SQL Manager.net™

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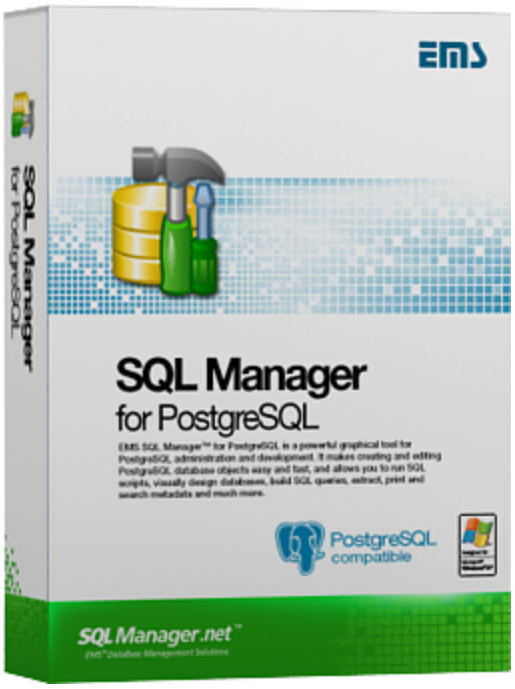

SQL Manager for PostgreSQL User's Manual

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SQL Manager for PostgreSQL
User's Manual

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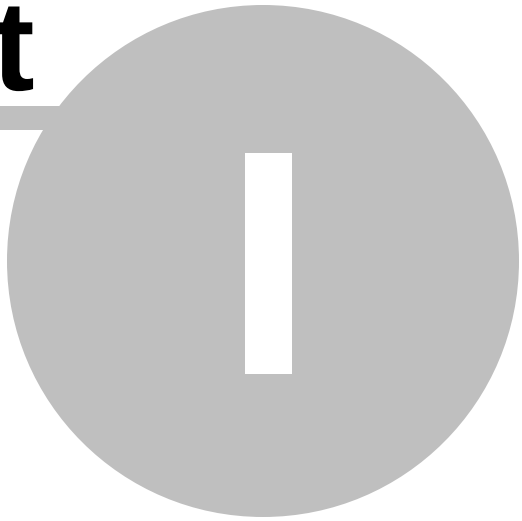
Part



1 Welcome to SQL Manager for PostgreSQL!

EMS SQL Manager for PostgreSQL is a high performance tool for PostgreSQL server administration and development. SQL Manager for PostgreSQL works with all PostgreSQL versions up to 17 and supports all of the latest PostgreSQL features including the FILLFACTOR parameter in tables and indexes, building indexes concurrently, ENUM data types, TSVECTOR, TSQUERY, XML and UUID types, arrays of composite types, operator classes in index keys, and others. It offers plenty of powerful tools for experienced users such as Database Designer, Visual Design Query and powerful BLOB viewer/editor to satisfy all their needs. SQL Manager has a new state-of-the-art graphical user interface with well-described wizard system, so clear in use that even a newbie will not be confused with it.

Visit our web-site for details: https://www.sqlmanager.net/

Key features

- Full support of all PostgreSQL versions up to 17
- Support of Unicode data
- Support of collations
- Support of database extensions
- Support of view triggers
- Support of unlogged tables
- Rapid database management and navigation
- Easy management of all PostgreSQL objects
- Advanced data manipulation tools
- Effective security management
- Excellent visual and text tools for query building
- Impressive data export and import capabilities
- Database Designer to handle database structure in a few clicks
- Easy-to-use wizards performing PostgreSQL server administrative tasks
- Powerful tools to make your work with PostgreSQL as easy as it can be
- Report designer with clear in use report construction wizard
- Tools providing version control

Product information

Homepage:	https://www.sqlmanager.net/products/postgresql/manager
Support Ticket System:	https://www.sqlmanager.net/support
Register on-line:	https://www.sqlmanager.net/products/postgresql/manager/buy

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1.1 What's new?

Version	Release date
SQL Manager for PostgreSQL 6.6.1	December 11, 2024

What's new in SQL Manager for PostgreSQL?

- The Types created by server are not displayed in autocompletion list now.
- The error occurred on calling Debugger with extension for functions. Fixed now.
- Sorting and filtering for JSON and JSONB types improved.
- In case of using large COPY statements the script is parsed correctly.
- Some visual issues with displaying editors have been fixed.
- SSL settings were discarded in some cases in the DB Registration info. Fixed now.

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1.2 System requirements

System requirements for SQL Manager for PostgreSQL

- Microsoft Windows XP, Microsoft Windows Server 2003, Microsoft Windows Server 2008, Microsoft Windows Server 2008 R2, Microsoft Windows Server 2012, Microsoft Windows Server 2012 R2, Microsoft Windows Server 2016, Microsoft Windows Server 2019, Microsoft Windows Vista, Microsoft Windows 7, Microsoft Windows 8/8.1, Microsoft Windows 10, Microsoft Windows 11, Microsoft Windows 11 ARM
- 512 Mb of RAM or more; 1024 Mb or more recommended
- 200 Mb of available HD space for program installation
- Possibility to connect to any local or remote PostgreSQL server
- Supported PostgreSQL server versions: from 7.3 up to 17

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1.3 Feature Matrix

The **FREE** *Lite version* of SQL Manager for PostgreSQL does not include all features of the *Full version* and has some limitations concerning the number of the databases that can be registered and the set of data manipulation and server maintenance tools. The detailed feature matrix is given below.

Note that when using the **FREE** *Lite version* of SQL Manager for PostgreSQL you can activate 874 a 30-day period of fully-functional usage. After the period expires, you will be able to continue using the **Lite** version.

For more information on activating the **Full** version features see Full Mode activation 874.

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1.4 Installation

If you are **installing SQL Manager for PostgreSQL for the first time** on your PC:

- download the SQL Manager for PostgreSQL distribution package from the download page available at our site;
- unzip the downloaded file to any local directory, e.g. *C:\unzipped*;
- run *PgManagerFull.exe* (**Full** version) or *PgManagerLite.exe* (**Lite** version) from the local directory and follow the instructions of the installation wizard;
- after the installation process is complete, find the SQL Manager shortcut in the corresponding group of Windows Start menu.

If you want to **update an installed copy of SQL Manager for PostgreSQL** you need to use SQL Direct 995.
Also you can use the full distribution package to upgrade your current version of SQL Manager for PostgreSQL. In this case, you should repeat the steps you have made for the first-time installation.

See also:
SQL Manager FAQ 28

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1.5 Registration

All purchases are provided by **PayPro Global** registration service. The **PayPro Global** order process is protected via a secure connection and makes on-line ordering by credit/ debit card quick and safe.

PayPro Global is a global e-commerce provider for software and shareware sales via the Internet. It accepts payments in US Dollars, Euros, Pounds Sterling, Japanese Yen, Australian Dollars, Canadian Dollars or Swiss Franks by Credit Card (Visa, MasterCard/ EuroCard, American Express, Diners Club), Bank/Wire Transfer.

If you want to review your order information, or you have questions about ordering or payments please visit our PayPro Global Shopper Support, provided by **PayPro Global.**

Please note that all of our products are delivered via ESD (Electronic Software Delivery) only. After purchase you will be able to immediately download the registration keys. Also you will receive a copy of registration keys by email. Please make sure to enter a valid email address in your order. If you have not received the keys within 2 hours, please, contact us at sales@sqlmanager.net.

Product distribution	PayPro Global
SQL Manager for PostgreSQL (Business license) + 1-Year Maintenance*	Register Now!
SQL Manager for PostgreSQL (Business license) + 2-Year Maintenance*	
SQL Manager for PostgreSQL (Business license) + 3-Year Maintenance*	
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SQL Manager for PostgreSQL (Trial version)	Download Now!
SQL Manager for PostgreSQL Freeware	Download Now!

***EMS Maintenance Program** provides the following benefits:

- Free software bug fixes, enhancements, updates and upgrades during the maintenance period
- Free unlimited communications with technical staff for the purpose of reporting Software failures
- Free reasonable number of communications for the purpose of consultation on operational aspects of the software

After your maintenance expires you will not be able to update your software or get technical support. To protect your investments and have your software up-to-date, you need to renew your maintenance.

You can easily reinitiate/renew your maintenance with our on-line, speed-through Maintenance Reinstatement/Renewal Interface. After reinitiating/renewal you will receive a confirmation e-mail with all the necessary information.

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See also:

How to register SQL Manager 26

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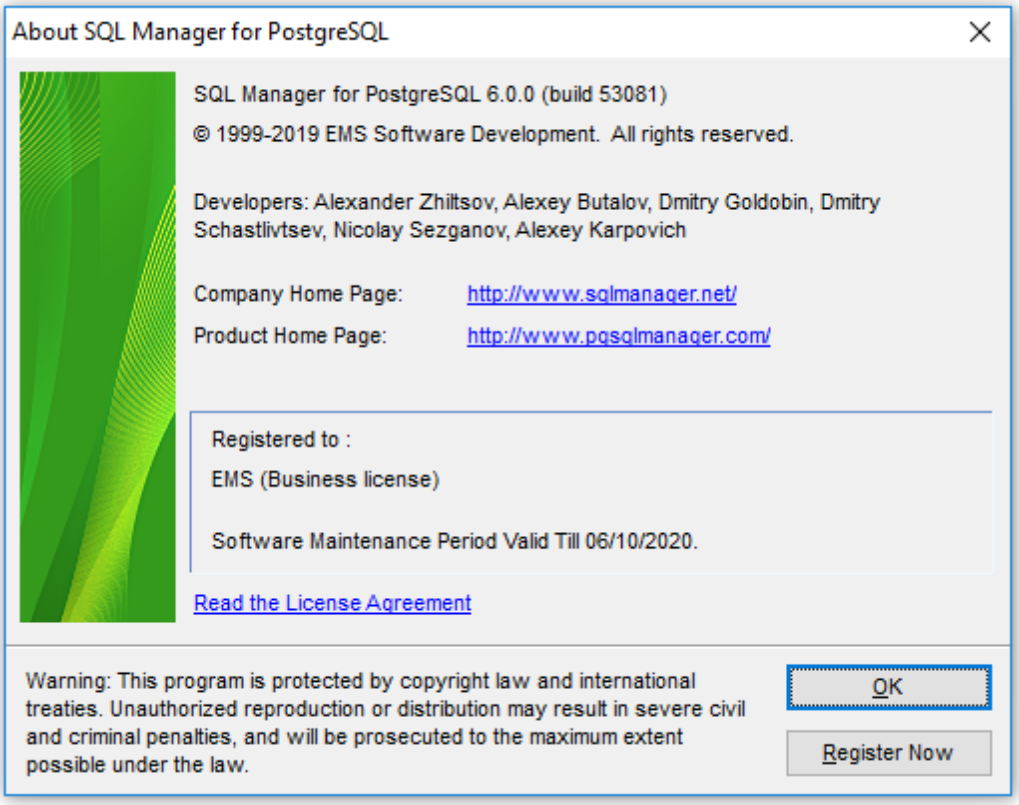
1.6 How to register SQL Manager

If you have not registered your copy of SQL Manager for PostgreSQL yet, you can do it by pressing the **Register Now** button and entering your registration information in the **Register SQL Manager for PostgreSQL** dialog.



To register your newly purchased copy of EMS SQL Manager for PostgreSQL, perform the following steps:

- receive the notification letter from **Digital River** with the registration info;
- enter the **Registration Name** and the **Registration Key** from this letter;
- make sure that the registration process has been completed successfully – check the registration information in the **About SQL Manager for PostgreSQL** dialog (use the **Help | About** menu item to open this dialog).

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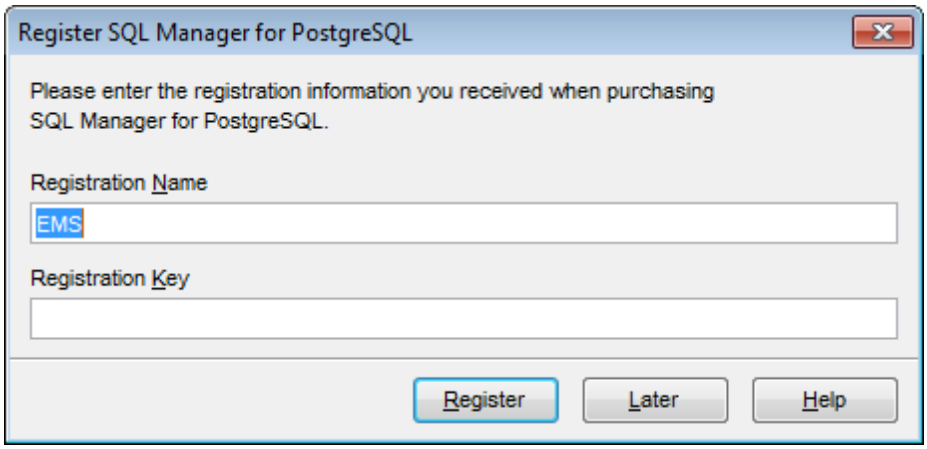

See also:

Registration 24

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1.7 EMS SQL Manager FAQ

Please read this page attentively if you have questions about EMS SQL Manager for PostgreSQL.

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Question/answer list

Product questions

Q: What is EMS SQL Manager for PostgreSQL?

A: EMS SQL Manager for PostgreSQL is a powerful tool for PostgreSQL database server administration and development. SQL Manager for PostgreSQL works with any PostgreSQL versions up to 17 and supports all of the latest PostgreSQL features. It offers plenty of powerful tools for experienced users to satisfy all their needs. SQL

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Manager for PostgreSQL has a new state-of-the-art graphical user interface with well-described wizard system, so clear in use that even a newbie will not be confused with it.

Q: What is the difference between Full/Lite editions of EMS SQL Manager for PostgreSQL?
A: These editions of SQL Manager for PostgreSQL differ in price and features. To register SQL Manager for PostgreSQL, see the Purchase page, and to learn about the difference in features please go to our Feature Matrix page 22.

Q: What do I need to start working with EMS SQL Manager for PostgreSQL?
A: First of all you must have a possibility to connect to some local or remote PostgreSQL server to work with SQL Manager for PostgreSQL. You can download PostgreSQL server from https://www.postgresql.org/downloads (download is free). Besides, you need your workstation to satisfy the system requirements 21 of SQL Manager for PostgreSQL.

Q: What is the difference between the Export/Import functions in SQL Manager and the Data Export/Import utilities?
A: The Data Export/Import for PostgreSQL utilities include some additional features which are not available in SQL Manager, such as:
- export/import data from/to several tables simultaneously;
- export/import data from/to tables selected from different databases on one host;
- a command-line utility to export/import data using the configuration file with all the export/import options.

Q: What is the difference between the Design Query module in SQL Manager and the SQL Query for PostgreSQL utility?
A: First of all, SQL Query for PostgreSQL works faster as it is a much lighter product. Besides, it provides additional features for query building, e.g.:
- keeping query history which allows you to rollback to any edited query;
- various interface improvements for more productive and easier work.

Q: What is the difference between the Extract Database function in SQL Manager for PostgreSQL and the DB Extract for PostgreSQL standalone utility?
A: The DB Extract for PostgreSQL utility includes some additional features which are not available in SQL Manager, such as:
- extracting metadata and/or data from several databases on one host;
- a console application for performing extract in one-touch;
- faster extraction speed.

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Common questions

Q: I've registered the DB, but on attempt to open it the "dynamic library libpq.dll not found" message appears.
A: Please make sure that the libpq.dll file exists in the SQL Manager for PostgreSQL directory. Reinstallation of the application can solve the problem.

Q: I can't modify DDL. Why?
A: The DDL tab of the SQL Manager editors is read-only. It displays object structure as SQL text and reflects the operations you perform over the object under other editor tabs. To modify an object, you can copy the text to the clipboard and edit it using SQL Script Editor 646. For more details refer to Viewing object DDL structure 965.

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Q: How can I customize data formats in grid?
A: You can customize all display formats: integer, float, date, time and datetime using the Color & Formats 915 page of the Environment Options 871 dialog.

Q: I need to perform some changes in database objects of my test database and then make the same changes on master database. Are there any tools for this purpose in SQL Manager for PostgreSQL?
A: The Database Registration Info 108 dialog provides the Logs 117 section where you can enable logging metadata changes performed over the database and/or SQL queries executed in Query Data 415.

Q: When I create database objects, their names are always converted to lower case. How I can prevent it?
A: Please try to switch off the "Convert created objects' names to lower case" option within the Object Editors 886 section of the Environment Options 871 dialog.

Q: I am trying to create a report in Report Designer, but I can't get access to the table data: 'Band data source' list is empty.
A: It is recommended to use Create Report wizard 693 which is run by right-clicking the Reports node in DB Explorer 65 and selecting the 'New Report...' context menu item. The wizard will create all necessary data sources.
If you still want to use Report Designer 701, to get the data source in a report, you need to add database and query components 704 to the report.

Q: How can I speed up my work with large tables?
A: For your convenience and to speed up your work, the Data Grid 457 allows customizing a number of data display parameters. Here are the most important of them (accessible through the Grid | Data Options 912 section of the Environment Options 871 dialog):
- *Limit options in table and view editors*. The 'Select all records of a table' option will enable you to see all table records without extra references to the server, yet in case of large tables or low speed connection channel the data may be fetched with huge delays and the incoming traffic might grow considerably. This mode is recommended when working with local databases or in a private network. The 'Select only' mode restricts the maximum number of records returned after the query. A man cannot process a massive amount of information at once. Hence, we came up with this mode. This mode speeds up table data viewing considerably, prevents hanging and connection timeout. It is recommended to work with large tables, in case of low speed connection channels and when the traffic volume is of importance. This is the default mode. When in this mode, enabling the 'Use SQL sorting in data view' and 'Use SQL filter in data view' options comes really helpful.
- *Default Grid Mode*. This option defines whether the requested rows will be loaded in the Grid all at once ('Load all rows'), or in parts ('Load visible rows') as the user scrolls down table data. The first mode increases the query opening time, but speeds up scrolling. In the second mode the query opens very fast, but there might be delays when navigating the grid.
We recommend that you set the following option values to achieve maximum efficiency when working with large tables:
- *Select only* – ON
- *Load visible rows* – ON

Q: I have a table with appr. 1000 records only, and a large number of columns. Opening this table on the 'Data' tab takes too much time.

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A: You need to set the Grid Mode 912 for the table to 'Load Visible Rows'. Please right click within the table grid 194 and select the 'Grid Mode' | 'Load Visible Rows' context menu item.

Q: I get error 'Timeout expired' when I try to execute a query in Query Data or when I perform some operations with database objects.
A: You need to increase timeout values within the Tools | Timeouts 881 section of the Environment Options 871 dialog, or set them to 0 (unlimited).

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Export/Import questions

Q: I'm trying to export data from a table, but TEXT columns are not exported.
A: Columns of type TEXT are not exported by default. You should select these columns manually at the Selecting columns for export 539 step.

Q: What is the difference between the "Extract Database" and "Export as SQL Script" functions?
A: Export as SQL Script 608 is intended for exporting table data that will be inserted into a database system other than PostgreSQL. Use Extract Database Wizard 653 to copy metadata and/or data to a database on PostgreSQL afterwards.

Q: How can I change the default directory where exported data are saved?
A: Follow the steps below to change the default directory:
1. Right-click the database alias in DB Explorer 65 and select the 'Database Registration Info...' context menu 54 item (you can also find this item in the 'Database' main menu 961) to open the Database Registration Info 108 dialog.
2. Proceed to the Directories 116 section within the dialog.
3. Set the 'Default directory for Export Data'.

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If you still have any questions, contact us at our Support Center.

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1.8 Other EMS Products

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MySQL

SQL Management Studio for MySQL
EMS SQL Management Studio for MySQL is a complete solution for database administration and development. SQL Studio unites the must-have tools in one powerful and easy-to-use environment that will make you more productive than ever before!

SQL Manager for MySQL
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for MySQL
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more.

Data Import for MySQL
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for MySQL
Migrate from most popular databases (MySQL, PostgreSQL, Oracle, DB2, InterBase/Firebird, etc.) to MySQL.

Data Generator for MySQL
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Comparer for MySQL
Compare and synchronize the structure of your databases. Move changes on your development database to production with ease.

DB Extract for MySQL
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

SQL Query for MySQL
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

Data Comparer for MySQL
Compare and synchronize the contents of your databases. Automate your data migrations from development to production database.

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Microsoft SQL Server

SQL Management Studio for SQL Server
EMS SQL Management Studio for SQL Server is a complete solution for database administration and development. SQL Studio unites the must-have tools in one powerful and easy-to-use environment that will make you more productive than ever before!

EMS SQL Backup for SQL Server
Perform backup and restore, log shipping and many other regular maintenance tasks on the whole set of SQL Servers in your company.

SQL Administrator for SQL Server
Perform administrative tasks in the fastest, easiest and most efficient way. Manage maintenance tasks, monitor their performance schedule, frequency and the last execution result.

SQL Manager for SQL Server
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for SQL Server
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more

Data Import for SQL Server
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for SQL Server
Migrate from most popular databases (MySQL, PostgreSQL, Oracle, DB2, InterBase/Firebird, etc.) to Microsoft® SQL Server™.

Data Generator for SQL Server
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Comparer for SQL Server
Compare and synchronize the structure of your databases. Move changes on your development database to production with ease.

DB Extract for SQL Server
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

SQL Query for SQL Server
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

Data Comparer for SQL Server
Compare and synchronize the contents of your databases. Automate your data migrations from development to production database.

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PostgreSQL

SQL Management Studio for PostgreSQL
EMS SQL Management Studio for PostgreSQL is a complete solution for database administration and development. SQL Studio unites the must-have tools in one powerful and easy-to-use environment that will make you more productive than ever before!

EMS SQL Backup for PostgreSQL
Creates backups for multiple PostgreSQL servers from a single console. You can use automatic backup tasks with advanced schedules and store them in local or remote folders or cloud storages

SQL Manager for PostgreSQL
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for PostgreSQL
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more

Data Import for PostgreSQL
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for PostgreSQL
Migrate from most popular databases (MySQL, SQL Server, Oracle, DB2, InterBase/Firebird, etc.) to PostgreSQL.

Data Generator for PostgreSQL
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Comparer for PostgreSQL
Compare and synchronize the structure of your databases. Move changes on your development database to production with ease.

DB Extract for PostgreSQL
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

SQL Query for PostgreSQL
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

Data Comparer for PostgreSQL
Compare and synchronize the contents of your databases. Automate your data migrations from development to production database.

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InterBase / Firebird

SQL Management Studio for InterBase/Firebird
EMS SQL Management Studio for InterBase and Firebird is a complete solution for database administration and development. SQL Studio unites the must-have tools in one powerful and easy-to-use environment that will make you more productive than ever before!

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SQL Manager for InterBase/Firebird
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for InterBase/Firebird
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more

Data Import for InterBase/Firebird
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for InterBase/Firebird
Migrate from most popular databases (MySQL, SQL Server, Oracle, DB2, PostgreSQL, etc.) to InterBase/Firebird.

Data Generator for InterBase/Firebird
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Comparer for InterBase/Firebird
Compare and synchronize the structure of your databases. Move changes on your development database to production with ease.

DB Extract for InterBase/Firebird
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

SQL Query for InterBase/Firebird
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

Data Comparer for InterBase/Firebird
Compare and synchronize the contents of your databases. Automate your data migrations from development to production database.

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Oracle

SQL Management Studio for Oracle
EMS SQL Management Studio for Oracle is a complete solution for database administration and development. SQL Studio unites the must-have tools in one powerful and easy-to-use environment that will make you more productive than ever before!

SQL Manager for Oracle
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for Oracle
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more.

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Data Import for Oracle
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for Oracle
Migrate from most popular databases (MySQL, PostgreSQL, MySQL, DB2, InterBase/Firebird, etc.) to Oracle

Data Generator for Oracle
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Comparer for Oracle
Compare and synchronize the structure of your databases. Move changes on your development database to production with ease.

DB Extract for Oracle
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

SQL Query for Oracle
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

Data Comparer for Oracle
Compare and synchronize the contents of your databases. Automate your data migrations from development to production database.

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IBM DB2

SQL Manager for DB2
Simplify and automate your database development process, design, explore and maintain existing databases, build compound SQL query statements, manage database user rights and manipulate data in different ways.

Data Export for DB2
Export your data to any of 20 most popular data formats, including MS Access, MS Excel, MS Word, PDF, HTML and more.

Data Import for DB2
Import your data from MS Access, MS Excel and other popular formats to database tables via user-friendly wizard interface.

Data Pump for DB2
Migrate from most popular databases (MySQL, PostgreSQL, Oracle, MySQL, InterBase/Firebird, etc.) to DB2

Data Generator for DB2
Generate test data for database testing purposes in a simple and direct way. Wide range of data generation parameters.

DB Extract for DB2
Create database backups in the form of SQL scripts, save your database structure and table data as a whole or partially.

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SQL Query for DB2
Analyze and retrieve your data, build your queries visually, work with query plans, build charts based on retrieved data quickly and more.

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Tools & components

Advanced Data Export for RAD Studio VCL
Advanced Data Export for RAD Studio VCL allows you to save your data in the most popular office programs formats.

Advanced Data Export .NET
Advanced Data Export .NET is a component for Microsoft Visual Studio .NET that will allow you to save your data in the most popular data formats for the future viewing, modification, printing or web publication. You can export data into MS Access, MS Excel, MS Word (RTF), PDF, TXT, DBF, CSV and more! There will be no need to waste your time on tiresome data conversion - Advanced Data Export will do the task quickly and will give the result in the desired format.

Advanced Data Import for RAD Studio VCL
Advanced Data Import for RAD Studio VCL will allow you to import your data to the database from files in the most popular data formats.

Advanced PDF Generator for RAD Studio
Advanced PDF Generator for RAD Studio gives you an opportunity to create PDF documents with your applications written on Delphi or C++ Builder.

Advanced Query Builder for RAD Studio VCL
Advanced Query Builder for RAD Studio VCL is a powerful component for Delphi and C++ Builder intended for visual building SQL statements for the SELECT, INSERT, UPDATE and DELETE clauses.

Advanced Excel Report for RAD Studio
Advanced Excel Report for RAD Studio is a powerful band-oriented generator of template-based reports in MS Excel.

Advanced Localizer for RAD Studio VCL
Advanced Localizer for RAD Studio VCL is an indispensable component for Delphi for adding multilingual support to your applications.

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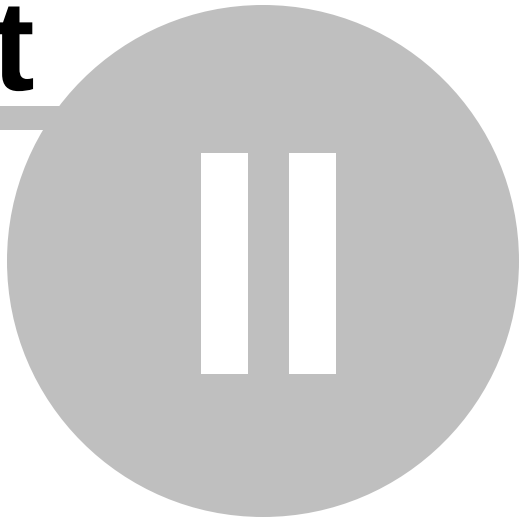
Part



2 Getting Started

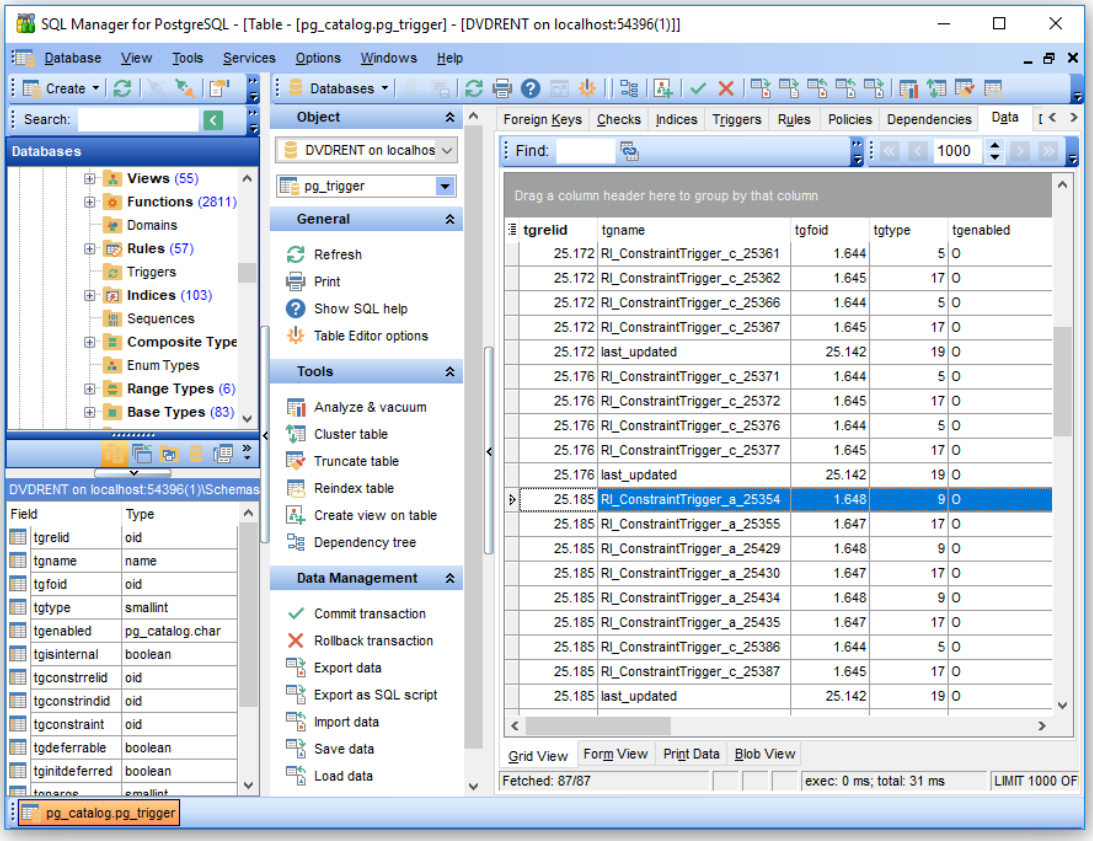
SQL Manager for PostgreSQL provides you with an ability to contribute to efficient PostgreSQL administration and development using a variety of available tools easily and quickly.

The succeeding chapters of this document are intended to inform you about the tools implemented in SQL Manager for PostgreSQL. Please see the instructions below to learn how to perform various operations in the easiest way.

- Selecting style and language 41
- How the application looks when you start it for the first time 43
- Using Desktop Panel 45
- Database navigation 47
- Working with database objects 49
- Using context menus 51
- Working with child windows 59

See the How to... 1006 chapter to view brief instructions on how to perform some operations on databases, database objects, etc.

Enjoy your work with EMS SQL Manager for PostgreSQL!



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See also:

Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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2.1 Selecting style and language

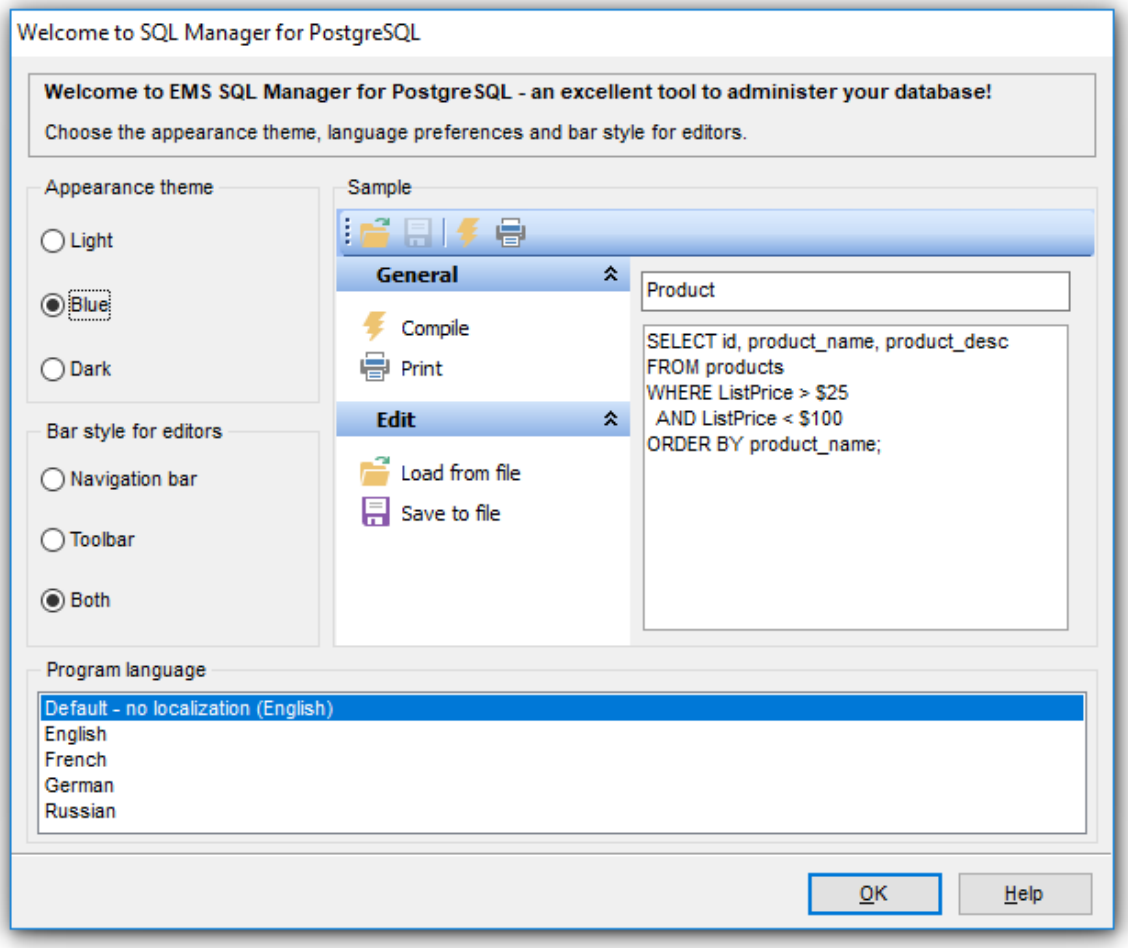
Before you start SQL Manager for the first time, you have to choose the appearance style and the interface language. You can change these settings any time using the Environment Options 877 dialog to configure environment style and the language.

Appearance theme
Select the main color theme for the application: Light, Blue or Dark.

Bar style for editors
Here you can define the location of action buttons: ◉ within the *Navigation bar* (on the left) and/or ◉ on the *Toolbar*.

Program language
Select the interface language from the list of available languages.

Sample
See the example of selected options for interface.



See also:
First time started 43

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Using Desktop Panel 45
Database navigation 47
Working with database objects 49
Using context menus 51
Working with windows 59

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2.2 First time started

This is how SQL Manager for PostgreSQL looks when you start it for the first time. Use the Desktop panel 45 to fulfill any of common tasks: Create a new database 89, Manage existing database(s) 98, and several tasks that do not require database registration, i.e. Execute script 646, accessing the **reference system** or using available **Internet resources**.

The main menu 961 allows you to perform various **Database** operations, open To-Do List 985 and activate/deactivate Database Explorer 65, SQL Assistant 81 and various toolbars 963 within the **View** menu, manage your databases using items of the **Tools** and **Services** menus, customize 870 the application using the **Options** menu, manage SQL Manager **Windows** using Window List 987 and other tools, access Registration 24 information and product documentation, update 995 the product to the latest version using the corresponding items available within the **Help** menu.

To start working with your PostgreSQL server, you should first register one or several databases using Register Database Wizard 98.

By default the corresponding **Register Database** button is available on the toolbar 963 and within the **Database** menu.

When the database connection settings are specified, you can set connection to your database and proceed to Database navigation 47, Database Objects management 155, working with SQL queries 413 and other tools of SQL Manager.

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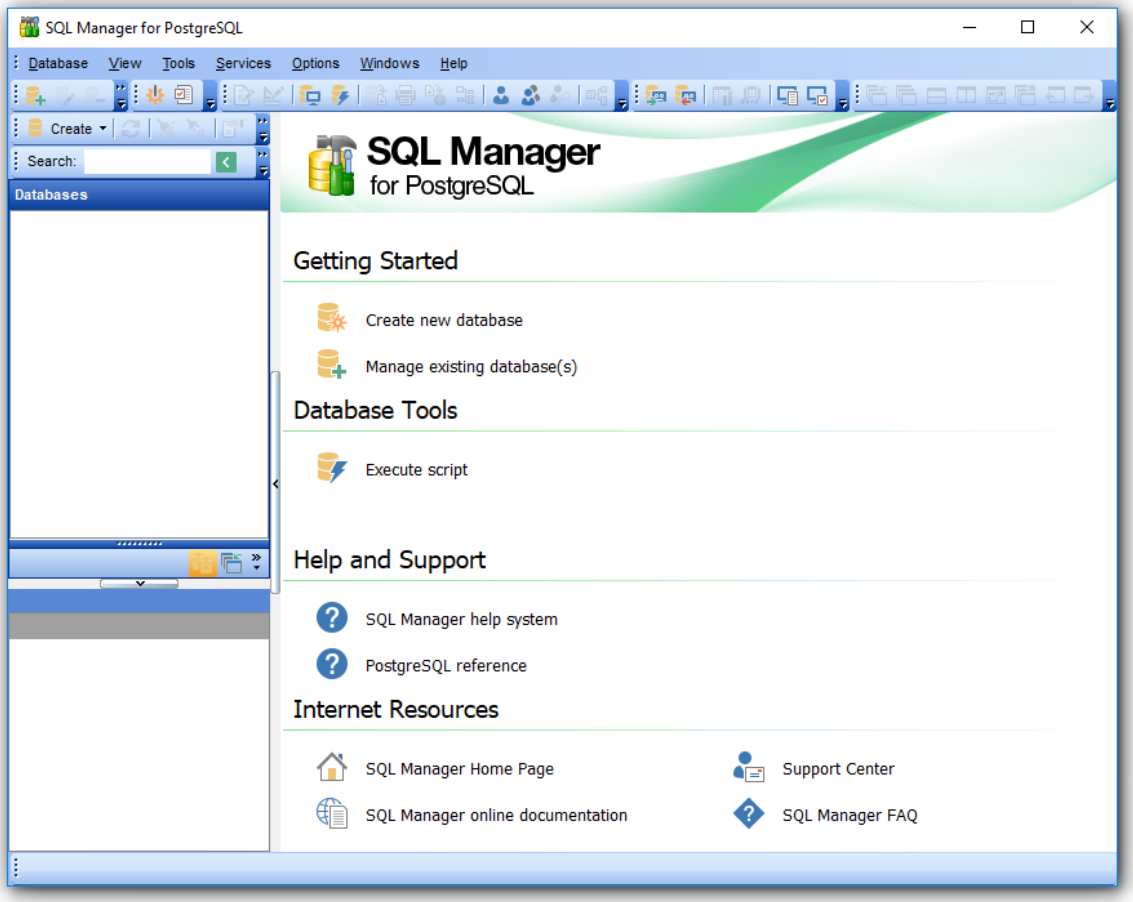

See also:

Selecting style and language 41
Using Desktop Panel 45
Database navigation 47
Working with database objects 49
Using context menus 51
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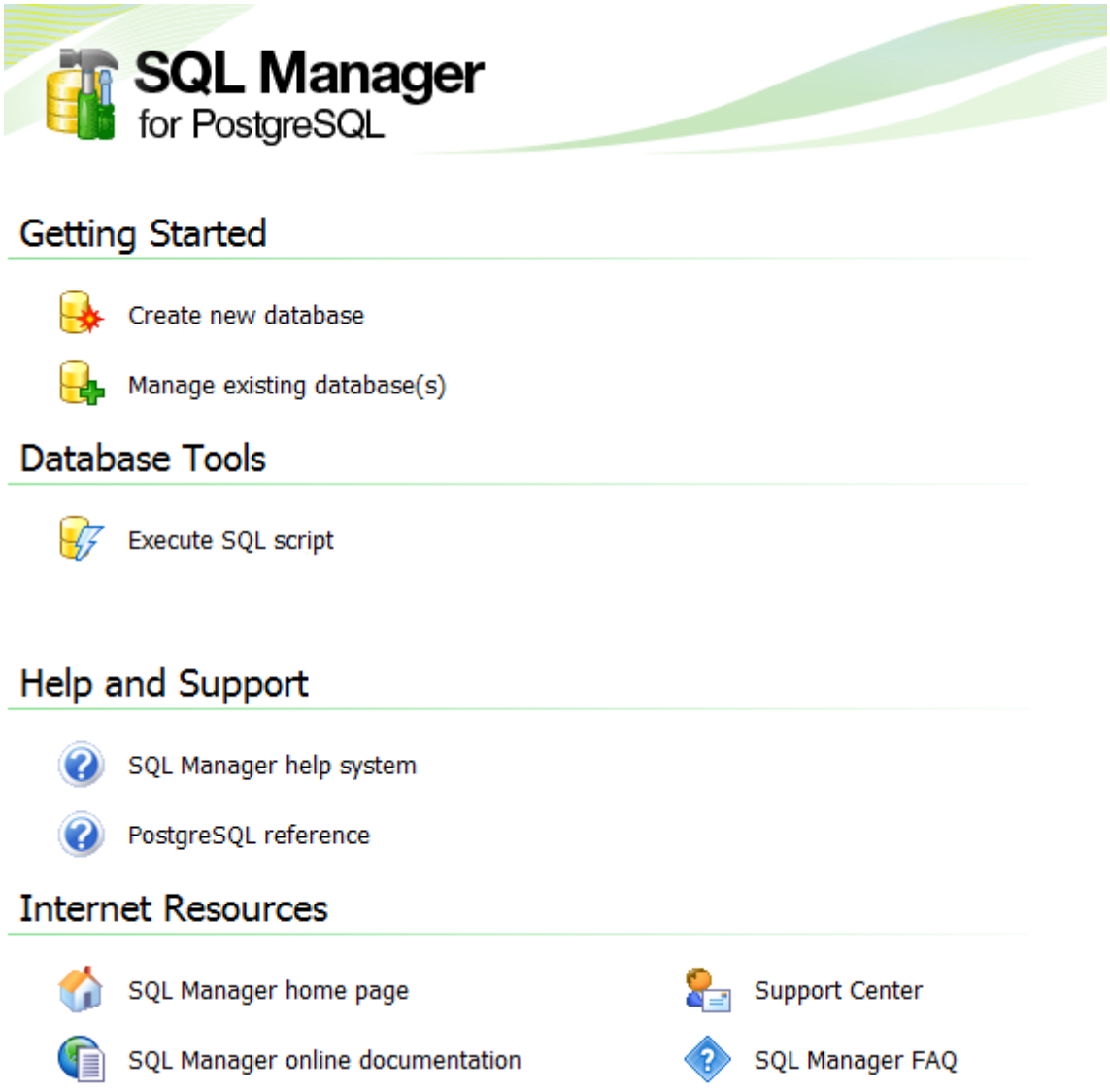
2.3 Using Desktop Panel

Desktop Panel is the area that is visible when no child windows are open in SQL Manager for PostgreSQL. The working area of **Desktop Panel** is divided into four sections: *Getting Started*, *Database Tools*, *Help and Support*, *Internet Resources*.



Using the **Desktop Panel** items you can:

Getting Started

create 89 a new PostgreSQL database

register 98 existing database(s) to operate them afterwards in SQL Manager

create a new table within the current database using the New Table 170 window (this item is available if there is at least one active database connection)

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create a new database object 157 within the current database (this item is available if there is at least one active database connection)

Database Tools

execute a script using SQL Script Editor 646

execute a SQL query 415 (this item is available if there is at least one active database connection)

grant permissions on database objects to PostgreSQL users 751 using Grant Manager 762 (this item is available if there is at least one active database connection)

Help and Support

show this help file

use PostgreSQL reference

Internet Resources

visit SQL Manager Home Page

browse SQL Manager on-line documentation

go to Technical Support Center

look through the Frequently Asked Questions 28 page

See also:

Selecting style and language 41
First time started 43
Database navigation 47
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Using context menus 51
Working with windows 59

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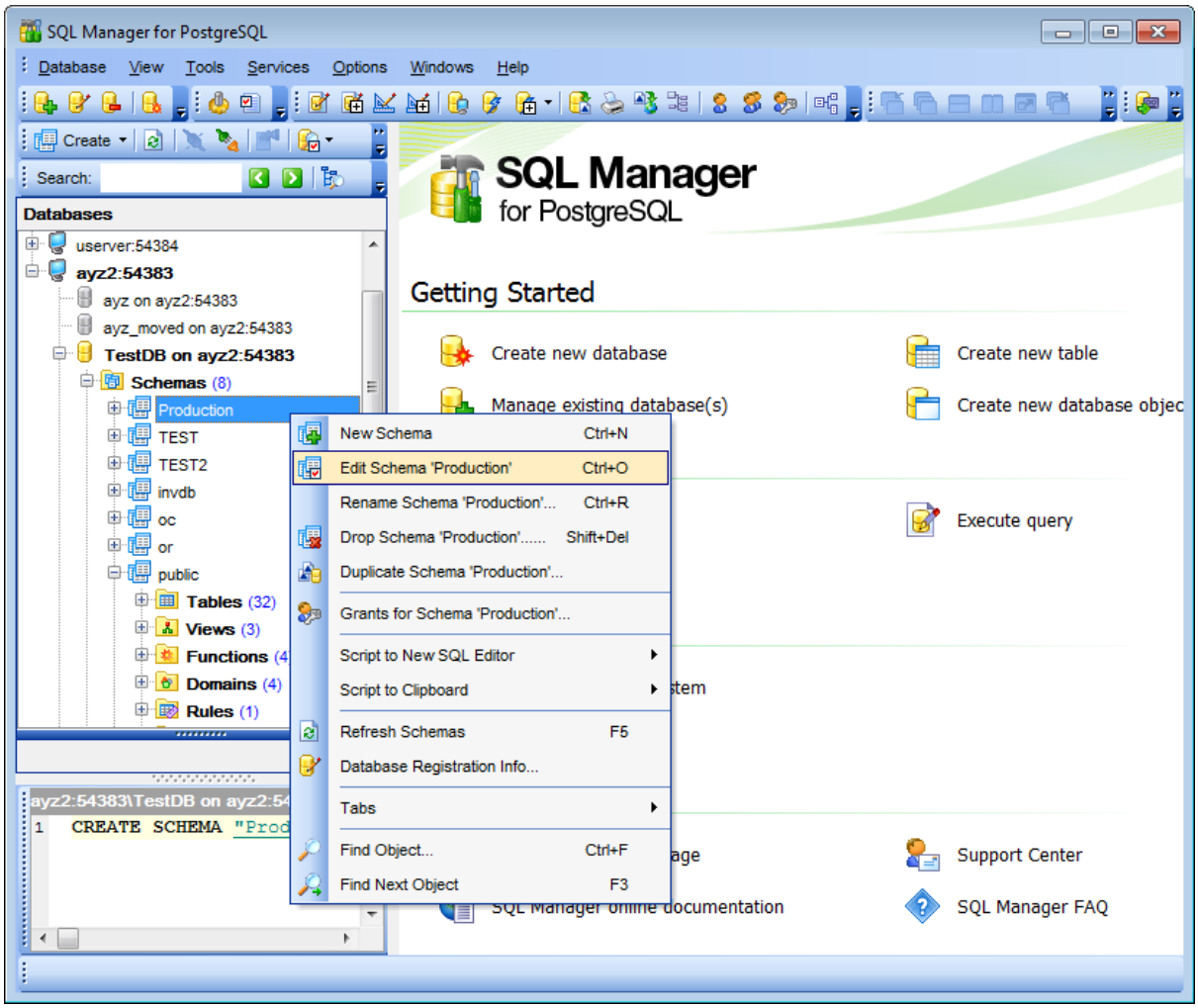
2.4 Database navigation

After you have registered the required database(s), the corresponding alias(es) appear in the DB Explorer 65 tree on the left. If the **Show Hosts** option is checked on the Environment Options 871 | DB Explorer 882 page, the host nodes are also displayed in the tree (alternatively, you can use the **Show Hosts** item of the Database context menu 54, or the drop-down menu of the **View Mode** toolbar 84 button for the same purpose). If necessary, you can also specify that empty schemas should be hidden in the tree: use the corresponding option available on the DB Explorer 882 page of the Environment Options 871 dialog.



DB Explorer 65 displays all registered databases. Connected/disconnected databases can be easily distinguished in the tree: aliases of disconnected databases are grayed out.

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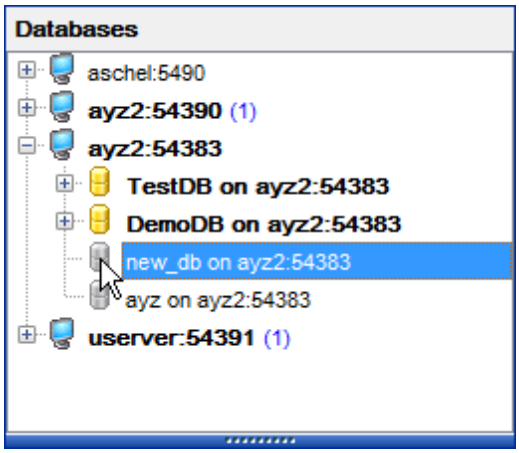

To connect 68 to a database, simply double-click its alias (or select the database alias in DB Explorer 65 and press **Enter**). If the connection is successful, the database node expands into a tree of objects. To select the types of objects to be expanded upon successful database connection, you can use the **Expand after connection** group of the Environment Options 871 | DB Explorer 882 page.

Now you can navigate within the database objects. Use SQL Assistant 81 to get extended information about the currently selected object.

See also:

Selecting style and language 41
First time started 43
Using Desktop Panel 45
Working with database objects 49
Using context menus 51
Working with windows 59

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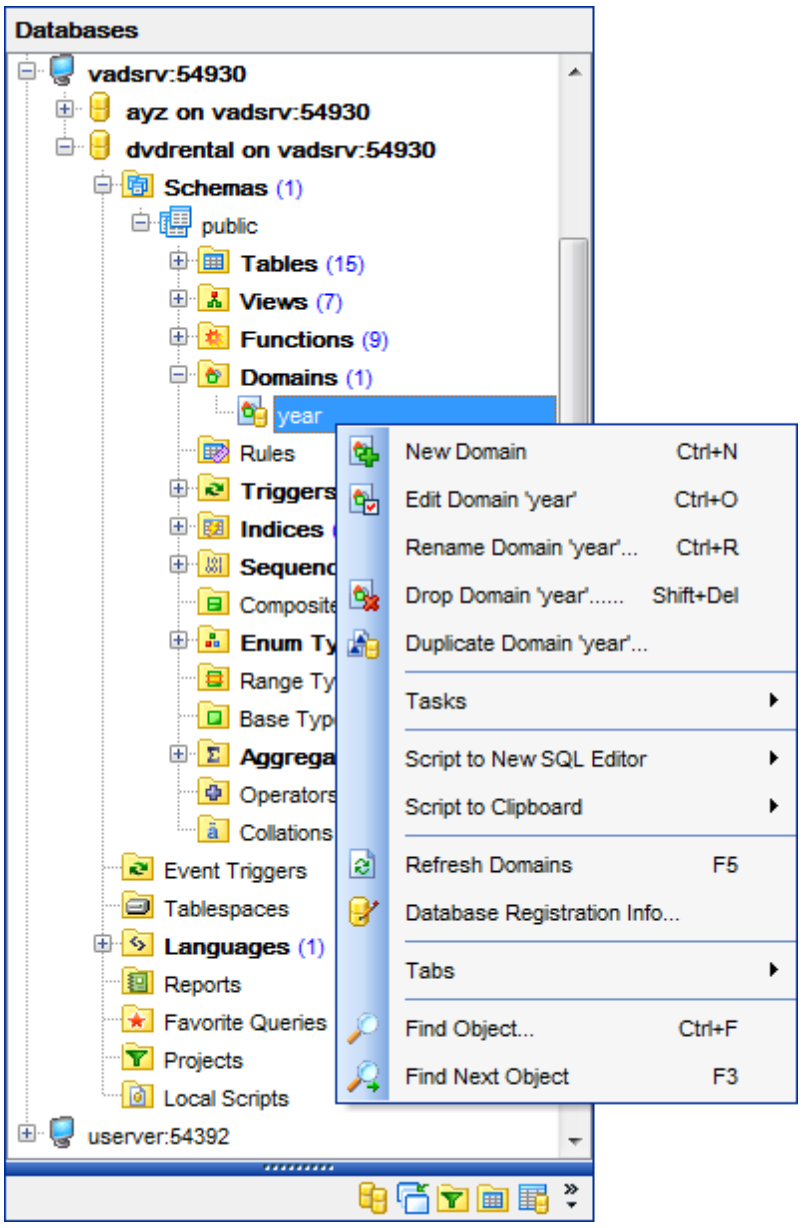
2.5 Working with database objects

The nodes of the DB Explorer 65 tree allow you to access objects of the selected database 155. If PostgreSQL server you are connected to supports certain types of objects, their nodes will appear in the tree.

Double-click an object group *to expand/collapse the corresponding tree node*.
Double-click an object *to open it in the corresponding editor*.
Right-click an object to display its context menu 57 which allows you to perform various *operations over the selected object or database*.



If you want to use the DB Explorer 65 tree for working with **table subobjects** (columns, indexes, Foreign keys, etc.), check the **Show table subobjects** option which is available

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within the **General options** group of the Environment Options 871 | DB Explorer 882 page (you can also use the **Show Table Subobjects** menu item in the drop-down menu of the **View Mode** toolbar 84 button for the same purpose.)

See also:

Selecting style and language 41
First time started 43
Using Desktop Panel 45
Database navigation 47
Using context menus 51
Working with windows 59

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2.6 Using context menus

The **context menus** are aimed at facilitating your work with SQL Manager for PostgreSQL : you can perform a variety of operations using context menu items.

Select an object in DB Explorer 65 and right-click its alias to open the context menu.

- Host context menu 52
- Database context menu 54
- Object context menu 57

See also:

Selecting style and language 41
First time started 43
Using Desktop Panel 45
Database navigation 47
Working with database objects 49
Working with windows 59

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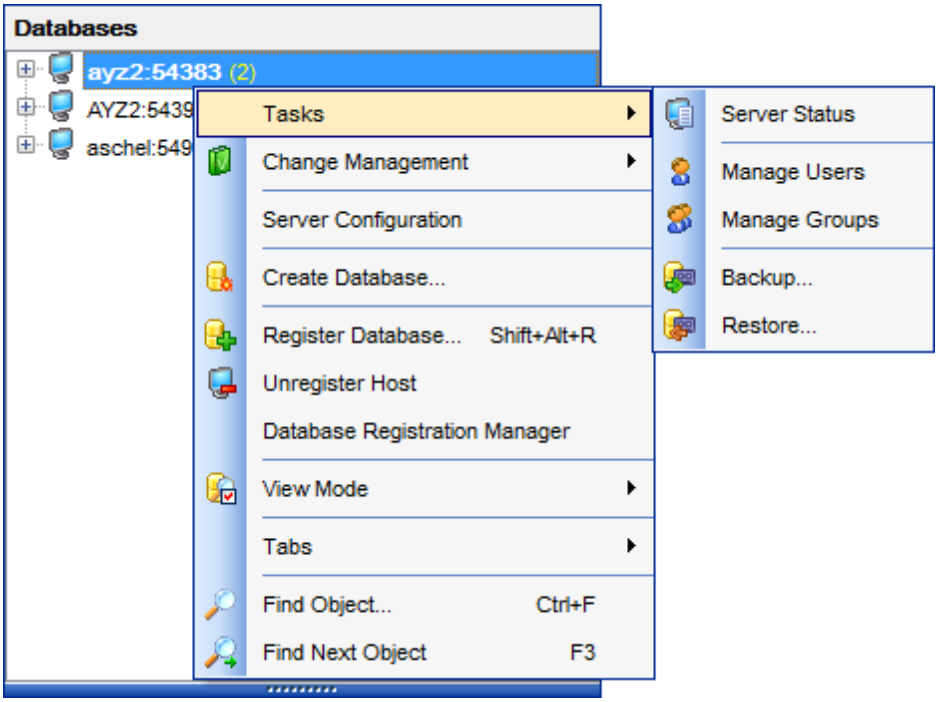
2.6.1 Host context menu

The **context menu of a host** in the DB Explorer 65 tree allows you to:
- access services and principals 771 within the **Tasks** submenu
- launch Change management 344 tools
- define host connection settings in the Server Configuration 852 dialog
- create database using the Create Database Wizard 89
- register a new database using the Register Database Wizard 98
- unregister the selected host
- manage databases registration 152
- access View Mode 53 options
- manage DB Explorer Tabs 53
- search for database objects using Find Object 78 dialog
- continue searching for database objects that match the defined conditions.



Tasks
- check server status 839 within the corresponding dialog
- manage user privileges 751
- manage user groups 754 and their privileges
- backup database 808 using the wizard
- restore database 821 using the wizard.

Change Management
- create branch/label/tag 348 using the wizard
- check repository 356 using the wizard
- get change script 366 using the wizard

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- release new version of database 375 using wizard
- browse history 406 of object/database changes.

View Mode

- show/hide table subobjects
- show/hide hosts
- sort databases by their aliases (by default databases are displayed due to their registration order)
- show/hide disconnected databases
- check table subobjects to display in SQL Assistant 81 within the **Tables' Details** submenu
- check other subobjects to display in SQL Assistant 81 within the **Objects' Details** submenu.

Tabs

- create a new DB Explorer tab 75 with the selected database/host only
- rename active tab
- delete active tab.

See also:

Database context menu 54

Object context menu 57

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2.6.2 Database context menu

The **context menu of a registered database** in the DB Explorer 65 tree allows you to:

- connect 68 to the selected database (if connection to the database is not active yet);
- disconnect 88 from the selected database (if connection to the database has been already activated);
- access database tools 636 and services 771 available in the **Tasks** submenu;
- access change management 344 tools;
- view/edit the Database properties 145;
- view/edit the host properties within the Server Configuration 852 dialog;
- create a new database 89 at the host where the selected database resides;
- drop 87 the selected database;
- view/edit the selected database registration information within the Database registration manager 152;
- register a new database or host using Register Database Wizard 98;
- unregister 87 the selected database;
- unregister 87 the host where the selected database resides;
- view/edit the selected database registration information within the Database Registration Info 108 dialog;
- generate the database script and open it in Query Data 415;
- generate the database script and copy its text to Windows clipboard;
- access View Mode 56 options;
- configure representation of hosts and databases in Database Explorer 65;
- refresh the selected database;
- test connection to the database (or reconnect if connection has been already established);
- manage DB Explorer Tabs 56;
- search 78 for an object within the tree;
- continue searching for database objects that match the defined conditions.

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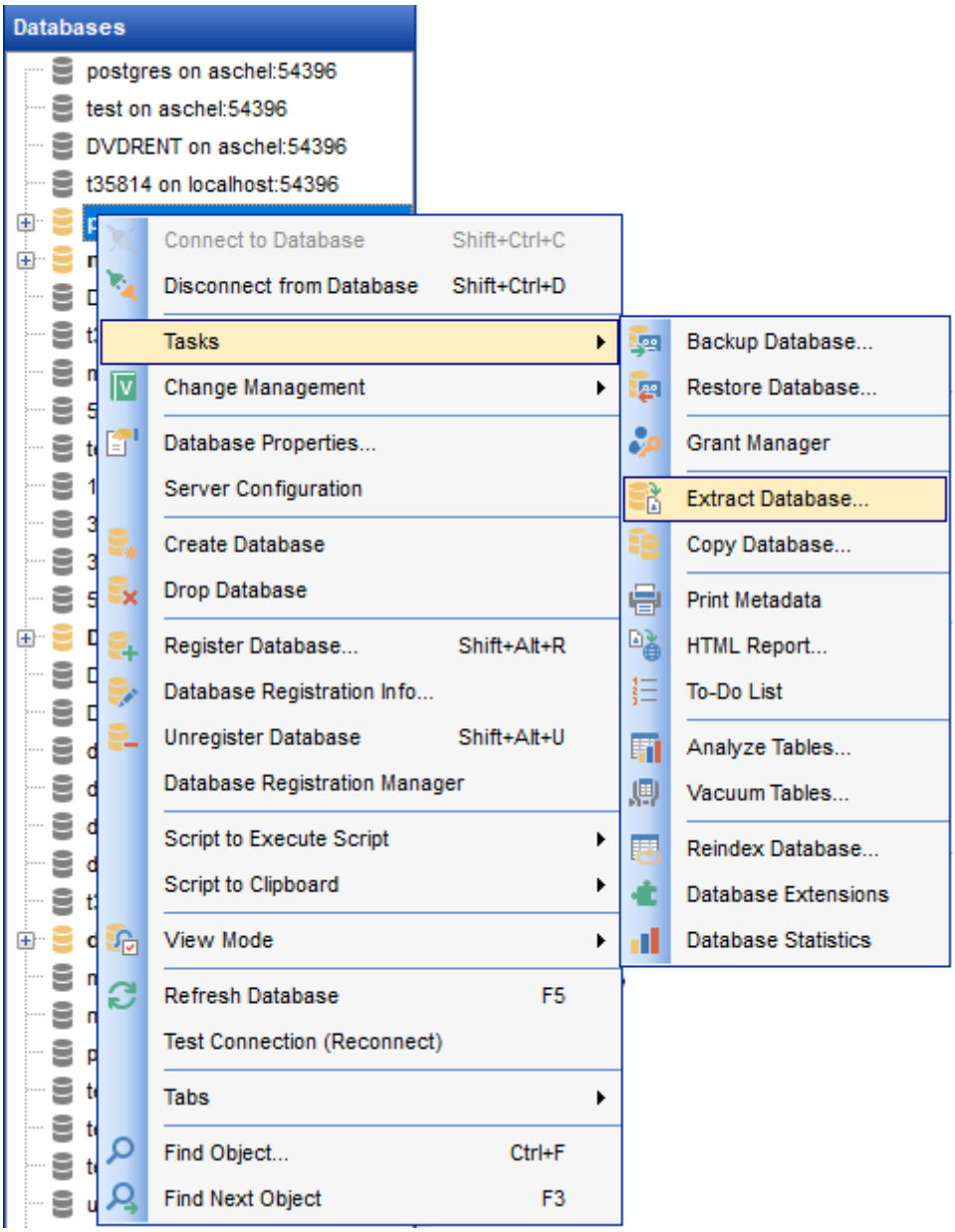

Tasks submenu allows you to:

- backup database 808 using the wizard
- restore database 821 using the wizard
- manage privileges 762
- extract database 653 objects and/or data to an SQL script
- copy database 663 objects and data to different location
- print metadata 680
- generate html report 686 of the selected objects
- create to-do list 985
- analyze tables 773
- vacuum tables 777

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reindex database 782
database extensions 864
database statistics 794

Change Management submenu allows you to:
- create branch/label/tag 348 using the wizard
- check repository 348 using the wizard
- get change script 366 using the wizard
- release new version of database 375 using wizard
- browse history 406 of object/database changes

View Mode submenu allows you to:
- show/hide table subobjects
- show/hide hosts
- sort databases by their aliases (by default databases are displayed due to their registration order)
- show/hide disconnected databases
- check table subobjects to display in SQL Assistant 81 within the **Tables' Details** submenu
- check other subobjects to display in SQL Assistant 81 within the **Objects' Details** submenu

Tabs submenu allows you to:
- create a new DB Explorer tab 75 with the selected database/host only
- rename active tab
- delete active tab.

See also:

Host context menu 52
Object context menu 57

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2.6.3 Object context menu

The **context menu of an object** (e.g. *table* or *view*) in the DB Explorer 65 tree allows you to:

- create 157 a new database object of the same type;
- edit 155 the selected object in its editor;
- rename the selected object;
- drop 155 the selected object from the database;
- duplicate 159 the selected object (create a new object with the same DDL 965 structure and properties as the selected object has);
- access common **Tasks** applied to this object;
- perform data manipulation 535 operations (for tables 169 and views 229);
- access change management 344 features;
- view properties 191 (for tables 169);
- define grants 762 for the selected object;
- generate the object script and open it in Query Data 415;
- generate the object script and copy its text to Windows clipboard;
- refresh all objects of the selected object type;
- view/edit the database registration information within the Database Registration Info 108 dialog.
- create a new tab for the selected object to access it through this tab quickly 75 and/or manage the existing tab;
- search 78 for an object within the tree.

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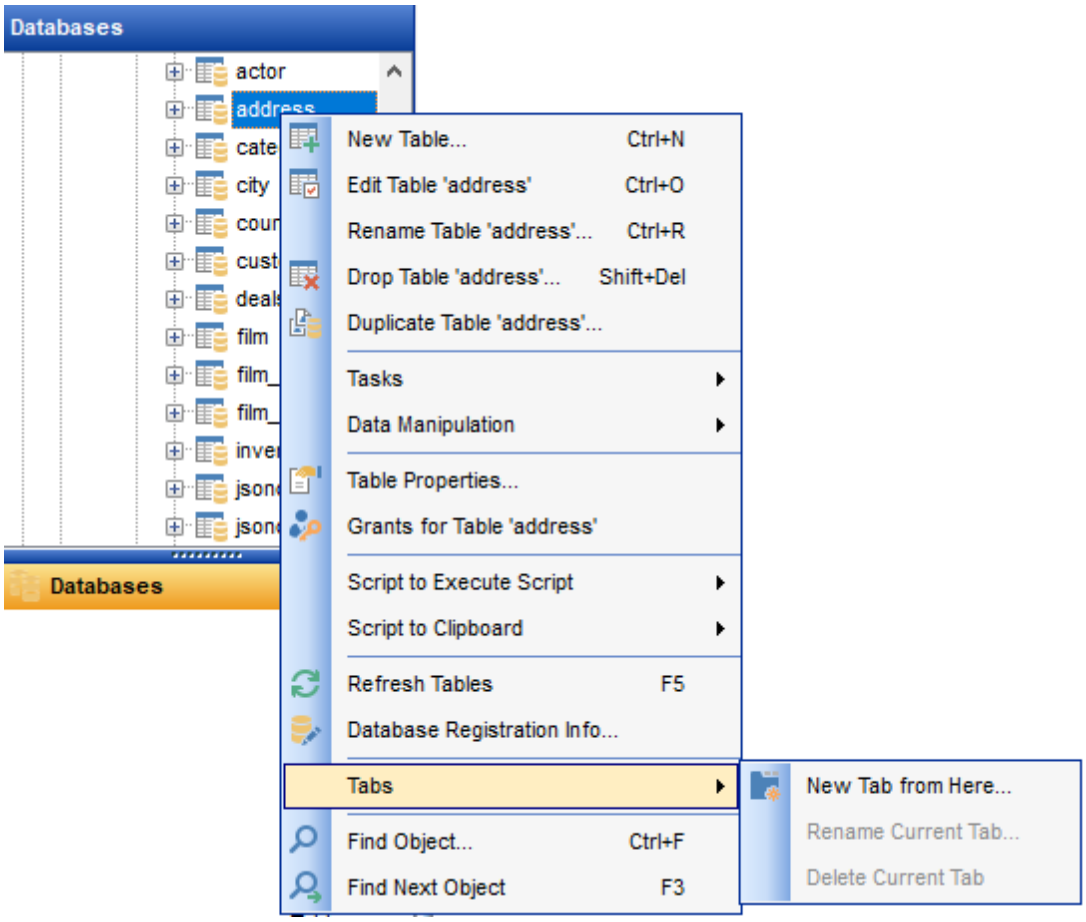

See also:

Host context menu 52

Database context menu 54

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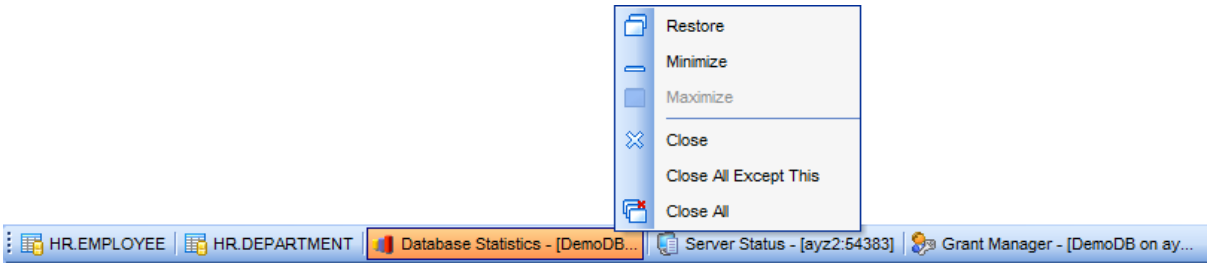
2.7 Working with windows

The **Windows Toolbar** of SQL Manager allows you to switch between child windows easily, like in Windows Task Bar.

To activate the window you need, simply click one of the window buttons. To perform some additional actions with the window, right-click its tab and select the corresponding menu item from the popup menu.



If you have multiple windows opened, you can also switch between them using the *Ctrl+Tab* shortcut[1004].

The **Number of open editors is restricted** option available in the Windows[877] section of the Environment Options[871] options dialog allows you to set the maximum number of editors that may be opened simultaneously. When the number of editors exceeds the specified value, the previously opened editors will be closed automatically.

The **Windows** menu facilitates your work with SQL Manager windows.

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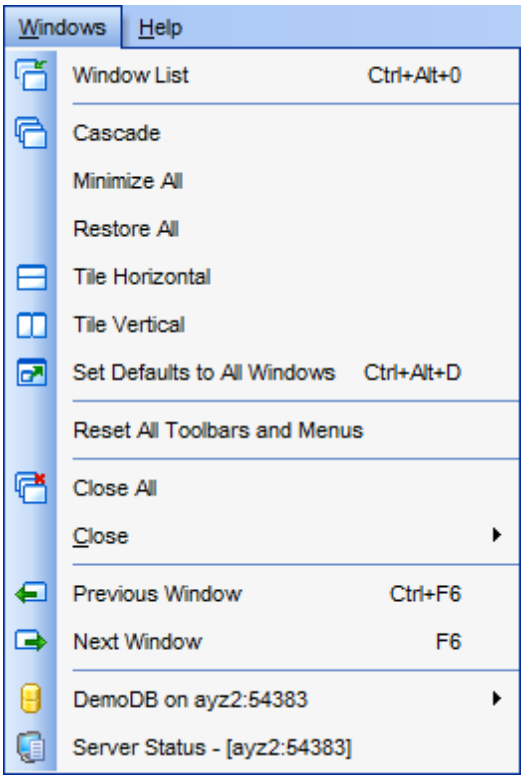

The **Windows** menu allows you to:

- view the Windows List 987 within the corresponding tab 75 of DB Explorer;
- set all current windows *cascade*:

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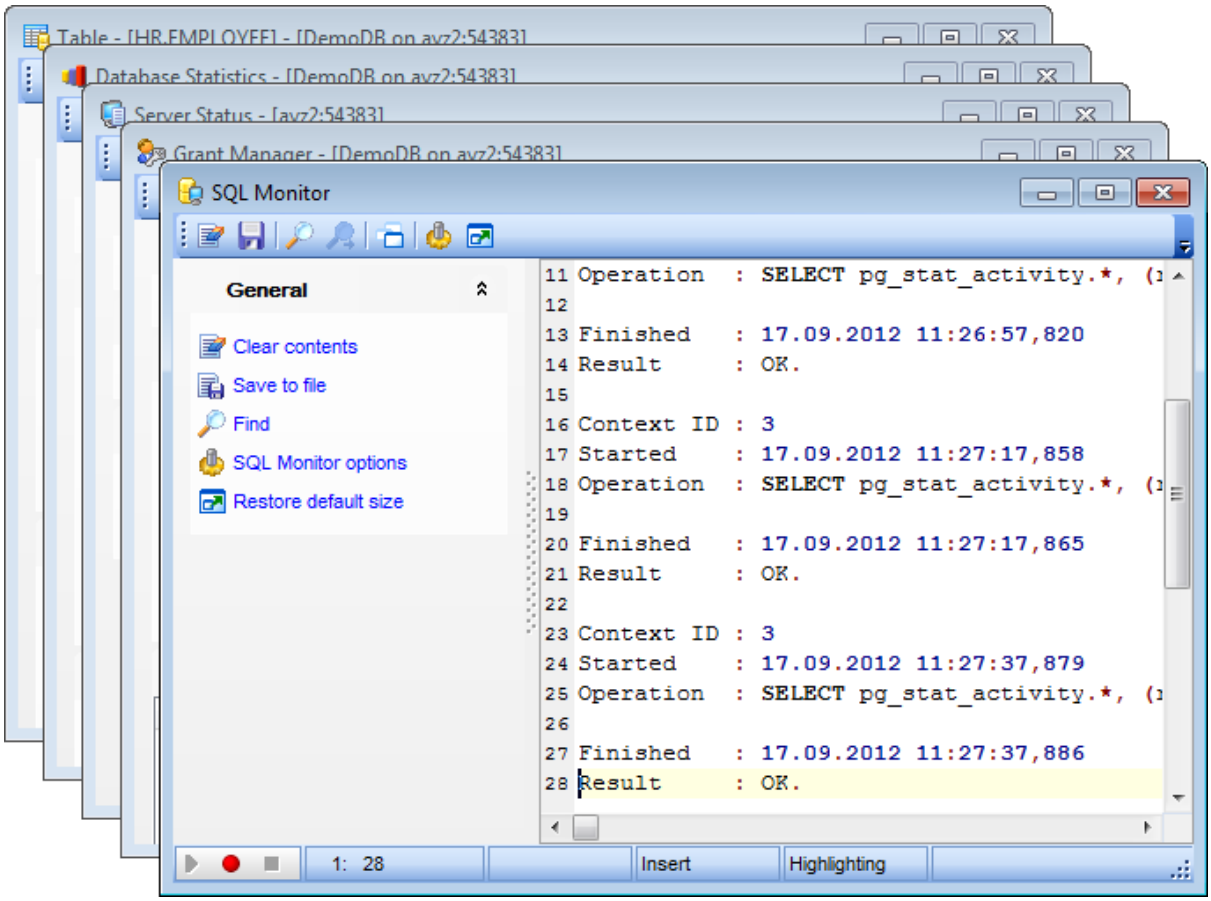

- minimize all windows;
- restore all windows;
- tile all current windows *horizontally*:

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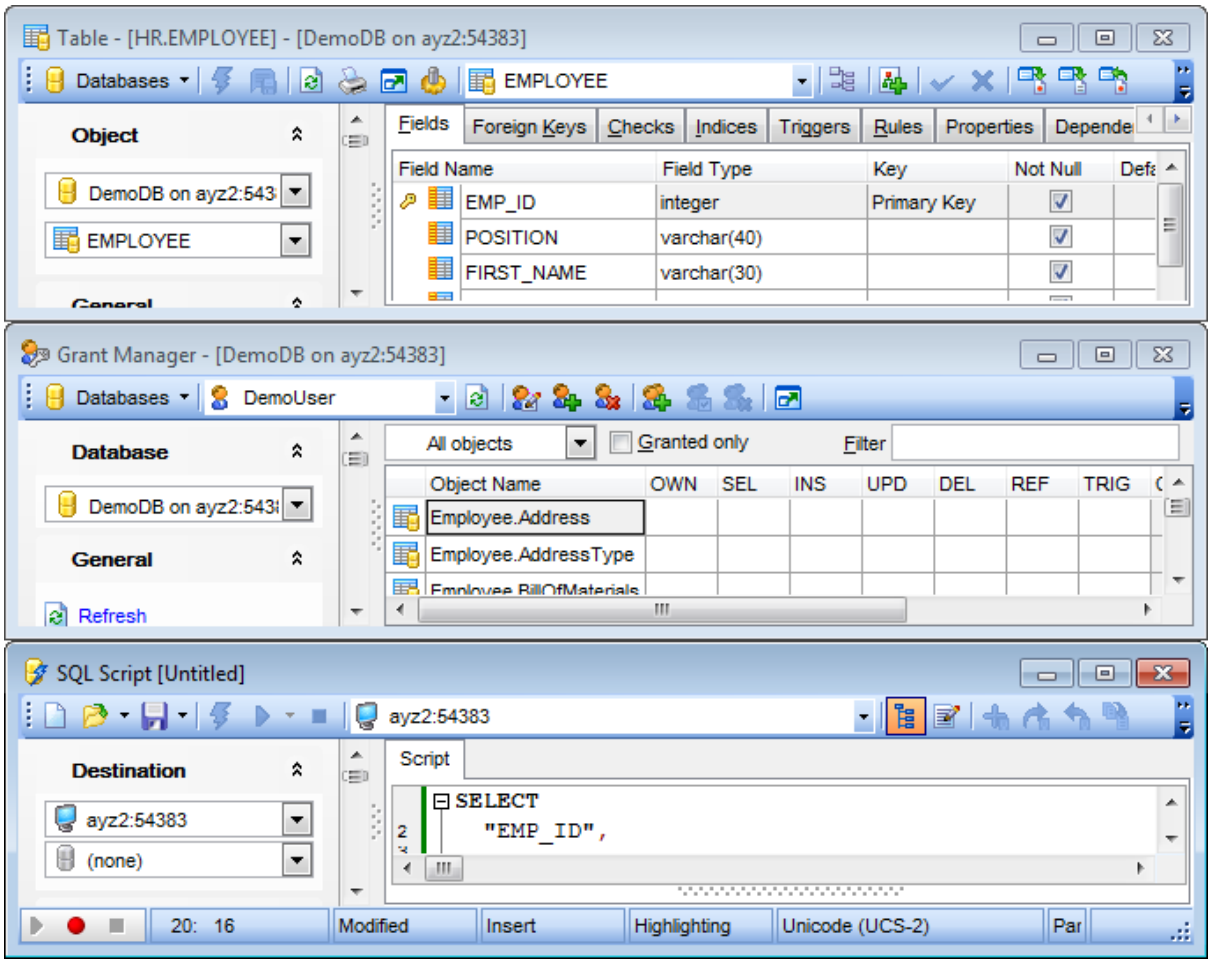

- tile all current windows *vertically*:

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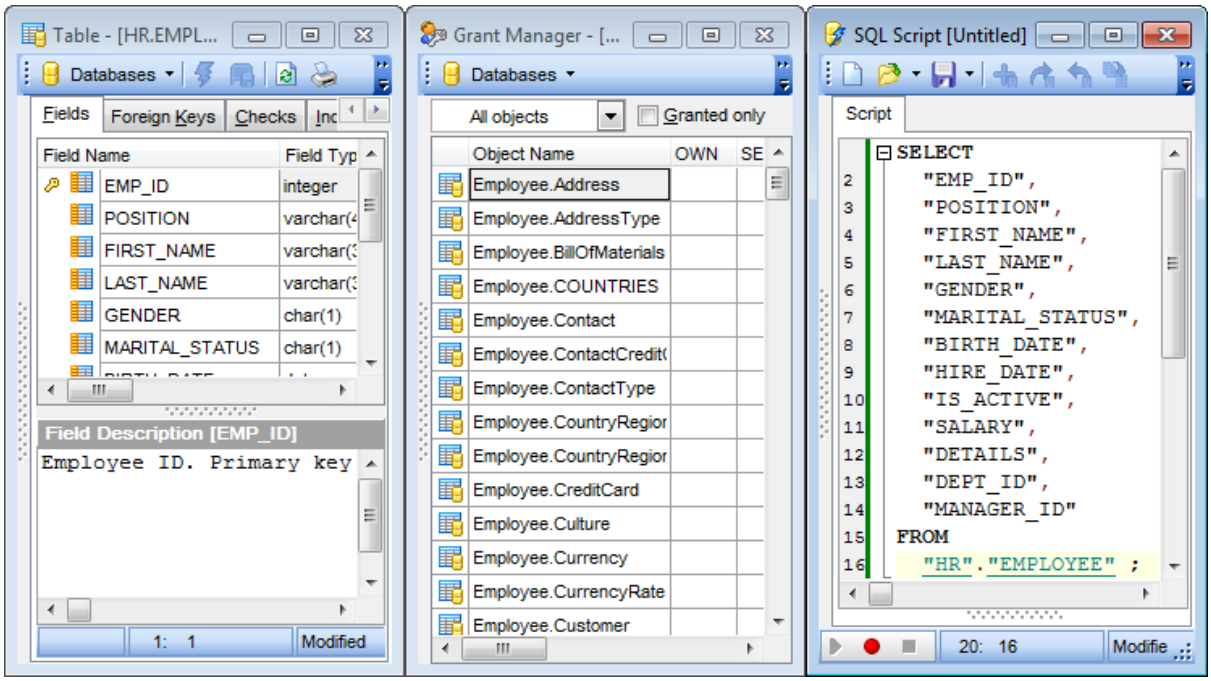

- set defaults to all windows;
- reset all toolbars and menus 988;
- close all windows;
- close all database windows (closes all windows owned by the database selected in the windows list);
- close all editors of the specified object type (can be selected from the submenu);
- switch to the previous window;
- switch to the next window;
- activate one of currently opened windows.

See also:

Selecting style and language 41
First time started 43
Using Desktop Panel 45
Database navigation 47
Working with database objects 49
Using context menus 51

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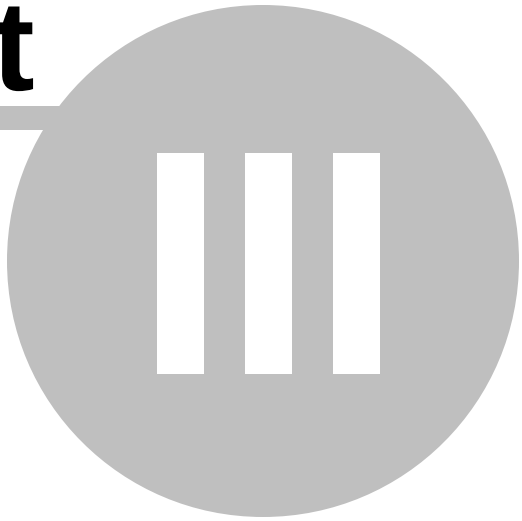
Part



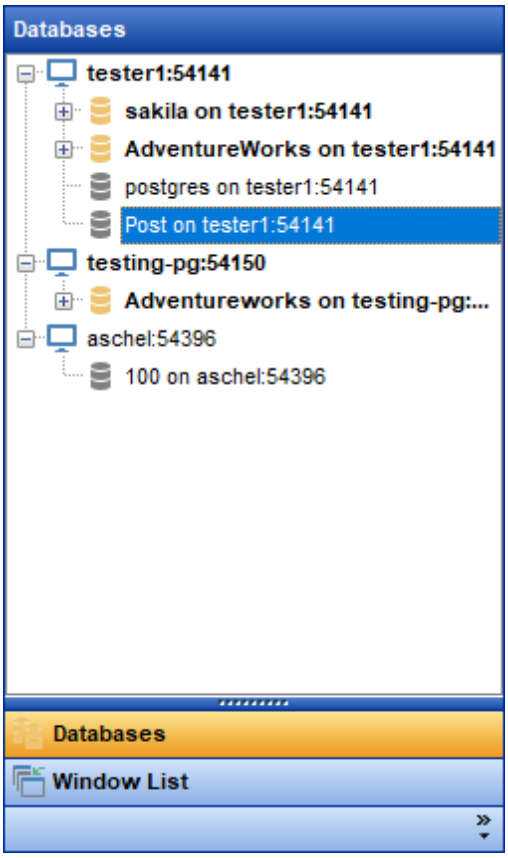
3 Database Explorer

Database Explorer (or **DB Explorer**) is the basic window of SQL Manager for PostgreSQL for navigation 47 within databases and working with database objects. The tree-like structure of DB Explorer allows you to manage the databases and database objects, and perform other everyday operations quickly and easily.

