Right dialog box, where the resulting change script is displayed. In this dialog box you can choose to execute the SQL, save it to a file, or show it in DatabaseSpy (if installed).



### Copy from Right to Left (Alt+Left)

- For the selected difference in a file comparison or Microsoft Word comparison, copies text from the document in the right pane to the document in the left pane.
- For the selected non-equal file in a directory comparison, copies the file from the (directory in the) right pane to the (directory in the) left pane.
- For the selected table in a database data comparison, copies the table's data from the (table in the) right component to the (table in the) left component.

- For the selected non-equal row in a database data comparison result, copies the data from the row in the right column to the row in the left column.
- For the selected non-equal item in a database schema comparison, opens the Merge Schema Right to Left dialog box, where the resulting change script is displayed. In this dialog box you can choose to execute the SQL, save it to a file, or show it in DatabaseSpy (if installed).

In file and Microsoft Word comparisons, the source difference is copied in its entirety (i.e., the entire unit highlighted in the current difference background color overwrites the entire difference in the target document). Merged differences in file and Microsoft Word document comparisons can be shown in a different background color. This setting is made in the [File Comparison tab](#) <sup>255</sup> of the **DiffDog Options** dialog box.

### To merge a difference in file, Microsoft Word, and directory comparisons:

1. Place the cursor in the required difference (which could be anywhere in the document) or navigate to it using the **Next Difference**  or **Previous Difference**  navigation commands listed above.
2. If applicable, select the menu option **Diff and Merge | Make Current Difference** or press **Alt+Enter** or select the corresponding toolbar icon  from the Diff and Merge toolbar.
3. Do one of the following:
  - Select the menu option **Diff and Merge | Copy from Left to Right** or click the corresponding toolbar icon  or press **Alt+Right** if you want to copy from the left pane to the right pane.
  - Select the menu option **Diff and Merge | Copy from Right to Left** or click the corresponding toolbar icon  or press **Alt+Left** to copy from the right pane to the left pane.

### To merge database data:

- To merge every difference in all tables of a database comparison, select the menu option **Diff and Merge | Copy from Left to Right (Alt+Right)** or **Copy from Right to Left (Alt+Left)**, respectively.
- To merge every difference in selected tables of a database comparison, select one or several tables in the left or right component and choose the menu option **Diff and Merge | Copy from Left to Right (Alt+Right)** or **Copy from Right to Left (Alt+Left)**, respectively. Alternatively, right-click the desired tables and choose **Merge selected Left to Right** or **Merge selected Right to Left**, respectively, from the context menu.

An information box with an overview appears. Optionally, click the **Show Details** button, and click **Yes** to confirm the merge.

- To merge selected differences in a result window of a database comparison:
  1. Select a table in the left or right component and choose the menu option **Diff and Merge | Show results** or right-click a table and choose **Show selected results** from the context menu. Alternatively, click the comparison result  icon.
  2. In the Database Data Comparison Result window, place the cursor in the required difference (which could be anywhere in the document) or navigate to it using the **Next Difference**  or **Previous Difference**  navigation commands listed above.

3. Select the menu option **Diff and Merge | Copy from Left to Right (Alt+Right)** or **Copy from Right to Left (Alt+Left)**, respectively).
4. In the Merge data (x to y) dialog box that appears, choose either the Merge the selected rows and cells or the Merge the whole table radio button.
5. Click **Yes** to confirm the merge.

#### To merge database schemas:

1. Place the cursor in the required difference and do the following:
  - Select the menu option **Diff and Merge | Copy from Left to Right** or click the corresponding toolbar icon  or press **Alt+Right** if you want to copy from the left pane to the right pane.
  - Select the menu option **Diff and Merge | Copy from Right to Left** or click the corresponding toolbar icon  or press **Alt+Left** to copy from the right pane to the left pane.

The Merge Schema Left|Right to Right|Left dialog box appears and shows the SQL that will change the schema in the database.

2. Chose one of the following options:
  - Click **Execute** to commit the changes to the database.
  - Click **Save SQL to File** to save the script to a file for later execution.
  - If you have DatabaseSpy installed, click **Show SQL in DatabaseSpy** to display the SQL in DatabaseSpy's SQL Editor where you can check, edit, and execute the script.

## 11 Exporting Differences

For file and directory comparisons, the differences can be exported to file. Differences can be exported either in XML  or in text  format; the available format depends on the [comparison mode](#) <sup>21</sup>, according to the following table:

					
File comparison			n.a.		n.a.
Directory comparison					

### To export differences to file:

1. Run a file or directory comparison.
2. On the **File** menu, click **Export differences**.
3. Enter a destination file name, select the desired format (XML or text), and click **Save**.

If you are comparing files using the **XML comparison**  mode, note that a certain combination of options causes the **Export Differences** command to be disabled (grayed out). To enable the command, do the following:

1. On the **Tools** menu, click **Comparison Options**.
2. Click the **XML** tab.
3. Select the **Detailed differencing** check box.
4. Clear the **Ignore node depth** check box.

## 12 Saving and Loading Comparisons

The settings selected for a file or directory comparison can be saved in a `.filedif` or `.dirdif` file, respectively. The `.filedif` extension is used for file and MS Word comparisons. The `.dirdif` contains Word options only if saved from the Enterprise edition. When a `.filedif` or `.dirdif` file is opened with DiffDog, the GUI loads the two objects to be compared using the settings saved in the `.filedif` or `.dirdif` file. This feature is useful if you wish to repeat a comparison of two files or two folders at a later time with the same settings as the current settings for that comparison.

### Saving `.filedif` and `.dirdif` files

To save the settings of the comparison, select the command **File | Save As**. Select the appropriate filetype (`.filedif` or `.dirdif`), enter the filename you want and click **Save**. The file is saved to the specified location. DiffDog will be the default editor of these file extensions; this will have been set by the installer at the time of installation.

### Opening `.filedif` and `.dirdif` files

To open a comparison file (`.filedif` or `.dirdif`), select the command **File | Open Comparison File**, browse for the comparison file, and click **Open**. You can also drag-and-drop the file from Windows Explorer into DiffDog. Full URL support (that is, local, http, and ftp) is available.

A `.dirdif` file can be opened in any edition, irrespective of which edition the file was saved from. (MS Word options can only be saved in the Enterprise edition.) If you are using a Professional Edition and the `.dirdif` file contains Word options (which are not supported in the Professional edition), then an error message appears on opening the file.

### Command line support

You can also use the [command line](#)<sup>326</sup> to open one comparison file at a time, for example:

```
DiffDog.exe C:\test1.filedif
DiffDog.exe C:\test*.filedif
DiffDog.exe C:\test.*dif
```

The asterisk ( `*` ) wildcard is allowed when opening `.filedif` or `.dirdif` files.

### Running Comparisons with DiffDog Server

If you have licensed DiffDog Server, you can run `.filedif` or `.dirdif` comparisons at the command line with DiffDog Server. To do this, supply the `.filedif` or `.dirdif` file path as argument to the `import` command.

Running `*.filedif` and `*.dirdif` files with DiffDog Server is supported only on Windows. For the comparison to be successful, all the file or directory paths that were valid on the desktop machine must be valid on the server machine. If you set up the comparison jobs directly in DiffDog Server (as opposed to using `*.filedif` or `*.dirdif` files), you can run them regardless of the platform.

If you need to redirect the comparison output to a file in XML or text format, take the following steps:

1. Open an existing `.dirdif` or `.filedif` file (or create a new comparison) in DiffDog.

2. On the **Tools** menu, click **Comparison Document Options**.
3. Do one of the following:
  - a. To use no redirection to a file, click **No Export** (this is the default option).
  - b. To redirect the report to a text file, click **Text file**, and then enter the path in the adjacent text box.
  - c. To redirect the report to an XML file, click **XML file**, and then enter the path in the adjacent text box.
4. On the **File** menu, click **Save As**, and then save the comparison as .filedif (or .dirdif, if applicable).

For more information, refer to DiffDog Server documentation (<https://www.altova.com/documentation>).

## 13 Comparison Management Options

The **Diff and Merge** menu includes a series of commands that are used to customize the file, directory, Microsoft Word document, and database comparisons and can be summed up as comparison management options. Apart from the option to explicitly start a comparison (see below), options to [automate certain comparison functions](#)<sup>249</sup> as well as to facilitate the [selection of recently compared pairs](#)<sup>250</sup> are available.

### Starting a comparison

The **Start Comparison** command in the **Diff and Merge** menu applies to File Comparison as well as Directory Comparison, XML Schema Comparison, Word Comparison, and Database Comparison windows and is used to explicitly start a comparison at any time. Please note that a comparison starts automatically and this command is thus not needed if the [Autostart Comparison](#)<sup>249</sup> or [Compare while Editing](#)<sup>249</sup> comparison management options are toggled on.

#### To explicitly start a comparison:

- Select the menu option **Diff and Merge | Start Comparison** or press **F5**. Alternatively, you can also click the corresponding toolbar button  in the Diff and Merge toolbar or right-click the tab of a comparison window and select the **Start Comparison** command from the context menu that appears.

## 13.1 Automatic Comparison Functions

DiffDog provides options that automatically start a comparison when files are loaded or edited. In addition, you can display the comparison options each time before a comparison is actually started. Note that all of these options are toggle commands.

### Autostart Comparison

If the **Autostart Comparison** option is toggled on, then a comparison is automatically made when files or directories are loaded into a comparison window. If this option is toggled off, then a comparison (file or directory) must be [explicitly started](#)<sup>248</sup>.

#### To autostart comparisons:

- Activate the menu option **Diff and Merge | Autostart Comparison** or activate the corresponding toolbar icon  in the Diff and Merge toolbar.

### Compare while Editing

A toggle to compare or not compare documents in File Comparison windows while editing. If toggled on, differences are highlighted as you edit. If toggled off, highlighting of differences is turned off in both documents as soon as you start typing in either document; to highlight differences after editing, you must [run a comparison](#)<sup>248</sup>.

#### To compare files while editing:

- Activate the menu option **Diff and Merge | Compare while Editing** or activate the corresponding toolbar icon  in the Diff and Merge toolbar.

### Show Options Before Comparison

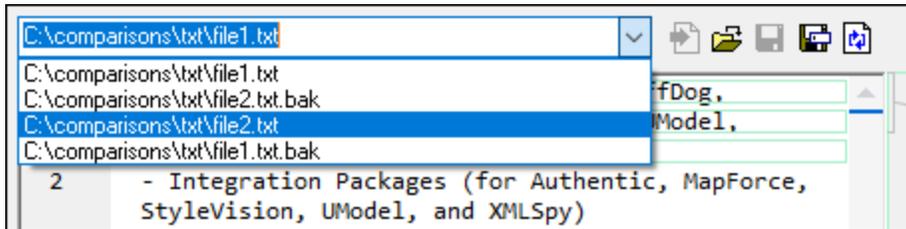
This command is toggled either on or off for individual comparison windows. When toggled on for a comparison window, the Comparison Options dialog box is displayed each time a comparison is made in that window. Note that the Comparison Options dialog box is not displayed before comparisons made dynamically by DiffDog while you edit a document.

#### To show the options before comparison:

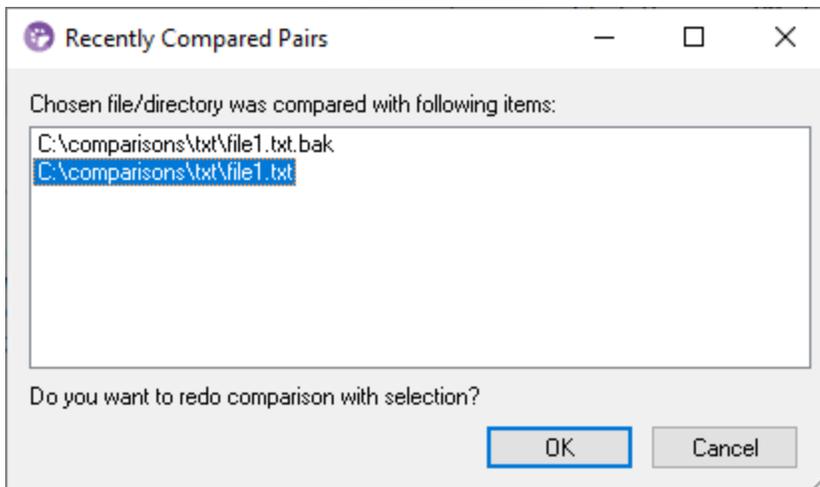
- Activate the menu option **Diff and Merge | Show Options Before Comparison** or activate the corresponding toolbar icon  in the Diff and Merge toolbar.

## 13.2 Recently Compared Pairs

The menu item **Diff and Merge | Support Recently Compared Pairs** lets you enable or disable the "recently compared pairs" feature. More specifically, if this option is on, a history of the most recently compared files or directories is kept whenever you compare a pair of files or directories. You can select any recently compared file or directory from the drop-down list at the top of the comparison window, for example:



Selecting an item from the list above causes the "Recently Compared Pairs" dialog box to appear. This dialog box lists all the files (or directories, if applicable) with which the selected entry was compared recently, for example:



To compare the file or directory with any of the recently compared items, select the corresponding item, and click **OK**.

**Note:** Clicking **Cancel** causes the selected file or directory to open in one pane without opening any previously compared file or directory in the other pane. Clicking **Cancel** does not stop the selected file or directory from being opened. If you do not wish to have the "Recently Compared Pairs" dialog box appear each time you open a document, then toggle the **Support Recently Compared Pairs** option off.

## 13.3 Auto-Mapping XML Schemas

If the **Automap on Load XML Schema** toggle is activated in the Diff and Merge menu, DiffDog performs an automatic mapping of the XML Schemas in the comparison components when the documents are loaded into the XML Schema Comparison window.

## 14 DiffDog Options

The **Tools | DiffDog Options** command enables you to define global application settings. These settings are specified in a dialog box and saved in the registry. They apply to all current and future document windows. The **Apply** button in the DiffDog Options dialog box displays the changes in the currently open documents and fixes the current settings. The changes are seen immediately in the background windows.

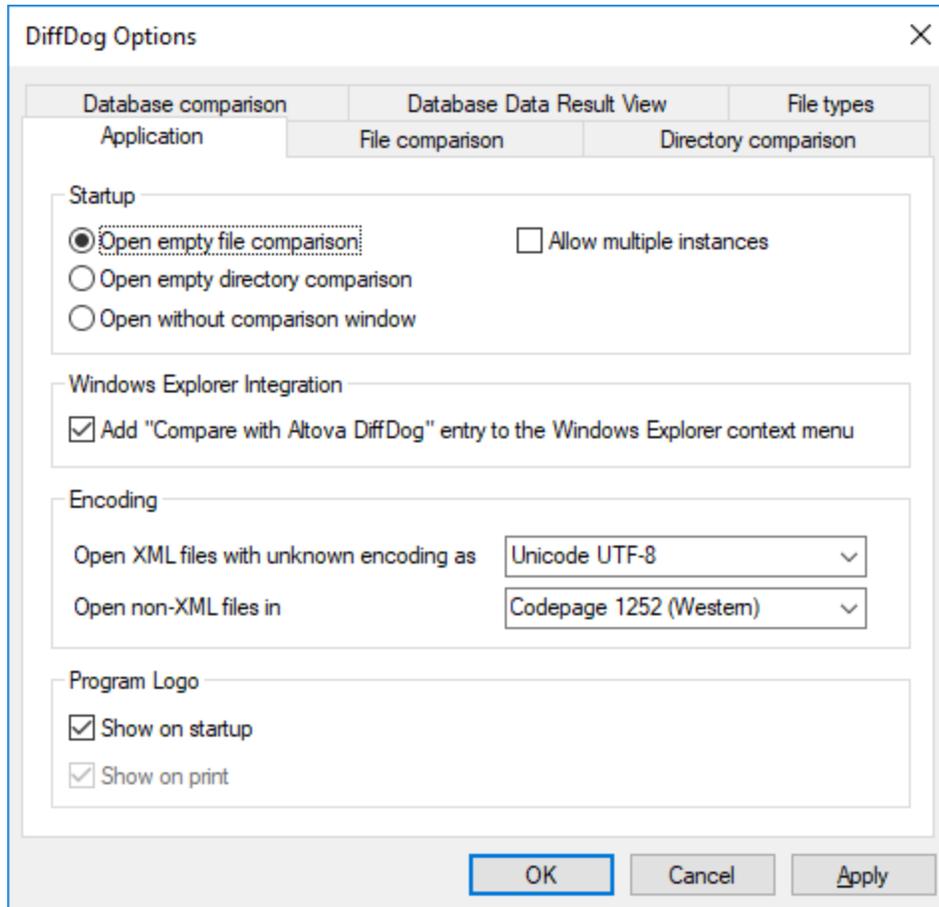
Each page of the DiffDog Options dialog box is described in detail in this section.

### To change DiffDog settings:

1. Select **Tools | DiffDog Options...** or select the **DiffDog Options**  button in the Diff and Merge toolbar.  
The DiffDog Options dialog box appears.
2. Select the tabs for the following options:
  - [Application](#) <sup>253</sup>
  - [File Comparison](#) <sup>255</sup>
  - [Directory Comparison](#) <sup>257</sup>
  - [Database Comparison](#) <sup>261</sup>
  - [Database Data Result View](#) <sup>263</sup>
  - [File Types](#) <sup>264</sup>
  - [Network Proxy Settings](#) <sup>266</sup>
  - [Java Settings](#) <sup>268</sup>
3. Make the desired changes and click **OK**.

## 14.1 Application

In the **Application** tab of the DiffDog Options dialog box, you define the startup options of the application.



### Startup

Three radio buttons are available to define whether DiffDog starts up with an empty File Comparison window, an empty Directory Comparison window, or no comparison window.

If the **Allow multiple instances** check box is deactivated, starting DiffDog when an instance of DiffDog is already running causes a new comparison window (file, directory, or empty) to open in the already running instance of DiffDog.

### Windows Explorer Integration

If the **Add "Compare with Altova DiffDog" entry to the Windows Explorer context menu** check box is selected, you can start a file or directory comparison directly from Windows Explorer by selecting the respective files or directories and choosing **Compare with Altova DiffDog** from the context menu.

## Encoding

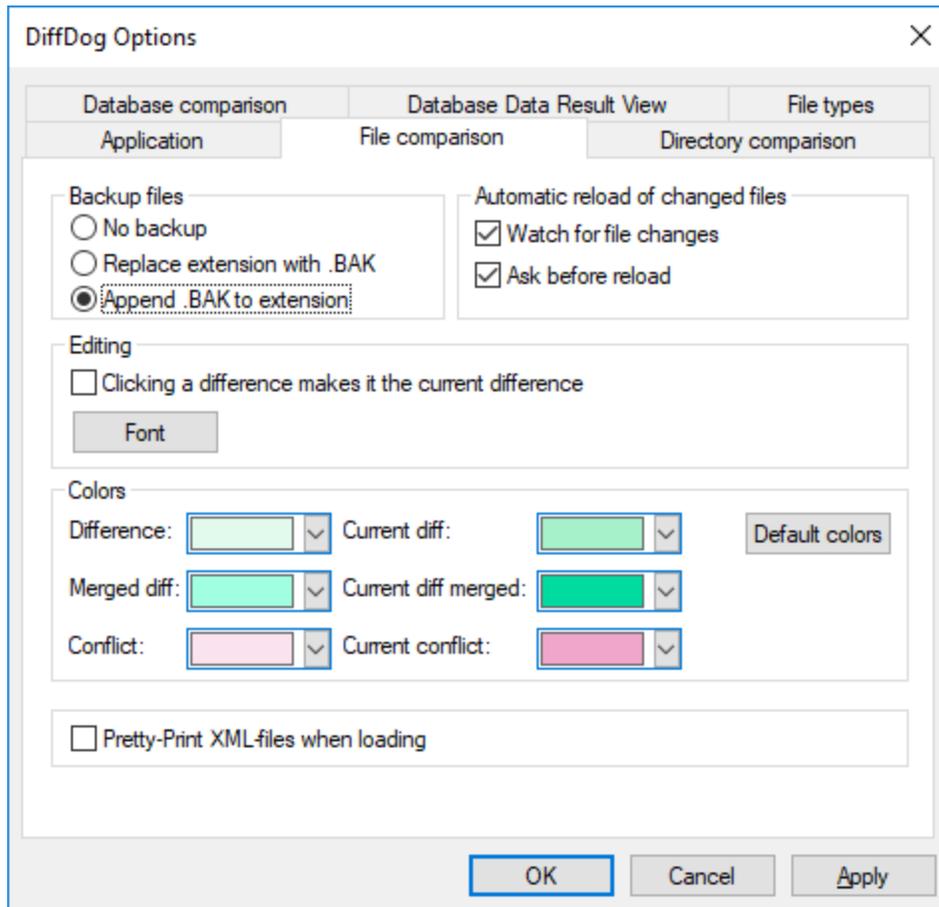
You can select the encoding with which to open an XML file or non-XML files, respectively, where the encoding cannot be detected.

## Program logo

The **Show on startup** option—if checked—displays the splash screen (logo) when DiffDog starts. The **Show on print** option is read-only; it prints the program logo when a comparison result is printed.

## 14.2 File Comparison

The **File comparison** tab enables you to set preferences for file comparisons. These options range from display attributes to file actions, and apply to all open and subsequently opened file comparisons.



### Backup files

This option lets you configure whether the original file should be saved if you decide to save a version of it that you have edited in DiffDog, and, in such cases, how the original file and edited file should be named. The newly named files are created when you save an edited file. The following options are available.

- **No backup:** The original file is overwritten by the edited file, and the name of the original file is retained.
- **Replace extension with .BAK:** If the original file was called abc.xml, changes are written to this file, and a copy of the original is saved as abc.bak.
- **Append .BAK to extension:** If the original file was called abc.xml, changes are written to this file, and a copy of the original is saved as abc.xml.bak.

**Tip:** The .BAK files can be [set to be XML-conformant](#)<sup>264</sup>, and used for comparisons with other XML files.

If ZIP-conformant files change, DiffDog creates a backup for the individual files that have changed inside the ZIP rather than a backup of the ZIP itself.

### Automatic reload of changed files

If a file that is open in DiffDog has been changed by another application or another person, DiffDog can reload the changed file, with or without prompting you to reload.

### Editing

You can make a difference in the compared documents the current difference by clicking in it if the **Clicking a difference makes it the current difference** check box is activated.

The properties of the display font can be freely chosen. Clicking the **Font** button opens the Font dialog box for this purpose.