The following list contains the most frequently used features provided by Database Explorer.

- Managing database registration info 67
- Connecting to databases 68
- Performing basic operations upon database objects 70
- Selecting multiple objects 73
- Navigating database objects using multiple tabs 75
- Easy access to recently opened objects 77
- Searching within the tree 78
- Viewing extended information about database objects 81
- Configuring Database Explorer 83
- Managing Favorite queries 85

All objects are structured by their types and are available within the corresponding nodes of the tree. The number of objects of each type is displayed in brackets after the node name denoting the object type. To expand/collapse a node, you can double-click it or use the +/- icons.



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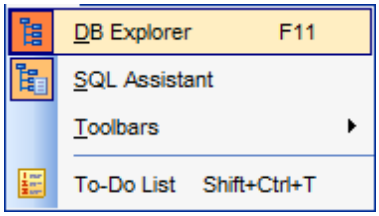
To view/hide the Database Explorer window, use the **View | DB Explorer** main menu 961 item or press the **F11** key.



Use the *Ctrl+Shift+C* shortcut 1001 to collapse the current **DB Explorer** tree branch and switch to the parent node.

Note that you can change database aliases order by dragging them within the **DB Explorer** tree.

See also:

Getting Started 39
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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3.1 Managing database registration info

After you have created and/or registered your database in SQL Manager for PostgreSQL, you can perform a number of operations with the database using the context menu 54.

If you need to view/edit the registration information of a database, right-click the database alias in DB Explorer and select the **Database Registration Info...** context menu item to open the Database Registration Info 108 dialog.

See also:

Register Database 98
Database Registration Info 108
Database Registration Manager 152

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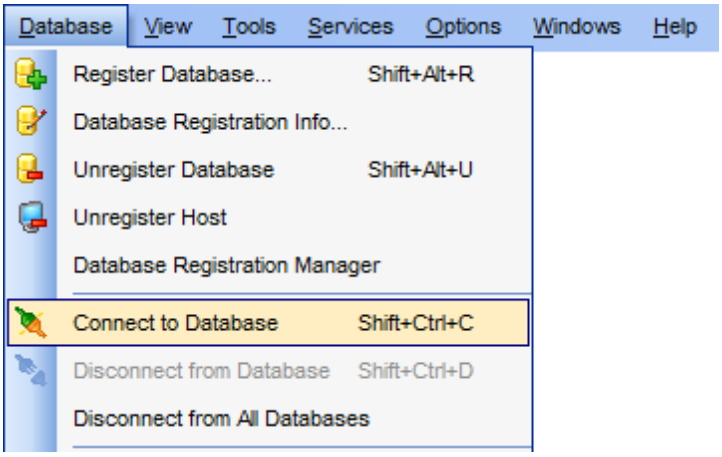
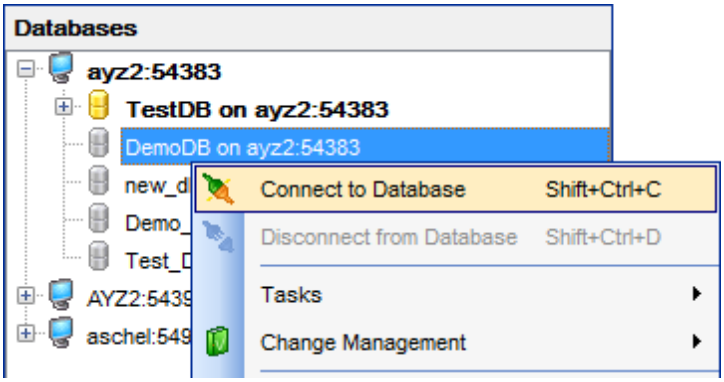
3.2 Connecting to databases

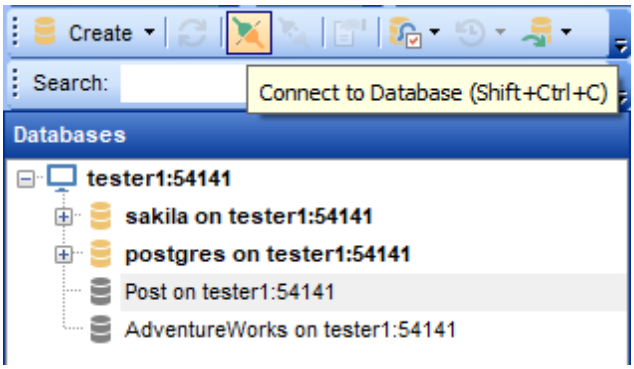
When the database registration 98 is complete, you can establish connection to your database.



The simplest way to connect to a database is to double-click its alias in the Database Explorer 65 tree. The same operation can be performed by selecting the **Connect to Database** item of the database alias context menu 54, or by using the **Database | Connect to Database** main menu 961 item.



Alternatively, you can use the *Shift+Ctrl+C* shortcut 1001 or the **Connect to Database** toolbar 83 button.



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See also:

Register Database 98

Database Registration Info 108

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3.3 Operations with database objects

Database Explorer allows you to perform various operations with database objects 155.

To open an object in its editor, you can double-click the object in the **DB Explorer** tree.

You can also right-click an object within the **DB Explorer** tree and use its context menu 57 to perform a number of operations:

- create a new object (the **New <object>...** item);
- edit currently selected object (the **Edit <object_name>...** item);
- rename currently selected object (the **Rename <object_name>...** item);
- drop the selected object from the database (the **Drop <object_name>...** item);
- duplicate the selected object (the **Duplicate <object_name>...** item);
- define grants for the selected object (the **Grants for <object_name>...** item).

Note that the context menu contains object-specific items only when the object is currently selected in **DB Explorer**.

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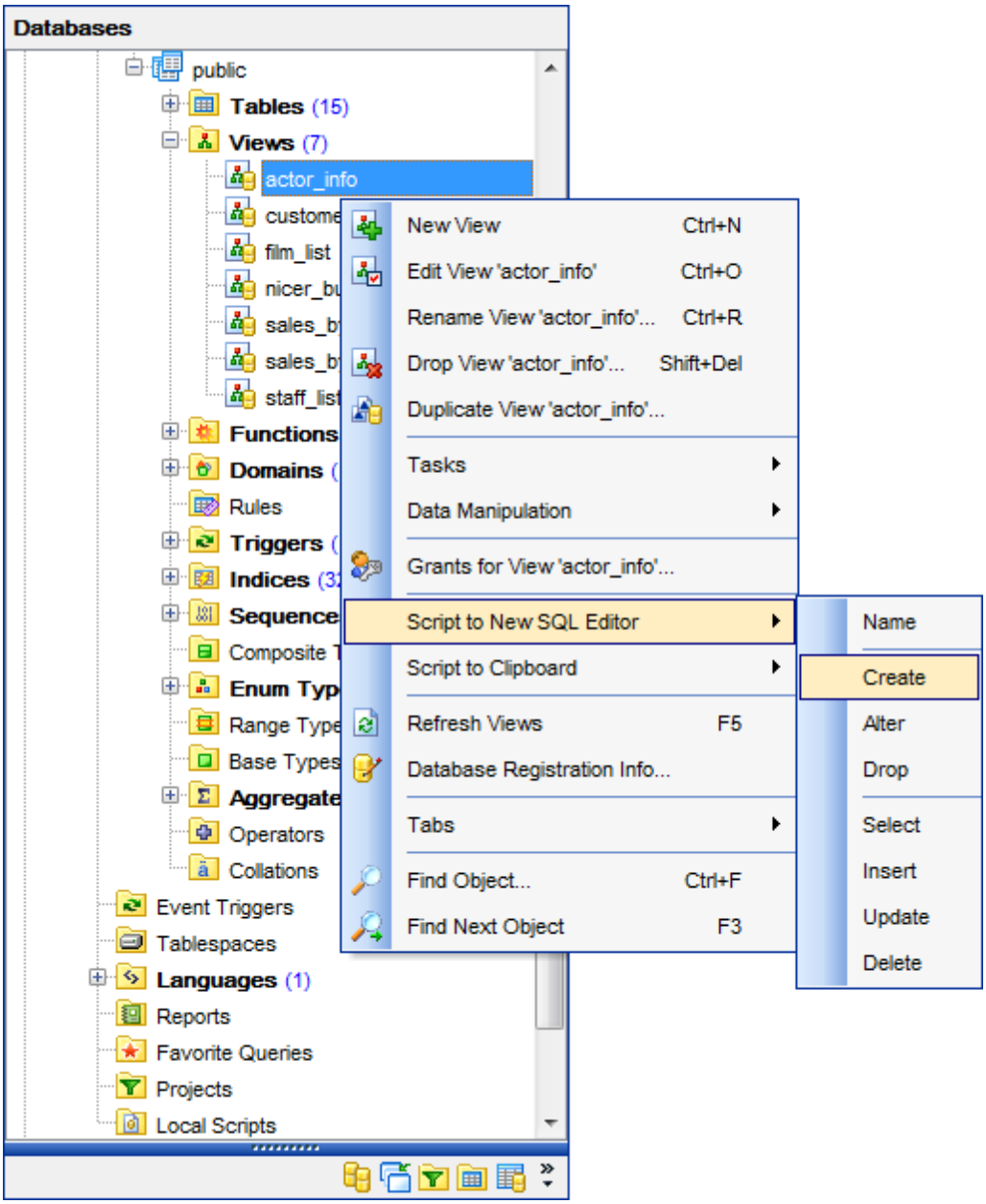

Using drag-and-drop operations you can add objects to Query Data 415, Design Query 431 or Execute Script Editor 646. For your convenience the **Insert to editor** dialog is implemented. The dialog allows you to specify the **statement** to be inserted into the editor: *Name*, *SELECT*, *INSERT*, *UPDATE*, *DELETE*, *CREATE*, *DROP*, *columns list*, *Name and Type*. If necessary, set the **Alias** and **Prefix for variable**.

If more convenient, you can edit the generated statement manually (see Working with Query Data area 418).

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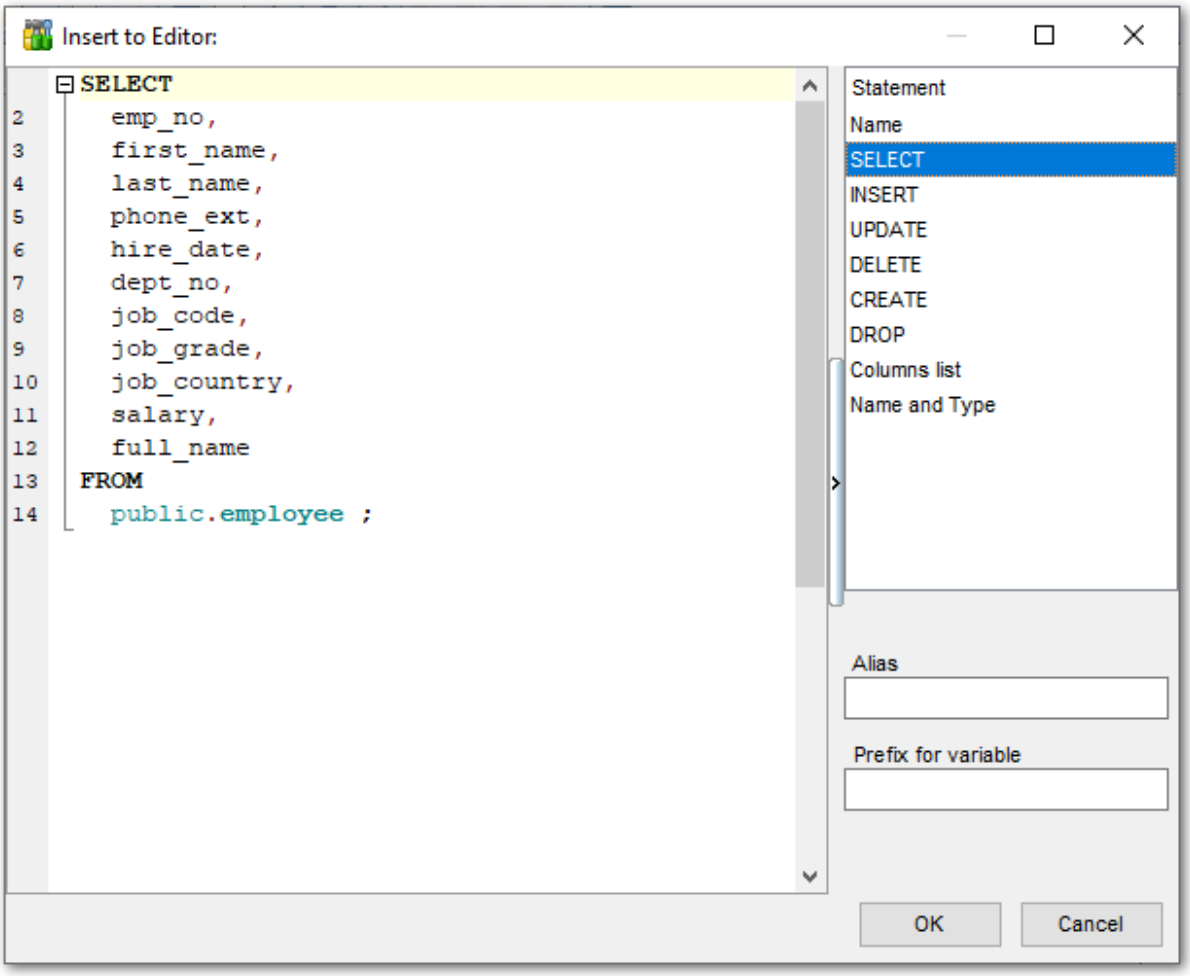

See also:

Database Objects Management 155
Query Data 415
Selecting multiple objects 73

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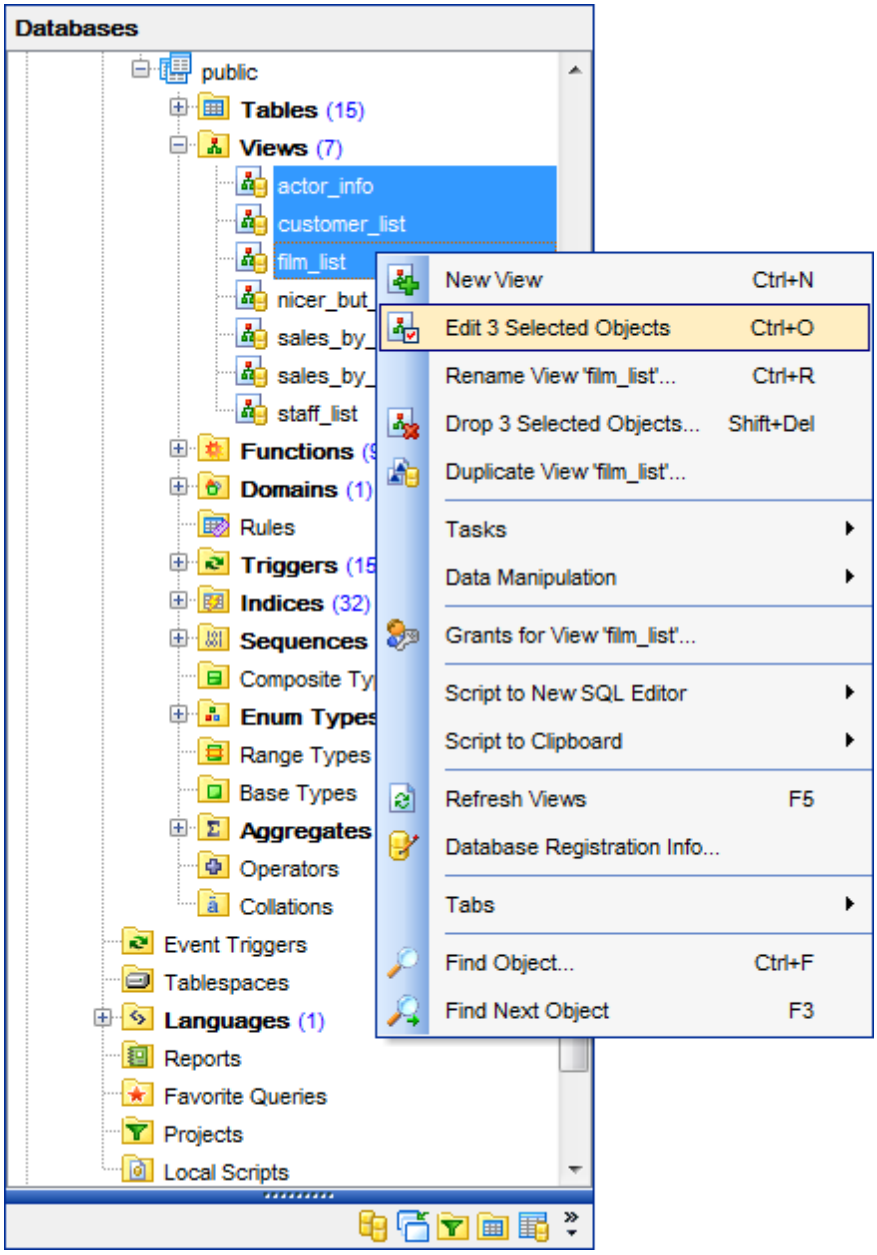
3.4 Selecting multiple objects

You can select more than one object in **Database Explorer** by pressing the *Ctrl* or the *Shift* key and selecting multiple objects one by one.

The **context menu** of several selected objects allows you to:

- create[155] a new database object of the same type;
- edit the selected objects;
- drop the selected objects;
- perform other operations with the current object (see Operations with database objects[70]).



Hint: You can move several objects to your projects: just drag and drop the selected

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objects to the previously created subfolder within the **Projects** node of **DB Explorer**.

See also:

Operations with database objects 70

Database Objects Management 155

Managing projects

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3.5 Using tabs for database navigation

To make your work with **Database Explorer** even more convenient, the capability of **working with several tabs** is implemented.

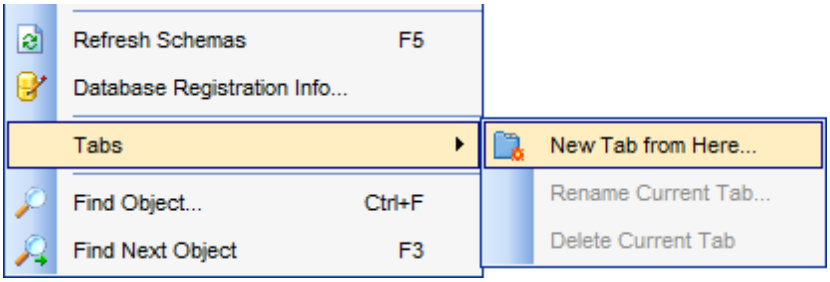
You can use tabs when you wish to work with a particular node of the DB Explorer tree only: with one specific schema, or with tables of some schema, or with a specific database project. Creating such tabs will minimize scrolling within large trees, you only need to switch between them with a single click on the corresponding tab.

Creating tabs

In order to create a new tab:

- right-click the node (e.g. the **Tables** node) for which you wish to create a tab and select the **New Tab from Here...** context menu item.

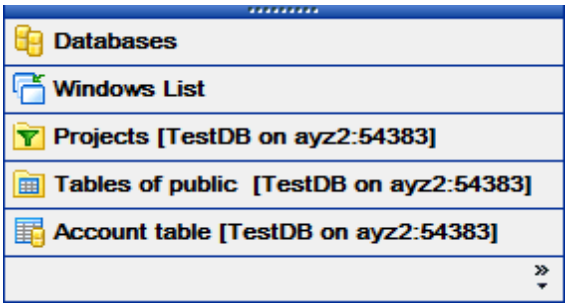
Note: A tab can be created only on the basis of a tree node. For example, if the **Show Table Subobjects** option is disabled in the View Mode 84 menu, the **New Tab from Here...** item will not be available for tables, since none of them will be a tree node anymore.



The specified tabs can be displayed in either of the two views:

- as *icons* on the lower pane of DB Explorer:

- as *tabs* with captions:



Hint: You can reorder items in the *tabs* view by dragging their captions up and down.

To add/remove items to/from the *tabs* view, you can drag the horizontal splitter 963 up/down:

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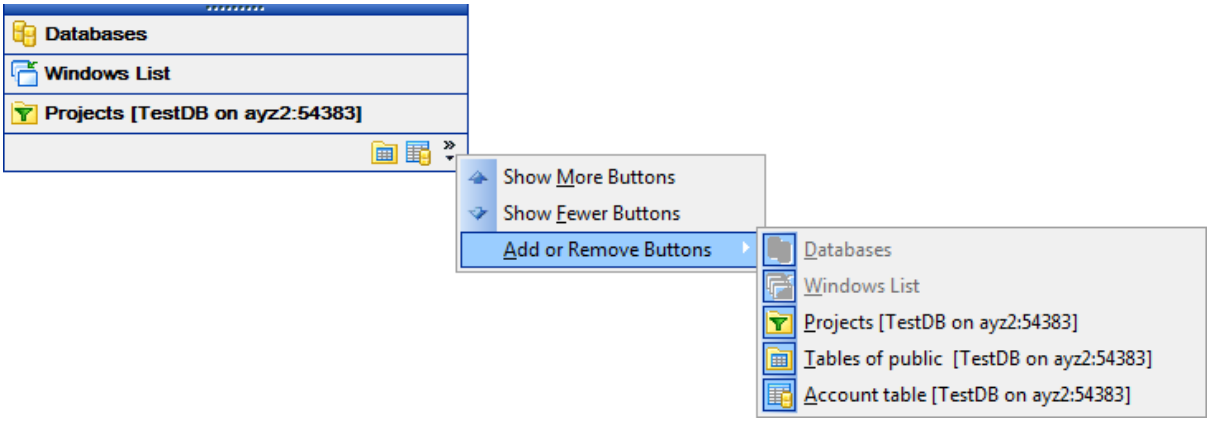
or click the **Configure buttons** icon available in the bottom right corner of the **DB Explorer** window, and select **Show More Buttons** / **Show Fewer Buttons** / **Add or Remove Buttons** items from the popup menu.



Note: Navigation through the tabs is also possible with the help of the following shortcuts 1004:

- *Ctrl+Shift+N* - move to the next tab;
- *Ctrl+Shift+P* - move to the previous tab.

Renaming tabs

In order to rename a tab:

- switch to the tab by clicking its caption or icon (there can be only one active tab, and it is highlighted with a different color);
- right-click within the DB Explorer area and select the **Rename Current Tab...** context menu item.

Removing tabs

In order to remove a tab:

- switch to the tab by clicking its caption or icon (there can be only one active tab, and it is highlighted with a different color);
- right-click within the DB Explorer area and select the **Delete Current Tab** context menu item.

See also:

Managing projects

Windows List 987

Database Objects Management 155

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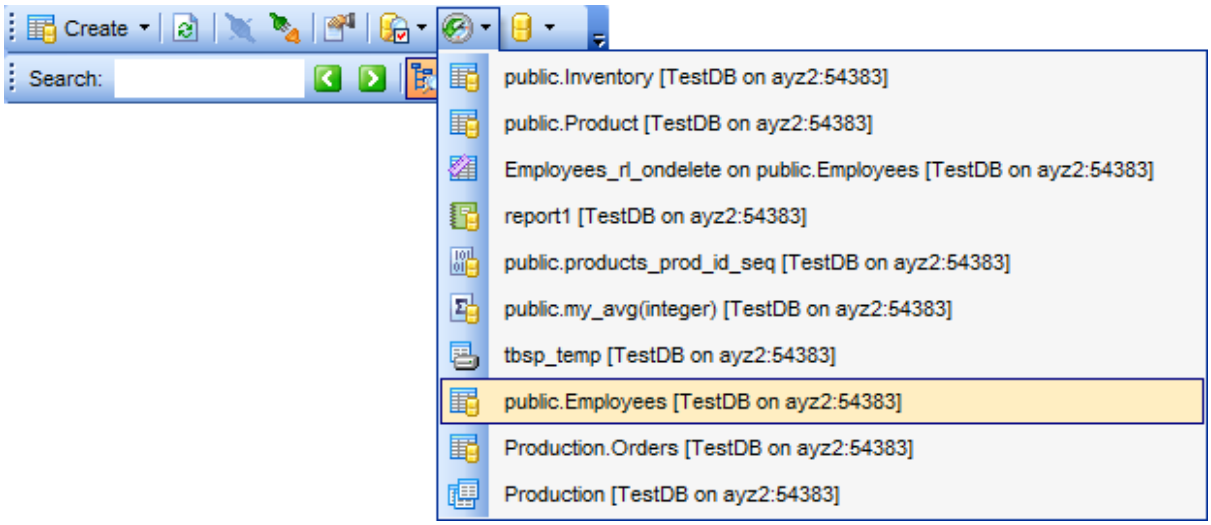
3.6 Recently opened objects

Use the **Recent Objects** button available on the DB Explorer toolbar[83] to access the list of recently opened database objects (during the current session).

This list is common for all registered databases. Next to the object name the database name and the host/address are displayed. Select an object from this list to open it using its editor.



To change the number of objects that are considered 'recent', select the **Options | Environment Options** main menu[961] item, proceed to the **Tools | DB Explorer** section within the **Environment Options** dialog, and set the **Recent objects count** option value (see Environment Options[871] for details).

See also:

Database Objects Management[155]

Environment Options[871]

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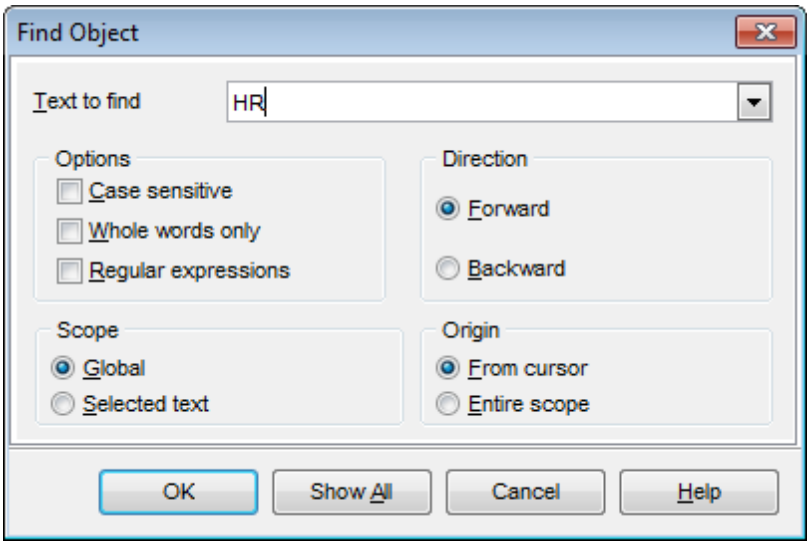
3.7 Searching within the tree

SQL Manager for PostgreSQL provides an ability to search for items within the **DB Explorer** tree. Searching for items may be useful if you have a lot of database objects, and it may be sometimes hard to find the one you need.

There are two search facilities implemented in SQL Manager for your convenience. You can search for objects within the **DB Explorer** tree in either of the following ways:

- using the **Find Object** dialog

To call the **Find Object** dialog, right-click the **Database** alias, any database object group nodes or objects in the **DB Explorer** tree and select the **Find Object...** context menu 51 item, or use the *Ctrl+F* shortcut 1001.



Available search options are similar to those provided by the **Find Text** dialog. For detailed description of the search options refer to the Find Text dialog 971 page.

Note: You can specify whether the search will be performed within the entire tree or within the currently selected node only: toggle search mode using the **Search by categories** button on the Search Panel 83, or use the corresponding option available in the Tools | DB Explorer 882 section of the Environment Options 871 dialog.

- using the **Search Panel**

Type in the first letters in the edit-box, and the corresponding object will be highlighted in the tree, as displayed in the picture below. The buttons allow you to define the search direction.

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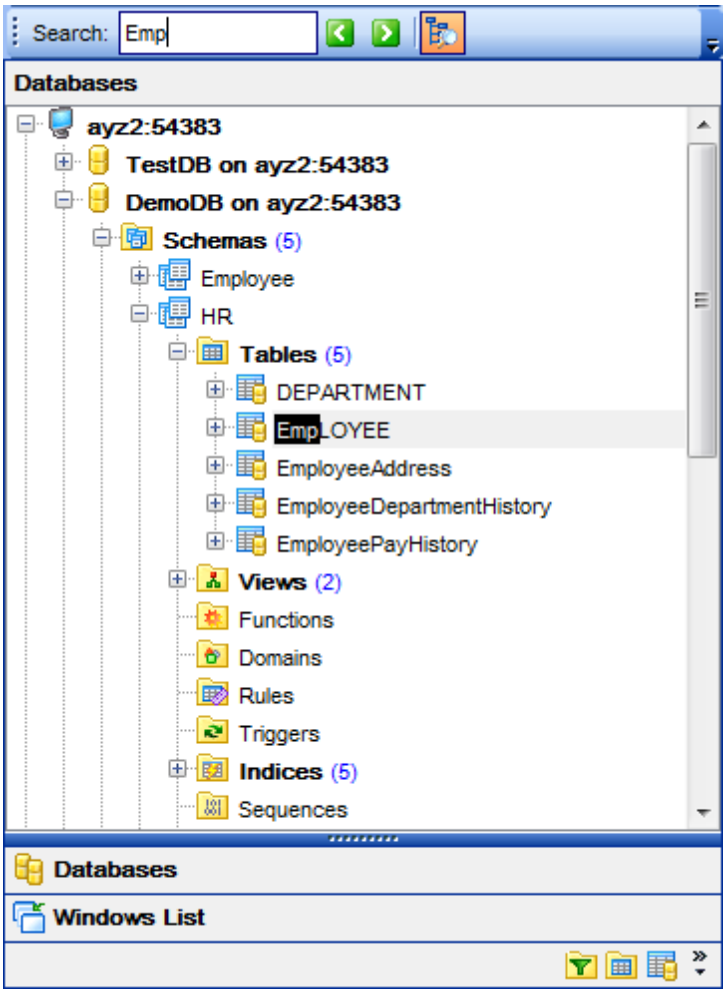
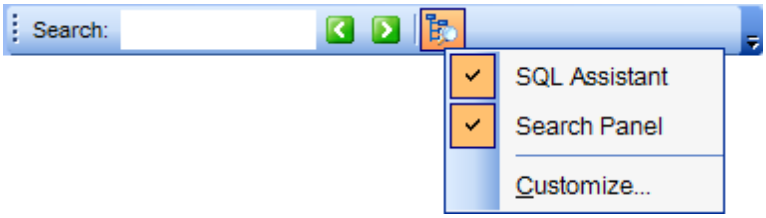


By default, the **Search Panel** is activated in the upper area of DB Explorer. To disable the panel, right-click within the panel and deselect the checkbox at the corresponding popup menu item.



The **Search Panel** also contains the button for switching the search mode which allows performing the search by object categories.

Hint: The **Search Panel** is dockable, i.e. you can drag it to any location within the **DB Explorer** form.

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See also:

Find Text dialog 971

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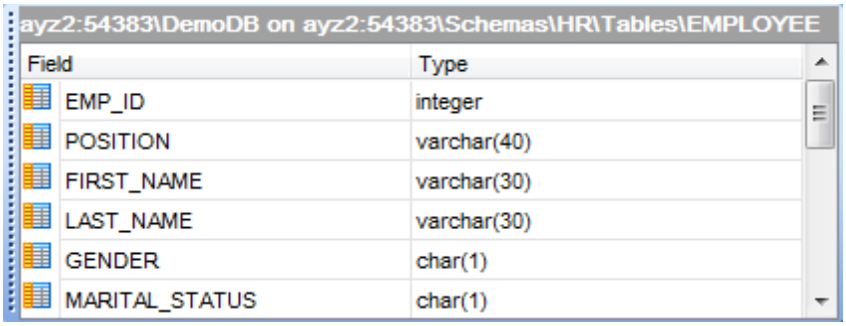
3.8 SQL Assistant

SQL Assistant which is located at the bottom of the **Database Explorer** window helps you to work with your database objects[155]. Depending on the current selection in DB Explorer, the SQL Assistant area displays additional information pertaining to the selected object.



If you select a **host** in DB Explorer, SQL Assistant displays the list of registered *databases* that reside on this host.

If you select a **database** in DB Explorer, SQL Assistant displays the list of the database *object groups* and *the number of objects* in each group.

If you select a **schema** in DB Explorer, SQL Assistant displays the schema *definition* (by default).

Selecting an **object group** in DB Explorer displays the list of the *objects* in SQL Assistant. Double-clicking the object name in **SQL Assistant** makes the object available for editing in the appropriate editor. The context menu of the object or group of objects (selected with the *Ctrl* or *Shift* keys pressed) allows you to edit or drop the selected objects.

If you select a **table** in DB Explorer, SQL Assistant displays the list of the table subobjects (e.g. *columns* and their *types*) by default. What is displayed in **SQL Assistant** when a table is selected in DB Explorer depends on the **Table Details** selection. Click the **View Mode** toolbar[84] button and select the **Table Details | Show...** drop-down menu item, or use the context menu of SQL Assistant. Possible values are: *Show Columns*, *Show Foreign Keys*, *Show Checks*, *Show Indexes*, *Show Triggers*, *Show Rules*, *Show Table Status*, *Show DDL*, *Show Description*.

Selecting other objects in **DB Explorer** displays the definition in **SQL Assistant** by default. Use the **Other Objects' Details | Show...** context menu item within the SQL Assistant area to define the content of SQL Assistant when an object is selected in DB Explorer. Possible values are: *Show DDL*, *Show Description*.

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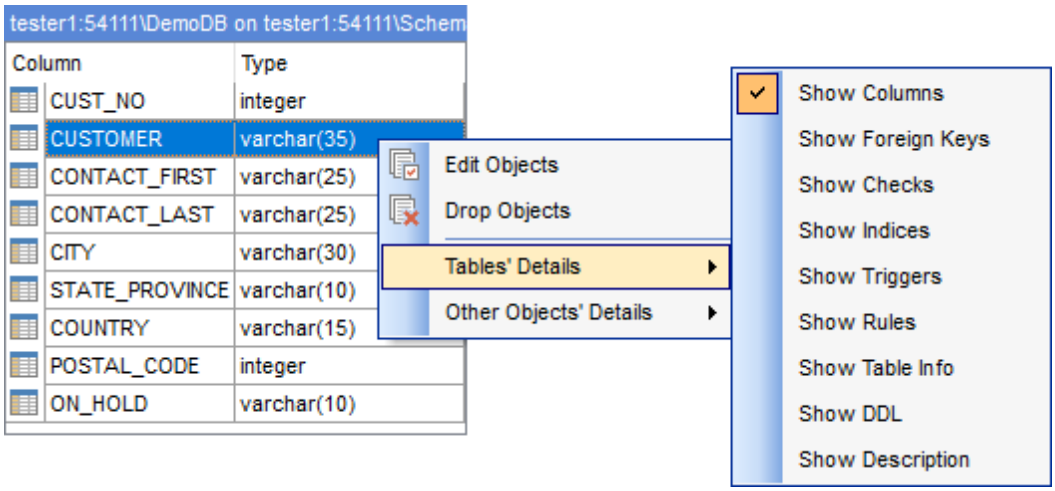

You can also use **SQL Assistant** to work with your queries[413] quickly. You can drag-and-drop object aliases to the Query Data[415], Design Query[431] or Execute Script Editor[646] working area, in the same way as this operation[70] is performed in **Database Explorer**.

See also:

Database Objects Management[155]

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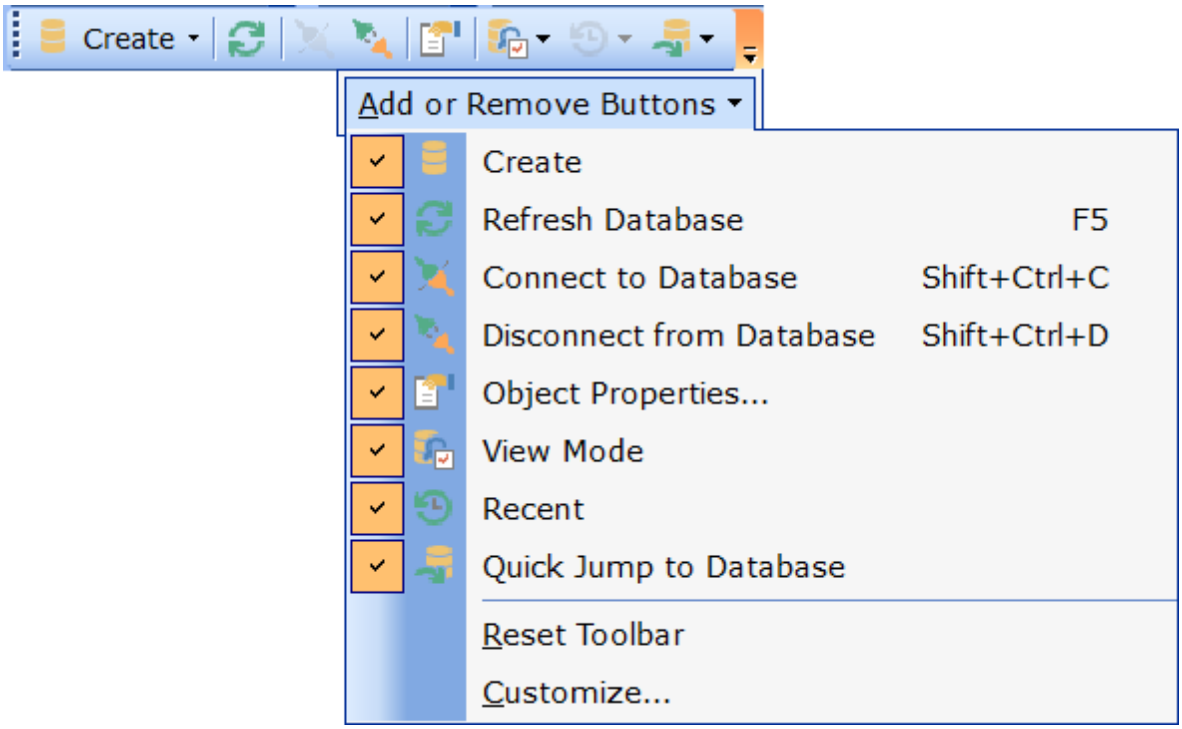
3.9 Configuring Database Explorer

Configuring DB Explorer toolbar

The toolbar[963] of Database Explorer contains most frequently used tools for working with databases and database objects, and a tool for configuring DB Explorer. The following actions are available in the toolbar by default:

- create[155] a new object;
- refresh the current tree branch;
- connect[68] to a database;
- disconnect[88] from a database;
- view the selected object properties;
- configure Database Explorer using the View Mode[84] menu;
- view the list of recently opened objects[77];
- jump to any of registered databases quickly.

Click **More buttons...** on the right side of the toolbar and use the **Add or Remove Buttons** popup menu items to define the set of actions available in the toolbar. To customize[988] the toolbar, select the **Add or Remove Buttons | Customize...** item from the popup menu.



Configuring the Search Panel

Click **More buttons...** on the right side of the Search Panel[78] and use the **Add or Remove Buttons** popup menu items to define the set of the panel elements. To customize[988] the panel, select the **Add or Remove Buttons | Customize...** item from the popup menu.

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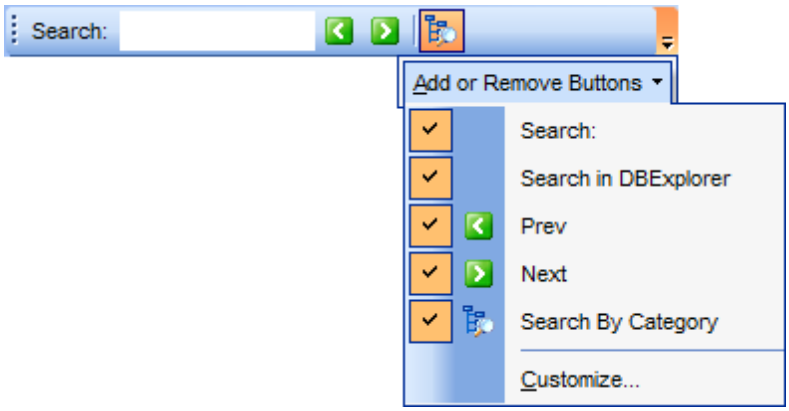
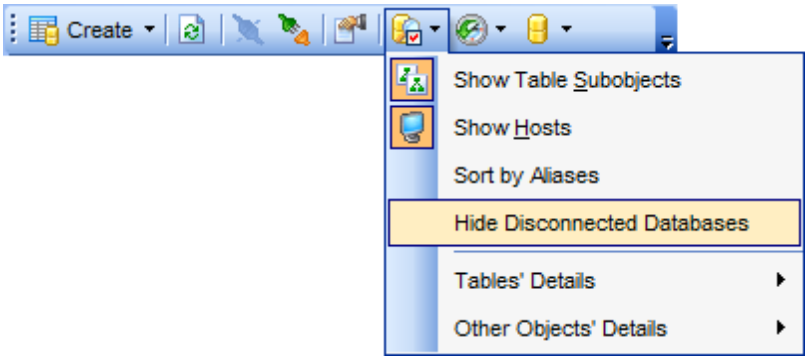


Using View Mode menu

Use the **View Mode** toolbar[83] button to configure **Database Explorer** according to your needs.

The drop-down menu called upon clicking this button allows you to:

- show/hide table subobjects as child nodes of tables[169];
- show/hide host nodes for registered databases[98];
- sort the list of databases by their aliases in the DB Explorer tree;
- show/hide disconnected databases[68];
- configure tables' details for the SQL Assistant[81] area;
- configure other objects' details for the SQL Assistant[81] area.



Use the DB Explorer[882] section of the Environment Options[871] dialog (**Options | Environment Options...**) to see more options to configure **Database Explorer**.

See also:

Database Objects Management[155]

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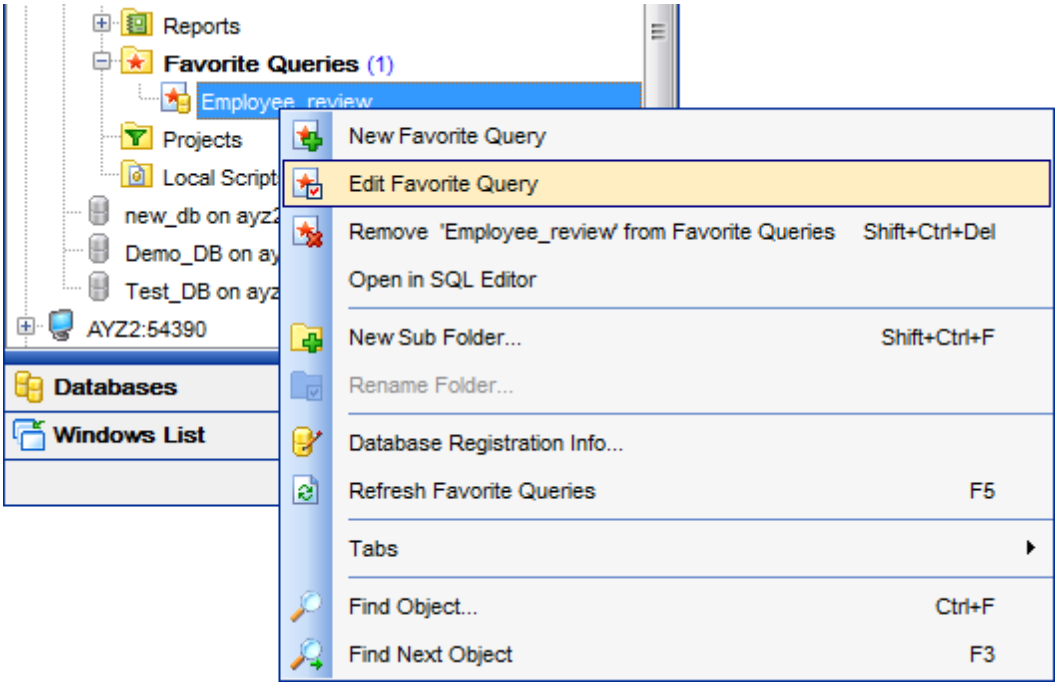
3.10 Managing Favorite queries

Favorite Queries is a new feature of SQL Manager. Now you are provided with an opportunity to save the most frequently used SQL queries as Favorite Queries.

Use the **Favorite Queries** node of DB Explorer to access the list of your Favorite queries quickly. Queries stored in the database and those stored in Windows registry can be easily distinguished by their icons.

Using the context menu you can create a new Favorite query or edit an existing one using Favorites editor 429, open any of the existing queries in Query Data 415 or remove a query if you don't need it any longer.



You can also create a separate tab for your Favorite queries. See Using tabs for database navigation 75 section for details.

See also:

Using tabs for database navigation 75
Favorites editor 429

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Part

4 Database Management

SQL Manager for PostgreSQL provides a number of tools you may need to manage your PostgreSQL databases.
Find the list of common database management operations for working in SQL Manager below.

Unregistering host

In order to unregister a host in SQL Manager for PostgreSQL:

- select the host to unregister in the DB Explorer 65 tree, then select the **Database | Unregister Host** main menu 961 item or use the corresponding **Unregister Host** toolbar 963 button;
- right-click the host alias and select the **Unregister Host** context menu 52 item in the DB Explorer 65 tree;
- confirm unregistering in the corresponding dialog window.

Creating database

In order to create a database in SQL Manager for PostgreSQL:

- select the **Database | Create Database** main menu 961 item or use the corresponding **Create Database** toolbar 963 button;
- set all the necessary options using Create Database wizard 89 which guides you through the entire process of creating a new database.

Dropping database

In order to drop a database in SQL Manager for PostgreSQL:

- select the database to drop in the DB Explorer 65 tree;
- select the **Database | Drop Database** main menu 961 item;
- confirm dropping in the corresponding dialog window.

Registering database

In order to register a single database in SQL Manager for PostgreSQL:

- select the **Database | Register Database...** main menu 961 item or use the corresponding **Register Database** toolbar 963 button;
- right-click any database alias and select the **Register Database...** context menu 54 item in the DB Explorer 65 tree;
- set all the necessary options using Register Database wizard 98 which guides you through the entire process of database registration.

Unregistering database

In order to unregister a database in SQL Manager for PostgreSQL:

- select the database to unregister in the DB Explorer 65 tree, then select the **Database | Unregister Database** main menu 961 item or use the corresponding **Unregister Database** toolbar 963 button;
- right-click the database alias and select the **Unregister Database** context menu 54 item in the DB Explorer 65 tree;
- confirm unregistering in the corresponding dialog window.

Connecting to database

In order to connect to a database in SQL Manager for PostgreSQL:

- select the database to connect to in the DB Explorer 65 tree, then select the **Database | Connect to Database** main menu 961 item or use the corresponding **Connect to**

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Database toolbar 83 button;
- right-click the database alias and select the **Connect to Database** context menu 54 item in the DB Explorer 65 tree.

Disconnecting from database

In order to disconnect from a database in SQL Manager for PostgreSQL:
- select the database to disconnect from in the DB Explorer 65 tree, then select the **Database | Disconnect from Database** main menu 961 item or use the corresponding **Disconnect from Database** toolbar 83 button;
- right-click the database alias and select the **Disconnect from Database** context menu 54 item in the DB Explorer 65 tree.

Viewing and editing database registration info

In order to view/edit database registration info in SQL Manager for PostgreSQL:
- select the database or any of its objects in the DB Explorer 65 tree, then select the **Database | Database Registration Info...** main menu 961 item;
- right-click the database alias or any of its objects and select the **Database Registration Info...** context menu 54 item in the DB Explorer 65 tree.

Viewing and editing database properties

In order to view/edit database properties in SQL Manager for PostgreSQL:
- select the database in the DB Explorer 65 tree;
- right-click the database alias and select the **Database Properties...** context menu 54 item or use the corresponding **Properties** toolbar 83 button.

See also:

Getting Started 39
Database Explorer 65
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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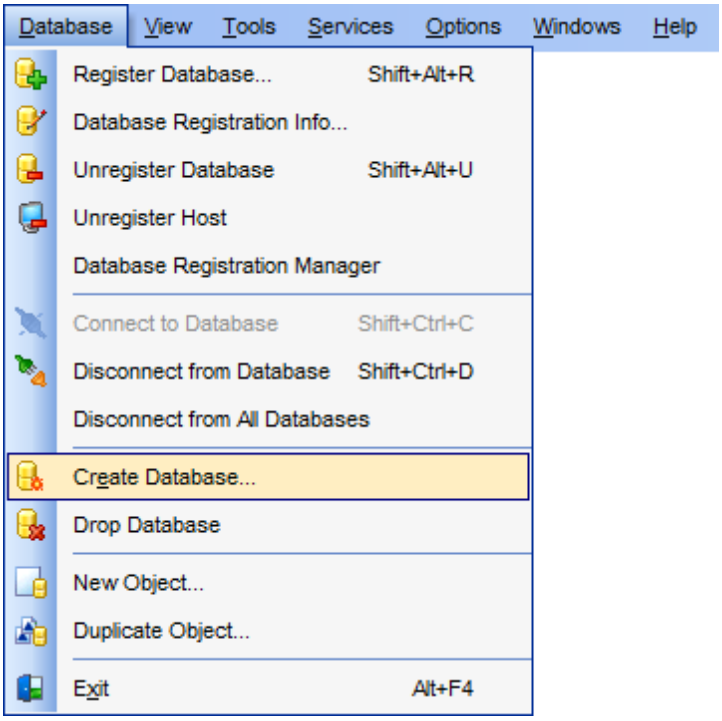
4.1 Create Database wizard

Create Database wizard allows you to create a new database on your PostgreSQL host.

To start the wizard, select the **Database | Create Database...** main menu 961 item, or use the **Create Database** button on the main toolbar 963.

- Setting database name 90
- Setting connection properties 91
- Specifying tunneling parameters 93
- Setting advanced database properties 95
- Viewing result SQL statement 97



See also:

Register Database wizard 98
Database Registration Info 108
Database Properties 145

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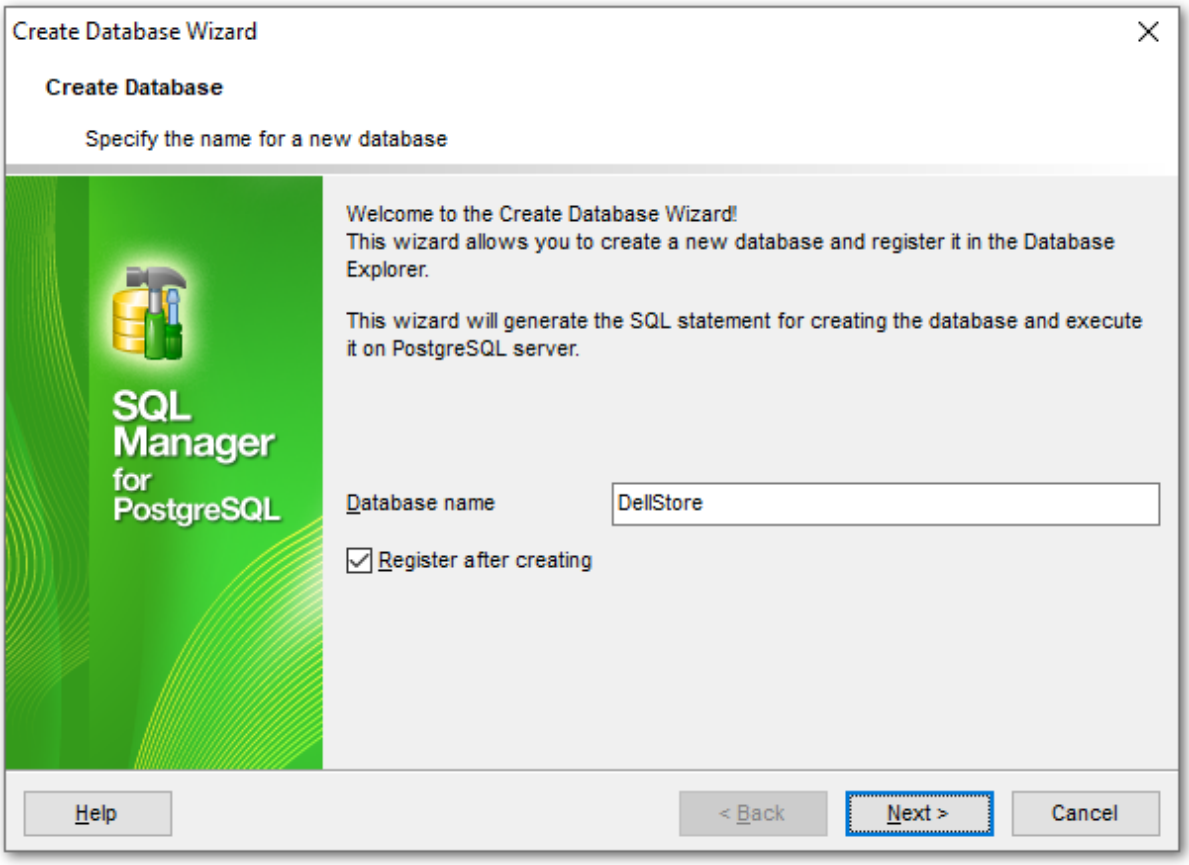
4.1.1 Setting database name

Use this step of the wizard to enter a **name** for the database being created.



Register after creating
Check this option to register[98] the newly created database in SQL Manager (the Database Registration Info[108] dialog will be opened after database creation).

Click the **Next** button to proceed to the Setting connection properties[91] step of the wizard.

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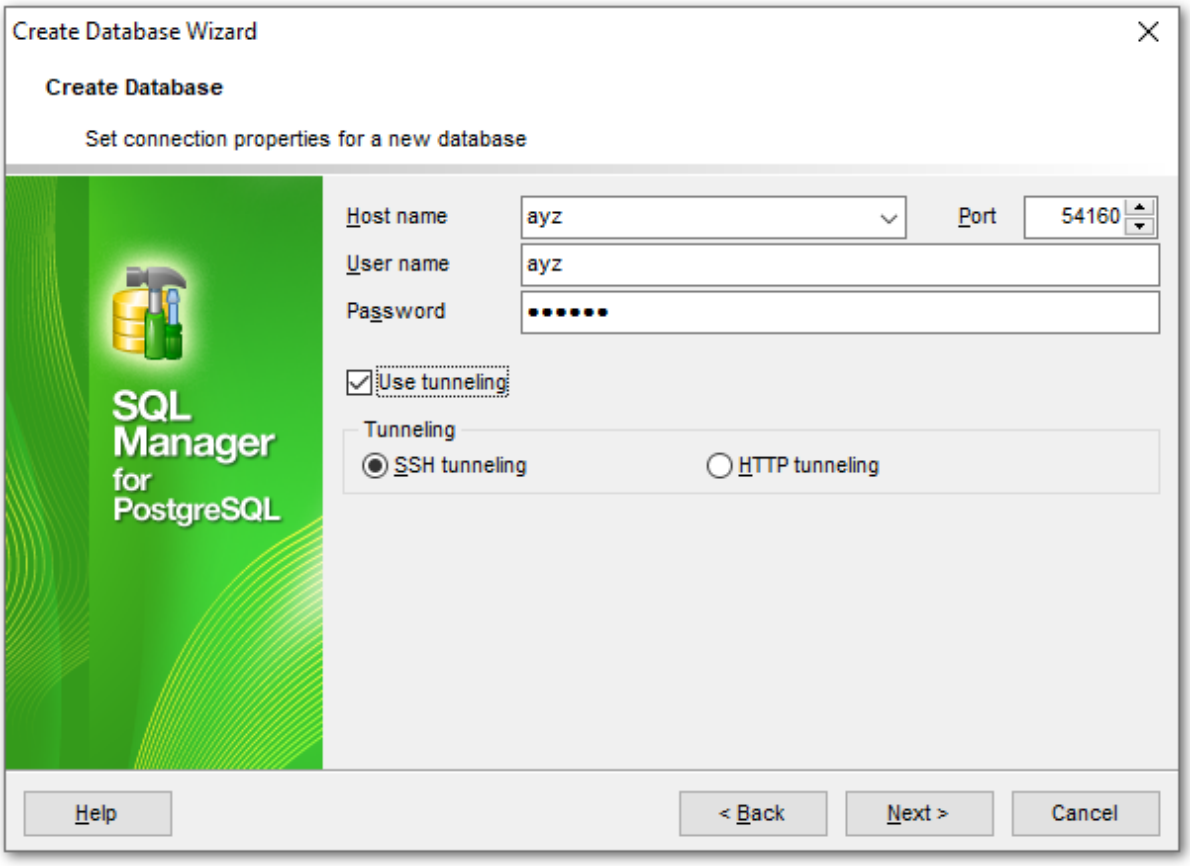
4.1.2 Setting connection properties

Use this step of the wizard to set the necessary **connection parameters** for the database being created. Use the corresponding boxes and options: *Host name*, *Port*, *User name* and *Password*.



Specify the host where the database being created will reside: type in the host name in the **Host name** field or select one in the drop-down list.
Enter PostgreSQL port to connect through in the **Port** field and provide *authorization* settings: **User name** and **Password**.

Use tunneling
If this option is checked, you should set tunneling parameters at the *Specifying tunneling parameters* step of the wizard.

Tunneling
SSH tunneling
Select this option to establish connection to an intermediate SSH server and forward all PostgreSQL commands through the secure tunnel. The next step of the wizard allows you to define the corresponding parameters for SSH tunneling.

HTTP tunneling
Select this option to access PostgreSQL server through the HTTP protocol in case of Internet access through HTTP proxy only, or if the server does not allow direct

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connections to PostgreSQL, but allows HTTP connections. The next step of the wizard allows you to define the corresponding parameters for HTTP tunneling.

Click the **Next** button to proceed to the Setting advanced database properties 95 step of the wizard.

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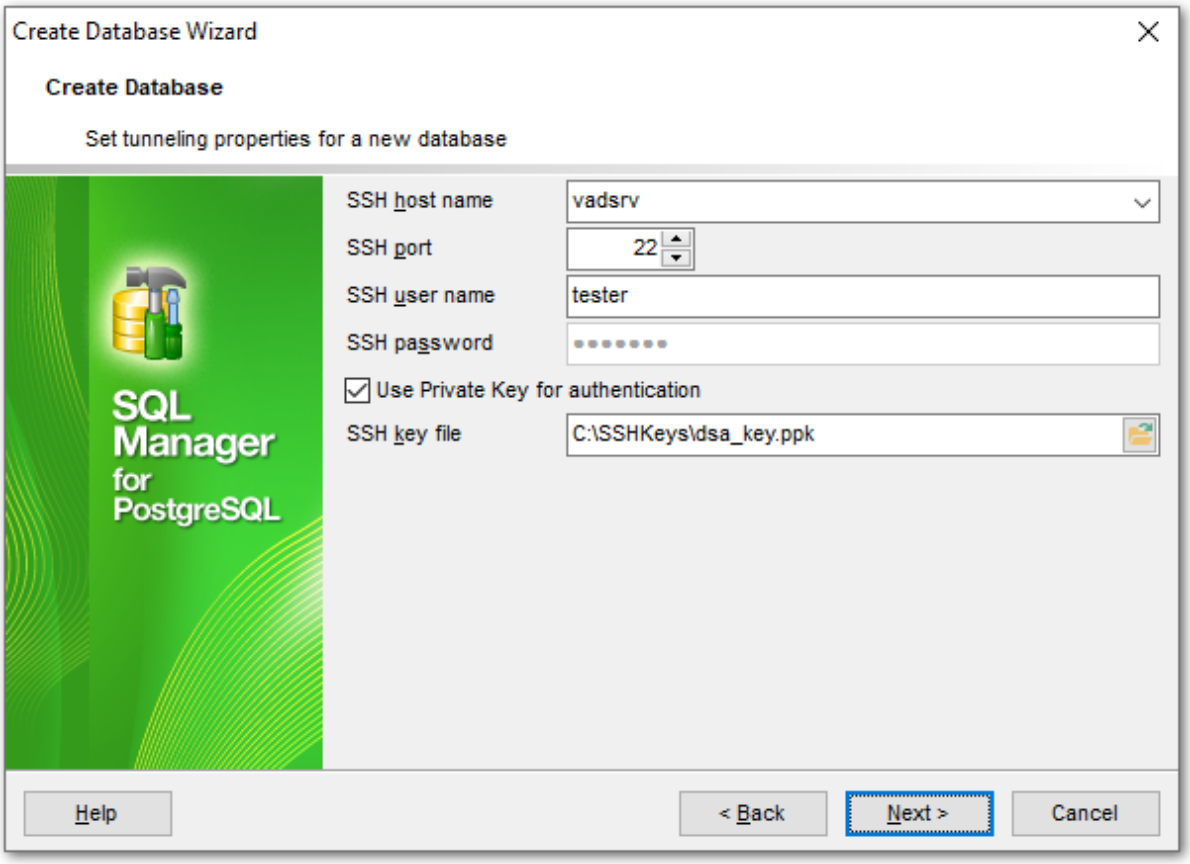
4.1.3 Specifying tunneling parameters

This step of the wizard allows you to specify the necessary parameters for connection with **SSH** or **HTTP tunneling** used.

SSH Tunneling parameters

Specify **SSH Host name**, **SSH port**, **SSH user name**, **SSH password**, the path to the **SSH key file** (if necessary) in the corresponding boxes.

See SSH connection properties 992 for details.



HTTP Tunneling parameters

If you have selected **HTTP tunneling** at the first step 99, you need to upload the tunneling *emsproxy.php* script to the webserver and specify the **URL** in the corresponding box in the following format: http://webserver_address/emsproxy.php

See HTTP connection properties 994 for details.

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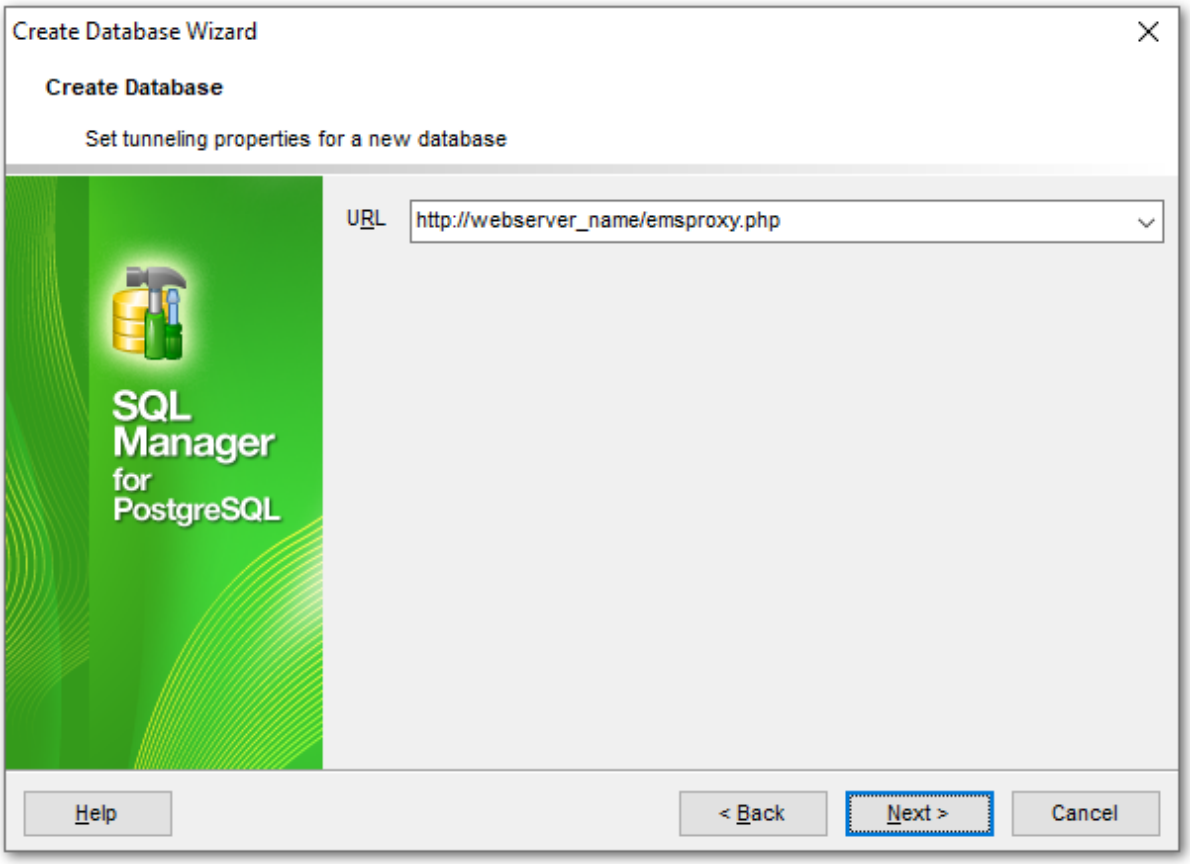

Click the **Next** button to proceed to the Setting specific options[105] step or to the Selecting databases[103] step of the wizard, depending on whether the ☑ **Register a single database** option has been selected or not.

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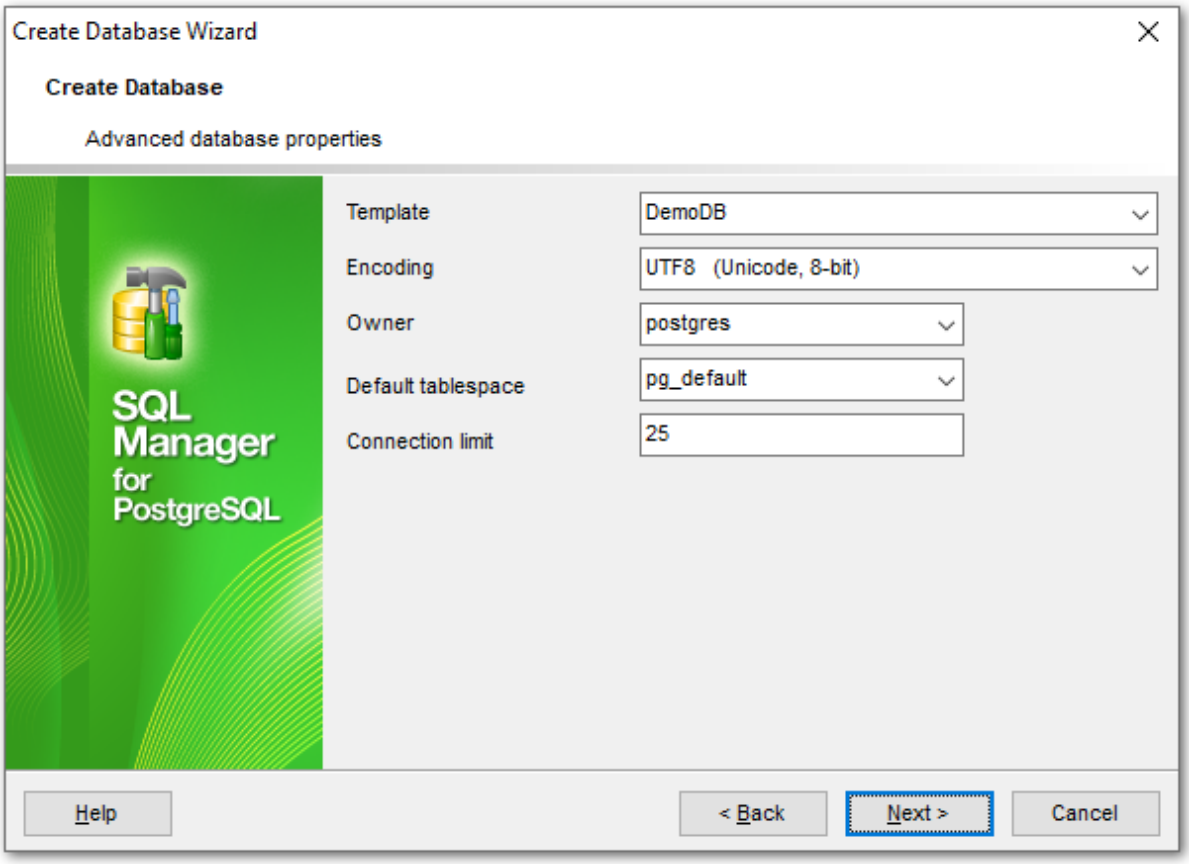
4.1.4 Setting advanced database properties

This step of the wizard allows you to set **advanced database properties** for the new database.



Location
Specify an alternate file system location in which the new database should be saved, specified as a literal string (for PostgreSQL 7.4 or lower).

Template
Use the drop-down list to select one of the existing databases on the host to indicate as a template for the database you create. Note that if you specified the template, your new database will contain all the data from the selected template.

Encoding
This option allows you to use multibyte encoding method in the new database. Use the drop-down list to select the required encoding value.

Owner
Use the drop-down list to select the name of the database user who will own the new database (for PostgreSQL 7.3 or higher). If no user is defined, then the currently connected user is used by default.

Default Tablespace

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Use the drop-down list to set the default tablespace for objects of the database being created (for PostgreSQL 8.0 or higher).

Connection Limit
Specify the time limit (in milliseconds, use *-1* for unlimited) for connecting to the new database (for PostgreSQL 8.1 or higher).

When you are done, click the **Next** button to view the result SQL statement 97.

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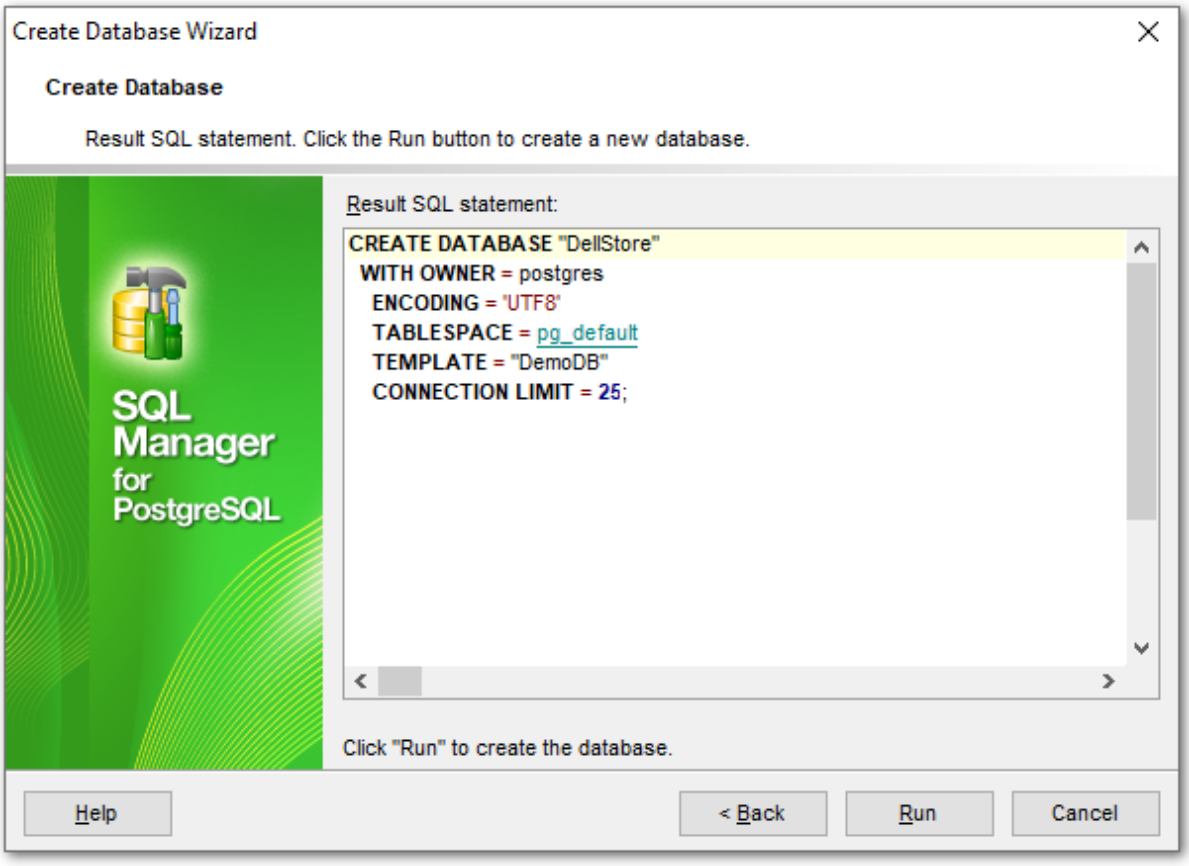
4.1.5 Viewing result SQL statement

View the result *CREATE DATABASE* statement issued for the new database creation. You can alter the script manually, if necessary. For more information see Changing Metadata window 969.



If the ☑ **Register after creating** option was checked at the Setting database name 90 step of the wizard, the Database Registration Info 108 dialog will appear.

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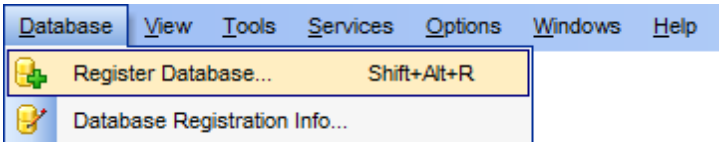
4.2 Register Database wizard

Register Database Wizard allows you to register a single database.

To start the wizard, select the **Database | Register Database...** main menu[961] item, or use the **Register Database** button on the main toolbar[963]. You can also use the *Shift+Alt+R* shortcut[1001] for the same purpose.

- Setting connection parameters[99]
- Specifying tunneling parameters[101]
- Selecting databases[103]
- Setting specific options[105]



See also:

Create Database wizard[89]

Database Registration Info[108]

Database Properties[145]

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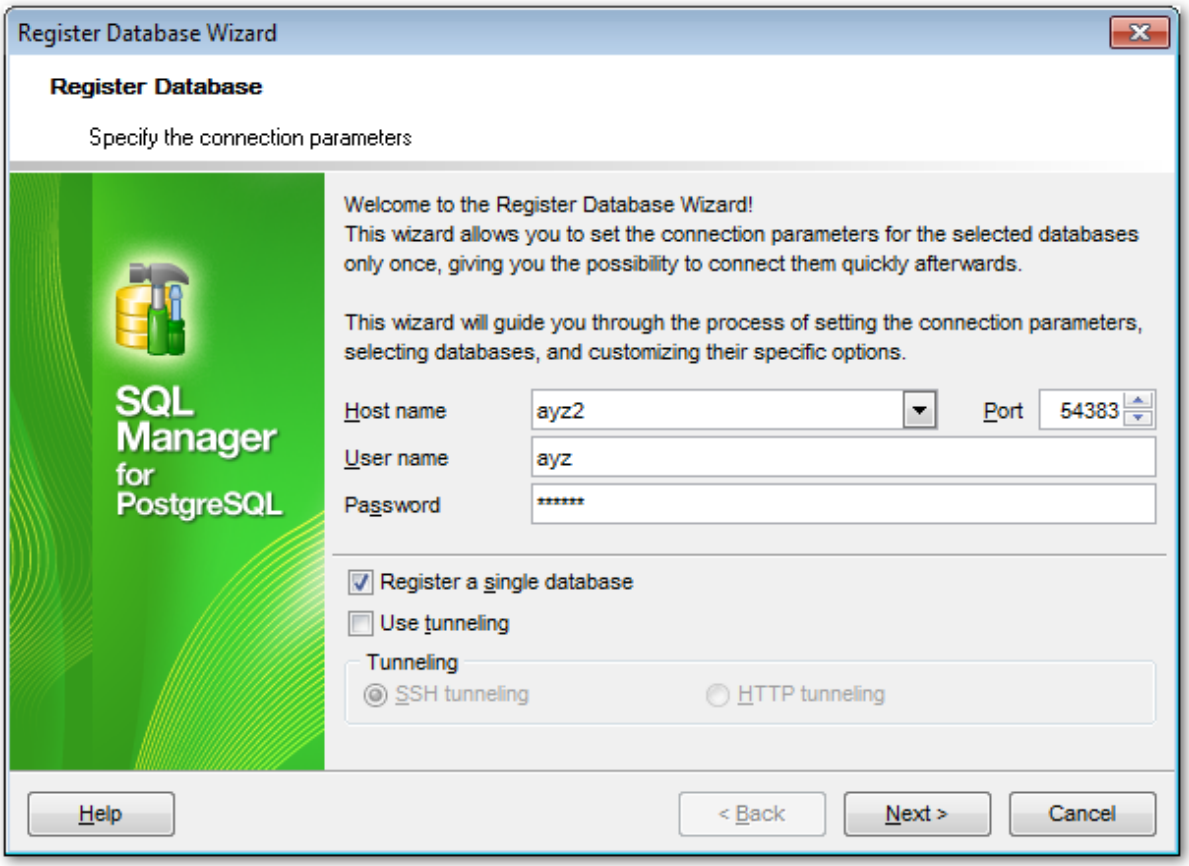
4.2.1 Setting connection parameters

Use this step of the wizard to set the necessary **connection parameters** for the new database/host using the corresponding boxes and options: *Host name*, *Port*, *User name* and *Password*.



Specify the host you are going to work with: type in the host name in the **Host name** field or select one in the drop-down list.
Enter PostgreSQL port to connect through in the **Port** field and provide *authorization* settings: **User name** and **Password**.

Register a single database
Check this option if you wish to register only one database at the host.

Use tunneling
If this option is checked, you should set tunneling parameters at the *Specifying tunneling parameters* step of the wizard.

Tunneling

SSH tunneling
Select this option to establish connection to an intermediate SSH server and forward all PostgreSQL commands through the secure tunnel. The next step of the wizard allows you to define the corresponding parameters for SSH tunneling.

HTTP tunneling

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Select this option to access PostgreSQL server through the HTTP protocol in case of Internet access through HTTP proxy only, or if the server does not allow direct connections to PostgreSQL, but allows HTTP connections. The next step of the wizard allows you to define the corresponding parameters for HTTP tunneling.

Click the **Next** button to proceed to the Setting specific options 105 step or to the Selecting databases 103 step of the wizard, depending on whether the ☑ **Register a single database** option has been selected or not.

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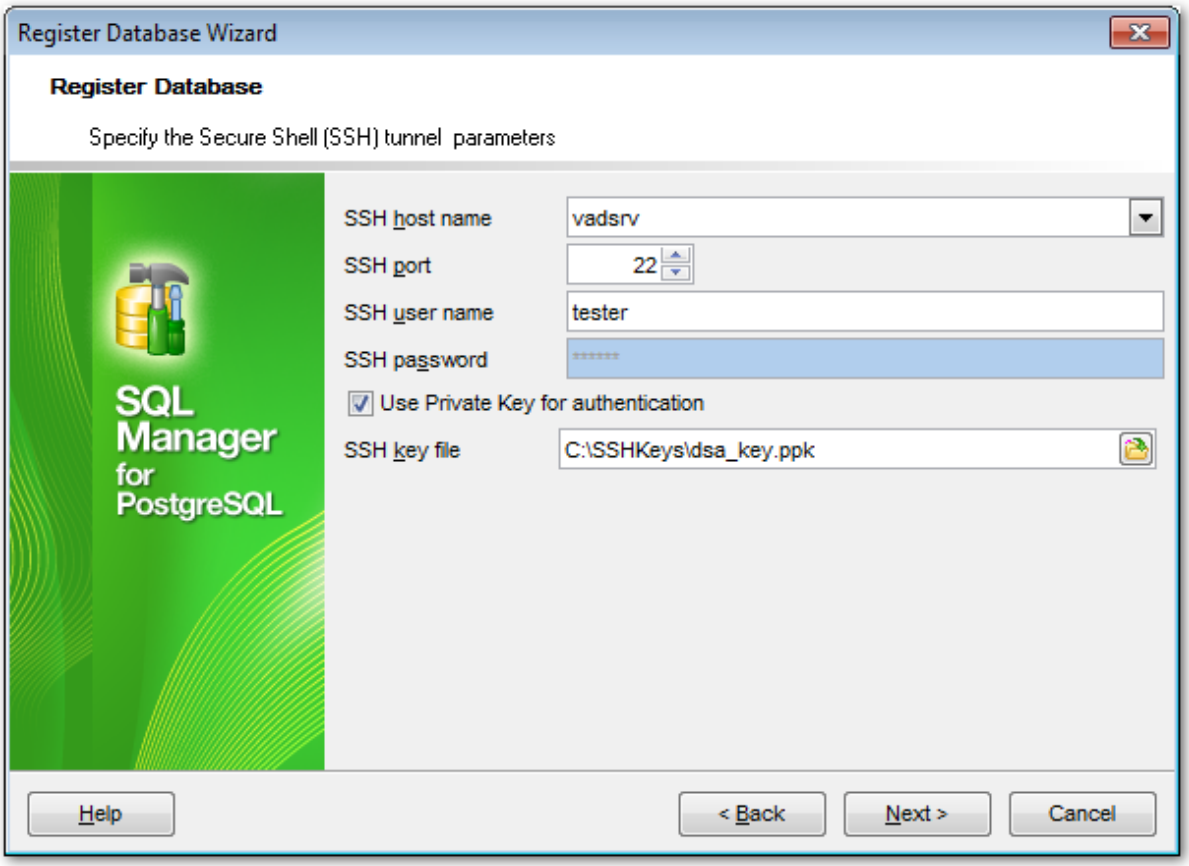
4.2.2 Specifying tunneling parameters

This step of the wizard allows you to specify the necessary parameters for connection with **SSH** or **HTTP tunneling** used.

SSH tunneling parameters

Specify **SSH Host name**, **SSH port**, **SSH user name**, **SSH password**, the path to the **SSH key file** (if necessary) in the corresponding boxes.

See SSH connection properties 992 for details.



HTTP tunneling parameters

If you have selected **HTTP tunneling** at the first step 991, you need to upload the tunneling *emsproxy.php* script to the webserver and specify the **URL** in the corresponding box in the following format: http://webserver_address/emsproxy.php

See HTTP connection properties 994 for details.

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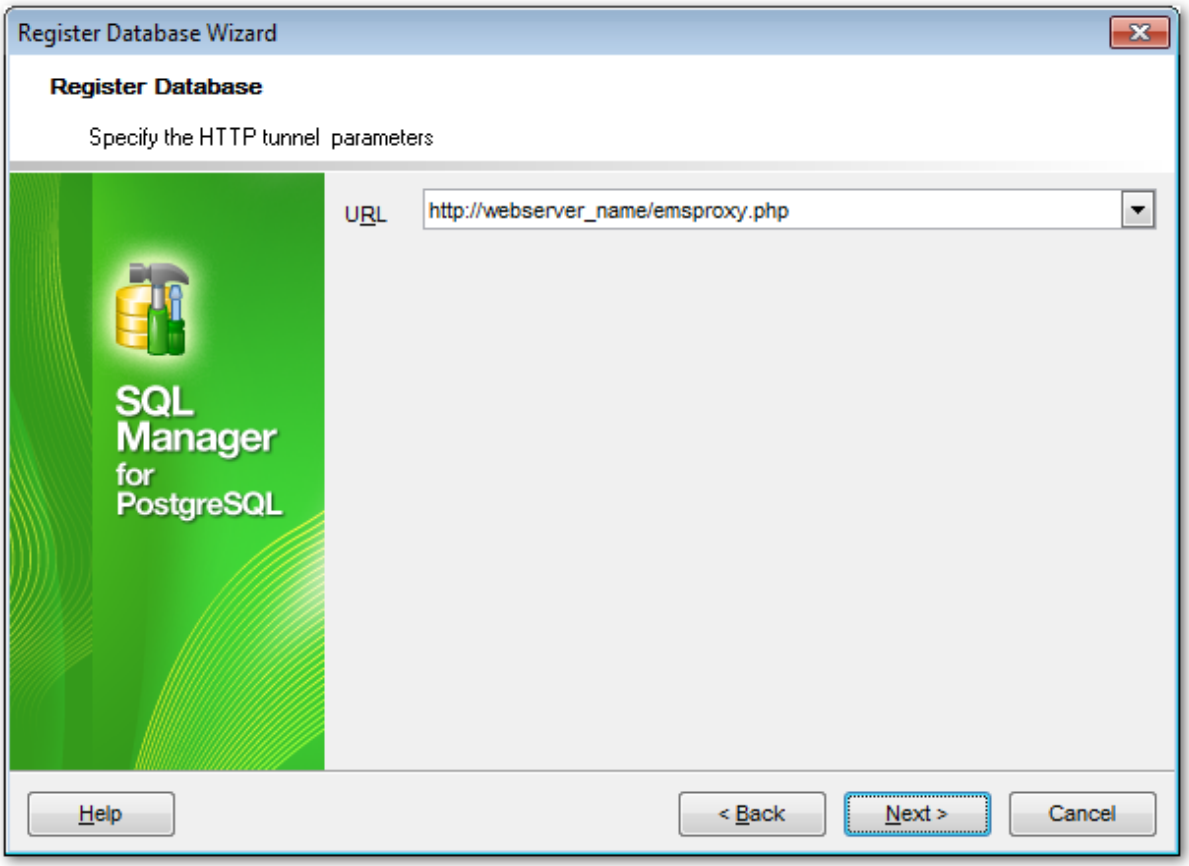

Click the **Next** button to proceed to the Setting specific options 105 step or to the Selecting databases 103 step of the wizard, depending on whether the ☑ **Register a single database** option has been selected or not.

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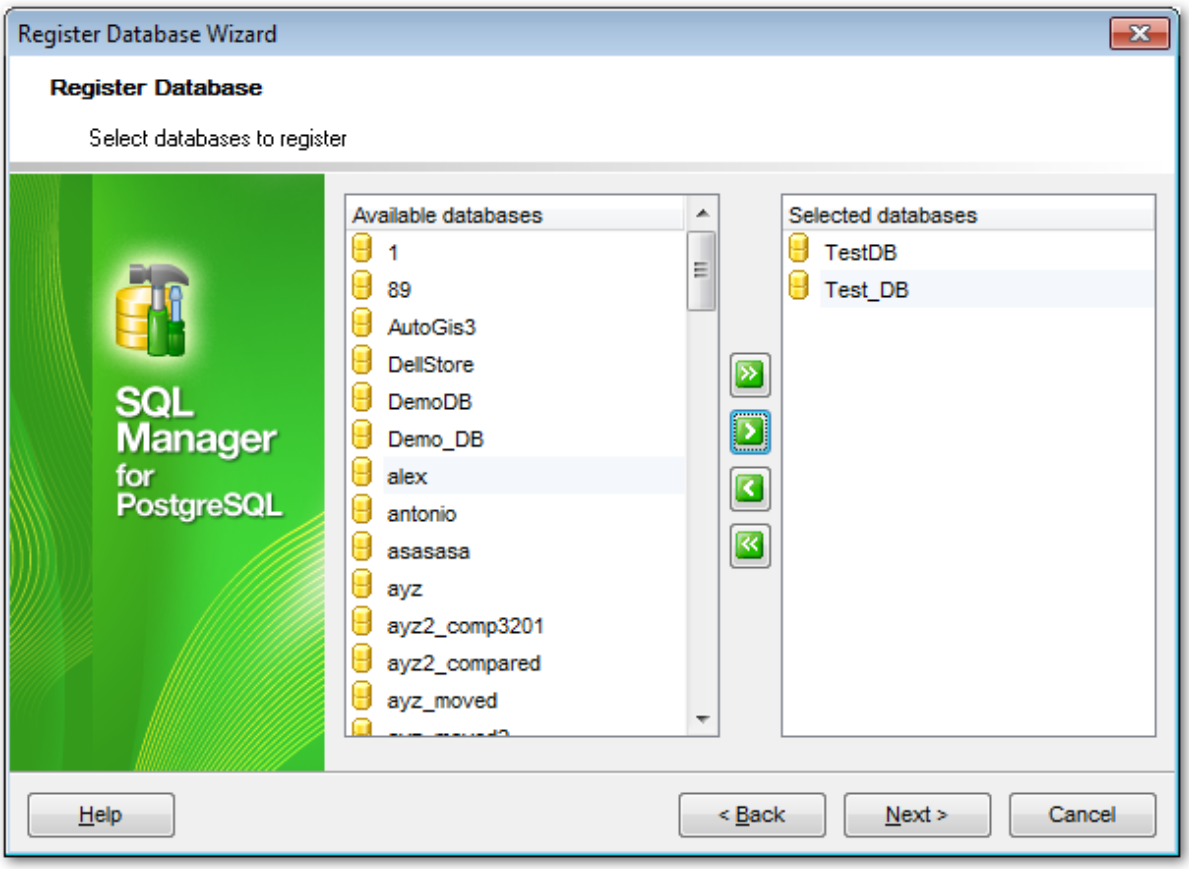
4.2.3 Selecting databases

This step of the wizard allows you to select the database(s) that reside on the host for registration in SQL Manager.
To select a database, you need to move it from the **Available databases** list to the **Selected databases** list. Use the buttons or drag-and-drop operations to move the databases from one list to another.



If database is created by executing script in SQL Script 646 editor then the **Register Database** dialog appears.
Move required databases to the *Selected databases* list of the window and click **OK** to register databases.

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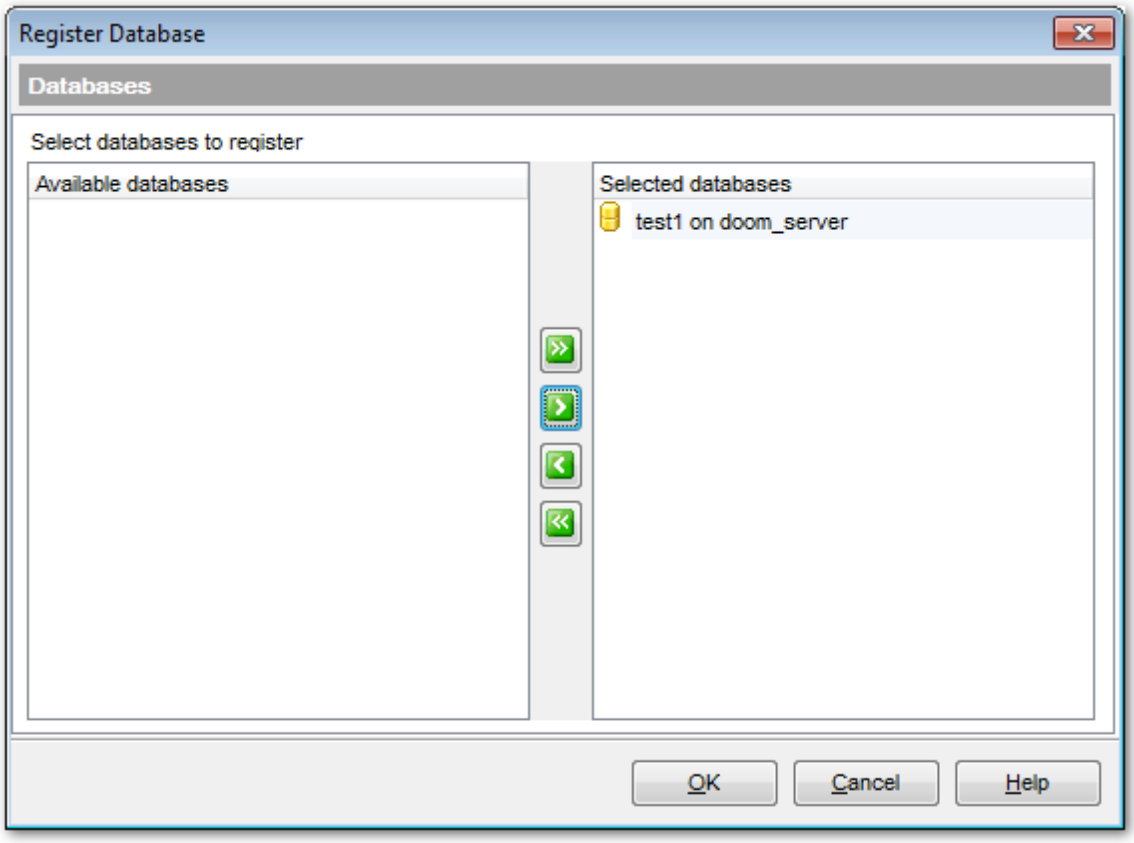

Note: This dialog appears only if the **Register newly created databases** option is enabled in the SQL Script 892 section of Environment Options 871.

Note: In the **Lite version** you can register only five databases.

Click the **Next** button to proceed to the Setting specific options 105 step of the wizard.

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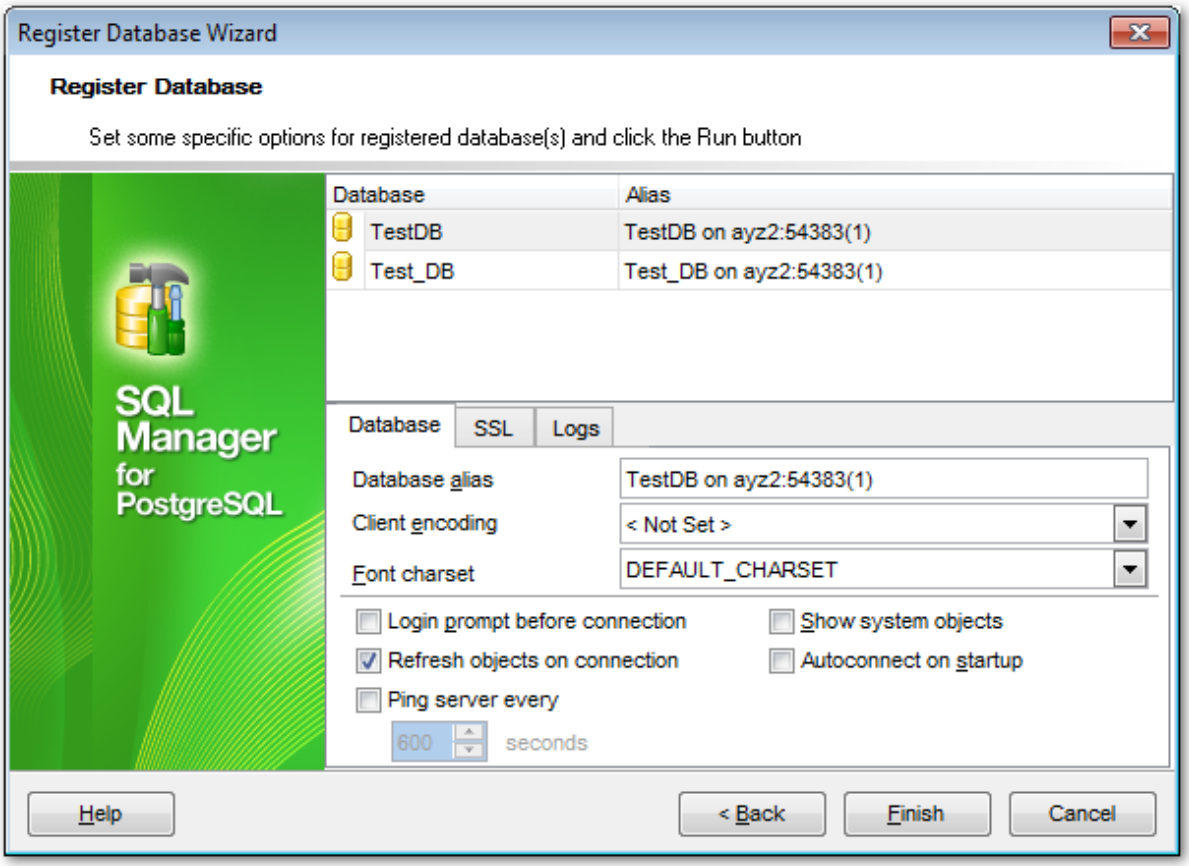
4.2.4 Setting specific options

This step of the wizard allows you to set database alias, database options, logs and SSL parameters.



Database

Database name
Type in or use the drop-down list to select the database to be registered.

Client encoding
This option allows you to use multibyte encoding method in the database. Use the drop-down list to select the required encoding value, or leave this option to apply the default server encoding.

Auth. method - selecting the authentication method when connecting to the database.

☑ **Login prompt before connection**
Enables SQL Manager for PostgreSQL to prompt 997 for user name and password each time you connect 68 to the database.

☑ **Refresh objects on connection**
This option allows you to enable/disable refreshing objects on connection to the database. It is highly recommended to uncheck this option if your database contains many objects or if connection to the database is slow.

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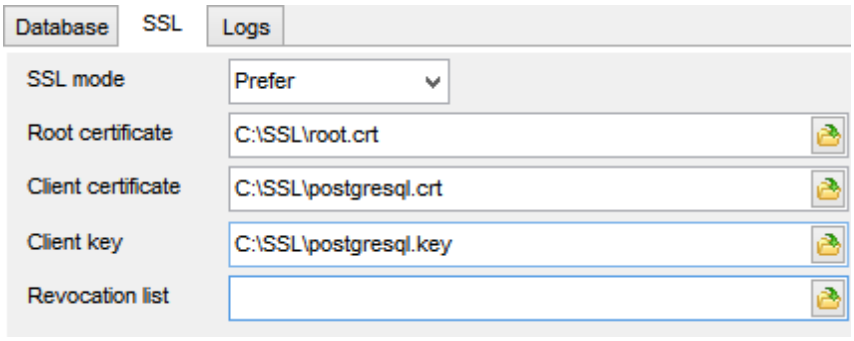
Autoconnect at startup
With this option set, connection[68] to the registered database is established automatically at application startup.

Show system objects
If this option is checked, PostgreSQL system objects will be displayed in DB Explorer[65].

Ping server every ... seconds
Defines minimal time interval for PostgreSQL server to be pinged. You may find this option useful in some cases.

SSL



Select the preferable **SSL mode**: *Disabled*, *Allow*, *Prefer*, *Require*, *Verify CA*, *Verify Full*. *Allow*, *Prefer*, *Required*, or *Disabled*.

Root certificate
Select the path to the client root.crt file.

Client certificate
Select the path to the client certificate.

Client key
Select the path to the client private key.

Revocation list
Select the file for Certificate Revocation List.

Logs

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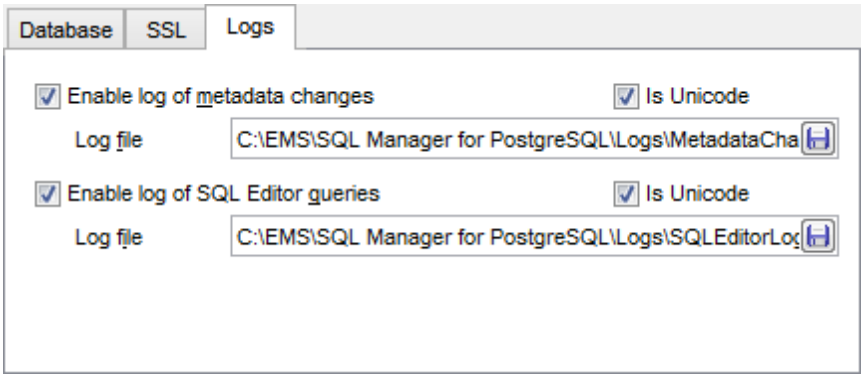

Enable log of metadata changes
Check this option if you wish to log metadata changes of your database in a file.

Log file
This field is enabled if the **Enable log of metadata changes** option is selected. Type in or use the **Save as** button to specify the path to the **.sql* file to store the metadata logs.

Enable log of Query Data queries
Check this option if you wish to log your Query Data 415 queries in a file.

Log file
This field is enabled if the **Enable log of Query Data queries** option is selected. Type in or use the **Save as** button to specify the path to the **.sql* file to store the logs of SQL queries.

Is Unicode
Enable this option to save logs in Unicode. If the option is disabled, ANSI will be used.

Click the **Finish** button when done to start working with the newly registered database in SQL Manager for PostgreSQL.

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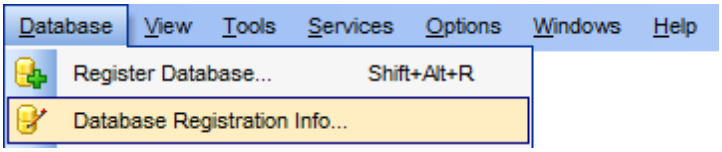
4.3 Database Registration Info

Use the **Database Registration Info** dialog to view and edit the registration properties of the database.

To open the dialog, select the database or any of its objects in the DB Explorer 65 tree, then select the **Database | Database Registration Info...** main menu 961 item, or right-click the database alias in DB Explorer 65 and use the **Database Registration Info...** context menu 54 item. You can also use the **Database Registration Info...** button on the main toolbar 963.



- Editing connection properties 109
- Setting database options 111
- Setting display options 115
- Setting default directories 116
- Setting log options 117
- Setting SSL options 119
- Setting SSH tunneling options 120
- Setting HTTP tunneling options 122
- Setting data options 124
- Find Option 144

See also:

Create Database wizard 89

Register Database wizard 98

Database Properties 145

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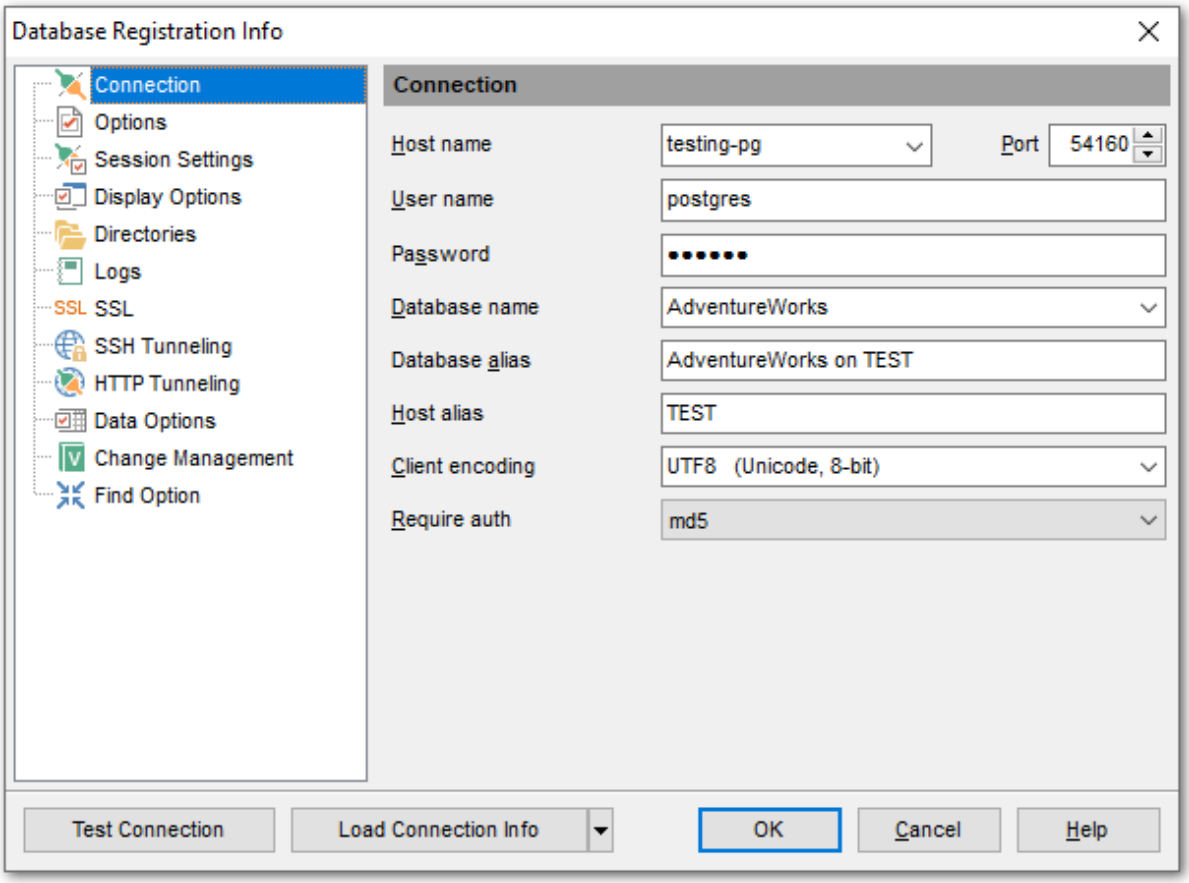
4.3.1 Connection

The **Connection** section of the **Database Registration Info** dialog allows you to view and/or edit the connection properties in the corresponding boxes.



Host name
Stores the name of the Host where the database resides.

Port
Enter PostgreSQL port to connect through.

User name
If necessary, edit the User name used to access the database.

Password
If necessary, edit the Password used to access the database.

Database name
Stores the name of the database.

Database alias
Stores the database alias which is displayed in the DB Explorer 65 tree and SQL Manager tools. By default, a database alias generated by the application has the following format:

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<database_name> on <host_name>[:<port>]

Host alias
Set the alias for the current host to be displayed in the DB Explorer.

Client encoding
This option allows you to use multibyte encoding method in the database. Use the drop-down list to select the required encoding value, or leave this option to apply the default server encoding.

Auth method
Select the authentication method on connecting to the database.

Once you have specified the connection properties, you can check whether it is possible to establish connection to the database: click the **Test Connection** button for this purpose. If connection is successful, you will get the *'Connected!'* message; otherwise an error message will be returned.

The **Load Connection Info...** menu allows you to select the alias of a previously registered database and use it for the newly created/configured database.

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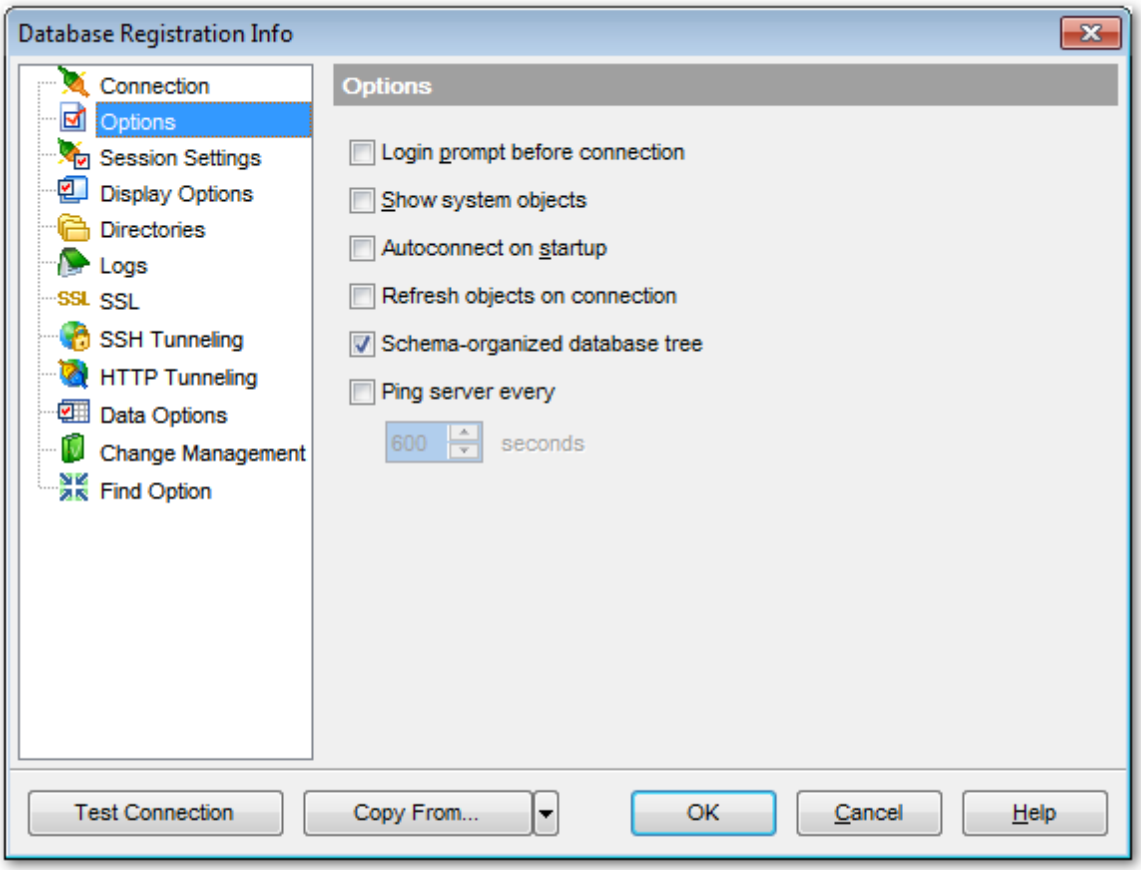
4.3.2 Options

The **Options** section of the **Database Registration Info** dialog allows you to set various options for the database.



Customize common database options according to your needs. The detailed description is given below.

☑ **Login prompt before connection**
Enables SQL Manager for PostgreSQL to prompt 997 for user name and password each time you connect 68 to the database.

☑ **Show system objects**
This option determines whether PostgreSQL system objects are displayed in the DB Explorer 65 tree.

☑ **Autoconnect at startup**
Check this option to specify that SQL Manager for PostgreSQL automatically establishes connection to the registered database at application startup.

☑ **Refresh objects on connection**
This option allows you to enable/disable refreshing objects on connection to the database. It is highly recommended to uncheck this option if your database contains

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many objects or if connection to the database is slow.

Schema-organized database tree
If this option is disabled, the object tree is built without grouping into schemas.

Ping server every ... seconds
Defines minimal time interval for PostgreSQL server to be pinged. You may find this option useful in some cases.

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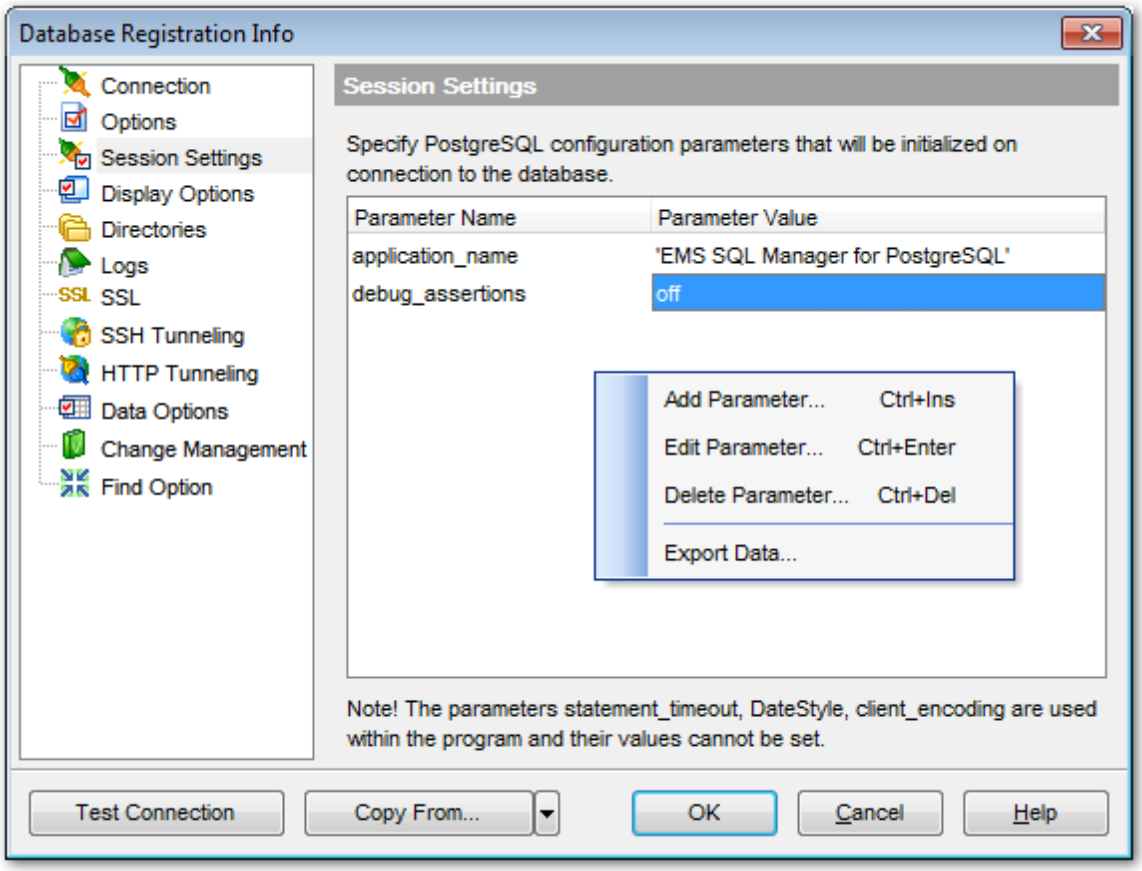
4.3.3 Session settings

The **Session Settings** section of the **Database Registration Info** dialog allows you to define specific server parameters according to your needs.



Right-click an item within the list to call the **context menu** allowing you to *add/edit/remove* a parameter and export parameters list to a file of preferable format by means of the Export Data Wizard[536].

The following dialog appears on adding or editing parameters.

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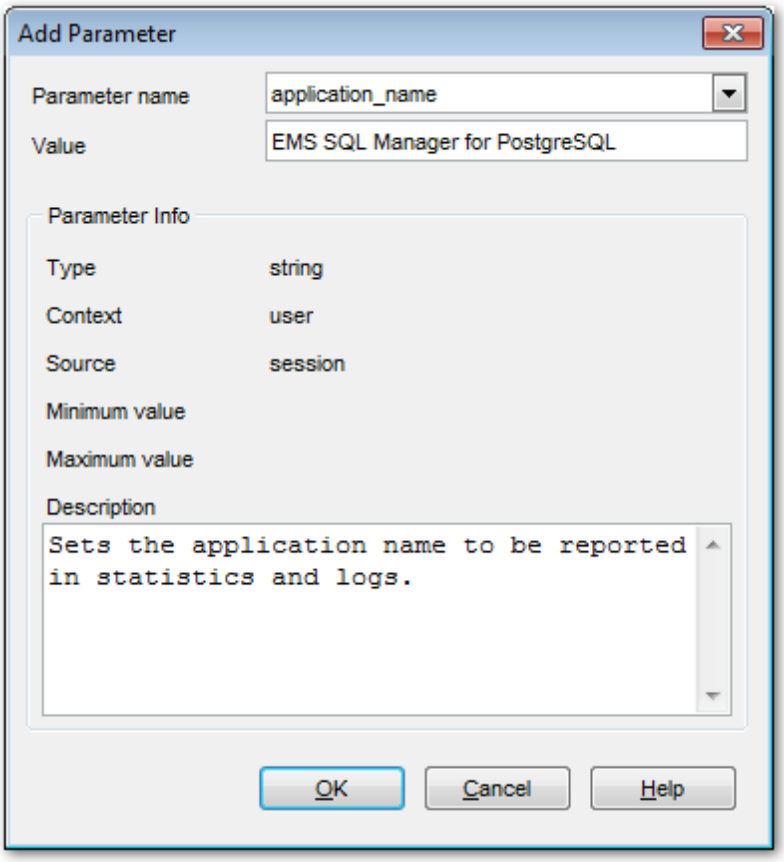

This dialog allows you to change the *parameter name*, set its *value*, browse *parameter info* and supply a *description*, if necessary.

To obtain more information on specific parameters, refer to PostgreSQL documentation.

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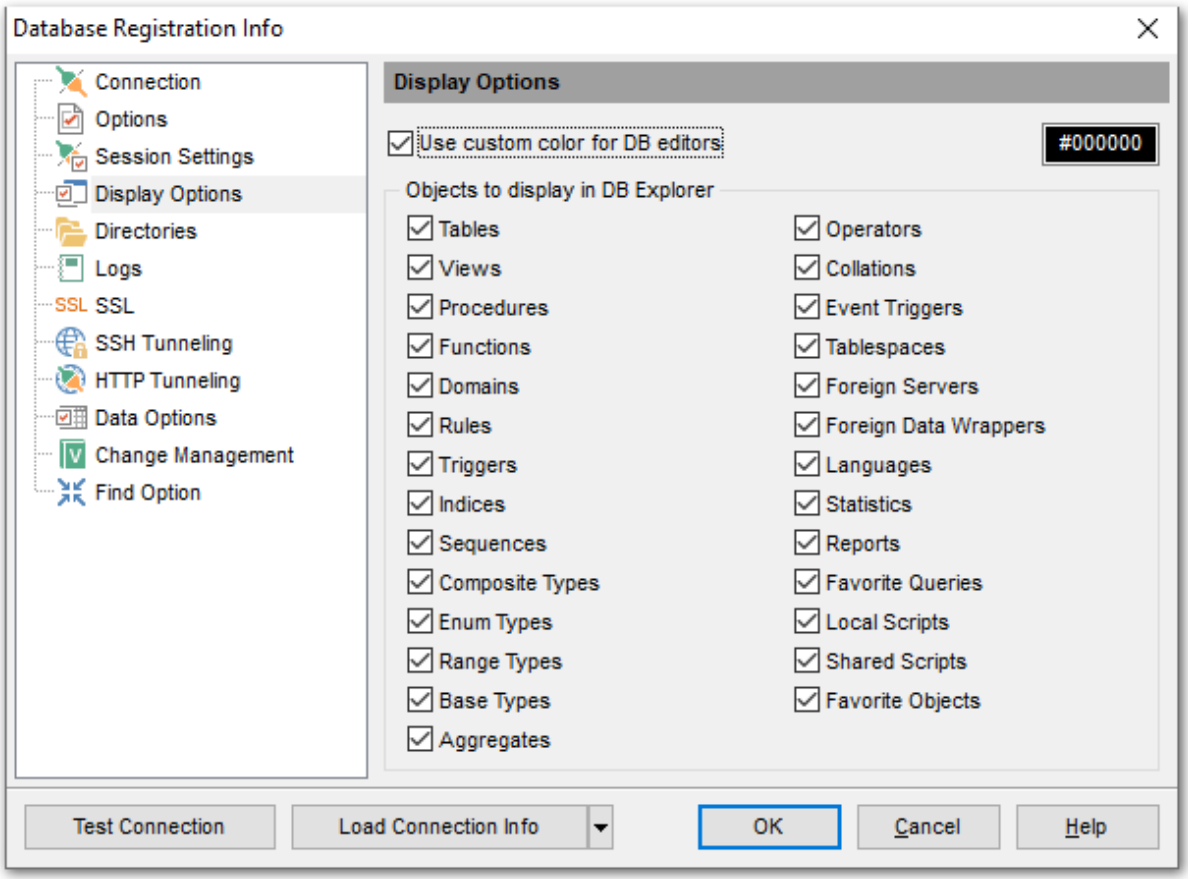
4.3.4 Display options

The **Display Options** section of the **Database Registration Info** dialog allows you to specify which objects[155] will be displayed in the Database Explorer[65] tree.

Use custom color for DB editors
With this option checked the text color for editor tabs is black. To apply user font color uncheck the option and select the color.



For your convenience the *Select All* and *Deselect All* functions are implemented in the **context menu** of the objects list area.

See also:
Database Objects Management[155]

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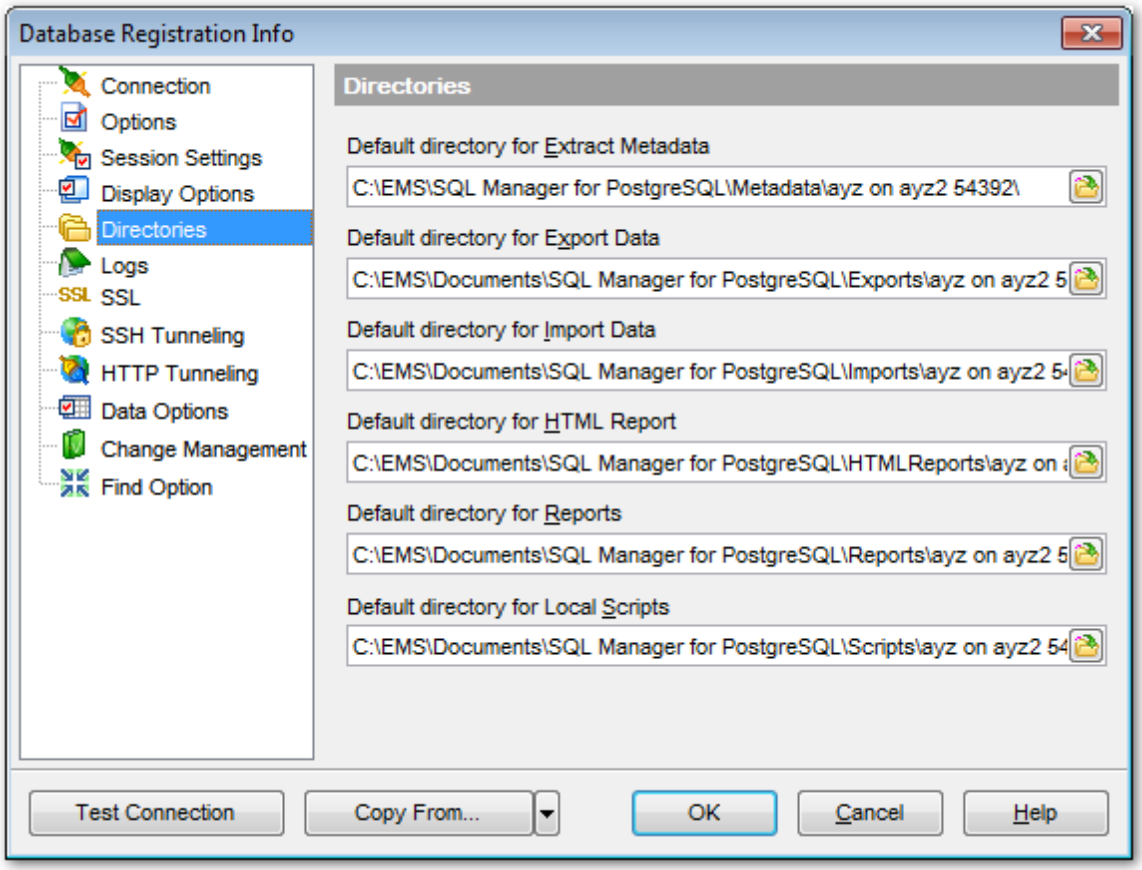
4.3.5 Directories

The **Directories** section of the **Database Registration Info** dialog allows you to set the directories to be used by default for database extract 653, data export 536, data import 582, saving HTML reports 686, creating reports 693, saving Local Scripts 335 operations.



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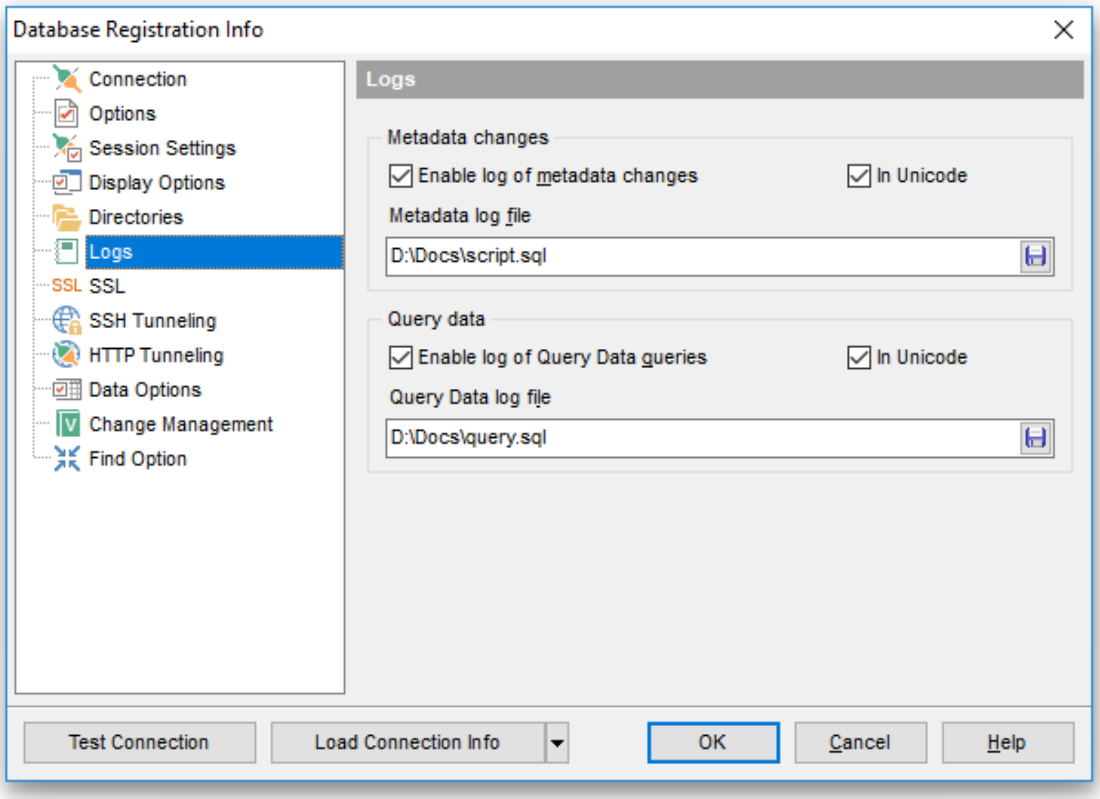
4.3.6 Logs

The **Logs** section of the **Database Registration Info** dialog allows you to specify log file names for metadata changes logging and SQL query logging, if necessary.

Logging can be useful when you are going to move the changes made in the development database to the production database.



Metadata changes

Enable log of metadata changes
Check this option if you wish to log metadata changes of your database in a file.

Metadata log file
This field is enabled if the **Enable log of metadata changes** option is selected. Type in or use the **Save as** button to specify the path to the **.sql* file to store the metadata logs.

Query data

Enable log of Query Data queries
Check this option if you wish to log your queries 415 in a file.

Query Data log file

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This field is enabled if the **Enable log of Query Data queries** option is selected. Type in or use the **Save as** button to specify the path to the **.sql* file to store the logs of SQL queries: date/time of query execution, SQL text, execution result or errors (if any).

In Unicode
Enable this option to save logs in Unicode. If the option is disabled, ANSI will be used.

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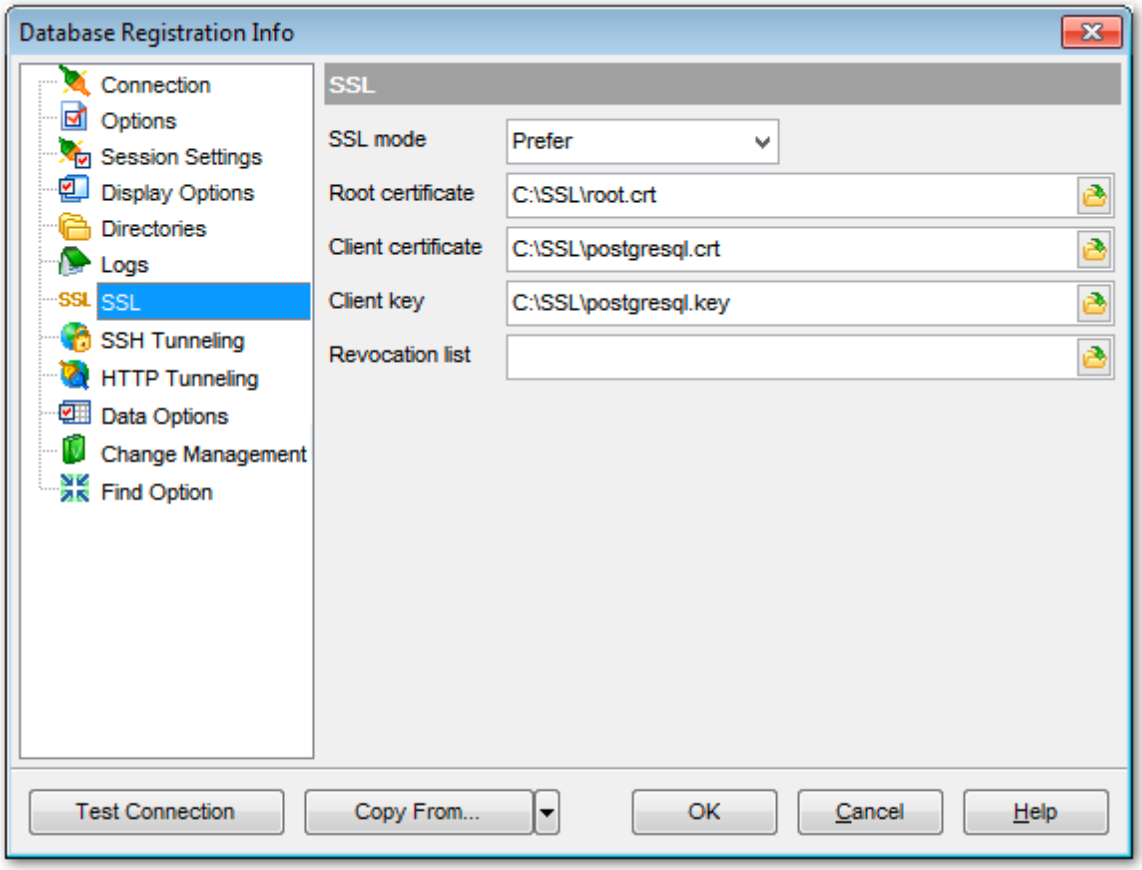
4.3.7 SSL options

The **SSL** tab allows you to connect to the server via encrypted channel for increased security.

SSL mode
Select the required SSL mode from the dropdown menu: *Disabled*, *Allow*, *Prefer*, *Require*, *Verify CA*, *Verify Full*.



Root certificate
Select the path to the client root.crt file.

Client certificate
Select the path to the client certificate.

Client key
Select the path to the client private key.

Revocation list
Select the file for Certificate Revocation List.

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4.3.8 SSH tunneling options

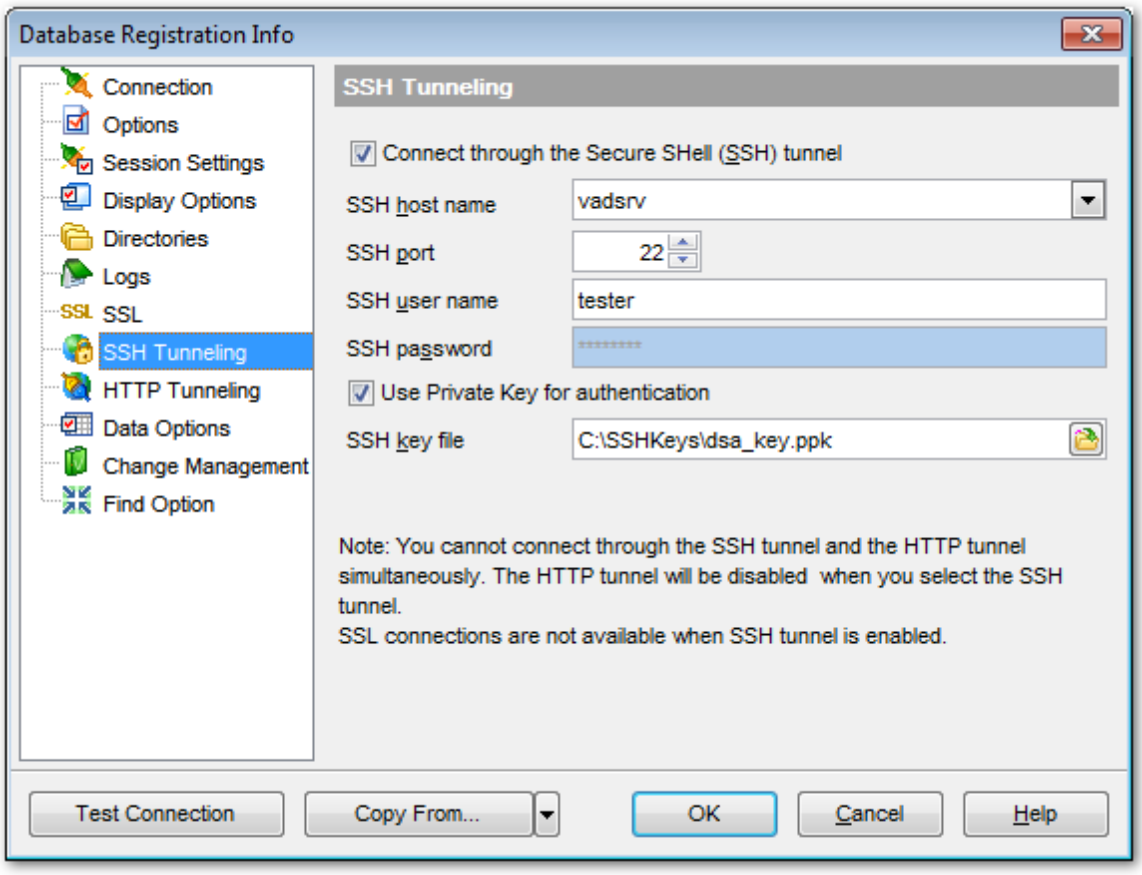
The **SSH Tunneling** section of the **Database Registration Info** dialog allows you to enable/disable SSH tunneling for connection to the database and set all the necessary SSH tunneling parameters.

☑ **Connect through the Secure Shell (SSH) tunnel**
Select this option to establish connection to an intermediate SSH server and forward all PostgreSQL commands through the secure tunnel.

Specify **SSH Host name**, **SSH port**, **SSH user name**, **SSH password**, the path to the **SSH key file** (if necessary) in the corresponding boxes.

See SSH connection properties[992] for details.

Note: PostgreSQL host name on the Connection[109] page should be set relatively to the SSH server in this case. For example, if both PostgreSQL and SSH servers are located on the same computer, you should specify *localhost* as **Host name** instead of the server's external host name or IP address.



Please note that either *SSH tunneling*, or *HTTP tunneling* can be used for one connection, but not both types simultaneously.

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See also:

HTTP tunneling options 122

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4.3.9 HTTP tunneling options

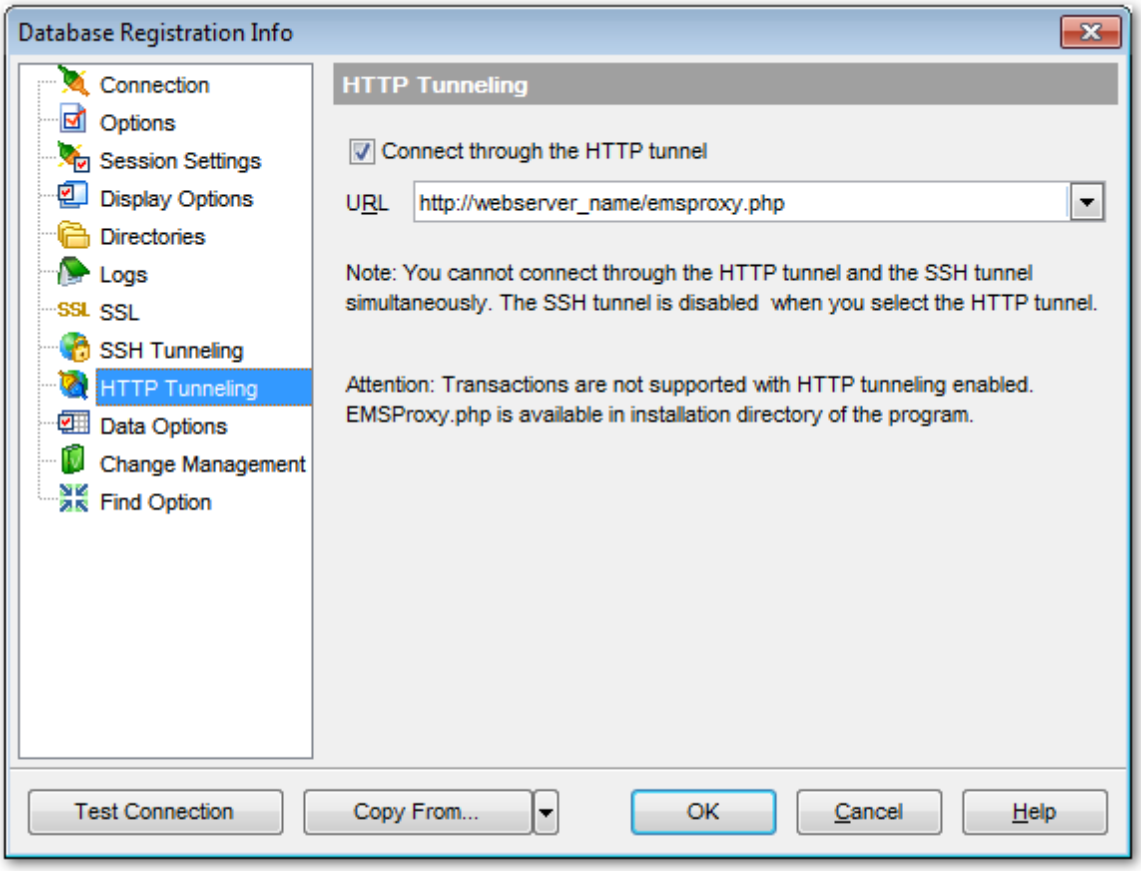
The **HTTP Tunneling** section of the **Database Registration Info** dialog allows you to enable/disable HTTP tunneling for connection to the database and set the necessary HTTP tunneling parameters.

Connect through the HTTP tunnel
Select this option to access PostgreSQL server through the HTTP protocol in case of Internet access through HTTP proxy only, or if the server does not allow direct connections to PostgreSQL, but allows HTTP connections.

In order to use HTTP tunneling for the connection, you need to upload the tunneling *emsproxy.php* script to the webserver and specify the **URL** in the corresponding box in the following format: http://webserver_address/emsproxy.php

See HTTP connection properties 994 for details.

Note: In case of using this connection method, the response will be slower as compared to the direct connection or SSH Tunneling method, as the data are XML encoded and HTTP is stateless by nature.



Please note that either *SSH tunneling*, or *HTTP tunneling* can be used for one connection, but not both types simultaneously.

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See also:

SSH tunneling options 120

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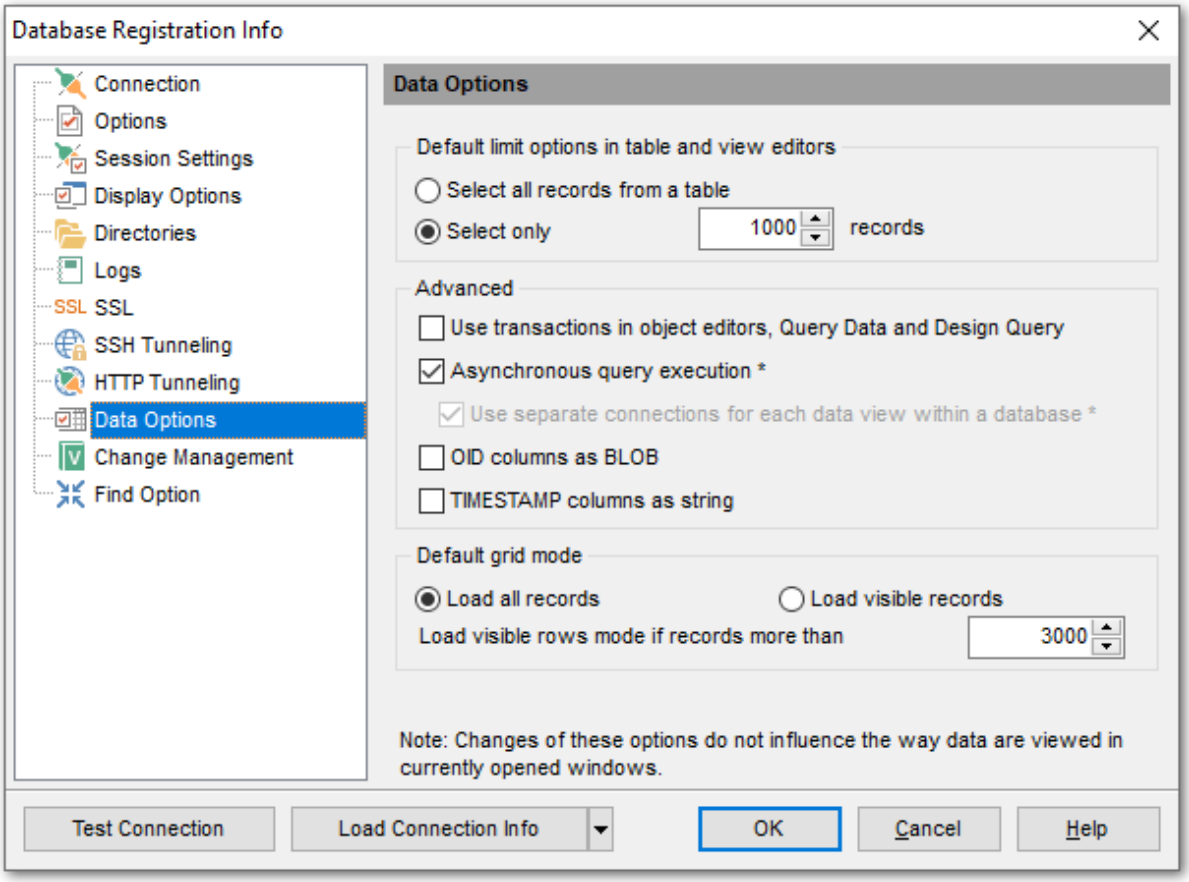
4.3.10 Data options

The **Data Options** section of the **Database Registration Info** dialog allows you to define options for data view[453]. These options will be applied only to this database. Default settings for newly registered databases can be defined on the Grid | Data Options[912] page of the Environment Options[871] dialog.



Default limit options in table and view editors

Define the number of records to be selected on opening the **Data** tab of Table Editor[177] and View Editor[229]:

- *Select all records from a table*
- *Select only ... records* (you should set the number of records using the corresponding spinner control)

Advanced

Use transactions in object editors, Query Data and Design Query

If this option is enabled, a transaction is active until the 'Data' tab is closed or the 'Commit' button is pressed; all edited records are blocked until the transaction is committed. If this option is disabled, the transaction starts and is immediately committed (autocommit) on saving each record which is blocked only for a short period of time.

Asynchronous query execution

Check this option to allow executing queries in background mode (asynchronously).

Use separate connections for each data view within a database

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Select this option to use a separate connection for each data view[453] within a database. Disabling this option is recommended if maximum allowed number of connections is too low. Note that this option is only available when the *Use transactions in Data tab of object editors, Query Data and Design Query* option is enabled.

OID columns as BLOB
Enable this option if you want the OID column to be displayed as a BLOB (OID - object ID - the object identifier of a row).

Default grid mode
It defines grid mode which will be used by default on Data tab.

Load all records
The grid loads all records from a dataset. This option increases the grid performance by reloading only changed dataset records when updating. In this mode all features (automatic sorting, filtering and summary calculations) are available.

Load visible records
The grid loads only a fixed number of dataset records into memory. This option minimizes dataset loading time. The automatic sorting, filtering, summary calculations are not supported in this mode.

With the **Load all records** option enabled, when loading data, all the records are loaded into grid buffers. In this mode opening the tables with many records may take a very long time. But in this case you have some advantages: e.g. in the filter drop-down list the column headers are displayed with the values for quick filter; it is possible to open several sublevels at the same time when viewing data in master-detail view, etc.
Because opening and other operations with an object consisting of many records takes sufficient time the **Load visible records** mode should be used instead. It can be set individually for each table and is saved between sessions (can be set through the context menu[466] of the grid).

Load visible rows mode if records more than...
Set this option to switch to the **Load visible rows** mode when the number of records in the dataset exceeds the specified value.

See also:
Data View[453]
Grid options[909]

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4.3.11 Change management

The **Change Management** section of the **Database Registration Info** dialog allows you to define settings for database version control.
Change management 344 system (Version control system) enables teamwork under a project.

This system can be useful for single developers, whose databases have complex business logic in procedures, triggers etc. Version control system (VCS) provides change management means to control changes of objects.

VCS contains service information about database added to system, about databases included to a branch etc. If the database backup is created on client workstation, then the label backup will be stored in VCS repository. If the backup is created on server, VCS system only remembers its location.

Version control in SQL Manager for PostgreSQL provides:
- Systematization of release new versions of database process;
- Storing different database versions;
- Tracking of database changes ;
- Getting (storing, testing) change scripts which reveal differences between two database states;
- Possibility to rollback database to definite state;
- Control of database changes.

For database administrators:
- Control of database changes.

Enabled
Use this option to enable/disable change management feature for the database. Enabling this option provides access to the VCS settings.

Note: *Databases with Change Management enabled* can have different icon in the DB Explorer 65 tree.

Click the corresponding button to launch the Repository management wizard 129. It allows you to *create/check out* repository.

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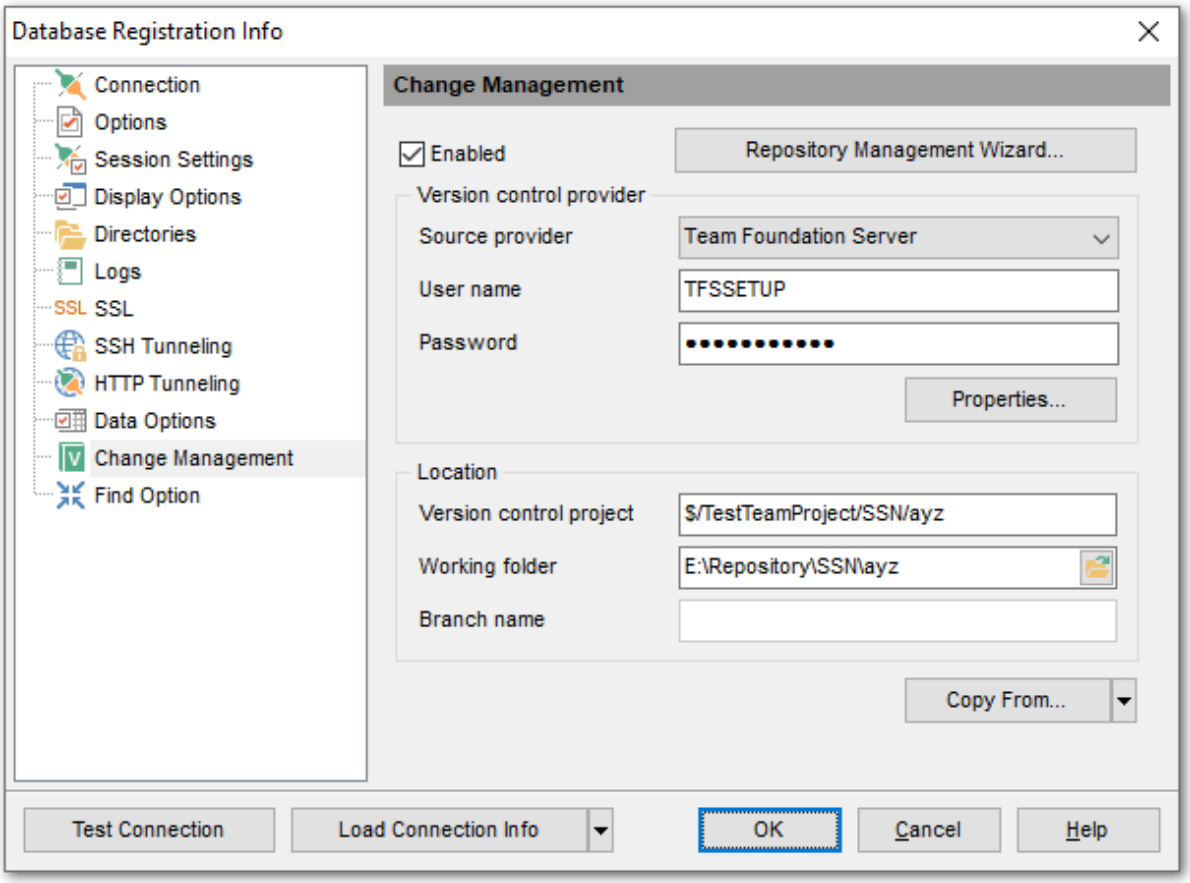

Version control provider

Source provider
Use the drop-down list to select version control provider.
The following versions of the VCS providers are supported:
- **CVS** (version 1.9 or higher)
- **Microsoft Visual SourceSafe** (version 8.0)
- **Team Foundation Server** (2005, 2008, 2010)

Client program installation is required for each version control system.

Note: .Net Framework 4.0 must be installed for working with 2005/2008 Team Foundation Server.

Specify **User Name** and **Password** if VCS repository requires authorization.

The **Properties** button opens the **Provider Settings** dialog. Use this dialog to view/edit or test the selected VCS provider settings:
CVS 138
SVN 139
VSS 140
TFS 141

Location

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Version control project
Use this field to define the location of VCS project. Format of the server path depends on the VCS selected.

Working folder
Specify the location of the local repository directory.

Branch name
Displays name of the database branch. The branch containing information about current database is selected automatically. If there is no branch with information about current database in VCS, the Version Control Branches dialog 142 appears. Use this dialog to select the branch to link with the current database.

The **Copy From...** allows you to get repository settings from any of the registered databases with VCS settings defined.

See also:
Enable change management 1044
Create branch/label/tag 348
Check repository 356
Get change script 366
Release new database version 375
Changes history 406

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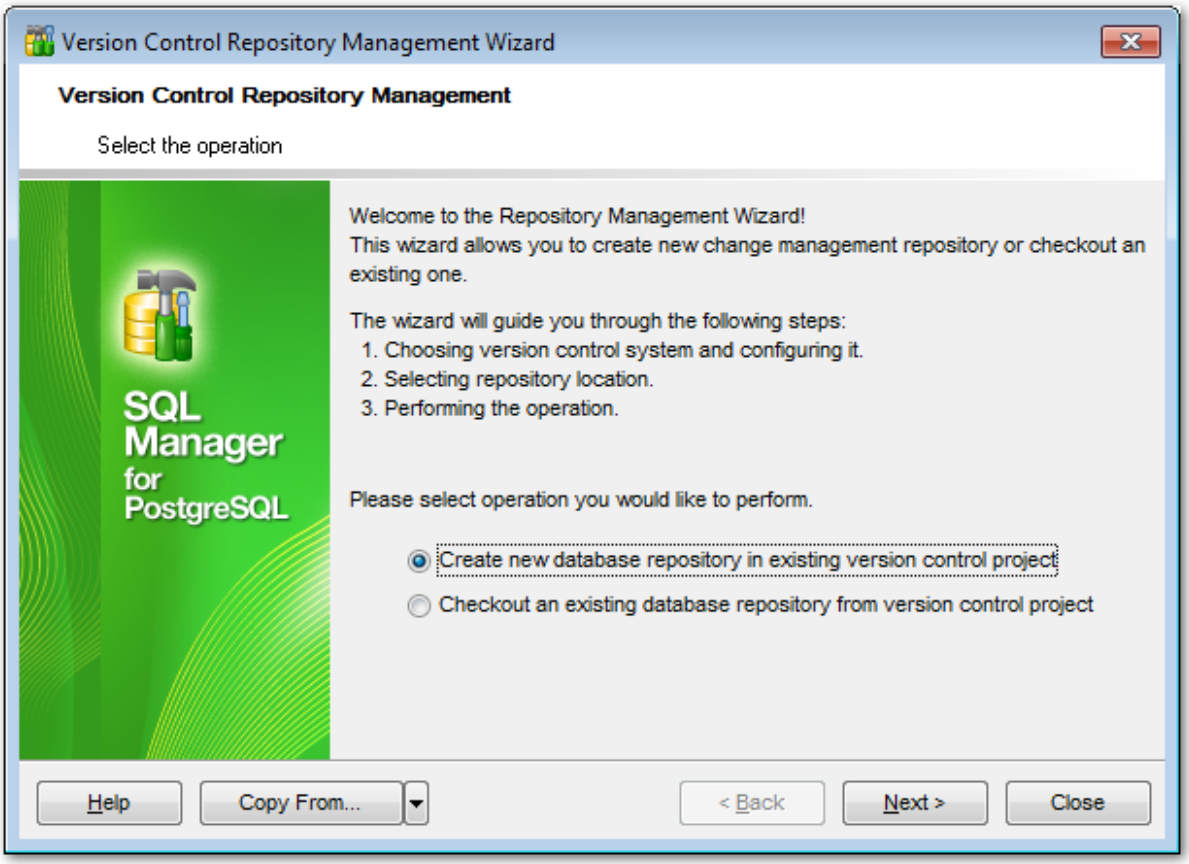
4.3.11.1 Repository management wizard

This wizard allows you to create VCS repository for the database or checkout the existing one. See the instructions below to get sufficient information to perform the operation.



Selecting operation 130
Selecting version control provider 131
Configuring provider settings 132
Specifying repository settings 135
Defining label options 136
Performing operation 137

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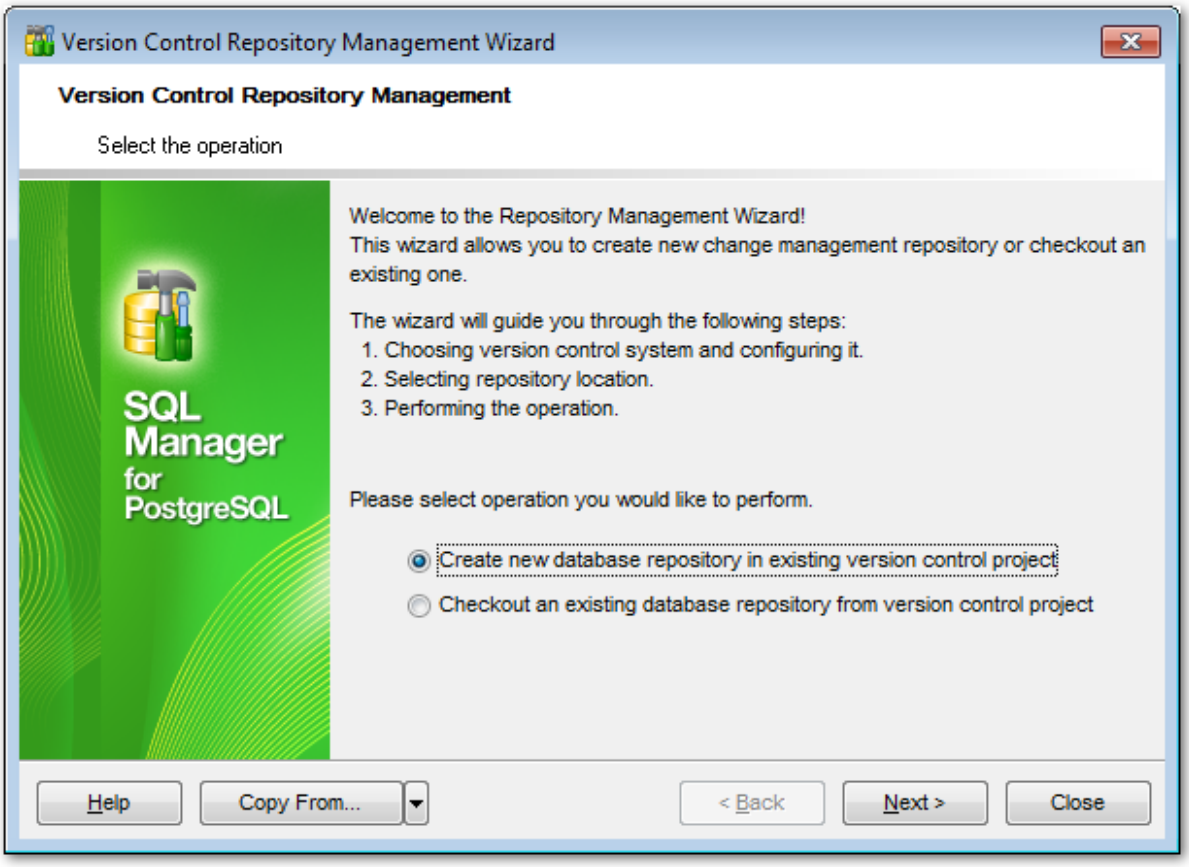
4.3.11.1.1 Selecting operation

This step of the wizard allows you to select the operation to be performed.



It is possible either to **Create new repository** or **Checkout an existing** one.

Note: If you are using VCS system for the first time select the **Create new repository** mode.

Click the **Next** button to proceed to the Selecting version control provider[131] step of the wizard.

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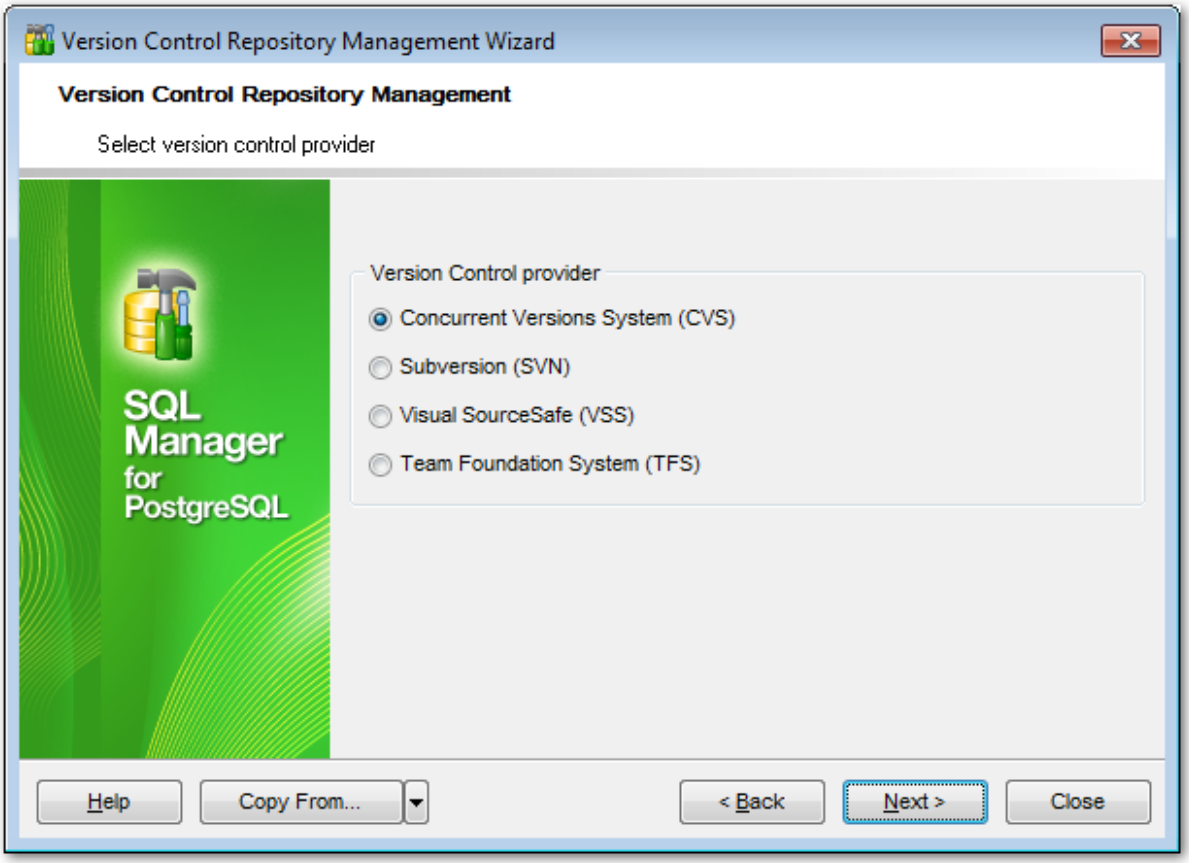
4.3.11.1.2 Selecting version control provider

Use this step to select version control provider:
- **Concurrent Version System**,
- **Subversion**,
- **Visual SourceSafe**,
- **Team Foundation System**.



Click the **Next** button to proceed to the Configuring version control provider[132] step of the wizard.

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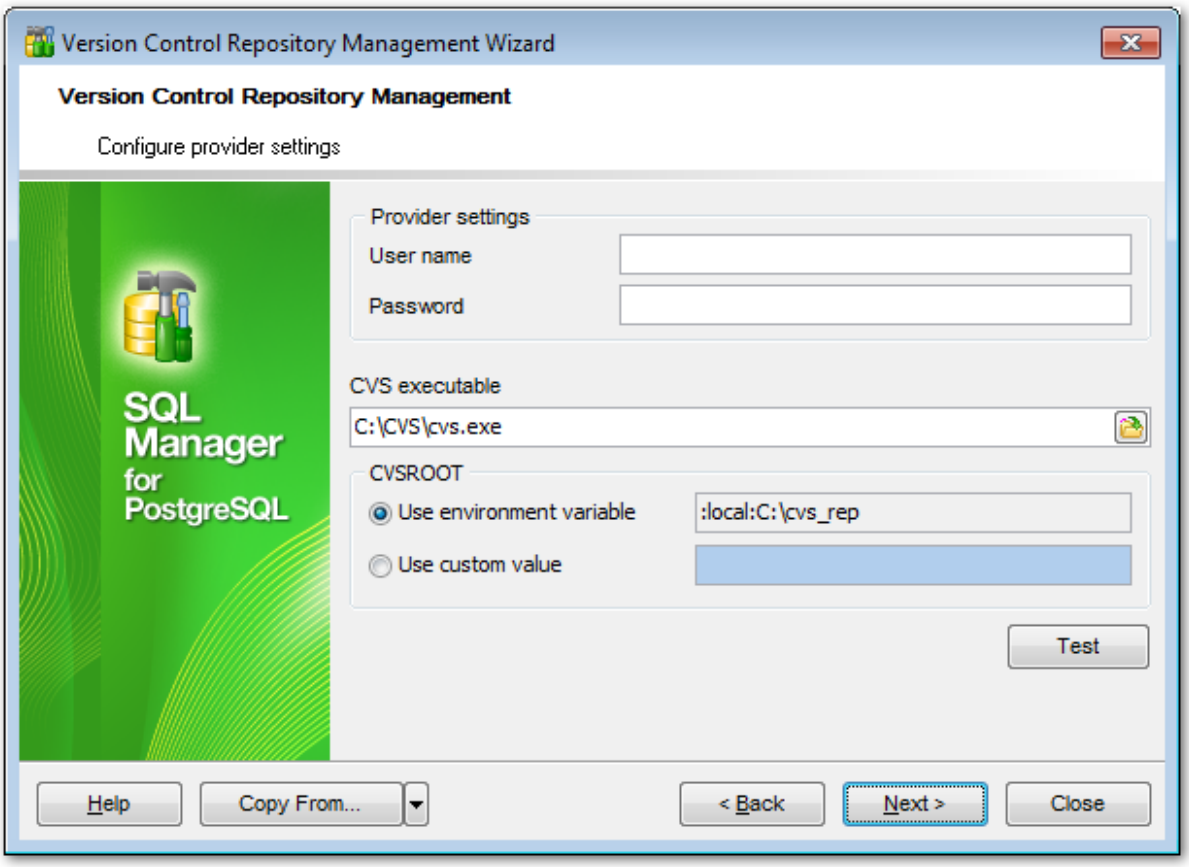
4.3.11.1.3 Configuring provider settings

This step of the wizard contains the set of options necessary to define the version control repository.

Set of options available in this step depends on the provider selection made in the Selecting version control provider[131] step of the wizard:
CVS[132]
SVN/VSS[133]
TFS[134]

4.3.11.1.3.1 CVS

This step of the wizard contains settings available for CVS provider.



Specify **Username** and **Password** to authorize to the repository.

CVS executable
Use this field to locate the 'cvs.exe' file. Type the path to the file or use the **Explorer** button to locate it within the Open dialog.

CVSROOT
This section allows you to define *CVSROOT* variable's value - set protocol, repository

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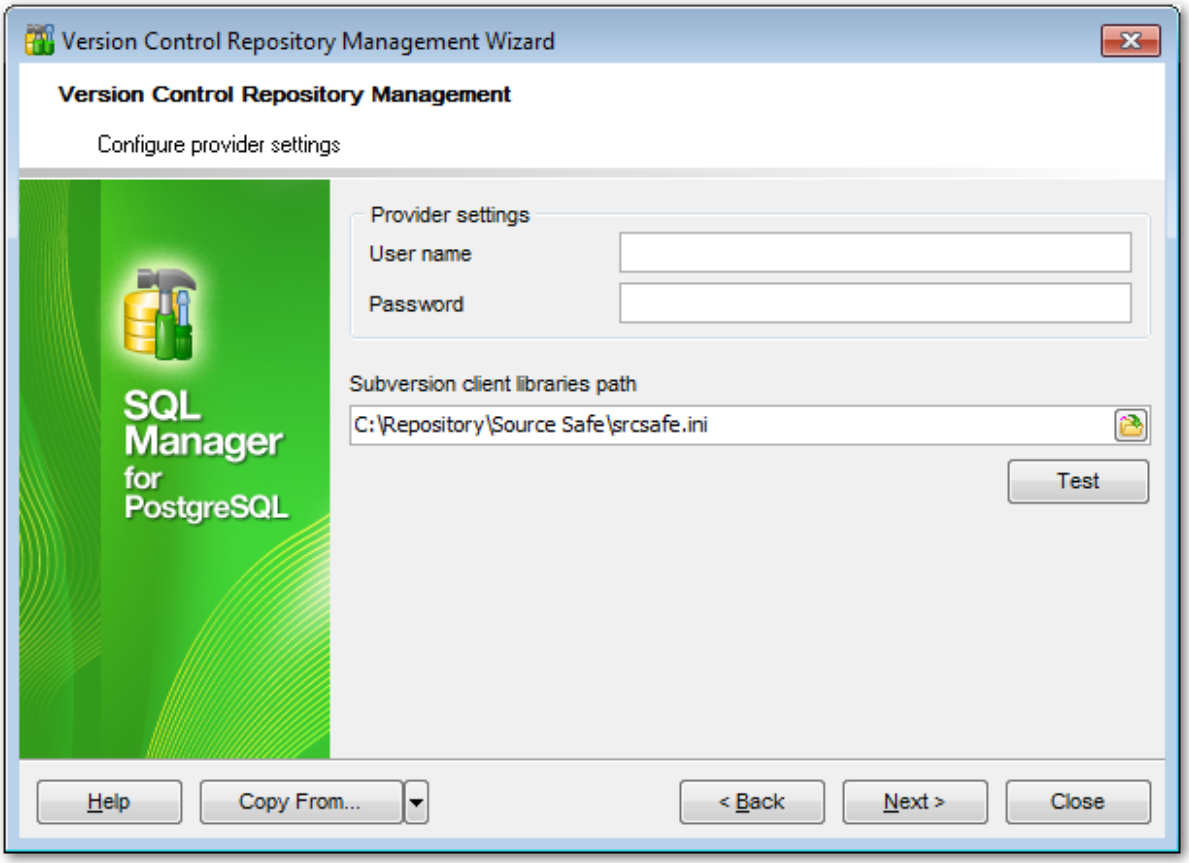
location, default user name and so on. At least the CVS repository location must be specified. You can **Use environment variable** or specify **custom value**.

To check the defined repository settings click the **Test** button.

Click the **Next** button to proceed to the Specifying repository settings 135 step of the wizard.

4.3.11.1.3.2 SVN/VSS

Use this step to define **Subversion**/**Visual SourceSafe** version control provider settings.



Specify **Username** and **Password** to authorize to the repository.