### Colors

You can choose different background colors for highlighting differences in compared documents, including:

- the current difference (that is, the difference that is currently in focus, or selected)
- merged differences (that is, all merged differences that have not been saved as yet)
- the current merged difference (a merged difference that is currently selected)
- any conflict, or the currently selected conflict (this option is applicable only when comparing files 3-way, see [Three-Way Comparisons](#)<sup>34</sup>)

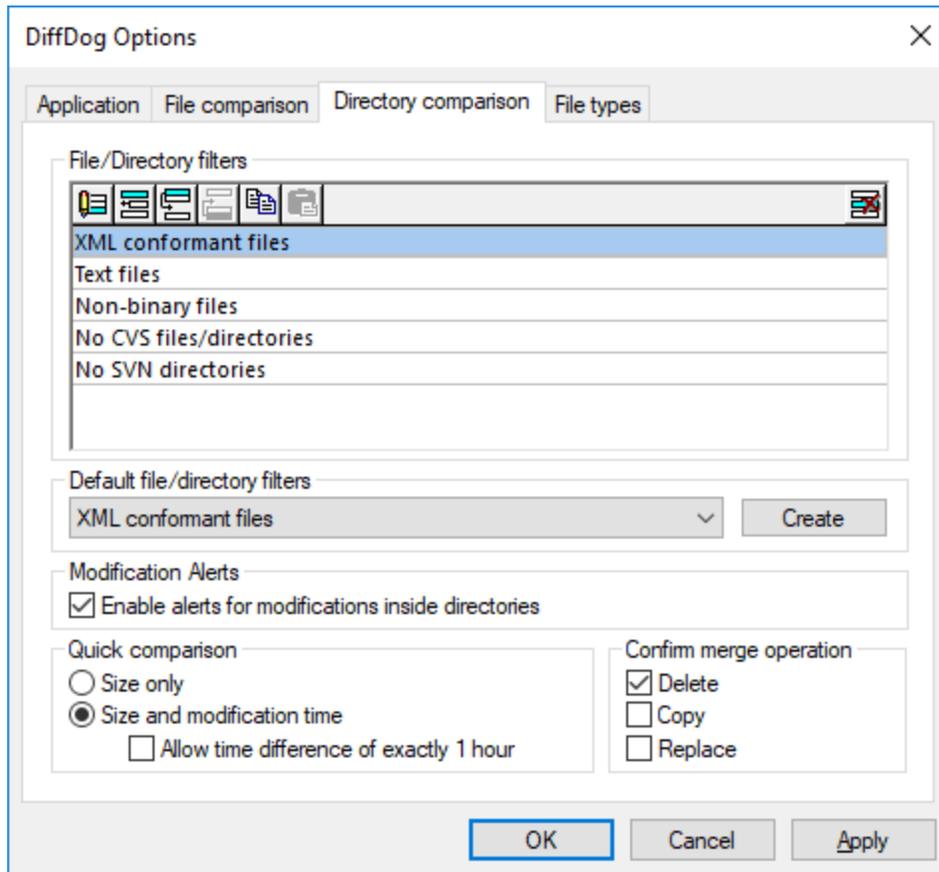
To reset the default colors, click the **Default colors** button. Note that these colors are also used in Word comparison windows.

### Pretty-Print

The **Pretty-Print XML files when loading** option automatically creates a more user-friendly display when XML files that are originally delivered in a continuous stream without line breaks are loaded into File Comparison windows.

## 14.3 Directory Comparison

The **Directory comparison** tab enables you to [create filters](#)<sup>259</sup> that determine what files will be considered in directory comparisons.



**Note:** After exiting this dialog box by clicking **OK**, you still have to select the required filter in the Directory Comparison window. Clicking **OK** does not select the filter for use; it saves the changes and exits the dialog box.

### File/Directory filters

Filters are available for selection in the toolbar of the Directory Comparison window and in the Open Comparison dialog box if the **Compare directories** option has been selected.

The File/Directory filters group box contains several buttons for defining, organizing, and deleting the filters:

-  Opens the Edit Filter dialog for the selected filter, where you can change the filter definition.
-  Opens the Edit Filter dialog, where you can create a new filter. When the definition is completed, the filter is added to the list of available filters below the filter that has been selected when the button has been clicked.
-  Moves the selected filter one position down in the list of filters.

-  Moves the selected filter one position up in the list of filters.
-  Creates a copy of the selected filter.
-  Pastes the copy of a filter below the selected filter.
-  Deletes the selected filter.

### Default file/directory filters

This group box contains a drop-down list with the available default filters. Select a filter and click **Create** to open the Edit Filter dialog box, where you can create a new filter based on the definition of the selected default. Edit name and filter definition as required and click **OK** to add a new filter to the list of available filters in the File/Directory filters group box.

### Modification Alerts

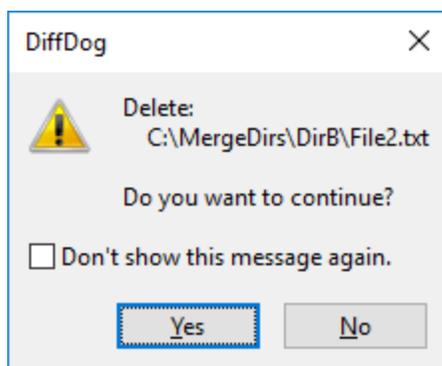
If the **Enable alerts for modifications inside directories** check box is activated, DiffDog displays a warning message when the content of the displayed folders is changed outside of DiffDog. You can then decide whether or not you want to update the display.

### Quick comparison

In this group box, you can define whether size only, or size and modification date should be considered during quick comparison. When **Size and modification time** is selected, you can also activate the **Allow time difference of exactly 1 hour** check box. A time difference of exactly one hour may occur shortly after the shift to, or from, daylight saving time when the system time is changed automatically. Activating the **Allow time difference of exactly 1 hour** check box will prevent such files from being displayed as different.

### Confirm merge operation

You can define whether or not a warning message should be displayed before files are deleted, copied, or replaced during directory merge operations.



If you activate the **Don't show this dialog again!** in this dialog box, the corresponding option is automatically deactivated in the DiffDog Options dialog box.

### 14.3.1 Defining a Filter

The Edit Filter dialog provides several options to restrict the directory comparison:

- Consider only files of a certain type
- Consider only specific directories
- Ignore certain files or directories
- Compare files or directories with certain attributes
- Define a date range for files/directories to be compared
- Restrict files to a certain file size

Note that if a file type is included in both the **Include only files** and **Ignore files** field, then that file type is ignored in a directory comparison.

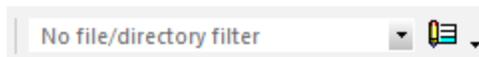
For Directory Comparison windows that were opened before a new filter is selected, you must reload both directories so that the new filters are applied to these comparison windows.

## Modification date

In the Modification date group box, you can enter a From and/or a Till date to define a date range for directory comparison. Only files within that particular date range will be considered when the directories are compared. To include all files from or until a particular date, select only the corresponding check box (**From** or **Till**, respectively) and leave the second check box unchecked. After you select the **From** or **Till** check box, you can either type or select the part of the date that you want to change.

### To define a filter for directory comparison:

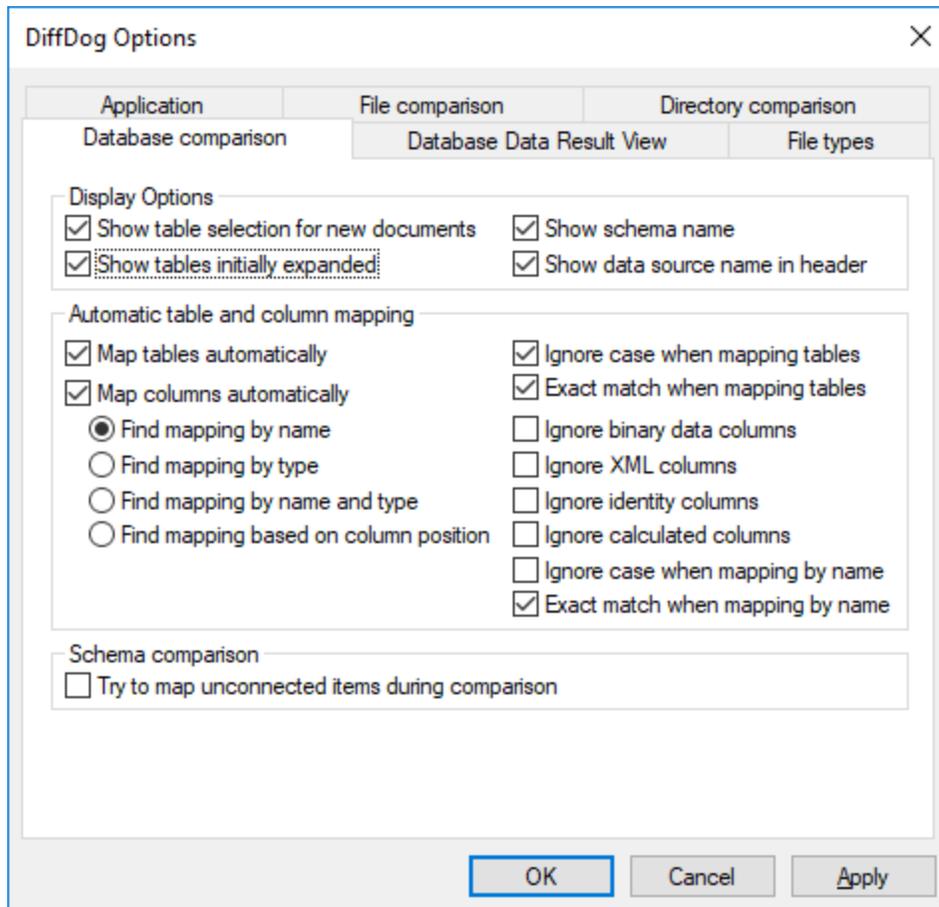
1. Do one of the following:
  - a. Select the menu option **Tools | DiffDog Options** and click the **Directory Comparison** tab.
  - b. Click the **Edit Filter**  button in the toolbar of a Directory Comparison window. Note that, if a filter is already selected from the drop-down list, then you will be editing that filter instead of creating a new one.



2. Click the  button to open the Edit Filter dialog.
3. In the Edit Filter dialog, enter a descriptive name in the **Filter name** field.
4. To restrict the comparison to certain file types, enter the file extension in the **Include only files** field. To exclude file types from comparison, enter the file extension in the **Ignore files** field. Note that file types are listed in the form `*.ext`, and that the delimiter between file types in a filter is the semi-colon (`;`).
5. To include or ignore specific sub-folders of a directory during comparison, enter the name of the folder(s) in the **Include only directories** field or the **Ignore directories** field, respectively. You can also use the wildcard character `*` to enter only parts of folder names. Note that the delimiter between individual folder names in a filter is the semi-colon (`;`).
6. To include files or directories that have certain attributes applied, activate the respective check box(es) in the File/Directory attributes group box. Files or directories with unchecked attributes will not be shown in the Directory Comparison window. Note that hidden files in hidden directories will not be shown if the Hidden check box is activated for files but deactivated for directories.
7. Activate the **From** and/or **Till** check boxes in the Modification date group box, if you want to restrict the comparison to a certain date range.
8. Activate the **From** and/or **Till** check boxes in the File size group box, if you want to restrict the comparison to files of a certain size. Enter a number and select the appropriate unit from the drop-down list.
9. Click **OK** to save the changes.

## 14.4 Database Comparison

The **Database comparison** tab defines how compared data and structure in tables are displayed in the comparison components and whether tables and/or columns should be mapped automatically when added to a comparison. Additional settings related to database data comparison are defined on the [XML](#)<sup>41</sup> and [Text](#)<sup>40</sup> tabs of the Comparison Options dialog box.



### Display Options

In order to be able to open a Database Comparison window without having to specify data source and tables to be compared, clear the **Show table selection for new documents** check box. If you prefer that all tables be shown with the columns not expanded, clear the **Show tables initially expanded** check box. You can deactivate the display of the schema name for tables in components, and show the data source name in the component header.

### Automatic table and column mapping

This group of options is applicable when you perform database data and schema comparisons. By default, when tables are added to a comparison, they are automatically mapped. To disable automatic mapping of

tables or columns, clear the **Map tables automatically** or **Map columns automatically** check box, respectively.

If automatic mapping is enabled for columns, you can further specify how DiffDog should create the mapping:

- **Find mapping by name:** DiffDog checks for matching column names in both tables. By default, matching is case insensitive (for example, "Expenses" will match to "expenses"). To perform a case sensitive matching, clear the **Ignore case when mapping by name** check box.
- **Find mapping by type:** DiffDog maps columns that have a different name but share the same data type. It is recommended to use this option only in small databases, provided that each column of the same table has a different type; otherwise, unwanted mappings are likely to occur.
- **Find mapping by name and type:** DiffDog considers first the column name and then its data type when mapping.
- **Find mapping based on column position:** Columns will only be mapped if the ordinal position at the time of table creation is identical in both tables. This way you can compare tables that are equally designed but use different column names.

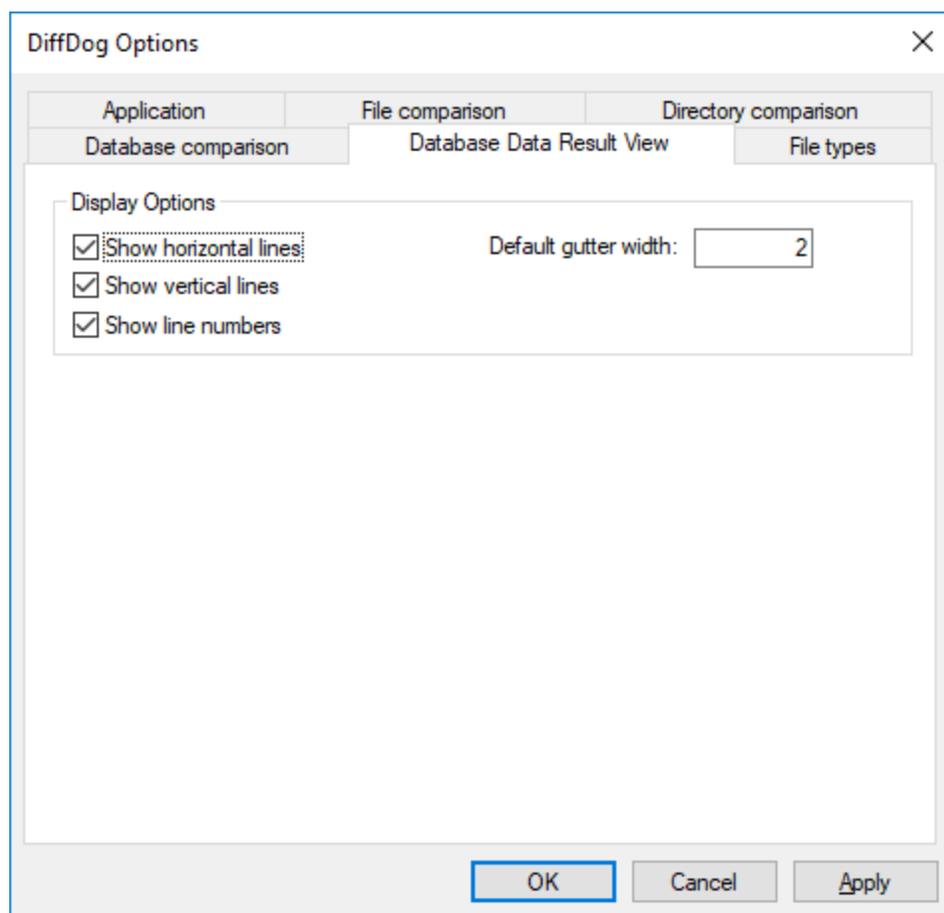
In addition, you can specify whether or not binary data columns, XML columns, identity columns, calculated columns, or the case of a column name should be ignored. If you want to map item names that match to a large extent but are not exactly equal (e.g. "expenses2008" and "expenses\_09"), clear the **Exact match when mapping by name** check box.

### Schema comparison

If you select the **Try to map unconnected items during comparison** check box, DiffDog will try to find corresponding items for unmapped items in the opposite component when a schema (not data) comparison is started.

## 14.5 Database Data Result View

The **Database Data Result View** tab of the DiffDog Options dialog box provides options for customizing the display of the comparison results.

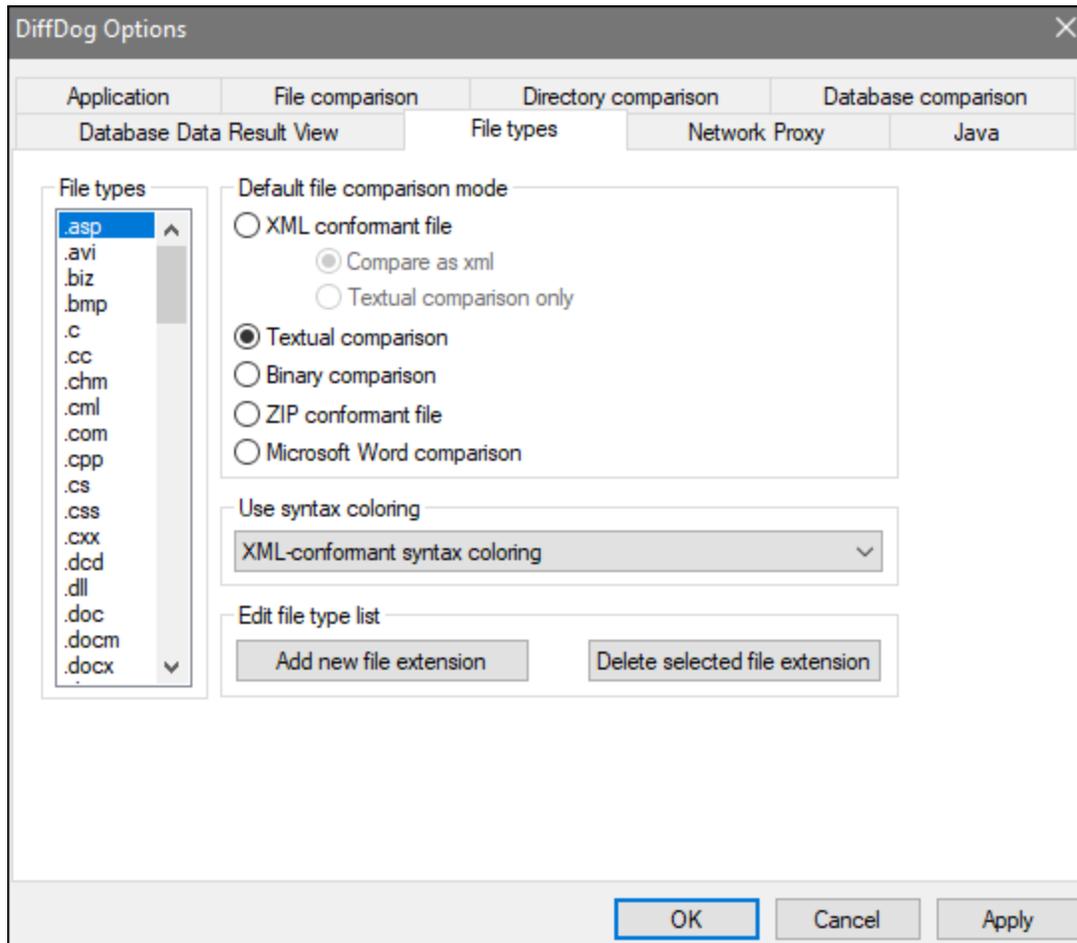


### Display options

Activate the relevant check boxes if you want to display horizontal or vertical lines, or line numbers in the Compare Result View. You can also adapt the default gutter width if you want to separate the compared columns from each other more clearly.

## 14.6 File Types

In the **File types** tab, you can set the default comparison mode of various file types. File types are identified by their extension (.asp, .biz, etc.), and the [comparison mode](#)<sup>21</sup> can be XML, text, binary, ZIP-conformant, or Microsoft Word.



### File types

This pane is used to select the file extension for which the options in the group boxes **Default file comparison mode** and **Use syntax coloring** are defined. Please note that any changes that you make in these two group boxes only apply to the file type currently selected in the File Types pane.

### Default file comparison mode

To assign a default comparison mode for a particular file type, in the Default file comparison mode group box, choose one of the following radio buttons:

- XML-conformant file

An instance of that file type is checked for XML conformance, and is treated as an XML file if it is conformant. An XML-conformant file may be compared as XML or text.

- Textual comparison
- Binary comparison  
An instance of that file type is considered as binary file. A byte-by-byte comparison is used in directory comparison. Files of this type will not be displayed in text view.
- ZIP-conformant file  
An instance of that file type is considered as a sub-directory in directory comparison. In file comparison, files of this type are compared as binaries.
- Microsoft Word comparison (*Enterprise Edition*)  
An instance of that file is considered as Microsoft Word document and can be compared in a Microsoft Word comparison.

The comparison mode can be overridden for individual file comparisons by selecting the desired comparison mode in the **Diff and Merge** menu. DiffDog detects binary files automatically.

### Use syntax coloring

You can choose from among the following options for syntax coloring:

- No syntax coloring
- XML-conformant syntax coloring
- Source code-conformant syntax coloring

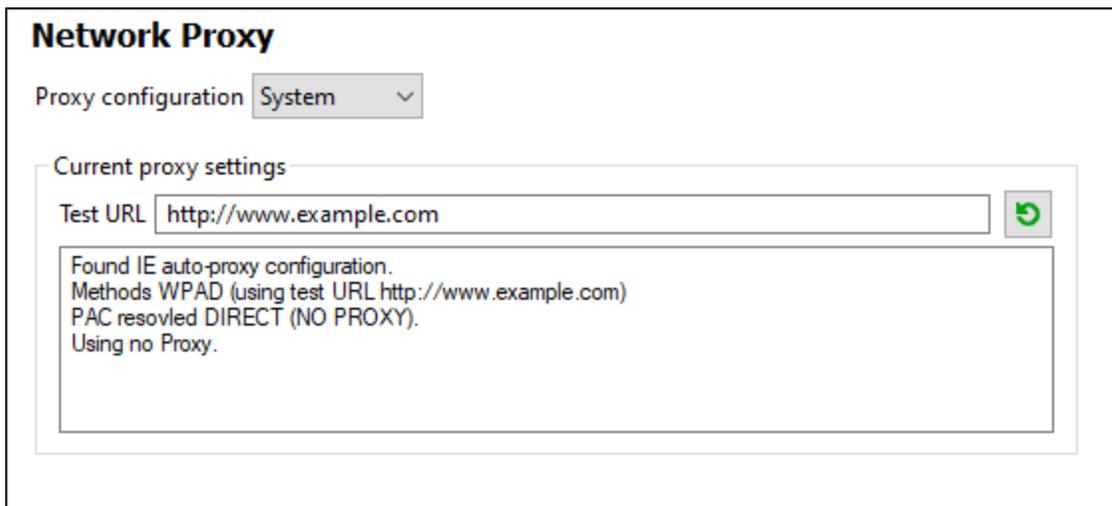
### Edit file type list

To add a new file type to the list in the File types pane, click the **Add New File Extension** button. To delete a file type from the list, select the file extension in the list and then click the **Delete Selected File Extension** button.