Locate the **SourceSafe database file** for the VSS or **Subversion client libraries path** for the SVN using the corresponded field. You can click the **Explorer** button to define file location.

To check the defined repository settings click the **Test** button.

Click the **Next** button to proceed to the Specifying repository settings 135 step of the

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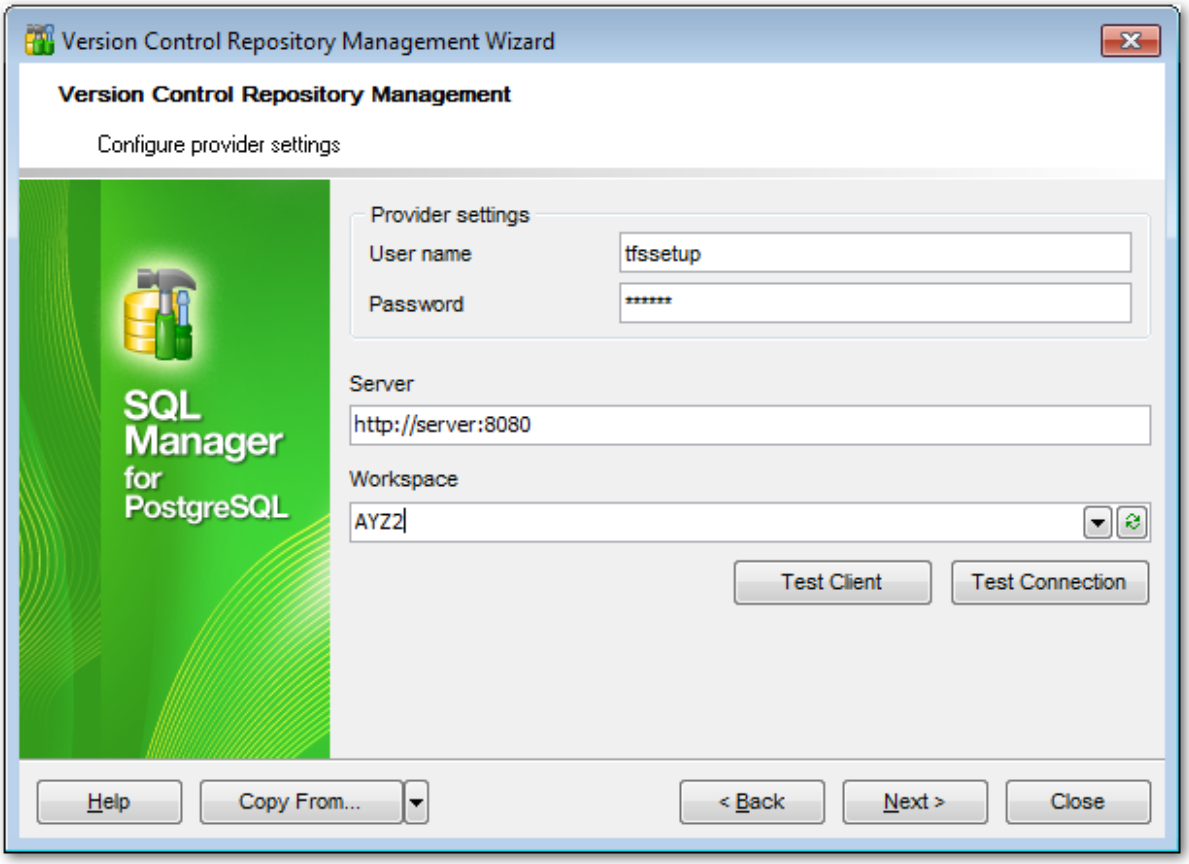
wizard.

4.3.11.1.3.3 TFS

Use this step to define settings for **Team foundation server** version control provider.



Specify **Username** and **Password** to authorize to team foundation server.

Server
Define HTTP-address of the TFS server. For example: 'http://server:8080' or 'http://localhost:8080'.

Workspace
Select the workspace on the TFS server to be used with repository.

Click the **Test client** button to check TFS client availability.
Click the **Test connection** button to check connection to the TFS server with the settings defined above.

Click the **Next** button to proceed to the Specifying repository settings 135 step of the wizard.

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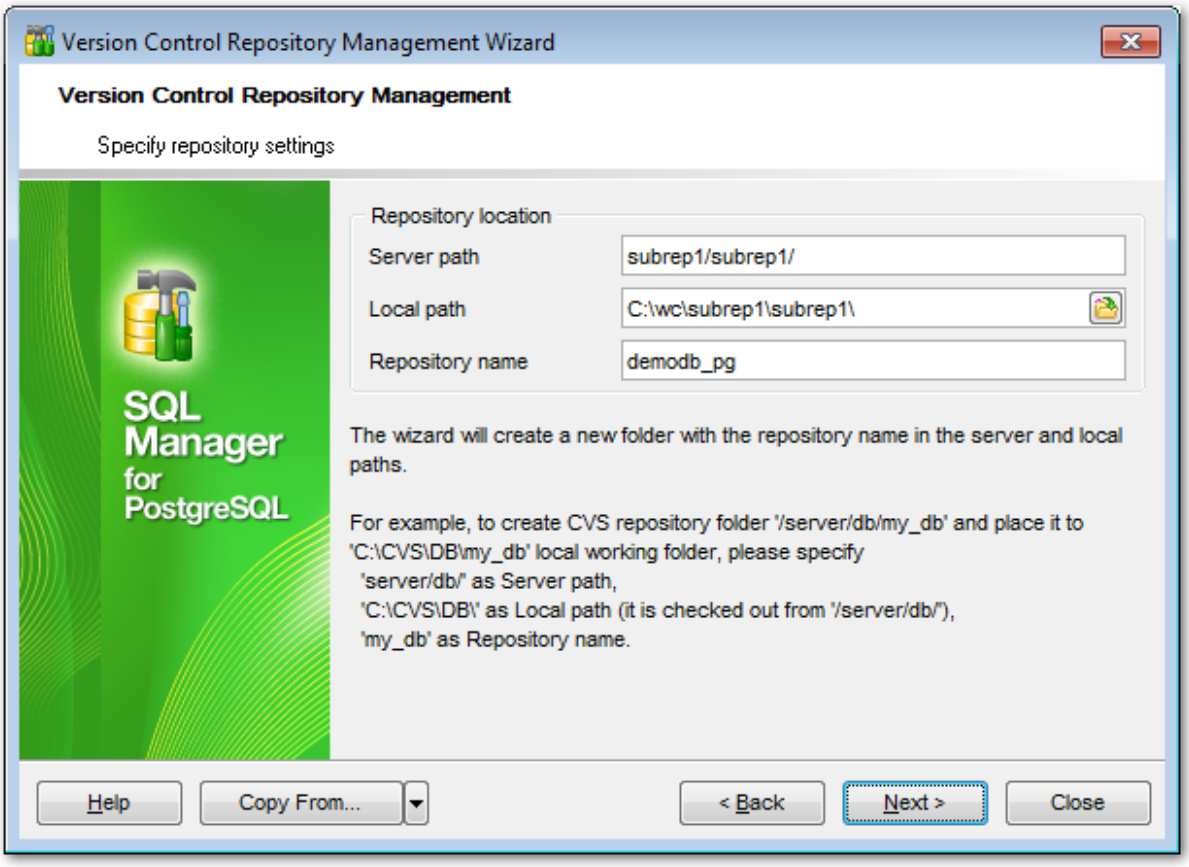
4.3.11.1.4 Specifying repository settings

Use this step of the wizard to define repository location.



Server path
Path to the repository on the VCS server. Specify the repository name in this field only when checking out the repository. You need to specify the server path under convention of version control system used. You can specify the repository name in this field only when extracting information from the repository and creating a local copy (*check_out* operation).

Local path
Location of repository working folder on client computer without repository directory. Directory with the **Repository name** must be absent form the specified local path folder or empty.

Repository name
Name of the repository to be created. This field is disabled when checking out the repository.

Click the **Next** button to proceed to the Defining label options 136 step of the wizard.

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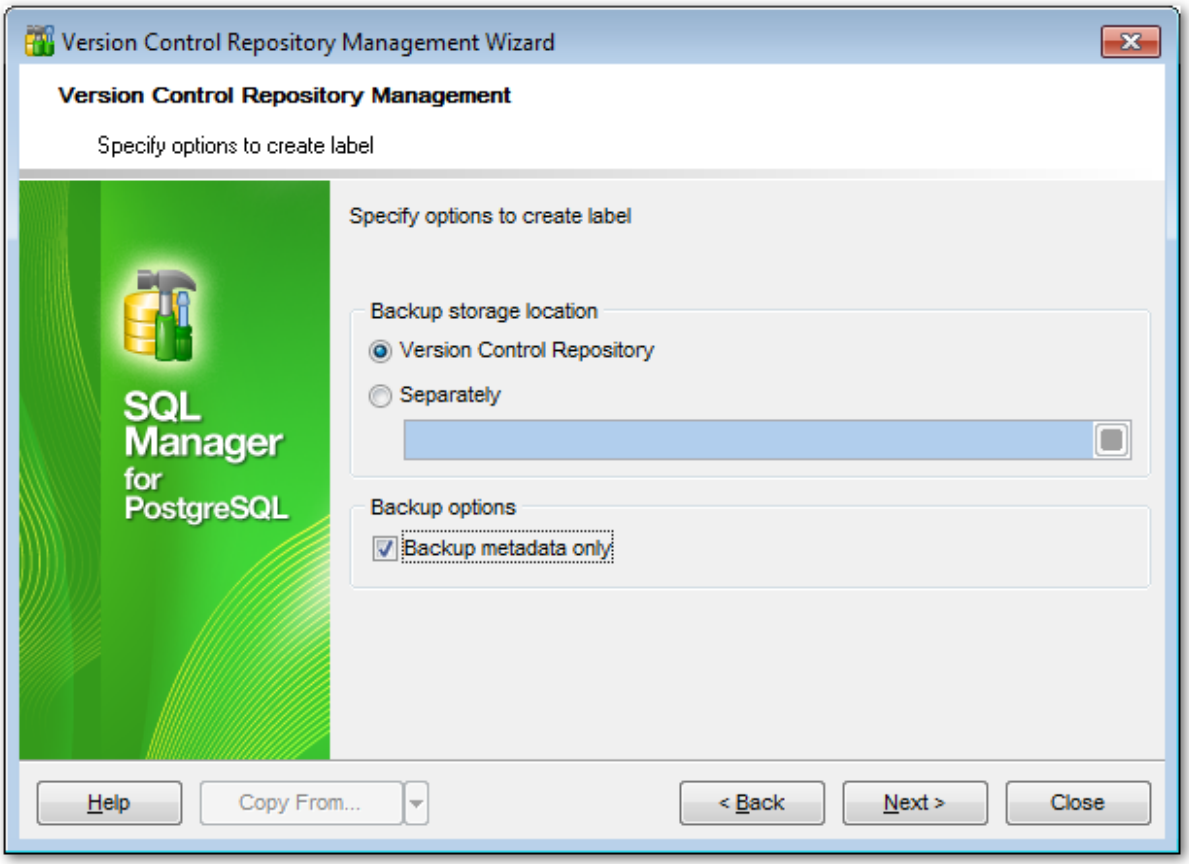
4.3.11.1.5 Defining label options

This step appears only when creating new repository. Use this step to define database label options.



Backup storage location

This section defines the directory to store backup copies that are created with the label. By default these copies are stored in the **Version control repository**. To set different location activate the **Separately** option.

Backup metadata only

Use this option to define whether to include data in backups created with the label.

Click the **Next** button to proceed to the final[137] step of the wizard.

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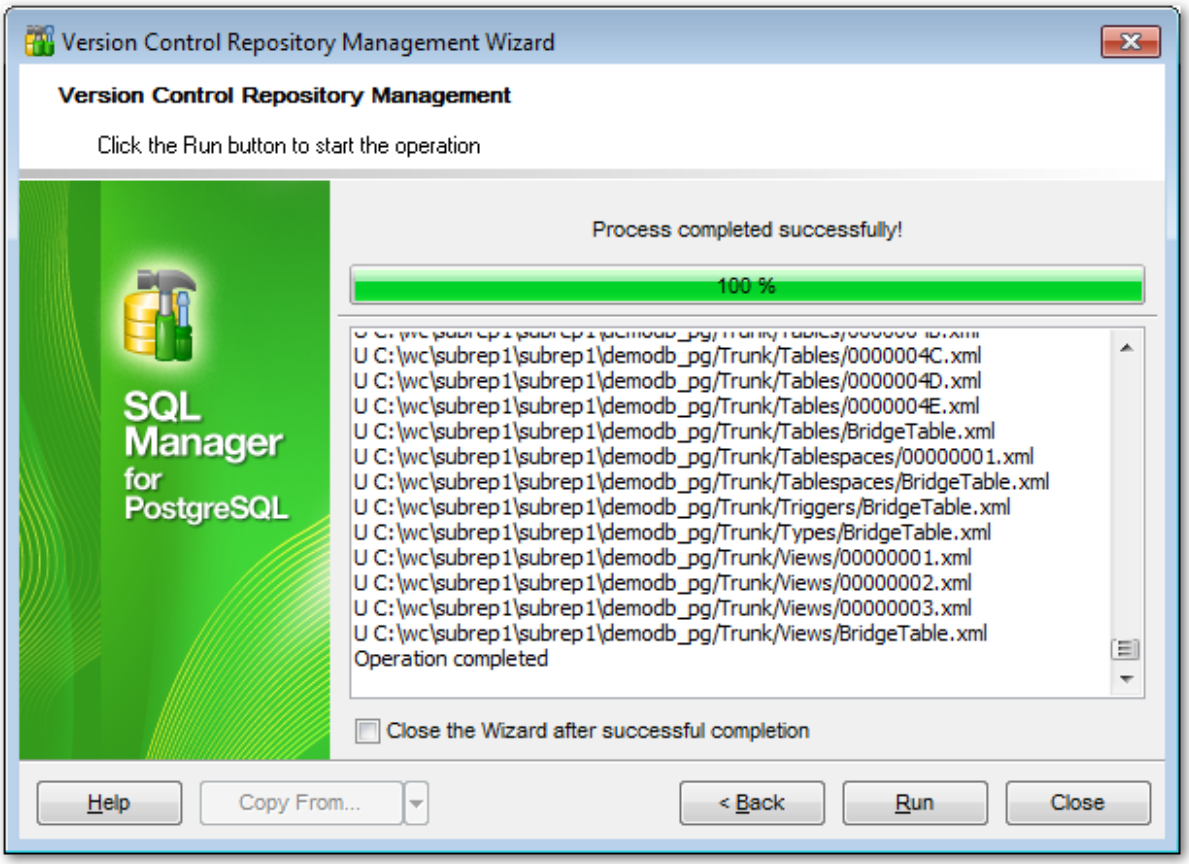
4.3.11.1.6 Performing operation

This step informs you that all necessary settings are defined and version control repository can be created/checked out.



To close the wizard after successful completion of the operation use the respective option.

Click the **Run** button to perform the operation.

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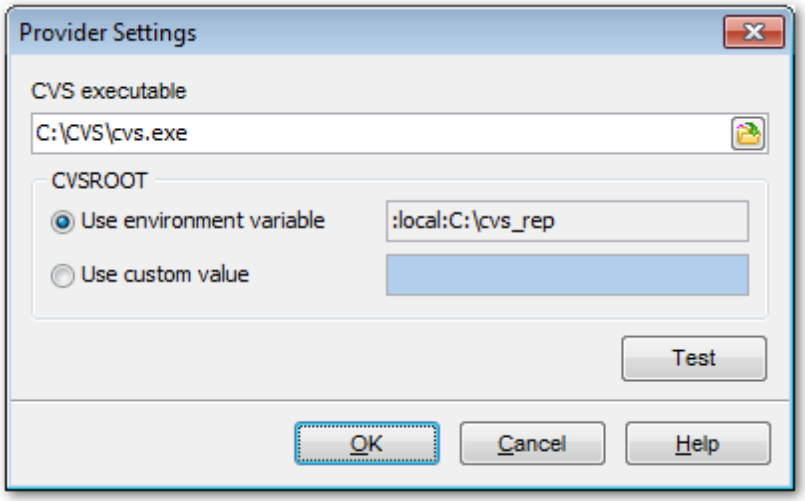
4.3.11.2 Configuring provider settings

4.3.11.2.1 CVS

CVS executable
Use this field to locate the 'cvs.exe' file. Type or use the **Explorer** button to locate the file within the standard *Open* dialog.



CVSROOT
This section allows you to set CVS repository settings. At least the CVS repository location must be specified. You can **Use environment variable** or specify **custom value** for the purpose.

To check the defined repository settings click the **Test** button.

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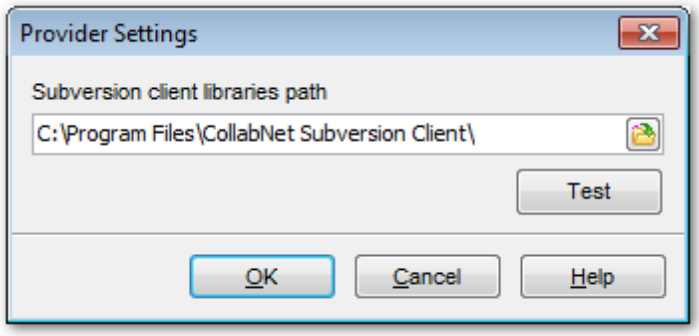
4.3.11.2.2 SVN

Locate the **Subversion client libraries path** in the corresponding field. You can click the **Explorer** button to define file location using the Open dialog.

Note that SQL Manager supports only 32-bit SVN clients.



To check the defined repository settings click the **Test** button.

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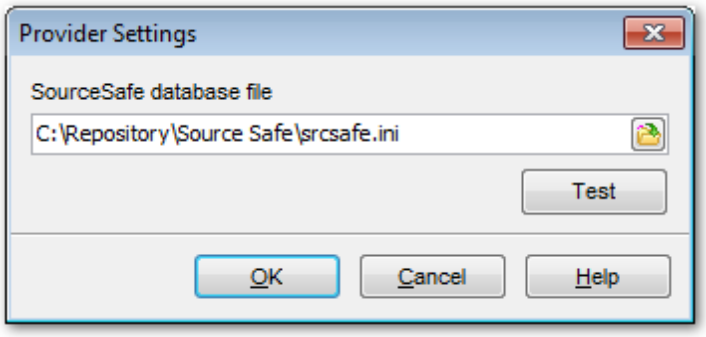
4.3.11.2.3 VSS

Locate the **SourceSafe database file**, using corresponded field. You can click the **Explorer** button to define file location using the Open dialog.



To check the defined repository settings click the **Test** button.

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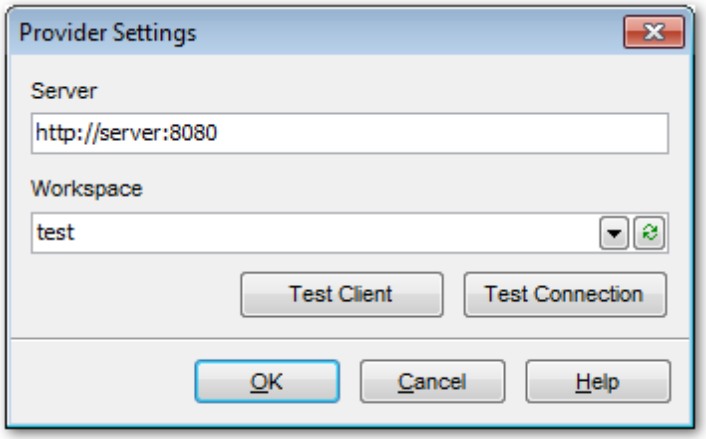
4.3.11.2.4 TFS

Server
Define HTTP-address of the TFS server. For example: 'http://server:8080' or 'http://localhost:8080'.

Workspace
Select the workspace on the TFS server to be used when working with the repository.



Click the **Test client** button to check TFS client availability.
Click the **Test connection** button to check connection to the TFS server with settings defined above.

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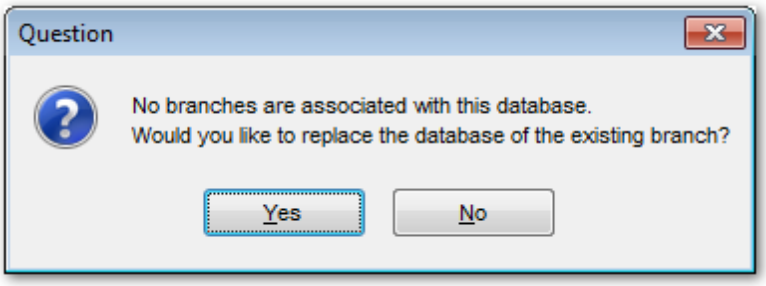
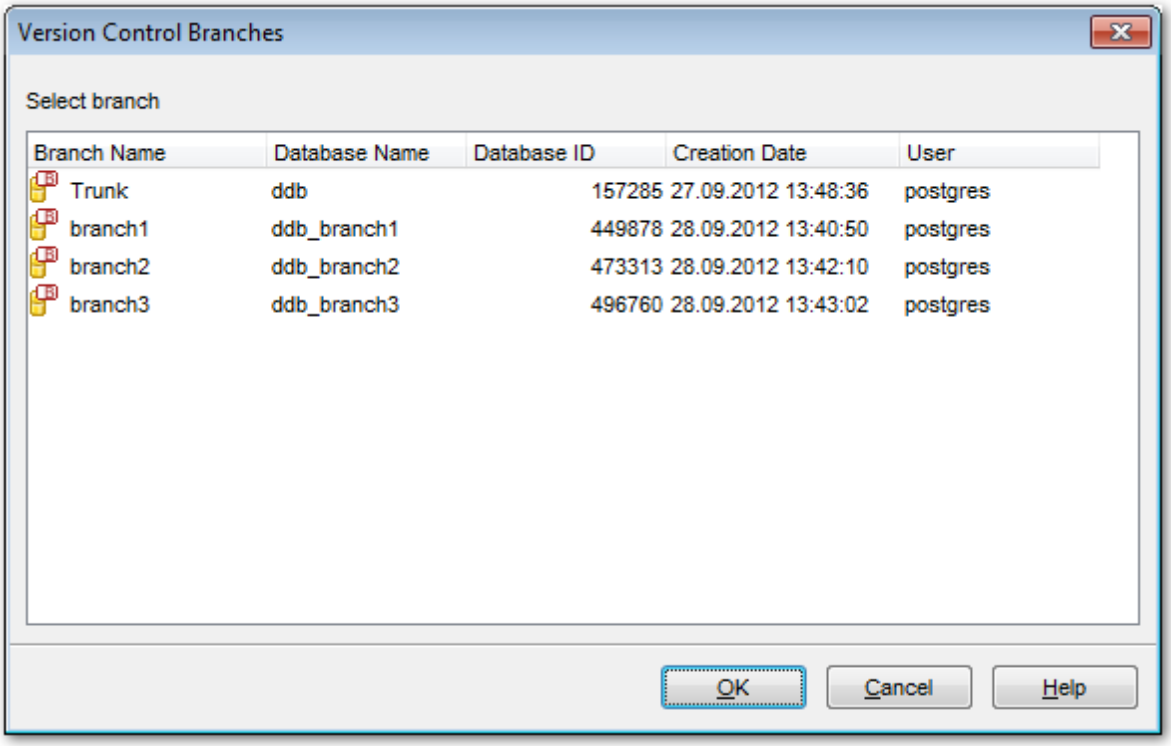
4.3.11.3 Version Control Branches

Using database change management functionality in SQL Manager for PostgreSQL implies that a database is linked with VCS repository branch. Therefore with each repository branch a database copy is created.
When creating new database repository the name of this database is stored in the head/trunk branch of VCS repository. When you are using the existing repository, the working branch is defined automatically by the database name. If no branches of the repository contain information about the database, then you will be offered to associate existing repository branch with the database:



Press **Yes** to open the **Version Control Branches** dialog to select the needed branch:



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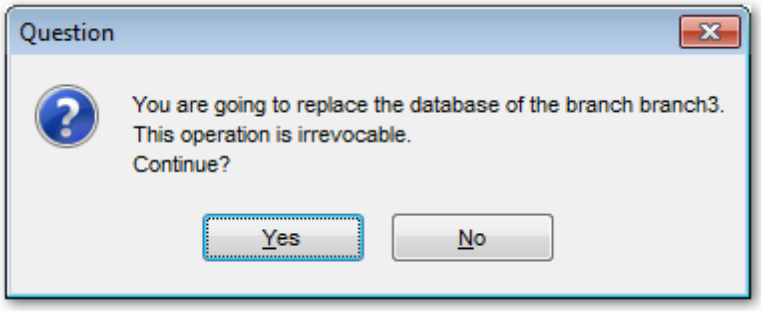
Branch selection needs to be confirmed in the appeared window.
Database name in the selected branch will be change with the current database name.



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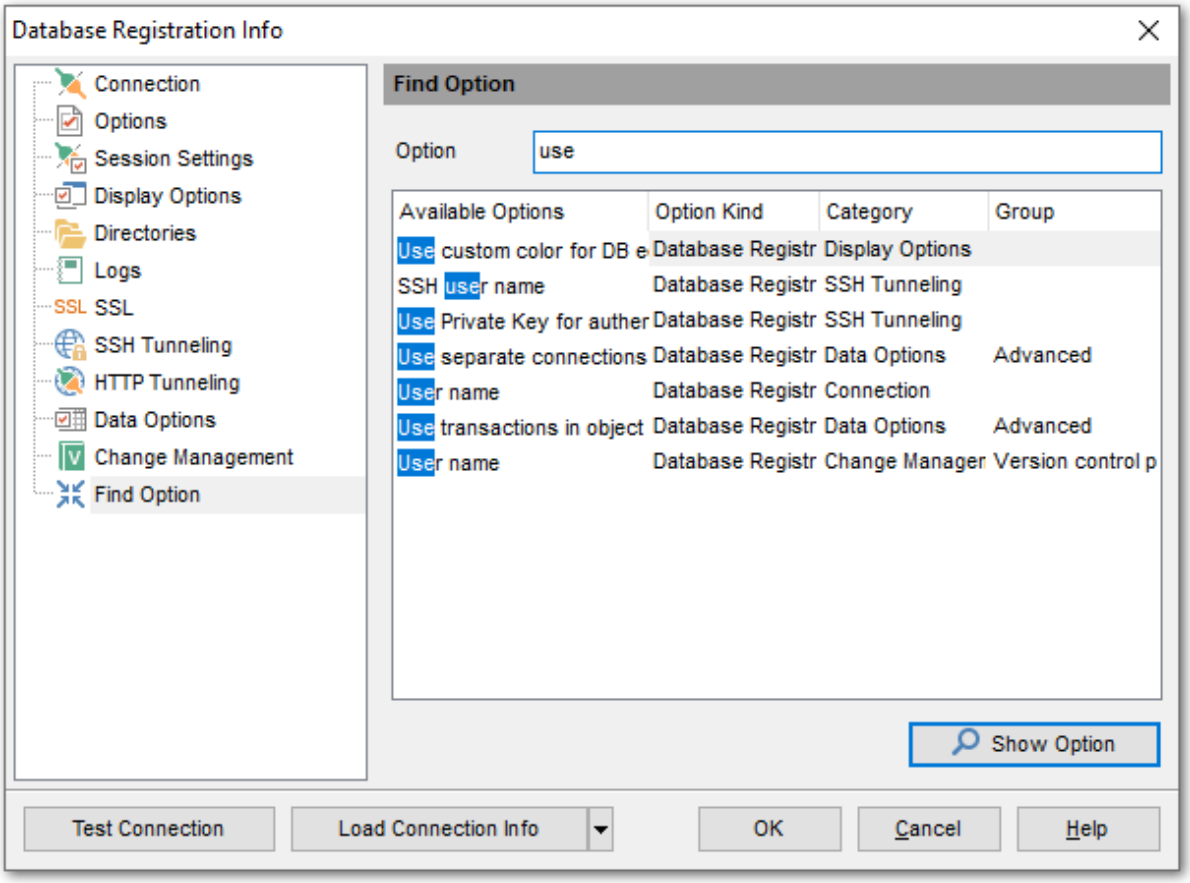
4.3.12 Find Option

The **Find Option** section allows you to search for options available within the **Database Registration Info** dialog easily and quickly.

Option
In this field you can enter the name of the option to search for within the database registration options.



The **Available options** area lists all options of the Database Registration category according to the specified name. The **Option Kind**, **Category** and **Group** columns specify option type and location.
Select the required option in the list and click **Show Option** to open the corresponding section where you can view/edit the value of this option. For your convenience the required option is marked with an animated icon.

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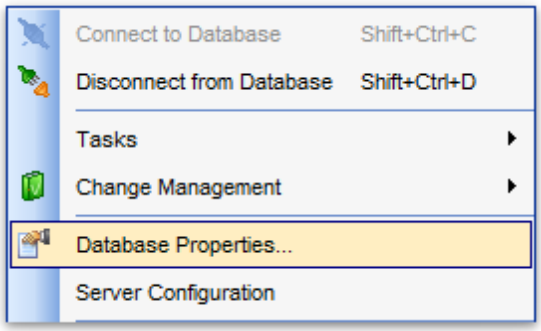
4.4 Database Properties

The **Database Properties** dialog allows you to view/edit a number of properties which can be changed to optimize database performance.

To open the dialog, right-click the database alias in DB Explorer 65 and select the **Database Properties...** context menu 54 item, or use the **Properties** button on the DB Explorer toolbar 83.



A number of database options that determine the characteristics of the database can be set for each database. These options are unique to each database and do not affect other databases.

- General 146
- Description 148
- Permissions 149
- Find Option 151

See also:

Create Database wizard 89
Register Database wizard 98
Database Registration Info 108

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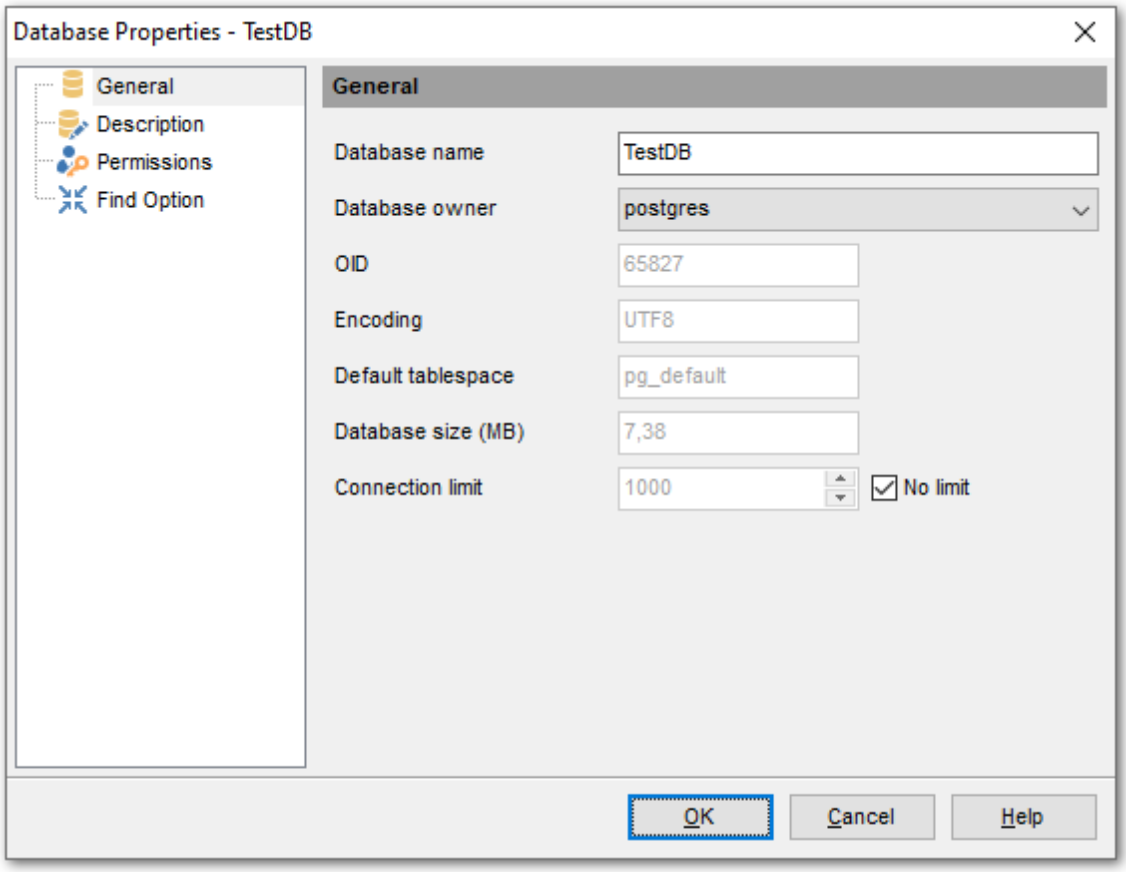
4.4.1 General

The **General** section of the **Database Properties** dialog allows you to view/edit general database properties: *Database name*, *Database owner*, *OID*, *Encoding*, *Default tablespace*, *Database size* (in MB), *Connection limit*.



Database name
Displays the name of the database.

Database owner
Specifies the database user who owns the database (for PostgreSQL 7.3 or higher).

OID
Displays the object identifier of the database.

Encoding
Displays the encoding used in the database.

Default tablespace
Displays the default tablespace for the database (for PostgreSQL 8.0 or higher).

Database size
Displays the size of the database (in megabytes).

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Connection limit
Specifies the time limit for connecting to the database (for PostgreSQL 8.1 or higher).

No limit
Enable the option for unlimited connections.

See also:

Description 148
Permissions 149
Find Option 151

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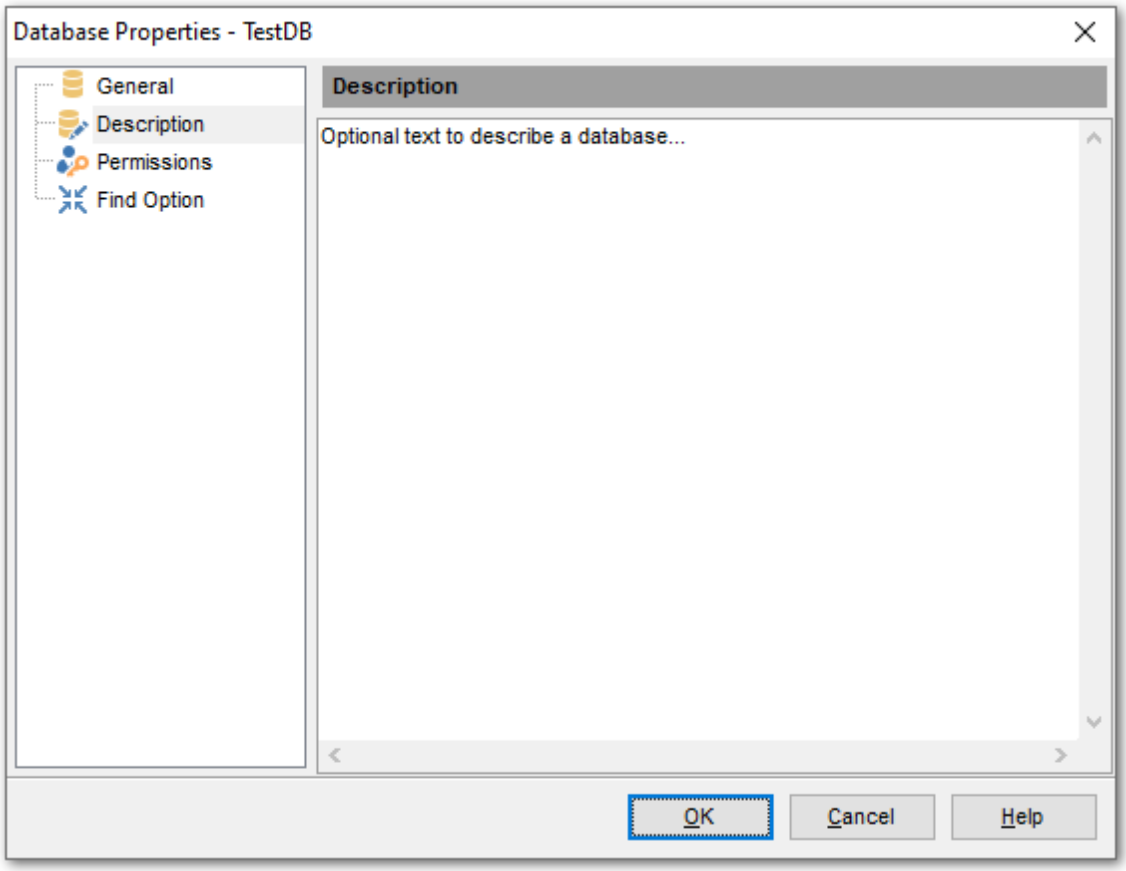
4.4.2 Description

The **Description** section of the **Database Properties** dialog allows you to add/edit an optional description for the database.



See also:

General 146
Permissions 149
Find Option 151

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4.4.3 Permissions

The **Permissions** section of the **Database Properties** dialog allows you to view and set grants for the current database.

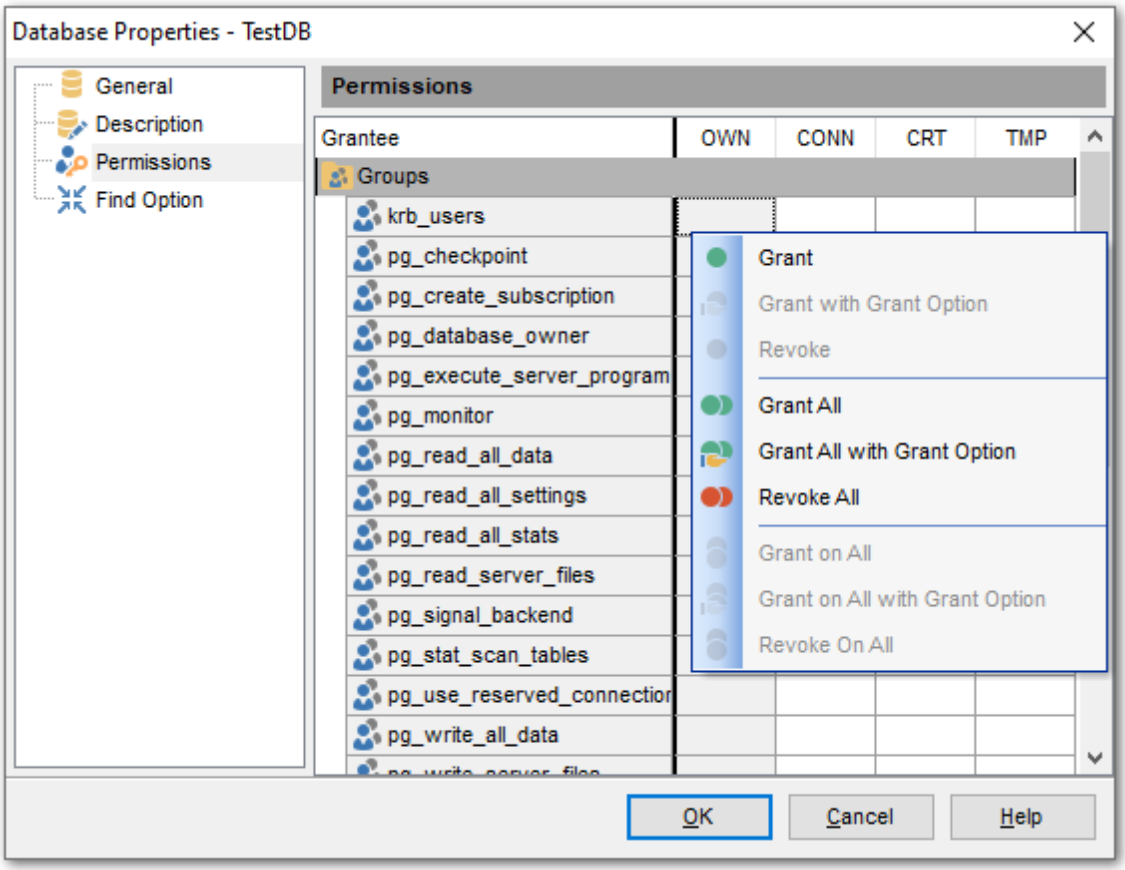
Right-click on the grid cell where the row stands for a group 754 or user 751, and the column is the operation for granting (OWN, CRT, etc), then select the Grant item from the context menu to permit the selected operation to the group/user. See Managing privileges 766 for details.

OWN (*OWNER*)
Allows to set the new owner of the database (to alter the owner, you must own the database and also be a direct or indirect member of the new owning role).

CONN (*CONNECT*)
Allows the user to connect to the current database (note that this column appears only when working with server version 8.2 or higher).

CRT (*CREATE*)
Allows new schemas to be created within the database.

TMP (*TEMPORARY*)
Allows temporary tables to be created while using the database.



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See also:

General 146
Description 148
Find Option 151

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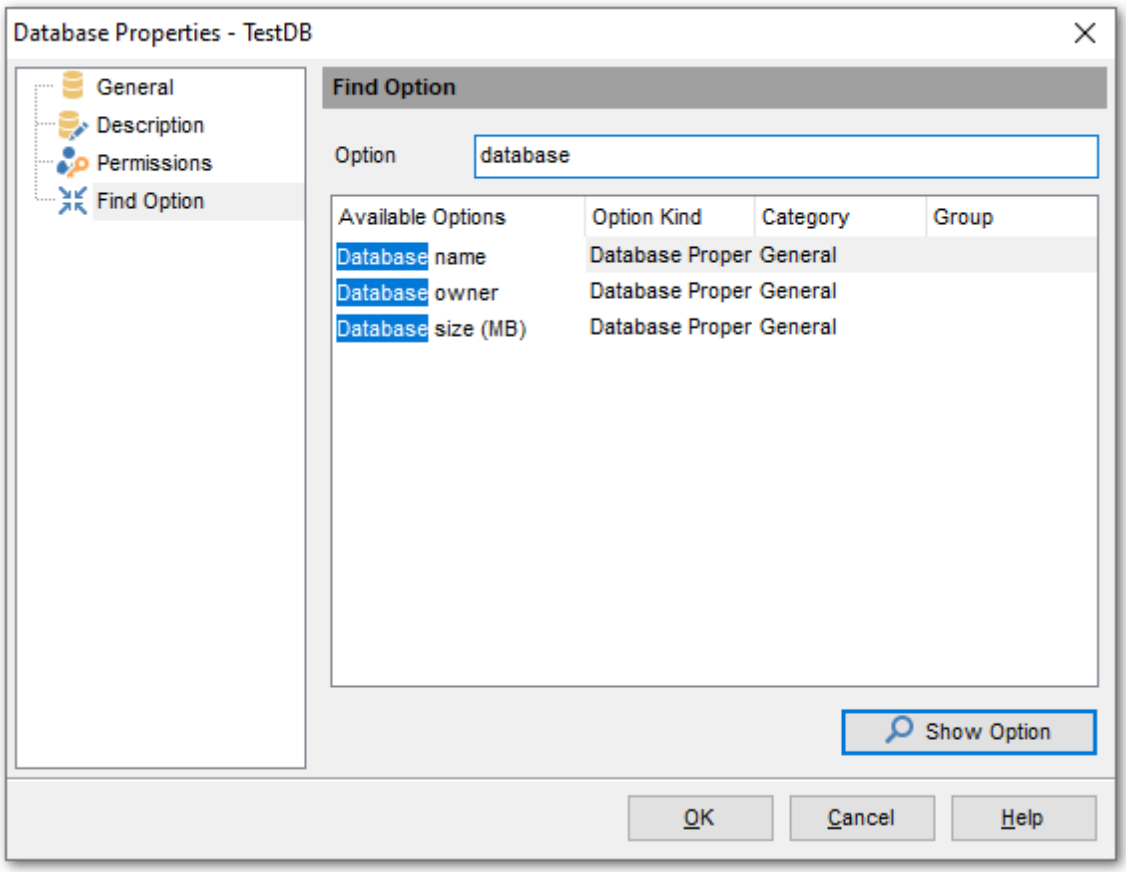
4.4.4 Find Option

The **Find Option** section allows you to search for options available within the **Database Properties** dialog easily and quickly.

Option
In this field you can enter the name of the option to search for within the database properties.



The **Available options** area lists all options of the Database Properties category according to the specified name. The **Option Kind**, **Category** and **Group** columns specify option type and location.
Select the required option in the list and click **Show Option** to open the corresponding section where you can view/edit the value of this option. For your convenience the required option is marked with an animated icon.

See also:

General 146
Description 148
Permissions 149

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4.5 Database Registration Manager

Database Registration Manager allows you to register new databases and delete the registration of non-existing databases.

To open **Database Registration Manager** use the corresponding item of the database context menu 54.

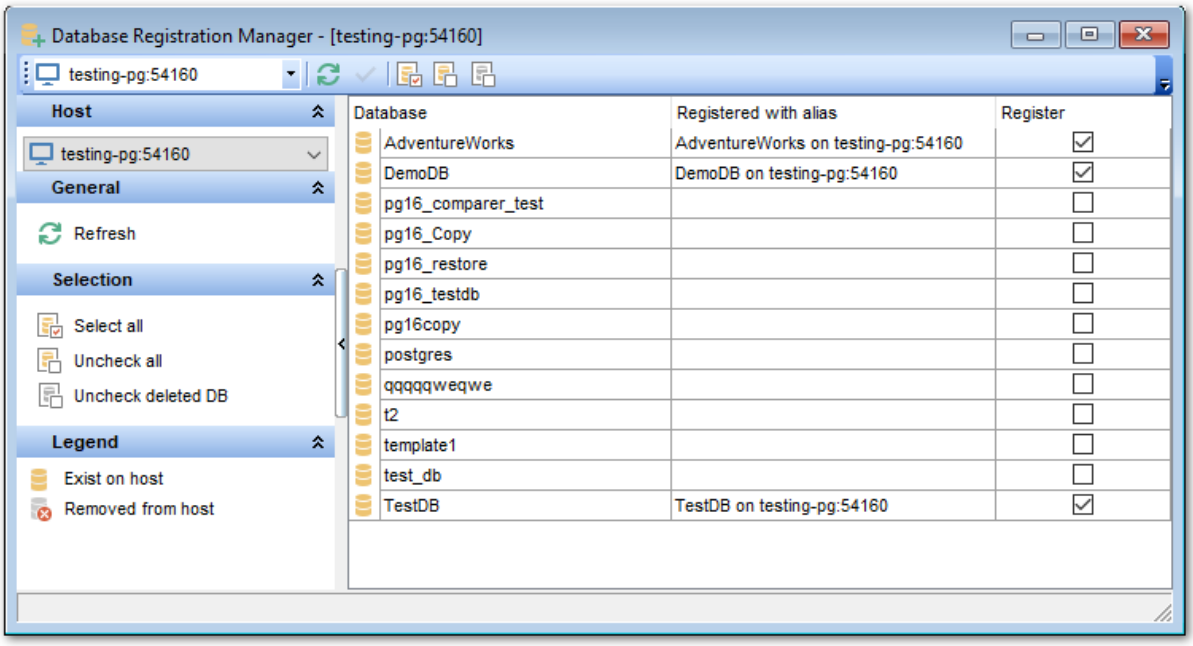

Table contains all databases located on the selected host. You can change **Host** selection using the appropriate drop-down list in the navigation bar 153.
Check all databases to be registered.
For automatic registration of selected databases click the **Apply changes button**.

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Register Database wizard 98

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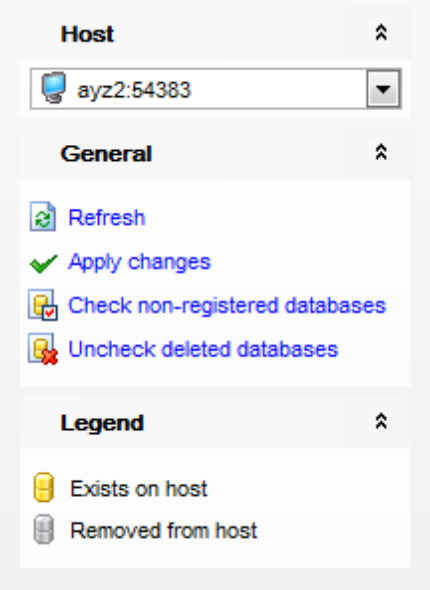
4.5.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Database Registration Manager**.



The **Navigation bar** of **Database Registration Manager** allows you to:

Host
select a host

General
Refresh the list of databases
Apply changes - register selected databases
Select databases located on the host, but not registered in <PRODUCT_TITLE> 98
Delete registration of the database removed from the server.

Legend
Exist on host
Removed from host

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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Part V

5 Database Objects Management

SQL Manager for PostgreSQL provides powerful tools to manage **database objects**.

To obtain detailed information concerning PostgreSQL database objects, refer to the official PostgreSQL server documentation.

Note: Before working with database objects in SQL Manager for PostgreSQL you should connect to the database 68 first.

Creating Database Objects

To create a database object:
- select the **Database | New Object...** main menu 961 item;
- select the type of object within the New Object 157 dialog;
- follow the steps of the wizard which guides you through the entire process of creating the object, or set the object properties using its editor - depending on the selected object type.

Note that you can also create a database object by selecting the appropriate context menu 51 item of the DB Explorer 70 tree or using the *Ctrl+N* shortcut 1001.

To create a new object with the same properties as one of existing objects has:
- select the **Database | Duplicate Object...** main menu 961 item;
- follow the instructions of Duplicate Object Wizard 159.

Alternatively, you can right-click an object in the DB Explorer 65 tree and select the **Duplicate Object <object_name>...** context menu item.

Editing Database Objects

To edit a database object:
- select the database object in the DB Explorer 65 tree;
- right-click the object to call its context menu 57 and select the **Edit <object type> <object name>** context menu item, or double-click the object to open it in its editor;

Renaming Database Objects

To rename a database object:
- select the object to rename in the DB Explorer 65 tree;
- right-click the object and select the **Rename <object type> <object name>...** item from the context menu 57;
- edit the object name using the **Rename Object...** dialog.

Note: This operation is possible for all objects except for schemas 164, domains 259, rules 264, base types 278, composite types 283, enumerated types 287, operators 300, tablespaces 318.

Dropping Database Objects

To drop a database object:
- select the database object in the DB Explorer 70 tree;
- right-click the object to call its context menu 57 and select the **Drop <object type> <object name>** context menu item;
- confirm dropping in the dialog window.

Note: If more convenient, you can also use the following shortcuts 1001:
Ctrl+N to create a new object;

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Ctrl+O to edit the selected object;
Ctrl+R to rename the object;
Shift+Del to drop the object from the database.

When using an object editor, you can benefit from **tabs**. To switch between tab views, click on their respective tabs at the top of the main editor window. You can do it at any time, since the tab views are absolutely independent.

To compile a newly created or edited object, you can use the **Compile** item available within the Navigation bar 961 or Toolbar 963 of the object editor.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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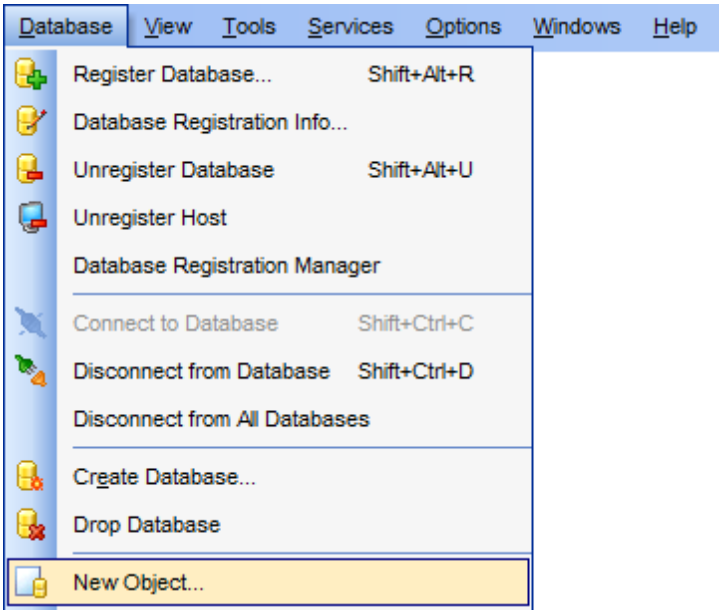
5.1 New Object

The **Create New Object** dialog allows you to select the type of the object to be created and run the appropriate wizard or editor.

To open the dialog, select the **Database |** **New Object...** main menu 961 item.



Use the **Database** drop-down list to select the alias of the database where the new object should be created. Pick an object type icon and click **OK** to invoke the corresponding wizard or dialog.

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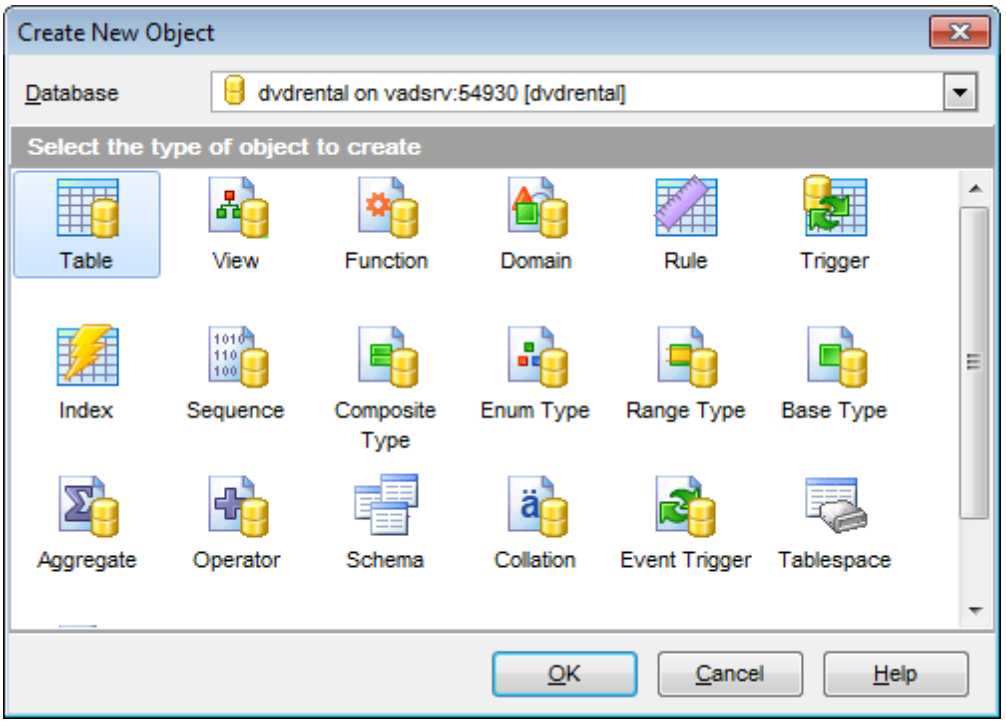

See also:

Operations with database objects 70
Duplicate Object Wizard 159
Schemas 164
Schema Objects 168
Non-schema Objects 313

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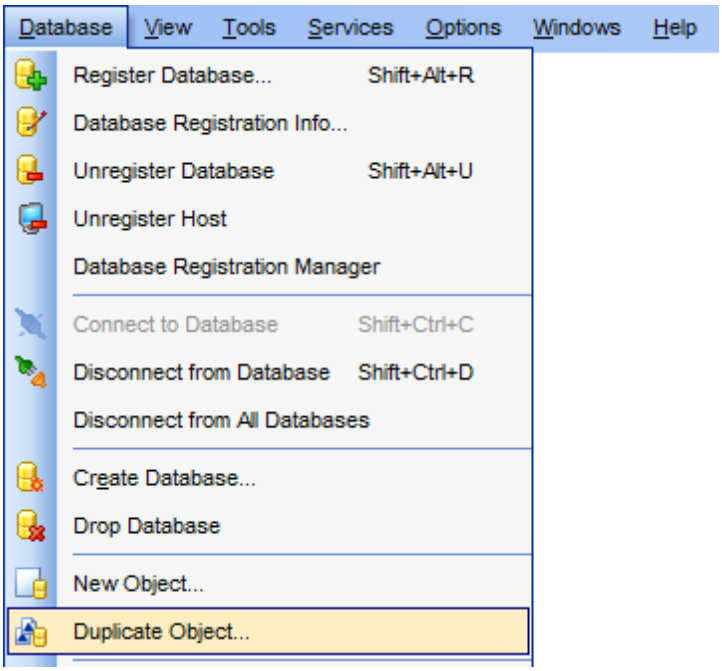
5.2 Duplicate Object Wizard

Use the **Duplicate Object Wizard** to create a new database object of the same type and having the same properties as one of the existing ones.

To run the wizard, select the **Database | Duplicate Object...** main menu 961 item, or right-click an object of the desired type in the DB Explorer 65 tree and use the **Duplicate <object type> <object name>...** context menu 57 item.



- Selecting the source database 160
- Selecting object to duplicate 161
- Selecting destination database 162
- Modifying the new object's definition 163

See also:

Operations with database objects 70
New Object 157
Schemas 164
Schema Objects 168
Non-schema Objects 313

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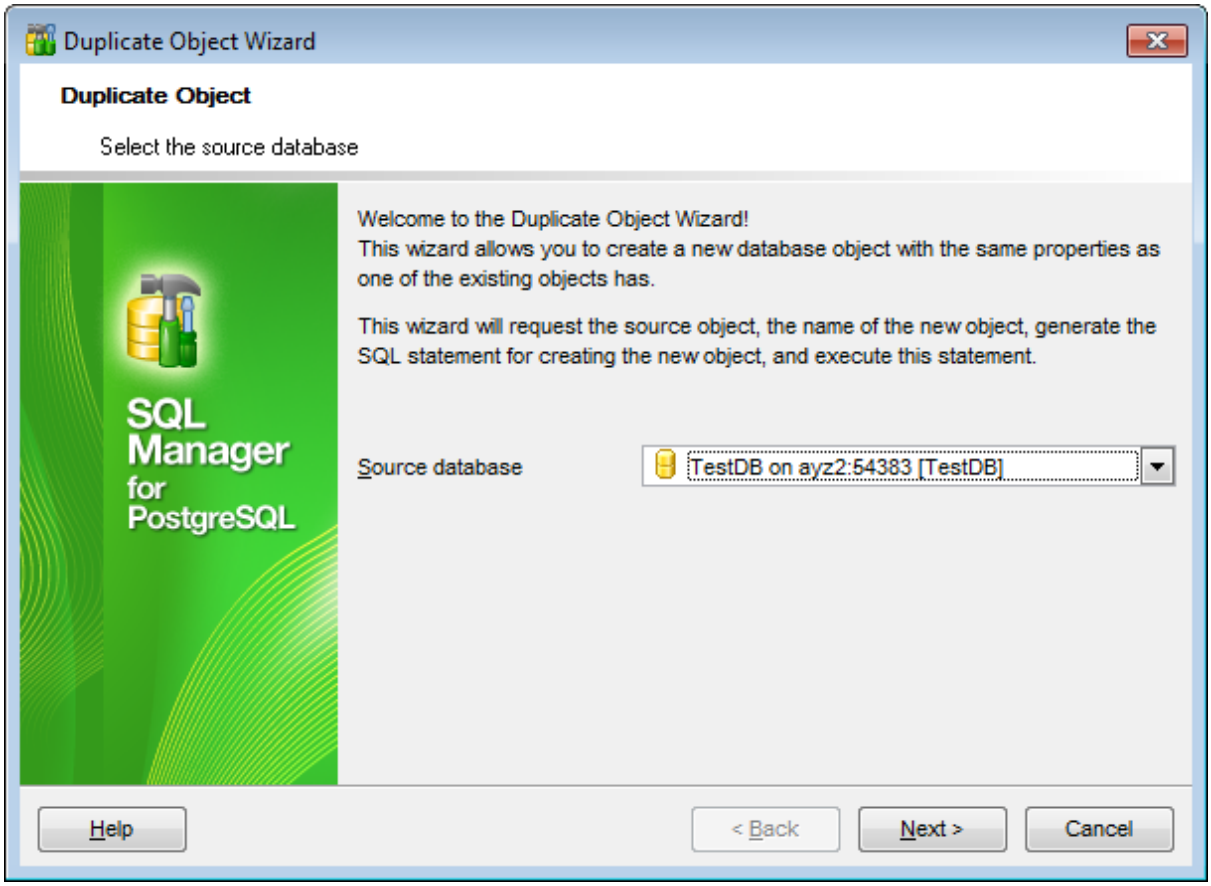
5.2.1 Selecting the source database

This step of the wizard allows you to select the **source database** containing the source object to be duplicated.



Click the **Next** button to proceed to the Selecting object to duplicate 161 step of the wizard.

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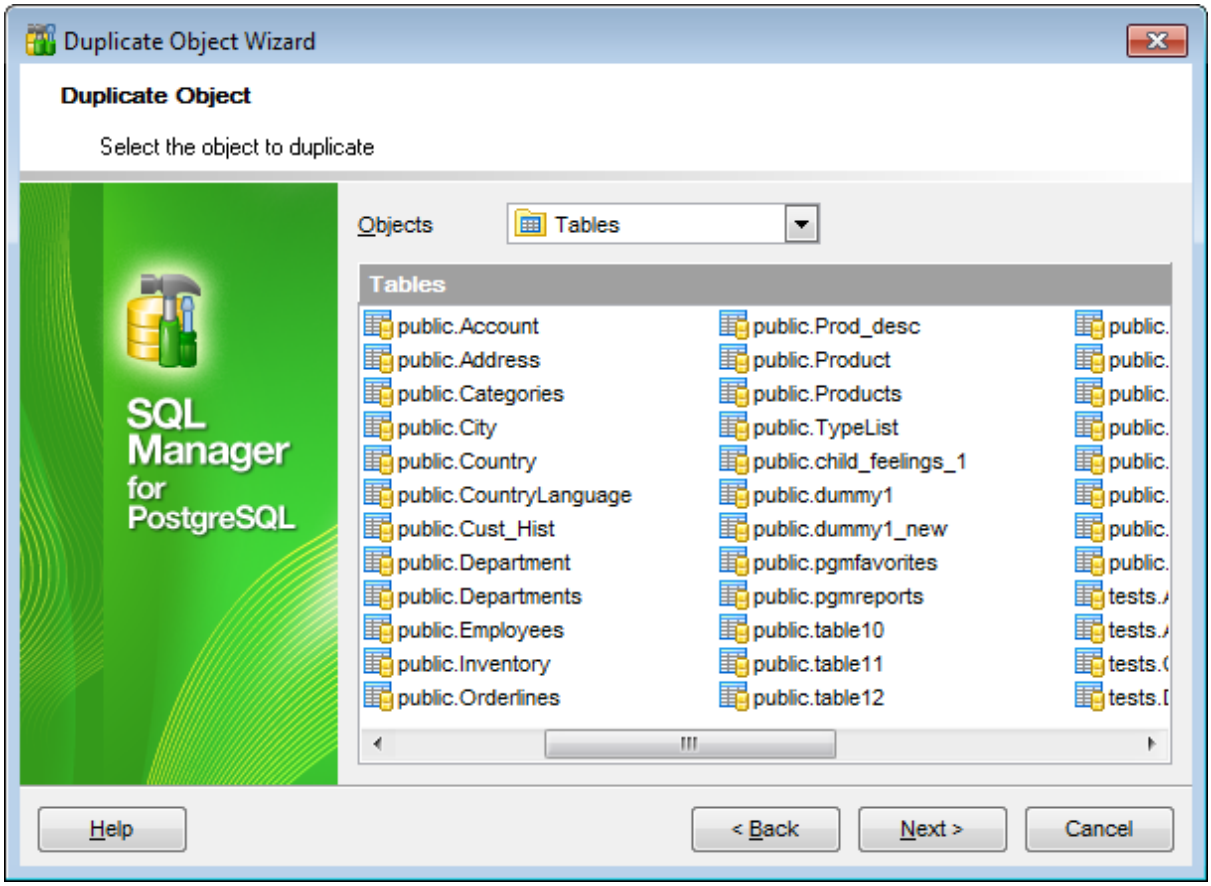
5.2.2 Selecting object to duplicate

Use the **Objects** drop-down menu to select the type of object you intend to duplicate.

Select a database object to copy its properties to the new object.

Hint: The **context menu** of the objects list area allows you to specify whether objects of the specified type should be displayed as *icons* or as *list*.



Click the **Next** button to proceed to the Selecting destination database 162 step of the wizard.

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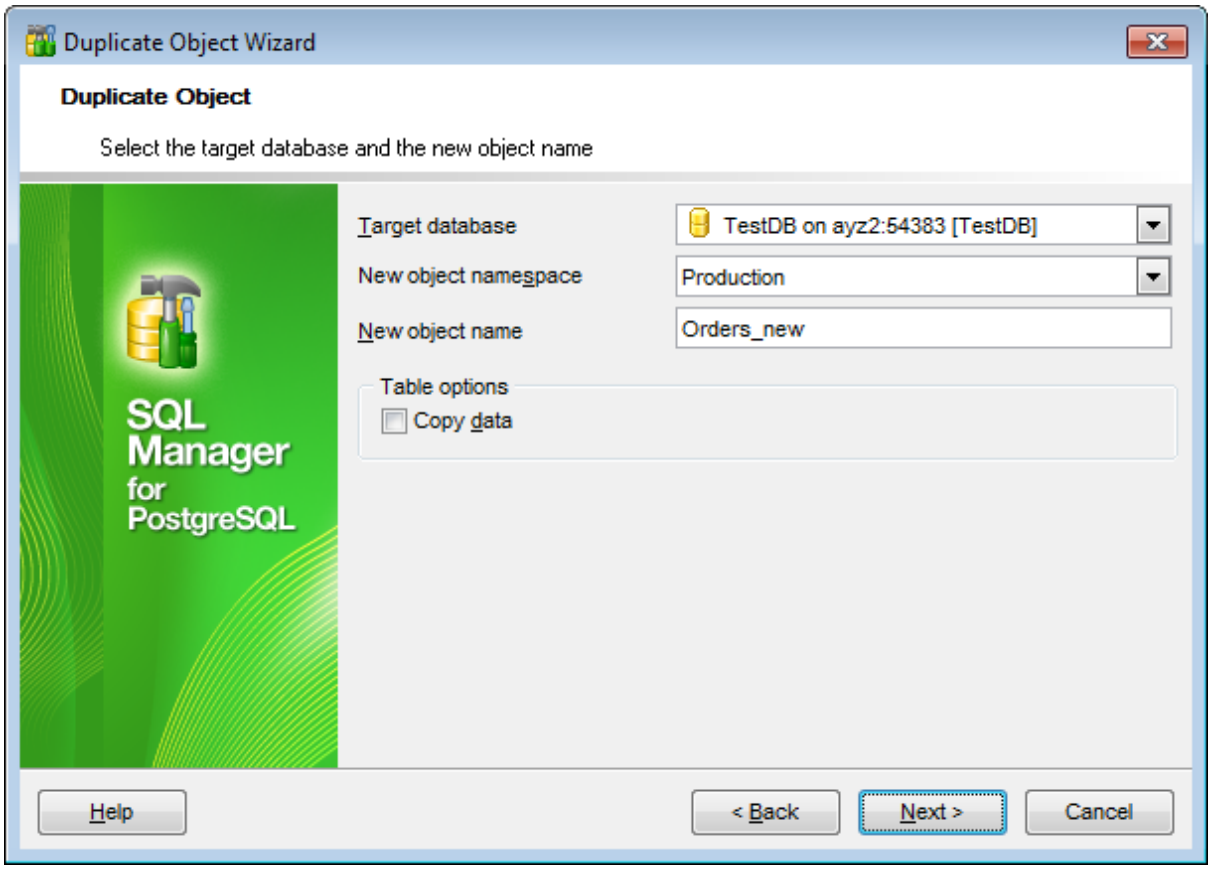
5.2.3 Selecting destination database

Select the **target database** and **schema** (**New object namespace**) to create the new object in, set the **name** of the new database object.

Check the ☑ **Copy data** option to copy data from the source table to the new one.



Click the **Next** button to proceed to the Modifying the new object's definition 163 step of the wizard.

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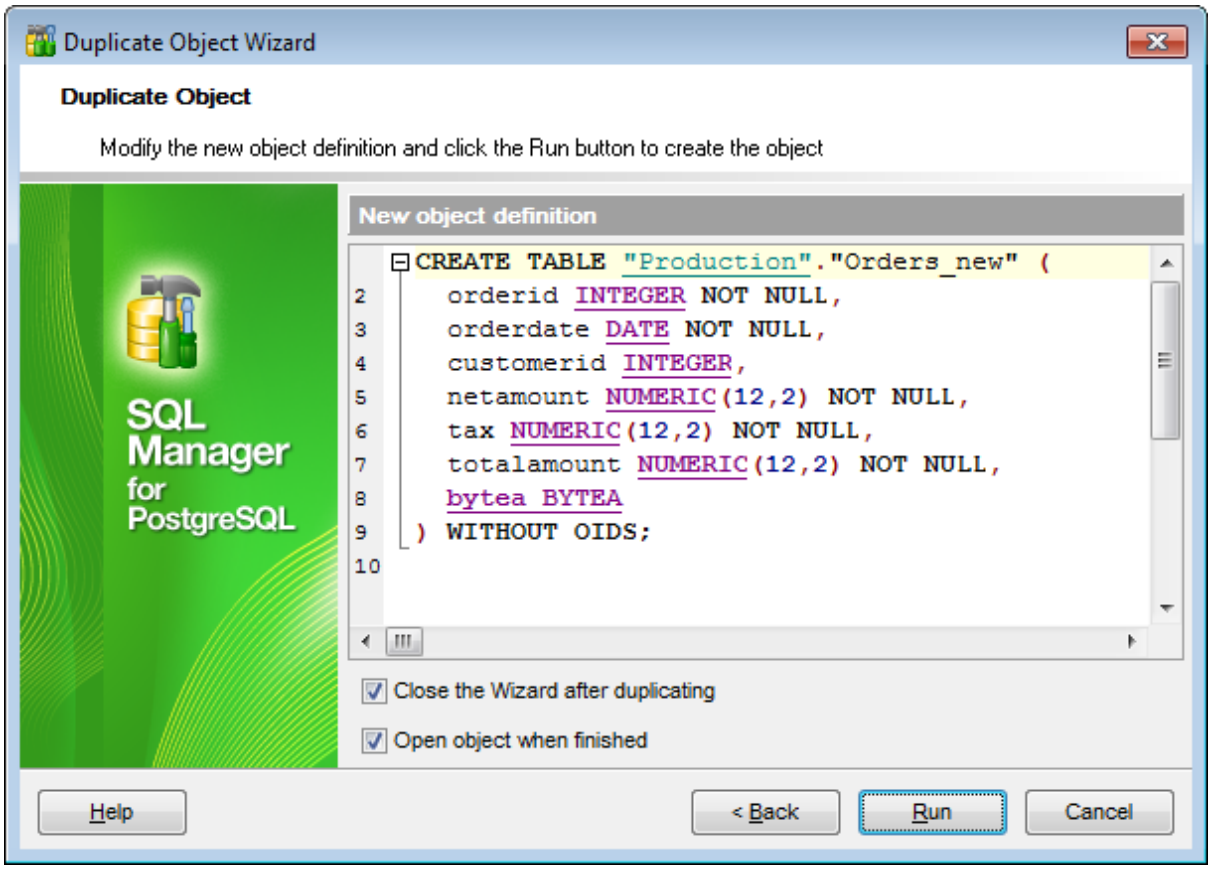
5.2.4 Modifying the new object's definition

This step of the wizard allows you to browse **the result SQL statement**.

If necessary, you can edit the definition of the new object.



Close the wizard after duplicating
If this option is selected, the wizard is closed automatically when the new object is created.

Open object when finished
Select this option to open the newly created object in its editor.

Click the **Run** button to create the object.

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5.3 Schemas

A **Schema** is essentially a namespace: it can be defined as a collection of database objects[168] that form a single namespace. A namespace is a set in which each element has a unique name.

Creating Schemas

- select the **Database | New Object...** main menu[961] item;
- select **Schema** in the Create New Object[157] dialog;
- define schema properties using the appropriate tabs of Schema Editor[165].

Hint: To create a new schema, you can also right-click the **Schemas** node or any object within this node in the DB Explorer[65] tree and select the **New Schema** item from the context menu[57].

To create a new schema with the same properties as one of existing schemas has:

- select the **Database | Duplicate Object...** main menu[961] item;
- follow the instructions of Duplicate Object Wizard[159].

Alternatively, you can right-click a schema in the DB Explorer[65] tree and select the **Duplicate Schema <schema_name>...** context menu item.

Duplicate Object Wizard[159] allows you to select the database to create a new schema in, and to edit the result SQL statement for creating the schema.

Editing Schemas

- select the schema for editing in the DB Explorer[65] tree (type the first letters of the schema name for quick search[78]);
- right-click the object and select the **Edit Schema <schema_name>...** context menu item, or simply double-click the schema;
- edit schema properties using the appropriate tabs of Schema Editor[165].

Dropping Schemas

- select the schema to drop in the DB Explorer[65] tree;
- right-click the object and select the **Drop Schema <schema_name>...** context menu item;
- confirm dropping in the dialog window.

Note: If more convenient, you can also use the following shortcuts[1001]:
Ctrl+N to create a new schema;
Ctrl+O to edit the selected schema;
Shift+Del to drop the object from the database.

See also:

Operations with database objects[70]
New Object dialog[157]
Duplicate Object Wizard[159]
Schema Objects[168]
Non-schema Objects[313]

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5.3.1 Schema Editor

Schema Editor allows you to manage PostgreSQL schemas efficiently. It opens automatically when you create a new schema and is available on editing an existing one (see Create schema 164 and Edit schema 164 for details).

To open a schema in **Schema Editor**, double-click it in the DB Explorer 65 tree.

- Using Navigation bar and Toolbar 166
- Creating/editing schema 167
- Browsing object dependencies 967
- Editing schema description 966
- Viewing DDL definition 965

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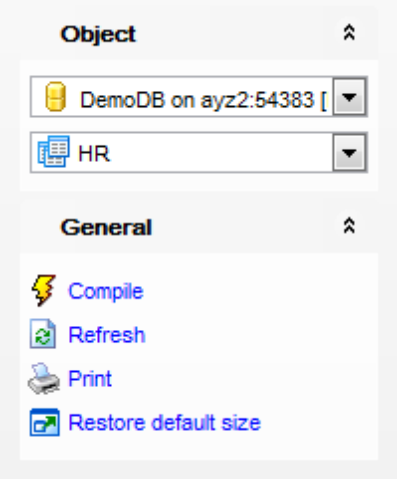
5.3.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Schema Editor**.



Object
select a database
select a schema for editing

General
compile[969] the schema (if it is being created/modified)
save the schema description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the schema
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the schema:

Description
save object description[966] to file
copy description[966] to clipboard

DDL
save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[87].

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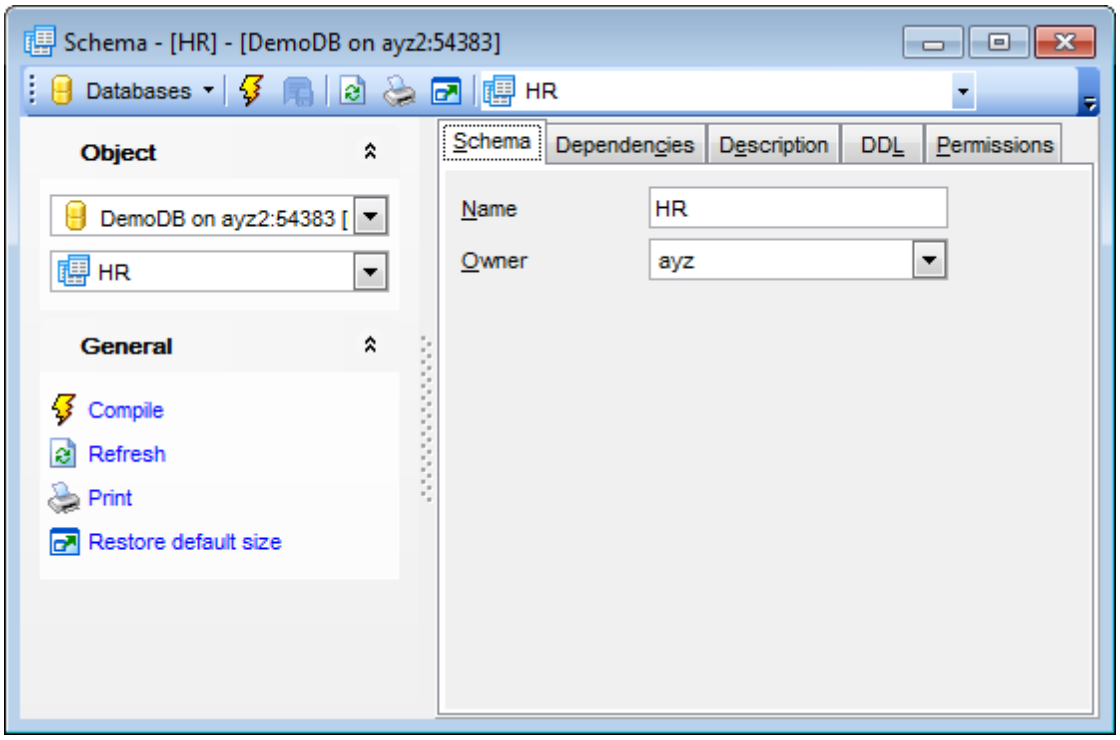
5.3.1.2 Creating/editing schema

Use the **Schema** tab of **Schema Editor** to create/edit a schema and specify its properties.



Name
Specify the name by which the schema is identified within the database.

Owner
Specify the name of the database-level principal (user[751] or role[754]) that will own the schema. This principal may own other schemas, and may not use the current schema as its default schema.

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5.4 Schema Objects

A **schema** is a collection of logical structures of data, or **schema objects**. A schema is owned by a database user. Each user can own a single schema. Schema objects can be created and manipulated with SQL and include the following types of objects:

- Tables 169
- Views 229
- Functions 239
- Procedures 254
- Domains 259
- Rules 264
- Sequences 274
- Base Types 278
- Composite Types 283
- ENUM Types 287
- Range Types 291
- Aggregates 295
- Operators 300
- Collations 305
- Statistics 309

Use the DB Explorer 65 tree to navigate 47 within the existing schemas and their objects.

See also:

Operations with database objects 70

New Object dialog 157

Duplicate Object Wizard 159

Schemas 164

Non-schema Objects 313

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5.4.1 Tables

Relational databases store all their data in **Tables**. A table is a data structure consisting of an unordered set of horizontal rows, each containing the same number of vertical columns. The intersection of an individual row and column is a field that contains a specific piece of information. Much of the power of relational databases comes from defining the relations among the tables.

Creating Tables

- select the **Database | New Object...** main menu 961 item;
- select **Table** in the Create New Object 157 dialog;
- define table properties and fields using the appropriate tabs of Table Editor 170.

Hint: To create a new table, you can also right-click the **Tables** node or any object within this node in the DB Explorer 65 tree and select the **New Table...** item from the context menu 57.

To create a new table with the same properties as one of existing tables has:

- select the **Database | Duplicate Object...** menu item;
- follow the instructions of Duplicate Object Wizard 159.

Alternatively, you can right-click a table in the DB Explorer 65 tree and select the **Duplicate Table <table_name>...** context menu item.

Duplicate Object Wizard 159 allows you to select the database to create a new table in, and to edit the result SQL statement for creating the table.

Editing Tables

To edit an existing table (manage its columns 205, indexes 187, data 194, etc.):

- select the table for editing in the DB Explorer 65 tree (type the first letters of the table name for quick search 78);
- right-click the object and select the **Edit Table <table_name>** context menu item, or simply double-click the table;
- edit table subobjects and data using the appropriate tabs of Table Editor 177.

To change the name of a table:

- select the table to rename in the DB Explorer 65 tree;
- right-click the table alias and select the **Rename Table <table_name>...** item from the context menu 57;
- edit the table name using the **Rename Object...** dialog.

Dropping Tables

- select the table to drop in the DB Explorer 65 tree;
- right-click the object and select the **Drop Table <table_name>...** context menu item;
- confirm dropping in the dialog window.

Note: If more convenient, you can also use the following shortcuts 1001:
Ctrl+N to create a new table;
Ctrl+O to edit the selected table;
Ctrl+R to rename the table;
Shift+Del to drop the object from the database.

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5.4.1.1 New table

The **New Table** window is a mode of Table Editor[177] that opens automatically when you create a new table (see Create table[169] for details) and allows you to create a new table, set table properties[172], specify table columns[175] and edit table description.

To call **Table Editor** for creating a new table, you can right-click the **Tables** node or any object within this node in the DB Explorer[65] tree and use the *Ctrl+N* shortcut[1001].

- Using Navigation bar and Toolbar[171]
- Setting table properties[172]
- Specifying table columns[175]

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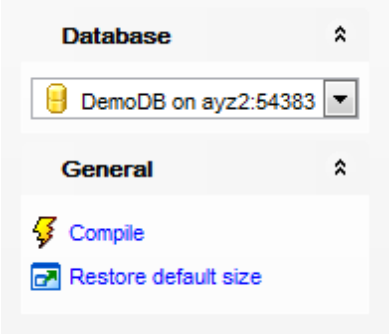
5.4.1.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Table Editor**.



Database
select a database to create a new table in

General
compile 969 the newly created table
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the table:

Columns
add 208 a new column
edit 208 selected column
drop 208 selected column(s)

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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5.4.1.1.2 Setting table properties

Use the **Table** tab of **Table Editor** to create a table and specify its properties.

Table name
Select a schema[164] and enter a name for the new table. Note that table names must comply with the rules for identifiers and must be unique within the schema[164]. A table name can contain a maximum of 128 characters.

Table type

- *Ordinary table*

Use this option to create an ordinary PosgreSQL table.

- *Foreign table*

Select this option to create a foreign table. Such tables allow data stored outside the database to be used like native PostgreSQL-stored data. From the drop-down list select the foreign server[325] to be used for the foreign table.
If the selected foreign server has the *'postgres_fdw'* as a data wrapper then the **Select Table** button becomes available.

- *Temporary table*

Select this option to create a temporary table. A temporary table will automatically be deleted if the connection dies and the name is valid per connection. This means that two different connections can both use the same temporary table name without conflicting with each other or with an existing table of the same name (the existing table is hidden until the temporary table is deleted).