## 14.7 Network Proxy Settings

The *Network Proxy* section enables you to configure custom proxy settings. These settings affect how the application connects to the Internet (for XML validation purposes, for example). By default, the application uses the system's proxy settings, so you should not need to change the proxy settings in most cases. If necessary, however, you can set an alternative network proxy by selecting, in the *Proxy Configuration* combo box, either *Automatic* or *Manual* to configure the settings accordingly.

**Note:** The network proxy settings are shared among all Altova MissionKit applications. So, if you change the settings in one application, all MissionKit applications will be affected.



### Use system proxy settings

Uses the Internet Explorer (IE) settings configurable via the system proxy settings. It also queries the settings configured with `netsh.exe winhttp`.

### Automatic proxy configuration

The following options are provided:

- *Auto-detect settings:* Looks up a WPAD script (`http://wpad.LOCALDOMAIN/wpad.dat`) via DHCP or DNS, and uses this script for proxy setup.
- *Script URL:* Specify an HTTP URL to a proxy-auto-configuration (`.pac`) script that is to be used for proxy setup.
- *Reload:* Resets and reloads the current auto-proxy-configuration. This action requires Windows 8 or newer, and may need up to 30s to take effect.

### Manual proxy configuration

Manually specify the fully qualified host name and port for the proxies of the respective protocols. A supported scheme may be included in the host name (for example: `http://hostname`). It is not required that the scheme is the same as the respective protocol if the proxy supports the scheme.

### Network Proxy

Proxy configuration Manual v

HTTP Proxy  Port

Use this proxy server for all protocols

SSL Proxy  Port

No Proxy for

Do not use the proxy server for local addresses

---

Current proxy settings

Test URL  ↻

(using test URL http://www.example.com)  
Using no Proxy.

The following options are provided:

- *HTTP Proxy*: Uses the specified host name and port for the HTTP protocol. If *Use this proxy server for all protocols* is selected, then the specified HTTP proxy is used for all protocols.
- *SSL Proxy*: Uses the specified host name and port for the SSL protocol.
- *No Proxy for*: A semi-colon (;) separated list of fully qualified host names, domain names, or IP addresses for hosts that should be used without a proxy. IP addresses may not be truncated and IPv6 addresses have to be enclosed by square brackets (for example: `[2606:2800:220:1:248:1893:25c8:1946]`). Domain names must start with a leading dot (for example: `.example.com`).
- *Do not use the proxy server for local addresses*: If checked, adds `<1oca1>` to the *No Proxy for* list. If this option is selected, then the following will not use the proxy: (i) `127.0.0.1`, (ii) `:::1`, (iii) all host names not containing a dot character (.).

#### Current proxy settings

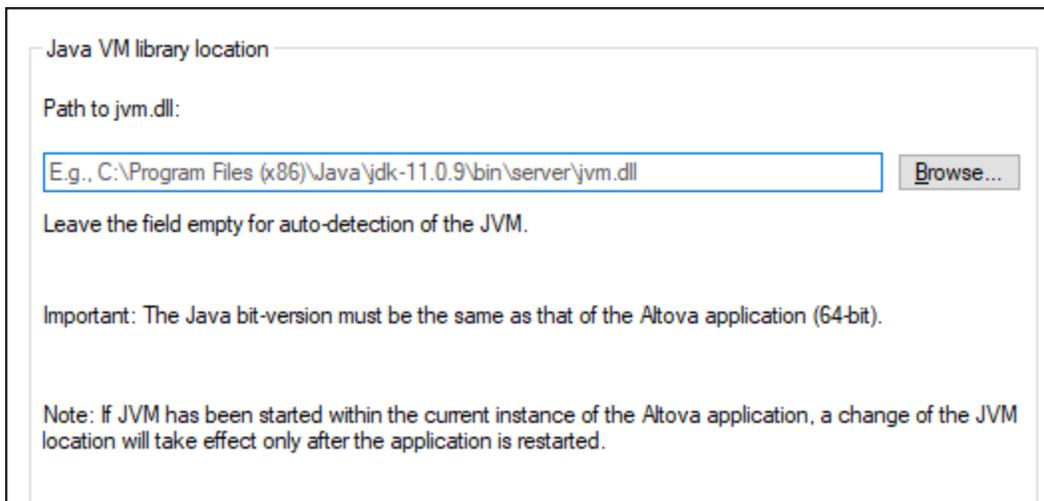
Provides a verbose log of the proxy detection. It can be refreshed with the **Refresh** button to the right of the *Test URL* field (for example, when changing the test URL, or when the proxy settings have been changed).

- *Test URL*: A test URL can be used to see which proxy is used for that specific URL. No I/O is done with this URL. This field must not be empty if proxy-auto-configuration is used (either through *Use system proxy settings* or *Automatic proxy configuration*).

## 14.8 Java Settings

In the *Java* section (see *screenshot below*), you can optionally enter the path to a Java VM (Virtual Machine) on your file system. Note that adding a custom Java VM path is not always necessary. By default, DiffDog attempts to detect the Java VM path automatically by reading (in this order) the Windows registry and the JAVA\_HOME environment variable. The custom path added in this dialog box will take priority over any other Java VM path detected automatically.

You may need to add a custom Java VM path, for example, if you are using a Java virtual machine which does not have an installer and does not create registry entries (e.g., Oracle's OpenJDK). You might also want to set this path if you need to override, for whatever reason, any Java VM path detected automatically by DiffDog.



Note the following:

- The Java VM path is shared between Altova desktop (not server) applications. Consequently, if you change it in one application, it will automatically apply to all other Altova applications.
- The path must point to the `jvm.dll` file from the `\bin\server` or `\bin\client` directory, relative to the directory where the JDK was installed.
- The DiffDog platform (32-bit, 64-bit) must be the same as that of the JDK.
- After changing the Java VM path, you may need to restart DiffDog for the new settings to take effect.

Changing the Java VM path affects database connectivity via JDBC.

## 15 Menu Commands

The **User Reference** section contains a complete description of all DiffDog menu commands. We've tried to make this user manual as comprehensive as possible. If, however, you have questions which are not covered in the User Reference or other parts of this documentation, please look up the FAQs and Discussion Forums on the Altova website. If you are still not able to have your problem satisfactorily addressed, please do not hesitate to contact us through the Support Center on the Altova website.

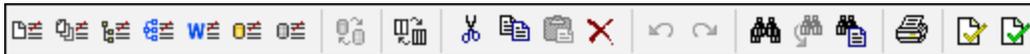
Note that in the [File](#)<sup>273</sup> and [Edit](#)<sup>278</sup> menus, all standard Windows commands are supported, as well as DiffDog-related commands.

## 15.1 Toolbar Icons

Icons in the toolbar are shortcuts for various commands, most of which are also available as menu commands. You can make any toolbars visible/invisible using the [Toolbars tab](#)<sup>309</sup> of the **Customize** dialog (**Tools | Customize**). To move a toolbar, drag its handle to the desired location. The available toolbars are described below.

### Standard toolbar

The **Standard** toolbar (see *screenshot below*) contains file and general editing commands, which can also be accessed in the [File](#)<sup>273</sup>, [Edit](#)<sup>278</sup>, and [XML](#)<sup>301</sup> menus.



### Comparison toolbars

The **Comparison Mode** toolbar (see *screenshot below*) enables you to select a comparison mode for files and directories. This group of commands is available in the **Diff and Merge** menu.



The **Diff and Merge** toolbar (see *screenshot below*) enables you to start comparisons, navigate through differences between files, merge differences, and set application and comparison options. All these commands are available in the **Diff and Merge** menu and in the **Tools** menu.



The **Directory Content** toolbar (see *screenshot below*) enables you to configure the display of Directory Comparison windows. Note that—except for the directory synchronization commands, which are included in the **Diff and Merge** menu—these commands are available only as toolbar buttons. To find out more about commands in the **Directory Content** toolbar, see [Configuring the View](#)<sup>79</sup> and [Running a Directory Comparison](#)<sup>78</sup>.



The **Word Comparison** toolbar enables you to configure the display of Word Comparison windows. Note that these commands are available only as toolbar buttons. For more information about commands in the **Word Comparison** toolbar, see [Configuring the Word Comparison Window](#)<sup>97</sup>.



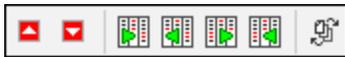
The **Database Data Comparison Mode** toolbar (see *screenshot below*) enables you to select a comparison mode for database data. These commands are also available in the **Diff and Merge** menu.



The **Database Data Comparison Result** toolbar (see *screenshot below*) enables you to configure the display of Database Data Comparison Result windows. For more information about commands in the **Database Data Comparison Result** toolbar, see [Viewing Differences Between Tables](#)<sup>135</sup>.

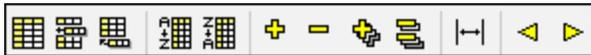


The **3-way Comparison** toolbar (see *screenshot below*) enables you to navigate and merge differences in [three-way comparisons](#)<sup>36</sup>.



## Text/grid view

The **Grid** toolbar (see *screenshot below*) is enabled in [Grid View](#)<sup>55</sup> in File Comparison windows. With the Grid commands, you can make structural editing changes and modify the Grid View of your XML document. Only well-formed XML documents can be seen in Grid View mode.



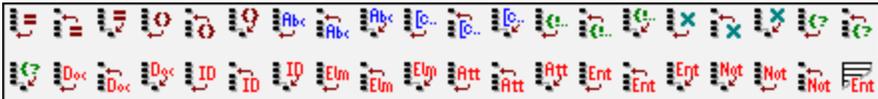
The commands below, which are available only as toolbar buttons, enable you to take the following actions in Grid View mode:

-  (**Expand all selected**): Expands one or more selected nodes in Grid View.
-  (**Collapse all selected**): Collapses the selected nodes.
-  (**Fully expand all selected**): Expands all selected nodes and their descendant nodes.
-  (**Collapse unselected**): Collapses all selected nodes and their descendant nodes.
-  (**Optimal widths**): Sets columns to optimal widths.

The **Text** toolbar (see *screenshot below*) enables you to configure the display and navigation features of [Text View](#)<sup>51</sup>. All these commands are available as [Text View menu commands](#)<sup>284</sup>.

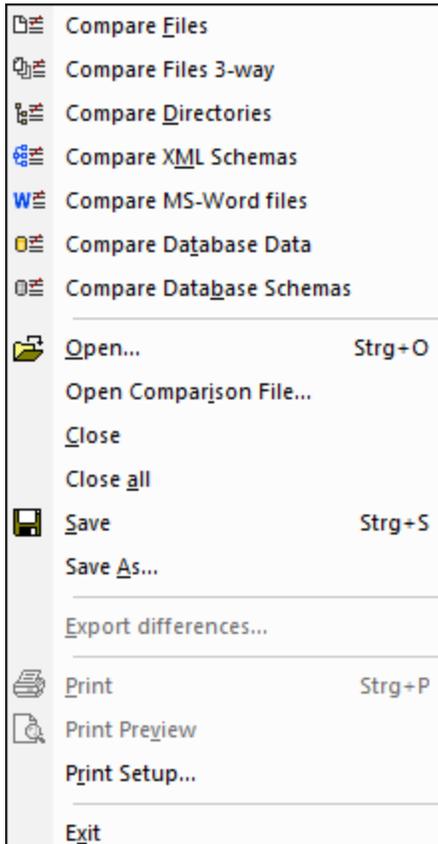


Icons in the **Grid Edit** toolbar (see *screenshot below*) are used for editing in [Grid View](#)<sup>55</sup>. For information about these commands, see [Grid View Menu](#)<sup>286</sup>. This toolbar is deactivated by default. If you want to make the toolbar visible in the interface, select the menu command **Tools | Customize** and check the box *Grid Edit* in the [Toolbars](#)<sup>309</sup> tab.



## 15.2 File Menu

The **File** menu contains all commands relevant to manipulating files, in the order common to most Windows software products.



In addition to the standard [Open](#)<sup>275</sup>, [Save](#)<sup>276</sup>, [Print](#)<sup>276</sup>, [Print Setup](#)<sup>277</sup>, and [Exit](#)<sup>277</sup> commands, DiffDog offers a range of application-specific commands. Note that in File Comparison and Directory Comparison windows, each of the two panes also has pane-specific icons located near the top of each pane to open and refresh the file/directory in that pane and (for file comparisons) to save the file in that pane.

### 15.2.1 Compare Files

The **Compare Files**  command opens a new empty window with two empty panes for file comparison. The two files to be compared must be opened subsequently in the panes of the comparison window. See [Running a File Comparison](#)<sup>28</sup>.

## 15.2.2 Compare Files 3-way

The **Compare Files 3-Way**  command opens a new window containing three comparison panes, see [Three-Way Comparisons](#) <sup>34</sup>.

## 15.2.3 Compare Directories

The **Compare Directories**  command [opens a new empty window](#) <sup>74</sup> for directory comparison. The two directories to be compared must be [opened](#) <sup>75</sup> separately in each pane.

## 15.2.4 Compare XML Schemas

The **Compare XML Schemas**  command [opens a new empty window](#) <sup>103</sup> for XML Schema comparison. The two XML Schemas to be compared must be [opened](#) <sup>104</sup> subsequently in the components of the comparison window.

## 15.2.5 Compare MS-Word Files

The **Compare MS-Word Files**  command [opens a new empty window](#) <sup>92</sup> with two empty Microsoft Word documents for Microsoft Word file comparison. The two Microsoft Word documents to be compared must be [opened](#) <sup>93</sup> subsequently in the panes of the comparison window.

## 15.2.6 Compare Database Data

The **Compare Database Data**  command opens a new empty window for database data comparison. The two databases to be compared must be opened and the tables to be compared must be selected separately in each component. For more information, see [Comparing Database Data](#) <sup>119</sup>.

## 15.2.7 Compare Database Schemas

The **Compare Database Schemas**  command opens a new empty window for database schema comparison. The two databases to be compared must be opened and the schemas to be compared must be selected separately in each component. For more information, see [Comparing Database Schemas](#) <sup>144</sup>.

## 15.2.8 Open

The **Open**  (**Ctrl+O**) command enables you to open a File Comparison window or Directory Comparison window with the files or directories already selected. This is in contrast with the [Compare Files](#)<sup>273</sup> and [Compare Directories](#)<sup>274</sup> commands, which open empty comparison windows.

Note that the layout of the dialog box changes depending on whether you choose Compare files or Compare directories in the Mode group box.

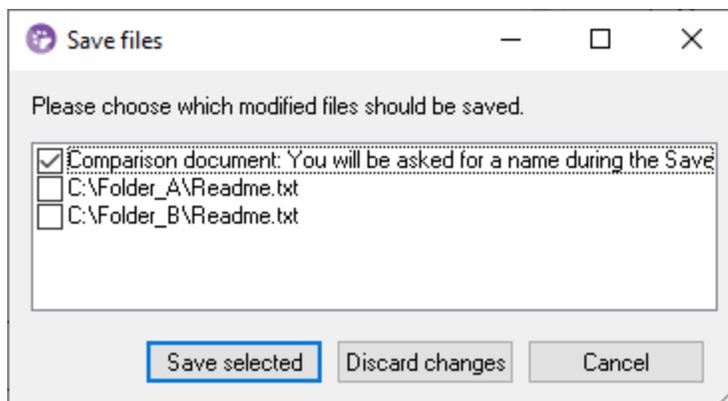
Database data comparison files (\*.dbdif) cannot be opened with this command, you have to use the [Open Comparison File...](#)<sup>275</sup> command.

## 15.2.9 Open Comparison File

The **Open Comparison File** command enables you to open a Database Data Comparison window, Database Schema window, or XML Schema Comparison window with the data sources and tables or XML Schemas, respectively, already selected. This is in contrast with the [Compare Database Data](#)<sup>274</sup>, [Compare Database Schema](#)<sup>274</sup>, or [Compare XML Schema](#)<sup>274</sup> commands, which open an empty Comparison window.

## 15.2.10 Close

The **Close** command closes the active comparison window. If you have unsaved changes in either document of a file comparison being closed, the Save files dialog box appears. Both files in the file comparison are displayed, as well as the comparison document itself. If a file contains unsaved changes, it is checked.



## 15.2.11 Close All

The **Close all** command closes all open comparison windows. If a document in a file comparison contains unsaved changes, the Save files dialog box ([see screenshot](#)<sup>275</sup> above) appears for that file comparison. Directory comparisons are closed without any prompt.

If more than one file comparison contains document/s with unsaved changes, a Save files dialog box is displayed for each File Comparison window before the window is closed.

## 15.2.12 Save

The **Save**  (**Ctrl+S**) command is available only for file comparisons and database data comparisons. For file comparisons, it pops up the Save files dialog box, where you can decide whether to save or discard the changes for each individual file, including the comparison file itself.

**Note:** Clicking the **Save**  icon of an **individual pane** in a File Comparison window causes the document in that pane to be saved without further prompting. The **Save As**  icon enables you to save the document in that pane with a different file name.

## 15.2.13 Save As

The **Save As** command pops up the familiar Windows **Save As** dialog box, in which you enter the name and location of the file you wish to save the active file as.

## 15.2.14 Export Differences

The **Export differences** command allows you to [export differences to a file](#)<sup>245</sup>. This menu option is available only for file and directory comparisons.

## 15.2.15 Print

The **Print**  (**Ctrl+P**) command pops up the Windows Print dialog box, in which you enter details about the print job. Note that this command prints the **active document**, that is, the document in which the cursor is when the command is invoked.

**Note:** You can print the active document from both [Text View](#)<sup>51</sup> and [Grid View](#)<sup>55</sup>. The output will be a printout of the selected view.

## 15.2.16 Print Preview

The **Print Preview**  command displays a preview of how the active document will be printed.

## 15.2.17 Print Setup

The **Print Setup** command pops up the Windows Print Setup dialog, in which you can change printer settings for the print job and other printer properties. Settings include page orientation, paper size, and paper source. After you exit the Print Setup dialog, you must still use the **Print** command to print a document.

## 15.2.18 Exit

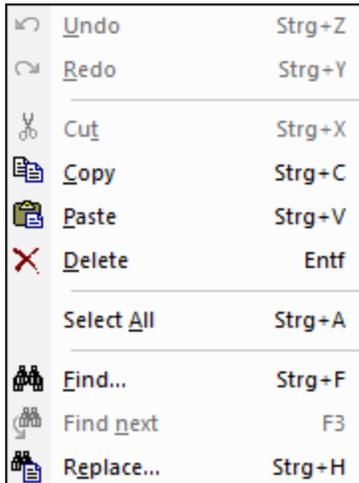
This command exits the DiffDog application. If documents in one or more File Comparison windows contain unsaved changes, DiffDog pops up the Save files dialog box separately for each file comparison containing an unsaved change.

If you have not saved a database data comparison to a database data comparison file (\*.dbdif) when you close DiffDog, a message box appears and prompts you to save the Database Data Comparison window.

After you have answered the prompts, DiffDog closes.

## 15.3 Edit Menu

In DiffDog, you can [edit documents](#)<sup>59</sup> displayed in a File Comparison window. You edit a document either by typing directly into it, and/or by using keyboard shortcuts or commands in the **Edit** menu.



The commands in the **Edit** menu include standard editing functions, such as [Undo](#)<sup>278</sup>, [Cut](#)<sup>279</sup>, [Copy](#)<sup>279</sup>, [Paste](#)<sup>279</sup>, and a powerful [Find](#)<sup>280</sup> and [Replace](#)<sup>280</sup> function. These commands are described in the sub-sections of this section.

**Note:** Editing commands are document-specific and that **Edit** menu commands are not available when a directory comparison or a Database Data Comparison Result window is active.

### 15.3.1 Undo

The **Undo**  ( **Alt+Backspace**, **Ctrl+Z** ) command enables you to undo an unlimited number of previous actions for each document separately. To undo previous actions in any document, place the cursor in that document and select the **Undo** command. You can switch among documents in multiple open file comparisons. In each document, the Undos will continue from the point where it was last left.

Please consider the following when using the **Undo** and [Redo](#)<sup>279</sup> commands:

- The **Undo** and **Redo** commands also undo and redo merged differences an unlimited number of times.
- It is important to place the cursor in the document that has been changed. For example, if you merge a difference from the Left Pane to the Right Pane, then the **Undo** for this action will only be available if the cursor is placed in the Right Pane (because this pane contains the document that has been changed).
- The Undo and Redo history is lost when the view is switched from Text View to Grid View, or vice versa.
- The **Edit** menu and the **Undo** and **Redo** commands are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.3.2 Redo

The **Redo**  ( **Ctrl+Y** ) command reverses a previous **Undo** <sup>278</sup> command, and can be executed as many times as an Undo was performed. Like the **Undo** command, the **Redo** command is also document-specific, and you can switch among documents.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.3.3 Cut

The **Cut**  ( **Shift+Delete**, **Ctrl+X** ) command copies the selected text to the clipboard and deletes it from its present location.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.3.4 Copy

The **Copy**  ( **Ctrl+C** ) command copies the selected text to the clipboard. This can be used to duplicate data within DiffDog or to move data to another application.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.3.5 Paste

The **Paste**  ( **Ctrl+V** ) command inserts the contents of the clipboard at the current cursor position of any document you make active in DiffDog. You can also paste text from the clipboard into any other document in an application that supports pasting from the clipboard.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.3.6 Delete

The **Delete**  ( **Del** ) command enables you to delete a selection in the document.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database

Data Comparison Result windows.

### 15.3.7 Select All

The **Select All** command enables you to select all the content of a file in one of the [file comparison panes](#)<sup>23</sup>. Place the mouse cursor inside the pane with the file you would like to select and click **Select All** in the **Edit** menu.