Behavior on end of transaction

This group allows you to define the temporary table behavior at the end of a transaction block:

- *Preserve rows*
- *Delete rows*
- *Drop table*

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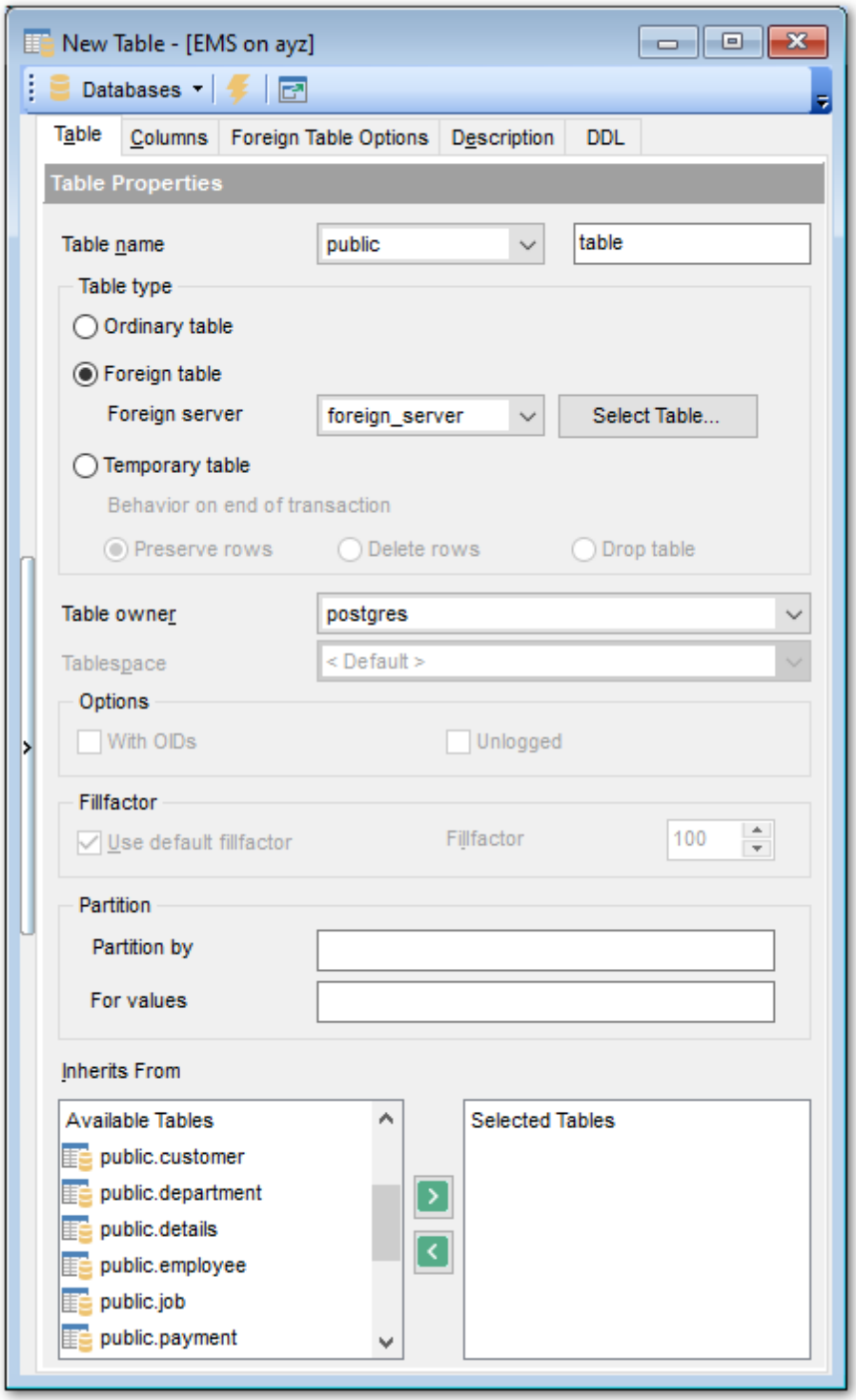

Table owner
Use the drop-down list to select the user[751] that will own the table being created.

Tablespace
Use the drop-down list to specify the new table data storage (a tablespace[318]).

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Options

With OIDs
This option specifies whether rows of the new table should have OIDs (object identifiers) assigned to them.

Unlogged
For PostgreSQL ver. 9.1 and above.
If specified, the table is created as an unlogged table. Data written to unlogged tables is not written to the write-ahead log, which makes them considerably faster than ordinary tables.
Note: An unlogged table is automatically truncated after a crash or unclean shutdown.

Fillfactor

The fillfactor for a table is a percentage between 10 and 100. 100 (complete packing) is the default. When a smaller fillfactor is specified, INSERT operations pack table pages only to the indicated percentage; the remaining space on each page is reserved for updating rows on that page. This gives UPDATE a chance to place the updated copy of a row on the same page as the original, which is more efficient than placing it on a different page. For a table whose entries are never updated, complete packing is the best choice, but in heavily updated tables smaller fillfactors are appropriate.

Use default fillfactor.
Check this option to set fillfactor value to 100.

Fillfactor
Specify the custom fillfactor value in this field.
Note: To set this value you need to uncheck **Use default fillfactor** option.

Partition

Partition by
Select the column to set a partition key.

For values
Set the range of partition table values.

Inherits from
This area allows you to define the table(s) to inherit properties from. Use of inheritance creates a persistent relationship between the new child table and its parent table(s). Schema modifications to the parent(s) normally propagate to children as well, and by default the data of the child table is included in scans of the parent(s).
To select a table, you need to move it from the **Available Tables** list to the **Selected Tables** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.

The following icons distinguish inherited tables in Database Explorer 65:
- means that there is a table inherited from this table
- means that the table is inherited from another one
- means that the table is inherited from a table and there is another table inherited from this table

To compile the table, use the **Compile** item available within the Navigation bar 171.

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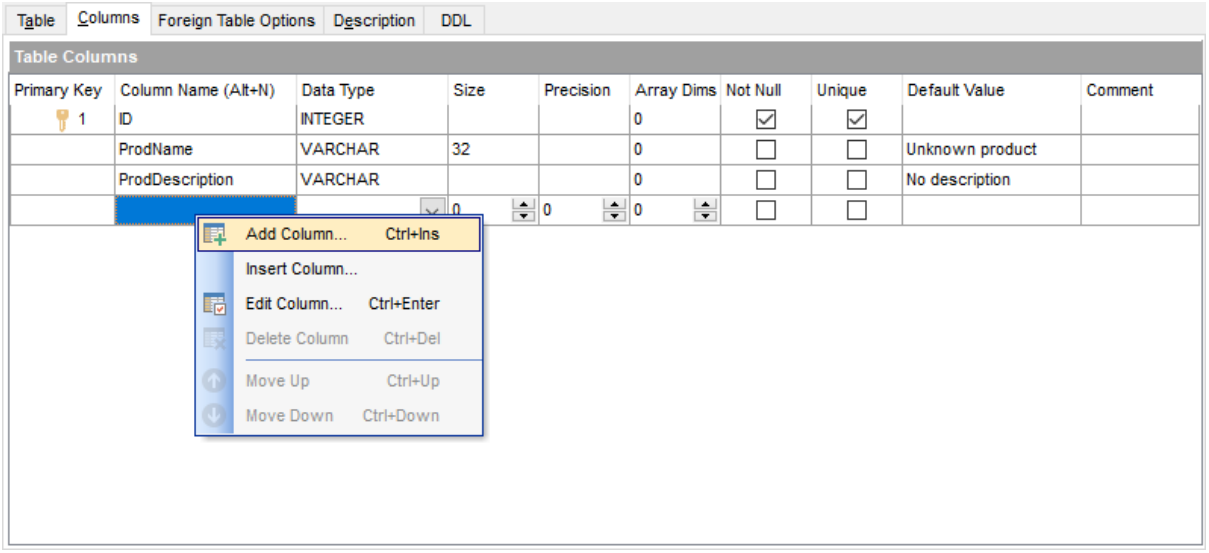
5.4.1.1.3 Specifying columns

The **Columns** tab is intended for setting up table columns[208]. Double-click a column to open Column Editor[209] for editing the column.

Right-click within the **Table Columns** area to display the context menu allowing you to *add*, *insert*, *edit* or *delete* columns.

Columns management tools are also available through the Navigation bar[171] and toolbar[171] of **Table Editor**.



The **Columns** list provides the following attributes of each column of the new table:
Primary Key
Column Name
Data Type
Size
Precision
Array Dims
Not Null
Unique
Default Value
Comment

For details see columns[208].

To compile the table, use the **Compile** item available within the Navigation bar[171] or toolbar[171].

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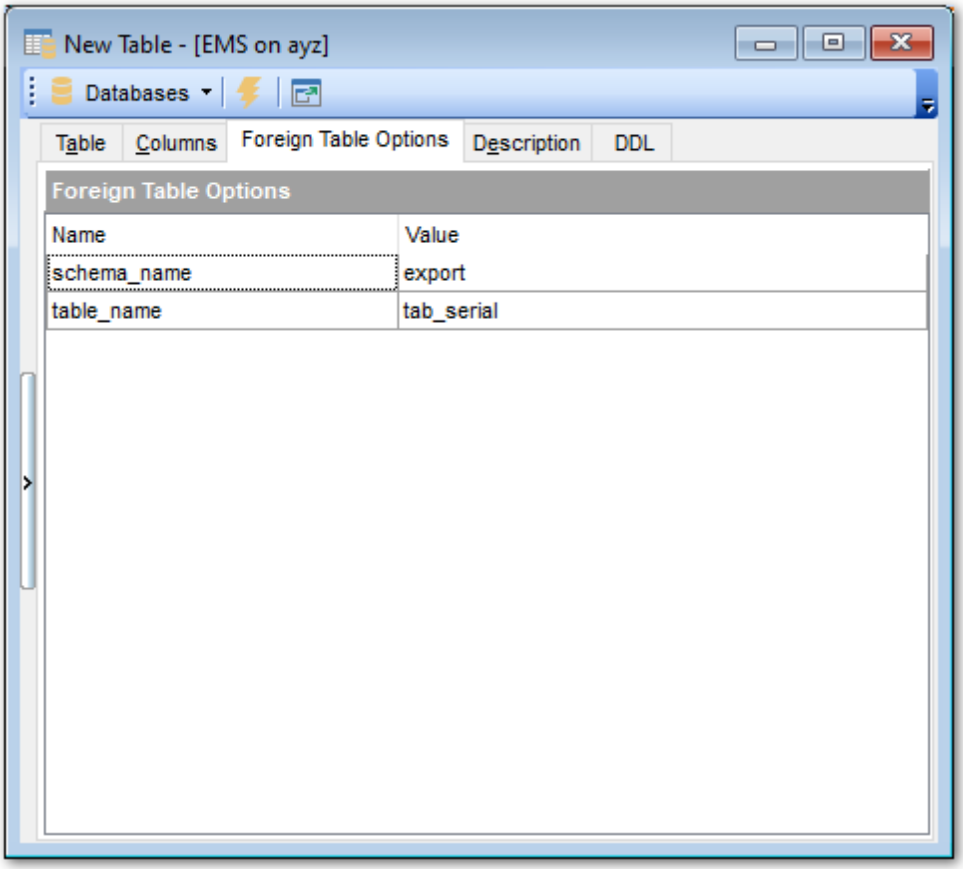
5.4.1.1.4 Foreign table options

Use this tab to define options to be associated with the new foreign table or one of its columns. This tab is available for editing if the *Foreign table* is selected on the Table 172 tab.



To add and delete options use the **New Option** and **Delete Option(s)** context menu items.
The allowed option names and values are specific to each foreign data wrapper and are validated using the foreign-data wrapper's validator function. Duplicate option names are not allowed (although it's OK for a table option and a column option to have the same name).

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5.4.1.2 Table Editor

Table Editor is the basic SQL Manager tool for working with tables[169]. It opens automatically in the New table[170] mode when you create a new table and is available on editing an existing one (see Create table[169] and Edit table[169] for details).

Table Editor allows you to create, edit and drop table's columns[208], indexes[219], foreign keys[212] and other table subobjects, manage table data[194], properties[191] and much more.

To open a table in **Table Editor**, double-click it in the DB Explorer[65] tree.

- Using Navigation bar and Toolbar[178]
- Managing table columns[181]
- Changing columns order[183]
- Managing table foreign keys[185]
- Managing table checks[186]
- Managing table indexes[187]
- Managing table triggers[189]
- Managing rules[190]
- Managing policies[193]
- Browsing object dependencies[967]
- Working with table data[194]
- Editing table description[966]
- Viewing DDL definition[965]
- Setting object permissions[968]
- Table properties[191]

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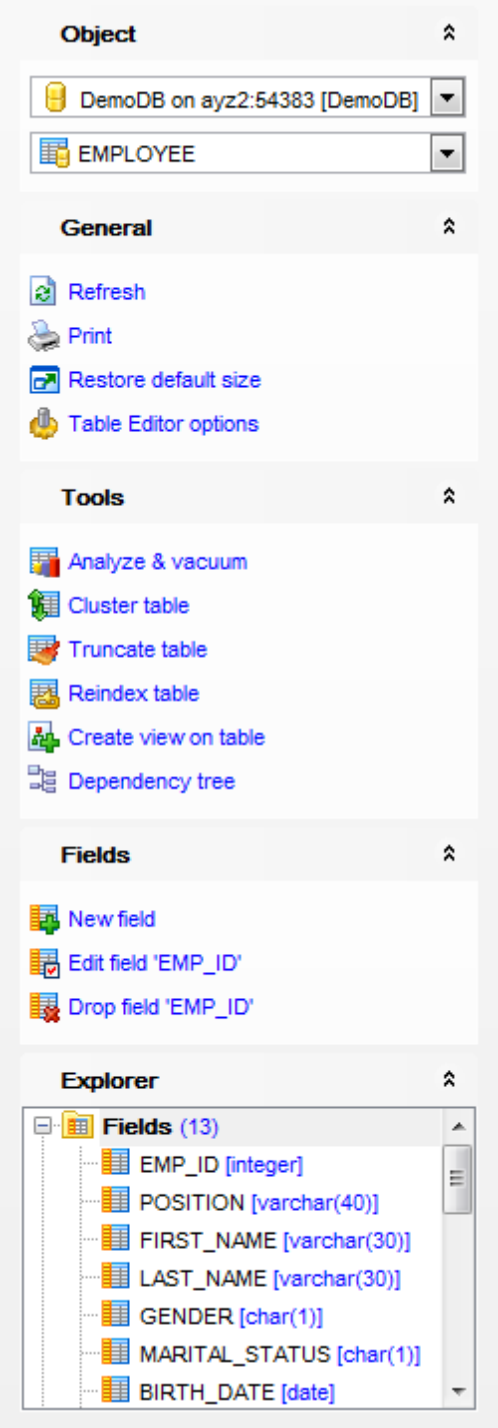
5.4.1.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Table Editor**.



Object

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select a database
select a table for editing

General

save the table description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the table
adjust Table Editor options 886
restore the default size and position of the editor window

Tools

analyze and vacuum 197 the table
cluster 201 the table indexes
truncate 205 data of the table
reindex 206 the table indexes
create a view 229 based on the table
view the dependency tree 638 for the table

Explorer

browse the table subobjects using the Explorer tree

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the table:

Columns

add 208 a new column
edit 208 selected column
drop 208 selected column(s)

Foreign keys

add 212 a new foreign key
edit 212 selected foreign key
drop 212 selected foreign key(s)

Checks

add 216 a new check
edit 216 selected check
drop 216 selected check(s)

Indices

add 219 a new index
edit 219 selected index
drop 219 selected index(-es)

Triggers

add a new trigger
edit selected trigger
drop selected trigger(s)

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Rules
add a new rule
edit selected rule
drop selected rule(s)

Policies
add a new policy
edit selected policy
drop selected policy(s)

Data Management
commit transaction
rollback transaction
Note: These actions are available if the **Use transactions in object editors, Query Data and Design Query** option is checked in the Database Registration Info | Data options 124 dialog.
export data from the table using Export Data Wizard 536
export data from the table as SQL script using Export as SQL Script Wizard 608
import data into the table using Import Data Wizard 582
save data 617
load data 626

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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5.4.1.2.2 Managing columns

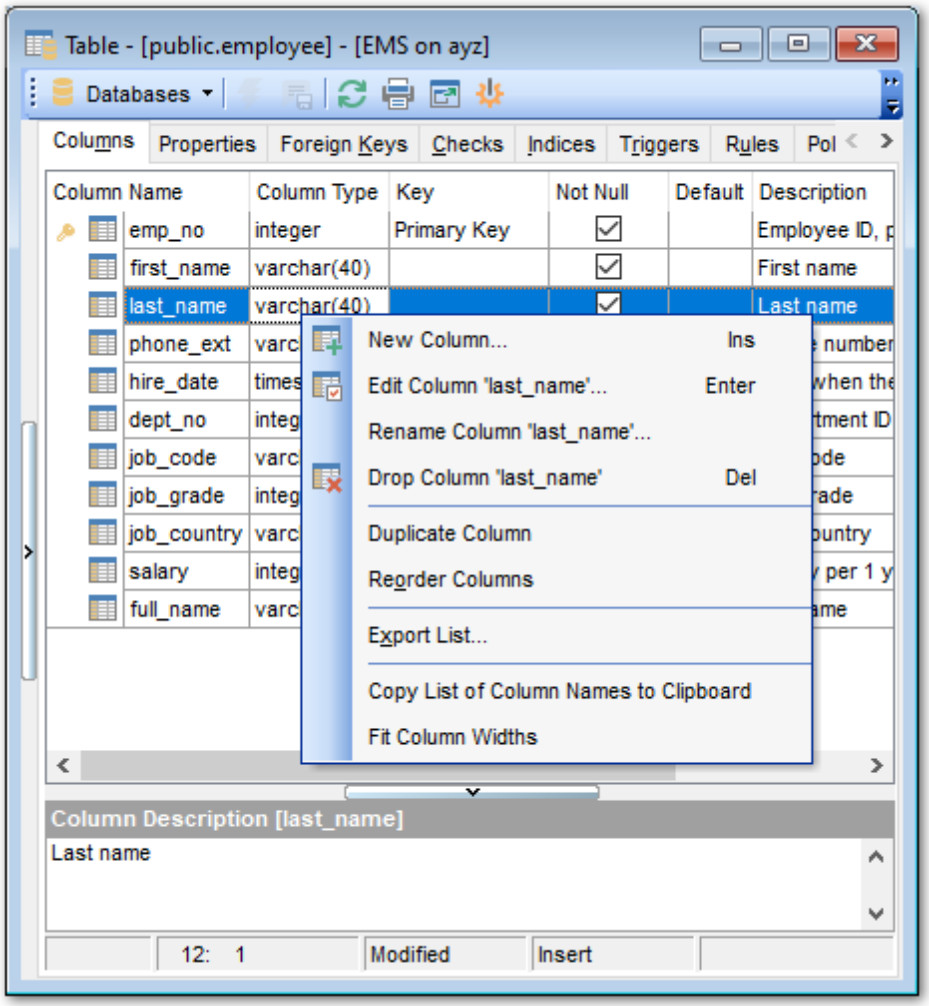
The **Columns** tab is intended for managing table columns[208].

Hint: This tab is selected by default upon opening **Table Editor** if the *Always open the first tab* option is enabled on the Tools | Object Editors[886] page of the Environment Options[871] dialog.

Double-click a column to open Column Editor[209] for editing the column.

Right-click a column to display the context menu allowing you to *create* new, *edit*, *drop*, *rename*, *duplicate* the selected column, or reorder[183] columns of the table. Using the menu you can also copy to clipboard or export[536] the list of the table columns to any of supported formats[983].

Columns management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Columns** list provides the following attributes of each column of the table:

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Column Name
Column Type
Key
Not Null
Default
Description

For details see Columns 208.

If necessary, you can also use the **Column Description** area to supply a *description* for each column.

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5.4.1.2.3 Changing columns order

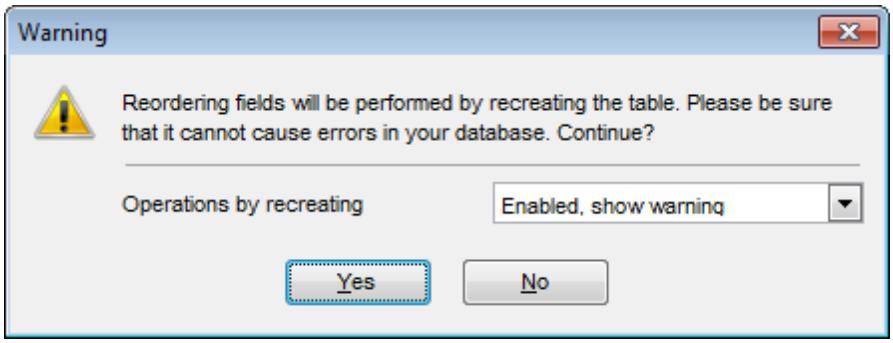
The **Reorder Columns** dialog allows you to change the columns order in the table.

To open this dialog, open the table in **Table Editor**, proceed to the Columns 181 tab there, right-click within the **Columns** list and select the **Reorder Columns** item from the context menu.

NB: Since PostgreSQL server does not have a native command for reordering table columns, this operation is implemented in SQL Manager for PostgreSQL by generating the script according to which the data of the original table are copied into a temporary table, then the original table is dropped, and a new table with the same name but having the newly specified order of columns is created, and afterwards all the data are copied from the temporary table into the new one.
Nevertheless such script cannot be executed in some cases. If a table is referenced by another table (e.g. there is a Foreign Key 212 constraint) or is a base table for a view 229, the **Reorder Columns** operation cannot be performed. It is recommended to drop Foreign Keys before column reordering, and create them again after the reordering operation is completed.

By default, before the **Reorder Columns** dialog is opened, a warning window is displayed. Use the **Operations by recreating** drop-down list to specify whether the **Reorder Columns** operation will be available after the current operation is performed:
Enabled - such operation will be performed without warnings;
Enabled, show warning - the warning window will appear if the operation requires table recreation;
Disabled - denies operations of this type.

Note: You can change this value any time using the **Table altering operations performed via recreation** drop-down list available on the Confirmations 875 page of the Environment Options 871 dialog.



The columns are displayed in the **Column name** list in the current order.

To change the columns order, use the buttons or drag-and-drop operations within the list. Click the **OK** button to view the modification script in the Changing Metadata 969 window and apply changes.

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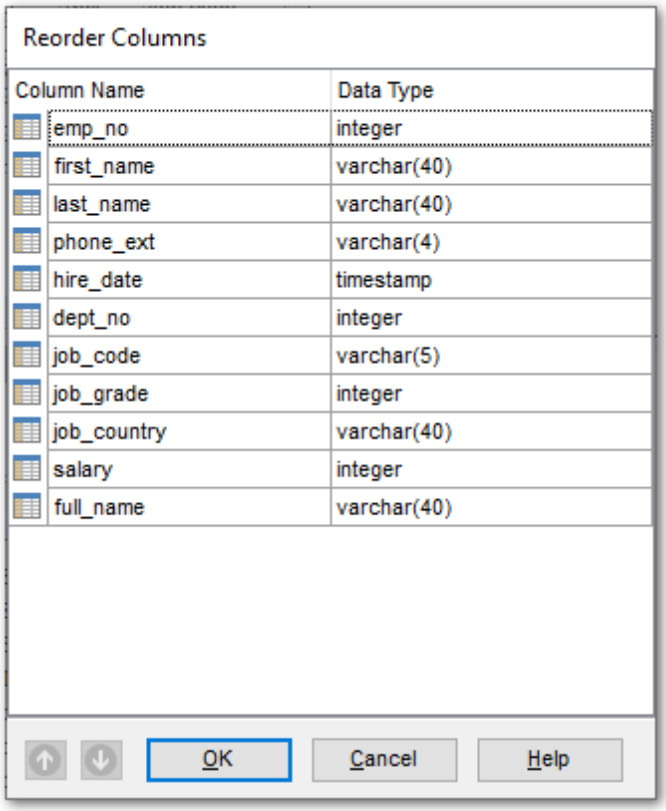

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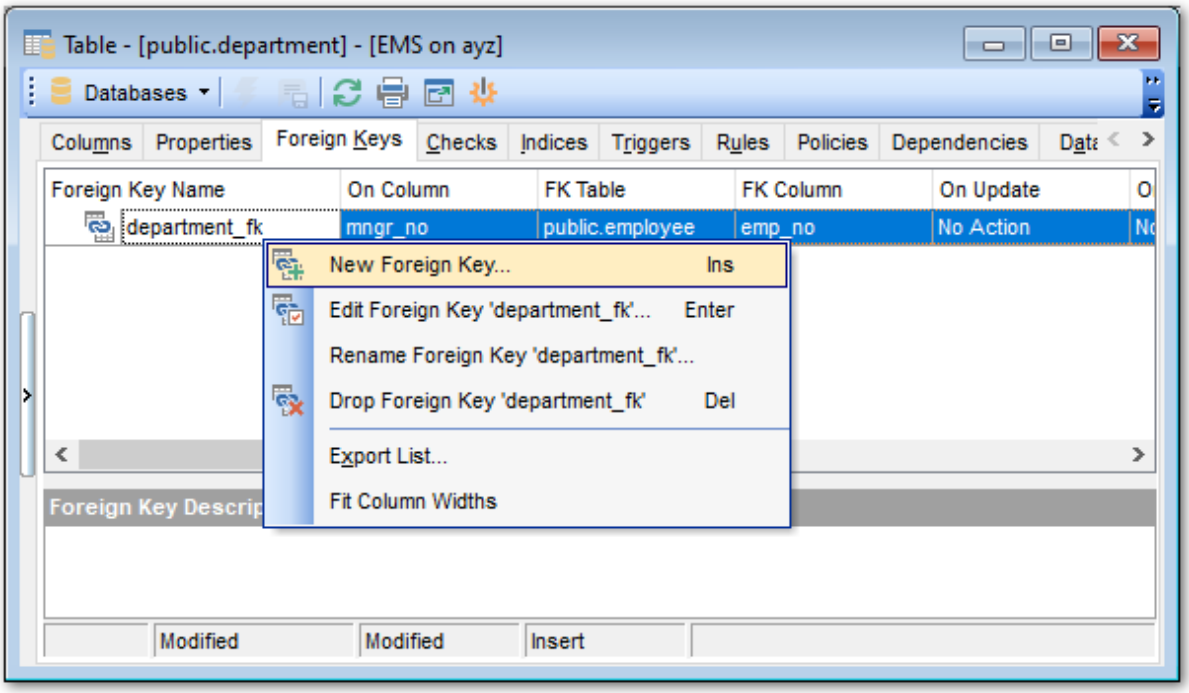
5.4.1.2.4 Managing foreign keys

The **Foreign Keys** tab is provided for managing table foreign keys[212]. Double-click a foreign key to open Foreign Key Editor[213] for editing the foreign key.

Right-click a foreign key to display the context menu allowing you to *create* new, *edit*, *drop* a foreign key. Using the menu you can also export[536] the list of the table foreign keys to any of supported formats[983].

Foreign keys management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Foreign Keys** list provides the following attributes of each foreign key of the table:
Foreign Key Name
On Column
FK Table
FK Column
On Update
On Delete
Deferrable
Check Time
Description

For details see Foreign Keys[212].

If necessary, you can also use the **Foreign Key Description** area to supply a *description* for each foreign key.

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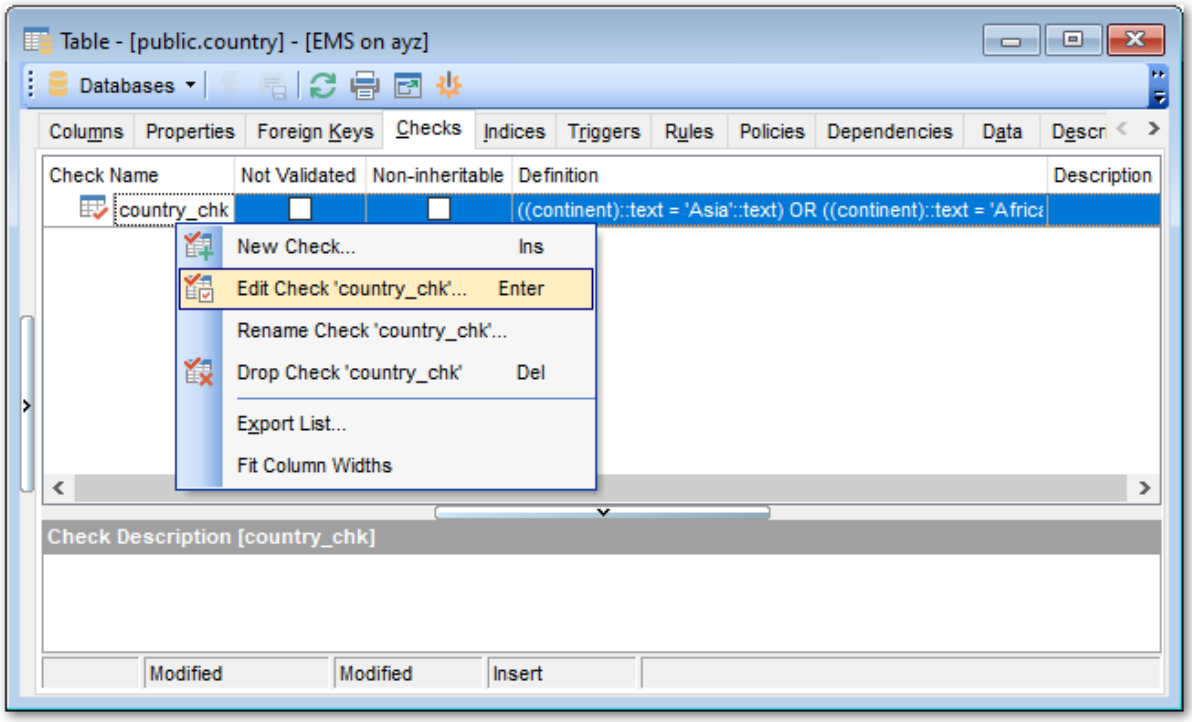
5.4.1.2.5 Managing checks

The **Checks** tab is provided for managing table check constraints[216]. Double-click a check to open Check Editor[217] for editing the check.

Right-click a check to display the context menu allowing you to *create* new, *edit*, *drop* the selected check. Using the menu you can also export[536] the list of the table checks to any of supported formats[983].

Check constraints management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Checks** list provides the following attributes of each check constraint of the table:
Check Name
Definition
Description

For details see Checks[216].

If necessary, you can also use the **Check Description** area to supply a *description* for each check constraint.

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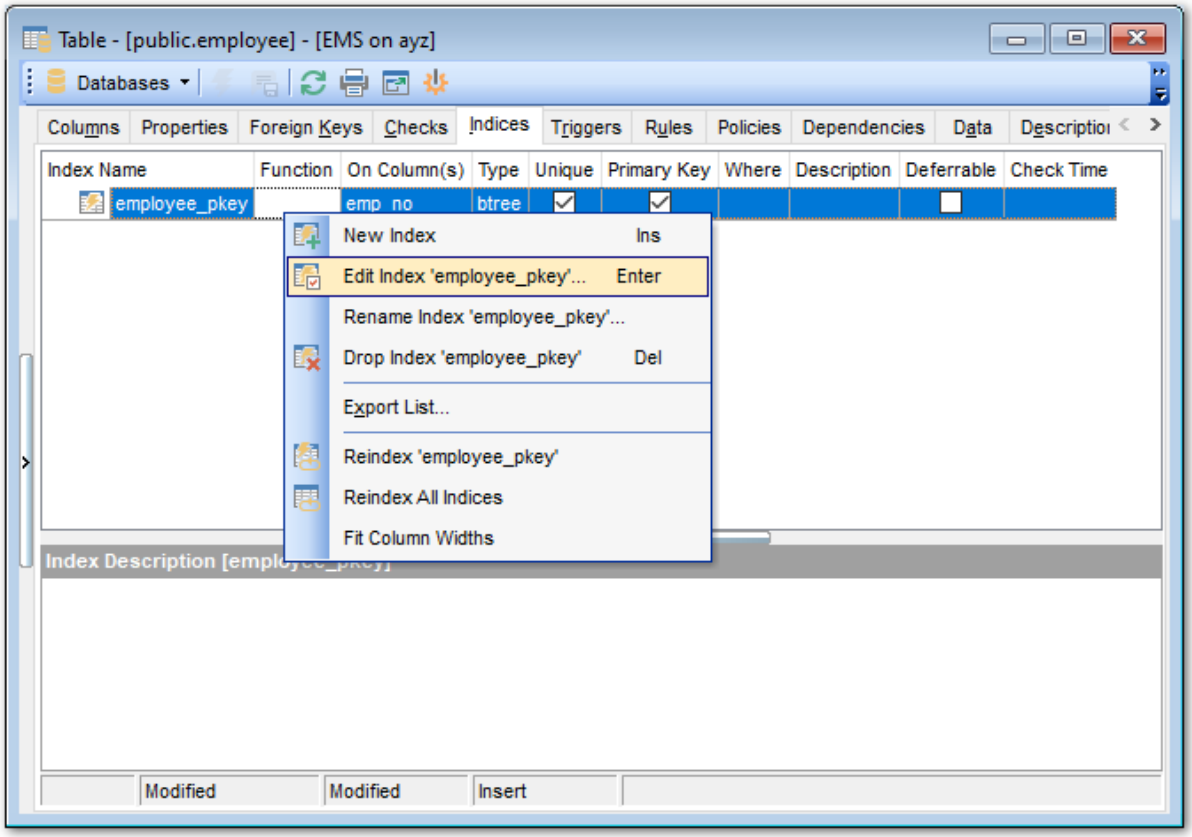
5.4.1.2.6 Managing indexes

The **Indices** tab is provided for managing table indexes[219]. Double-click an index to open Index Editor[220] for editing the index.

Right-click an index to display the context menu allowing you to *create* new, *edit*, *drop*, *reindex* the selected index, or *reindex all* indexes. Using the menu you can also export[536] the list of the table indexes to any of supported formats[983].

Indexes management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Indexes** list provides the following attributes of each index of the table:
Index Name
Function
On Column(s)
Type
Unique
Primary Key
Where
Description

For details see Indexes[219].

If necessary, you can also use the **Index Description** area to supply a *description* for each index.

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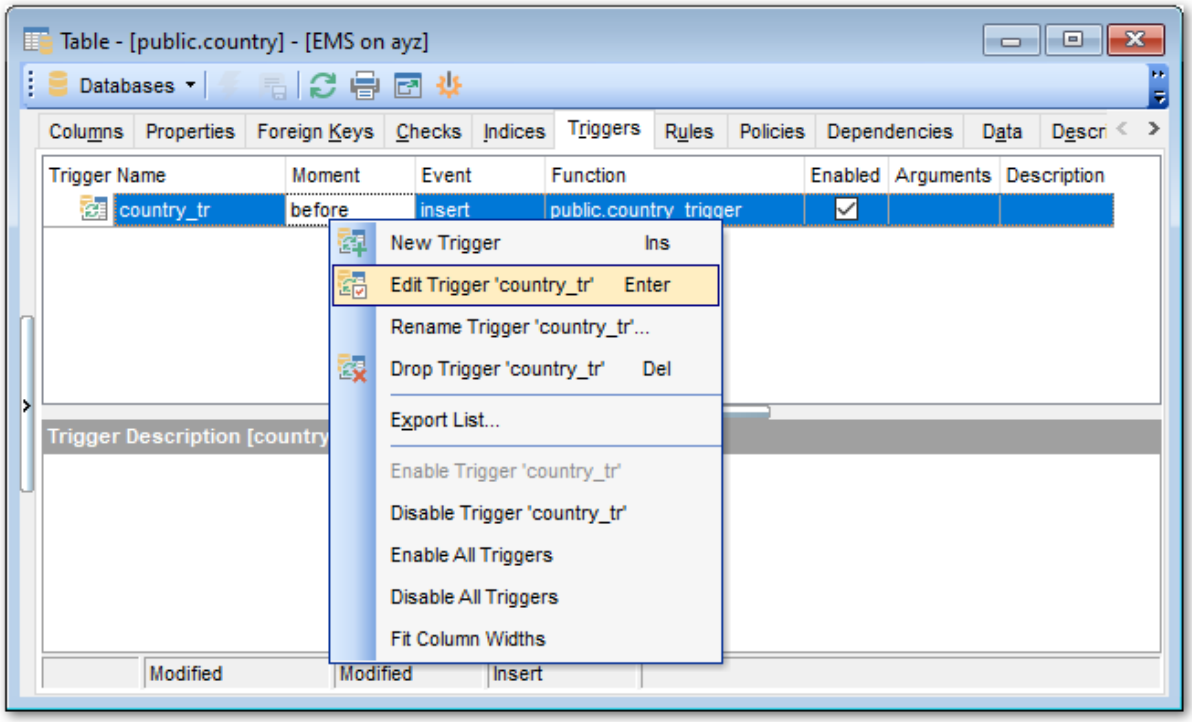
5.4.1.2.7 Managing triggers

The **Triggers** tab is provided for managing table triggers[268]. Double-click a trigger to open Trigger Editor[268] for editing the trigger.

Right-click the area to display the context menu allowing you to *create* new, *edit*, *drop*, *enable/disable* the selected trigger, or *enable/disable* all triggers. Using the menu you can also export[536] the list of the table triggers to any of supported formats[983].

Triggers management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Triggers** list provides the following attributes of each trigger of the table:
Trigger Name
Moment
Event
Function
Disabled
Arguments

For details see Triggers[268].

If necessary, you can also use the **Trigger Description** area to supply a *description* for each trigger.

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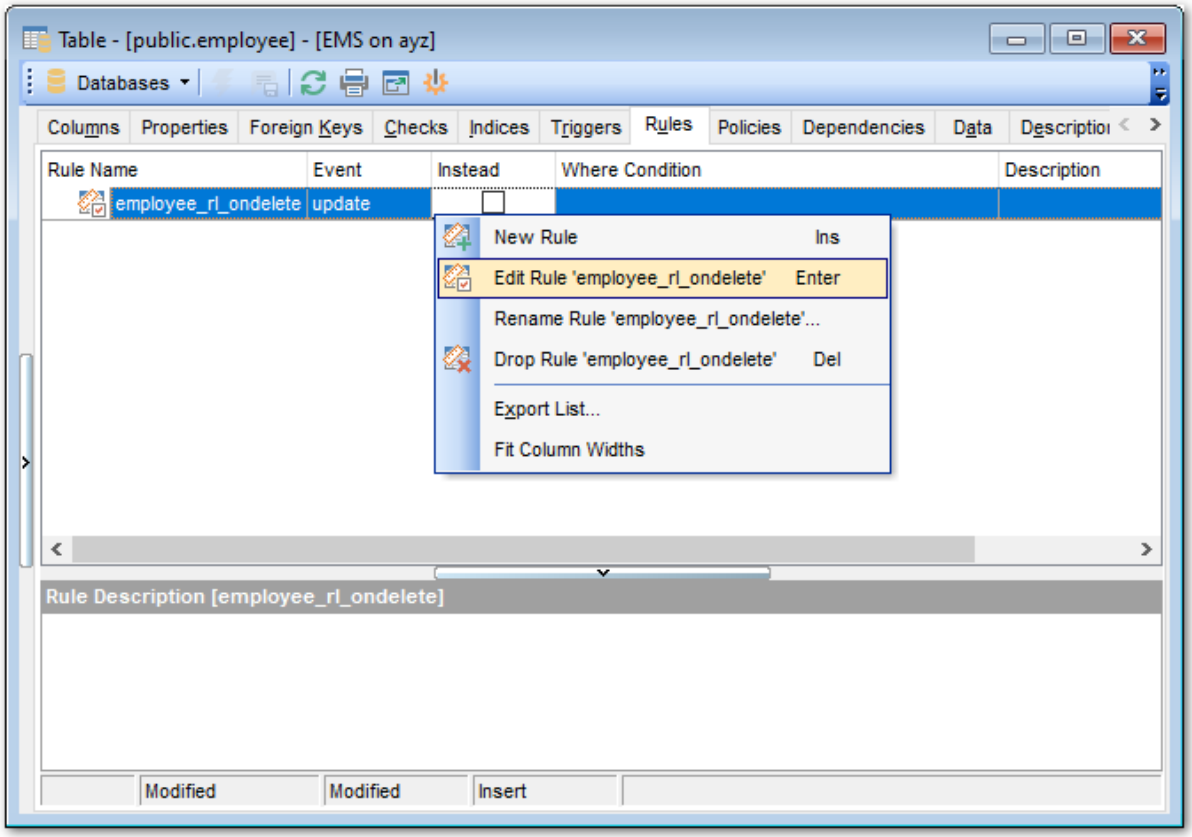
5.4.1.2.8 Managing rules

The **Rules** tab is provided for managing table rules[264]. Double-click a rule to open Rule Editor[264] for editing the rule.

Right-click the area to display the context menu allowing you to *create* new, *edit*, *drop* the selected rule. Using the menu you can also export[536] the list of the table rules to any of supported formats[983].

Rules management tools are also available through the Navigation bar[178] and toolbar[178] of **Table Editor**.



The **Rules** list provides the following attributes of each rule of the table:
Rule Name
Event
Instead
WHERE Condition
Description

See Rules[264] for details.

If necessary, you can also use the **Rule Description** area to supply a *description* for each rule.

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5.4.1.2.9 Table properties

The **Properties** tab allows you to view/edit common properties of the table: *Table name*, *Schema name*, *Table options* (*Storage attributes*, *Table lock usage*, etc.), *Table information*.

Hint: These properties are also available within a modal dialog which is called through the **Table Properties...** context menu item of the table alias in DB Explorer 65.

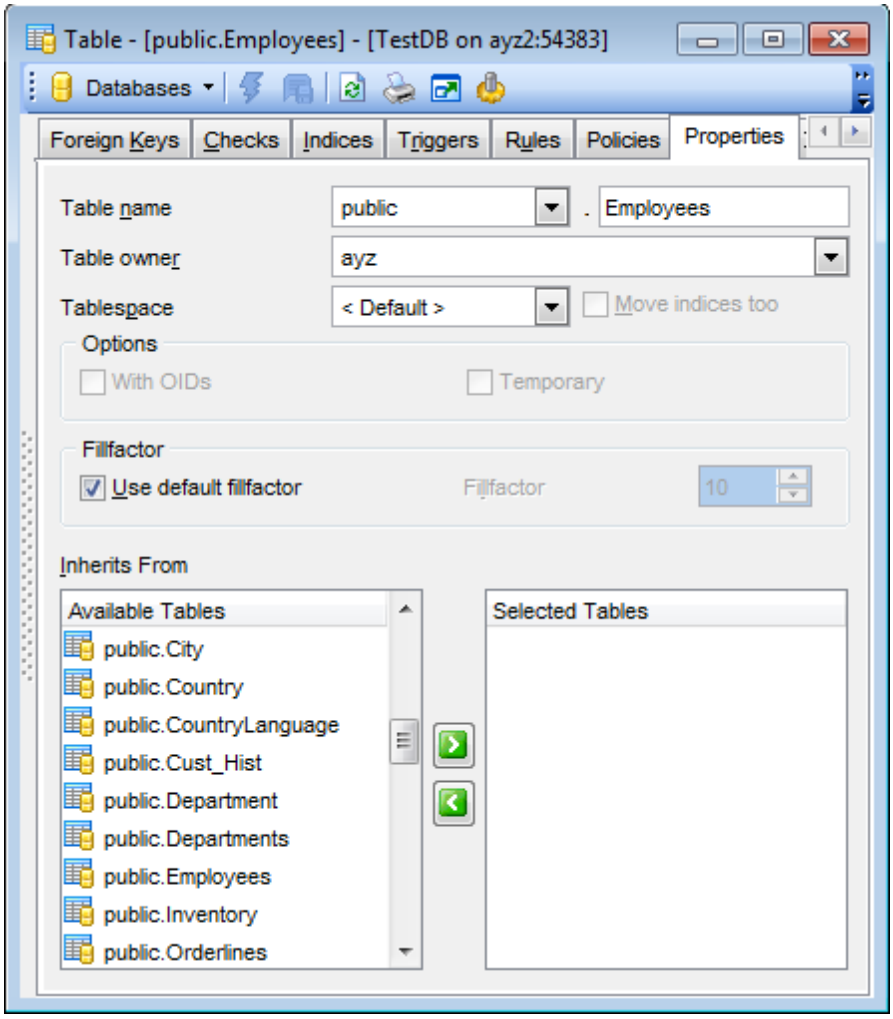

Table name
Select a schema 164 and edit the name of the table. Note that table names must comply with the rules for identifiers. The name of the table must be unique within the schema. A table name can contain a maximum of 128 characters.

Table owner
Use the drop-down list to select the user 751 that will own the table being created.

Tablespace
Use the drop-down list to specify the new table data storage (a tablespace 318). Check the **Move indices too** option if you prefer the table indices stored in the specified tablespace.

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Options
This group allows you to specify the *With OIDs*, and *Temporary* options.

With OIDs
This option specifies whether rows of the new table should have OIDs (object identifiers) assigned to them.

Unlogged
For PostgreSQL ver. 9.1 and above.
If specified, the table is created as an unlogged table. Data written to unlogged tables is not written to the write-ahead log, which makes them considerably faster than ordinary tables.
Note: An unlogged table is automatically truncated after a crash or unclean shutdown.

Temporary
Check this option to create a temporary table. A temporary table will automatically be deleted if the connection dies and the name is valid per connection. This means that two different connections can both use the same temporary table name without conflicting with each other or with an existing table of the same name (the existing table is hidden until the temporary table is deleted).

Inherits from
This area allows you to define the table(s) to inherit properties from. Use of inheritance creates a persistent relationship between the new child table and its parent table(s). Schema modifications to the parent(s) normally propagate to children as well, and by default the data of the child table is included in scans of the parent(s).
To select a table, you need to move it from the **Available Tables** list to the **Selected Tables** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.

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5.4.1.2.10 Managing policies

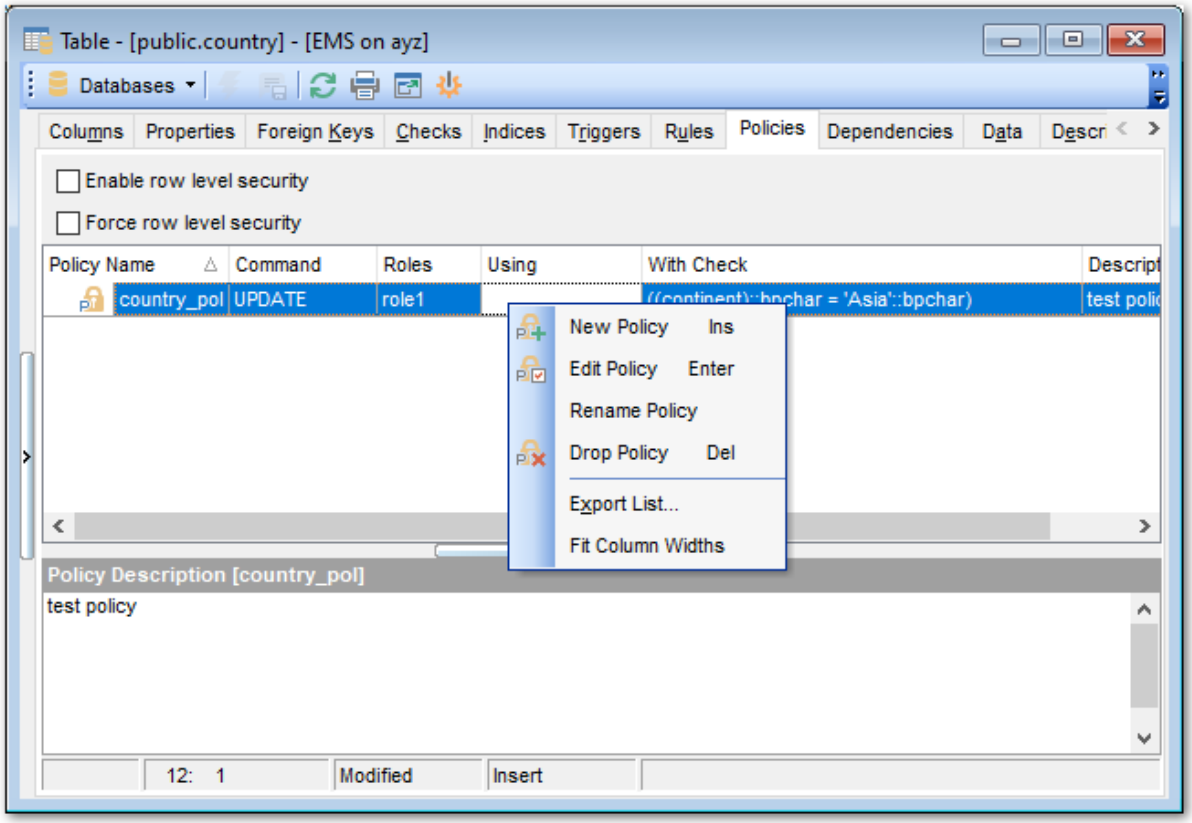
The **Policies** tab is provided for managing table policies.

Enable row level security
Enables row security on a table. включить

Force row level security
Enables row level security for table owner.

Right-click the area to display the context menu allowing you to *create* new, *edit*, *rename* or *drop* the selected policy. Using the menu you can also export 536 the list of the table policies to any of supported formats 983. Double-click a policy to open editor 226 for editing the policy.

Policy management tools are also available through the Navigation bar 178 and toolbar 178 of **Table Editor**.



See the Policy editor 226 to edit policy properties.

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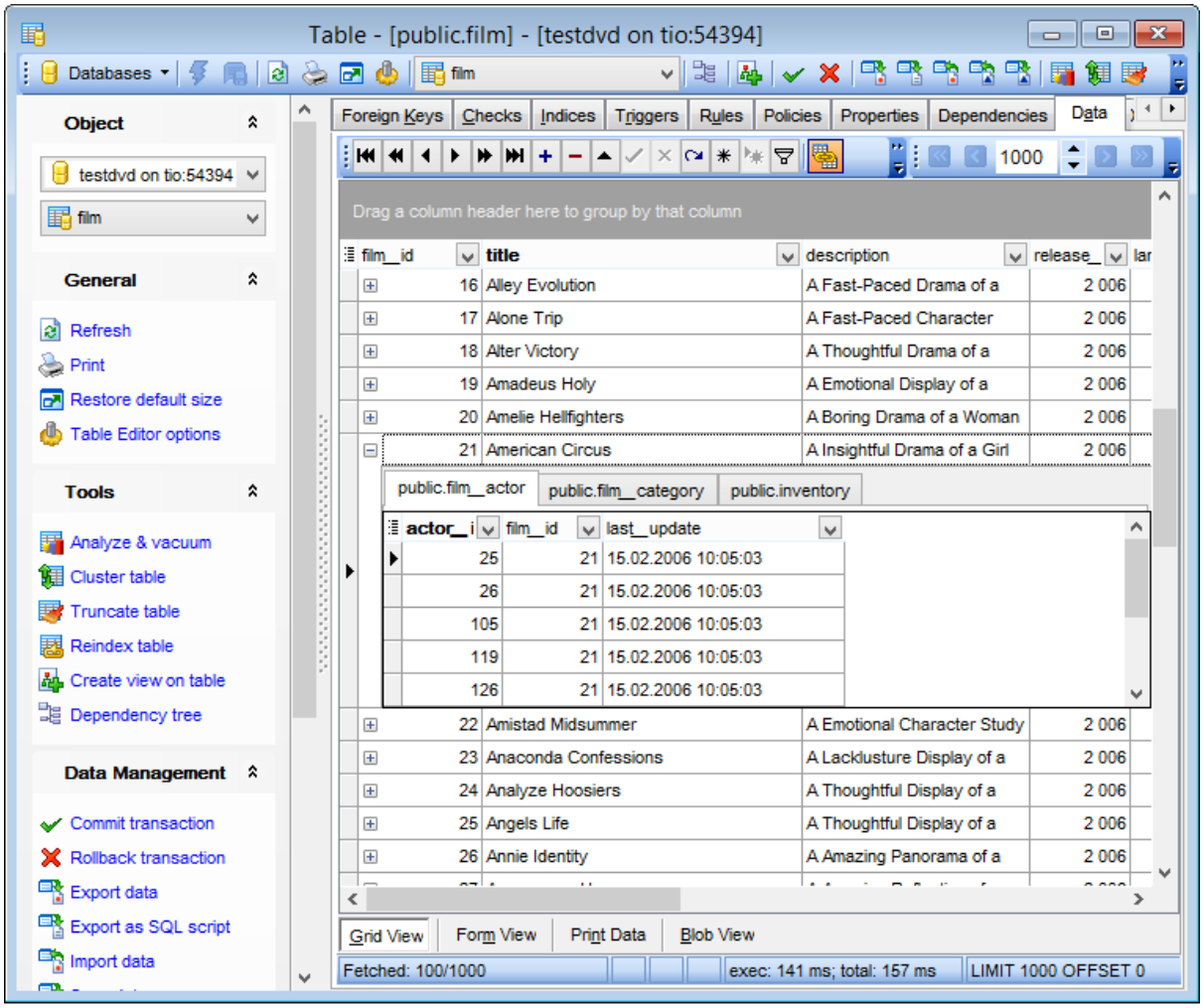
5.4.1.2.11 Working with table data

The **Data** tab displays the table data as a grid by default (see Data View 453 for details). The context menu of this tab allows you to Export Data 536, Import Data 582, Export as SQL Script 608, Save Data 617, Load Data 626.

Data management 452 tools are also available through the Navigation bar 178 and toolbar 178 of **Table Editor**.

While working with data, you are provided with a number of filtering 463 and grouping 460 facilities.
If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.



See also:
Working with view data 237
Data View 453

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5.4.1.3 Table Services

SQL Manager for PostgreSQL provides a number of powerful tools that allow you to perform various operations over your tables.
The following *table services* are available in SQL Manager for PostgreSQL:

Analyze & Vacuum Table 197
Collects statistics about the contents of tables in the database.

Cluster Table 201
Allows you to cluster a table on its indexes 219 (with PostgreSQL routines used).

Truncate Table 205
Allows you to truncate a table, i.e. delete all records from the table.

Reindex Table 206
Allows you to rebuild corrupted indexes.

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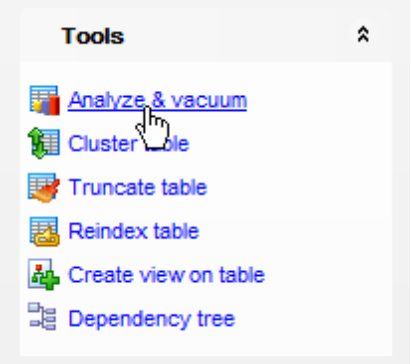
5.4.1.3.1 Analyze & Vacuum Table

Analyze & Vacuum Table Wizard collects statistics about the table contents, and reclaims storage occupied by deleted tuples (optionally). These operations can also be performed for multiple tables with the help of Analyze Tables 773 and Vacuum Tables 777 wizards.

To run the wizard, use the **Analyze & vacuum** item of the Navigation bar 178 (or toolbar 178) in Table Editor 177, or right-click the table alias in the DB Explorer 65 tree and select the **Tasks | Analyze & Vacuum Table...** item from the context menu 57.

- Setting analyze parameters 197
- Selecting columns to analyze 198
- Running analyze & vacuum service 199
- Using templates 982



Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Cluster Table 201
Truncate Table 205
Reindex Table 206

5.4.1.3.1.1 Setting analyze parameters

This step of the wizard allows you to specify basic analyze *parameters* to be applied to the operation.

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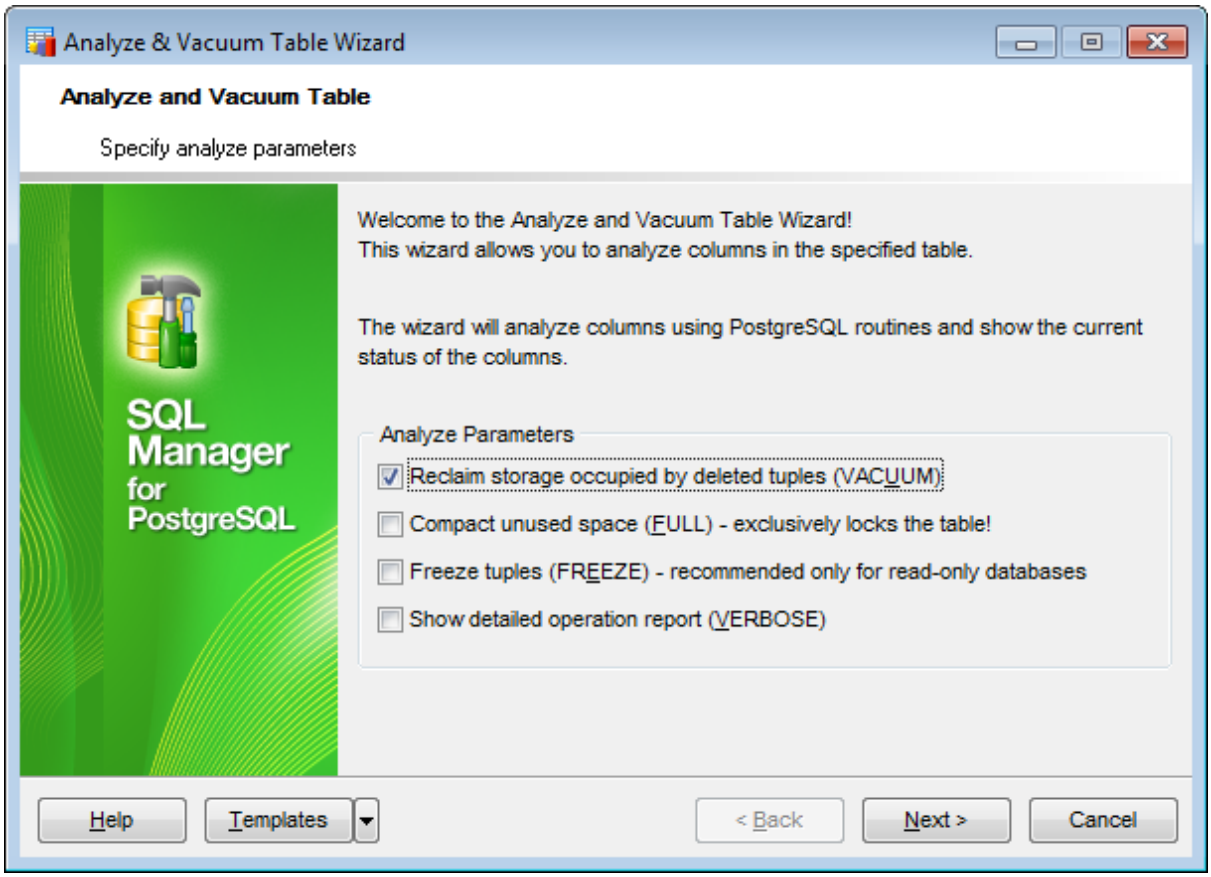

Reclaim storage occupied by deleted tuples
In normal PostgreSQL operation, tuples that are deleted or obsolete due to an update are not physically removed from their table and therefore remain present. Select this option to perform the *VACUUM* operation that reclaims storage occupied by deleted and obsolete tuples.

Compact unused space
This option specifies "full" vacuum which may reclaim more space, but takes much longer and exclusively locks the table (*FULL*).

Freeze tuples
This option enforces "freezing" of tuples (*FREEZE*). The option is recommended for read-only databases.

Show detailed operation report
Check this option to receive a detailed vacuum activity report for the table (*VERBOSE*).

Click the **Next** button to proceed to the Selecting columns to analyze 198 step of the wizard.

5.4.1.3.1.2 Selecting columns to analyze

Use this step of the wizard to *select the columns* to be analyzed using PostgreSQL routines.

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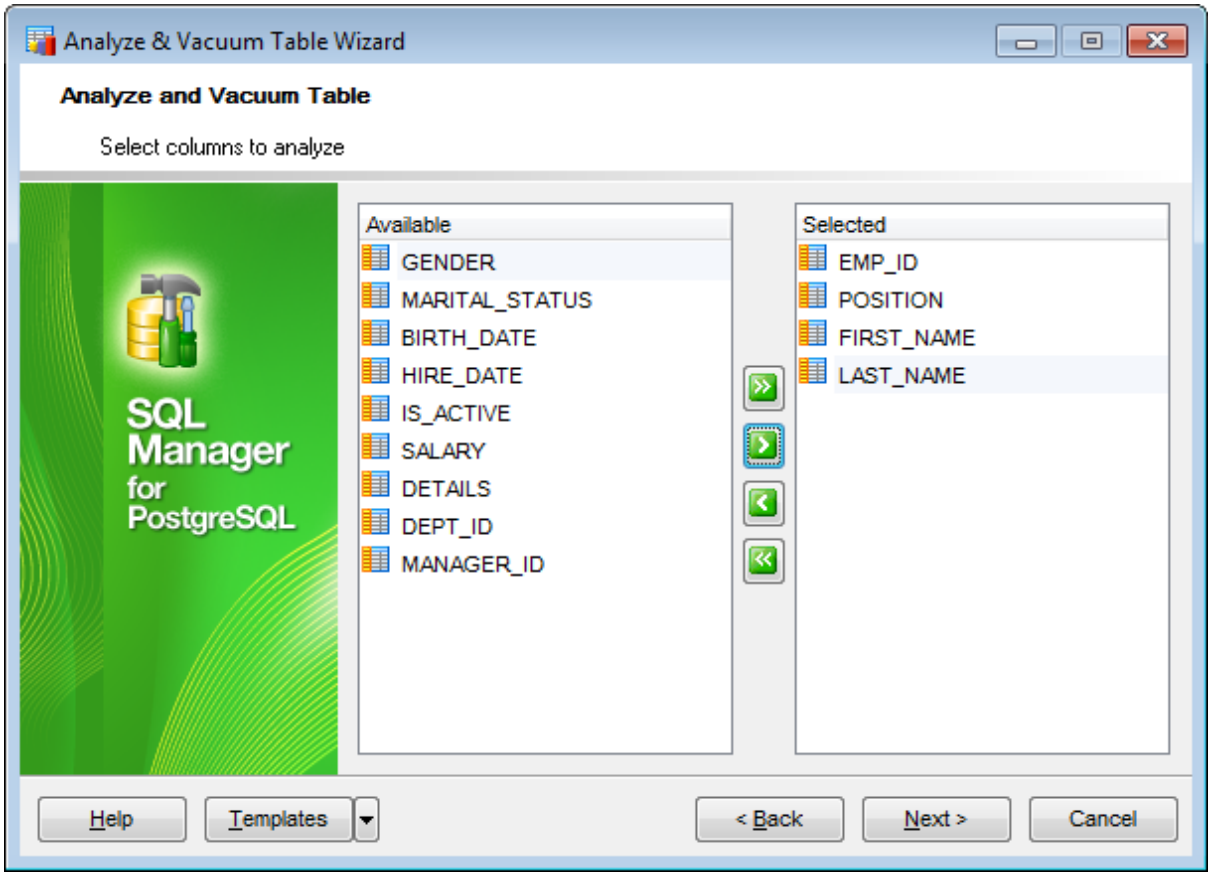
To select a column, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.



When you are done, click the **Next** button to proceed to the Running service[199] step of the wizard.

5.4.1.3.1.3 Running service

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the analyze and vacuum table process.

The **Operations** tab allows you to view the log of operations and errors (if any).

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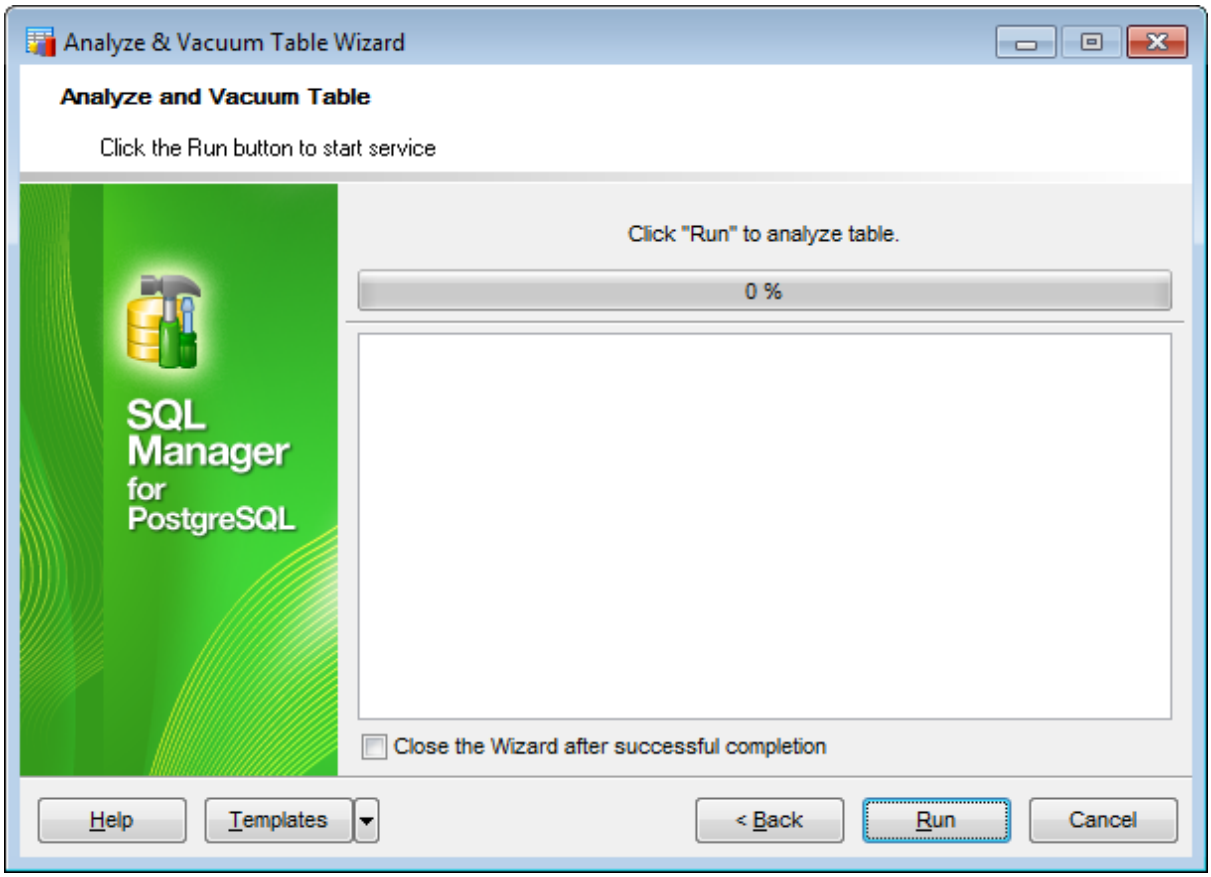

Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to complete the operation.

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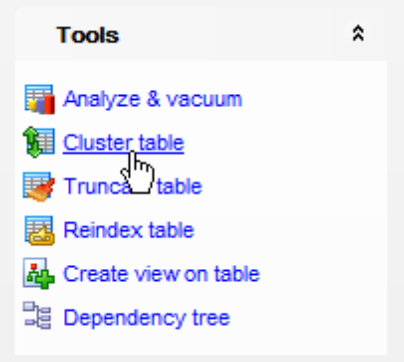
5.4.1.3.2 Cluster Table

Cluster Table Wizard allows you to cluster a table on its indexes 219 (with PostgreSQL routines used).

To run the wizard, use the **Cluster table** item of the Navigation bar 178 (or toolbar 178) in Table Editor 177, or right-click the table alias in the DB Explorer 65 tree and select the **Tasks | Cluster Table...** item from the context menu 57.

- Selecting index for clustering 201
- Running service 203
- Using templates 982



Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Analyze & Vacuum Table 197
Truncate Table 205
Reindex Table 206

5.4.1.3.2.1 Selecting index for clustering

The first step informs you about the operations that will be performed by the wizard.

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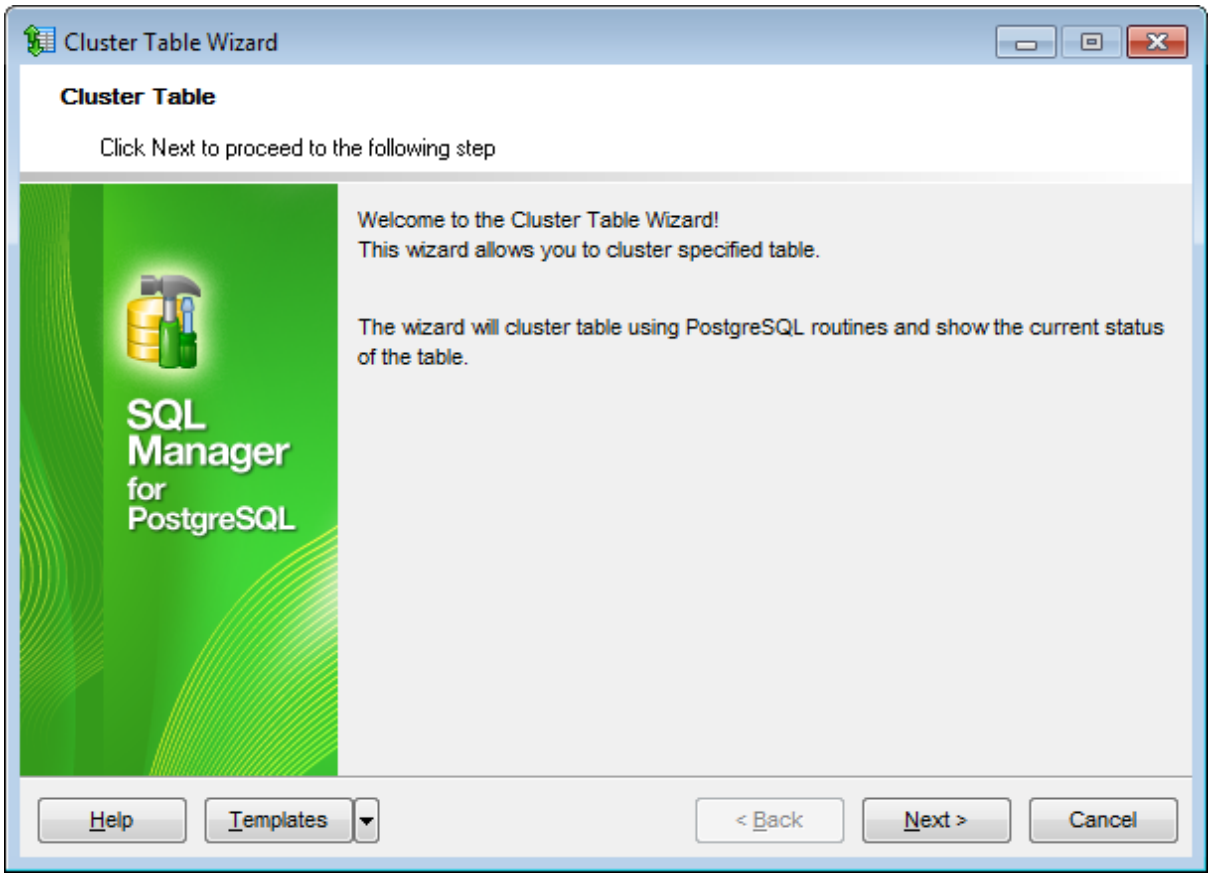

Click the **Next** button to proceed to the **Selecting index for clustering** step of the wizard.

The **Selecting index for clustering** step lists table indexes. If the table was clustered previously, the index used for that clustering operation is selected by default.

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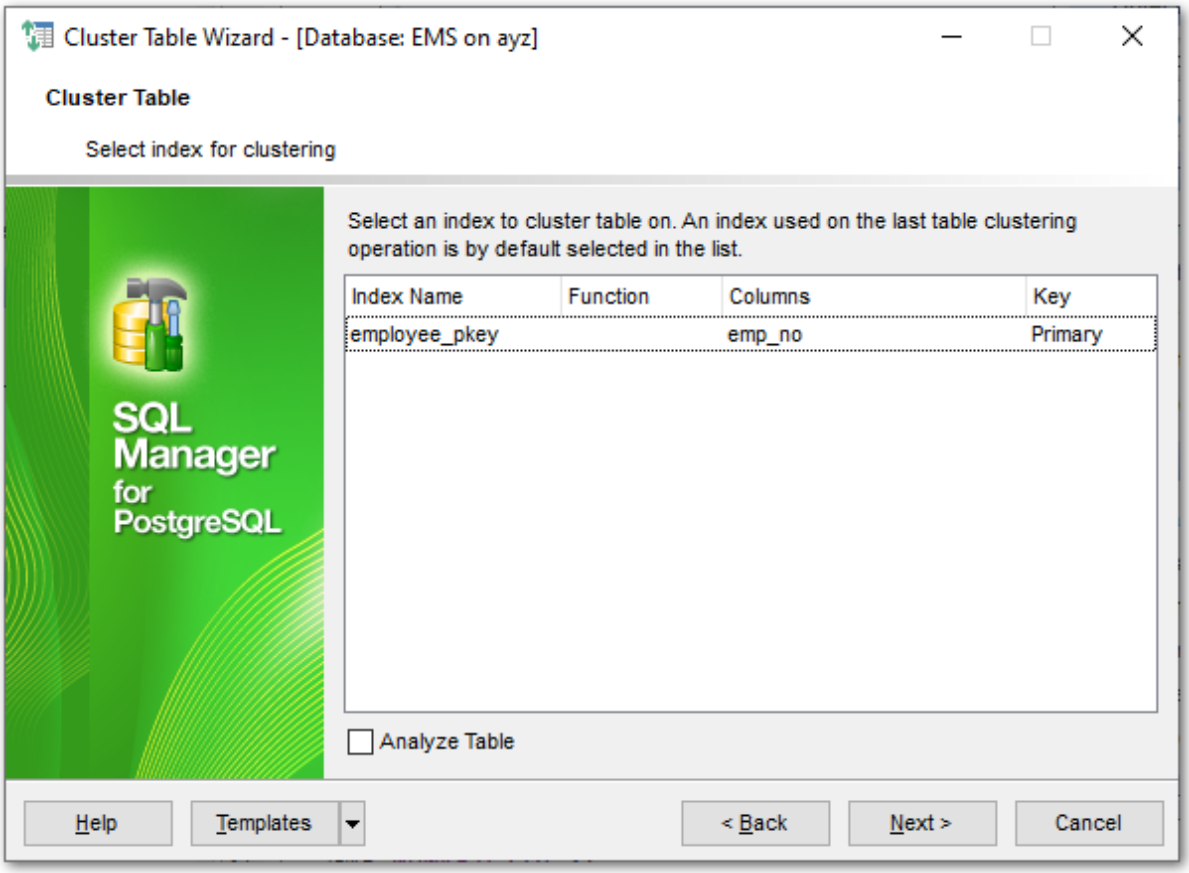

Select one **index** to cluster the table on.

Analyze table
Select this option if you want to perform the Analyze table[773] operation as well.

Click the **Next** button to proceed to the Running service[203] step of the wizard.

5.4.1.3.2.2 Running service

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the cluster table process.

The **Operations** tab allows you to view the log of operations and errors (if any).

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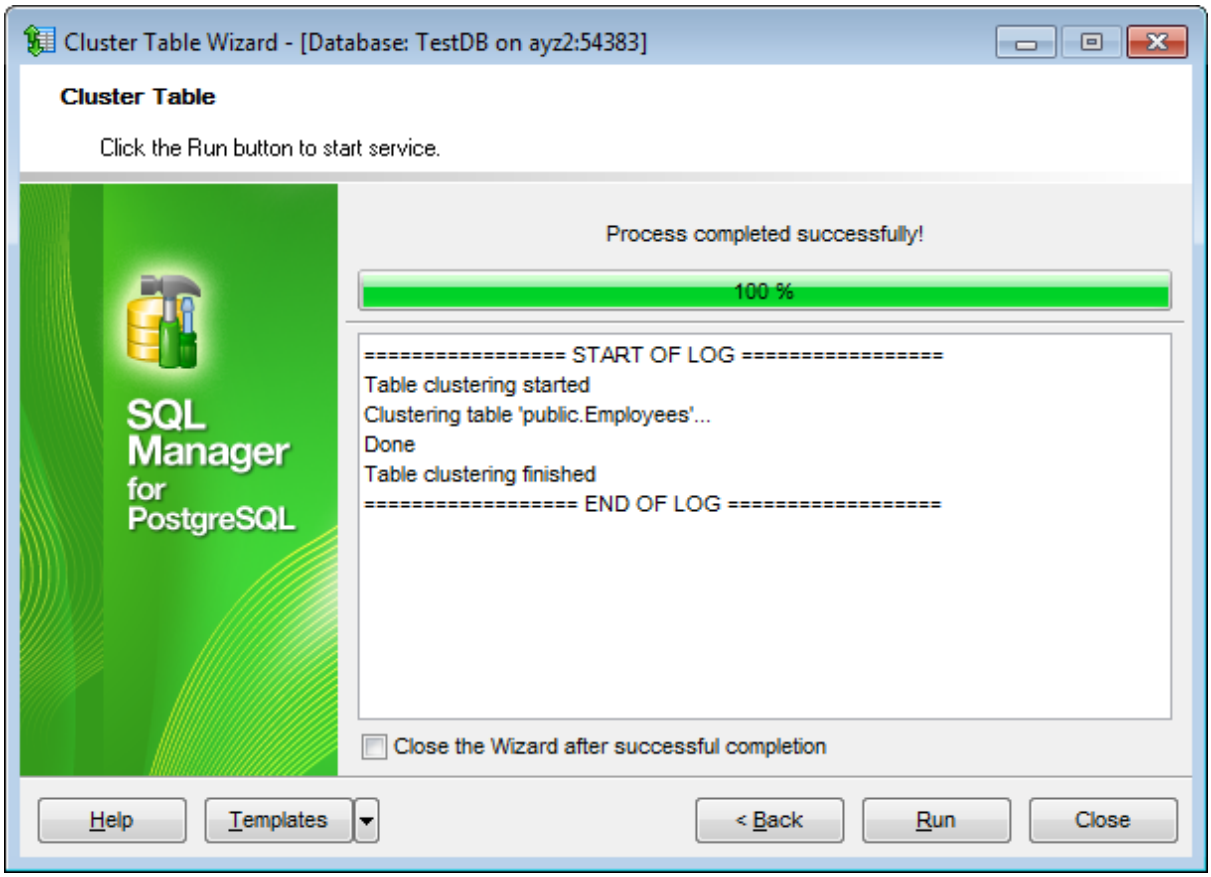

Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to complete the operation.

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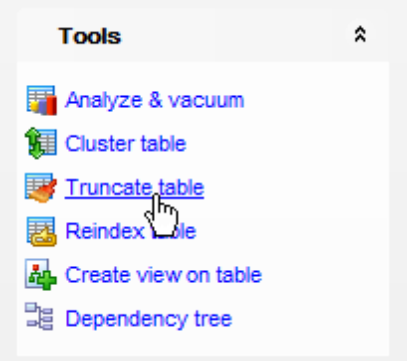
5.4.1.3.3 Truncate Table

The **Truncate Table** service allows you to truncate a table, i.e. delete all records from the table.

To run the service, use the **Truncate table** item of the Navigation bar 178 (or toolbar 178) in Table Editor 177, or right-click the table alias in the DB Explorer 65 tree and select the **Tasks | Truncate Table** item from the context menu 57.

- Running service 205

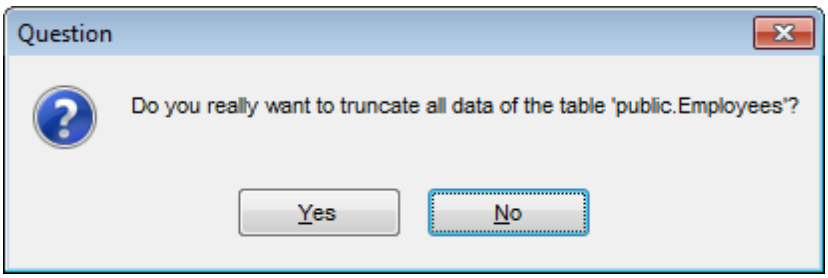


Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Analyze & Vacuum Table 197
Cluster Table 201
Reindex Table 206

5.4.1.3.3.1 Running service

By default, before the *TRUNCATE* operation is performed, a confirmation window is displayed. Click **Yes** to confirm truncating all data of the table, or **No** to cancel the operation.



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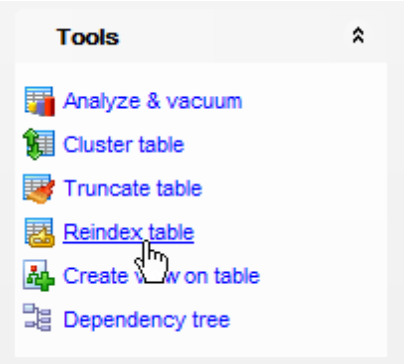
5.4.1.3.4 Reindex Table

The **Reindex Table** service allows you to rebuild corrupted indexes 219 for a table. This operation can also be performed for multiple tables with the help of Object Reindex 782 wizard.

To run the service, use the **Reindex table** item of the Navigation bar 178 (or toolbar 178) in Table Editor 177, or right-click the table alias in the DB Explorer 65 tree and select the **Tasks | Reindex Table...** item from the context menu 57.

- Running service 206



Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Analyze & Vacuum Table 197

Cluster Table 201

Truncate Table 205

5.4.1.3.4.1 Running service

The service is implemented by issuing the *REINDEX TABLE* statement. Click **Commit** to execute the statement. For more information refer to the Changing Metadata window 969 page.

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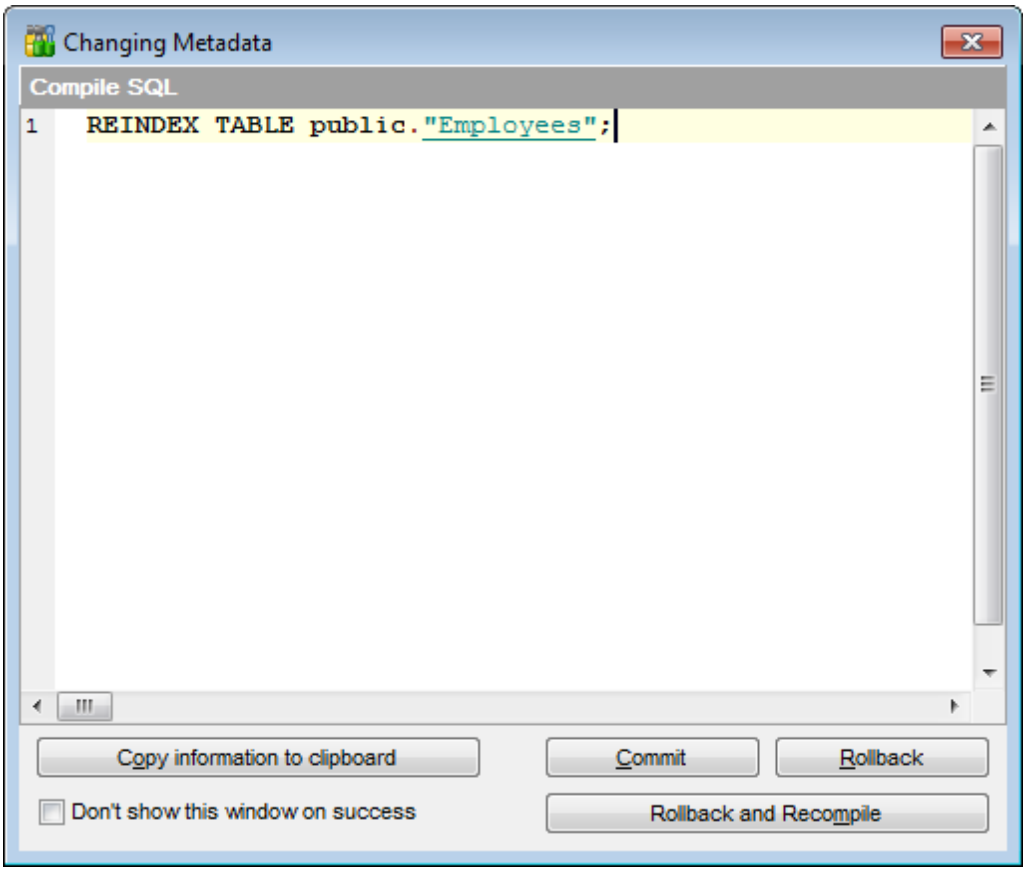

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5.4.1.4 Columns

Table fields are managed within the **Fields** tab of Table Editor 177.

Creating Columns

- open the table in Table Editor 177;
- proceed to the **Columns** tab there;
- right-click the tab area and select the **New Columns** context menu item, or press the *Ins* key;
- define the field properties using the Column Editor 209 dialog.

Editing Columns

- open the table in Table Editor 177;
- proceed to the **Columns** tab there;
- right-click the column and select the **Edit Column <column_name>** context menu item, or simply double-click the column;
- edit the column properties using the Column Editor 209 dialog.

To change the order of table columns:

- open the table in Table Editor 177;
- proceed to the **Columns** tab there;
- right-click a column and select the **Reorder Columns <column_name>** context menu item;
- edit columns' order using the Reorder Columns 183 dialog.

Dropping Columns

- open the table in Table Editor 177;
- proceed to the **Columns** tab there;
- right-click the field and select the **Drop Column <column_name>** context menu item;
- confirm dropping in the dialog window.

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5.4.1.4.1 Columns Editor

Column Editor allows you to specify column definition and set field properties. It opens automatically when you create a new column and is available on editing an existing one (see Create column 208 and Edit column 208 for details).

To open a column in **Column Editor**, double-click it in the DB Explorer 65 tree, or use the **Edit Column...** item of the context menu within the Columns 181 tab of Table Editor 177.

5.4.1.4.1.1 Editing column definition

Column name
Enter a name for the new column, or modify the name of the column being edited. Note that the name of a column must be unique among all the column names in the table.

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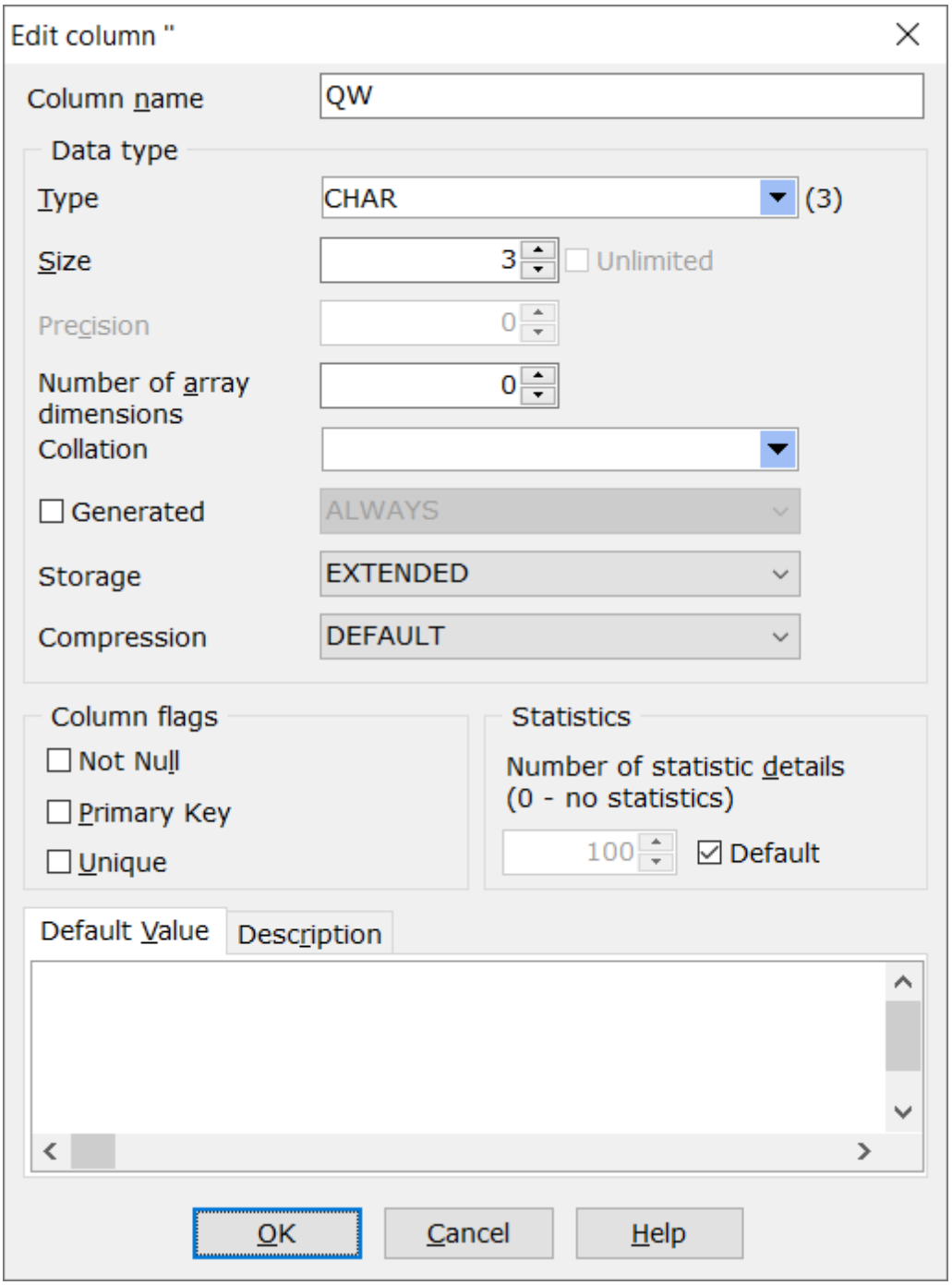

Data type

Type

Here you can set the column type by selecting it from the drop-down list of the standard PostgreSQL data types.

Change by expression

Specify an expression that defines the value of the computed column.

Size

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Specify the size value (for certain types). Check the **Unlimited** option to use the maximum values set by PostgreSQL.

Precision
Specify precision for numeric data type column.

Set the number of array dimensions in the **Number of array dimensions** spinner control. This control is disabled if the column is not an array column.

Collation
Select column collation from the list.

Generated
Select the value for identity column. If ALWAYS is specified, a user-specified value is only accepted if the INSERT statement specifies OVERRIDING SYSTEM VALUE. If BY DEFAULT is specified, then the user-specified value takes precedence.

Storage
You can change the storage type to PLAIN, EXTENDED, EXTERNAL or MAIN.

Compression
Select the compression method: pglz, lz4 or default to be selected by the server. Compression is supported only for variable-width data types, and is used only when the column's storage mode is main or extended.

Column flags

Not Null
Check this option to specify that the values for the column should never contain a null value.

Primary key
Check this option to include the column into the primary key. Note that if you include a column to a primary key, you should also make it *Not Null*.
A table typically has a column or combination of columns that contain values that uniquely identify each row in the table. This column, or columns, is called the primary key (PK) of the table and enforces integrity of the table.

Unique
Check this option to create a unique key on the column that provides entity integrity for a particular column or columns using a unique index.

The **Statistics** group enables collection of row-level statistics on database activity.
Number of statistic details
Allows setting the level of row-level statistics on database activity accumulation.

Use the **Default Value** and the **Description** tabs of **Column Editor** to set values taken by default and optional text as a description for the column.

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5.4.1.5 Foreign Keys

A **Foreign key** constraint (also called a *referential integrity constraint*) designates a column as the Foreign key and establishes a relationship between that foreign key and a specified *Primary* or *Unique* key called the *referenced key*. A composite Foreign key designates a combination of columns as the foreign key.

Table Foreign keys are managed within the **Foreign Keys** tab of Table Editor 177.

Creating Foreign Keys

- open the table in Table Editor 177;
- proceed to the **Foreign Keys** tab there;
- right-click the tab area and select the **New Foreign Key** context menu item, or press the *Ins* key;
- define the Foreign key properties using the Foreign Key Editor 213 dialog.

Editing Foreign Keys

- open the table in Table Editor 177;
- proceed to the **Foreign Keys** tab there;
- right-click the Foreign key to edit and select the **Edit Foreign Key <foreign_key_name>** context menu item, or simply double-click the Foreign key;
- edit the Foreign key properties using the Foreign Key Editor 213 dialog.

Dropping Foreign Keys

- open the table in Table Editor 177;
- proceed to the **Foreign Keys** tab there;
- right-click the Foreign key and select the **Drop Foreign Key <foreign_key_name>** context menu item;
- confirm dropping in the dialog window.

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5.4.1.5.1 Foreign Key Editor

Foreign Key Editor allows you to specify foreign key definition and set foreign key properties. It opens when you create a new foreign key or edit an existing one (see Create Foreign Key 212 and Edit Foreign Key 212 for details).

To open a foreign key in **Foreign Key Editor**, double-click it in the DB Explorer 65 tree, or use the **Edit Foreign Key...** item of the context menu within the Foreign Keys 185 tab of Table Editor 177.

- Editing foreign key definition 213
- Editing foreign key description 966

5.4.1.5.1.1 Editing foreign key definition

Use the **Foreign Key** tab of **Foreign Key Editor** to create/edit a foreign key constraint and specify its properties.

Foreign key name
Enter a name for the new foreign key, or modify the name of the foreign key being edited.

☑ **Not validated (for Postgres 9.1 and higher)**
If this option is selected then a foreign key can initially be added to a large existing table without checking its initial contents, but new tuples must comply with it.

Foreign table
The drop-down list of tables 169 allows you to select the table for which the foreign key is created.

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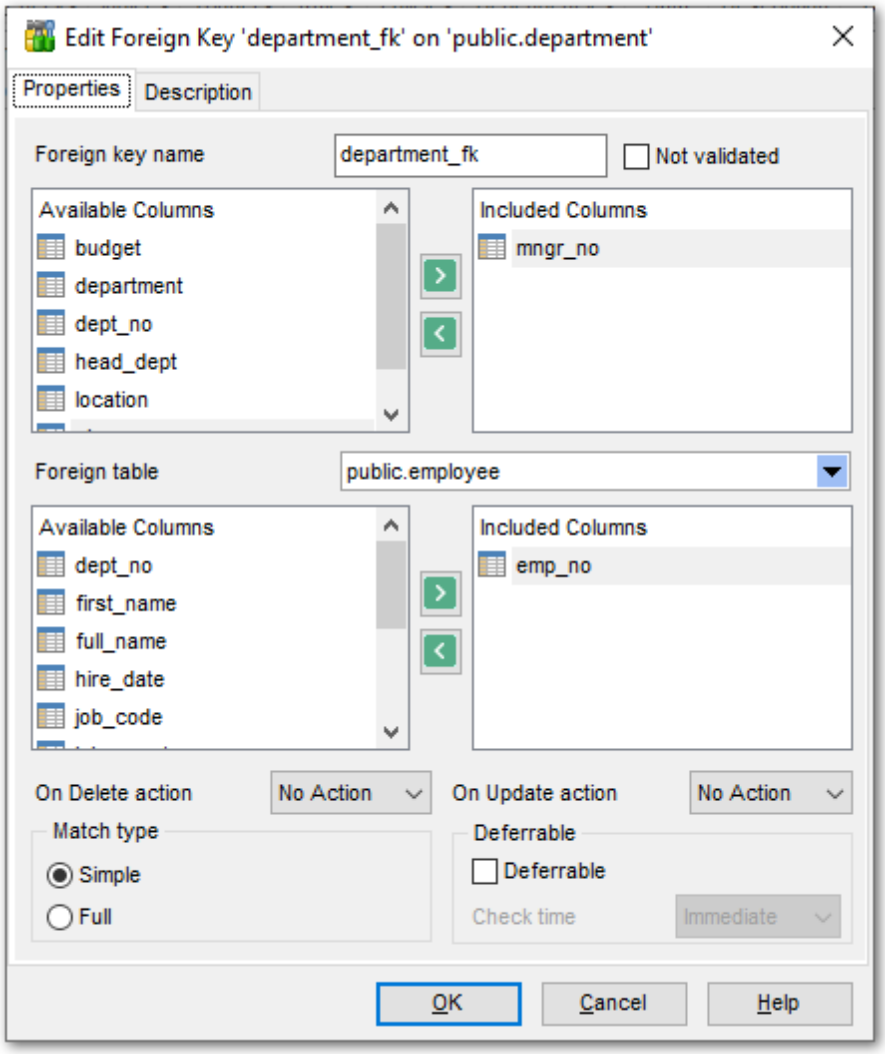

The **Table Columns** area allows you to select Foreign key column(s).
To select a column, you need to move it from the **Available Columns** list to the **Included Columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.

Foreign table
Use the drop-down list to select the foreign table.

The **Foreign Table Columns** area allows you to select the column(s) of the Foreign table.
To select a column, you need to move it from the **Available Columns** list to the **Included Columns** list. Use the buttons or drag-and-drop operations to move the column from one list to another.

If the referenced column(s) are changed frequently, it may be wise to add an index to the foreign key column so that referential actions associated with the foreign key column were performed more efficiently. See Indexes 219 for details.

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On Update action / On Delete action

- *No action*
  Produce an error indicating that the deletion or update would create a foreign key constraint violation. If the constraint is deferred, this error will be produced at constraint check time if there still exist any referencing rows. This is the default action.
- *Restrict*
  Produce an error indicating that the deletion or update would create a foreign key constraint violation. This is the same as NO ACTION except that the check is not deferrable.
- *Cascade*
  Delete any rows referencing the deleted row, or update the value of the referencing column to the new value of the referenced column, respectively.
- *Set NULL*
  Set the referencing column(s) to null.
- *Set default*
  Set the referencing column(s) to their default values.

Match type

A value inserted into the referencing column(s) is matched against the values of the referenced table and referenced columns using the given match type. These are the available match types:

Simple

Allows some foreign key columns to be null while other parts of the foreign key are not null (*MATCH SIMPLE*).

Full

Does not allow one column of a multicolumn foreign key to be null unless all foreign key columns are null (*MATCH FULL*).

Deferrable

Deferrable

This option controls whether the constraint can be deferred. A constraint that is not deferrable will be checked immediately after every command. Checking of constraints that are deferrable may be postponed until the end of the transaction.

Check Time

If a constraint is deferrable, this option specifies the default time to check the constraint:

Immediate

If the constraint is *INITIALLY IMMEDIATE*, it is checked after each statement.

Deferred

If the constraint is *INITIALLY DEFERRED*, it is checked only at the end of the transaction.

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5.4.1.6 Checks

A **check** specifies an expression producing a Boolean result which new or updated rows must satisfy for an insert or update operation to succeed. Expressions evaluating to TRUE or UNKNOWN succeed. Should any row of an insert or update operation produce a FALSE result an error exception is raised and the insert or update does not alter the database. A check constraint specified as a column constraint should reference that column's value only, while an expression appearing in a table constraint may reference multiple columns.

Table checks are managed within the **Checks** tab of Table Editor 177.

Creating Checks

- open the table in Table Editor 177;
- proceed to the **Checks** tab there;
- right-click the tab area and select the **New Check** context menu item, or press the *Ins* key;
- define the check properties using the Check Editor 217 dialog.

Editing Checks

- open the table in Table Editor 177;
- proceed to the **Checks** tab there;
- right-click the check and select the **Edit Check <check_name>** context menu item, or simply double-click the check;
- edit the check properties using the Check Editor 217 dialog.

Dropping Checks

- open the table in Table Editor 177;
- proceed to the **Checks** tab there;
- right-click the check and select the **Drop Check <check_name>** context menu item;
- confirm dropping in the dialog window.

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5.4.1.6.1 Check Editor

Check Editor allows you to specify check definition and set check properties. It opens automatically when you create a new check and is available on editing an existing one (see Create check 216 and Edit check 216 for details).

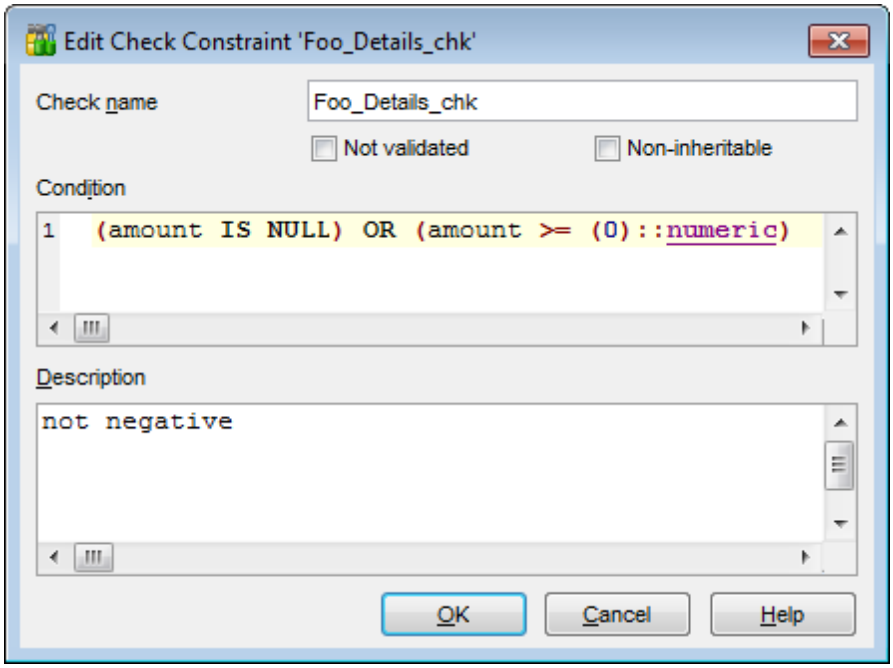
To open a check constraint in **Check Editor**, double-click it in the DB Explorer 65 tree, or use the **Edit Check...** item of the context menu within the Checks 186 tab of Table Editor 177.

- Editing check definition 217

5.4.1.6.1.1 Editing check definition

Use the **Check** tab of **Check Editor** to create/edit a check constraint and specify its properties.

Check name
Enter a name for the new check, or modify the name of the check being edited.



Not validated (for Postgres 9.2 and higher)
If this option is selected then a check can initially be added to a large existing table without checking its initial contents, but new tuples must comply with it.

Non-inheritable (for Postgres 9.2 and higher)
If this option is selected then a check will not propagate to child tables.

Condition
This area represents the condition implied by the check constraint.
You can specify any logical (Boolean) expression that returns *TRUE* or *FALSE* based on the logical operators. For example, *salary >= 15000 AND salary <= 100000*.

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The **Description** field allows you to view and edit the comment for the object.

For your convenience the **syntax highlight**, **code completion** and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area 418 and Using the context menu 420.

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5.4.1.7 Indexes

Indexes are objects used to find rows with specific column values quickly. If a table has an index for the columns in question, PostgreSQL can quickly determine the position to seek to in the middle of the data file without having to look at all the data.

Table indexes are managed within the **Indices** tab of Table Editor 177.

Creating Indexes

- open the table in Table Editor 177;
- proceed to the **Indexes** tab there;
- right-click the tab area and select the **New Index** context menu item, or press the *Ins* key;
- define the index properties using the Index Editor 220 dialog.

Editing Indexes

- open the table in Table Editor 177;
- proceed to the **Indexes** tab there;
- right-click the index and select the **Edit Index** context menu item, or simply double-click the index;
- edit the index properties using the Index Editor 220 dialog.

Dropping Indexes

- open the table in Table Editor 177;
- proceed to the **Indexes** tab there;
- right-click the index and select the **Drop Index** context menu item;
- confirm dropping in the dialog window.

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5.4.1.7.1 Index Editor

Index Editor allows you to specify index definition and set index properties. It opens automatically when you create a new index and is available on editing an existing one (see Create Index 219 and Edit Index 219 for details).

To open an index in **Index Editor**, double-click it in the DB Explorer 65 tree, or use the **Edit Index...** item of the context menu within the Indices 187 tab of Table Editor 177.

- Using Navigation bar and Toolbar 220
- Editing index definition 220
- Editing index description 966
- Viewing DDL definition 965

5.4.1.7.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Index Editor**.

Object

select a database
select an index for editing

General

compile 969 the index (if it is being created/modified)
save the index description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the index
view the dependency tree 638 for the index
reindex 782 the current table index
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the index:

Description

save object description 966 to file
copy description 966 to clipboard

DDL

save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

5.4.1.7.1.2 Editing index definition

Use the **Index** tab of **Index Editor** to create/edit an index on a specified table or materialized view, and specify index properties.

Name

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Enter a name for the new index, or modify the name of the index being edited.

For table or materialized view
The drop-down list of tables[169] and materialized views[229] allows you to select the object to be indexed (available on creating a new index).

Index type

Primary key - this selection indicates that the primary key index is created.

Unique key - this selection indicates that the unique key index is created.

Unique index - makes index unique, causes the system to check for duplicate values in the table when the index is created (if data already exist) and each time data is added.

Index - this selection specifies a regular, non-unique index.

Exclusion - this selection specifies that the exclusion constraint is created. It ensures that if any two rows are compared on the specified columns or expressions using the specified operators, at least one of these operator comparisons will return false or null.

Mark for table cluster
This option selects the index as default for future CLUSTER operations. It does not actually re-cluster the table (*ALTER TABLE ... CLUSTER ON ...*).

Deferrable

If Primary or Unique key is selected as Index type, this section appears. It controls whether the index can be deferred. A constraint that is not deferrable will be checked immediately after every command.

Deferrable
Check this option to defer the index.

Check Time
If a constraint is deferrable, this option specifies the default time to check the constraint:
Immediate - it is checked after each statement.
Deferred - it is checked only at the end of the transaction.

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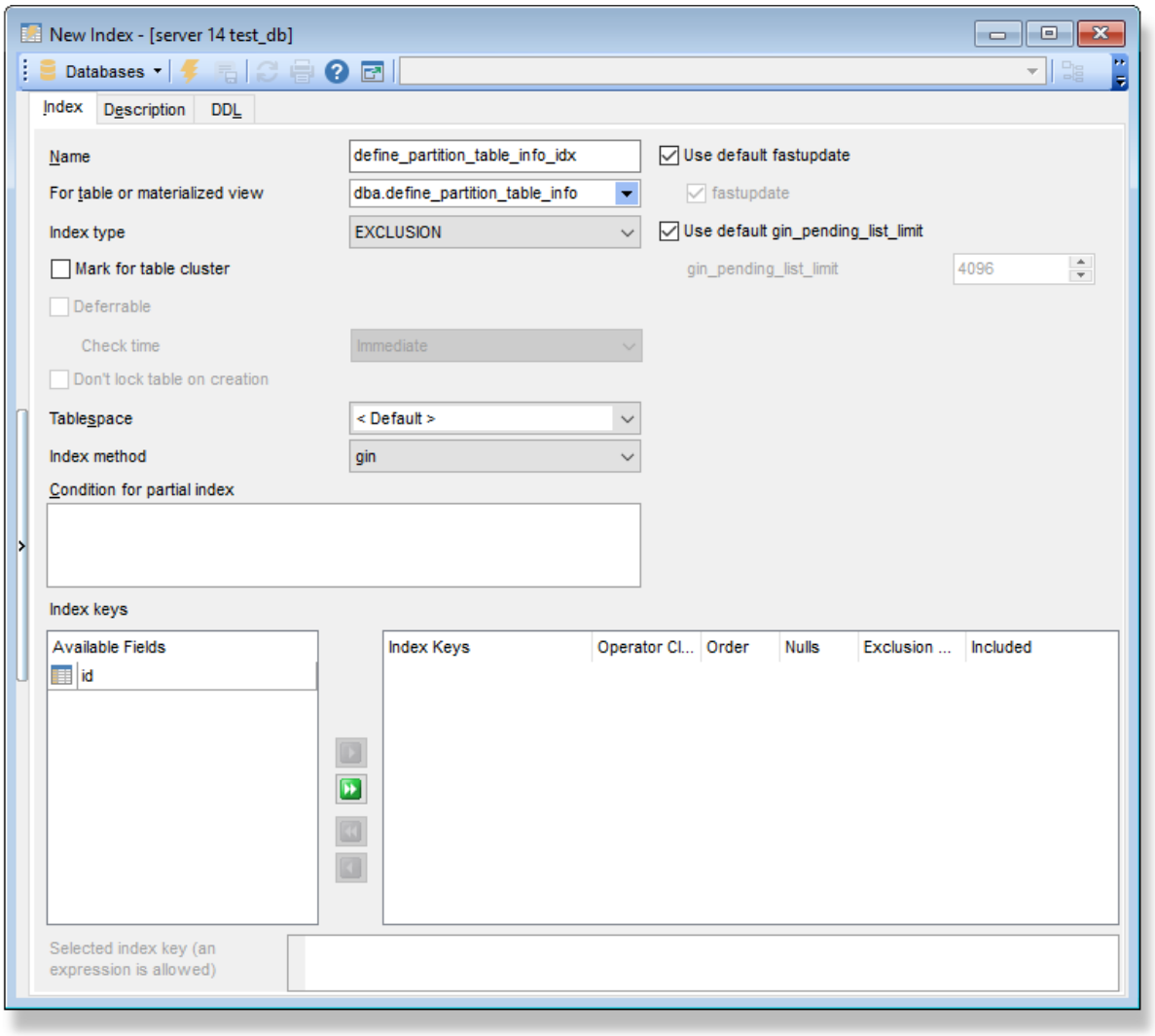

Don't lock table on creation
Use this option to build the index without taking any locks that prevent concurrent inserts, updates, or deletes on the table.

Tablespace
Use the drop-down list to specify the index storage (a tablespace 318).

Index method
Select the index type. PostgreSQL provides several index methods: *B-tree*, *R-tree*, *hash*, *GiST (Generalized Index Search Trees)*, *SP-GiST (space-partitioned GiST for Postgres 9.2 and higher)*, *brin (Block Range INdex for Postgres 9.5 and higher)*.
The **B-tree** index method is an implementation of Lehman-Yao high-concurrency B-trees.
The **R-tree** index method implements standard R-trees using Guttman's quadratic split algorithm.
The **hash** index method is an implementation of Litwin's linear hashing.

Use default fillfactor
Check this option to set fillfactor value to 100.

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Fillfactor
Specify the custom fillfactor value in this field.
Note: To set this value you need to uncheck **Use default fillfactor** option.

B-tree index method

Use default deduplicate items
This option is available for *B-tree* method only. It controls usage of the B-tree deduplication technique for work optimization. If enabled, it applies the default value.

Deduplicate_items
Sets the value for inserts from triggering deduplication.

GIN index method

Use default fast update
This option is available for *Gin* method only. Enable this setting to control the usage of the fast update technique. If enabled, it applies the value set below by default.

Fastupdate
Set this option ON to improve update speed or OFF otherwise.

Use default gin_pending_list_limit
This option is available for *Gin* method only. Enable this setting to control the limit to move entries to the main GIN data structure. If enabled, it applies the default value (4Mb).

Gin_pending_list_limit
This value is specified in kilobytes. If the pending list becomes larger than this value, the entries are moved to the main GIN data structure using the same bulk insert techniques used during initial index creation.

GIST index method

Use default buffering
This option is available for *Gist* method only. It controls whether to use the buffered build technique to build the index. If enabled, it applies the value set by default.

Buffering
If it's OFF the buffering is disabled, ON it is enabled, and with AUTO it is initially disabled, but is turned on on-the-fly once the index size reaches effective_cache_size.

BRIN index method

Use default pages_per_range
This option is available for *Brin* method only. It controls whether the default value must be applied.

Pages_per_range
It defines the number of table blocks that make up one block range for each entry of an index.

Use default autosummarize
This option is available for *Brin* method only. It applies the default value fo autosummarizing.

Autosummarize

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Enables summarization is queued for the previous page range whenever an insertion is detected on the next one. Whenever autovacuum runs in that database, summarization will occur for all unsummarized page ranges that have been filled.

Condition for partial index
A partial index is an index that contains entries for only a portion of a table, usually a portion that is more useful for indexing than the rest of the table. If you wish to create partial index, enter conditional expression in this edit box.

Index keys
To include column(s) in the index, you need to move it from the **Available Columns** list to the **Index Keys** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.

Operator Class
This column allows you to specify an operator class for each column of the index. Use the drop-down list to select the operator class identifying the operators to be used by the index for the column.

Selected index key
Specifies an index key name or an expression based on one or more index key columns of the table. This feature is useful to obtain fast access to tables based on the results of computations.

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5.4.1.8 Policies

A policy grants the permission to select, insert, update, or delete rows that match the relevant policy expression.

Table policies are managed within the Policy tab[193] of Table Editor[177].

Creating Policies

To create a new policy:

- open the table in Table Editor[177];
- proceed to the **Policies** tab there;
- right-click the tab area and select the **New Policy** context menu item, or press the *Ins* key;
- define the policy properties using the Policy Editor[226] dialog.

Editing Policies

To view an existing policy:

- open the table in Table Editor[177];
- proceed to the **Policies** tab there;
- right-click the policy and select the **Edit Policy <policy_name>** context menu item, or simply double-click the policy;
- edit the policy properties using the Policy Editor[226] dialog.

Dropping Policies

To drop a policy:

- open the table in Table Editor[177];
- proceed to the **Policies** tab there;
- right-click the policy and select the **Drop Policy <policy_name>** context menu item;
- confirm dropping in the dialog window.

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5.4.1.8.1 Policy Editor

5.4.1.8.1.1 Editing Policy Definition

Use the **Policies** tab of **Policy Editor** to create/edit a policy and specify its properties.

Policy name
Enter a name for the new policy, or modify the name of the policy being edited. Policy names are per-table. Therefore, one policy name can be used for many different tables and have a definition for each table which is appropriate to that table.

For table
Select a table to create a policy for.

☑ **Restrictive**
When enabled a restrictive policy is created. By creating restrictive policies, administrators can reduce the set of records which can be accessed as all restrictive policies must be passed for each record.

Command
Select the command to which the policy applies: ALL, SELECT, INSERT, UPDATE, or DELETE.

Roles
Move the roles from *Available* to *Selected* to which the policy is to be applied.

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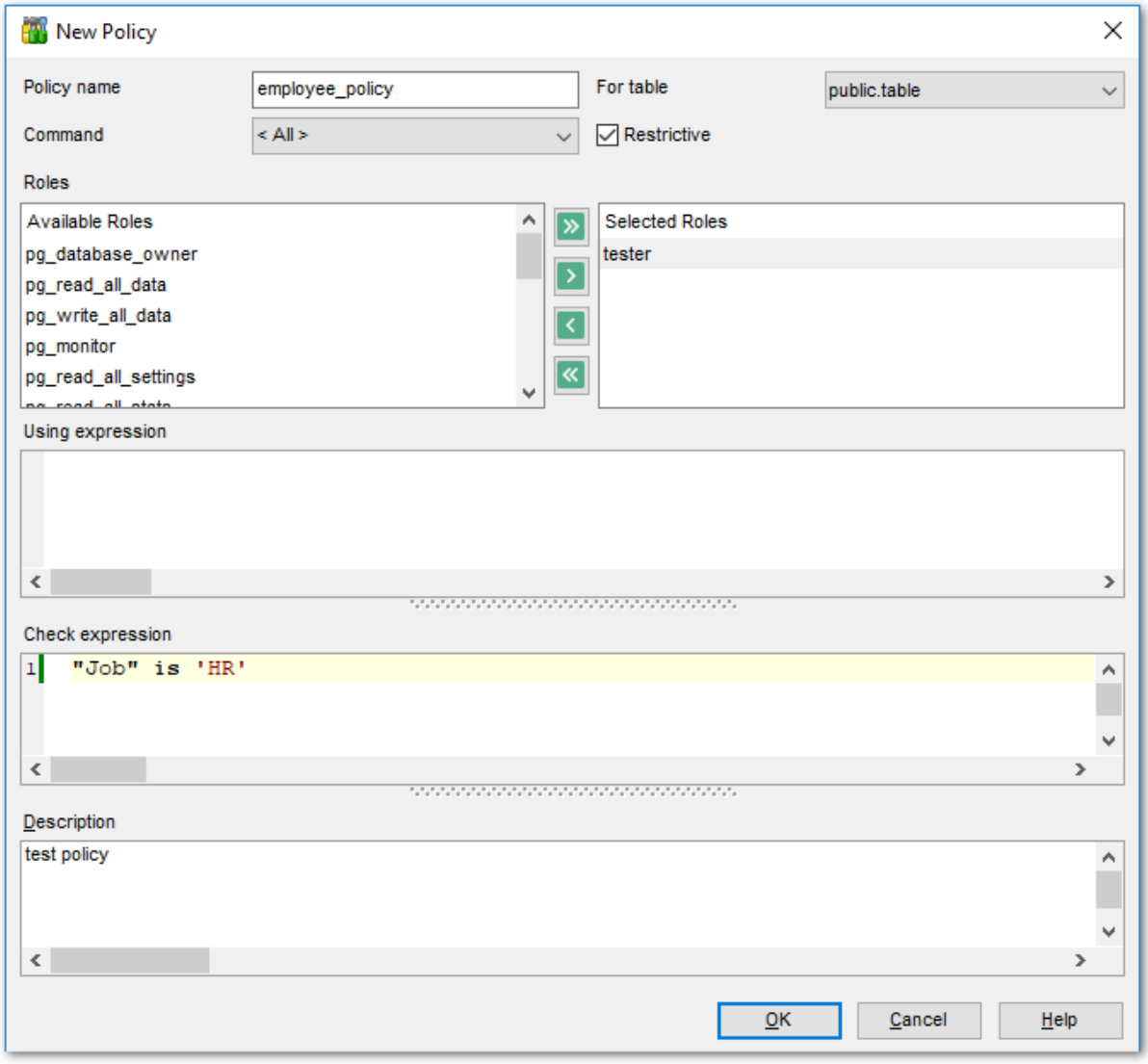

Using expression
Use this field to define an SQL conditional expression to be added to queries that refer to the table if row level security is enabled. Rows for which the expression returns true will be visible. Any rows for which the expression returns false or null will not be visible to the user (in a SELECT), and will not be available for modification (in an UPDATE or DELETE).

Check expression
Use this field to define an SQL conditional expression. It's only available for INSERT and UPDATE commands. Only the rows satisfying the expression will be allowed.

The **Description** field allows you to view and edit the comment for the policy.

After all properties have been set you can enable or force row level security for the table on the **Policies tab** using the corresponding options:

☑ **Enable row level security**
Use this option to apply the policies to the table.

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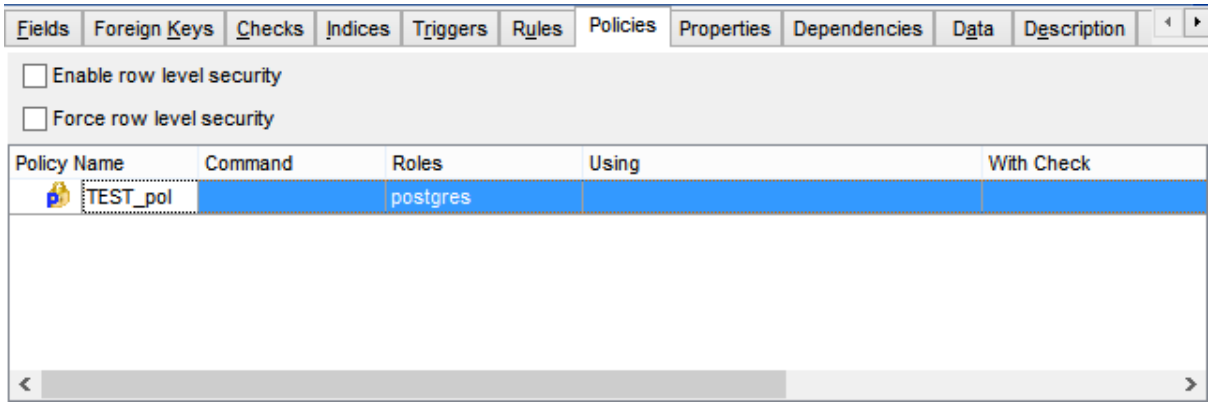
Force row level security
With this option ON, row level security policies will be applied when the user is the table owner. If disabled then row level security will not be applied when the user is the table owner.



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5.4.2 Views

A **View** is a logical table based on one or more tables[169] or views. A view contains no data itself. The tables upon which a view is based are called *base tables*.

Views are useful for allowing users to access a set of relations (tables[169]) as if it were a single table, and limiting their access to just that. Views can also be used to restrict access to rows (a subset of a particular table).

View Editor allows you to create new views and define their properties (view name and the SELECT statement it implements). It opens automatically when you create[155] a new view and is available on editing[155] an existing one. SQL Manager supports manual creating and editing of Materialized views.

Hint: A view can be created by building a query in Visual Design Query[431] (click the **Create view** Navigation bar[432] item after building).

- Using Navigation bar and Toolbar[230]
- Creating/editing view[232]
- Managing columns[233]
- Managing indexes[234]
- Managing rules[235]
- Managing triggers[236]
- Browsing object dependencies[967]
- Working with data[237]
- Editing view description[966]
- Viewing DDL definition[965]
- Setting object permissions[968]

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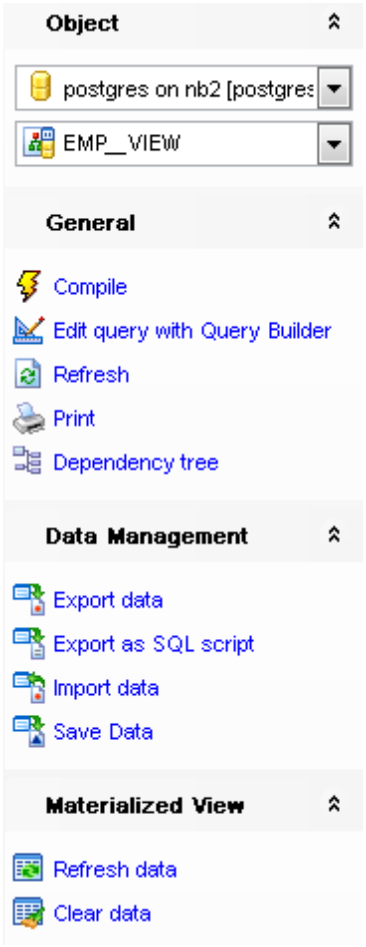
5.4.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **View Editor**.



Object
select a database
select a view for editing

General
compile 969 the view (if it is being created/modified)
save the view description 966 (if it has been modified)
edit the view query using Design Query 431
refresh the content of the active tab
print metadata 680 of the view
view the dependency tree 638 for the view
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the view:

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Rules
add a new rule
edit selected rule
drop selected rule(s)

Triggers
add a new trigger
edit selected trigger
drop selected trigger(s)

Data Management
commit transaction
rollback transaction
Note: These actions are available if the **Use transactions in object editors, Query Data and Design Query** option is checked in the Database Registration Info | Data options 124 dialog.
export data from the view using Export Data Wizard 536
export data from the view as SQL script using Export as SQL Script Wizard 608
import data 582

Materialized View
refreshes data of materialized view
clears data of materialized view

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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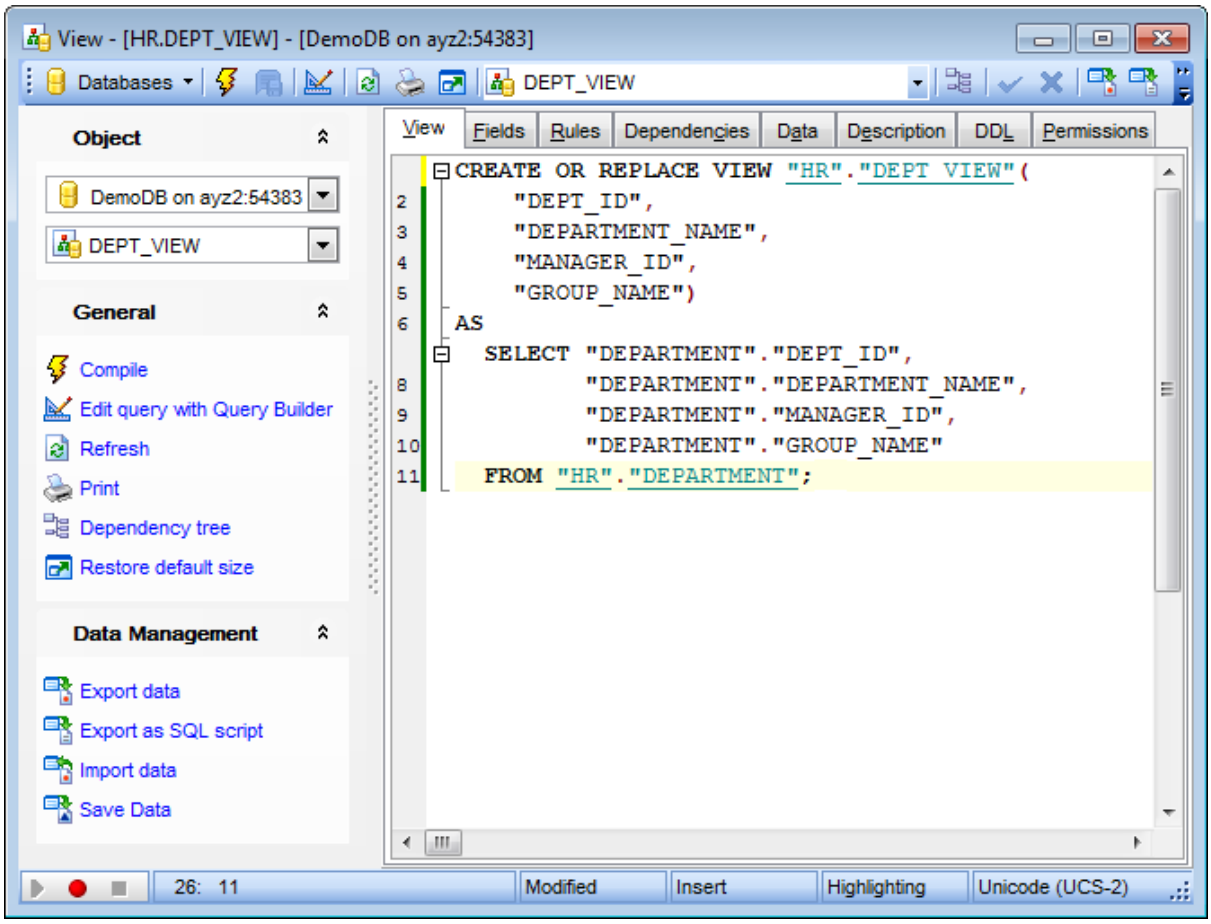
5.4.2.2 Creating/editing view

Use the **View** tab of **View Editor** to create/edit a view and specify its definition.

This tab represents the view definition as SQL statement, hence it is enough to simply edit the whole definition using the editor area to make appropriate changes, and recompile the view.

For your convenience the **syntax highlight**, **code completion** and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area 418 and Using the context menu 420.



Note: The visual representation of a view can be easily created using the Visual Design Query 431.
Note: You can create Materialized views manually.

To compile a view, you can use the **Compile** item available within the Navigation bar 230 or toolbar 230.

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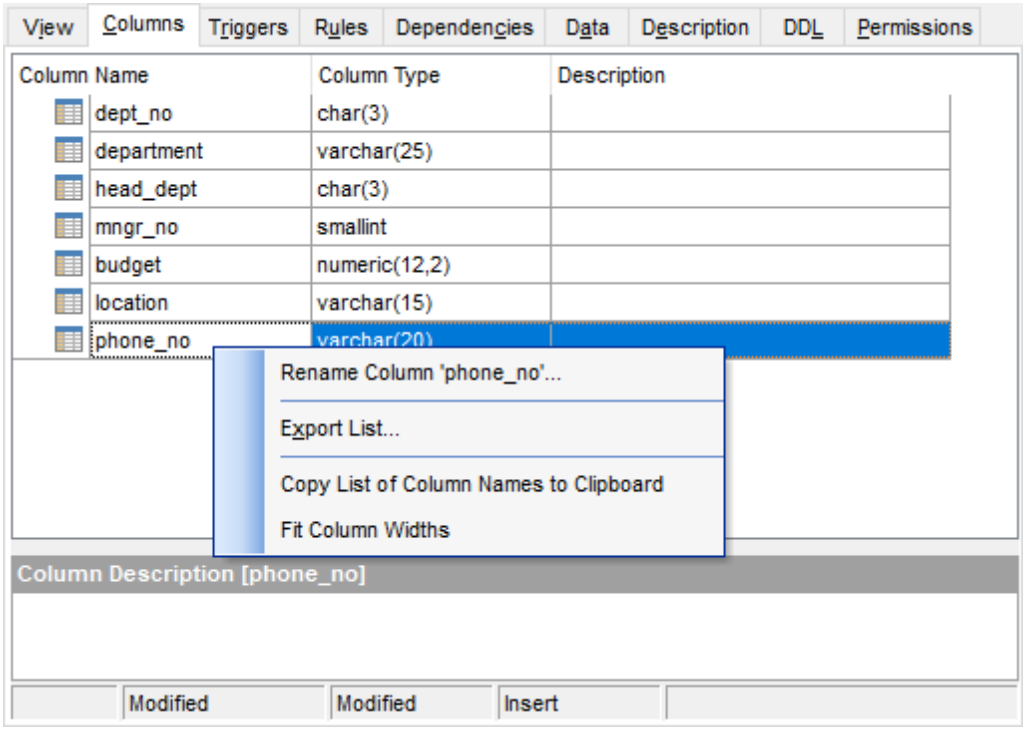
5.4.2.3 Managing columns

The **Columns** tab is provided for viewing columns represented in the view.

Right-click a column to display the context menu allowing you to *rename* the selected column, export 536 column name list or copy it to clipboard.



The **Columns** list provides the following attributes of each column of the view:
Column Name
Column Type
Description

For details see Columns 208.

If necessary, you can also use the **Column Description** area to supply a *description* for each column.

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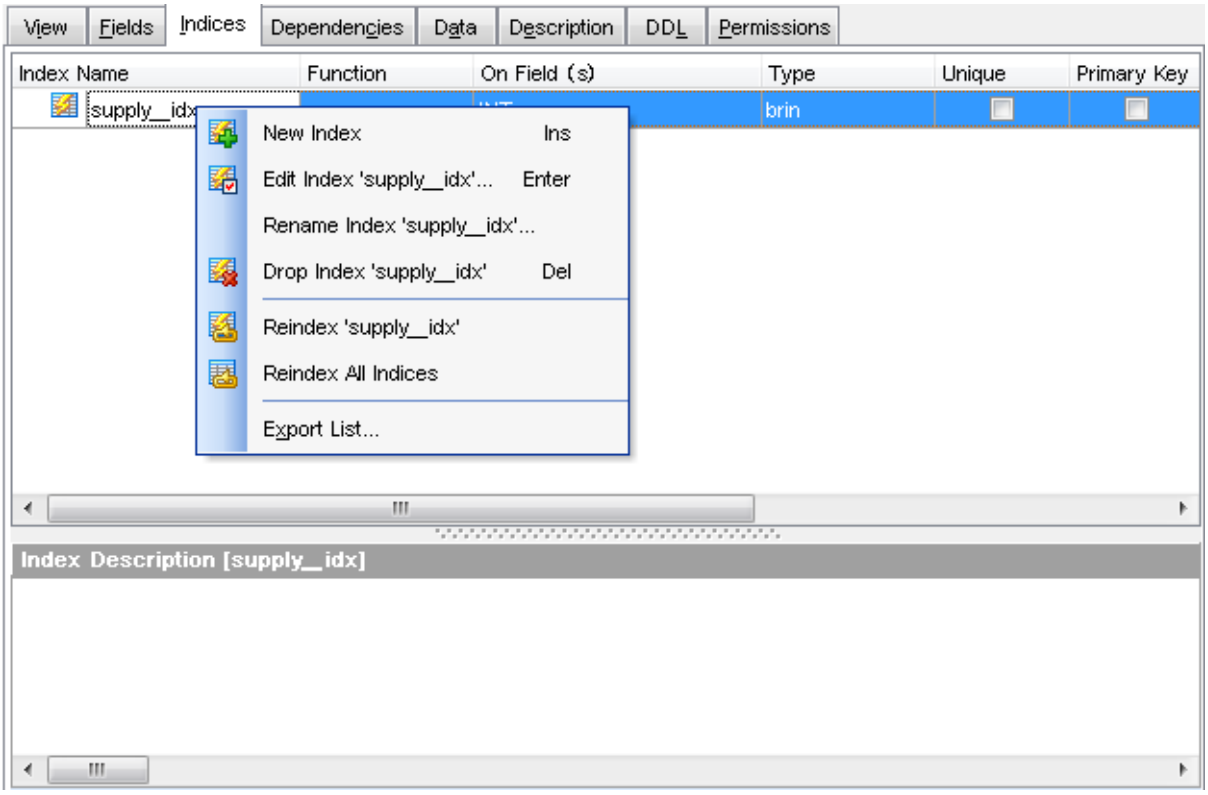
5.4.2.4 Managing indexes

The **Indices** tab is provided for managing indices for the **Materialized views** only. Double-click an index to open Index Editor 220 for editing the index.

Right-click the area to display the context menu allowing you to *Create new*, *Edit*, *Rename*, *Drop*, *Reindex* the selected index, or *Reindex all* indices. Using the menu you can also export 536 the list of the table indices to any of the supported formats 983.

Indices management tools are also available through the Navigation bar 220 and toolbar 220 of **View Editor**.

If necessary, you can also use the **Index Description** area below to supply a *description* for each index.



NOTE: This tab is only available for materialized views.

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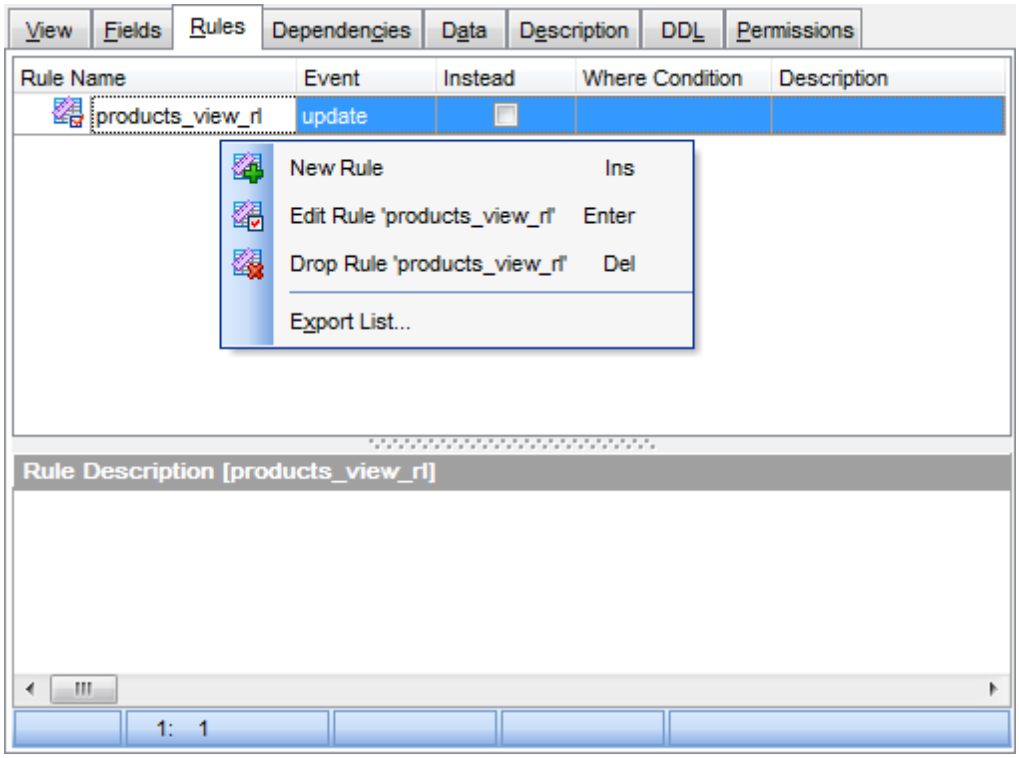
5.4.2.5 Managing rules

The **Rules** tab is provided for viewing rules specified for the view. Double-click a rule to open Rule Editor[264] for editing the rule.

Right-click a rule to display the context menu allowing you to *create* new, *edit*, or *drop* the selected rule. Using the menu you can also export[536] the list of the view rules to any of supported formats[983].



The **Rules** list provides the following attributes of each rule of the view:
Rule Name
Event
Instead
WHERE condition

For details see Rules[264].

If necessary, you can also use the **Rule Description** area to supply a *description* for each rule.

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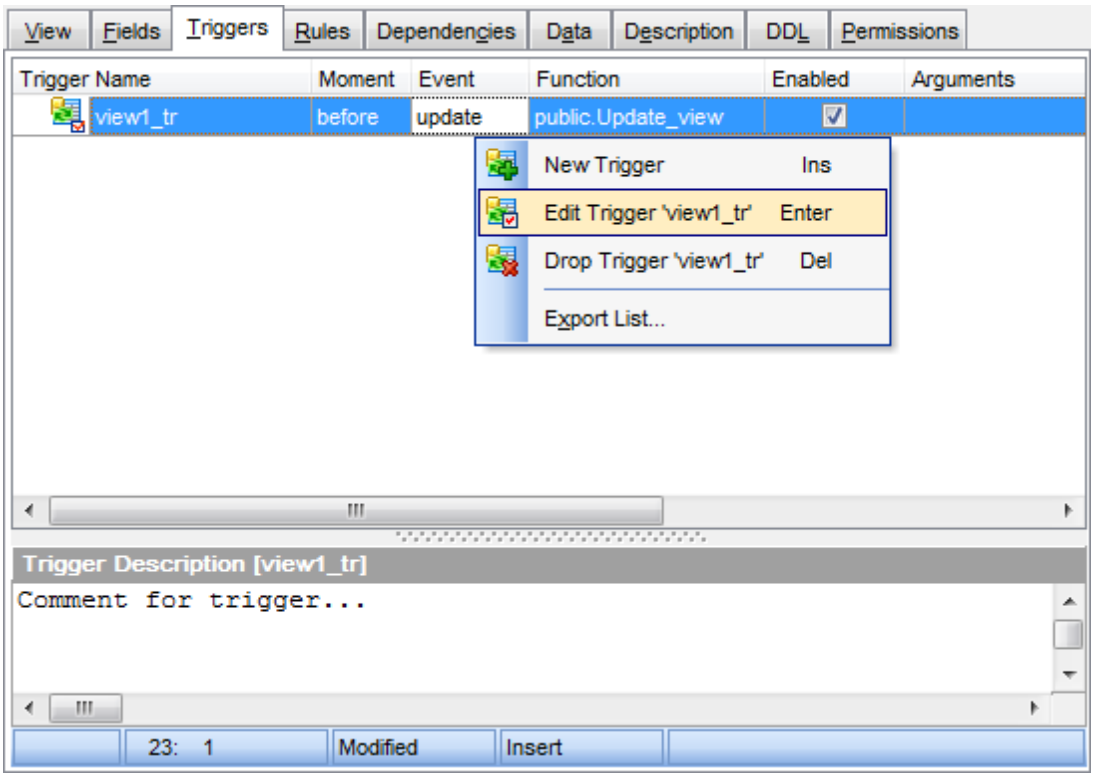
5.4.2.6 Managing triggers

The **Triggers** tab is provided for managing table triggers[268]. Double-click a trigger to open Trigger Editor[268] for editing the trigger.

Right-click the area to display the context menu allowing you to *create* new, *edit*, *drop*, *enable/disable* the selected trigger, or *enable/disable* all triggers. Using the menu you can also export[536] the list of the table triggers to any of supported formats[983].

Triggers management tools are also available through the Navigation bar[230] and toolbar[230] of **View Editor**.



The **Triggers** list provides the following attributes of each trigger of the table:
Trigger Name
Moment
Event
Function
Disabled
Arguments

For details see Triggers[268].

If necessary, you can also use the **Trigger Description** area to supply a *description* for each trigger.

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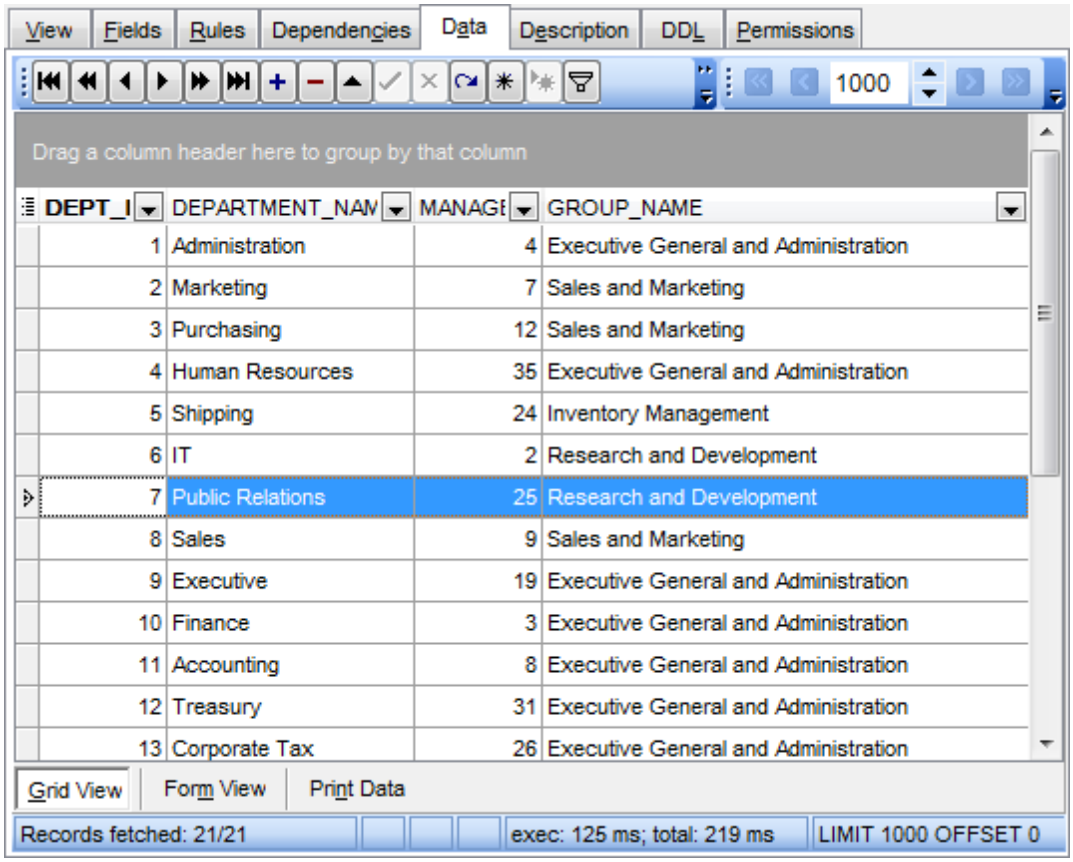
5.4.2.7 Working with data

The **Data** tab displays the view data as a grid by default (see Data View 453 for details). The context menu of this tab and the Navigation bar 230 allow you to Export Data 536, Import Data 582, Export as SQL Script 608.

While working with view data, you are provided with a number of filtering 463 and grouping 460 facilities.
If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Data management 452 tools are also available through the Navigation bar 230 and toolbar 230 of **View Editor**.



For **Materialized views** the following operations are available on the Navigation bar or Toolbar:
refreshes data of materialized view
clears data of materialized view (REFRESH with NO DATA)

See also:
Working with table data 194
Data View 453

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5.4.3 Functions

A **Function** is a mapping embodied as a program (the function *body*) that can be invoked by using zero or more input values (*arguments*) to a single value (the *result*). A **Function** can be stored as a database object providing reusable code.

PostgreSQL provides four kinds of functions:
- query language functions (functions written in SQL);
- procedural language functions (functions written in, for example, PL/Tcl or PL/pgSQL);
- internal functions;
- C-language functions.

Every kind of function can take base types 278, composite types 283, or combinations of these as arguments (parameters). In addition, every kind of function can return a *base type* or a *composite type*. Many kinds of functions can take or return certain *pseudo-types* (such as *polymorphic types*), but the available facilities vary.

Function Editor allows you to define function properties. It opens automatically when you create 155 a new function and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 240
- Creating/editing function 242
- Executing functions 246
- Specifying input parameters 247
- Browsing object dependencies 967
- Editing function description 966
- Viewing DDL definition 965
- Debugger 248

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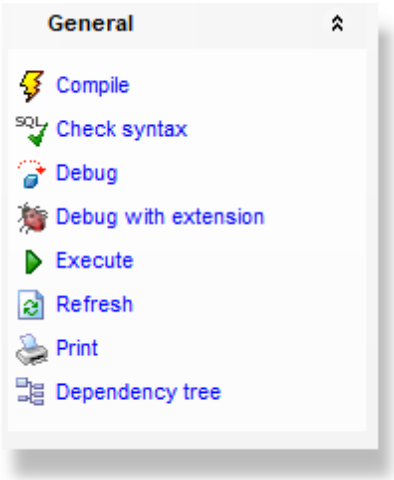
5.4.3.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Function Editor**.



The **Navigation bar** of **Function Editor** allows you to:

Object
- select a database
- select a function for editing

General
- compile 969 the function (if it is being created/modified)
- save the function description 966 (if it has been modified)
- check function syntax
- debug the function using Function debugger 248
- debug with pldbgapi extension 248
- execute 246 the function
- refresh the content of the active tab
- print metadata 680 of the function
- view the dependency tree 638 for the function
- restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the function:

Description
- save object description 966 to file
- copy description 966 to clipboard

DDL
- save DDL 965 to file
- open DDL 965 in Query Data 415

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NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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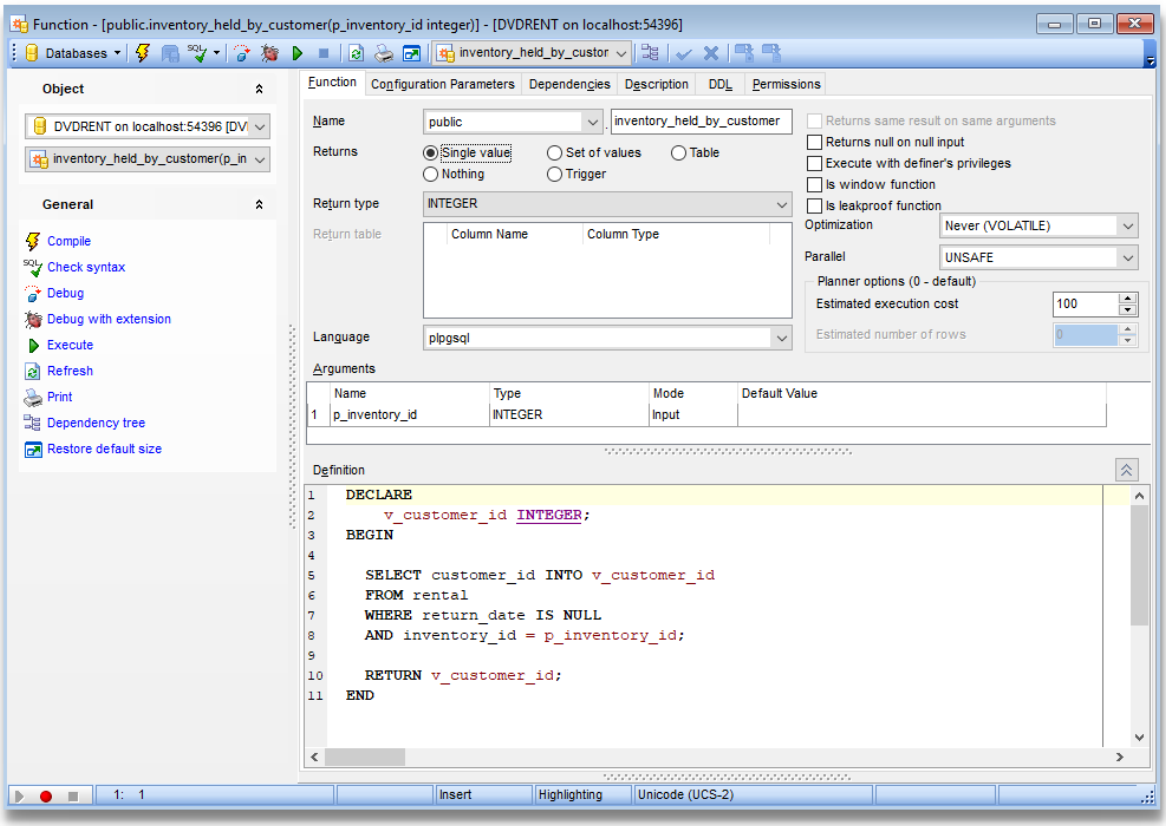
5.4.3.2 Creating/editing function

Use the **Function** tab of **Function Editor** to create/edit a function and specify its definition.

Name
Select a schema[164] and enter a name for the new function, or modify the name of the function being edited.



Returns
Use this options to define what data is to return by the function:
- *Single value* - the function returns a single item; to define its type use the drop-down list.
- *Set of values* - the function returns a set of items; define its type using the drop-down list.
- *Table* - the function returns table; define its type using the Return table column (for Postgres 9.1 and higher).
- *Nothing - the function returns void.*
- *Trigger* - the function returns a trigger.

The **Arguments** list provides the following attributes of each argument used in the function:
Name
Type (the argument data type)
Mode (*in*, *out*, *in/out*)
Default value

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Set the function arguments by right-clicking in the list and selecting **Add Argument**. Once the argument is added, select its type from the **Argument Type** drop-down list. To delete the existing argument, select **Delete Argument** from the popup menu. To reorder the arguments within the list, use the **Move Up** and **Move Down** items or the corresponding *Ctrl+Up/Ctrl+Down* shortcuts[1001].
It is possible to set the argument names for server version 8.0 and higher.
Hint: You can reorder arguments in the list using the **Move Up** and **Move Down** popup menu items.

Language
Select the language that the function is implemented in: SQL, C, internal, or the name of a user-defined procedural language[321].

Returns NULL on NULL input
This option indicates that the function always returns null whenever any of its arguments are null. If this parameter is specified, the function is not executed when there are null arguments; instead a null result is assumed automatically.

Execute with definer's privileges
This option specifies that the function is to be executed with the privileges of the user[751] that created it. Otherwise, the function is to be executed with the privileges of the user that calls it.

Is window function
This option indicates that the function is a window function rather than a plain function. A window function performs a calculation across a set of table rows that are somehow related to the current row.

Is leakproof function
This option indicates that the function has no side effects. It reveals no information about its arguments other than by its return value. For example, a function which throws an error message for some argument values but not others, or which includes the argument values in any error message, is not leakproof.

Optimization
Select the behaviour of the function:
IMMUTABLE indicates that the function cannot modify the database and always returns the same result when given the same argument values.
STABLE indicates that the function cannot modify the database, and that within a single table scan it will consistently return the same result for the same argument values, but that its result could change across SQL statements.
VOLATILE indicates that the function value can change even within a single table scan, so no optimizations can be made.

Parallel
Set whether the function can be executed in the parallel mode:
UNSAFE value prohibits parallel mode.
RESTRICTED indicates that the function can be executed in parallel mode, but the execution is restricted to parallel group leader.
SAFE value indicates that the function can be run in parallel mode.

Planner options

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This group is available for server version 8.3 and higher. The spinner controls allow you to specify **Estimated execution cost** and **Estimated number of rows**.

Definition
This area allows you to set the function definition (body).

For your convenience the **syntax highlight**, **code folding**, using macro and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area 418, Using the context menu 420 and .

The possibility to use macros is also implemented.
To *start recording* a macro, click the **Record** button available in the status bar area, or use the *Shift+Ctrl+R* shortcut.
To *stop recording*, click the **Stop** button, or use the *Shift+Ctrl+R* shortcut.
To *call* the recorded macro, use the **Play** button, or use the *Shift+Ctrl+P* shortcut.

To execute 246 the function, you can use the **Execute** item available within the Navigation bar 240 or toolbar 240.

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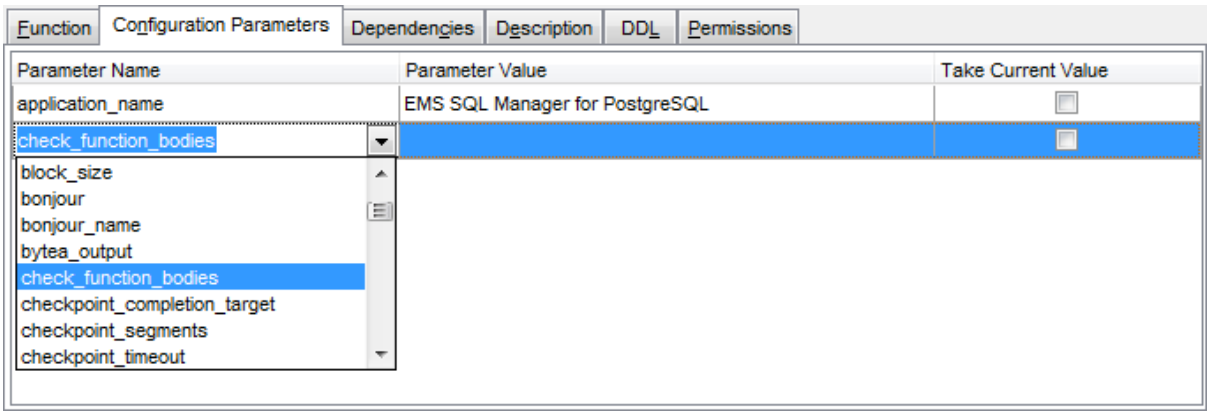
5.4.3.3 Setting configuration parameters

Use the **Configuration Parameters** tab to set function or procedure configuration parameters.



Configuration parameter is set to the specified value when the function\procedure is entered, and then restored to its prior value on exiting.

Use the **Parameter Name** list to select settable run-time parameters.

Parameter Value
Enter a new value of parameter. Values can be specified as string constants, identifiers, numbers, or comma-separated lists of these, as appropriate for the particular parameter.

If the **Take Current Value** option is checked for a particular parameter then the session's current value of the parameter is saved as the value to be applied when the function\procedure is entered.

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5.4.3.4 Executing functions

Function Editor provides an ability to execute functions. Click the **Execute** item of the Navigation bar[240] or use the corresponding toolbar[240] button to execute the function.

If the function has input parameters, SQL Manager allows you to specify the values for these parameters in the Input Parameters[247] dialog, which appears just before execution.

The result of the successfully executed function, as well as the error message in case of execution failure, appears in the message panel at the bottom of the **Function Editor** window.

Note: If any unsaved changes are applied to the stored function being currently edited, the execution of the function is impossible unless changes are saved through the **Compile** item of the **Navigation bar**.

See also:

Specifying input parameters[247]

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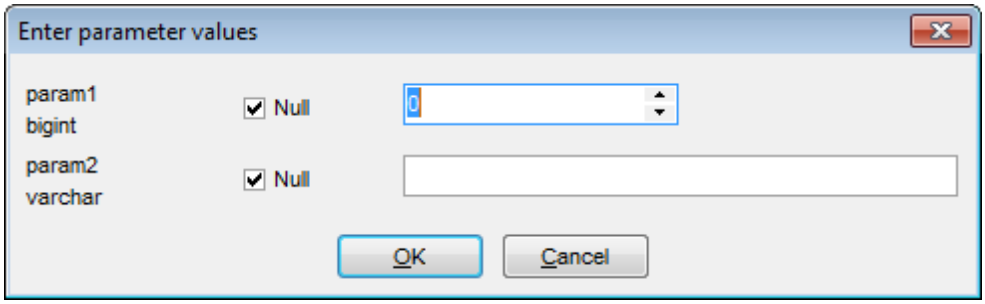
5.4.3.5 Specifying input parameters

If the stored function has parameters, the **Enter Parameter values** dialog appears before the function execution[246]. This dialog is provided for browsing the list of parameters of the function and allows you to specify the values for all function parameters. After changes are done, click the **OK** button to execute the stored function, or the **Cancel** button to abort the execution.



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5.4.3.6 Debugger

To fix the errors in the function or procedure code and to optimize its work, you can debug the function or procedure step-by-step before compilation, using the **Debugger**.

To activate the debugger, open the function or procedure in the Editor, then click the **Debug** button on the toolbar 240 or on the Navigation bar 240.

NB You can use **Debug with extension** button to debug with server pldbgapi extension. In this case you will be able to use Step into feature, which is not available in the built-in program debugger. To install the extension 867 use Services --> Database extensions.

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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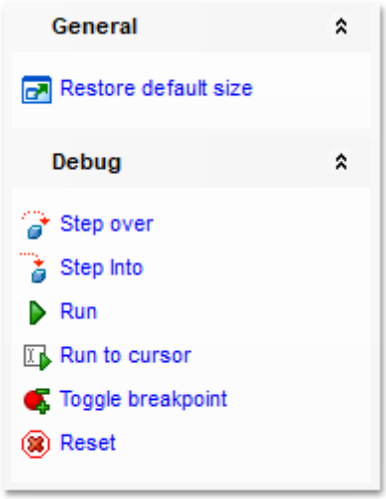
5.4.3.6.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in the **Debugger**.



General

restore the default size and position of the debugger window

Debug

commit retaining
step over the next statement
step into the statement. Available if Debug with extension 248 used
run the function\procedure
run the function\procedure to cursor
toggle breakpoint at the current statement
reset function\procedure execution

Items of the **Navigation bar** are also available on the **ToolBar** of **Function Debugger**. To enable the toolbar 963, open the Environment Options 871 dialog, proceed to the Windows 877 section there and select *Toolbar* (if you need the toolbar only) or *Both* (if you need both the toolbar and the Navigation bar 961) in the **Bar style for child forms** group.

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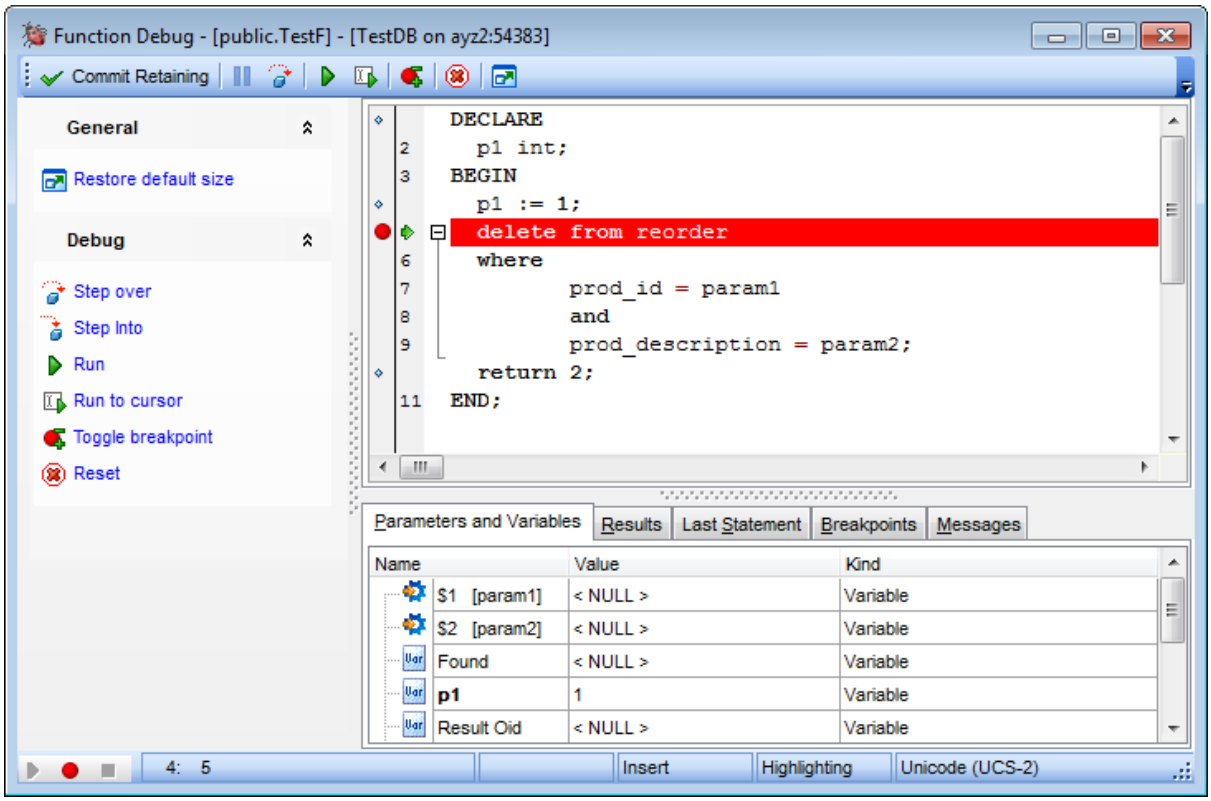
5.4.3.6.2 Debugging

The working area allows you to view the text of object definition.

The red spots (●) at the left of the workspace and red highlight stand for breakpoints[252]; the green arrow (➪) and blue highlight indicate the currently executed statement.



For your convenience the following shortcuts[1001] are implemented:

- To start executing step-by-step, press **F8**.
- To reset the execution, press the **Ctrl+F2** key combination.
- To add/remove a breakpoint to/from the current statement, press the **Ctrl+F8** key combination.
- To run the function\procedure (to the end or to the next breakpoint) press **F9**.

Set mouse cursor over a parameter to see a **hint** with its current value.

Hint: Click an embedded function (or any other object) name with the *Ctrl* key pressed to open the object in its editor. For details see Using object links[425].

NB: **Step into** button is only available if Debug with extension[248] used

The lower area of the **Debugger** window allows you to browse *parameters and variables*, *results*, *last statement*, *breakpoints*, *messages*. For details see Browsing debug information[251].

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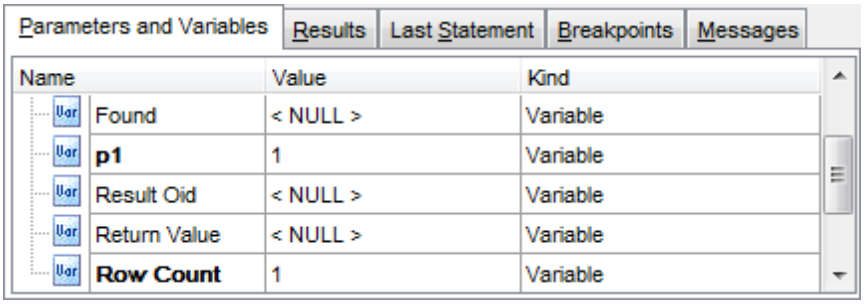
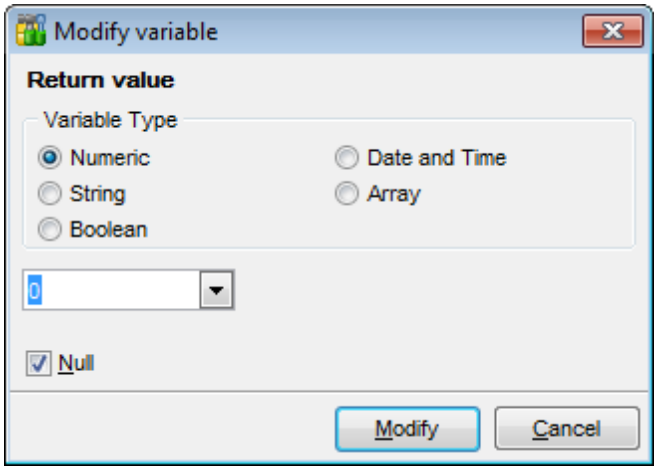
5.4.3.6.3 Browsing debug information

Use tabs at the bottom of the debugger window to view miscellaneous debug information.

Parameters and Variables
This tab displays the list of input and output parameters and variables (distinguished by respective icons) with their values and types.



Double-click an item in the list to call the **Modify variable** dialog allowing you to set the parameter/variable type and value.



Variable Type
Select the data type to be applied to the variable being edited:
- *Numeric*
- *String*
- *Boolean*
- *Date and Time*

Use the **Value** box below to specify a value for the variable, or select the **Null** option. The control varies according to the selected data type. For your convenience the *Calculator* and *Date editor* are implemented for *Numeric* and *Date and Time* types respectively: click the arrow-down button to call the *Calculator / Date editor* popup window.

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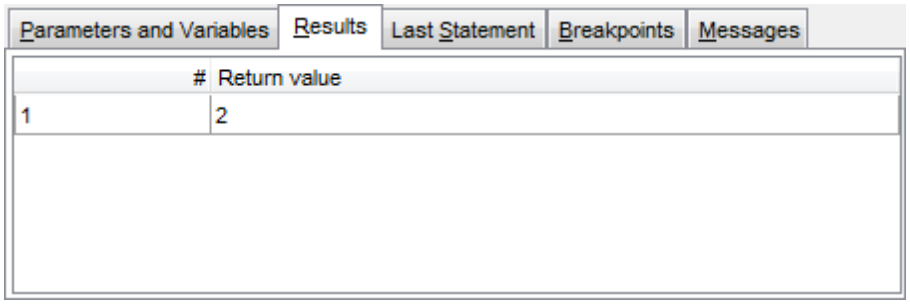
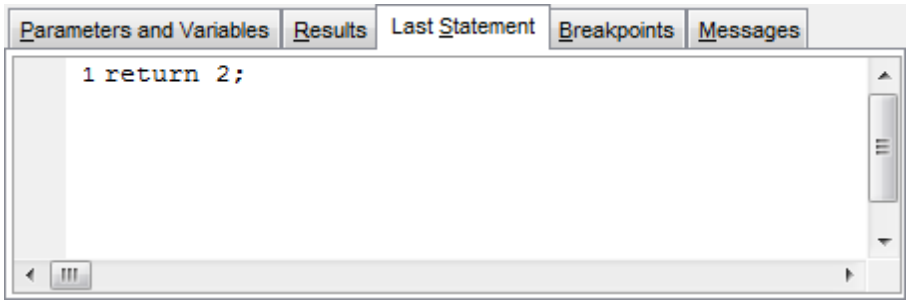
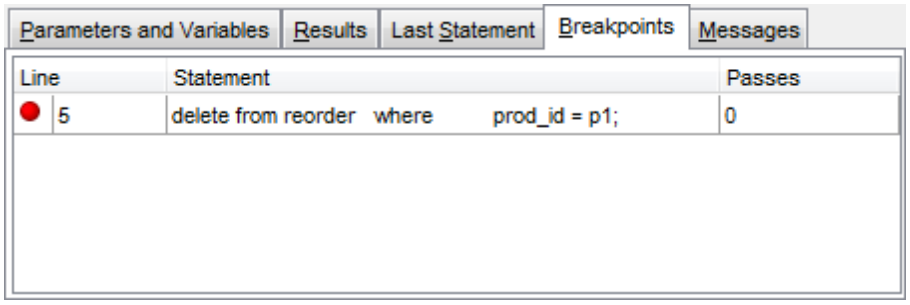
Results
This tab displays the function execution results.



Last Statement
This tab displays the last executed statement, the statement execution plan and the execution time.



Breakpoints
This tab displays the function breakpoints: the breakpoint line, statement and the number of its passes.



Messages
This tab displays various **Debugger** messages and errors (if any).

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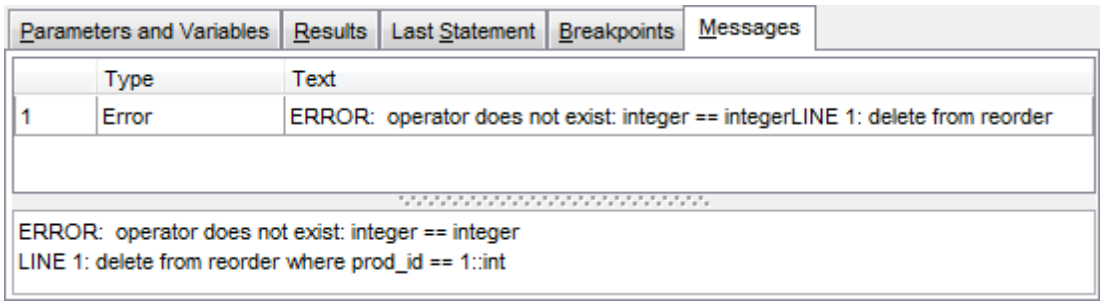

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5.4.4 Procedures

A Procedure is a part of code, which performs the row of actions, but doesn't return any values. One of the main features of procedures is using transaction in code. Procedures are supported in PostgreSQL server versions starting from 11.0.