### 15.3.8 Find

The **Find**  ( **Ctrl+F** ) command pops up the **Find**<sup>61</sup> dialog box, in which you can specify the string you want to find and other options for the search.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

### 15.3.9 Find next

The **Find next**  ( **F3** ) command repeats the last **Find...**<sup>280</sup> command to search for the next occurrence of the requested text. Clicking this command when the Find dialog box is open, closes the Find dialog box before taking you to the next occurrence of the search string.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

### 15.3.10 Replace

The **Replace**  ( **Ctrl+H** ) command enables you to find and replace one text string with another text string. It features the same options as the **Find...**<sup>280</sup> command. You can replace each item individually or you can use the **Replace All** button to perform a global search-and-replace operation.

Note that the **Edit** menu and, therefore, this command are not available in Directory Comparison and Database Data Comparison Result windows.

## 15.4 View Menu

The **View** menu contains the following commands:

- [Text View](#)<sup>281</sup>
- [Grid View](#)<sup>281</sup>
- [Toolbars](#)<sup>281</sup>
- [Status Bar](#)<sup>282</sup>
- [Toggle 2-way/3-way Comparison](#)<sup>282</sup>
- [Synchronized Scrolling](#)<sup>282</sup>
- [Go to line/char](#)<sup>283</sup>

### 15.4.1 Text View

The **Text View** command is available in File Comparison windows (not Directory Comparison or Database Data Comparison windows), and switches **both files** of the active File Comparison window to Text View. Note that **both** files are always displayed in the same view. To switch the view, you can also use the Text View tab of either pane; the tabs are located at the bottom of each pane.

### 15.4.2 Grid View

The **Grid View** command is available in File Comparison windows (not Directory Comparison or Database Data Comparison windows), and switches **both files** of the active File Comparison window to Grid View. Note that **both** files are always displayed in the same view. To switch the view, you can also use the Grid View tab of either pane; the tabs are located at the bottom of each pane.

### 15.4.3 Toolbars

The **Toolbars** menu item contains a submenu with commands that show or hide the respective application toolbars.

Toolbar settings take effect depending on the current comparison mode. For example, if toolbar settings are made with a File Comparison window open, the settings apply to all File Comparison windows that are currently open and that will be opened subsequently. You can restore all toolbars to their default state by running the menu command **Tools | Restore Toolbars and Windows**.

The **Customize** submenu item is a shortcut for the **Tools | [Customize...](#)**<sup>308</sup> command.

## 15.4.4 Status Bar

The Status Bar, located at the bottom of the DiffDog application window, displays the following application-level information:

- A description of menu command and toolbar icon actions; displayed when the mouse cursor is placed over the command or icon. This information is on the left side in the Status Bar.
- Position of the cursor in a document, in terms of line number and character number (lower-right corner)
- Status of the Caps Lock, Num Lock and Scroll Lock keys (lower-right corner)
- If you are using the 64-bit version of DiffDog, this is indicated in the status bar with the suffix (x64) after the application name. There is no suffix for the 32-bit version.

You can toggle the Status Bar on and off using the **Status Bar** command in File Comparison, XML Schema Comparison, Directory Comparison, Database Data Comparison, and Database Schema Comparison windows.

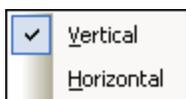
**Note:** Do not confuse the Application Status Bar described here with the File Comparison and Directory Comparison Status Bars, which are located at the bottom of Comparison Windows and contain information about that comparison. Comparison Window status bars are described in the [DiffDog Interface](#)<sup>25</sup> section.

## 15.4.5 Toggle 2-way/3-way Comparison

Switches the active comparison window from a two-pane comparison into a three-way comparison mode, and vice versa. For more information, see [Three-Way Comparisons](#)<sup>34</sup>.

## 15.4.6 Synchronized Scrolling

The **Synchronized Scrolling** command opens a sub-menu, where you can set this option separately for horizontal and vertical scrolling.



Synchronized scrolling is available in File Comparison windows. If documents extend over a horizontal or vertical length greater than the size of its containing pane, horizontal and vertical scrollbars, respectively, appear at the bottom and right of the pane, respectively. When synchronized scrolling is enabled, both documents can be scrolled simultaneously so that corresponding sections of the two documents are displayed simultaneously.

If you scroll through one document (by moving the scrollbar, clicking the scroll arrows, or using the mouse wheel) when synchronized scrolling is toggled on, the document in the other pane will also scroll (horizontally or vertically) so that the corresponding part of the document is displayed.

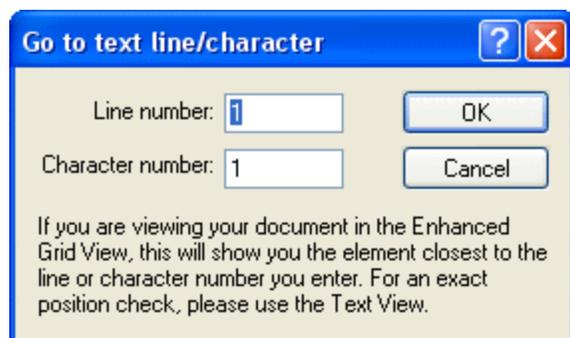
Please note that synchronized scrolling is possible only after a file comparison has been carried out (since the correspondence of sections in the two documents can only be determined after a comparison is made).

Settings for synchronized scrolling apply to the application as a whole, and take effect immediately for all open File Comparison windows and subsequently opened File Comparison windows.

Note that this command is not available in Database Data Comparison and Database Data Comparison Result windows.

## 15.4.7 Go to line/char

The **Go to line/char**  ( **Ctrl+G** ) feature is available in File Comparison windows only, and enables you to go to a particular location in the active document using line and character coordinates. The command pops up the Go to text line/character dialog (*screenshot below*).



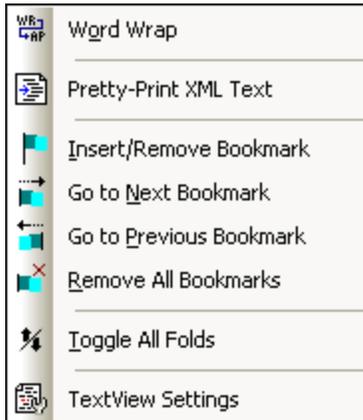
Enter the required line and character numbers in the respective text boxes, and click **OK**. This positions the cursor at the specified location.

**Note:** In Grid View, the **Go to line/char** feature highlights the grid cell closest to the line or character number you enter.

Note that this command is not available in Database Data Comparison and Database Data Comparison Result windows.

## 15.5 Text View Menu

The **Text View** menu contains commands that apply to the Text View display of documents in File Comparison windows. They enable you to customize the display of documents.



### 15.5.1 Word Wrap

The **Word Wrap**  command enables or disables word wrapping in [Text View](#) <sup>51</sup>.

### 15.5.2 Pretty-Print XML Text

The **Pretty-Print XML Text**  command reformats the active XML document in Text View to give a structured display of the document. Each child node is offset from its parent by four space characters.

**Note:** The Pretty-Print XML Text command is not a toggle command. Once the command is executed, the pretty-printed format cannot be undone by clicking the Pretty-Print XML Text command again. To undo the pretty-printed format, you must use the [Undo](#) <sup>278</sup> (**Ctrl+Z** or **Alt+Backspace**) command.

### 15.5.3 Insert/Remove Bookmark

The **Insert/Remove Bookmark**  command is available in [Text View](#) <sup>51</sup> only. It inserts a bookmark at the current cursor position, or removes the bookmark if the cursor is in a line that has been bookmarked previously.

Bookmarked lines are displayed in one of two ways: If the bookmarks margin has been enabled, then a solid cyan-colored ellipse appears to the left of the text in the bookmark margin. If the bookmarks margin has **not** been enabled, then the complete line containing the cursor is highlighted in cyan.

**Tip:** You can assign a keyboard shortcut for this command in the [Keyboard tab](#)<sup>312</sup> of the Customize dialog box.

## 15.5.4 Go to Next Bookmark

The **Go to Next Bookmark**  command is available in [Text View](#)<sup>51</sup> only. It places the text cursor at the beginning of the next bookmarked line.

**Tip:** You can assign a keyboard shortcut for this command in the [Keyboard tab](#)<sup>312</sup> of the Customize dialog box.

## 15.5.5 Go to Previous Bookmark

The **Go to Previous Bookmark**  command is available in [Text View](#)<sup>51</sup> only. It places the text cursor at the beginning of the previous bookmarked line.

**Tip:** You can assign a keyboard shortcut for this command in the [Keyboard tab](#)<sup>312</sup> of the Customize dialog box.

## 15.5.6 Remove All Bookmarks

The **Remove All Bookmarks**  command is available in [Text View](#)<sup>51</sup> only. It removes all currently defined bookmarks in the active document. Note that the [Undo](#)<sup>278</sup> command does not undo the effects of this command.

**Tip:** You can assign a keyboard shortcut for this command in the [Keyboard tab](#)<sup>312</sup> of the Customize dialog box.

## 15.5.7 Toggle All Folds

The **Toggle All Folds**  command toggles the active document between two states: (i) all nodes expanded, and (ii) all nodes collapsed.

## 15.5.8 Text View Settings

The **Text View Settings** command opens the Text View Settings dialog box where you can [define settings](#)<sup>51</sup> for the display of line number, bookmark, and source folding margins, specify the tab size, and define which visual aids are available in Text View.

## 15.6 Grid View Menu

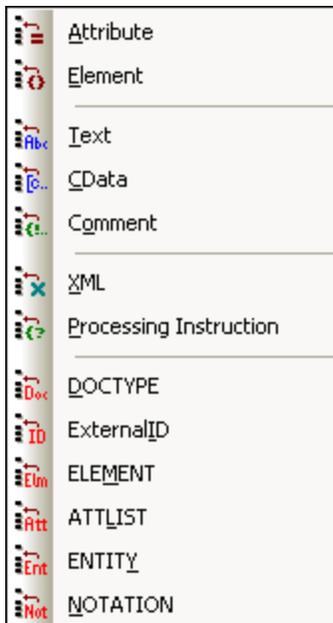
The **Grid View** Menu contains commands for working with documents in the [Grid View](#)<sup>55</sup> of File Comparison windows.



These commands are not available in Text View.

### 15.6.1 Insert

Placing the cursor over the **Insert** command pops up a sub-menu which contains the items that can be inserted. The submenu items of the **Insert** command are enabled only in [Grid View](#)<sup>55</sup>. Items that cannot be inserted for the current selection are grayed out.



The commands of the **Insert** sub-menu can be used to insert (i) the [XML declaration](#)<sup>288</sup> and node types ([Attribute](#)<sup>287</sup>, [Element](#)<sup>287</sup>, [Text](#)<sup>287</sup>, [CDATA](#)<sup>287</sup>, [Comment](#)<sup>287</sup>, [Processing Instruction](#)<sup>288</sup>) in XML documents, (ii) [DOCTYPE](#)<sup>288</sup> declarations and [external DTD declarations](#)<sup>288</sup> in XML documents, and (iii) DTD declarations ([ELEMENT](#)<sup>289</sup>, [ATTLIST](#)<sup>289</sup>, [ENTITY](#)<sup>290</sup>, and [NOTATION](#)<sup>290</sup>) in DTD documents and internal DTD declarations of XML documents.

### 15.6.1.1 Insert | Attribute

The **Insert | Attribute**  command is available in [Grid View](#)<sup>55</sup> only, and inserts a new attribute before the selected item. Sometimes, an inserted attribute may appear a few lines before the current item in Grid View. This is because attributes immediately follow their parent element in Grid View and precede all child elements of that parent element.

### 15.6.1.2 Insert | Element

The **Insert | Element**  command is available in [Grid View](#)<sup>55</sup> only, and inserts a new element before the selected item. If the current selection is an attribute, the new element is inserted before the first child element of the attribute's parent element.

### 15.6.1.3 Insert | Text

The **Insert | Text**  command is available in [Grid View](#)<sup>55</sup> only, and inserts a new text row before the selected item. If the current selection is an attribute, the text row is inserted after the attribute and before the first child element of the attribute's parent element.

### 15.6.1.4 Insert | CData

The **Insert | CData**  command is available in [Grid View](#)<sup>55</sup> only, and inserts a new CDATA block before the selected item. If the current selection is an attribute, the CDATA block is inserted after the attribute and before the first child element of the attribute's parent element.

### 15.6.1.5 Insert | Comment

The **Insert | Comment**  command is available in [Grid View](#)<sup>55</sup> only, and inserts a new comment before the selected item. If the current selection is an attribute, the new comment row is inserted after the attribute and before the first child element of the attribute's parent element.

### 15.6.1.6 Insert | XML

The **Insert | XML**  command is available in [Grid View](#) <sup>55</sup> only, and inserts a row for the XML declaration before the selected item. You must insert the child attributes of the XML declaration and the values of this attribute. An XML declaration must look something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
```

**Note:** Since an XML document may only contain one XML declaration at the very top of the file, this command should only be used with the topmost row selected and if an XML declaration does not already exist.

### 15.6.1.7 Insert | Processing Instruction

The **Insert | Processing Instruction**  command is available in [Grid View](#) <sup>28</sup> only, and inserts a new processing instruction (PI) before the selected item. If the current selection is an attribute, the PI is inserted after the attribute and before the first child element of the attribute's parent element.

### 15.6.1.8 Insert | DOCTYPE

The **Insert | DOCTYPE**  command is available in the [Grid View](#) <sup>55</sup> of an XML file when a top-level node is selected. It appends a DOCTYPE declaration at the top of the XML document. You must enter the name of the DOCTYPE, and this name must be the same as the name of the document element.



After you have entered the name of the DOCTYPE, you can enter the declarations you wish to use in the internal DTD subset.

**Note:** A DOCTYPE declaration may only appear between the XML declaration and the XML document element.

### 15.6.1.9 Insert | ExternalID

The **Insert | ExternalID**  command is available when a child item of the [DOCTYPE](#) <sup>288</sup> declaration in an XML file is selected in [Grid View](#) <sup>55</sup>. This command inserts a Grid View row for an external identifier (PUBLIC or SYSTEM). You must enter the type of identifier and its value.



The Text View corresponding to the screenshot of the Grid View shown above looks like this:

```
<!DOCTYPE OrgChart SYSTEM "orgchart.dtd" [
  <!ELEMENT name (#PCDATA)>
]>
```

**Note:** A row for ExternalID can be [added as a child](#)<sup>296</sup> when the DOCTYPE item is selected, or it can be inserted or [appended](#)<sup>293</sup> when one of the child items of the DOCTYPE item is selected, for example, the ELEMENT declaration `name` in the example above.

## Referencing external resources

A DOCTYPE declaration in an XML file can contain a reference to an external resource containing DTD declarations. This resource is referenced either through a public or system identifier. For example:

```
<!DOCTYPE doc_element_name PUBLIC "publicID" "systemID">
<!DOCTYPE doc_element_name SYSTEM "systemID">
```

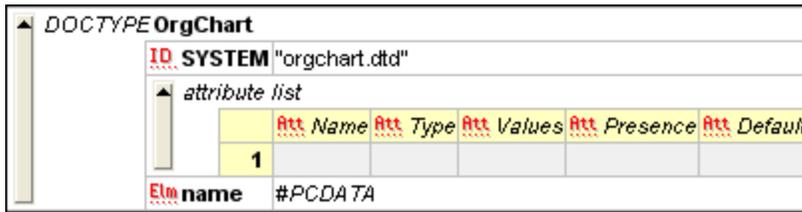
A system identifier is a URI that identifies the external resource. A public identifier is location-independent and can be used to dereference the location of an external resource. For example, in your `<%SPY-GEN%>` installation, URIs for popular DTDs and XML Schemas are listed in a catalog file called `MainCatalog.xml`. A public identifier in an XML document can be used to dereference a DTD listed in `MainCatalog.xml`.

### 15.6.1.10 Insert | ELEMENT

The **Insert | ELEMENT**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It inserts an ELEMENT declaration before the selected declaration.

### 15.6.1.11 Insert | ATTLIST

The **Insert | ATTLIST**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It inserts an ATTLIST declaration before the selected declaration.



DOCTYPE OrgChart					
<b>ID SYSTEM</b>	"orgchart.dtd"				
attribute list					
	<b>Att Name</b>	<b>Att Type</b>	<b>Att Values</b>	<b>Att Presence</b>	<b>Att Default</b>
<b>1</b>					
<b>Elm name</b>	#PCDATA				

### 15.6.1.12 Insert | ENTITY

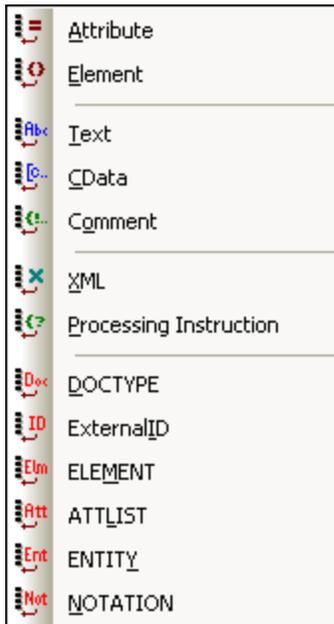
The **Insert | ENTITY**  command is available in [Grid View](#) <sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#) <sup>288</sup> declaration of an XML document is selected. It inserts an ENTITY declaration before the selected declaration.

### 15.6.1.13 Insert | NOTATION

The **Insert | NOTATION**  command is available in [Grid View](#) <sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#) <sup>288</sup> declaration of an XML document is selected. It inserts a NOTATION declaration before the selected declaration.

## 15.6.2 Append

Placing the cursor over the **Append** command pops up a submenu which contains the items that can be inserted for a given selection. The submenu items of the **Append** command are enabled only in [Grid View](#) <sup>55</sup>. Items that cannot be inserted for the current selection are grayed out.



The commands of the **Append** sub-menu can be used to append (i) the [XML declaration](#)<sup>292</sup> and node types ([Attribute](#)<sup>291</sup>, [Element](#)<sup>291</sup>, [Text](#)<sup>291</sup>, [CDATA](#)<sup>292</sup>, [Comment](#)<sup>292</sup>, [Processing Instruction](#)<sup>292</sup>) in XML documents, (ii) [DOCTYPE](#)<sup>292</sup> declarations and [external DTD declarations](#)<sup>293</sup> in XML documents, and (iii) DTD declarations ([ELEMENT](#)<sup>293</sup>, [ATTLIST](#)<sup>294</sup>, [ENTITY](#)<sup>294</sup>, and [NOTATION](#)<sup>294</sup>) in DTD documents and internal DTD declarations of XML documents.

### 15.6.2.1 Append | Attribute

The **Append | Attribute**  command is available in [Grid View](#)<sup>55</sup> only, and appends a new attribute.

### 15.6.2.2 Append | Element

The **Append | Element**  command is available in [Grid View](#)<sup>55</sup> only, and appends an element node after the last sibling element of the selected element. If an attribute node is selected, then the element node is appended after the last child of the selected attribute's parent element.

### 15.6.2.3 Append | Text

The **Append | Text**  command is available in [Grid View](#)<sup>55</sup> only, and appends a text block after the last sibling element of the selected element. If an attribute node is selected, then the text block is appended after the last child of the selected attribute's parent element.

### 15.6.2.4 Append | CData

The **Append | CData**  command is available in [Grid View](#) <sup>55</sup> only, and appends a CDATA node after the last sibling of any selected node other than an attribute node. If an attribute node is selected, then the CDATA section is appended after the last child of the selected attribute's parent element.

### 15.6.2.5 Append | Comment

The **Append | Comment**  command is available in [Grid View](#) <sup>55</sup> only, and appends a comment node after the last sibling of any selected node other than an attribute node. If an attribute node is selected, then the comment node is appended after the last child of the selected attribute's parent element.

### 15.6.2.6 Append | XML

The **Append | XML**  command is available in [Grid View](#) <sup>55</sup> only, and inserts a row for the XML declaration as the first item in a document. You must insert the child attributes of the XML declaration and the values of this attribute. An XML declaration must look something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
```

**Note:** Since an XML document may only contain one XML declaration at the very top of the file, this command should only be used with the topmost row selected and if an XML declaration does not already exist.

### 15.6.2.7 Append | Processing Instruction

The **Append | Processing Instruction**  command is available in [Grid View](#) <sup>28</sup> only, and appends a processing instruction node after the last sibling of any selected node other than an attribute node. If an attribute node is selected, then the processing instruction node is appended after the last child of the selected attribute's parent element.

### 15.6.2.8 Append | DOCTYPE

The **Append | DOCTYPE**  command is available in the [Grid View](#) <sup>55</sup> of an XML file when a top-level node is selected. It appends a DOCTYPE declaration at the top of the XML document. You must enter the name of the DOCTYPE, and this name must be the same as the name of the document element.



After you have entered the name of the DOCTYPE, you can enter the declarations you wish to use in the internal DTD subset.

**Note:** A DOCTYPE declaration may only appear between the XML declaration and the XML document element.

### 15.6.2.9 Append | ExternalID

The **Append | ExternalID**  command is available when a child item of the **DOCTYPE** <sup>288</sup> declaration in an XML file is selected in **Grid View** <sup>55</sup>. This command inserts a Grid View row for an **external identifier** <sup>289</sup> (PUBLIC or SYSTEM). You must enter the type of identifier and its value.



The Text View corresponding to the screenshot of the Grid View shown above looks like this:

```
<!DOCTYPE OrgChart SYSTEM "orgchart.dtd" [
  <!ELEMENT name (#PCDATA)>
]>
```

**Note:** A row for ExternalID can be **added as a child** <sup>296</sup> when the DOCTYPE item is selected, or it can be **inserted** <sup>288</sup> or appended when one of the child items of the DOCTYPE item is selected, for example, the ELEMENT declaration `name` in the example above.

### 15.6.2.10 Append | ELEMENT

The **Append | ELEMENT**  command is available in **Grid View** <sup>55</sup> only, for DTD documents or when an item in the **DOCTYPE** <sup>288</sup> declaration of an XML document is selected. It appends an ELEMENT declaration to the list of declarations.

### 15.6.2.11 Append | ATTLIST

The **Append | ATTLIST**  command is available in [Grid View](#) <sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#) <sup>288</sup> declaration of an XML document is selected. It appends an ATTLIST declaration to the list of declarations.