You can create or edit existing procedures in Procedure editor 257.

Using Navigation bar and Toolbar 255
Creating/editing procedure 257
Setting configuration parameters 245
Specifying input parameters 247
Browsing object dependencies 967
Editing procedure description 966
Viewing DDL definition 965
Setting object permissions 968

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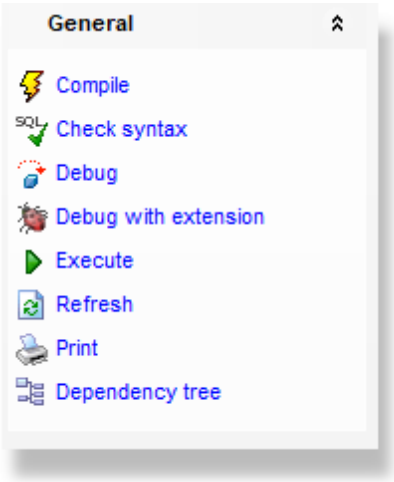
5.4.4.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Procedure Editor**.



The **Navigation bar** of **Procedure Editor** allows you to:

Object
select a database
select a procedure for editing

General
compile 969 the procedure (if it is being created/modified)
save the procedure description 966 (if it has been modified)
check procedure syntax
debug the procedure using debugger 248
execute 246 the function
refresh the content of the active tab
print metadata 680 of the function
view the dependency tree 638 for the function
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the procedure:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

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NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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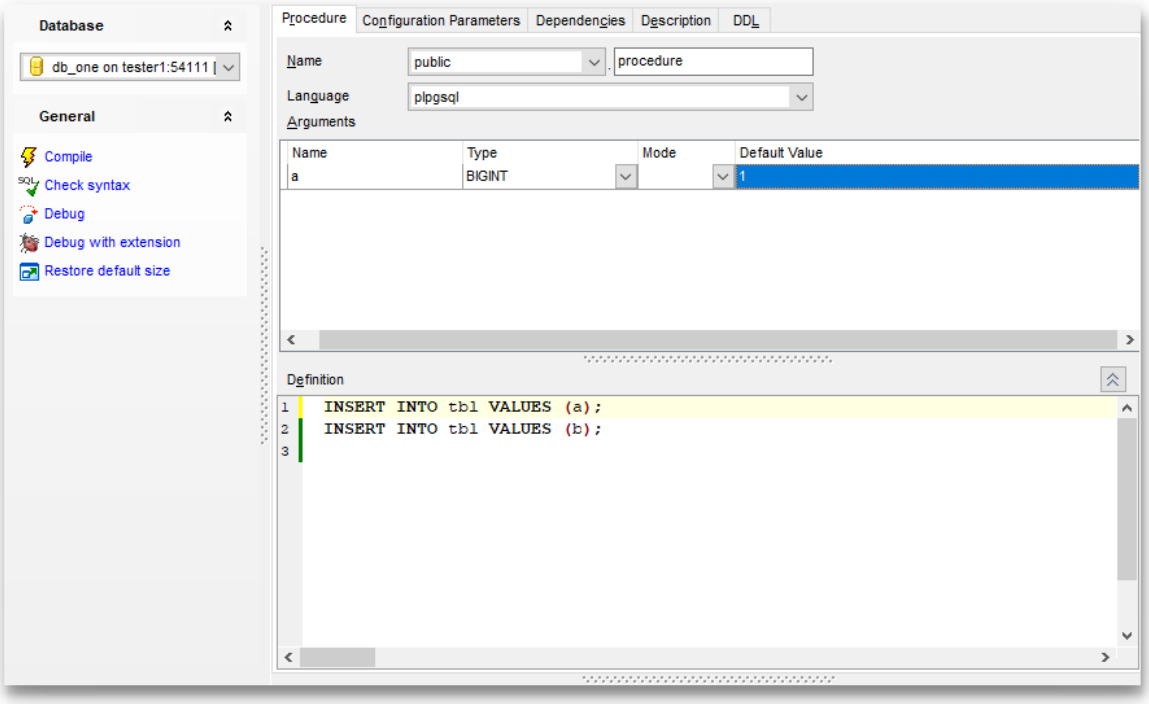
5.4.4.2 Creating/editing procedure

Use the **Procedure** tab of **Procedure Editor** to create/edit a procedure and specify its definition.

Name
Select a schema[164] and enter a name for the new procedure, or modify the name of the procedure being edited.



Language
Select the language that the procedure is implemented in: SQL, C, internal, or the name of a user-defined procedural language[321].

The **Arguments** list provides the following attributes of each argument used in the function:
Name
Type (the argument data type)
Mode (*in*, *out*, *in/out*)
Default value

Set the procedure arguments by right-clicking in the list and selecting **Add Argument**. Once the argument is added, select its type from the **Argument Type** drop-down list. To delete the existing argument, select **Delete Argument** from the popup menu. To reorder the arguments within the list, use the **Move Up** and **Move Down** items or the corresponding *Ctrl+Up/Ctrl+Down* shortcuts[1001].

Definition
This area allows you to set the procedure definition (body).

For your convenience the **syntax highlight**, **code folding**, using macro and a number of other features for efficient SQL editing are implemented. For details see Working with

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Query Data area 418, Using the context menu 420 and .

To execute the function you can use the **Execute** item available within the Navigation bar 240 or toolbar 240.

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5.4.5 Domains

A **Domain** is based on a particular base type[278] and for many purposes is interchangeable with its base type. However, a domain may have constraints that restrict its valid values to a subset of what the underlying base type would allow.

Domain Editor allows you to define domain properties. It opens automatically when you create[155] a new domain and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[260]
- Creating/editing domain[263]
- Managing domain checks[262]
- Browsing object dependencies[967]
- Editing domain description[966]
- Viewing DDL definition[965]
- Setting object permissions[968]

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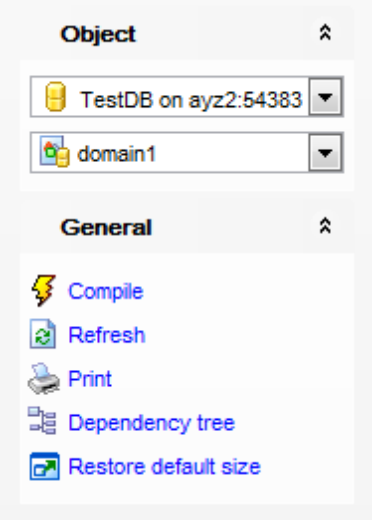
5.4.5.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Domain Editor**.



Object
select a database
select a domain for editing

General
compile[969] the domain (if it is being created/modified)
save the domain description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the domain
view the dependency tree[638] for the domain
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the domain:

Checks
add[216] a new check
edit[216] selected check
drop[216] selected check(s)

Description
save object description[966] to file
copy description[966] to clipboard

DDL
save DDL[965] to file
open DDL[965] in Query Data[415]

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NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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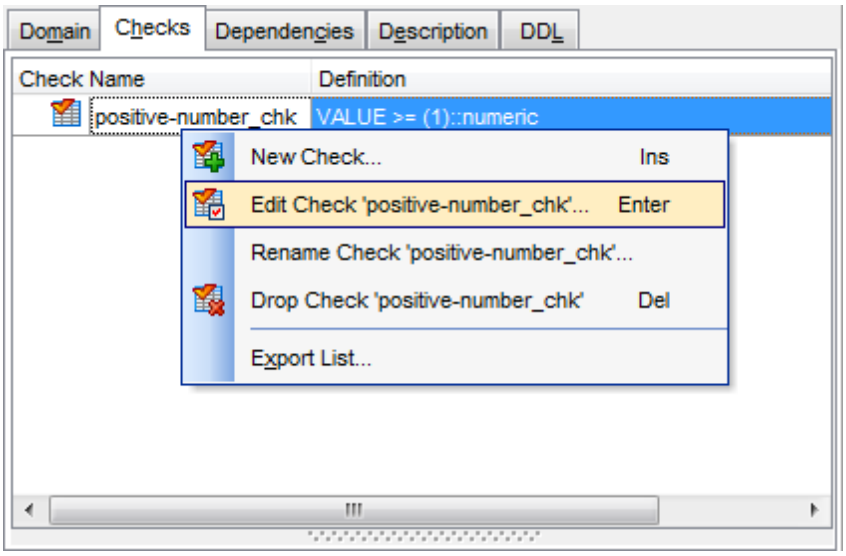
5.4.5.2 Managing domain checks

The **Checks** tab is provided for managing domain checks. Double-click a check to call Check Editor[217] for editing the check. A right-click displays the context menu allowing you to create a new, edit, or drop the selected check.



See Checks[216] for details.

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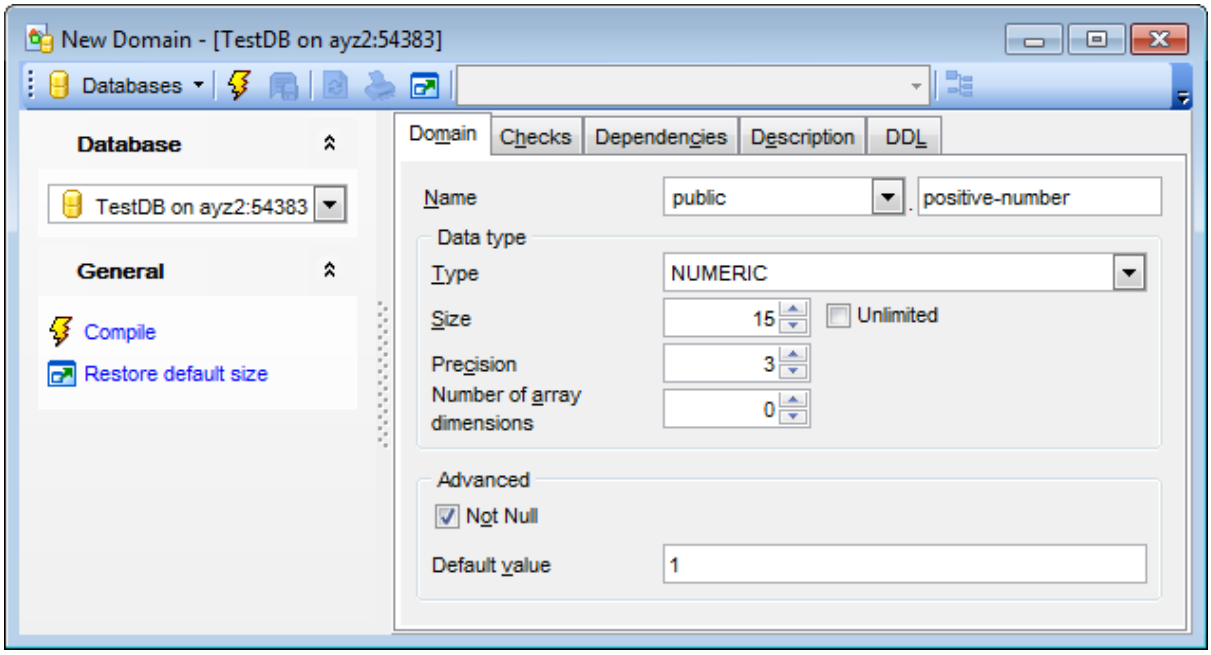
5.4.5.3 Creating/editing domain

Use the **Domain** tab of **Domain Editor** to create/edit a domain and specify its definition.

Name
Select a schema[164] and enter a name for the new domain, or modify the name of the domain being edited.



Data type

Select the underlying *data type* of the domain from the drop-down list, and set its *size*, *precision*, if required for the selected data type. To create an array of the chosen type, use the **Number of array dimensions** spinner control.

Advanced

Not Null
If enabled, specifies that values of this domain are not allowed to be null.

Default value
This specifies a default value for columns of the domain data type. The value is any variable-free expression (but subqueries are not allowed). The data type of the default expression must match the data type of the domain. If no default value is specified, then the default value is the null value.
The default expression will be used in any insert operation that does not specify a value for the column. If a default value is defined for a particular column, it overrides any default associated with the domain. In turn, the domain default overrides any default value associated with the underlying data type.

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5.4.6 Rules

The **Rule** system modifies queries to take rules into consideration, and then passes the modified query to the query planner for planning and execution. It is very powerful, and can be used for many things such as query language procedures, views, and versions.

Rule Editor allows you to define rule properties. It opens automatically when you create 155 a new rule and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 265
- Creating/editing rule 266
- Browsing object dependencies 967
- Editing rule description 966
- Viewing DDL definition 965

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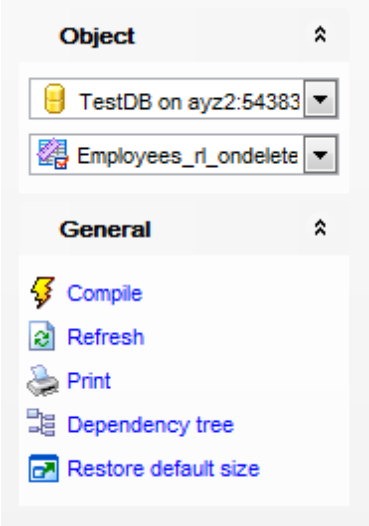
5.4.6.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Rule Editor**.



Object
select a database
select a rule for editing

General
compile 969 the rule (if it is being created/modified)
save the rule description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the rule
view the dependency tree 638 for the rule
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the rule:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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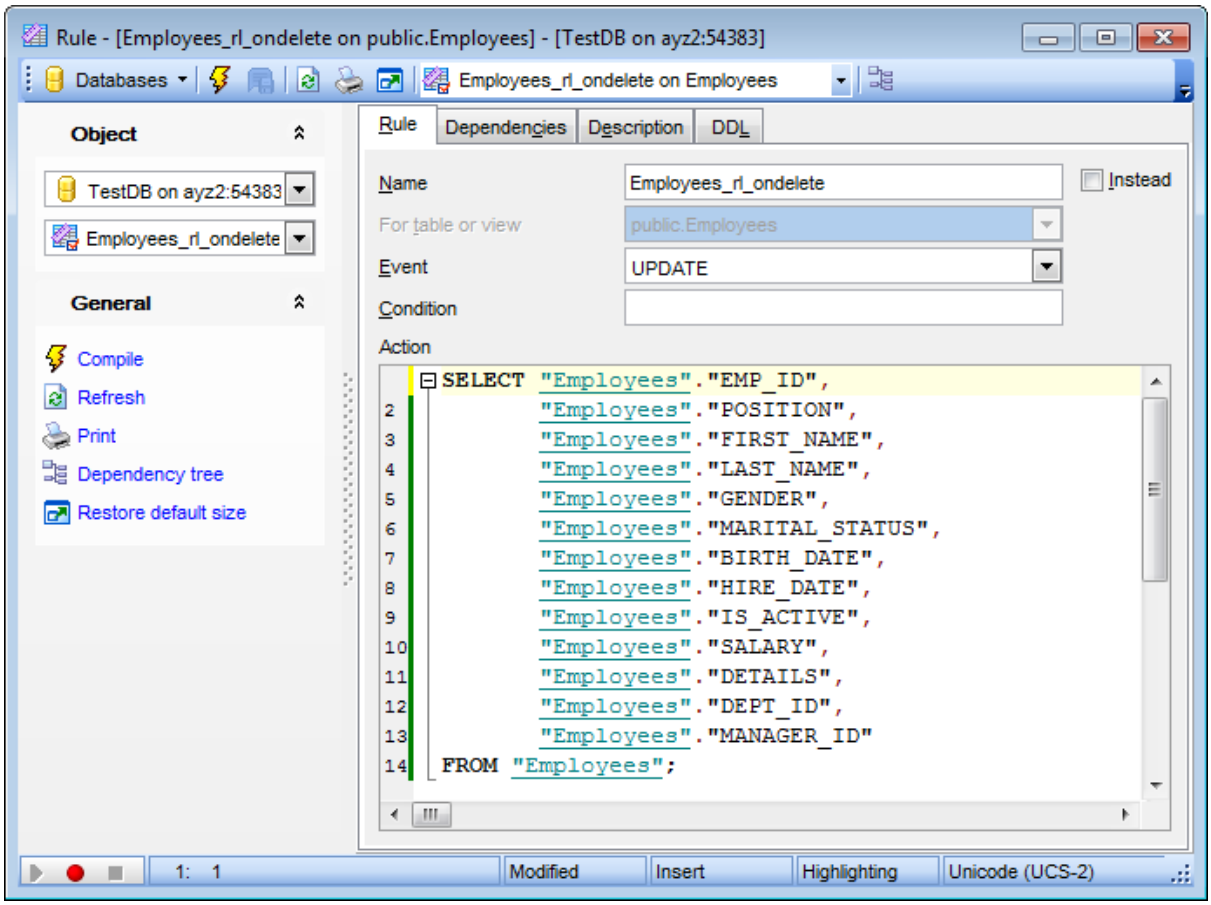
5.4.6.2 Creating/editing rule

Use the **Rule** tab of **Rule Editor** to create/edit a rule and specify its definition.

Name
Enter a name for the new rule, or modify the name of the rule being edited.

For table or view
Use the drop-down list to select the table/view the rule applies to.

☑ **Instead**
This option indicates that the commands should be executed instead of the original command.



Event
Use the drop-down list to select the rule event: *SELECT*, *UPDATE*, *INSERT*, *DELETE*.

Condition
Specify the condition that defines the rule using arithmetic and relational operators. This can be any SQL conditional expression (returning *boolean*). The condition expression may not refer to any tables except NEW and OLD, and may not contain aggregate functions.

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Action
This area represents the action(s) to be taken upon the specified event occurrence. Specify the command or commands that make up the rule action. Valid commands are *SELECT*, *INSERT*, *UPDATE*, *DELETE*, or *NOTIFY*.

For your convenience the **syntax highlight**, **code folding** and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area 418 and Using the context menu 420.

The possibility to use macros is also implemented.
To *start recording* a macro, click the **Record** button available in the status bar area, or use the *Shift+Ctrl+R* shortcut.
To *stop recording*, click the **Stop** button, or use the *Shift+Ctrl+R* shortcut.
To *call* the recorded macro, use the **Play** button, or use the *Shift+Ctrl+P* shortcut.

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5.4.7 Triggers

A **trigger** is a special kind of stored procedure that automatically executes when an event occurs in the database.
Data manipulation language triggers are executed in response to user's attempts to change data with the help of DML. DML events include *INSERT*, *UPDATE* and *DELETE* operations which can be applied to a table.

Table triggers are managed within the **Triggers** tab of Table Editor 177.

Trigger Editor allows you to specify trigger definition and set trigger properties. It opens automatically when you create 155 a new trigger and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 269
- Editing trigger definition 271
- Browsing object dependencies 967
- Editing trigger description 966
- Viewing DDL definition 965

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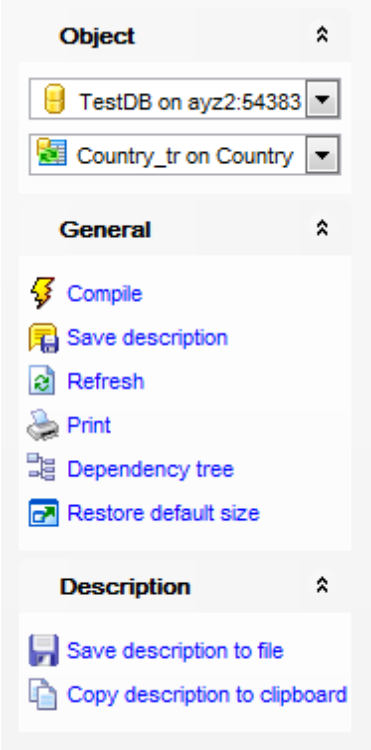
5.4.7.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Trigger Editor**.



Object
select a database
select a trigger for editing

General
compile 969 the trigger (if it is being created/modified)
save the trigger description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the trigger
view the dependency tree 638 for the trigger
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the trigger:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file

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open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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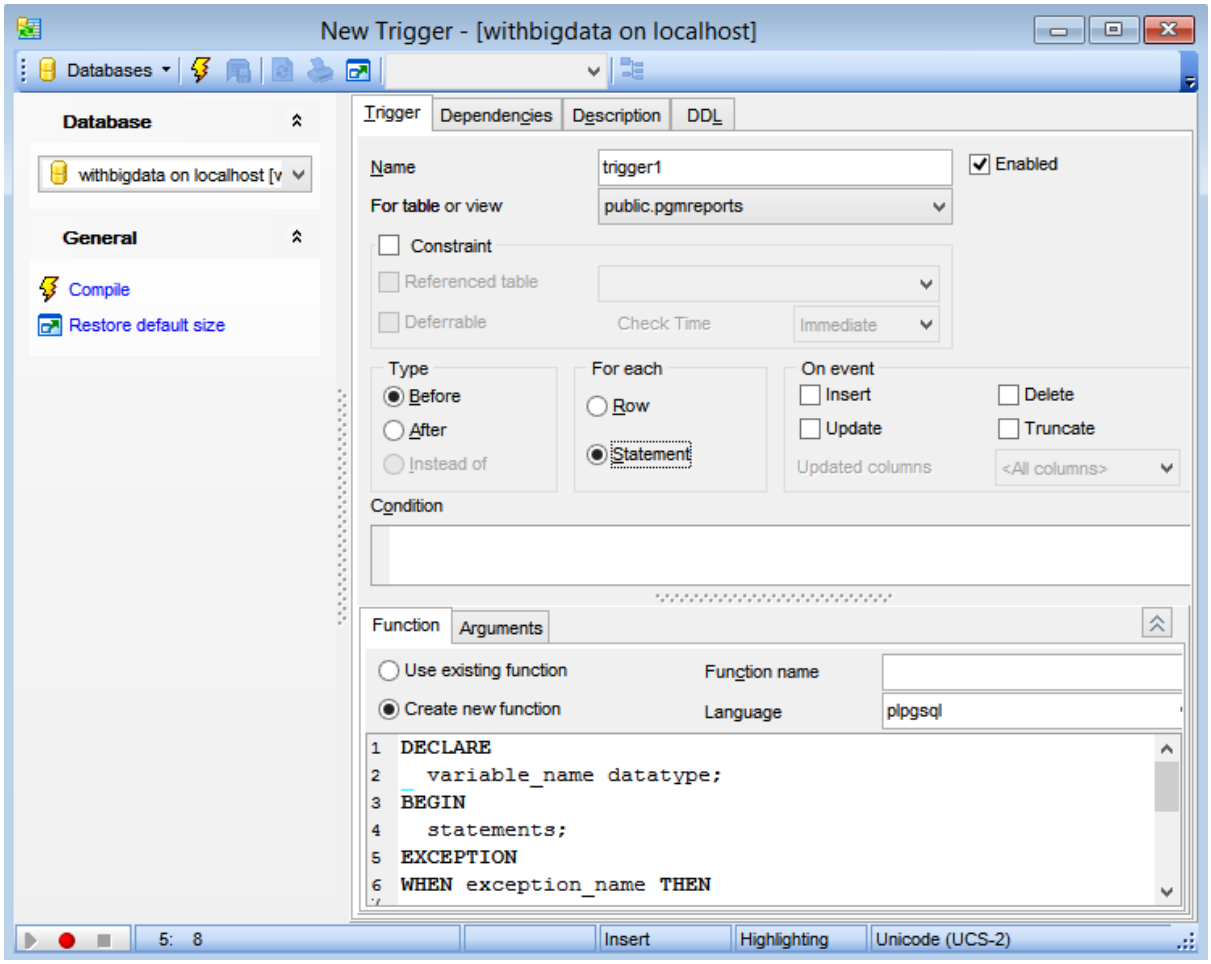
5.4.7.2 Editing trigger definition

Use the **Trigger** tab of **Trigger Editor** to create/edit a table trigger and specify its properties.

Name
Enter a name for the new trigger, or modify the name of the trigger being edited.

Enabled
Enables/disables the trigger immediately after it is created.

For table or view
The drop-down list of tables 169 and views 229 allows you to select the table on which the trigger is executed.



Constraint
Check this option to create a constraint trigger with adjusted timing of firing. A constraint trigger can only be of After Row type.

Referenced table
Select the table for the trigger.

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Deferrable
This option controls whether the trigger can be deferred. Set this option to fire the trigger at the end of the containing transaction, otherwise it's fired at the end of the statement causing the triggering event.

Check time
This option specifies the default timing of the trigger: deferred trigger can be fired immediately or can be deferred.

Type
Select the trigger behaviour type:
Before
Specifies that the trigger is fired before the event.
After
Specifies that the trigger is fired after the event.

For each
This specifies whether the trigger procedure should be fired once for every row affected by the trigger event, or just once per SQL statement.

On event
Specify the data modification statements that activate the trigger when it is tried against this table: *Insert*, *Update*, *Delete* or *Truncate* (ON TRUNCATE is supported only from PostgreSQL version 8.4). At least one option must be specified.

Updated columns
From this drop-down list you can select the columns that will be updated.

Condition
Define statement for WHEN condition of the trigger.

Function
A user-supplied function that is declared as taking no arguments and returning type trigger, which is executed when the trigger fires. You can use already existing function or create new one.

Arguments
This area allows you to specify an optional list of arguments to be provided to the **function** when the trigger is executed. The arguments are literal string constants. Simple names and numeric constants may be written here, too, but they will all be converted to strings.

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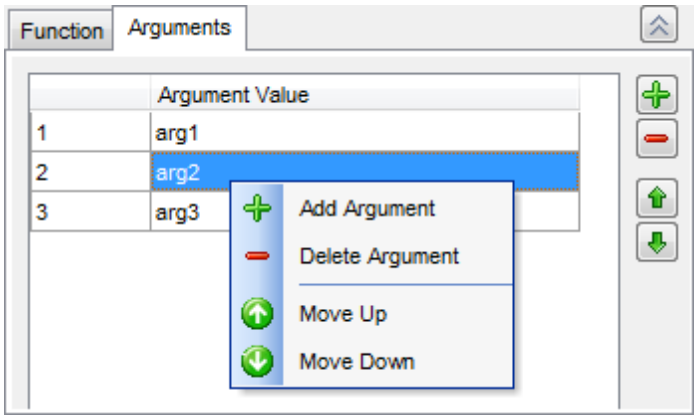

Set the arguments by right-clicking in the list and selecting **Add argument** from the context menu (or by pressing the corresponding button). After the argument is added, set its value in the **Argument Value** field. To delete the existing argument, select **Delete argument** from the context menu (or press the corresponding button).
To change the arguments order, use the **Move Up** / **Move Down** context menu items or the buttons.

The **Definition** area below specifies the trigger conditions and actions that determine whether the tried DML statements cause the trigger actions to be performed. The trigger actions take effect when the DML operation is performed.

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5.4.8 Sequences

Sequence objects (also called *sequence generators* or just *sequences*) are special single-row tables. A sequence object is usually used to generate unique identifiers for rows of a table.

Sequence Editor allows you to define sequence properties. It opens automatically when you create 155 a new sequence and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 275
- Creating/editing sequence 276
- Browsing object dependencies 967
- Editing sequence description 966
- Viewing DDL definition 965
- Setting object permissions 968

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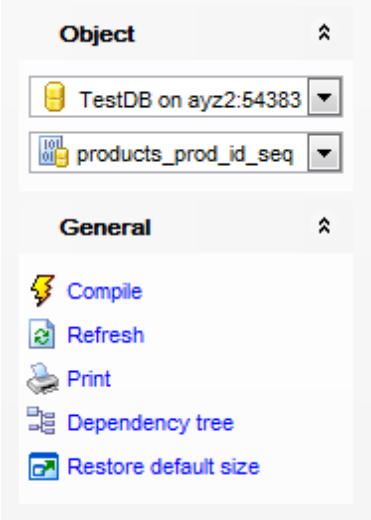
5.4.8.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Sequence Editor**.



Object
select a database
select a sequence for editing

General
compile[969] the sequence (if it is being created/modified)
save the sequence description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the sequence
view the dependency tree[638] for the sequence
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the sequence:

Description
save object description[966] to file
copy description[966] to clipboard

DDL
save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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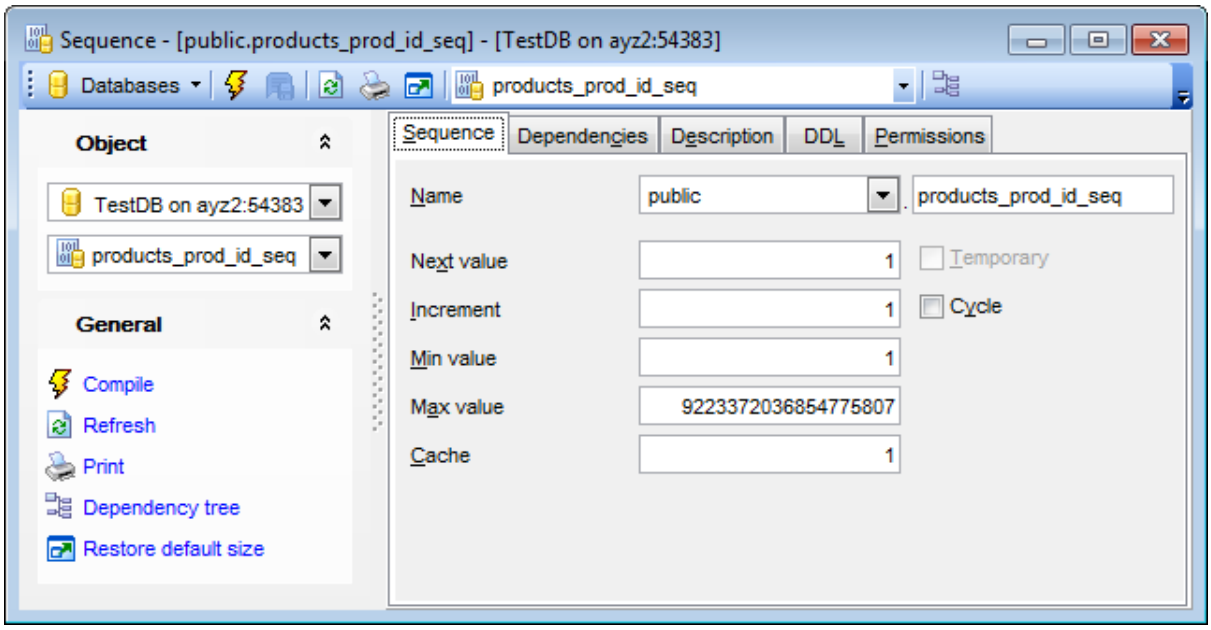
5.4.8.2 Creating/editing sequence

Name
Select a schema[164] and enter a name for the new sequence, or modify the name of the sequence being edited.



Next Value (**Start value -** when creating a new sequence)
This option defines the sequence value to begin from. The default starting value is **Min value** for ascending sequences and **Max value** for descending ones.

Increment
Specifies which value is added to the current sequence value to create a new value. A positive value will make an ascending sequence, a negative one a descending sequence. The default value is *1*.

Min Value
Determines the minimum value a sequence can generate.

Max Value
Determines the maximum value for the sequence.

Cache
Specifies how many sequence numbers are to be preallocated and stored in memory for faster access. The minimum value is *1* (only one value can be generated at a time, i.e., no cache).

☑ **Temporary**
If specified, the sequence object is created only for this session, and is automatically dropped on session exit. Existing permanent sequences with the same name are not visible (in this session) while the temporary sequence exists, unless they are referenced with schema-qualified names.

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Cycle
This option allows the sequence to wrap around when the maxvalue or minvalue has been reached by an ascending or descending sequence respectively. If the limit is reached, the next number generated will be the minvalue or maxvalue, respectively. Otherwise, any calls to nextval after the sequence has reached its maximum value will return an error.

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5.4.9 Base Types

A **Type** is internally represented as an existing type, but is considered to be a separate data type.

Base types are those, like int4, that are implemented below the level of the SQL language (typically in a low-level language such as C). They generally correspond to what are often known as **abstract data types**. PostgreSQL can only operate on such types through functions provided by the user and only understands the behavior of such types to the extent that the user describes them. Base types are further subdivided into **scalar** and **array** types. For each scalar type, a corresponding array type is automatically created that can hold variable-size arrays of that scalar type.

Base Type Editor allows you to define base type properties. It opens automatically when you create 155 a new base type and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 279
- Creating/editing base type 281
- Browsing object dependencies 967
- Editing base type description 966
- Viewing DDL definition 965
- Setting object permissions 968

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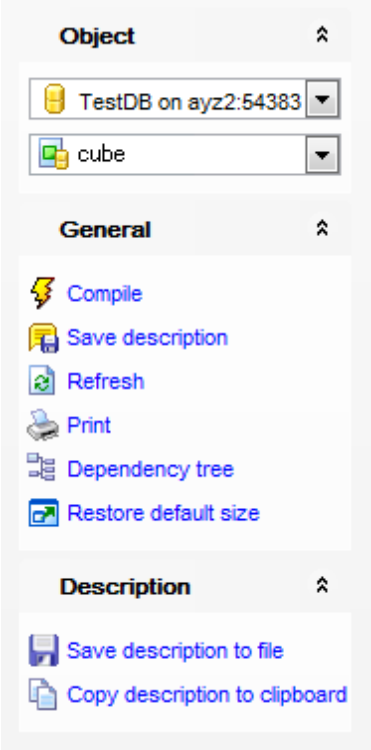
5.4.9.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Base Type Editor**.



Object
select a database
select a base type for editing

General
compile 969 the base type (if it is being created/modified)
save the base type description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the base type
view the dependency tree 638 for the base type
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the base type:

Description
save object description 966 to file
copy description 966 to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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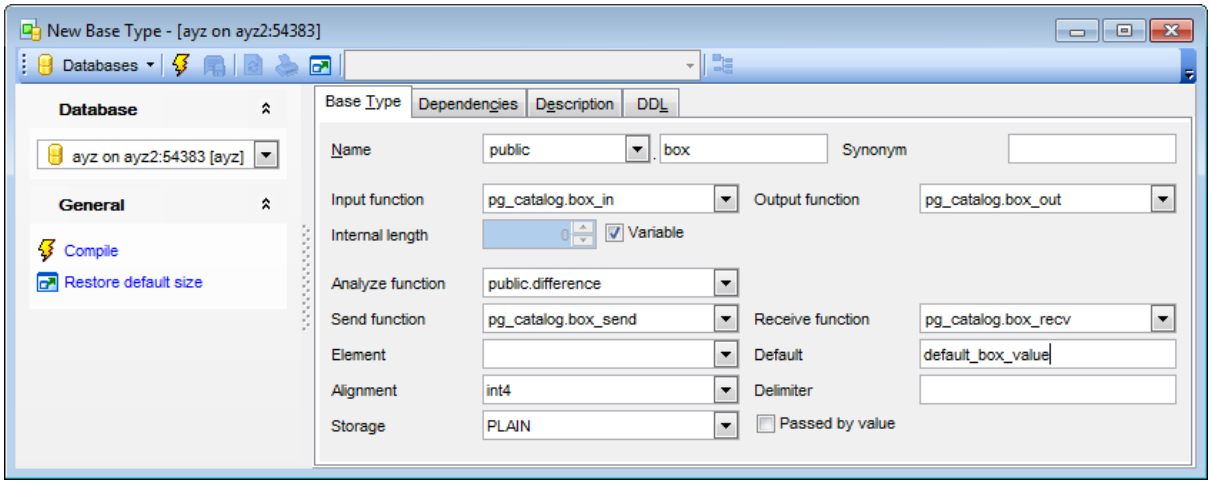
5.4.9.2 Creating/editing base type

The **Base Type** tab of **Base Type Editor** allows you to view/edit the base type properties.

Name
Select a schema[164] and enter a name for the new base type, or view the name of the base type being edited.



Synonym
Set the type synonym (available for older server versions).

Input function
Use the drop-down list to select the function[239] that will convert data from the type's external textual form to its internal form.

Output function
Use the drop-down list to select the function[239] that will convert data from the type's internal form to its external textual form.

Internal length
This value specifies the length (in bytes) of the new type's internal representation. Use the spinner control to set a value or check the **Variable** option to apply variable-length (default assumption).

External length
This value specifies the length (in bytes) of the new type's external representation. Use the spinner control to set a value or check the **Variable** option if the type length is unknown (for server version 7.3 and lower only).

Analyze function
Use the drop-down list to select the function[239] that will perform statistical analysis for the data type.

Receive function
Use the drop-down list to select the function[239] that will convert data from the type's

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external binary form to its internal form.

Send function
Use the drop-down list to select the function that will convert data from the type's internal form to its external binary form.

Element
If the type being created is an array, use the drop-down list to specify the type of the array elements.

Default
If necessary, specify the default value for the data type. By default the NULL value is applied.

Alignment
Use the drop-down list to select the storage alignment requirement of the data type: *char*, *int2*, *int4*, or *double*.

Delimiter
If necessary, specify the delimiter character to be used between values in arrays made of this type.

Storage
Use the drop-down list to select the storage strategy for the data type: *PLAIN*, *MAIN*, *EXTERNAL*, *EXTENDED*.

☑ **Passed by value**
This option indicates that values of this data type are passed by value rather than by reference.

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5.4.10 Composite Types

A **Type** is internally represented as an existing type, but is considered to be a separate data type.

Composite types, or **row types**, are created whenever the user creates a table; it is also possible to define a "stand-alone" composite type with no associated table. A composite type is simply a list of types with associated field names. A value of a composite type is a row or record of field values. The user can access the component fields from SQL queries.

Composite Type Editor allows you to define composite type properties. It opens automatically when you create 155 a new composite type and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 284
- Creating/editing composite type 286
- Browsing object dependencies 967
- Editing composite type description 966
- Viewing DDL definition 965
- Setting object permissions 968

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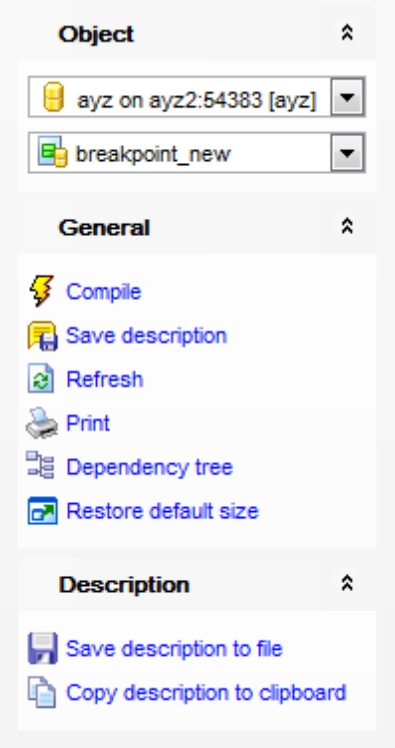
5.4.10.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Composite Type Editor**.



Object
select a database
select a composite type for editing

General
compile 969 the composite type (if it is being created/modified)
save the composite type description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the composite type
view the dependency tree 638 for the composite type
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the composite type:

Description
save object description 966 to file
copy description 966 to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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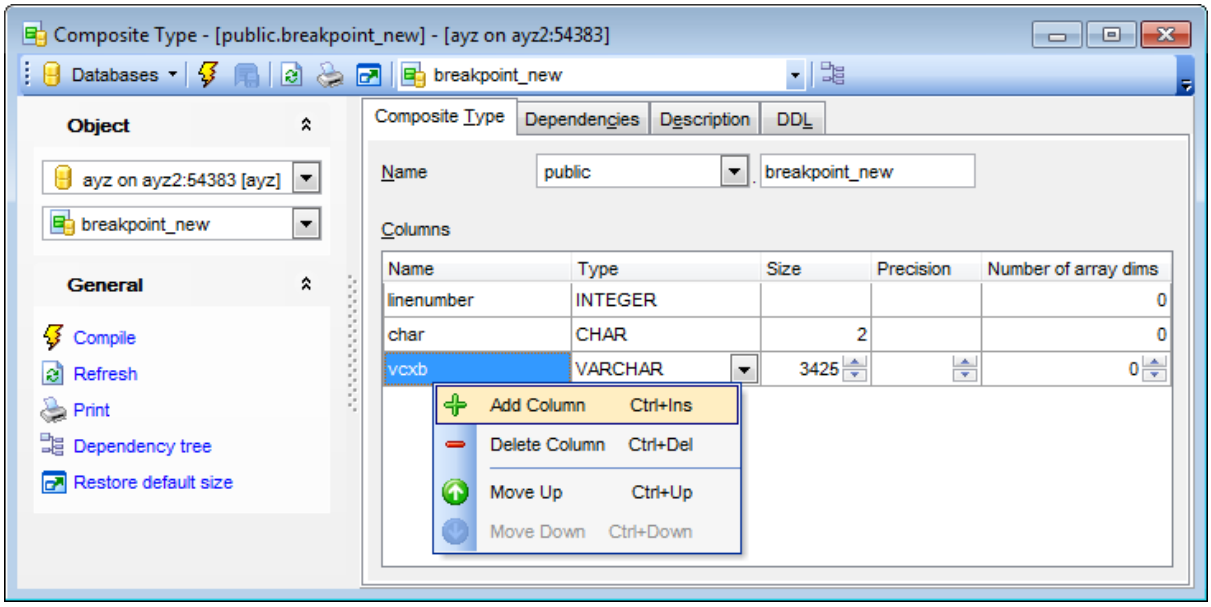
5.4.10.2 Creating/editing composite type

The **Composite Type** tab of **Composite Type Editor** allows you to view/edit the composite type properties.

Name
Select a schema[164] and enter a name for the new composite type, or modify the name of the composite type being edited.



Columns
This grid lists the arguments (columns) of the composite type: *Name*, *Type*, *Size*, *Precision*, *Number of array dims*.

Right-click within the **Columns** area to display the context menu allowing you to *add* new, *delete* the selected column, or move it up/down within the list.

Name
The name of an attribute (column) for the composite type.

Type
The name of an existing data type to become a column of the composite type.

Size
Specifies the size of the type for this attribute.

Precision
Specifies the precision of the type for this attribute. The precision indicates the number of significant digits.

Number of array dims
Specifies the number of array dimensions (for multidimensional arrays).

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5.4.11 Enumerated Types

A **Type** is internally represented as an existing type, but is considered to be a separate data type.

Enumerated types, or **ENUM types**, are data types that are comprised of a static, predefined set of values with a specific order. They are equivalent to the enum types in a number of programming languages. An example of an enum type might be the days of the week, or a set of status values for a piece of data.

ENUM Type Editor allows you to define ENUM type properties. It opens automatically when you create 155 a new ENUM type and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 288
- Creating/editing ENUM type 290
- Browsing object dependencies 967
- Editing ENUM type description 966
- Viewing DDL definition 965
- Setting object permissions 968

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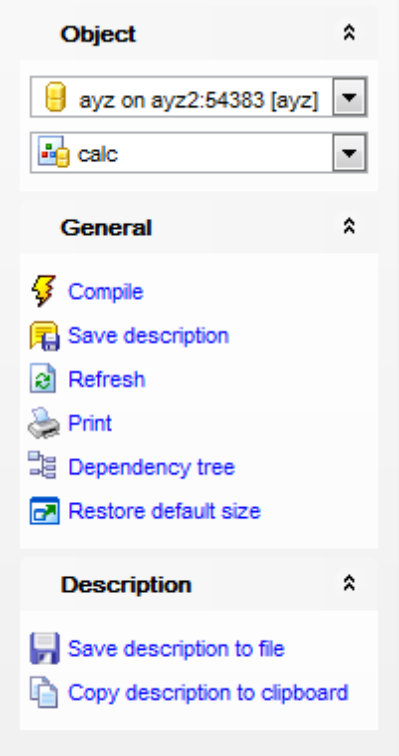
5.4.11.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **ENUM Type Editor**.



Object
select a database
select an enumerated type for editing

General
compile 969 the enumerated type (if it is being created/modified)
save the enumerated type description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the enumerated type
view the dependency tree 638 for the enumerated type
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the enumerated type:

Description
save object description 966 to file
copy description 966 to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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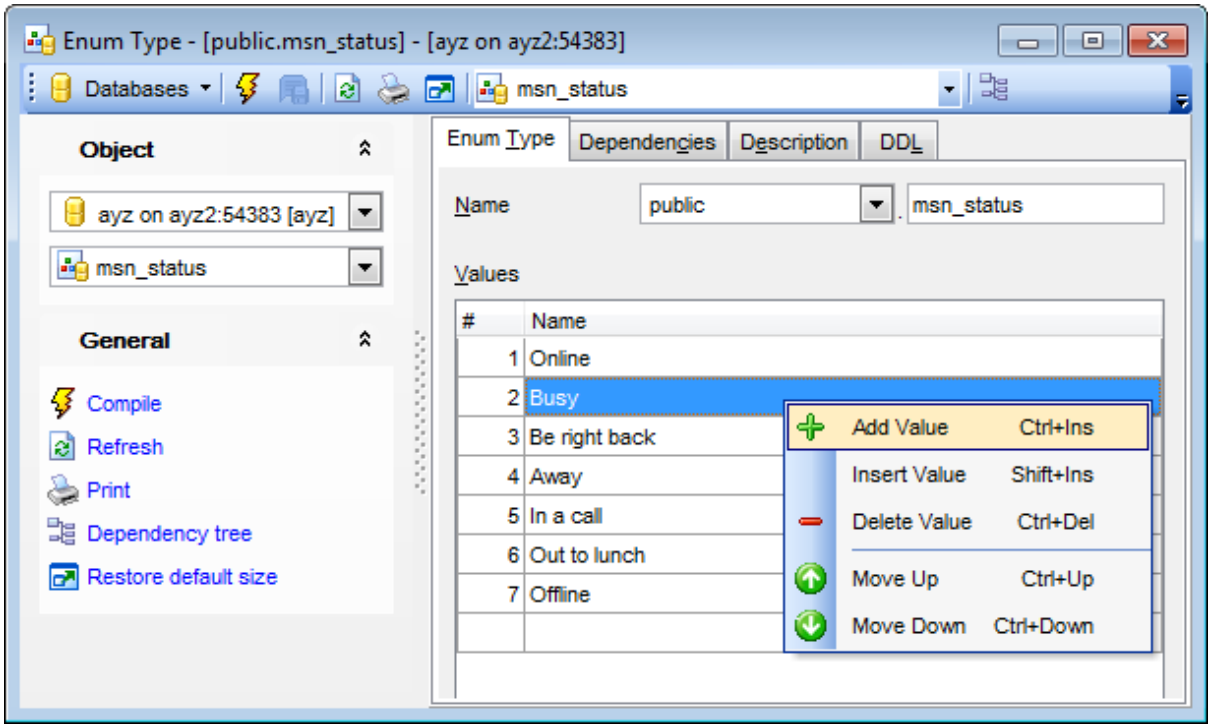
5.4.11.2 Creating/editing ENUM type

The **ENUM Type** tab of **ENUM Type Editor** allows you to view/edit the enumerated type properties.

Name
Select a schema[164] and enter a name for the new enumerated type, or modify the name of the enumerated type being edited.



Values
This grid lists the values implied by the enumerated type.

Right-click within the **Values** area to display the context menu allowing you to *add* new, *delete* the selected value, or move it up/down within the list.

Name
Specifies a string representing the textual label associated with one value of the enumerated type.

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5.4.12 Range Types

A **Type** is internally represented as an existing type, but is considered to be a separate data type.

Range types are data types representing a range of values of some element type (called the range's subtype). For instance, ranges of timestamp might be used to represent the ranges of time that a meeting room is reserved. In this case the data type is tsrange (short for "timestamp range"), and timestamp is the subtype. The subtype must have a total order so that it is well-defined whether element values are within, before, or after a range of values.

Range Type Editor allows you to define range type properties. It opens automatically when you create[155] a new range type and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[292]
- Creating/editing range type[294]
- Browsing object dependencies[967]
- Editing range type description[966]
- Viewing DDL definition[965]
- Setting object permissions[968]

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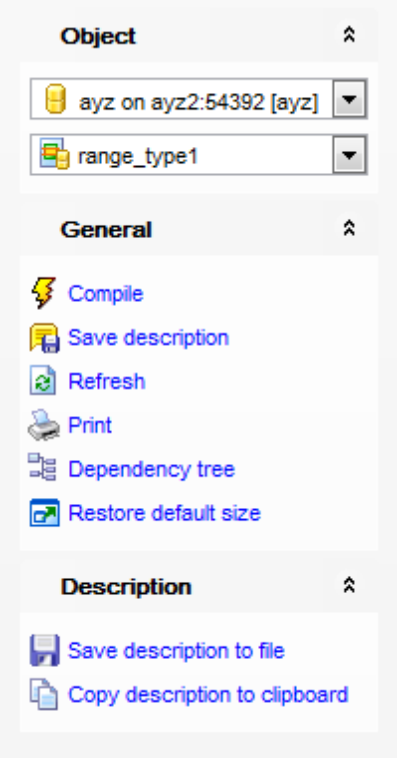
5.4.12.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Range Type Editor**.



Object
select a database
select a composite type for editing

General
compile 969 the range type (if it is being created/modified)
save the range type description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the range type
view the dependency tree 638 for the range type
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the range type:

Description
save object description 966 to file
copy description 966 to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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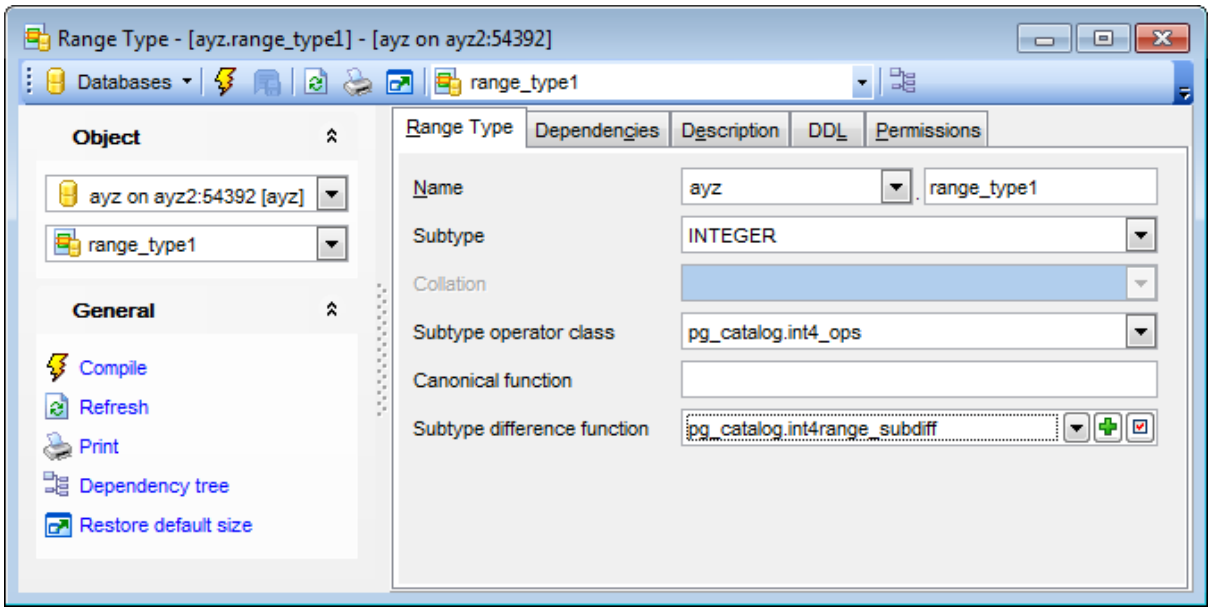
5.4.12.2 Creating/editing range type

The **Range Type** tab of **Range Type Editor** allows you to view/edit the range type properties.



Name
Select a schema[164] and enter a name for the new range type, or modify the name of the range type being edited.

Subtype
Use the drop-down list to select the subtype. The range type's subtype can be any type with an associated b-tree operator class (to determine the ordering of values for the range type).
If the selected subtype is collatable, and you want to use a non-default collation in the range's ordering, specify the desired collation in the **Collation** field.

Subtype operator class
If you want to use a non-default operator class, specify its name in this field.

Canonical function
Enter the canonical function name here. This function takes an input range value, and must return an equivalent range value that may have different bounds and formatting.

Subtype difference function
Use the drop-down list to specify the subtype difference function here. This function takes two input values of the subtype, and returns their difference (i.e., X minus Y).
You can use the button to create a new function or the button to edit selected function in Function Editor[239].

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5.4.13 Aggregates

Aggregate functions, or **Aggregates**, perform a calculation on a set of values and return a single value, i.e. compute a single result value from a set of input values.

Aggregate functions in PostgreSQL are expressed as state values and state transition functions. That is, an aggregate can be defined in terms of state that is modified whenever an input item is processed. To define a new aggregate function, one selects a data type for the state value, an initial value for the state, and a state transition function. The state transition function is just an ordinary function that could also be used outside the context of the aggregate. A final function can also be specified, in case the desired result of the aggregate is different from the data that needs to be kept in the running state value.

Aggregate Editor allows you to define aggregate properties. It opens automatically when you create 155 a new aggregate and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 296
- Creating/editing aggregate 298
- Browsing object dependencies 967
- Editing aggregate description 966
- Viewing DDL definition 965

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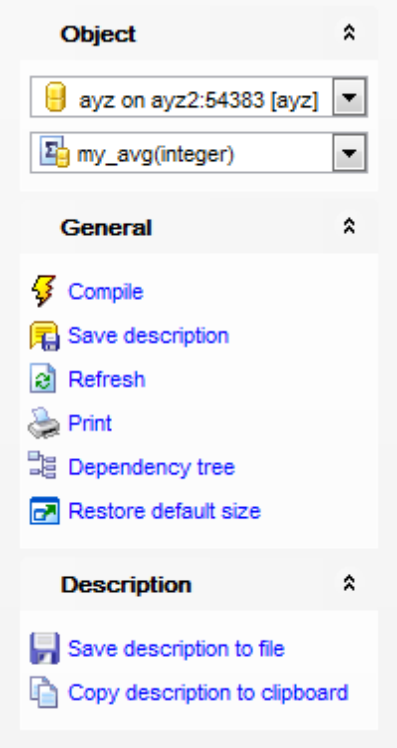
5.4.13.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Aggregate Editor**.



Object
select a database
select an aggregate for editing

General
compile 969 the aggregate (if it is being created/modified)
save the aggregate description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the aggregate
view the dependency tree 638 for the aggregate
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the aggregate:

Description
save object description 966 to file
copy description 966 to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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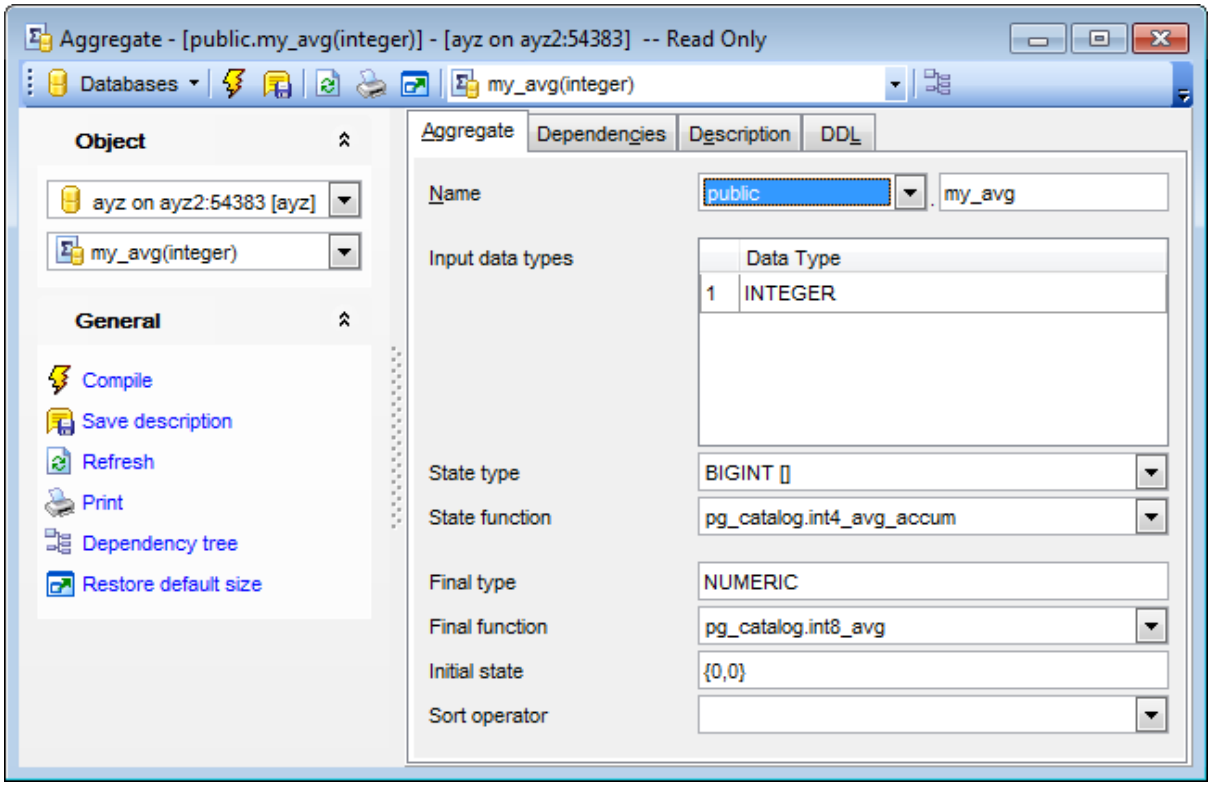
5.4.13.2 Creating/editing aggregate

Use the **Aggregate** tab of **Aggregate Editor** to create/edit an aggregate function and specify its definition.

Name
Select a schema[164] and enter a name for the new aggregate, or modify the name of the aggregate being edited.



Input data types
Use this area to specify the input data type(s) on which this aggregate function operates. This can be specified as "ANY" for an aggregate that does not examine its input values (an example is count(*)).

State type
Use the drop-down list to select the data type for the aggregate's state value.

State function
Use the drop-down list to select the name of the state transition function to be called for each input data value. This is normally a function of two arguments, the first being of type *state data type* and the second of type *input data type*. Alternatively, for an aggregate that does not examine its input values, the function takes just one argument of type *state data type*. In either case the function must return a value of type *state data type*. This function takes the current state value and the current input data item, and returns the next state value.

Final type

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Specifies the data type for the aggregate's result value.

Final function
Use the drop-down list to select the name of the final function called to compute the aggregate's result after all input data has been traversed. The function must take a single argument of type *state data type*. The return data type of the aggregate is defined as the return type of this function. If *ffunc* is not specified, then the ending state value is used as the aggregate's result, and the return type is *state data type*.

Initial state
Specifies the initial setting for the state value. This must be a string constant in the form accepted for the data type *state data type*. If not specified, the state value starts out of NULL.

Sort operator
Use the drop-down list to select the sort operator (for a MIN- or MAX-like aggregate).

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5.4.14 Operators

PostgreSQL supports *left unary*, *right unary*, and *binary* **operators**. **Operators** can be overloaded; that is, the same operator name can be used for different operators that have different numbers and types of operands. When a query is executed, the system determines the operator to call from the number and types of the provided operands.

Operator Editor allows you to define operator properties. It opens automatically when you create 155 a new operator and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 301
- Creating/editing operator 303
- Browsing object dependencies 967
- Editing operator description 966
- Viewing DDL definition 965

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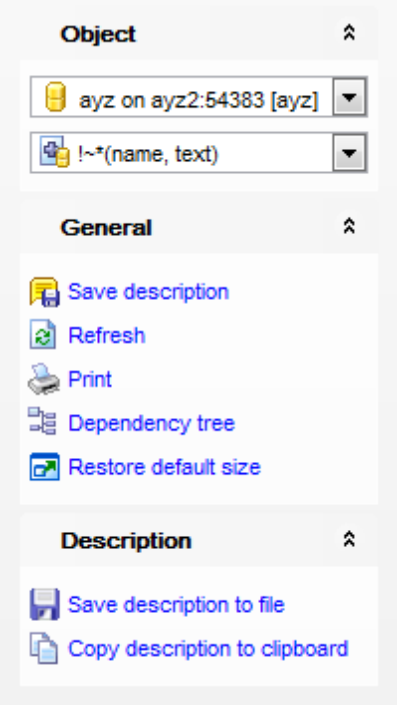
5.4.14.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Operator Editor**.



Object
select a database
select an operator for editing

General
compile 969 the operator (if it is being created/modified)
save the operator description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the operator
view the dependency tree 638 for the operator
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the operator:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file

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open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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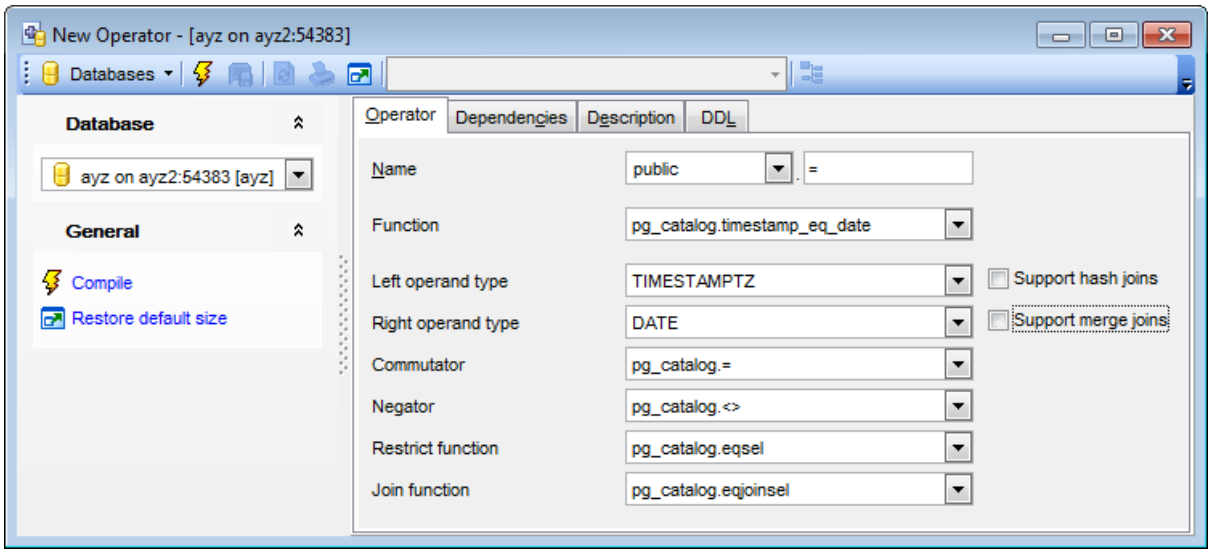
5.4.14.2 Creating/editing operator

Use the **Operator** tab of **Operator Editor** to create/edit an operator and specify its definition.



Name
Select a schema[164] and enter the name of the operator to be defined. See below for allowable characters. Two operators in the same schema can have the same name if they operate on different data types. This is called overloading.

The operator name is a sequence of up to NAMEDATALEN-1 (63 by default) characters from the following list:
+ - * / < > = ~ ! @ # % ^ & | ` ?
There are a few restrictions on your choice of name:

- -- and /* cannot appear anywhere in an operator name, since they will be taken as the start of a comment.
- A multicharacter operator name cannot end in + or -, unless the name also contains at least one of these characters:

~ ! @ # % ^ & | ` ?
For example, @- is an allowed operator name, but *- is not. This restriction allows PostgreSQL to parse SQL-compliant commands without requiring spaces between tokens.

Function
The function used to implement this operator. Select it from the list of all database functions[239].

Left operand type
The type of the left-hand argument of the operator, if any. This option would be omitted for a left-unary operator.

Right operand type
The type of the right-hand argument of the operator, if any. This option would be omitted for a right-unary operator.

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Commutator
Use the drop-down list to select the commutator of this operator.

Negator
Use the drop-down list to select the negator of this operator.

Restrict function
Use the drop-down list to select the restriction selectivity estimator function for this operator.

Join function
Use the drop-down list to select the join selectivity estimator function for this operator.

Support hash joins
Check this option to indicate that this operator can support a hash join.

Support merge joins
Check this option to indicate that this operator can support a merge join.

Left sort operator
If this operator can support a merge join, select the operator that sorts the left-hand data type of this operator.

Right sort operator
If this operator can support a merge join, select the operator that sorts the right-hand data type of this operator.

Less than operator
If this operator can support a merge join, select the less-than operator that compares the input data types of this operator.

Greater than operator
If this operator can support a merge join, select the greater-than operator that compares the input data types of this operator.

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5.4.15 Collations

The **collation** allows to specify the sort order and character classification behavior of data per-column, or even per-operation. This alleviates the restriction that the LC_COLLATE and LC_CTYPE settings of a database cannot be changed after its creation.

Collation Editor allows you to define Collation properties. It opens automatically when you create 155 a new Collation and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 306
- Creating/editing Collation 308
- Browsing object dependencies 967
- Editing Collation description 966
- Viewing DDL definition 965

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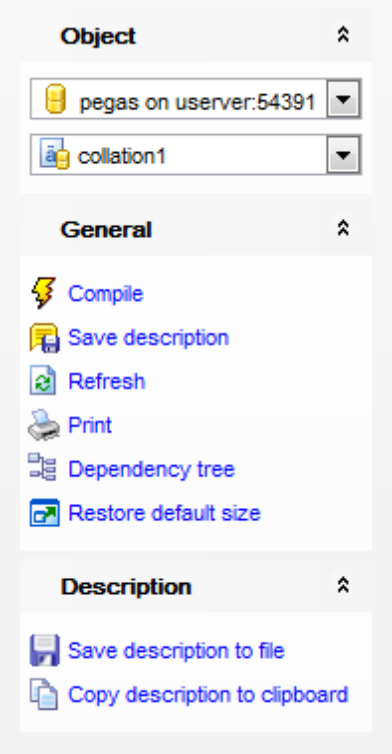
5.4.15.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Operator Editor**.



Object
select a database
select an operator for editing

General
compile[969] the Collation (if it is being created/modified)
save the Collation description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the Collation
view the dependency tree[638] for the Collation
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the Collation:

Description
save object description[966] to file
copy description[966] to clipboard

DDL
save DDL[965] to file

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open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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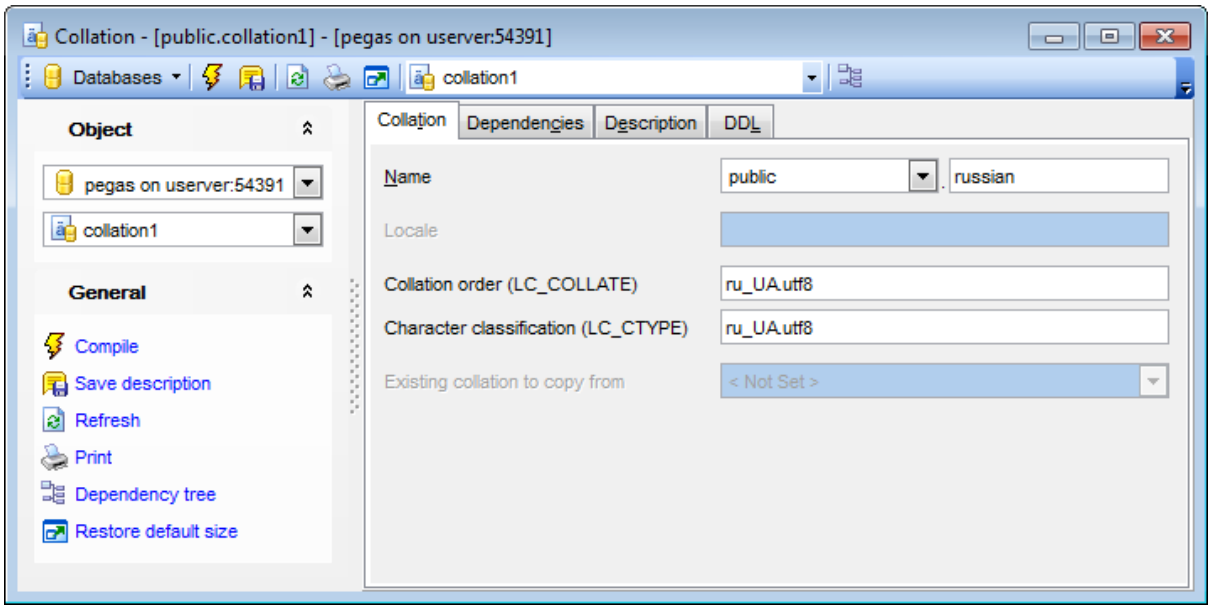
5.4.15.2 Creating/editing collation

Use the **Operator** tab of **Operator Editor** to create/edit an operator and specify its definition.



Name
The name of the collation. The collation name can be schema-qualified. If it is not, the collation is defined in the current schema. The collation name must be unique within that schema.

Locale
This is a shortcut for setting LC_COLLATE and LC_CTYPE at once. If you specify this, you cannot specify either of those parameters.

Collation order
Use the specified operating system locale for the LC_COLLATE locale category. The locale must be applicable to the current database encoding.

Character classification
Use the specified operating system locale for the LC_CTYPE locale category. The locale must be applicable to the current database encoding.

Existing collation to copy from
The name of an existing collation to copy from. The new collation will have the same properties as the existing one, but it will be an independent object.

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5.4.16 Statistics

The **statistics** creates a new extended statistics object to track data for the selected table, foreign table or materialized view.

Statistics Editor allows you to define Statistics properties. It opens automatically when you create[155] a new Statistics and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[306]
- Creating/editing statistics[311]
- Browsing object dependencies[967]
- Editing description[966]
- Viewing DDL definition[965]

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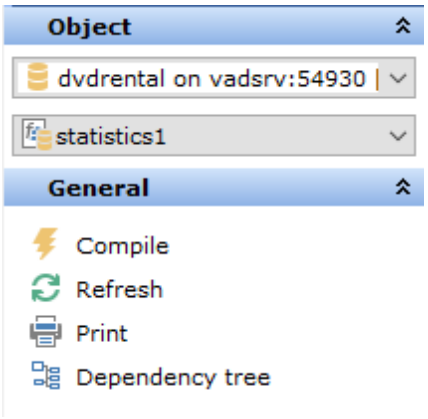
5.4.16.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Statistics Editor**.



Object
select a database
select a statistics for editing

General
compile 969 the Statistics (if it is being created/modified)
refresh the content of the active tab
print metadata 680 of the Statistics
view the dependency tree 638 for the Statistics
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the Statistics object:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Execute Script 646 editor

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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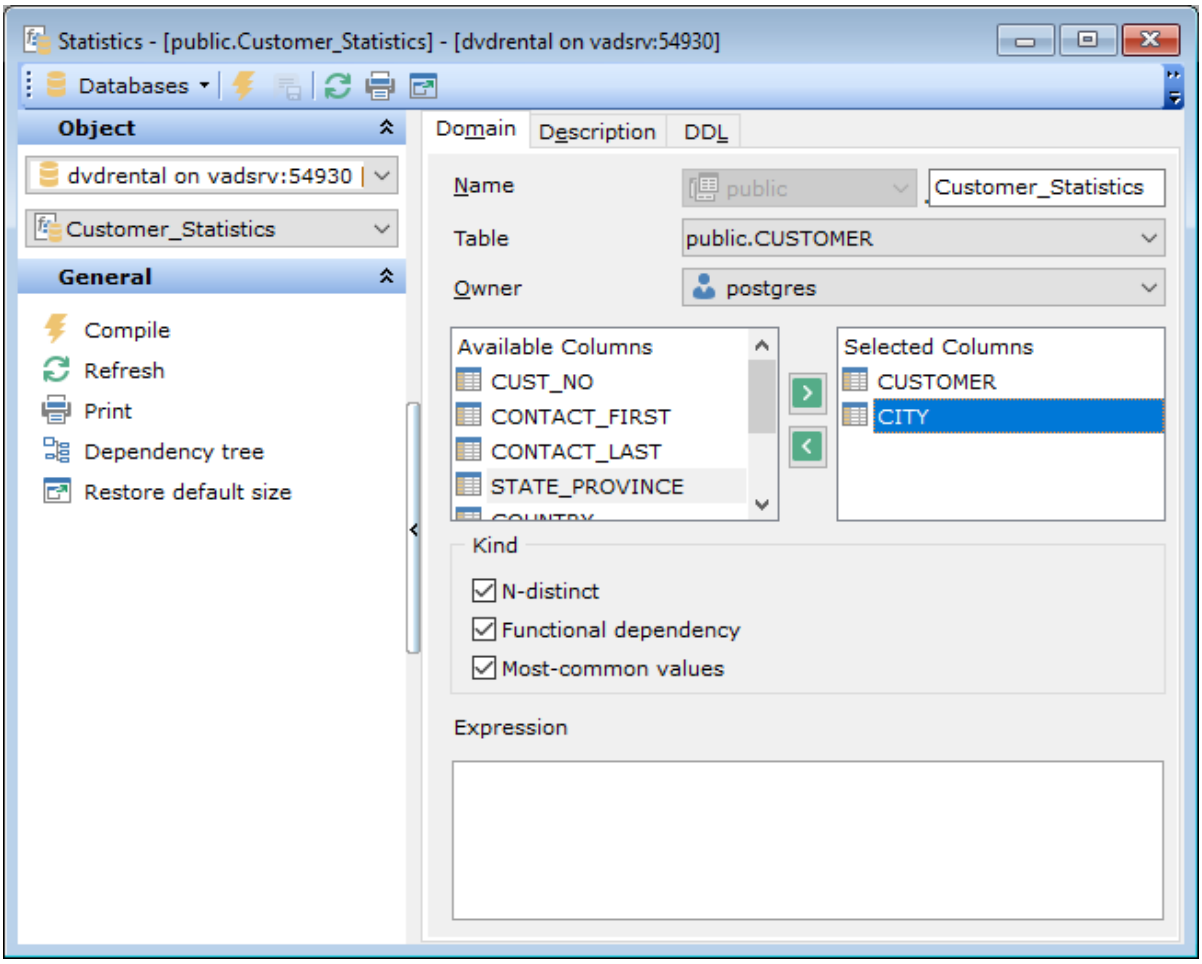
5.4.16.2 Creating/editing statistics

Use the **Statistics** tab of **Statistics Editor** to create/edit a Statistics object and specify its definition.



Name
Set the name for the statistics.

Table
Select the table containing columns to calculate statistics.

Owner
Set the owner of the statistics object.

Columns
Select the columns to be covered by the computed statistics using the corresponding buttons. At least two column names or expressions must be specified, and their order is not significant.

Kind
Select statistics types to be calculated. If none is selecte, all supported statistics kinds are included in the statistics object.

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- ☑ **N-distinct**
- ☑ **Functional dependency**
- ☑ **Most-common values**

Expression
Specify an expression to be covered by the computed statistics. This may be used to build univariate statistics on a single expression, or as part of a list of multiple column names and/or expressions to build multivariate statistics.

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5.5 Non-schema Objects

Other types of objects are also stored in the database and can be created and manipulated with SQL, but are not contained in a schema:

- Tablespaces 318
- Languages 321
- Local Scripts 335
- Shared scripts 336

Use the DB Explorer 65 tree to navigate 47 within the database(s) and the objects.

See also:

Operations with database objects 70

New Object dialog 157

Duplicate Object Wizard 159

Schemas 164

Schema Objects 168

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5.5.1 Event triggers

An **Event Trigger** fires whenever the event with which it is associated occurs in the database in which it is defined. Unlike regular triggers[268], which are attached to a single table and capture only DML events, event triggers are global to a particular database and are capable of capturing DDL events.

Event Trigger Editor allows you to define event trigger properties. It opens automatically when you create[155] a new event trigger and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[315]
- Creating/editing event trigger[316]
- Browsing object dependencies[967]
- Editing event trigger description[966]
- Viewing DDL definition[965]

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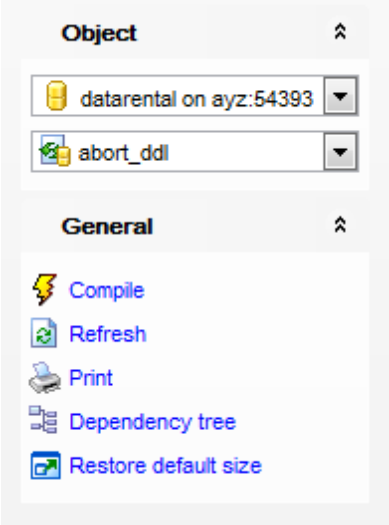
5.5.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Event Trigger Editor**.



Object
select a database
select an event trigger for editing

General
compile 969 the event trigger (if it is being created/modified)
refresh the content of the active tab
print metadata 680 of the event trigger
view the dependency tree 638 for the event trigger
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the tablespace:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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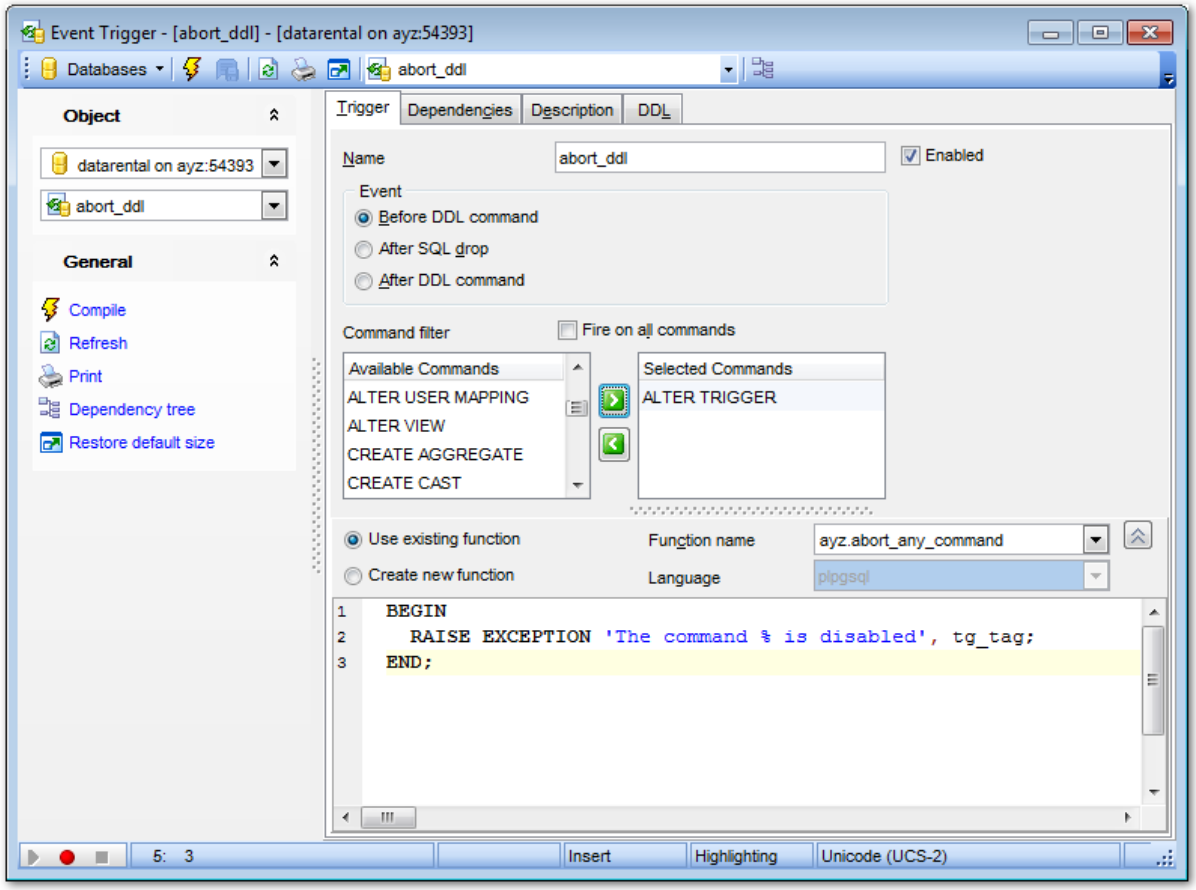
5.5.1.2 Creating/editing event trigger

Use the **Trigger** tab of **Event Trigger Editor** to create/edit an event trigger and specify its definition.

Name
Enter a name for the new event trigger, or modify the name of the event trigger being edited.

Enabled
Enables/disables the event trigger immediately after it is created or modified.



Event
Select the event on which the event trigger should be fired:

Before DDL command
This option is equal to the *ddl_command_start* PosgreSQL event. This event occurs just before the execution of a CREATE, ALTER, or DROP command. No check whether the affected object exists or doesn't exist is performed before the event trigger fires.

After SQL drop
This option is equal to the *sql_drop* PosgreSQL event. This event occurs just before the

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ddl_command_end event trigger for any operation that drops database objects.

After DDL command
This option is equal to the *ddl_command_end* PosgreSQL event. This event occurs just after the execution of a CREATE, ALTER, or DROP command.

Command filter

You can filter the list of commands on which the event trigger should be fired. To select a command, you need to move it from the **Available Commands** list to the **Selected Commands** list. Use the buttons or drag-and-drop operations to move the commands from one list to another.

If you want the trigger to be fired on all commands of the event check the **Fire on all commands** option.

In the lower area define the user-supplied function that is declared as taking no argument and returning type *event_trigger*. This function is executed when the trigger fires.
You can use already existing function and provide its name in the **Function name** field or create new one.

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5.5.2 Tablespaces

A **Tablespace** allows superusers to define an alternative location on the file system where the data files containing database objects (such as tables[169] and indexes[219]) may reside.

Tablespace Editor allows you to define tablespace properties. It opens automatically when you create[155] a new tablespace and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[319]
- Creating/editing tablespace[320]
- Browsing object dependencies[967]
- Viewing DDL definition[965]
- Setting object permissions[968]

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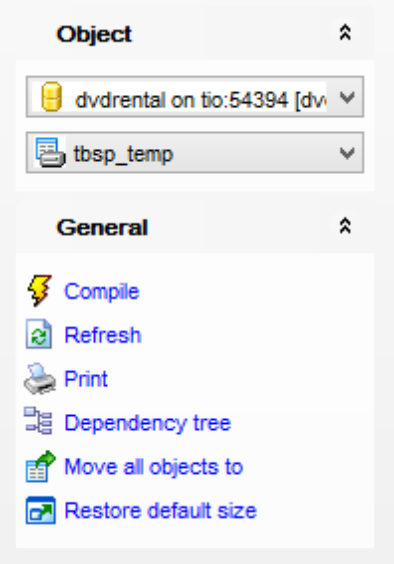
5.5.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Tablespace Editor**.