### 15.6.2.12 Append | ENTITY

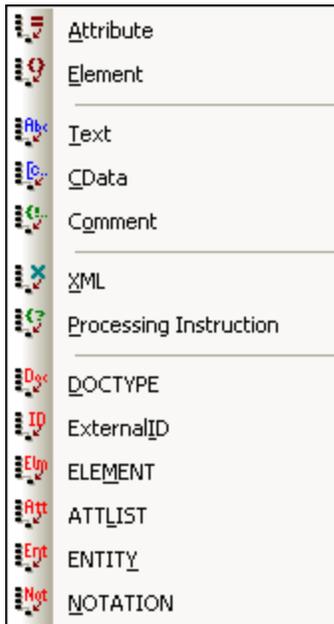
The **Append | ENTITY**  command is available in [Grid View](#) <sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#) <sup>288</sup> declaration of an XML document is selected. It appends an ENTITY declaration to the list of declarations.

### 15.6.2.13 Append | NOTATION

The **Append | NOTATION**  command is available in [Grid View](#) <sup>55</sup> only, for DTD documents or when an item in the [DOCTYPE](#) <sup>288</sup> declaration of an XML document is selected. It appends a NOTATION declaration to the list of declarations.

## 15.6.3 Add Child

Placing the cursor over the **Add Child** command pops up a submenu which contains the items that can be inserted for a given selection. The submenu items of the **Add Child** command are enabled only in [Grid View](#) <sup>55</sup>. Items that cannot be inserted for the current selection are grayed out.



The commands of the **Add Child** sub-menu can be used to add child nodes for (i) the [XML declaration](#)<sup>296</sup> and node types ([Attribute](#)<sup>295</sup>, [Element](#)<sup>295</sup>, [Text](#)<sup>295</sup>, [CDATA](#)<sup>296</sup>, [Comment](#)<sup>296</sup>, [Processing Instruction](#)<sup>296</sup>) in XML documents, (ii) [DOCTYPE](#)<sup>296</sup> declarations and [external DTD declarations](#)<sup>296</sup> in XML documents, and (iii) DTD declarations ([ELEMENT](#)<sup>297</sup>, [ATTLIST](#)<sup>297</sup>, [ENTITY](#)<sup>297</sup>, and [NOTATION](#)<sup>297</sup>) in DTD documents and internal DTD declarations of XML documents.

### 15.6.3.1 Add Child | Attribute

The **Add Child | Attribute**  command is available in [Grid View](#)<sup>55</sup> only and when an element node is selected. It inserts a new attribute as a child of the selected element node.

### 15.6.3.2 Add Child | Element

The **Add Child | Element**  command is available in [Grid View](#)<sup>55</sup> only. It inserts a new element as a child of the selected node.

### 15.6.3.3 Add Child | Text

The **Add Child | Text**  command is available in [Grid View](#)<sup>55</sup> only, and inserts new text content as a child of the selected item.

### 15.6.3.4 Add Child | CData

The **Add Child | CData**  command is available in [Grid View](#) <sup>55</sup> only, and inserts a new CDATA section as a child of the selected item.

### 15.6.3.5 Add Child | Comment

The **Add Child | Comment**  command is available in [Grid View](#) <sup>55</sup> only, and inserts a new Comment node as a child of the selected item.

### 15.6.3.6 Add Child | XML

The **Add Child | XML**  command is available in [Grid View](#) <sup>55</sup> only and when the file is **empty**. It inserts a row for the XML declaration. You must insert the child attributes of the XML declaration and the values of this attribute. An XML declaration must look something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
```

### 15.6.3.7 Add Child | Processing Instruction

The **Add Child | Processing Instruction**  command is available in [Grid View](#) <sup>28</sup> only and inserts a new Processing Instruction (PI) as a child of the selected item.

### 15.6.3.8 Add Child | DOCTYPE

The **Add Child | DOCTYPE** command  is available in the [Grid View](#) <sup>55</sup> of an **empty** document. It inserts a DOCTYPE declaration in an XML document. The DOCTYPE declaration can be used to declare an internal DTD subset.

### 15.6.3.9 Add Child | ExternalID

The **Add Child | ExternalID**  command is available when the [DOCTYPE](#) <sup>288</sup> declaration in an XML file is selected in [Grid View](#) <sup>55</sup>. This command inserts a Grid View row for an [external identifier](#) <sup>289</sup> (PUBLIC or SYSTEM). You must enter the type of identifier and its value.



The Text View corresponding to the screenshot of the Grid View shown above looks like this:

```
<!DOCTYPE OrgChart SYSTEM "orgchart.dtd" [
  <!ELEMENT name (#PCDATA)>
]>
```

**Note:** A row for ExternalID can be added as a child when the DOCTYPE item is selected, or it can be [inserted](#)<sup>288</sup> or [appended](#)<sup>293</sup> when one of the child items of the DOCTYPE item is selected, for example, the ELEMENT declaration `name` in the example above.

### 15.6.3.10 Add Child | ELEMENT

The **Add Child | ELEMENT**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It appends an ELEMENT declaration to the list of declarations.

### 15.6.3.11 Add Child | ATTLIST

The **Add Child | ATTLIST**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It appends an ATTLIST declaration to the list of declarations.

### 15.6.3.12 Add Child | ENTITY

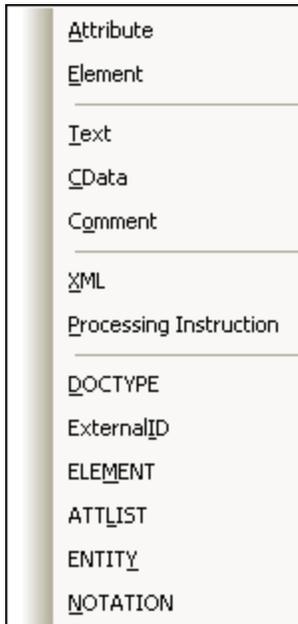
The **Add Child | ENTITY**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It appends an ENTITY declaration to the list of declarations.

### 15.6.3.13 Add Child | NOTATION

The **Add Child | NOTATION**  command is available in [Grid View](#)<sup>55</sup> only, for DTD documents or when the [DOCTYPE](#)<sup>288</sup> declaration of an XML document is selected. It appends a NOTATION declaration to the list of declarations.

## 15.6.4 Convert to

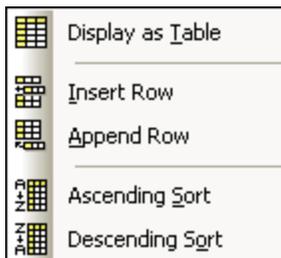
The **Convert to** command converts a selected item in [Grid View](#)<sup>55</sup> to a different item type. This operation is available only in Grid View on individual items that do not contain any child node. Placing the cursor over the **Convert to** command pops up a submenu which contains the items to which the selected item can be converted.



If the operation would result in a loss of data (for example, converting an attribute to a comment would result in a loss of the attribute name), a warning dialog box will appear.

## 15.6.5 Table

The **Table** menu command can be used only in [Grid View](#)<sup>55</sup>. It pops out a sub-menu with commands that enable you to edit the selection as a table.



### 15.6.5.1 Display as Table

The **Display as Table**  command allows you to switch between the standard [Grid View](#) <sup>55</sup> and [Table View](#) <sup>57</sup> of an element in the document.

### 15.6.5.2 Insert Row

The **Insert Row**  command is enabled in [Table View](#) <sup>57</sup> when a row or cell is selected. It inserts a new row before the selected row. The new row corresponds to an occurrence of the table element. Mandatory child elements are created for the new element.

### 15.6.5.3 Append Row

The **Append Row**  command is enabled in [Table View](#) <sup>57</sup> when a row or cell is selected. It appends a new row after the last row of the table. The new row corresponds to an occurrence of the table element. Mandatory child elements are created for the new element.

### 15.6.5.4 Ascending Sort

The **Ascending Sort**  command is enabled in [Table View](#) <sup>57</sup> when a column or cell is selected. It sorts the table on the basis of the contents of the selected column, in ascending order. DiffDog tries to automatically determine what kind of data is used in the column, and sorts on alphabetic or numeric order, as required. In case of uncertainty, you will be prompted for the sort method to use.

### 15.6.5.5 Descending Sort

The **Descending Sort**  command is enabled in [Table View](#) <sup>57</sup> when a column or cell is selected. It sorts the table on the basis of the contents of the selected column, in descending order. DiffDog tries to automatically determine what kind of data is used in the column, and sorts on alphabetic or numeric order, as required. In case of uncertainty, you will be prompted for the sort method to use.

## 15.6.6 Move Left

The **Move Left**  command is available in [Grid View](#) <sup>55</sup> only. It moves the selected node to the left by one level, thereby changing a child element into a sibling of its parent.

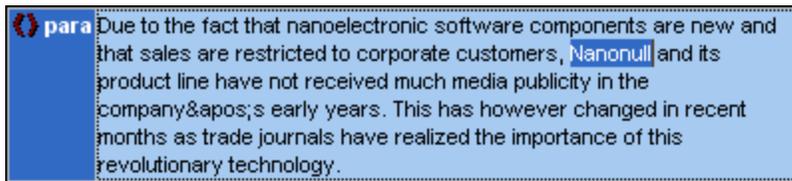
## 15.6.7 Move Right

The **Move Right**  command is available in [Grid View](#) <sup>55</sup> only. It moves the selected node to the right by one level, thereby turning it into a child element of the preceding sibling element.

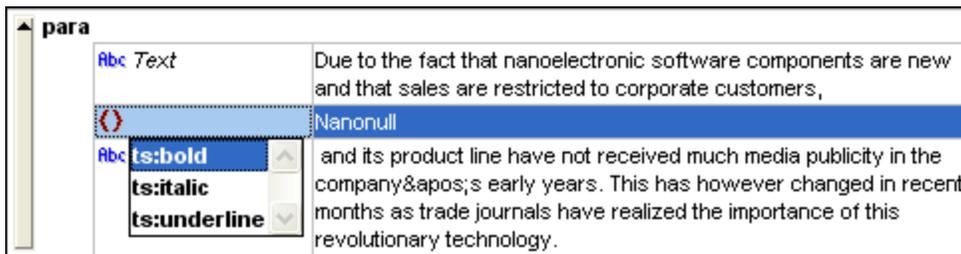
## 15.6.8 Enclose in Element

The **Enclose in Element** command is enabled in [Grid View](#) <sup>55</sup> only. It encloses a selected text range in a new element. The new element is created inline around the selected text. If you are editing a document based on a Schema or DTD, you will automatically be presented with a list of valid choices for the name of the element in which the text is to be enclosed.

For example, in the screenshot below, the text Nanonull in the para element is highlighted.



When you select the command **Grid View | Enclose in Element**, the text "Nanonull" is enclosed in a newly created inline element and a list appears offering a choice for the name of the element. These elements are defined in the schema as children of para.



The selection you make will be the name of the new element. Alternatively, you can enter some other name for the element.

## 15.7 XML Menu

The **XML** menu contains commands that relate to XML documents opened in File Comparison windows.

	Check <u>W</u> ell-Formedness	F7
	<u>V</u> alidate	F8

### 15.7.1 Check Well-Formedness

The **Check Well-Formedness**  ( **F7** ) command checks the active document for well-formedness by the definitions of the XML 1.0 specification. This command is available in both the [Text View](#) <sup>51</sup> and [Grid View](#) <sup>55</sup> of File Comparison windows. On running the well-formedness check, a message box displays the result of the check: whether successful or not.

**Note:** This command is available for all files with extensions that have been set as XML-conformant in the [File Types](#) <sup>264</sup> tab of the DiffDog Options dialog box.

### 15.7.2 Validate

The **Validate**  ( **F8** ) command is available in both the [Text View](#) <sup>51</sup> and [Grid View](#) <sup>55</sup> of File Comparison windows. It enables you to validate the active XML document against a DTD, XML Schema, or other schema. The associated schema must be declared in the file being validated. On validating the document, a message box displays the result of the validation: that is, whether successful or not.

**Note:** This command is available for all files with extensions that have been set as XML-conformant in the [File Types](#) <sup>264</sup> tab of the DiffDog Options dialog box.

## 15.8 Diff and Merge Menu

The **Diff and Merge Menu** lists commands to manage [file](#)<sup>26</sup>, [XML Schema](#)<sup>101</sup>, [directory](#)<sup>71</sup>, [Microsoft Word document](#)<sup>90</sup>, [database data](#)<sup>119</sup>, and [database schema](#)<sup>144</sup> comparisons. Depending on the active comparison window, commands to set the [comparison mode](#)<sup>21</sup>, [navigate](#)<sup>241</sup> compared documents in the comparison windows and [merge](#)<sup>242</sup> differences in them, as well as commands to [synchronize directories](#)<sup>84</sup>, generate merge scripts, or to map, expand and collapse database items are also available in this menu.

Please note that the content of the **Diff and Merge** menu changes dynamically, depending on the type of comparison.

### Diff and Merge general settings

This subsection describes general commands available in the **Diff and Merge** menu. To find out more about commands specific to comparison types, see [Directory Comparison Commands](#)<sup>304</sup> and [Database Comparison Commands](#)<sup>304</sup>.

#### Compare as

The **Textual Comparison Only**  command changes the comparison mode of a file or directory comparison to textual comparison. Note that this command is not available if the [Quick Comparison](#)<sup>304</sup> mode is active. To change to the Text Comparison mode in that case, you have to deactivate the Quick Comparison mode first.

The **Compare as XML**  command changes the comparison mode of a file or directory comparison to XML comparison. Note that this command is not available if the [Quick Comparison](#)<sup>304</sup> mode is active. To change to the XML Comparison mode in that case, you have to deactivate the Quick Comparison mode first.

The **Compare as Binary**  command changes the comparison mode of a file or directory comparison to binary comparison. Note that this command is not available if the [Quick Comparison](#)<sup>304</sup> mode is active. To change to the Binary Comparison mode in that case, you have to deactivate the Quick Comparison mode first.

The **Compare According to File Extension Settings**  command changes the comparison mode of a file or directory comparison dynamically according to the settings on the [File types](#)<sup>264</sup> tab of the DiffDog Options dialog box. Note that this command is not available if the [Quick Comparison](#)<sup>304</sup> mode is active. To change to the File Extension mode in that case, you have to deactivate the Quick Comparison mode first.

#### Start comparison

The **Start Comparison**  ( **F5** ) command [starts comparison](#)<sup>248</sup> for the active comparison window.

#### Next/last

The **Next Difference**  ( **Alt+Down** ) command selects the next difference as the [current difference](#)<sup>241</sup>.

The **Previous Difference**  ( **Alt+Up** ) command selects the previous difference as the [current difference](#)<sup>241</sup>.

The **Last Difference**  ( **Alt+End** ) command selects the last difference as the [current difference](#)<sup>241</sup>.

The **First Difference**  ( **Alt+Home** ) command selects the first difference as the [current difference](#)<sup>241</sup>.

The **Next Conflict**  command jumps to the next conflict. This command is applicable for three-way comparisons, see [Three-Way Comparisons](#) <sup>34</sup>.

The **Previous Conflict**  command jumps to the previous conflict. This command is applicable for three-way comparisons, see [Three-Way Comparisons](#) <sup>34</sup>.

#### *Current difference*

The **Display Current Difference**  ( **Ctrl+Enter** ) command scrolls through the document to display the [current difference](#) <sup>241</sup>.

The **Make Current Difference**  ( **Alt+Enter** ) command makes the selected difference the current difference, and sets it as the difference from which to navigate.

#### *Copy*

The **Copy from Left to Right**  ( **Alt+Right** ) command copies text of the selected difference from the document in the left pane to the document in the right pane.

The **Copy from Right to Left**  ( **Alt+Left** ) command copies text of the selected difference from the document in the right pane to the document in the left pane.

The **Copy from Left to Middle**  command is applicable when two versions of the same file are compared against a base version from which both files originate, see [Three-Way Comparisons](#) <sup>34</sup>. It merges the current difference from the left pane into the middle pane, where "middle" is the base version.

The **Copy from Middle to Left**  command is applicable when two versions of the same file are compared against a base version from which both files originate, see [Three-Way Comparisons](#) <sup>34</sup>. It merges the current difference from the middle pane into the left pane.

The **Copy from Middle to Right**  command is applicable when two versions of the same file are compared against a base version from which both files originate, see [Three-Way Comparisons](#) <sup>34</sup>. It merges the current difference from the middle pane into the right pane, where "middle" is the base version.

The **Copy from Right to Middle**  command is applicable when two versions of the same file are compared against a base version from which both files originate, see [Three-Way Comparisons](#) <sup>34</sup>. It merges the current difference from the right pane into the middle pane, where "middle" is the base version.

#### *Other options*

When the **Show Options Before Comparison**  command is toggled on for a Comparison Window, the Comparison Options dialog box is displayed each time a comparison is made in that window. Note that the Comparison Options dialog box is not displayed before comparisons made dynamically by DiffDog while you edit a document.

When toggled on, the **Autostart Comparison**  command automatically starts a comparison when both files or both directories are selected and opened in the comparison window. If this option is toggled off, then a comparison (file or directory) must be explicitly started (see the **Start Comparison** command above).

The **Compare while Editing**  command is a toggle to compare or not compare documents in File Comparison windows while editing. If toggled on, differences are highlighted as you edit. If toggled off,

highlighting of differences is turned off in both documents as soon as you start typing in either document; to highlight differences after editing, you must run a comparison (see the **Start Comparison** command above).

The **Support Recently Compared Pairs**  command is a toggle that switches on and off the option of suggesting recently compared files or directories each time a file or directory is selected in one pane.

## 15.8.1 Directory Comparison Commands

This topic describes menu commands that are specific to directory comparisons.

The **Show files in ZIP archives**  option is deactivated by default, therefore only the file itself will be shown in directory comparisons. To be able to expand the file and view its content you must activate the **Show files in ZIP archives** option.

The **Compare only Size and Modification Date**  command compares files within directories and subdirectories by size and date modified. This mode is either toggled on or off. When toggled off, the four [file comparison modes](#) <sup>21</sup> become available. Selecting one of the file comparison modes causes directories to be compared in terms of their contents as text, XML, or binary files.

The **Synchronize Directories**  command opens the [Synchronize directories](#) <sup>84</sup> dialog box and populates it with all non-equal files that are present in at least one of the directories.

The **Synchronize Selected Directory**  command is available when the following conditions are true:

- At least one of the compared directories contains a sub-directory which is selected.
- The selected sub-directory contains one or more non-equal files.

The command opens the [Synchronize directories](#) <sup>84</sup> dialog box and populates it with all non-equal files that are present in the selected sub-directory.

## 15.8.2 Database Comparison Commands

This topic describes menu commands that are specific to database comparisons.

The **Diff and Merge** menu for database data comparisons lists commands to (i) set comparison modes, (ii) start a comparison, (iii) navigate compared documents and display differences in Database Data Comparison windows, (iv) merge differences in them, (v) show results, (vi) sort tables (vii) map and unmap or, (viii) expand or collapse items, (ix) enable Autolayout, and (x) show the comparison options before comparison. For more information, see [Comparing Database Data](#) <sup>119</sup>.

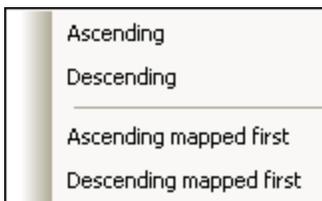
The **Compare as String**  command changes the comparison mode of a database data comparison to string comparison.

The **Compare Native**  command changes the comparison mode of a database data comparison to native comparison.

The **Compare XML Columns Native**  command changes the comparison mode for XML columns to native XML comparison. Note that this command is only available if the comparison mode of a database data comparison is set to [native comparison](#) <sup>21</sup>.

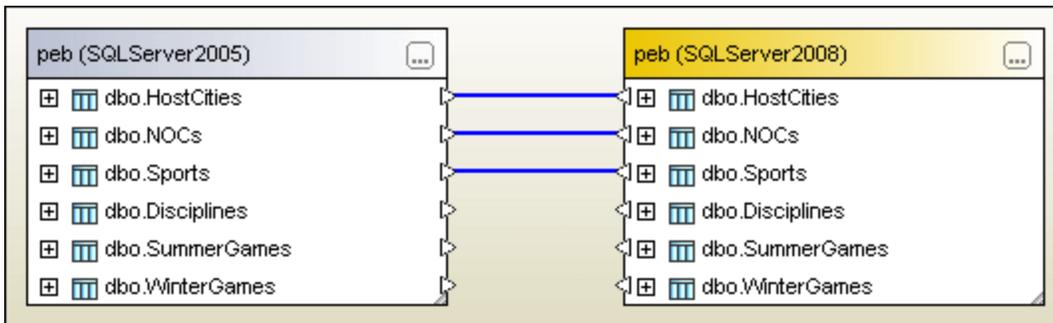
The **Show Results** command opens the Database Data Comparison Result window for (i) the selected table or (ii) all tables if no table is selected. If some of the tables do not contain differences or if you select a table with equal data in both databases, DiffDog displays a message box and you can still abort the operation.

The **Sort Tables** sub-menu of the **Diff and Merge** menu provides options for sorting the tables that are included in the components of a database comparison. The commands always affect both sides of the comparison (i.e., you cannot sort just one component).

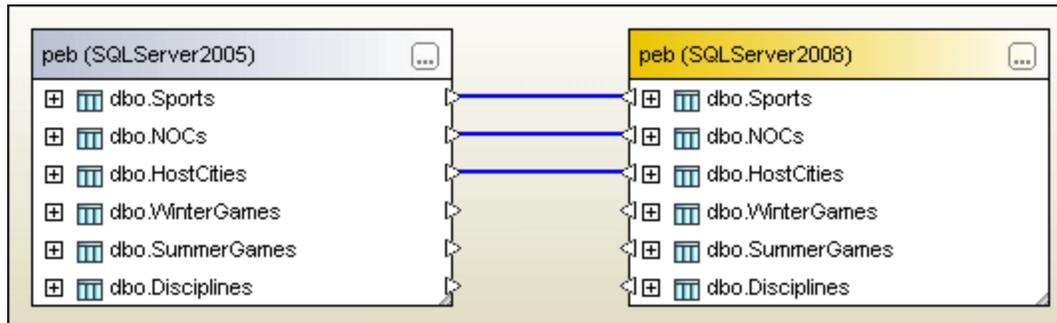


The **Ascending** command sorts all tables in ascending order. The **Descending** command sorts all tables in descending order.

The **Ascending Mapped First** command sorts all tables and displays the mapped tables in ascending order first (see screenshot below).



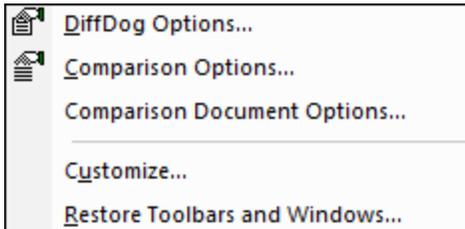
The **Descending Mapped First** command sorts all tables and displays the mapped tables in descending order first (see screenshot below).



The **Map items** command tries to map all tables in the Database Data Comparison window using the settings defined in the [Database comparison](#) <sup>261</sup> tab of the DiffDog Options dialog box.

## 15.9 Tools Menu

The **Tools Menu** contains commands that enable you to set the [application](#)<sup>307</sup> and [comparison](#)<sup>307</sup> options and to [customize](#)<sup>308</sup> the appearance of DiffDog.



### 15.9.1 DiffDog Options

The **DiffDog Options** dialog box enables you to define settings for the [application](#)<sup>253</sup>, [file comparison](#)<sup>255</sup>, [directory comparison](#)<sup>257</sup>, [database comparison](#)<sup>261</sup>, [database data result view](#)<sup>263</sup>, and [Java](#)<sup>268</sup>. You can also define [network proxy settings](#)<sup>266</sup> and specify [file types](#)<sup>264</sup> that can be compared.

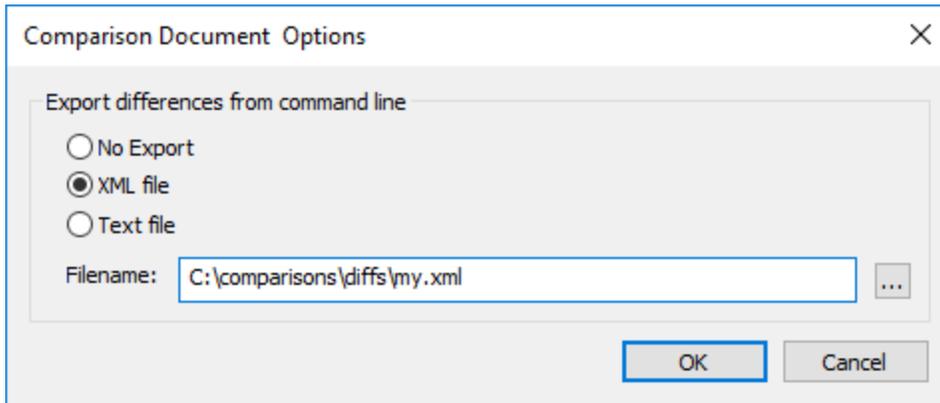
### 15.9.2 Comparison Options

The **Comparison Options** dialog box allows you to define [text comparison options](#)<sup>40</sup> and [XML comparison options](#)<sup>41</sup>.

### 15.9.3 Comparison Document Options

This command is applicable if you have licensed DiffDog Server and intend to run with it comparison files (.filedif and .dirdif) created with DiffDog, see also [Running comparisons with DiffDog Server](#)<sup>246</sup>.

When you run .filedif or .dirdif files with DiffDog Server, you might want to optionally redirect the report with the comparison results to an XML or text file. The dialog below lets you specify the format and path of the output report.

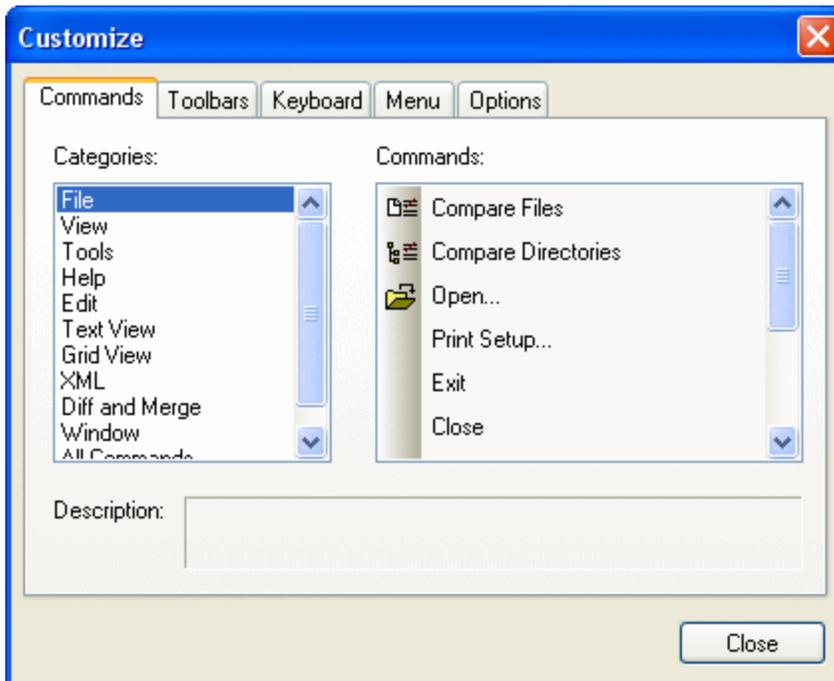


## 15.9.4 Customize

The **Customize** command lets you customize DiffDog to suit your personal needs.

### 15.9.4.1 Commands

The **Commands** tab allows you customize your menus or toolbars.



**To add a command to a toolbar or menu:**

1. Select the menu option **Tools | Customize**. The Customize dialog box appears.
2. Select the All Commands category in the Categories list box. The available commands appear in the Commands list box.
3. Click on a command in the Commands list box and drag it to an existing menu or toolbar. An **I**-beam appears when you place the cursor over a valid position to drop the command.
4. Release the mouse button at the position you want to insert the command.
  - A small button appears at the tip of mouse pointer when you drag a command. The "x" below the pointer means that the command cannot be dropped at the current cursor position.
  - The "x" disappears whenever you can drop the command (over a tool bar or menu).
  - Placing the cursor over a menu when dragging opens it, allowing you to insert the command anywhere in the menu.
  - Commands can be placed in menus or toolbars. If you created your own toolbar you can populate it with your own commands/icons.

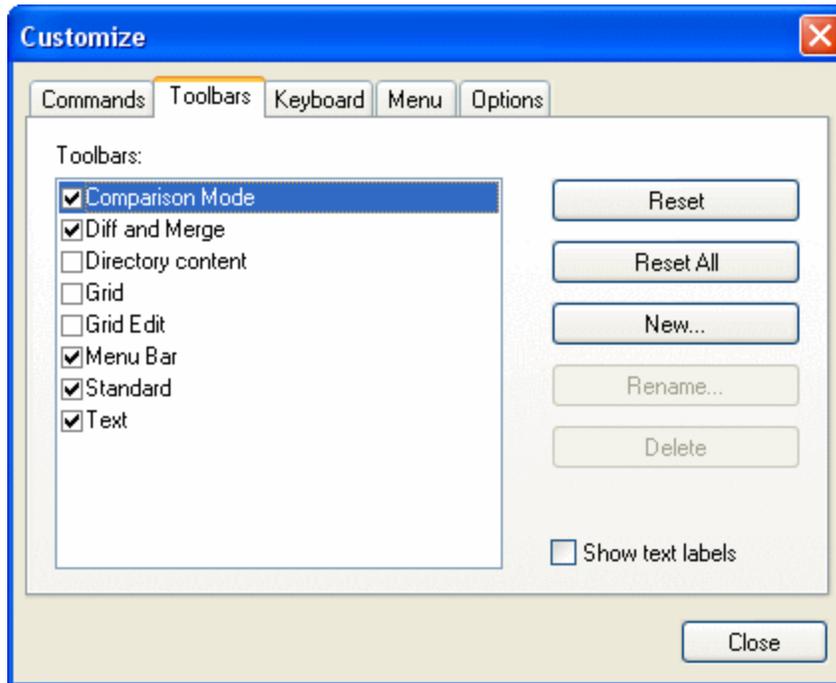
**Note:** You can also edit the commands in the [context menus](#)<sup>315</sup> (right-click anywhere to open the context menu), using the same method. Click the Menu tab and then select the specific context menu available in the Context Menus combo box.

## 15.9.4.2 Toolbars

The **Toolbars** tab allows you to activate or deactivate specific toolbars, as well as create your own specialized ones.

DiffDog toolbars contain symbols for the most frequently used menu commands. For each symbol you get a brief "tool tip" explanation when the mouse cursor is directly over the item and the status bar shows a more detailed description of the command.

You can drag the toolbars from their standard position to any location on the screen, where they appear as a floating window. Alternatively, you can also dock them to the left or right edge of the main window.



### Show text labels

This option displays explanatory text below toolbar icons when activated. You can activate or deactivate this option for each toolbar individually.

### To activate or deactivate a toolbar:

- Click the check box to activate (or deactivate) the specific toolbar.

### To create a new toolbar:

1. Click the **New...** button, and give the toolbar a name in the Toolbar Name dialog box that appears.
2. Drag commands to the toolbar in the [Commands](#)<sup>308</sup> tab of the Customize dialog box.

### To reset the Menu Bar:

1. Click the Menu Bar entry.
2. Click the **Reset** button, to reset the menu commands to the state they were in when DiffDog was installed.

**To reset all toolbar and menu commands:**

1. Click the **Reset All** button to reset all the toolbar commands to the state they were when the program was installed. A prompt appears stating that all toolbars and menus will be reset.
2. Click **Yes** to confirm the reset.

**To change a toolbar name:**

- Click the **Rename...** button to edit the name of the toolbar.

This option is available only for user-defined toolbars.

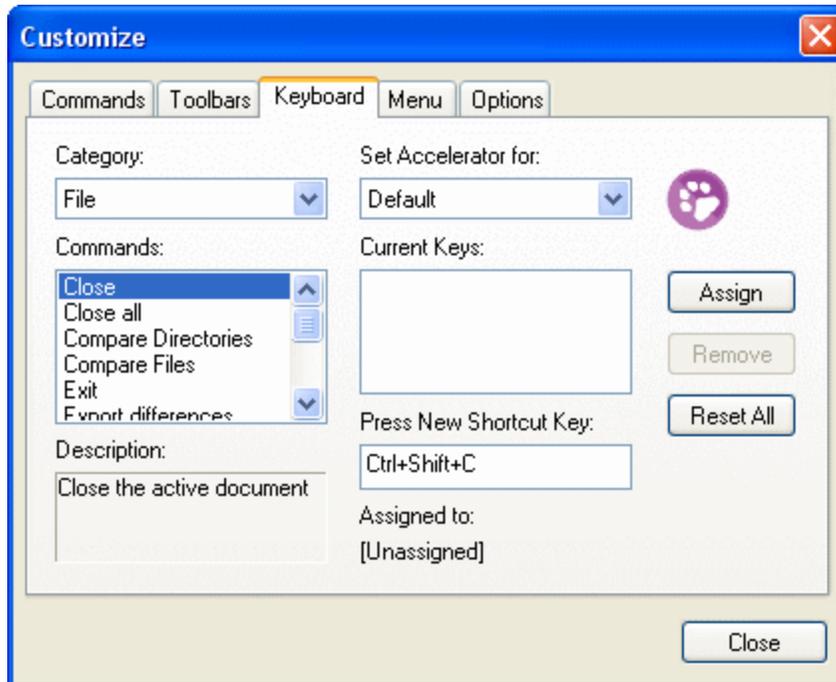
**To delete a toolbar:**

1. Select the toolbar you want to delete in the Toolbars list box.
2. Click the **Delete** button. A prompt appears, asking if you really want to delete the toolbar.
3. Click **Yes** to confirm the deletion.

This option is available only for user-defined toolbars.

### 15.9.4.3 Keyboard

The **Keyboard** tab allows you to define (or change) keyboard shortcuts for any DiffDog command.



#### To assign a new Shortcut to a command:

1. Select a command menu from the **Category** list, for example, "File". (Alternatively, select **All Commands** to view commands from all menus).
2. Select the command to which you want to assign a new shortcut from the **Commands** list.
3. Click in the **Press New Shortcut Key** text box, and press the shortcut keys that are to activate the command. The shortcuts appear immediately in the text box. If the shortcut was assigned previously, then that function is displayed below the text box. (To clear this text box, press any of the control keys, **CTRL**, **ALT** or **SHIFT**).
4. Click **Assign**. The shortcut now appears in the Current Keys list box.

**Note:** The only supported value in the **Set Accelerator for** drop-down list is **Default**.

#### To de-assign or delete a shortcut:

1. In the **Current Keys** list, click the shortcut you want to delete.
2. Click **Remove**.
3. Click **Close** to confirm.

**To reset all shortcut keys:**

1. Click the **Reset All** button to reset all the shortcut keys to the state they were when the program was installed. A message box appears stating that all keyboard assignments will be reset.
2. Click **Yes** to confirm the reset.

**Currently assigned keyboard shortcuts**

Hotkeys by key	
Ctrl+C	Copy
Ctrl+F	Find
Ctrl+G	Go to Line/Char
Ctrl+H	Replace
Ctrl+O	Open
Ctrl+P	Print
Ctrl+S	Save
Ctrl+V	Paste
Ctrl+X	Cut
Ctrl+Z	Undo
F1	Table Of Contents
F3	Find Next
F5	Start Comparison
F7	Check Well-Formedness
F8	Validate
Alt+Enter	Make Current Difference
Ctrl+Enter	Display Current Difference
Delete	Delete
Shift+Delete	Cut

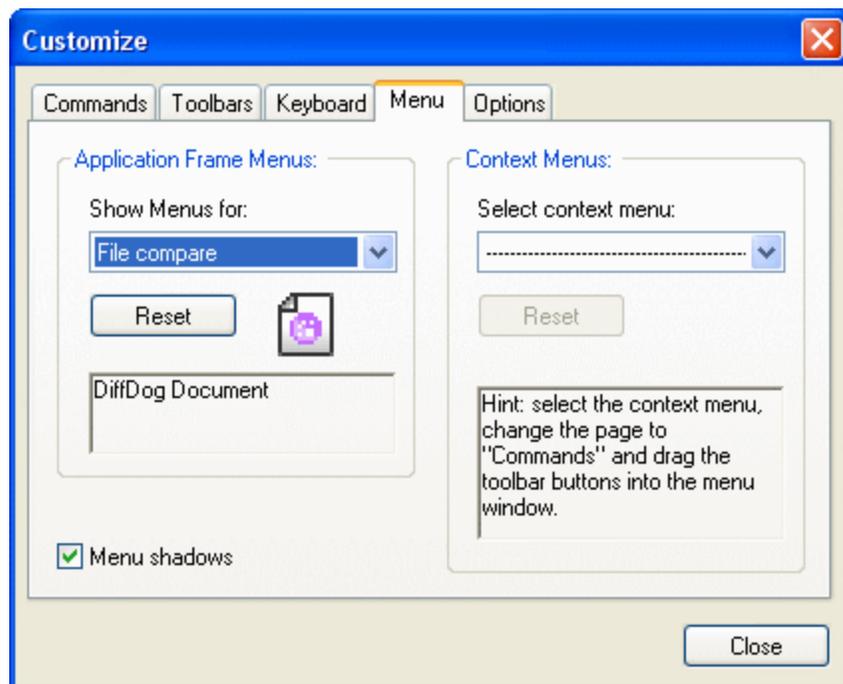
Hotkeys by key	
Alt+Backspace	Undo
Ctrl+Insert	Copy
Shift+Insert	Paste
Alt+Down	Next Difference
Alt+Up	Previous Difference
Alt+Home	First Difference
Alt+End	Last Difference
Alt+Left	Copy from Right to Left
Alt+Right	Copy from Left to Right

Hotkeys by function		
Check Well-Formedness	F7	
Copy	Ctrl+C	Ctrl+Insert
Copy from Left to Right	Alt+Right	
Copy from Right to Left	Alt+Left	
Cut	Ctrl+X	Shift+Delete
Delete	Delete	
Display Current Difference	Ctrl+Enter	
Find	Ctrl+F	
Find Next	F3	
First Difference	Alt+Home	
Go to Line/Char	Ctrl+G	
Last Difference	Alt+End	
Make Current Difference	Alt+Enter	
Next Difference	Alt+Down	

Hotkeys by function		
Open	Ctrl+O	
Paste	Ctrl+V	Shift+Insert
Previous Difference	Alt+Up	
Print	Ctrl+P	
Replace	Ctrl+H	
Save	Ctrl+S	
Start Comparison	F5	
Table Of Contents	F1	
Undo	Ctrl+Z	Alt+Backspace
Validate	F8	

### 15.9.4.4 Menu

The **Menu** tab allows you to customize menu bars as well as context menus.



## Customizing menus

The **Default Menu** bar is the menu bar that is displayed when no document is open in the main window. Other menu bars are as follows:

- The **File compare** menu bar is the menu bar visible when at least one File Comparison window has been opened and is active.
- The **Directory compare** menu bar is the menu bar visible when at least one Directory Comparison window has been opened and is active.
- The **Database Data Comparison** menu bar is the menu bar visible when at least one Database Data Comparison window has been opened and is active.
- The **Database Data compare result** menu bar is the menu bar visible when at least one Database Data Comparison Result window has been opened and is active.
- The **Database Schema Comparison** menu bar is the menu bar visible when at least one Database Schema Comparison window has been opened and is active.
- The **XML Schema Comparison** menu bar is the menu bar visible when at least one XML Schema Comparison window has been opened and is active.
- The **Word compare** menu bar is the menu bar visible when at least one Word Comparison window has been opened and is active.

To customize a menu bar, select it from the **Show Menus For** drop-down list. Then switch to the **Commands** tab and drag commands from the **Commands** list box to the menu bar or into any of the menus.

## Deleting commands from menus and resetting the menu bars

To delete an entire menu or a command inside a menu, do the following:

1. Select a menu bar from the **Show Menus for** drop-down list.
2. With the Customize dialog open, select (i) the menu you want to delete from the application's menu bar, or (ii) the command you want to delete from one of these menus.
3. Either (i) drag the menu from the menu bar or the menu command from the menu, or (ii) right-click the menu or menu command and select **Delete**.

You can reset any menu bar to its original installation state by selecting it from the **Show Menus For** drop-down list and then clicking the **Reset** button.

## Customizing the application's context menus

Context menus are the menus that appear when you right-click certain objects in the application's interface. Each of these context menus can be customized by doing the following:

1. Select the context menu from the **Select context menu** drop-down list. This pops up the context menu.
2. Click the **Commands** tab.
3. Drag a command from the **Commands** list box into the context menu.
4. To delete a command from the context menu, right-click that command in the context menu, and select **Delete**. Alternatively, drag the command out of the context menu.

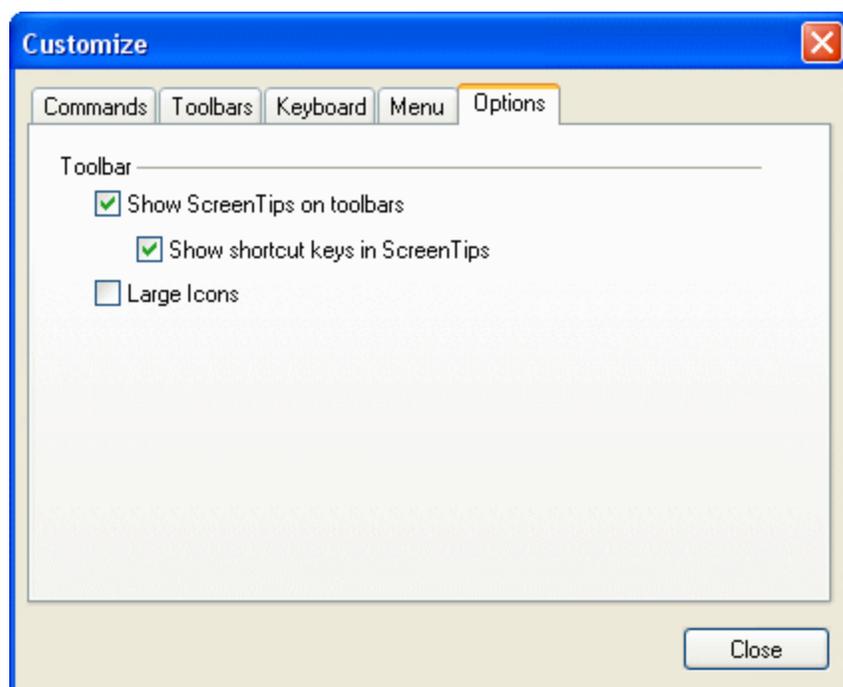
You can reset any context menu to its original installation state by selecting it in the **Select context menu** drop-down list and then clicking the **Reset** button.

## Menu shadows

Select the **Menu shadows** check box to give all menus shadows.

### 15.9.4.5 Options

The **Options** tab allows you to set general environment settings.



## Toolbar

When active, the **Show ScreenTips on toolbars** check box displays a popup when the mouse pointer is placed over an icon in any of the icon bars. The popup contains a short description of the icon function, as well as the associated keyboard shortcut, if one has been assigned.

The **Show shortcut keys in ScreenTips** check box allows you to decide whether or not you want to have the shortcut displayed in the tooltip.

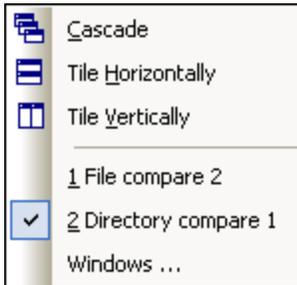
When active, the **Large icons** check box switches between the standard size icons, and larger versions of the icons.

## 15.9.5 Restore Toolbars and Windows

This menu command resets the toolbars, entry helper windows, docked windows etc. to their defaults. DiffDog needs to be restarted for the changes to take effect.

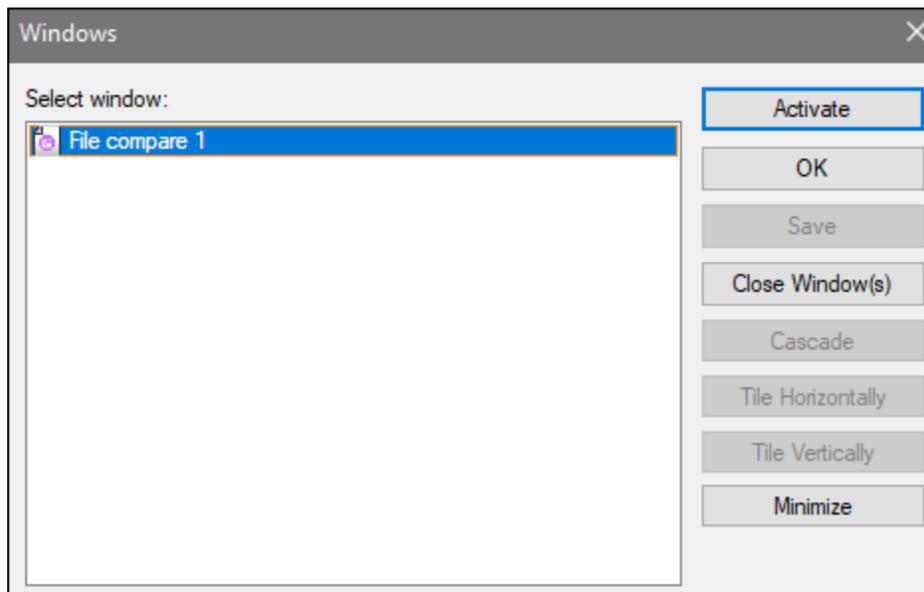
## 15.10 Window Menu

The **Windows** menu provides commands to arrange and organize the display of open windows. You can cascade open windows, tile them horizontally or vertically, or arrange document icons once you have minimized them. You can also switch to an open document window directly from the menu.



### Windows

Clicking the **Windows** command opens the **Windows** dialog box (see screenshot below), which displays a list of all open windows and provides commands that can be applied to the selected window(s). You can select a window by clicking on its name.



The **Cascade** and **Tile** options are available only when more than one window is selected. The **Activate** option is enabled only when a single window is selected.

**Note:** To exit the **Windows** dialog box, click **OK**; do **not** click the **Close Window(s)** button in the dialog box. The **Close Window(s)** button closes the window(s) currently selected in the **Windows** dialog box.

## 15.11 Help Menu

### ☐ Table of Contents

Opens the onscreen help manual of DiffDog with the Table of Contents displayed in the left-hand-side pane of the Help window. The Table of Contents provides an overview of the entire Help document. Clicking an entry in the Table of Contents takes you to that topic.

### ☐ Index

Opens the onscreen help manual of DiffDog with the Keyword Index displayed in the left-hand-side pane of the Help window. The index lists keywords and lets you navigate to a topic by double-clicking the keyword. If a keyword is linked to more than one topic, a list of these topics is displayed.

### ☐ Search

Opens the onscreen help manual of DiffDog with the Search dialog displayed in the left-hand-side pane of the Help window. To search for a term, enter the term in the input field and press Enter or List Topics. The Help system performs a full-text search on the entire Help documentation and returns a list of hits. Double-click any item to display that item.

### ☐ Software Activation

#### License your product

After you download your Altova product software, you can license—or activate—it using either a free evaluation key or a purchased permanent license key.

- **Free evaluation license.** When you first start the software after downloading and installing it, the **Software Activation** dialog will pop up. In it is a button to request a free evaluation license. Enter your name, company, and e-mail address in the dialog and click **Request**. A license file is sent to the e-mail address you entered and should reach you in a few minutes. Save the license file to a suitable location.

When you clicked **Request**, an entry field appeared at the bottom of the Request dialog. This field takes the path to the license file. Browse for or enter the path to the license file and click **OK**. (In the **Software Activation** dialog, you can also click **Upload a New License** to access a dialog in which the path to the license file is entered.) The software will be unlocked for a period of 30 days.

- **Permanent license key.** The **Software Activation** dialog allows you to purchase a permanent license key. Clicking this button takes you to Altova's online shop, where you can purchase a permanent license key for your product. Your license will be sent to you by e-mail in the form of a license file, which contains your license-data.

There are three types of permanent license: *installed*, *concurrent user*, and *named user*. An installed license unlocks the software on a single computer. If you buy an installed license for  $N$  computers, then the license allows use of the software on up to  $N$  computers. A concurrent-user license for  $N$  concurrent users allows  $N$  users to run the software concurrently. (The software may be installed on  $10N$  computers.) A named-user license authorizes a specific user to use the software on up to 5 different computers. To activate your software, click **Upload a New License**, and, in the dialog that appears, enter the path to the license file, and click **OK**.

**Note:** For multi-user licenses, each user will be prompted to enter his or her own name.

Your license email and the different ways to license (activate) your Altova product

The license email that you receive from Altova will contain your license file as an attachment. The license file has a `.altova_licenses` file extension.

To activate your Altova product, you can do one of the following:

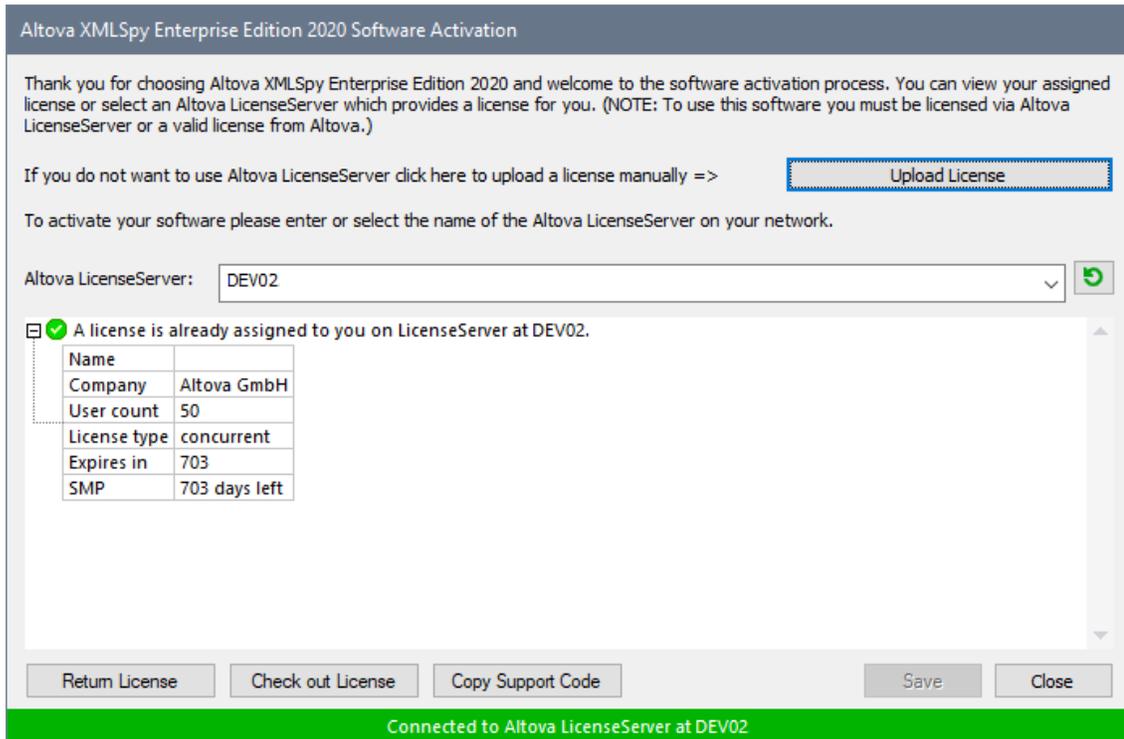
- Save the license file (`.altova_licenses`) to a suitable location, double-click the license file, enter any requested details in the dialog that appears, and finish by clicking **Apply Keys**.
- Save the license file (`.altova_licenses`) to a suitable location. In your Altova product, select the menu command **Help | Software Activation**, and then **Upload a New License**. Browse for or enter the path to the license file, and click **OK**.
- Save the license file (`.altova_licenses`) to any suitable location, and upload it from this location to the license pool of your [Altova LicenseServer](#). You can then either: (i) acquire the license from your Altova product via the product's Software Activation dialog (see below) or (ii) assign the license to the product from Altova LicenseServer. *For more information about licensing via LicenseServer, read the rest of this topic.*

You can access the **Software Activation** dialog (screenshot below) at any time by clicking the **Help | Software Activation** command.

Activate your software

You can activate the software by registering the license in the Software Activation dialog or by licensing via [Altova LicenseServer](#) (see details below).

- *Registering the license in the Software Activation dialog.* In the dialog, click **Upload a New License** and browse for the license file. Click **OK** to confirm the path to the license file and to confirm any data you entered (your name in the case of multi-user licenses). Finish by clicking **Save**.
- *Licensing via Altova LicenseServer on your network:* To acquire a license via an Altova LicenseServer on your network, click **Use Altova LicenseServer**, located at the bottom of the **Software Activation** dialog. Select the machine on which the LicenseServer you want to use has been installed. Note that the auto-discovery of License Servers works by means of a broadcast sent out on the LAN. As these broadcasts are limited to a subnet, License Server must be on the same subnet as the client machine for auto-discovery to work. If auto-discovery does not work, then type in the name of the server. The Altova LicenseServer must have a license for your Altova product in its license pool. If a license is available in the LicenseServer pool, this is indicated in the **Software Activation** dialog (see screenshot below showing the dialog in *Altova XMLSpy*). Click **Save** to acquire the license.



After a machine-specific (aka installed) license has been acquired from LicenseServer, it cannot be returned to LicenseServer for a period of seven days. After that time, you can return the machine license to LicenseServer (click **Return License**) so that this license can be acquired from LicenseServer by another client. (A LicenseServer administrator, however, can unassign an acquired license at any time via the administrator's Web UI of LicenseServer.) Note that the returning of licenses applies only to machine-specific licenses, not to concurrent licenses.

#### Check out license

You can check out a license from the license pool for a period of up to 30 days so that the license is stored on the product machine. This enables you to work offline, which is useful, for example, if you wish to work in an environment where there is no access to your Altova LicenseServer (such as when your Altova product is installed on a laptop and you are traveling). While the license is checked out, LicenseServer displays the license as being in use, and the license cannot be used by any other machine. The license automatically reverts to the checked-in state when the check-out period ends. Alternatively, a checked-out license can be checked in at any time via the **Check in** button of the **Software Activation** dialog.

To check out a license, do the following: (i) In the **Software Activation** dialog, click **Check out License** (see screenshot above); (ii) In the **License Check-out** dialog that appears, select the check-out period you want and click **Check out**. The license will be checked out. After checking out a license, two things happen: (i) The **Software Activation** dialog will display the check-out information, including the time when the check-out period ends; (ii) The **Check out License** button in the dialog changes to a **Check In** button. You can check the license in again at any time by clicking **Check In**. Because the license automatically reverts to the checked-in status after the check-out period elapses, make sure that the check-out period you select adequately covers the period during which you will be working offline.

License check-ins must be to the same major version of the Altova product from which the license was checked out. So make sure to check in a license before you upgrade your Altova product to the next major version.

**Note:** For license check-outs to be possible, the check-out functionality must be enabled on LicenseServer. If this functionality has not been enabled, you will get an error message to this effect when you try to check out. In this event, contact your LicenseServer administrator.

Copy Support Code

Click **Copy Support Code** to copy license details to the clipboard. This is the data that you will need to provide when requesting support via the [online support form](#).

Altova LicenseServer provides IT administrators with a real-time overview of all Altova licenses on a network, together with the details of each license as well as client assignments and client usage of licenses. The advantage of using LicenseServer therefore lies in administrative features it offers for large-volume Altova license management. Altova LicenseServer is available free of cost from the [Altova website](#). For more information about Altova LicenseServer and licensing via Altova LicenseServer, see the [Altova LicenseServer documentation](#).

☐ Order Form

When you are ready to order a licensed version of the software product, you can use either the **Purchase a Permanent License Key** button in the **Software Activation** dialog (see *previous section*) or the **Order Form** command to proceed to the secure Altova Online Shop.

☐ Registration

Opens the Altova Product Registration page in a tab of your browser. Registering your Altova software will help ensure that you are always kept up to date with the latest product information.

☐ Check for Updates

Checks with the Altova server whether a newer version than yours is currently available and displays a message accordingly.

☐ Support Center

A link to the Altova Support Center on the Internet. The Support Center provides FAQs, discussion forums where problems are discussed, and access to Altova's technical support staff.

☐ FAQ on the Web

A link to Altova's FAQ database on the Internet. The FAQ database is constantly updated as Altova support staff encounter new issues raised by customers.

☐ Download Components and Free Tools

A link to Altova's Component Download Center on the Internet. From here you can download a variety of companion software to use with Altova products. Such software ranges from XSLT and XSL-FO processors to Application Server Platforms. The software available at the Component Download Center is typically free of charge.

☐ DiffDog on the Internet

A link to the [Altova website](#) on the Internet. You can learn more about DiffDog, related technologies and products on the [Altova website](#).

☐ About DiffDog

Displays the splash window and version number of your product. If you are using the 64-bit version of DiffDog, this is indicated with the suffix (x64) after the application name. There is no suffix for the 32-bit version.

## 15.12 Status and Result Messages

For file and directory comparisons, status and result messages for comparisons appear in the Comparison Window Status Bar, which is located at the bottom of each Comparison Window.

In database data comparisons, the status as well as the result of a comparison is indicated by comparison result icons in the Database Data Comparison window.

### Status messages

Status messages indicate the status of that particular comparison, essentially whether files/directories have been selected; whether a comparison has been carried out; and what kind of comparison was carried out (that is, which Comparison Mode was used).

### Result messages

If differences are found, a summary of the comparison results is provided by result messages in the Status Bar. If no differences are found, this is also reported in the Status Bar. The result message lists number and type of differences in the form:

```
Result: n differences  n in left pane only  n in right pane only
```

In File Comparison windows, Text Comparison counts differences in terms of blocks of contiguous differences, even if the [Show Differences within Lines](#)<sup>40</sup> option is selected. So if there are six differences in four lines, four differences are reported. If two or more lines with differences appear consecutively, without being interrupted by a line that is equal in both files, only one difference is counted in the result message. In XML comparisons, differences are counted in terms of nodes. Note that a difference is counted when the node exists in both documents but is different. If the node does not exist in one document, such a node is listed as being either present **in Left Only** or **in Right Only**. In Binary Comparisons, it is only stated whether or not the file pair is different; no details concerning the number or location of differences are available.

### Comparison result icons

As long as no comparison has been started yet, no icons are displayed in the database data comparison window. For each compared table, however, an icon indicating whether or not the two tables are equal is displayed. By clicking such a comparison result icon, you can display the detailed differences of a comparison in an extra result window.

## 16 Command Line Options

In addition to running DiffDog from the graphical user interface, you can also trigger comparisons from a command line window. The file or directory paths to be compared can be supplied to the DiffDog executable as arguments. Additional comparison options (further described below) can also be supplied. When the command is executed, DiffDog starts, opens the directories or files in the appropriate comparison window, carries out a comparison, and displays the results.

**Note:** Calling the DiffDog executable at the command line will open the DiffDog graphical user interface with the options you specified. It is not possible to display the comparison outcome in the command line window, or to export the comparison results from the command line. These capabilities are available in DiffDog Server (<https://www.altova.com/diffdog-server>).

### To run DiffDog from the command line interface:

1. Type `cmd` in the Windows search box, and press **Enter** to open a new command line window.
2. Change the current directory to the directory where DiffDog is installed, for example:

```
cd C:\Program Files (x86)\Altova\DiffDog2023\
```

3. Call **DiffDog.exe** and supply the file or directory names to be compared as arguments, as well as any optional command line options. For example, in the command below, two text files are compared so the options `/cF /mT` are explicitly set:

```
DiffDog.exe /cF /mT file1.txt file2.txt
```

For reference to all available options, see [Command Line Syntax](#)<sup>327</sup>.

If DiffDog is already running when you start it from the command line, it will start as a new instance, provided that the option **Allow Multiple Instances** is enabled in the **Tools | DiffDog Options | Application**<sup>253</sup> tab. If **Allow Multiple Instances** is disabled, then the new comparison is opened in a new comparison window of an already running DiffDog instance.

## 16.1 Command Line Syntax

The command line options are simple switches and are optional. If not specified, the option is off. For best results, it is recommended that you specify the /cD or /cF option, to explicitly instruct DiffDog that you are comparing either files or directories. Note, however, that, if you use DiffDog as a differencing tool for a source control system, some control systems will not accept additional arguments except the file names.

Although they are organized into groups, the options listed below can appear in any order. The options are not case-sensitive, and you can use either the minus sign (-) or the slash (/) before options. The command line syntax is as follows:

```
DiffDog.exe [source name1 name2 [name3]] [general options] [compare mode] [compare options] [filter filename] [directory compare options] [file-filter file filename]
```

### source:

/cd compare [directories](#)<sup>71</sup>  
/cf compare [files](#)<sup>26</sup>

### name1 name2:

names of files or directories to compare

### name3

name of the third file to compare (applicable only for three-way comparisons, see [Three-Way Comparisons](#)<sup>34</sup>).

### general options

/h opens the help file

### compare mode:

/mE compare according to [extension](#)<sup>21</sup> settings  
/mX compare as [XML](#)<sup>21</sup>  
/mT compare as [text](#)<sup>21</sup>  
/mB compare [binary](#)<sup>21</sup>

### compare options:

/dD [detailed](#)<sup>42</sup> differencing  
/dL show differences [within lines](#)<sup>40</sup>  
/iB ignore [blank lines](#)<sup>41</sup>  
/iC ignore [case](#)<sup>43</sup> but not in node names  
/iCN ignore case  
/iD ignore [node depth](#)<sup>43</sup>  
/iN ignore [namespace](#)<sup>42</sup>  
/iNT A CD C PI D X  
ignore [node types](#)<sup>45</sup> (Attributes, CData, Comments, Processing Instructions, Doctype, XML declaration)  
/iOA ignore [order](#)<sup>43</sup> of attributes

/iOC ignore order of child nodes  
/iOC A G groupname T  
ignore order of child nodes and add attributes as comparison criteria (**All** Attributes, Specific Attributes as [defined](#)<sup>45</sup> in **G**roup groupname, Add Element **T**ext as Comparison Criteria)  
/iP ignore [prefixes](#)<sup>42</sup>  
/iT ignore [text](#)<sup>42</sup> (XML)  
/e resolve [entities](#)<sup>41</sup>  
/wN normalize [whitespaces](#)<sup>42</sup>  
/wS strip all whitespaces

#### filter:

/f filter out [specific elements/attributes](#)<sup>47</sup>

#### filename:

name of predefined filter

#### directory compare options:

/iS ignore [sub-directories](#)<sup>79</sup>

#### file-filter:

/fD filter out [specific files/directories](#)<sup>78</sup> in directory comparison

#### file filename:

name of predefined file-filter

**Note:** Some Comparison Options apply to XML Comparison Mode only (for example, /dD, /iN and /iNT). These options will therefore be ignored if the [compare mode] option is not /mX.

## 16.2 Command Line Examples

In the examples below, it is assumed that the current working directory is the directory where DiffDog is installed; therefore, all commands start with **DiffDog.exe**. If your working directory is different, make sure to enter the full path to the DiffDog executable instead (for example, "C:\Program Files (x86)\Altova\DiffDog2023\DiffDog.exe"). If the path to the executable contains spaces, do not forget to enclose it within quotes. The same applies for any referenced file or directory names which include spaces in their name.

To compare two files according to file extension, use:

```
DiffDog.exe /cF c:\work\Alice.txt c:\work\Bob.txt /mE
```

To compare three files in text comparison mode, use:

```
DiffDog.exe /cF c:\work\Alice.txt c:\work\Bob.txt c:\work\Chris.txt /mT
```

To compare two XML files in XML mode, with detailed differencing enabled (so that merge from right to left, or left to right is possible), use:

```
DiffDog.exe /cF c:\work\Alice.xml c:\work\Bob.xml /mX /dD
```

To compare only the XML structure of the files and ignore text, use:

```
DiffDog.exe /cF c:\work\Alice.xml c:\work\Bob.xml /mX /iT
```

To compare two directories, use:

```
DiffDog.exe /cD c:\work1 c:\work2
```

To compare two directories ignoring subdirectories, use:

```
DiffDog.exe /cD c:\work1 c:\work2 /iS
```

The following command compares XML files in two directories by applying a predefined filter (created previously from the graphical user interface), see also [Filtering the content of compared directories](#)<sup>78</sup>. Notice that quotes were used since the filter name contains spaces.

```
DiffDog.exe /cD c:\work1 c:\work2 /mX /fD "xml conformant files"
```

## 17 Version Control System Integration

DiffDog can easily be integrated with version control systems that provide the option to use a custom (external) executable for differencing and merging.

For your convenience, this section provides instructions on how to configure miscellaneous version control systems to use DiffDog as differencing and/or merging tool. If your version control system is not listed, or if it has a different version, refer to its documentation for instructions on how to use a custom differencing or merging tool.

This section includes the following topics:

- [Integrating DiffDog with Git](#) <sup>331</sup>
- [Integrating DiffDog with TortoiseSVN](#) <sup>334</sup>
- [Integrating DiffDog with SmartSVN](#) <sup>335</sup>
- [Other Version Control Systems](#) <sup>337</sup>

## 17.1 Integrating DiffDog with Git

If you are using Git (<https://www.git-scm.com/>) as version control system, you can set DiffDog as Git differencing tool. You can also integrate DiffDog with any Git-based tool that provides the option to define a custom external differencing tool (for example, **gitk**). The configuration instructions below were tested for Git 1.9.4; they are likely to be similar for other Git versions. For further information about integrating Git with external differencing tools, refer to the Git user's manual.

### To set DiffDog as the Git differencing tool:

- Add or edit the following lines in the **.gitconfig** file (this file is located in the user home directory, typically: **C:\Users\<username>\.gitconfig**):

```
[diff]
  tool = diffdog
[difftool "diffdog"]
  cmd = "C:/Program Files/Altova/DiffDog2023/DiffDog.exe" "$LOCAL" "$REMOTE"
```

**Note:** If you are using DiffDog 32-bit on a 64-bit operating system, adjust the path to the DiffDog executable so that it points to **C:/Program Files (x86)** instead of **C:/Program Files**.

### To check whether DiffDog is set as differencing tool:

- Open the Git shell and enter the command `git difftool --tool-help`, as shown below.

```
$ git difftool --tool-help
git difftool --tool=<tool>' may be set to one of the following:
  vimdifff
  vimdifff2
  user-defined:
    diffdog
```

### To view changes to a Git repository file in DiffDog:

1. Open the Git repository in the Git shell, and enter the command `git difftool <changed file>`, for example:

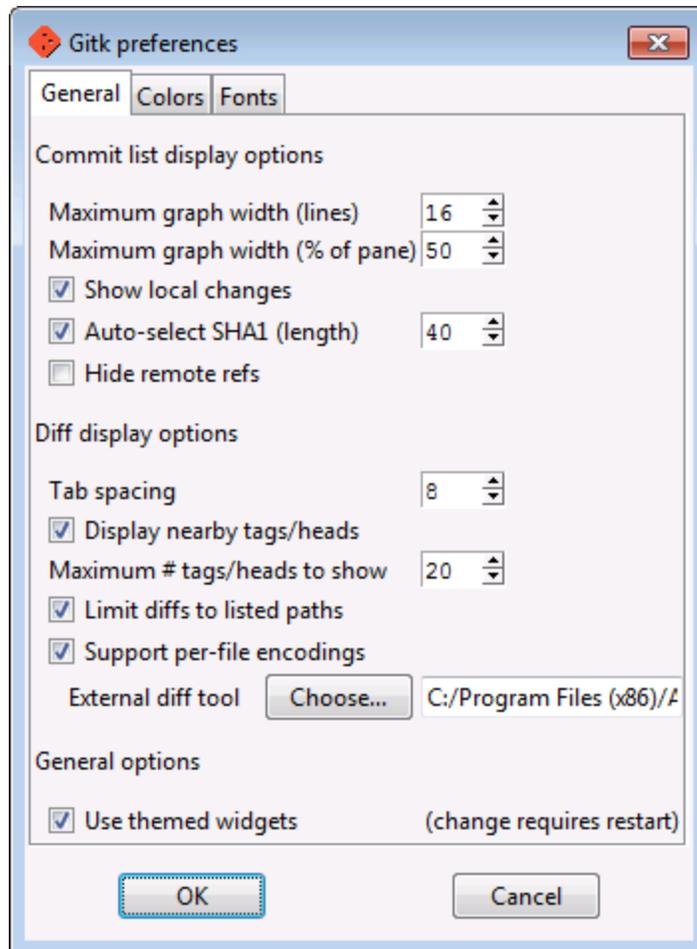
```
git difftool MyFile.txt
```

2. When prompted to confirm whether DiffDog should be launched, type **Y**, and then press **Enter**. To run DiffDog without being prompted first, use the command `git difftool -y <changed file>`.

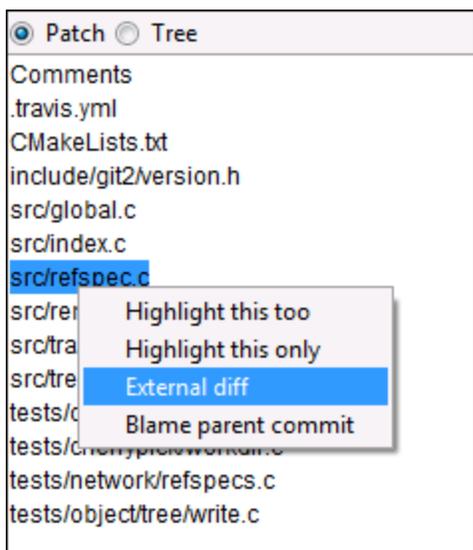
Note that the `difftool` command does not yield results if you provide an unchanged file as argument.

**To configure DiffDog as differencing tool in the Git graphical user interface:**

1. Run **gitk** (for example, by right-clicking on a directory which is under Git control, and selecting **Git History**).
2. On the **Edit** menu, click **Preferences**.
3. Under **External diff tool**, click **Choose** and select the path to the DiffDog executable (for example, `C:/Program Files/Altova/DiffDog2023/DiffDog.exe`).



In the Git graphical user interface, you can now use the **External diff** command to view in DiffDog the changes between two Git commits.



## 17.2 Integrating DiffDog with TortoiseSVN

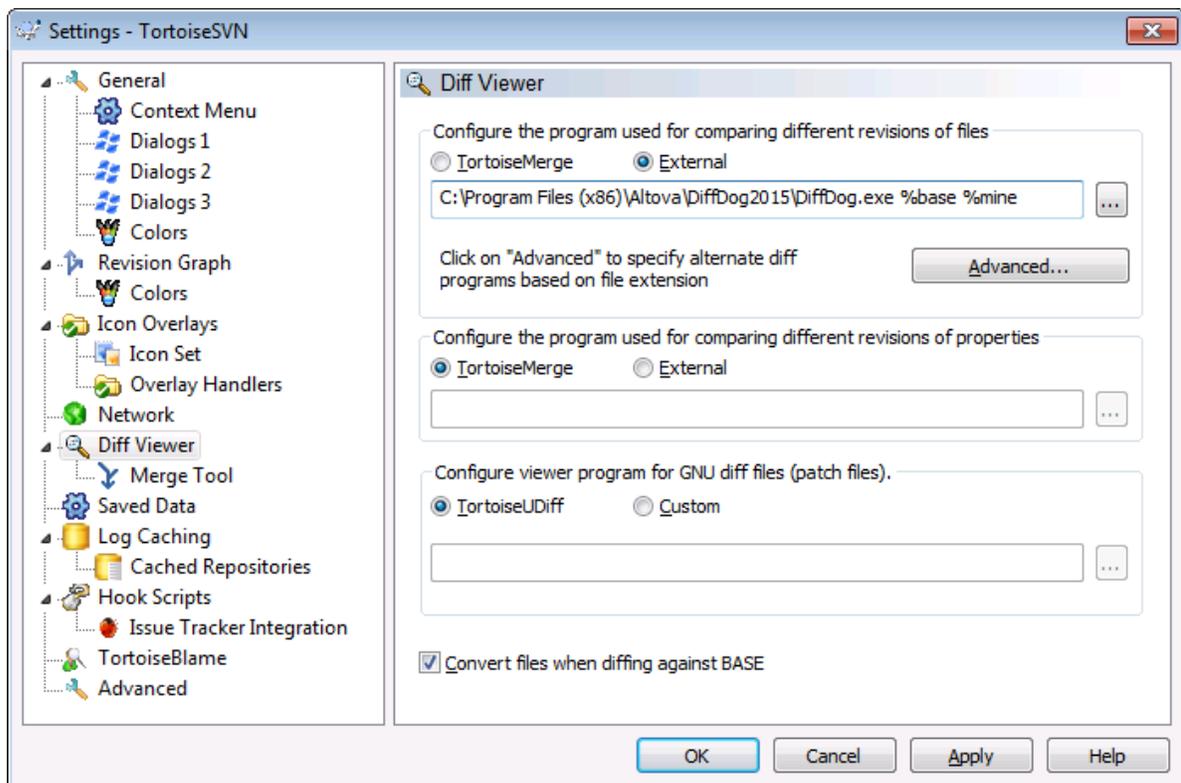
If you are using TortoiseSVN (<https://tortoisesvn.net/>) as Subversion client, you can set DiffDog as the program used for comparing different revisions of files. Although the configuration instructions below apply for TortoiseSVN 1.8.8, they are likely to be similar for other versions. For further information, refer to the TortoiseSVN user's manual.

### To set DiffDog as the TortoiseSVN differencing tool:

1. Right-click any folder, and select **TortoiseSVN | Settings**.
2. Click **Diff Viewer**.
3. Click **External**, and enter the path to the DiffDog executable in the format below.

```
C:/Program Files/Altova/DiffDog2023/DiffDog.exe %base %mine
```

**Note:** If you are using DiffDog 32-bit on a 64-bit operating system, adjust the path so that it points to C:/Program Files (x86) instead of C:/Program Files.



## 17.3 Integrating DiffDog with SmartSVN

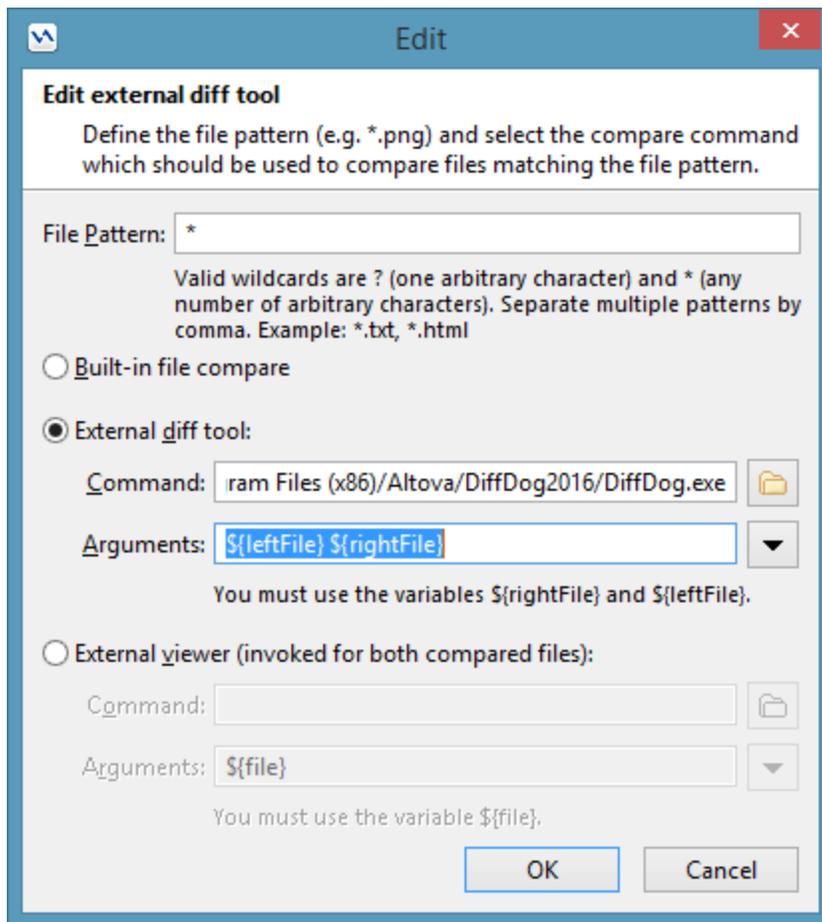
If you are using SmartSVN (<https://www.smartsvn.com/>) as Subversion client, you can add DiffDog as file comparison tool, in addition to the built-in comparison tool. The configuration instructions below apply for SmartSVN 8.5, but they are likely to be similar for other versions.

### To set DiffDog as the comparison tool:

1. Run SmartSVN.
2. On the **Edit** menu, click **Preferences**.
3. Under **Tools**, click **File Compare**.
4. Click **Add**, and select **External diff tool**.
5. Next to **File Pattern**, enter a pattern that matches file types that you wish to compare with DiffDog, for example **\*.xml**.
6. Next to **Command**, enter the path to the DiffDog executable, for example **C:/Program Files/Altova/DiffDog2023/DiffDog.exe**.

**Note:** If you are using DiffDog 32-bit on a 64-bit operating system, adjust the path so that it points to `C:/Program Files (x86)` instead of `C:/Program Files`.

7. Next to **Arguments**, enter `${leftFile} ${rightFile}`.



## 17.4 Other Version Control Systems

### Borland StarTeam Cross-Platform Client 2008 R2

<https://www.microfocus.com/products/change-management/starteam/>

The following steps integrate Altova DiffDog into Borland Star Team:

1. Use the StarTeam client personal options (**Tools | Personal options | File | Alternate applications**)
2. Compare utility: Enter the DiffDog full path.
3. Compare utility options: `$file1 $file2`.

### Dynamsoft SourceAnywhere for VSS 5.3.2 Client

[http://www.dynamsoft.com/Products/SAW\\_Overview.aspx](http://www.dynamsoft.com/Products/SAW_Overview.aspx)

The following steps will integrate Altova DiffDog into Dynamsoft SourceAnywhere for VSS:

1. Go to the Dynamic SourceAnywhere For VSS client Options.
2. Specify the DiffDog full path as External application for diff/merge, with the arguments: `%FIRST_FILE% "%SECOND_FILE%`.

**Note:** Do not perform these settings from the Altova product options, as there is no possibility of inserting the external application parameters.

### Dynamsoft SourceAnywhere Hosted Client (22252)

<http://www.dynamsoft.com/Products/SourceAnywhere-Hosting-Version-Control-Source-Control.aspx>

### Dynamsoft SourceAnywhere Standalone 2.2 Client

<http://www.dynamsoft.com/Products/SourceAnywhere-SourceSafe-VSS.aspx>

The following steps will integrate Altova DiffDog into Dynamsoft SourceAnywhere Hosted and Dynamsoft SourceAnywhere Standalone:

1. Click the **Advanced** button of the Source Control tab.
2. Specify the DiffDog full path as External program application for diff/merge with arguments `%FIRST_FILE%" "%SECOND_FILE%`.

### Jalindi Igloo 1.0.3

<http://www.jalindi.com/igloo/>

The following steps will integrate Altova DiffDog into Jalindi Igloo:

1. Start the **Show differences** command in your Altova application or other application that accesses the source control system's differencing tool.
2. Open the **Show Differences or Merge Files** panel.
3. Set the *External Diff Command* by entering the DiffDog full file path as the External Diff EXE path.

**Note:** When using the default diff editor CvsConflictEditor, you might have problems comparing files with excessively long lines. We recommended that you "pretty print" all files (particularly .ump files) before

storing them in the repository. This limits the line length, thus avoiding problems with the CVSConflictEditor.

### March-Hare CVS Suite Client 2008 (3321)

<https://www.march-hare.com/cvsnt/en.asp>

The following steps will integrate Altova DiffDog into Marc-Hare CVS Suite 2008:

1. Go to the TortoiseCVS Preferences and choose the **Tools** tab.
2. Specify the DiffDog full path as Diff application, and the parameters %1 %2 as two-way differencing parameters.

### Microsoft Visual Source Safe 2005 with CTP

<https://msdn.microsoft.com/en-us/vstudio/aa718670.aspx>

The following steps will integrate Altova DiffDog into Microsoft SourceSafe 2005:

1. Click the **Advanced** button of the **Source Control** tab.
2. Click the Custom Editors tab and enter `C:\Program Files\Altova\DiffDog2023\DiffDogexe %1 %2` in the Command Line field.
3. In the Operation combo box, select **File Difference**.

### Microsoft Team Foundation Server 2008/2010 MSSCCI Provider

<https://www.microsoft.com/en-us/download>

Requirements: Visual Studio 2008 Team Explorer or Visual Studio 2008 with Team Explorer 2008.

The following steps will integrate Altova DiffDog into Microsoft Visual Studio Team System 2008 Team Foundation Server MSSCCI Provider:

1. In the manager (Visual Studio 2008 Team Explorer or Visual Studio 2008) options, configure Altova DiffDog as new user tool
2. Choose Visual Studio Team Foundation Server source as the plug-in.
3. Configure a new user tool specifying: (i) the extensions of the files you wish to compare with DiffDog; and (ii) the DiffDog full file path.

### Perforce P4V 2008.1

<https://www.perforce.com/>

The following steps will integrate Altova DiffDog into Perforce 2008:

1. Click the **Advanced** button of the Source Control tab.
2. Choose the tab Diff in the Preferences panel.
3. Check as default differencing application the field "Other application" and enter the DiffDog full file path.

### PushOK CVS SCC NT 2.1.2.5

### PushOK CVS SCC x64 version 2.2.0.4

### PushOK SVN SCC 1.5.1.1

### PushOK SVN SCC x64 version 1.6.3.1

[http://www.pushok.com/soft\\_cvs.php](http://www.pushok.com/soft_cvs.php)

The following steps will integrate Altova DiffDog into PushOK CVS NT and PushOK SVN SCC:

1. Click the **Advanced** button of the Source Control tab.
2. Choose the CVS Executables tab.
3. Select the value *External merge/compare tool* into the Diff/Merge field.
4. Insert the DiffDog full file path.
5. Edit the value `%first %second` into the "2 way diff cmd" field.

**Note:** When using the default differencing editor `CvsConflictEditor`, you might have problems comparing files with excessively long lines. We recommended that you "pretty print" all files (particularly `.ump` files) before storing them in the repository. This limits the line length, thus avoiding problems with the `CVSConflictEditor`.

### QSC Team Coherence Client 7.2.1.35

<http://www.teamcoherence.com>

The following steps will integrate Altova DiffDog into Team Coherence Version Manager:

1. Go to Team Coherence client Options "Difference Viewer".
2. Specify as the Default Difference Viewer application, the DiffDog full file path.
3. Specify as parameters: "`$(LF) $(RF)`".

**Note:** It is possible that the new settings will only be applied after a Windows log off.

### Surround SCM Client 2009.0.0

<https://www.perforce.com/products/surround-scm>

The following steps will integrate Altova DiffDog into Seapine Surround SCM:

1. Go to the Surround SCM client user options (Diff/Merge) section.
2. Edit the Diff/Merge settings to compare with a selected application.
3. Enter the DiffDog full path with the parameters "`%1`" "`%2`".
4. Restart the Surround SCM client and the Altova products.

### SourceGear Vault 4.1.4 Client

<http://www.sourcegear.com/vault>

The following steps will integrate Altova DiffDog into SourceGear Fortress and SourceGear Vault:

1. Click the **Advanced** button of the Source Control tab.

2. Set the Diff/Merge Vault options by specifying as the differencing program the DiffDog full path and using the Arguments:  
/ro1 /ro2 /title1:"%LEFT\_LABEL%" /title2:"%RIGHT\_LABEL%" "%LEFT\_PATH%" "%RIGHT\_PATH%"

### SourceGear SourceOffsite Client 4.2.0 (Windows)

<http://www.sourcegear.com/sos/>

The following steps will integrate DiffDog into SourceGear SourceOffsite:

1. Click the **Advanced** button of the Source Control tab.
2. Specify as "External Programs", "Application for comparing files" the DiffDog full path.

### TamTam CVS SCC 1.2.40, TamTam SVN SCC 1.2.24

<http://www.fieldstonsoftware.com/software/tamtam/index.shtml>

The following steps will integrate Altova DiffDog into TamTam CVS SCC and TamTam SVN SCC:

1. Click the **Advanced** button of the **Source Control** tab.
2. Specify the DiffDog full file path as the external tool for Diff/Merge and Conflict.

**Note:** The default differencing editor CvsConflictEditor, has problems comparing files with excessively long lines. We recommended that you "pretty print" all files (particularly .ump files) before storing them in the repository. This limits the line length, avoiding problems with the CvsConflictEditor.

## 18 License Information

This section contains information about:

- the distribution of this software product
- software activation and license metering
- the license agreement governing the use of this product

Please read this information carefully. It is binding upon you since you agreed to these terms when you installed this software product.

To view the terms of any Altova license, go to the [Altova Legal Information page](#) at the [Altova website](#).

## 18.1 Electronic Software Distribution

This product is available through electronic software distribution, a distribution method that provides the following unique benefits:

- You can evaluate the software free-of-charge for 30 days before making a purchasing decision. (*Note: Altova MobileTogether Designer is licensed free of charge.*)
- Once you decide to buy the software, you can place your order online at the [Altova website](#) and get a fully licensed product within minutes.
- When you place an online order, you always get the latest version of our software.
- The product package includes an onscreen help system that can be accessed from within the application interface. The latest version of the user manual is available at [www.altova.com](http://www.altova.com) in (i) HTML format for online browsing, and (ii) PDF format for download (and to print if you prefer to have the documentation on paper).

### 30-day evaluation period

After downloading this product, you can evaluate it for a period of up to 30 days free of charge. About 20 days into the evaluation period, the software will start to remind you that it has not yet been licensed. The reminder message will be displayed once each time you start the application. If you would like to continue using the program after the 30-day evaluation period, you must purchase a product license, which is delivered in the form of a license file containing a key code. Unlock the product by uploading the license file in the Software Activation dialog of your product.

You can purchase product licenses at <https://shop.altova.com/>.

### Helping Others within Your Organization to Evaluate the Software

If you wish to distribute the evaluation version within your company network, or if you plan to use it on a PC that is not connected to the Internet, you may distribute only the installer file, provided that this file is not modified in any way. Any person who accesses the software installer that you have provided must request their own 30-day evaluation license key code and after expiration of their evaluation period, must also purchase a license in order to be able to continue using the product.

## 18.2 Software Activation and License Metering

As part of Altova's Software Activation, the software may use your internal network and Internet connection for the purpose of transmitting license-related data at the time of installation, registration, use, or update to an Altova-operated license server and validating the authenticity of the license-related data in order to protect Altova against unlicensed or illegal use of the software and to improve customer service. Activation is based on the exchange of license related data such as operating system, IP address, date/time, software version, and computer name, along with other information between your computer and an Altova license server.

Your Altova product has a built-in license metering module that further helps you avoid any unintentional violation of the End User License Agreement. Your product is licensed either as a single-user or multi-user installation, and the license-metering module makes sure that no more than the licensed number of users use the application concurrently.

This license-metering technology uses your local area network (LAN) to communicate between instances of the application running on different computers.

### Single license

When the application starts up, as part of the license metering process, the software sends a short broadcast datagram to find any other instance of the product running on another computer in the same network segment. If it doesn't get any response, it will open a port for listening to other instances of the application.

### Multi-user license

If more than one instance of the application is used within the same LAN, these instances will briefly communicate with each other on startup. These instances exchange key-codes in order to help you to better determine that the number of concurrent licenses purchased is not accidentally violated. This is the same kind of license metering technology that is common in the Unix world and with a number of database development tools. It allows Altova customers to purchase reasonably-priced concurrent-use multi-user licenses.

We have also designed the applications so that they send few and small network packets so as to not put a burden on your network. The TCP/IP ports (2799) used by your Altova product are officially registered with the IANA (see the [IANA Service Name Registry](#) for details) and our license-metering module is tested and proven technology.

If you are using a firewall, you may notice communications on port 2799 between the computers that are running Altova products. You are, of course, free to block such traffic between different groups in your organization, as long as you can ensure by other means, that your license agreement is not violated.

### Note about certificates

Your Altova application contacts the Altova licensing server ([link.altova.com](https://link.altova.com)) via HTTPS. For this communication, Altova uses a registered SSL certificate. If this certificate is replaced (for example, by your IT department or an external agency), then your Altova application will warn you about the connection being insecure. You could use the replacement certificate to start your Altova application, but you would be doing this at your own risk. If you see a *Non-secure connection* warning message, check the origin of the certificate and consult your IT team (who would be able to decide whether the interception and replacement of the Altova certificate should continue or not).

If your organization needs to use its own certificate (for example, to monitor communication to and from client machines), then we recommend that you install Altova's free license management software, [Altova LicenseServer](#), on your network. Under this setup, client machines can continue to use your organization's certificates, while Altova LicenseServer can be allowed to use the Altova certificate for communication with Altova.

## 18.3 Altova End-User License Agreement

- The Altova End-User License Agreement is available here: <https://www.altova.com/legal/eula>
- Altova's Privacy Policy is available here: <https://www.altova.com/privacy>

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