Object
select a database
select a tablespace for editing

General
compile 969 the tablespace (if it is being created/modified)
refresh the content of the active tab
print metadata 680 of the tablespace
view the dependency tree 638 for the tablespace
move all objects from the current tablespace to another one (available for PostgreSQL 9.4)

restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the tablespace:

DDL
save DDL 965 to file
open DDL 965 in Query Data 415

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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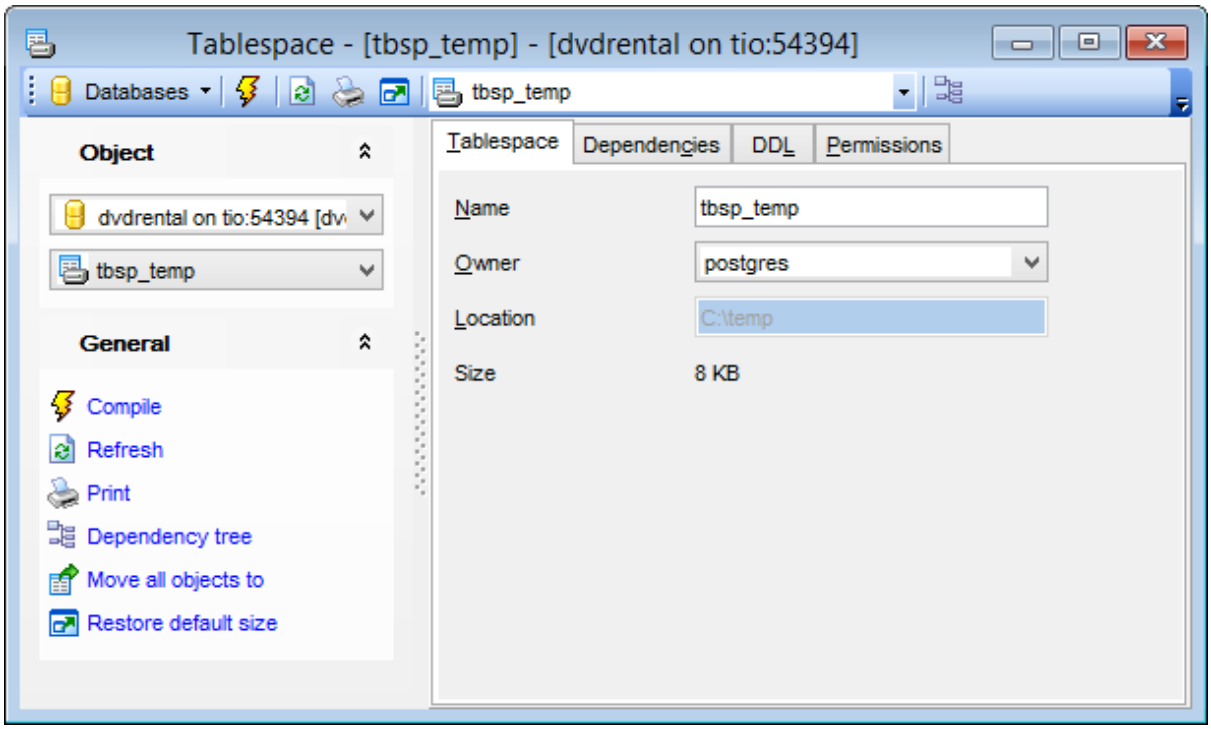
5.5.2.2 Creating/editing tablespace

Use the **Tablespace** tab of **Tablespace Editor** to create/edit a tablespace and specify its definition.

Name
Enter a name for the new tablespace, or modify the name of the tablespace being edited. The name cannot begin with *pg_*, as such names are reserved for system tablespaces.

Owner
Use the drop-down list to select the name of the user who will own the tablespace. Only superusers may create tablespaces, but they can assign ownership of tablespaces to non-superusers.

Location
Specify the directory that will be used for the tablespace. The directory must be empty and must be owned by the PostgreSQL system user. The directory name must be specified as an absolute path string.



The lower area displays the current **Size** of the tablespace being edited.

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5.5.3 Languages

There are currently four procedural **languages** available in the standard PostgreSQL distribution: PL/pgSQL, PL/Tcl, PL/Perl, and PL/Python. Other languages can be defined by users.

Language Editor allows you to define language properties. It opens automatically when you create 155 a new language and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 322
- Creating/editing language 324
- Browsing object dependencies 967
- Editing object description 966
- Viewing DDL definition 965
- Setting object permissions 968

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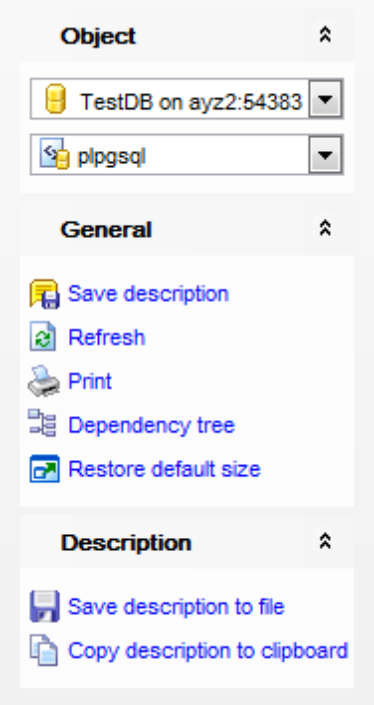
5.5.3.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Language Editor**.



Object
select a database
select a language for editing

General
compile[969] the language (if it is being created)
save the language description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the language
view the dependency tree[638] for the language
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the language:

Description
save object description[966] to file
copy description[966] to clipboard

DDL
save DDL[965] to file

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open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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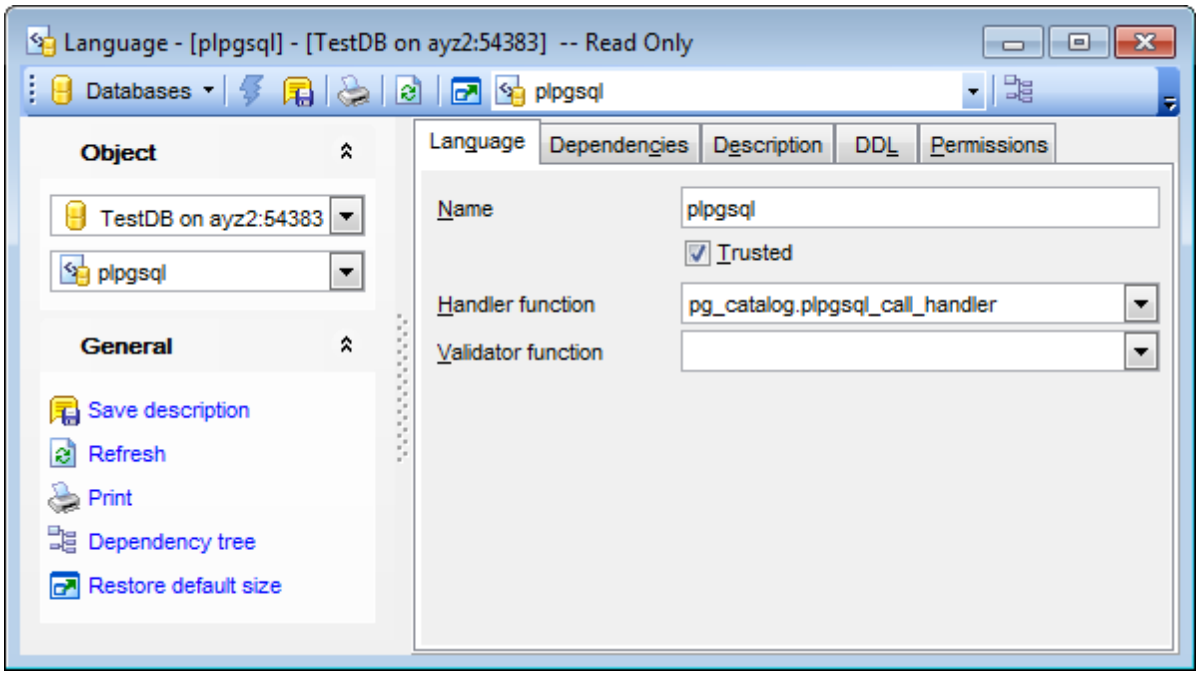
5.5.3.2 Creating/editing language

Name
The name of the new procedural language. The language name is case insensitive. The name must be unique among the languages in the database.



Trusted
This option specifies that the call handler for the language is safe, i.e. it does not offer an unprivileged user any functionality to bypass access restrictions. If this option is disabled, only users with the PostgreSQL superuser privilege can use this language to create new functions.

Handler function
Select the call handler function for this language from the drop-down list.
Call handler is the name of a previously registered function[239] that will be called to execute the procedural language functions. The call handler for a procedural language must be written in a compiled language such as C with version 1 call convention and registered with PostgreSQL as a function taking no arguments and returning the language_handler type, a placeholder type that is simply used to identify the function as a call handler.

Validator function
Select the validation function for this language from the drop-down list.
Validator function is the name of a previously registered function[239] that will be called when a new function in the language is created, to validate the new function.

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5.5.4 Foreign Servers

A **Foreign Server** typically encapsulates connection information that a foreign-data wrapper[331] uses to access an external data resource. Additional user-specific connection information may be specified by means of user mappings.

Foreign Server Editor allows you to define foreign server properties. It opens automatically when you create[155] a new server and is available on editing[155] an existing one.

- Using Navigation bar and Toolbar[326]
- Creating/editing foreign server[328]
- User mapping[329]
- Browsing object dependencies[967]
- Editing object description[966]
- Viewing DDL definition[965]
- Setting object permissions[968]

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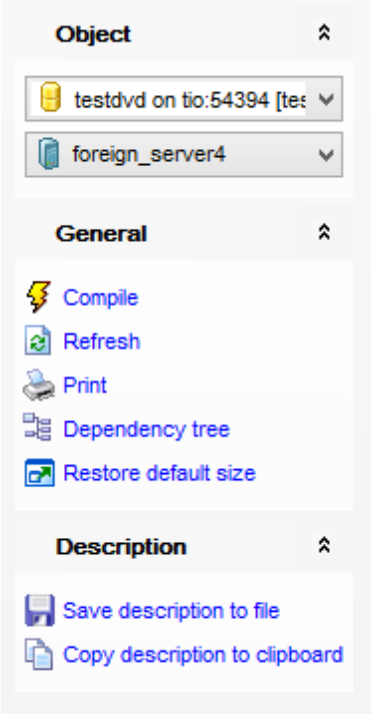
5.5.4.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Foreign Server Editor**.



Object
select a database
select a foreign server for editing

General
compile 969 the foreign server (if it is being created)
save the foreign server description 966 (if it has been modified)
refresh the content of the active tab
print metadata 680 of the foreign server
view the dependency tree 638 for the foreign server
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the language:

Description
save object description 966 to file
copy description 966 to clipboard

DDL
save DDL 965 to file

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open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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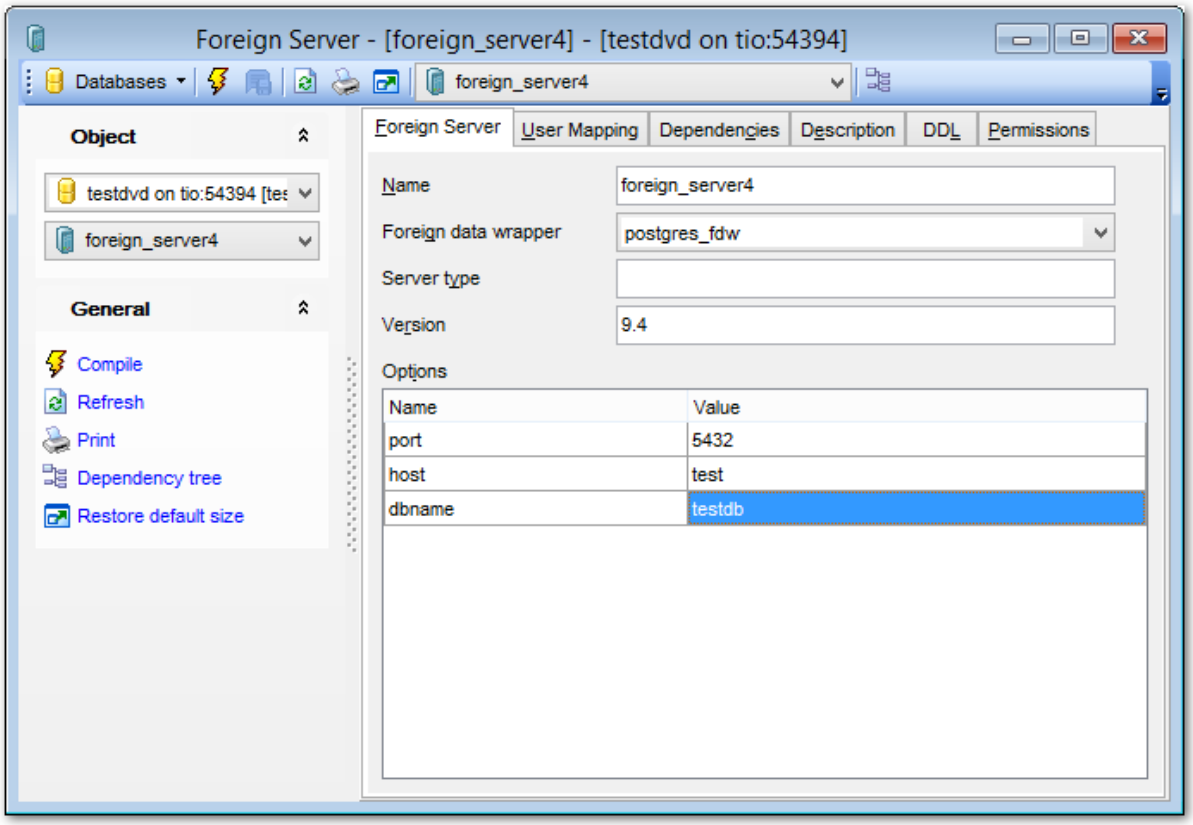
5.5.4.2 Creating/editing foreign server

Name
The name of the new/existing foreign server. The server name must be unique within the database.



Foreign data wrapper
Use the drop-down list to select the Foreign data wrapper[331] for the server being created.

Server type
Enter the optional server type.

Version
Enter the optional server version.

Options
Use the grid with **Name** and **Value** columns to specify the options for the server. The options typically define the connection details of the server, but the actual names and values are dependent on the server's foreign-data wrapper

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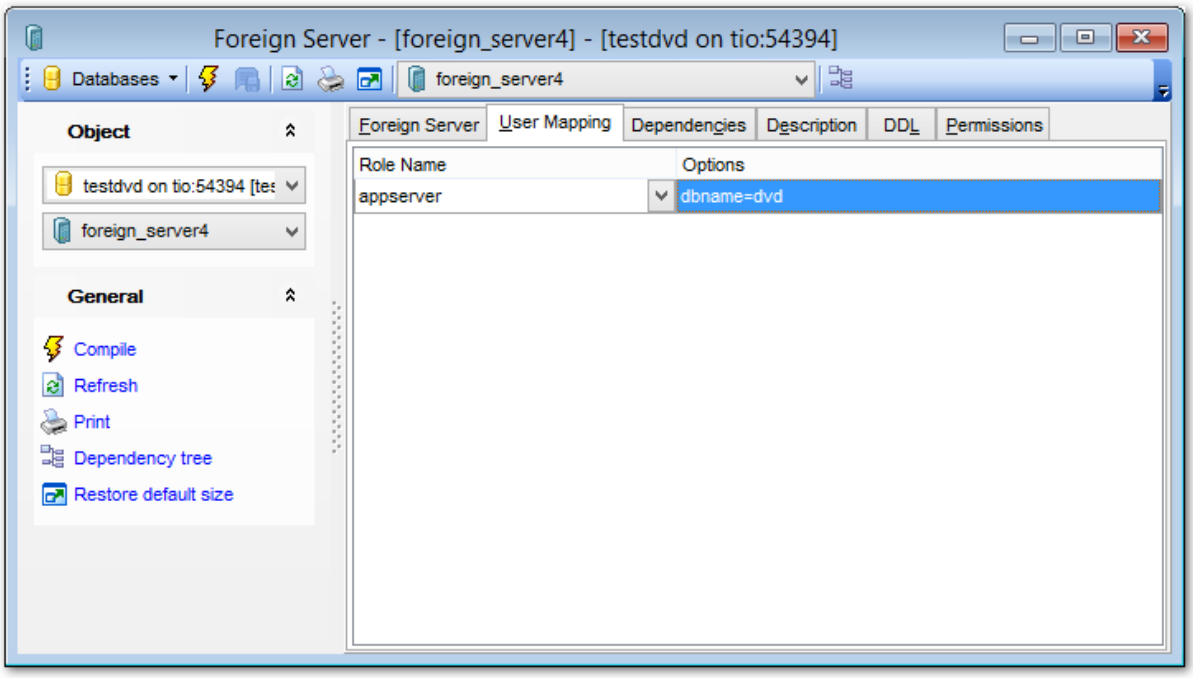
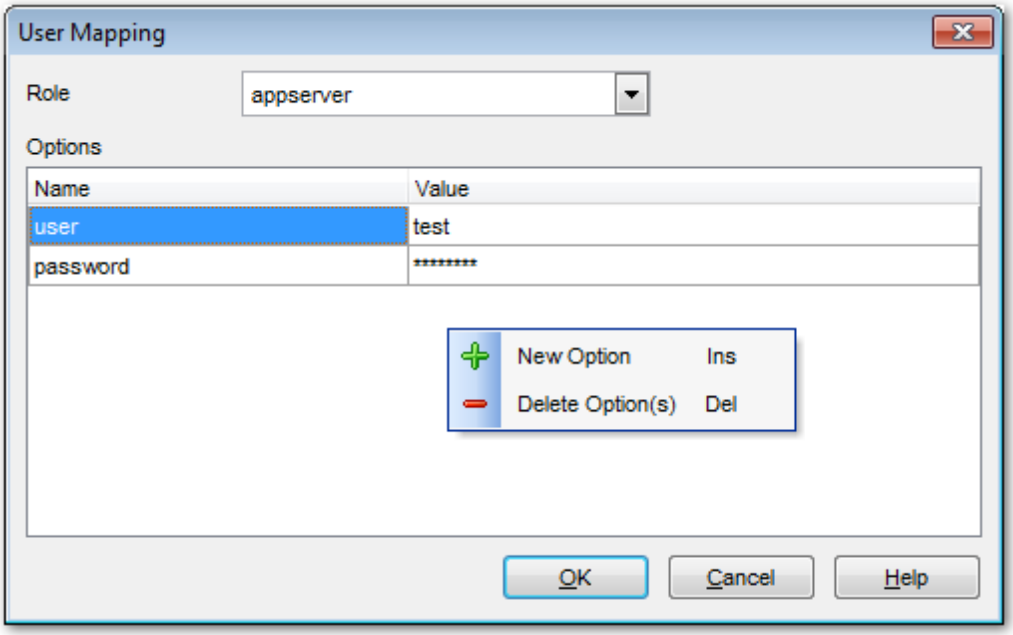
5.5.4.3 User mapping

Use this tab to specify additional user-specific connection information.



To add connection options for the Role use the **New User Mapping** item of the context menu.
To edit connection options for the Role use the **Edit User Mapping** item of the context menu.



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In the **User Mapping** dialog you can set the *User* and *Password* options for the selected **Role**. To manage these options use the **New Option** and **Delete Option(s)** context menu items.

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5.5.5 Foreign Data Wrappers

All operations on a foreign table are handled through its **Foreign Data Wrapper**, which consists of a set of functions that the core server calls. The foreign data wrapper is responsible for fetching data from the remote data source and returning it to the PostgreSQL executor.

Foreign Data Wrapper Editor allows you to define foreign data wrapper properties. It opens automatically when you create 155 a new foreign data wrapper and is available on editing 155 an existing one.

- Using Navigation bar and Toolbar 332
- Creating/editing foreign data wrapper 334
- Browsing object dependencies 967
- Editing object description 966
- Viewing DDL definition 965
- Setting object permissions 968

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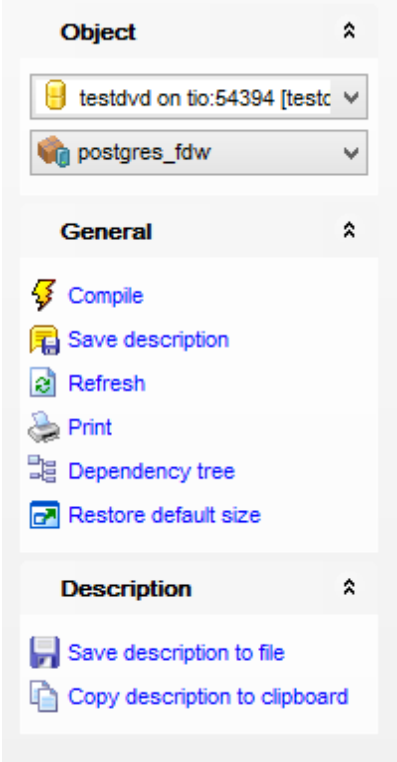
5.5.5.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Foreign Data Wrapper Editor**.



Object
select a database
select a foreign server for editing

General
compile[969] the foreign data wrapper (if it is being created)
save the foreign data wrapper description[966] (if it has been modified)
refresh the content of the active tab
print metadata[680] of the foreign data wrapper
view the dependency tree[638] for the foreign data wrapper
restore the default size and position of the editor window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with the language:

Description
save object description[966] to file
copy description[966] to clipboard

DDL

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save DDL[965] to file
open DDL[965] in Query Data[415]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

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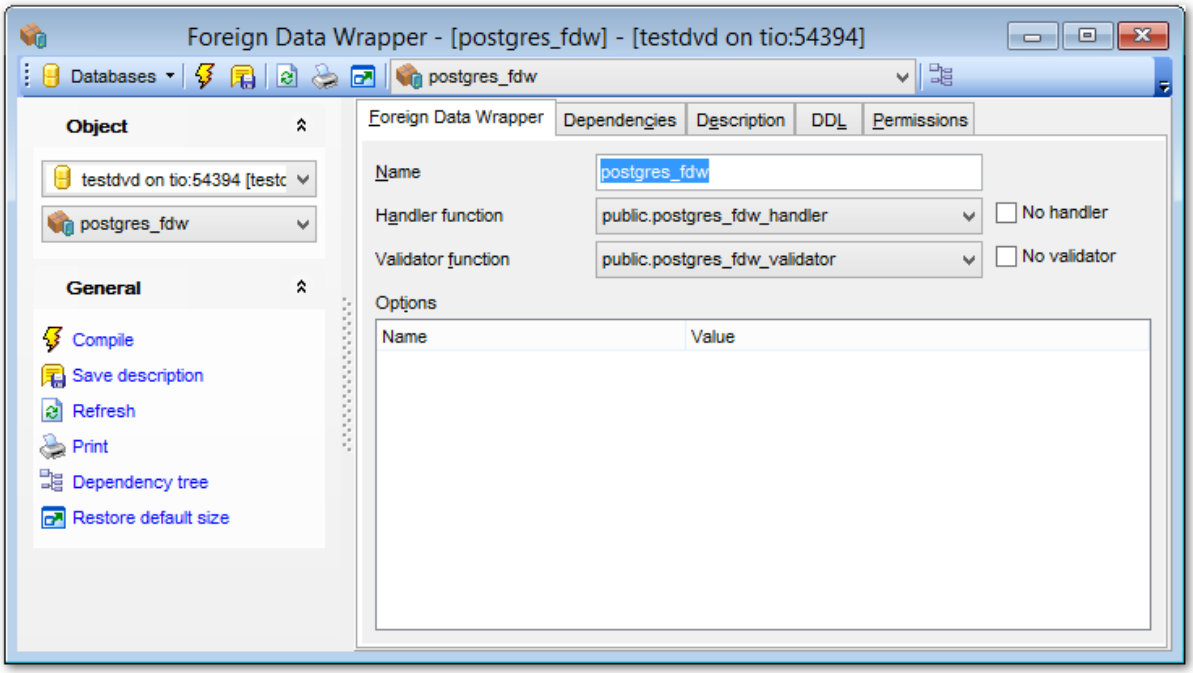
5.5.5.2 Creating/editing foreign data wrapper

Name
The name of the new/existing foreign data wrapper. The foreign data wrapper name must be unique within the database.



Handler function
This is the name of a previously registered function that will be called to retrieve the execution functions for foreign tables. The handler function must take no arguments, and its return type must be fdw_handler.

It is possible to create a foreign-data wrapper with no handler function by checking the **No handler** option.

Validator function
This is the name of a previously registered function that will be called to check the generic options given to the foreign data wrapper, as well as options for foreign servers, user mappings and foreign tables using the foreign-data wrapper. The validator function must take two arguments: one of type text[], which will contain the array of options as stored in the system catalogs, and one of type oid, which will be the OID of the system catalog containing the options.

If the **No validator** option is checked, then options will not be checked at creation time.

Options
Use the grid with **Name** and **Value** columns to specify the options for the server. The allowed option names and values are specific to each foreign data wrapper and are validated using the foreign-data wrapper's validator function. Option names must be unique.

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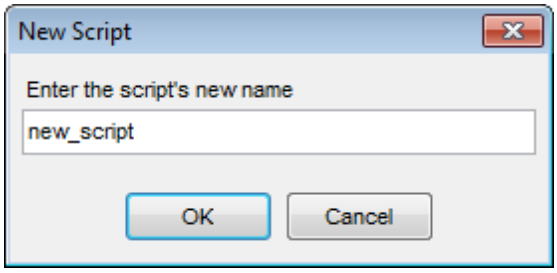
5.5.6 Local Scripts

Local scripts[646] are stored locally and can be easily accessed from the DB Explorer[65].

To create new local script right-click the appropriate branch in the DB Explorer tree and select the **New Script** item. You will be asked for the script name. When the name is assigned the script appears in the DB Explorer tree.
If a script is created in Execute Script editor and saved to the default folder, it will appear in the DB Explorer tree as local one.



It is also possible to create subfolders in the Local scripts branch. Folders created there are created physically as subfolders to the folder assigned as default for local scripts in the **DB Registration info** | **Directories**.

To change directory where local scripts to be stored use the **Select Directory** item of the **Local Scripts** context menu, or use the respective field of the **DB Registration info** | **Directories** dialog. If specified folder already contained scripts, these scripts will be added to the DBExplorer[65] tree.

Script is opened in the Execute Script[646] where it can be edited or performed. You can also save local script as the shared[336] one.

See also:
Execute Script Editor[646]
Database Explorer[65]
Shared Scripts[336]
Database Registration Info[108]

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5.5.7 Shared scripts

Shared scripts are the scripts stored in the VCS repository. That makes scripts available for all the users working with the database having version control enabled.

Any script opened in the Script Editor 646 can be saved as a shared script.

Note: Shared scripts are stored in the '*%LocalRepositoryPath%\Trunk\Script*' folder or its subfolders (where '*%LocalRepositoryPath%*' is a directory defined in the **Database registration info | Change management | Working folder** field).

Shared script is opened in the Execute Script Editor 646 where you can edit or execute it.

See the topics below to get information about specific actions for shared scripts:

- TFS 337
- CVS 339
- VSS 340
- SVN 342

See also:
Execute Script 646
DB Explorer 65
Local Script 335
Database registration info 108
Change Management Settings 126
Change Management Tools 344

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5.5.7.1 TFS

Actions you can perform under shared scripts in Team Foundation Server version control system:

Add to version control
Get latest version
Check in
Check out

Adding script to version control
Enables version control for the selected script, script folder or whole shared script branch. Operation is available only for scripts or folders that are not included in version control.

Getting latest version
Gets the selected script from server repository to either replace or to merge it with the local copy. You will be asked for operation confirmation. This should be used, if you need to discard all changes made to script locally and to start working with up-to-date script file. If the operation is applied to **Shared Script** branch of the DB Explorer 65 (or any shared script folder) you will get information about all shared scripts added by other database users that work in the same VCS repository (or about script added to the folder).

Checking out
Enables edit mode for the script. This operation should be used when you need to add changes to script. It locks the script file so that nobody else can open it until you perform the *Check In* operation.

Checking in
Commits changes made to the script. You will be asked for transaction comments. After script is checked in, its latest version appears on server repository.

You can also browse shared script history. Use the **Change management | History** item of the context menu for this purpose.

You can identify current script state by its icon:

Shared script is not added to version control;
Shared script is checked out and has been changed locally;
Shared script can't be edited until checked out;
Shared script is checked out and can be edited;
There is a conflict in this shared script.

Note: The most common situation for conflicts to occur is when you are trying to check in locally modified script, but there is a newer version of this script in server repository. Conflicts should be resolved manually by means of TFS. Shared scripts are stored in the '*%LocalRepositoryPath%\Trunk\Script*' folder (where '*%LocalRepositoryPath%*' is a directory defined in the **Database registration info | Change management | Working folder** field).

See also:

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Shared scripts in CVS 339
Shared scripts in VSS 340
Shared scripts in SVN 342

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5.5.7.2 CVS

Actions you can perform under shared scripts in Concurrent Versions System:

Add to version control
Update from Version Control
Commit to Version Control

Adding script to version control
Enables version control for the selected script, script folder or whole shared script branch. Operation is available only for scripts or folders that are not included in version control.

Updating script from Version Control
Merge two files: one from server repository and another from the local repository. Use this function when you need to work with the latest version of a file.

Committing changes to Version Control
Add latest changes made to shared script into server repository.

You can also browse shared script history. Use the **Change management |** **History** item of the context menu for this purpose.

You can identify current script state by its icon:

Shared script is not added to version control;
Shared script is added to version control and contains uncommitted changes;
Shared script is added to version control and contains no local changes;
There is a conflict in this shared script.

Note: The most common situation for conflicts to occur is when you are trying to commit changes made to script, but there is a newer version of this script in server repository. Conflicts should be resolved manually by means of CVS. Shared scripts are stored in the '*%LocalRepositoryPath%\Trunk\Script*' folder (where '*%LocalRepositoryPath%*' is a directory defined in the **Database registration info | Change management | Working folder** field).

See also:
Shared scripts in TFS 337
Shared scripts in VSS 340
Shared scripts in SVN 342

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5.5.7.3 VSS

Actions you can perform under shared scripts in Visual Source Safe version control system:

Add to version control
Get latest version
Check in
Check out

Adding script to version control
Enables version control for the selected script, script folder or whole shared script branch. Operation is available only for scripts or folders that are not included in version control.

Getting latest version
Gets the selected script from server repository to replace local copy. You will be asked for operation confirmation.
This should be used, if you need to discard all changes made to script locally and to start working with up-to-date script file. If the operation is applied to **Shared Script** branch of the DB Explorer 65 (or any shared script folder) you will get information about shared scripts added by other database users that work in the same VCS repository (or about script added to the folder).

Checking out
Enables edit mode for the script. This operation should be used when you need to add changes to script.

Checking in
Commits changes made to the script. You will be asked for transaction comments. After script is checked in, its latest version appears on server repository.

You can also browse shared script history. Use the **Change management |** **History** item of the context menu for this purpose.

You can identify current script state by its icon:

Shared script is not added to version control;
Shared script is checked out and has been changed locally;
Shared script can't be edited until checked out;
Shared script is checked out and can be edited;
There is a conflict in this shared script.

Note: The most common situation for conflicts to occur is when you are trying to check in locally modified script, but there is a newer version of this script in server repository. Conflicts should be resolved manually by means of VSS. Shared scripts are stored in the '*%LocalRepositoryPath%\Trunk\Script*' folder (where '*%LocalRepositoryPath%*' is a directory defined in the **Database registration info | Change management | Working folder** field).

See also:
Shared scripts in TFS 337

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Shared scripts in CVS 339
Shared scripts in SVN 342

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5.5.7.4 SVN

Actions you can perform under shared scripts in Subversion version control system:

Add to version control
Update from Version Control
Commit to Version Control

Adding script to version control
Enables version control for the selected script, script folder or whole shared script branch. Operation is available only for scripts or folders that are not included in version control.

Updating script from Version Control
Merge two files: one from server repository and another from the local repository. Use this function when you need to work with the latest version of a file.

Committing changes to Version Control
Add latest changes made to shared script into server repository.

You can also browse shared script history. Use the **Change management |** **History** item of the context menu for this purpose.

You can identify current script state by its icon:

Shared script is not added to version control;
Shared script is added to version control and contains uncommitted changes;
Shared script is added to version control and contains no local changes;
There is a conflict in this shared script.

Note: The most common situation for conflicts to occur is when you are trying to commit changes made to script, but there is a newer version of this script in server repository. Conflicts should be resolved manually by means of SVN. Shared scripts are stored in the '*%LocalRepositoryPath%\Trunk\Script*' folder (where '*%LocalRepositoryPath%*' is a directory defined in the **Database registration info | Change management | Working folder** field).

See also:
Shared scripts in TFS 337
Shared scripts in CVS 339
Shared scripts in VSS 340

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Part

6 Change Management

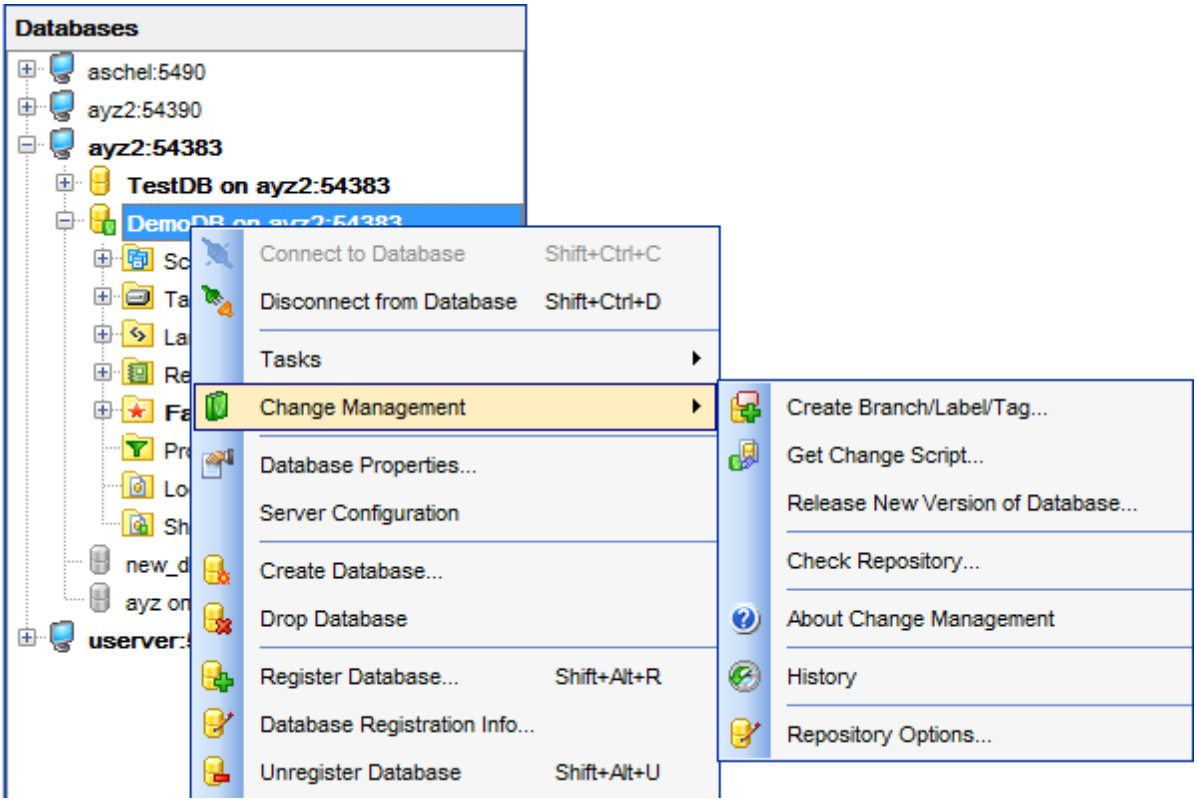
Database Change Management
Change Management integrated into version control system (VCS) allows you to:

- manage database related development processes;
- remember database states;
- get a script with differences between two database states;
- test generated scripts on a test database;
- rollback database to any of its previous versions;
- browse history of database and/or object changes;
- store any SQL scripts in version control system repository of a database.

Change management makes the process of deploying changes and updates from development to testing and production environments easier and more controllable. Supported VCS: Concurrent Versions System (CVS), Subversion (SVN), Visual SourceSafe (VSS), Team Foundation Server (TFS).

This tool can be useful not only for development teams, but also for single developers, who are in need of a mean for managing database versions, or whose databases have complex business logic in procedures, triggers etc.

Change management tools can be accessed through the respective section of database context menu or Tools section of the main menu.



To enable Change Management for a database you need to define connection settings for the VCS and create database repository. Open the Database Registration Info dialog at the Change management tab and launch the Version Control Repository Management

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Wizard for this purpose.

What VCS stores
Database VCS repository stores:

1. All database objects in XML files. All the object properties that affect object definition are recorded into these files
2. SQL scripts with all changes in the database
3. Database backups created with each label
4. User can add custom files to VCS (so-called shared scripts)

SQL manager automatically records each changing of a database object (made in object editor, or by SQL script) to the respective file and to database history and then commits these changes to VCS.

If database was changed in other program, not in SQL Manager, Check Version Control Repository Wizard provides resolving of differences in database and its description in the VCS repository. It is strongly recommended to launch Check Repository Wizard to reveal and remove such differences.

Repository stores metadata only, not data.

Branches, labels, tags
Change Management tool allows you to create database branches. Database branch is a copy of original DB and corresponding branch in the database repository. Database that has been originally added to VCS is a trunk branch of the repository. On branch creation any PostgreSQL server can be specified as destination for created branch database if its version coincides with the version of original server.

Database tags and labels can be created as well. Database tag is a mark for all database files in VCS repository. Using tags is recommended for marking definite database state or version. This provides possibility to get differential script to this state.

Database label is a database tag plus database backup copy. It enables restore of the database to the labeled state. Label is always created when creating a branch. In this case label gets the name of the branch with "_AutoLabel" ending. During initial creation of database repository, the label named "Trunk_AugoLabel" is created automatically.

Get Change script
One of the key features of Change Management is the possibility to get script of database changes from tag/time point/current database state to another tag/date/current database state. Script can be generated in two ways: differential or step-by-step.

Differential script is a result of comparing of two database states. Step-by-step script is an aggregate of all database changes occurred in a period. Step-by-step script can generated only for two contiguous database states and only in forward direction. For example, such script can be generated for two database states within a single branch. Step-by-step script contains all SQL statements that have been performed from start time point to destination one. It means that all intermediate changes of an object will be included to script. Instead of step-by-step script, differential script contains only sum of these changes. Step-by-step scripts, as opposed to differential ones, can contain DML statements in addition to DDL statements. Using of step-by-step scripts is more secure if all changes to database have been made in SQL Manager only.

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Change Management tools
Tools available:

1. Check Version Control Repository Wizard 356. Defines whether object description in repository matches object properties in database. If differences persist, wizard corrects repository in order to eliminate them and adds the script with missing statements to DB history.
2. Create Tag Wizard 348. Provides tag, label or branch creation. Also allows restore of database from an existing label. Such database will not be included in change management, and can be used, for example, for testing scripts.
3. Get Change Script Wizard 366. Enables getting script with changes from tag/date/ current database state to tag/date/current database state.
4. Release New Version of Database Wizard 375. Automates intermediate processes that are required when releasing new version of database. Allows to get script with changes between previous version of database and current one and to test this script on previous database version. The wizard includes the following operations:
   a. VCS repository is checked to ensure that description exactly matches current database state (same as Check Version Control Repository Wizard performs).
   b. Current database state is marked in the VCS repository with tag or label. This provides ability to get change script with possible additional changes.
   c. Script with changes between previous version of database and current database state is generated.
   d. Test database is created from for example an existing label. Generated scripts are tested on this database. After script is executed, test database is compared with current database state to ensure that there no differences between them.
5. Database History 407. Shows all changes of database in specified branch. History is a list of scripts performed on database.
   Object History 408. Shows all changes of a DB object similar to file history in VCS.

Connect to VCS 126

To access change management tools:
Select the **Tools | Change Management** item of the main menu 961
or
Select the **Change Management** item from the database 54 or host context menus 52.

For a single database object 155 only object history 406 can be browsed.

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Query Management Tools 413

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Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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6.1 Create branch/label/tag wizard

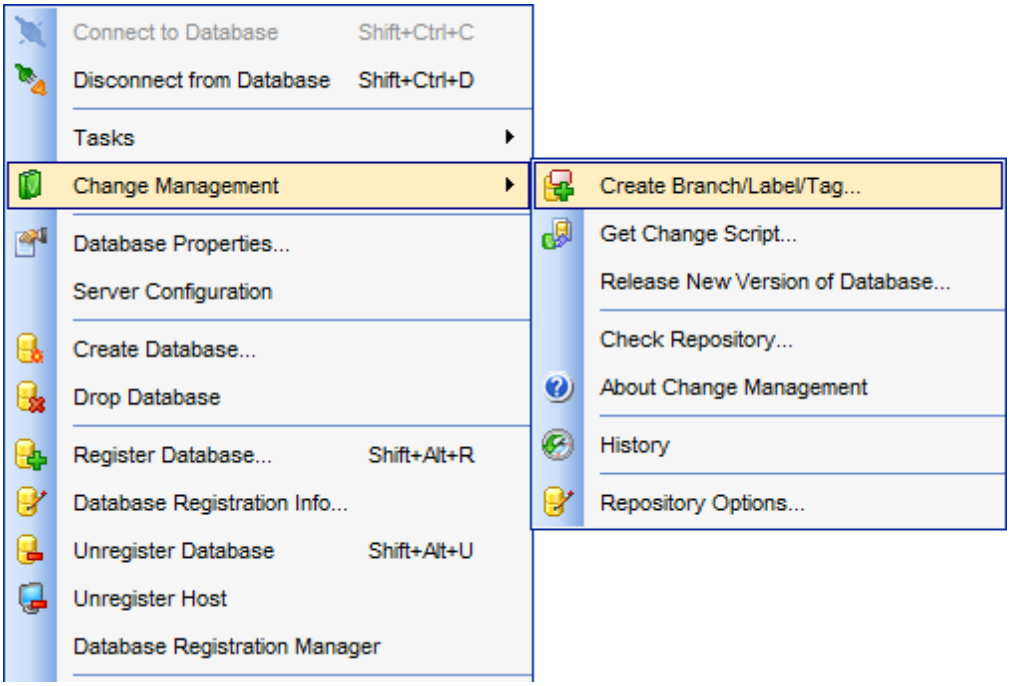
This wizard allows you to create tag, label or branch.

Tag is a special mark that defines certain database state. (It is a marks for all files of the database repository in the specified branch)

Label is a special mark that defines certain database state. With the label a backup copy of the database is created. Label provides database state for creating database branch/ copy.

Branch is an independent direction of database development. It is a database copy which can be modified with no effect on the original database (database in head branch). Objects in different branches are identical before branching point and divergent after it. Label is always created with branch. (This branch is for all files of DB repository in VCS plus copy of the original database)

To launch the wizard use the **Change Management** | **Create Branch/Label/Tag** item of the host 52 or database 54 context menu. Alternatively you can use the **Tools** | **Change Management** | **Create Branch/Label/Tag** item of the main menu 961.



- Selecting source database 350
- Selecting operation 351
- Setting created object options 353
- Specifying connection settings 354
- Performing operation 355

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**

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Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Check repository wizard 356
Get change script wizard 366
Release new version of database 375
History 406

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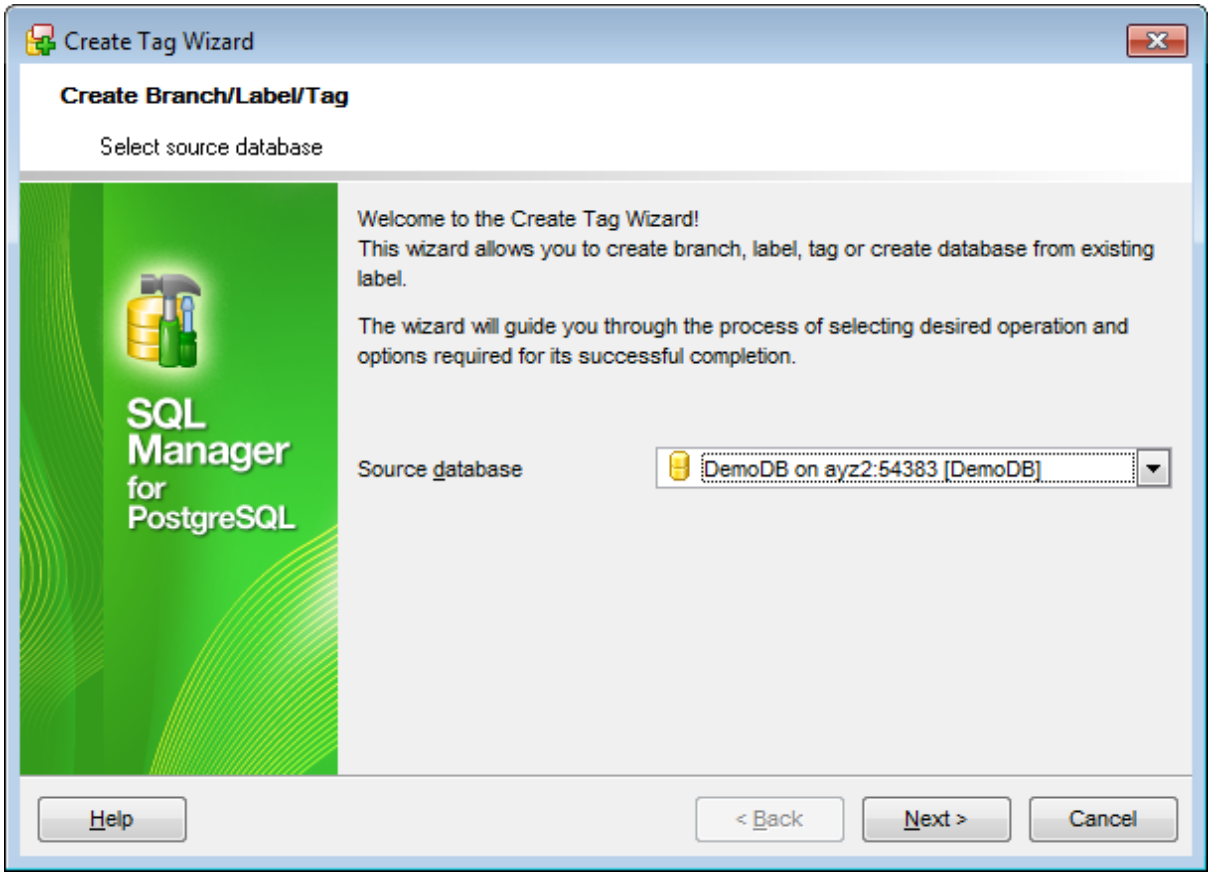
6.1.1 Selecting source database

In this step you need to select the database to create a tag for. Proceeding to the next step is possible only when VCS is enabled for the selected database.



Use the drop-down list to select **Source database**.

Click the **Next** button to proceed to the Selecting operation 351 step of the wizard.

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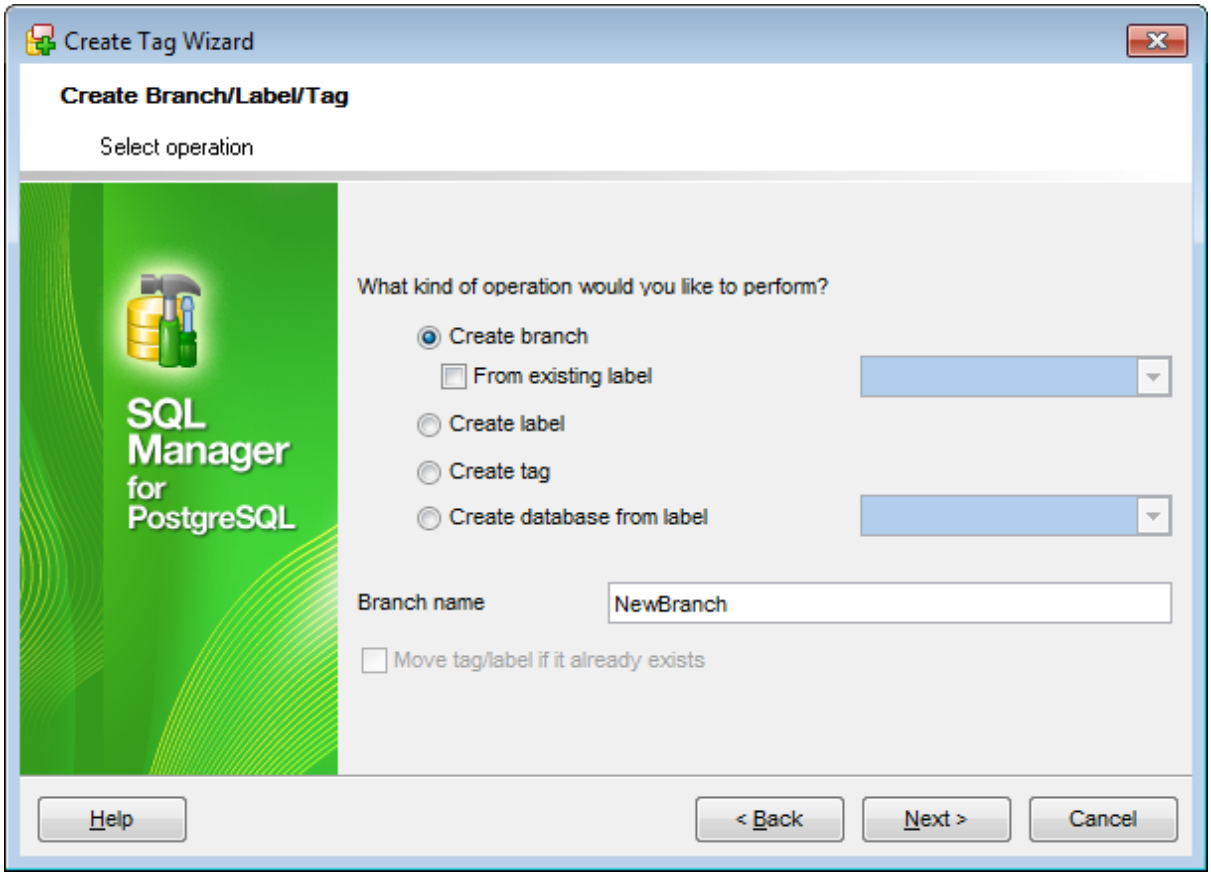
6.1.2 Selecting operation

In this step you need to select type of the operation to be performed.



Create branch
Use this option to create a branch.
If needed you can create branch ☑ **From existing label**. Enable the appropriate option and select a label from the drop-down list for the purpose.

Create label
Use this option to create a label.

Create tag
Select the option to create a tag.

Create database from label
This option allows you to create a database from label. Select a label from the corresponding drop-down list.

Branch / Label / Tag name
Defines the name of the created object.

☑ **Move tag/label if it already exists**
Enable the option to move the existing object with the new one if their names coincide.

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Click the **Next** button to proceed to the Setting created object options 353.

If a tag is created then clicking the **Next** button will move you to the last step 355.

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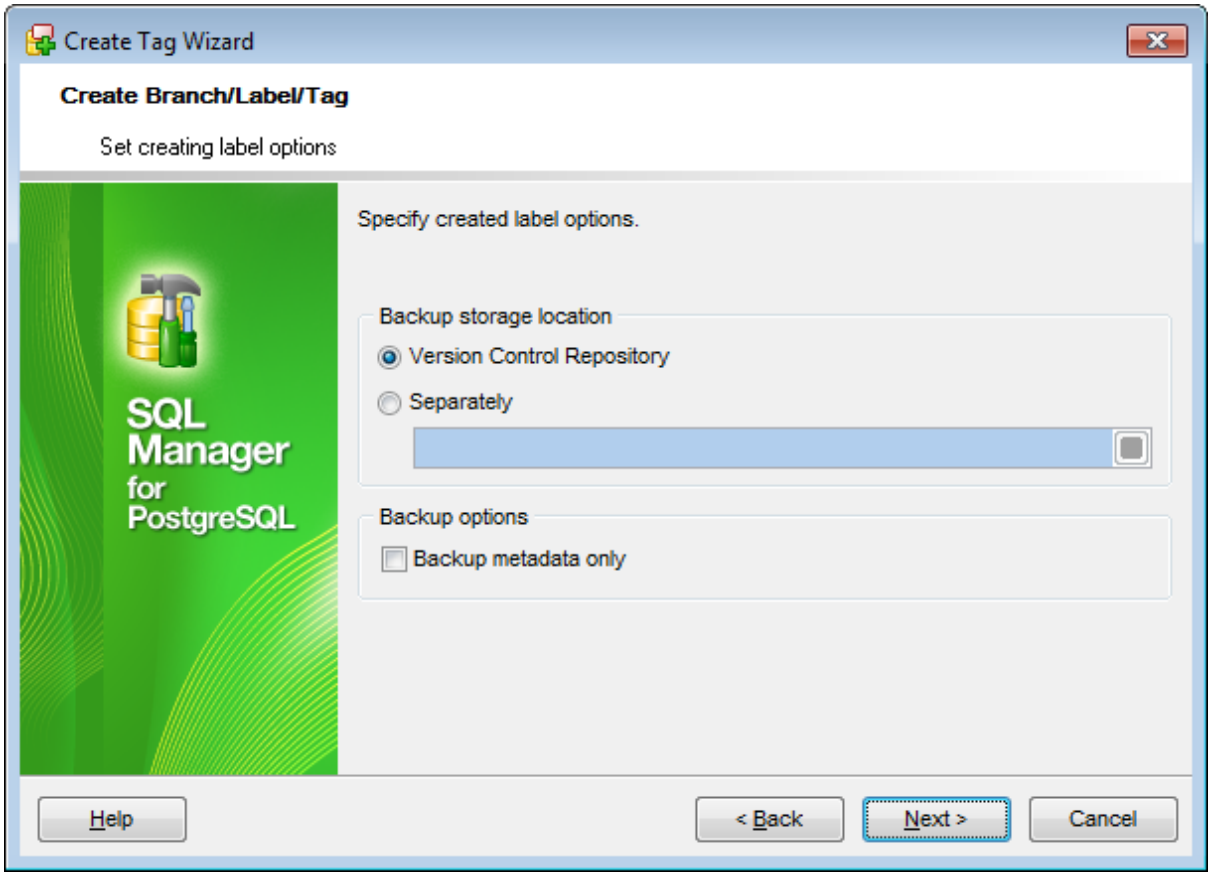
6.1.3 Setting created object options

This step appears only when creating label. Use this step to define label parameters.



Backup storage location
Use this section to define whether to store database backup in **Version Control Repository** or **Separately**.

Backup metadata only
Disable the option if you need full database backup to be created with the label.

Click the **Next** button to proceed to the Specifying connection settings 354 step.

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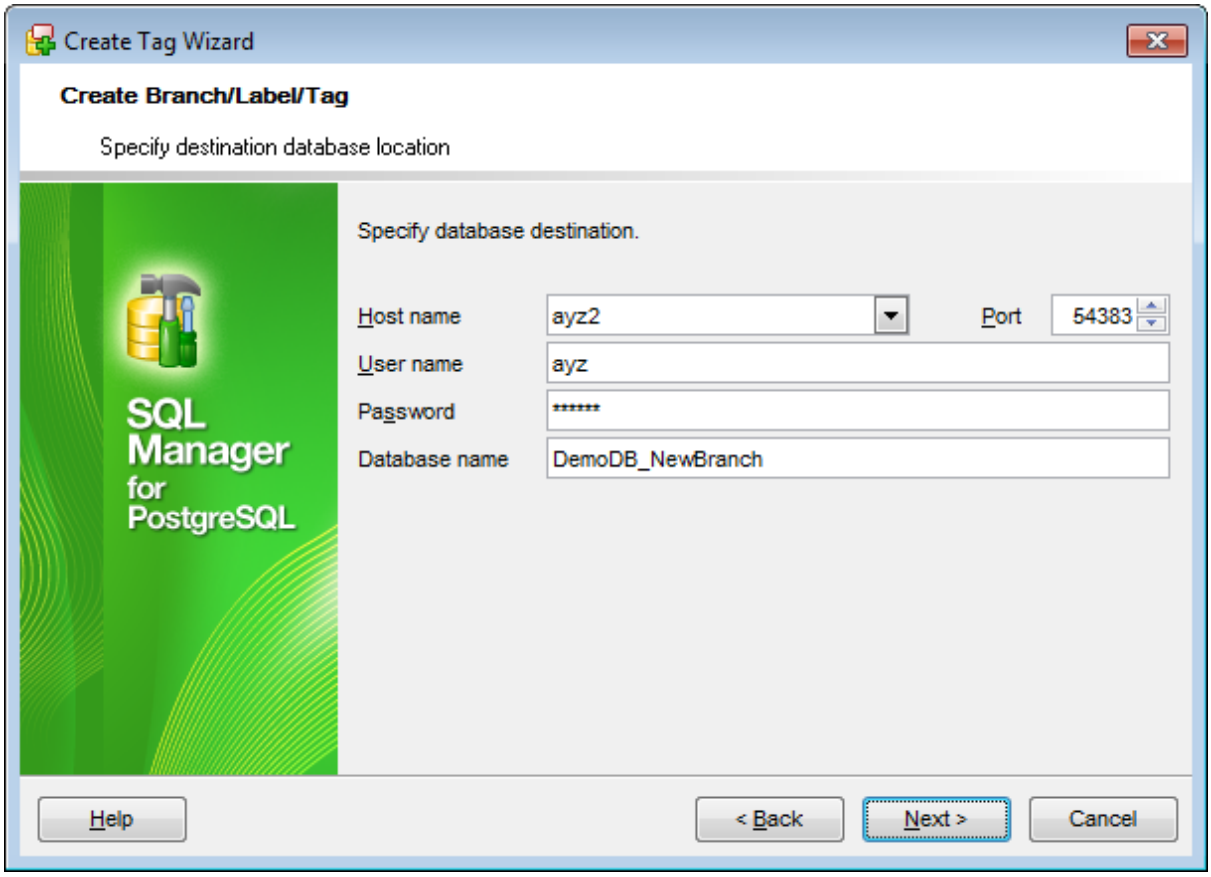
6.1.4 Specifying connection settings

This step appears when creating branch or database from label (action specified at the Selecting operation 351 step). Use this step to define settings for new database.



Use the **Host** drop-down list to define server. This list contains all registered hosts. Use the corresponding field to specify **Port** for connection.

Define **User name** and **Password** for server authorization.

Database name must be specified within the appropriate field.

Click the Next button to proceed to the final 355 step.

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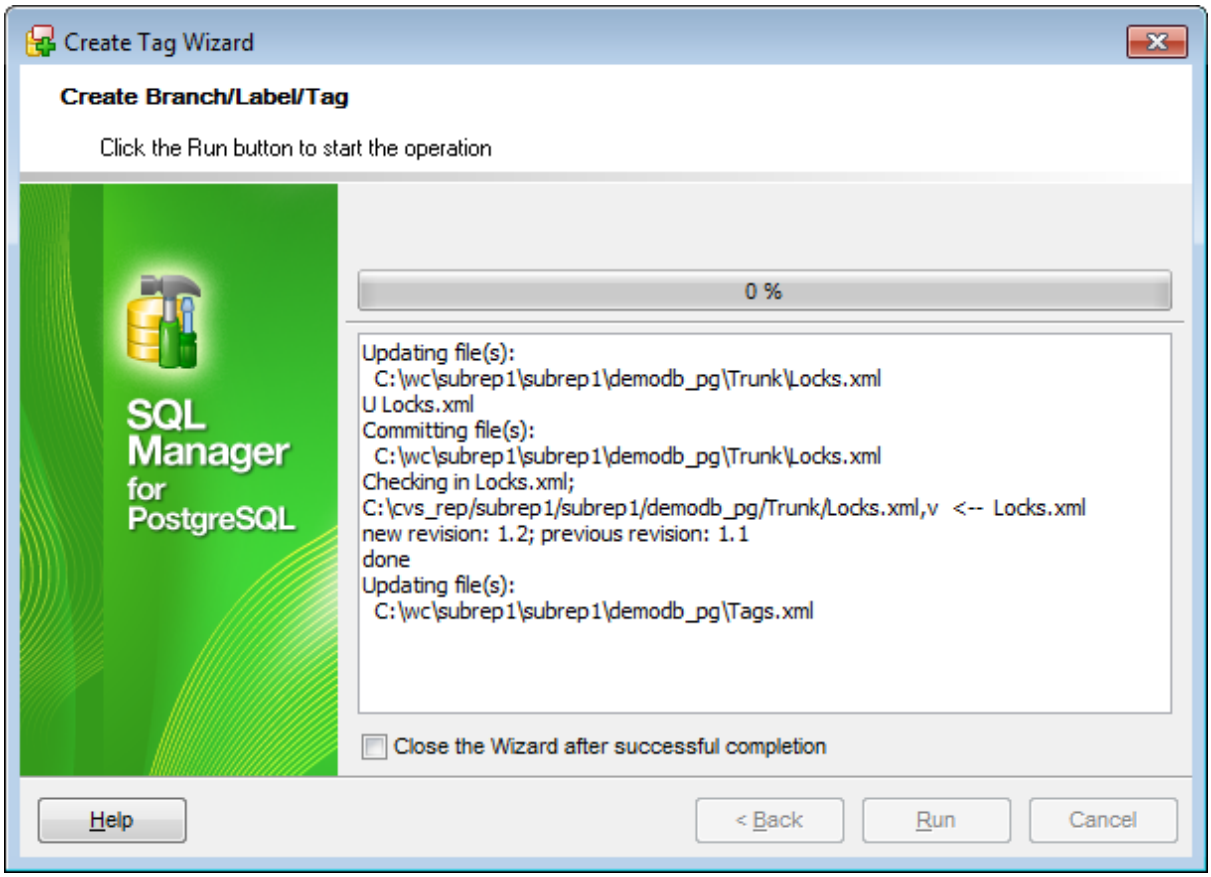
6.1.5 Performing operation

This step of the wizard is intended to inform you that all necessary options have been set, and you can run branch/label/tag creating process.

The log area allows you to view the log of operations and errors (if any).



☑ **Close the Wizard after successful completion**
If this option is selected, the wizard is closed automatically when the process is completed.

Click the **Run** button to create branch/label/tag.

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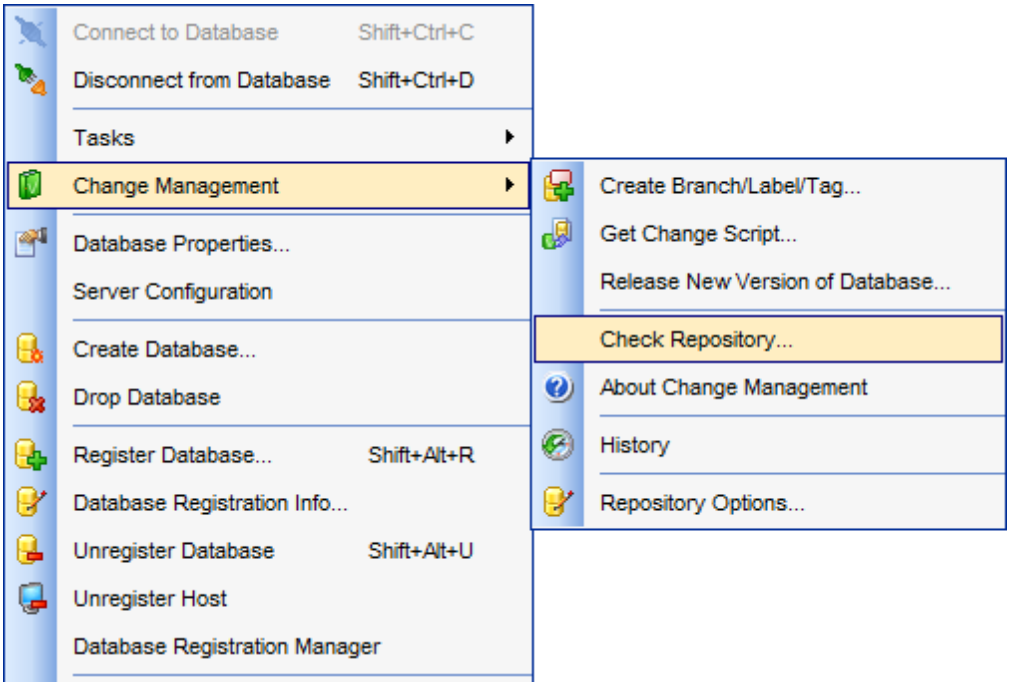
6.2 Check repository wizard

Check repository wizard reveals differences (if any) between database state and its description in the VCS repository and eliminates ones if any. This wizard should be used when any changes have been made to database without synchronization to the corresponding repository e.g. changes made when VCS was disabled for the database.

To launch the wizard use the **Change management | Check repository...** item of database context menu 54 (or any database object context menu), or use the **Tools | Change management | Check repository...** main menu item.



- Selecting database 358
- Selecting object types 359
- Checking repository 360
- Specifying action for each difference 361
- Selecting objects to remove from the repository 362
- Checking and correcting script 363
- Adding comments 364
- Performing operation 365

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

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Create tag wizard 348
Get change script 366
Release new version of database 375
History 406

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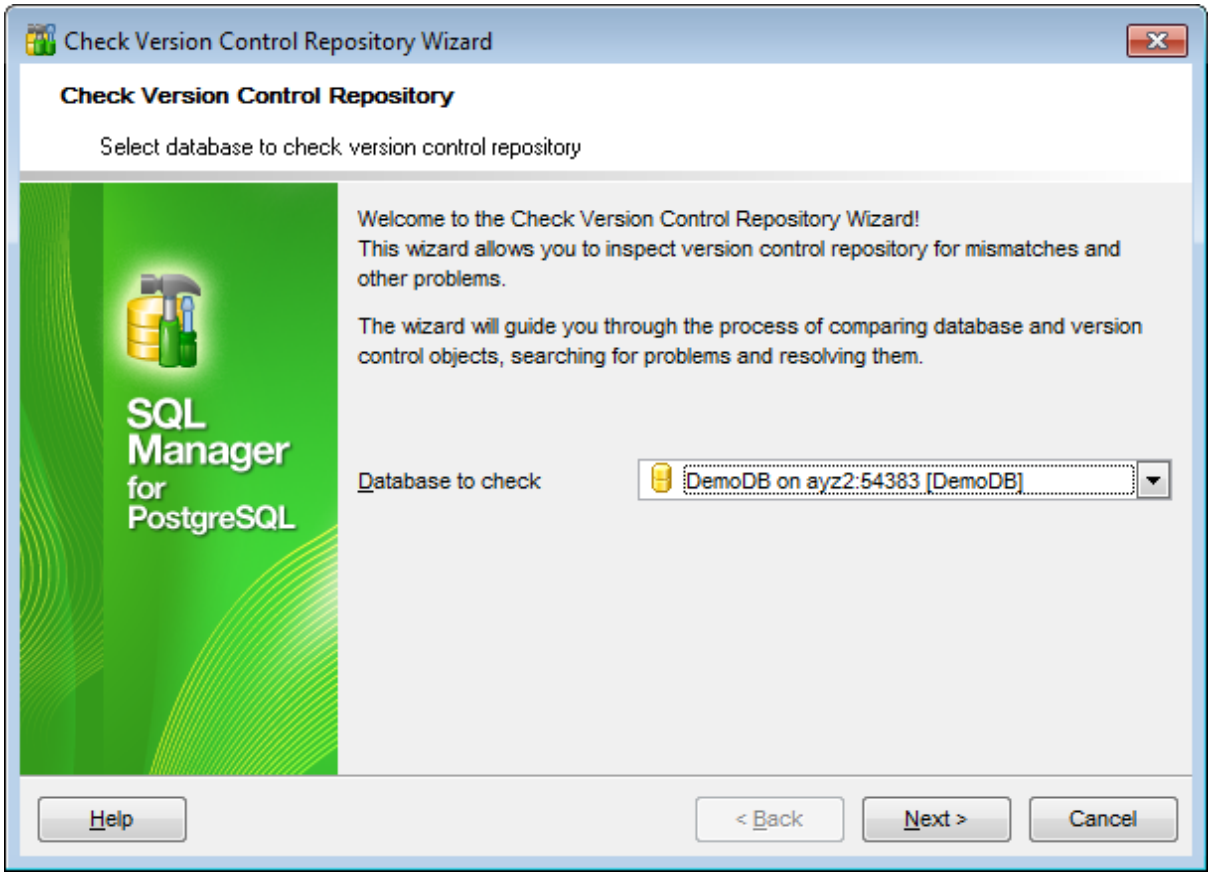
6.2.1 Selecting database

In this step you should select a database to check version control repository. Proceeding to the next step is allowed only if VCS is enabled for the selected database.



Use the **Database to check** drop-down list for the purpose.

Click the **Next** button to proceed to the Selecting object types 359 step of the wizard.

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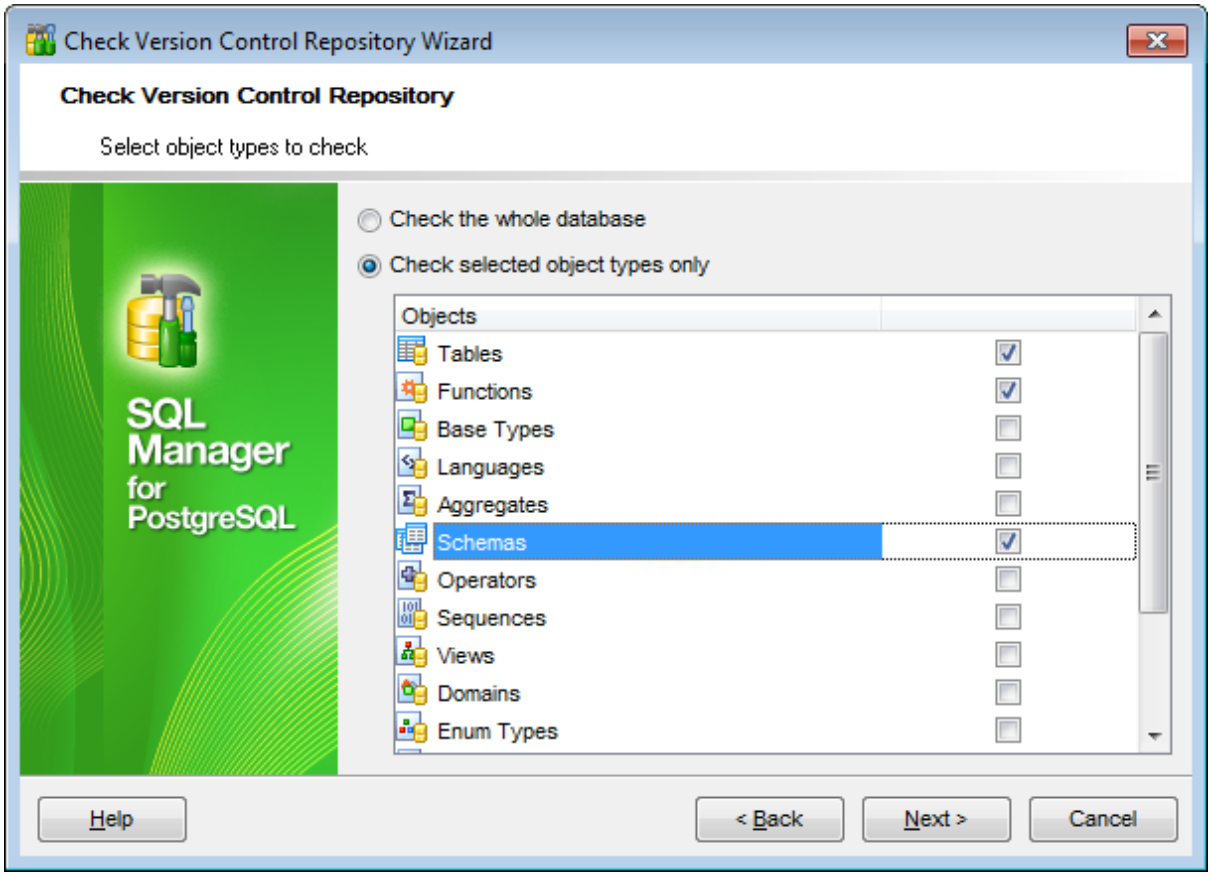
6.2.2 Selecting object types

In this step you need to select object types for check repository operation.



Check the whole database
Selects all database objects for check repository operation.

Check selected object types only
This option enables selecting object types manually. This option enables selecting object types manually. Selecting object types manually can increase speed of operation performance, but it also can make it less secure.

Click the **Next** button to proceed to the Checking repository 360 step of the wizard.

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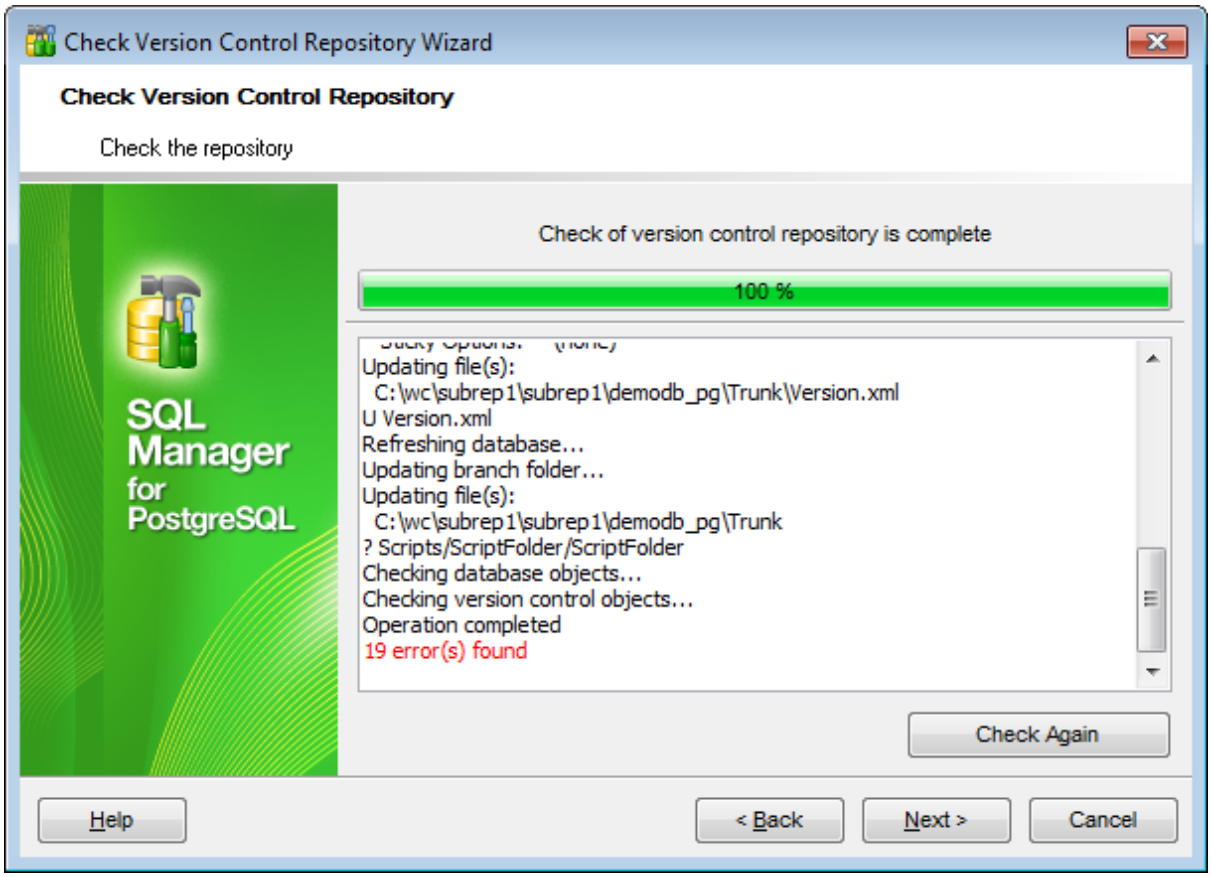
6.2.3 Checking repository

This step informs you that all necessary settings are defined and version control repository can be checked.

The log area allows you to view the log of operations and errors (if any). Errors state for differences between database objects and their description in the repository.



If differences are present, then the repository should be changed in order to correspond with current state of the database.

If no differences have been found, proceeding with the next step of the wizard is unavailable.

You can repeat repository checking clicking the **Check Again** button.

Click the **Next** button to proceed to the Specifying action for each difference 361 step of the wizard.

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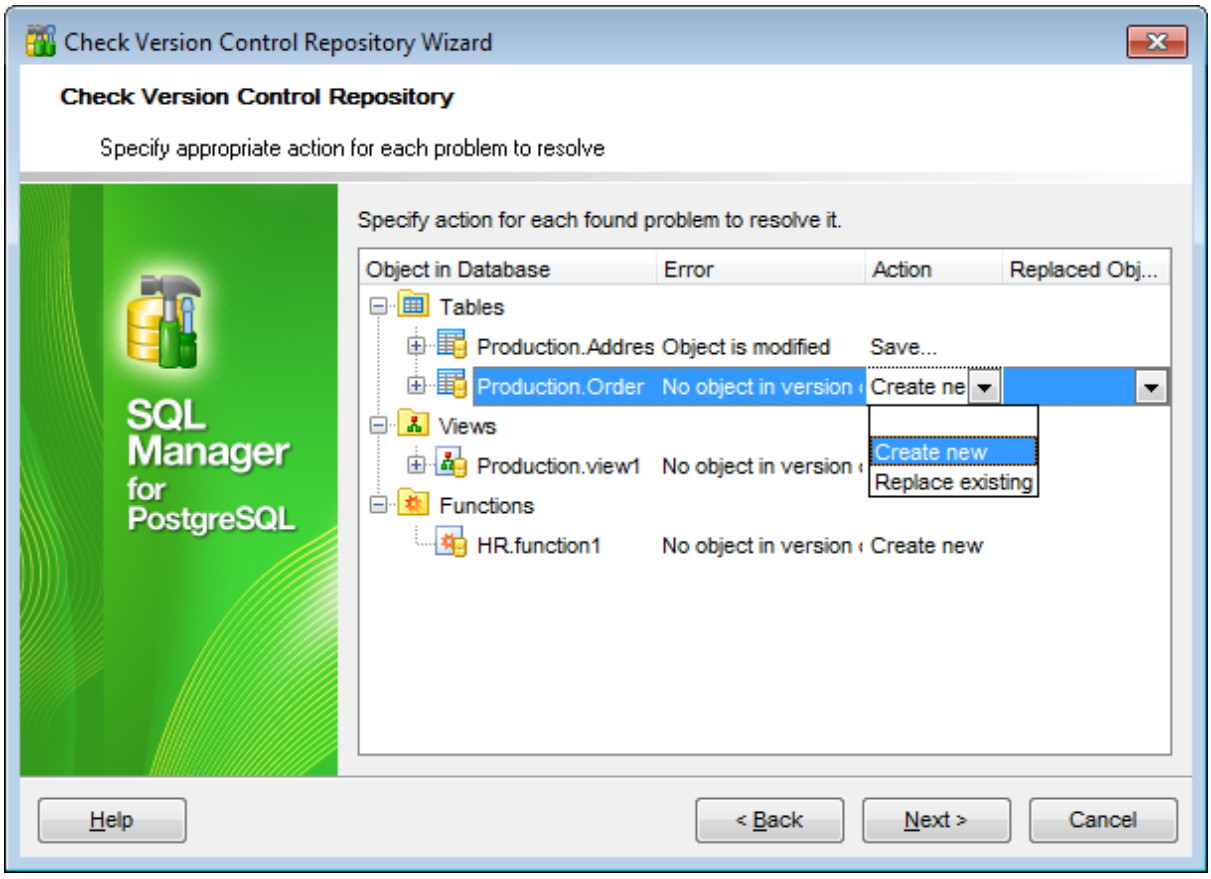
6.2.4 Specifying action for each difference

In this step you can view objects that have been changed and whose changes are not reflected in the repository.

Use the Action column to define action for the selected object.

Save
This action is available only for objects that exist in database and are described in VCS repository but whose properties are not up to date. Use the option to add changes to the object description.

Create New/Replace Existing
This actions appear for objects that exist in database but have no description in the database VCS repository. Use the **Create New** option to add new description, or the **Replace Existing** to substitute the existing description. If the **Replace Existing** option is selected, the **Replacement** should be defined. Note that the Replacement field contains the list of similar objects that are described in the repository but are absent from the database.



Click the **Next** button to proceed to the Selecting objects to remove from the repository 362 step.

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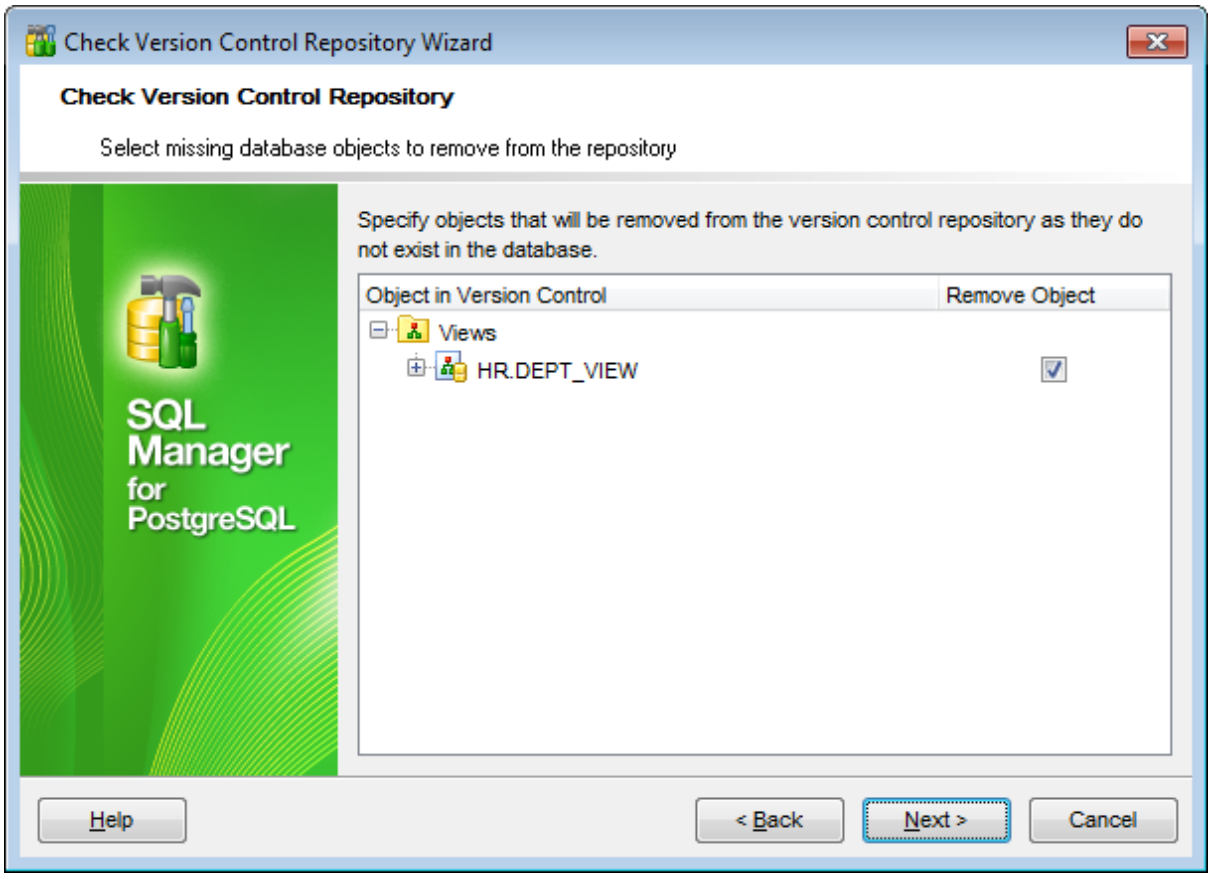
6.2.5 Selecting objects to remove from the repository

Use this step to mark objects to remove its description from the repository.

Table contains only objects whose descriptions exist in VCS repository but are absent from the database.



Click the **Next** button to proceed to the Checking and correcting script 363 step.

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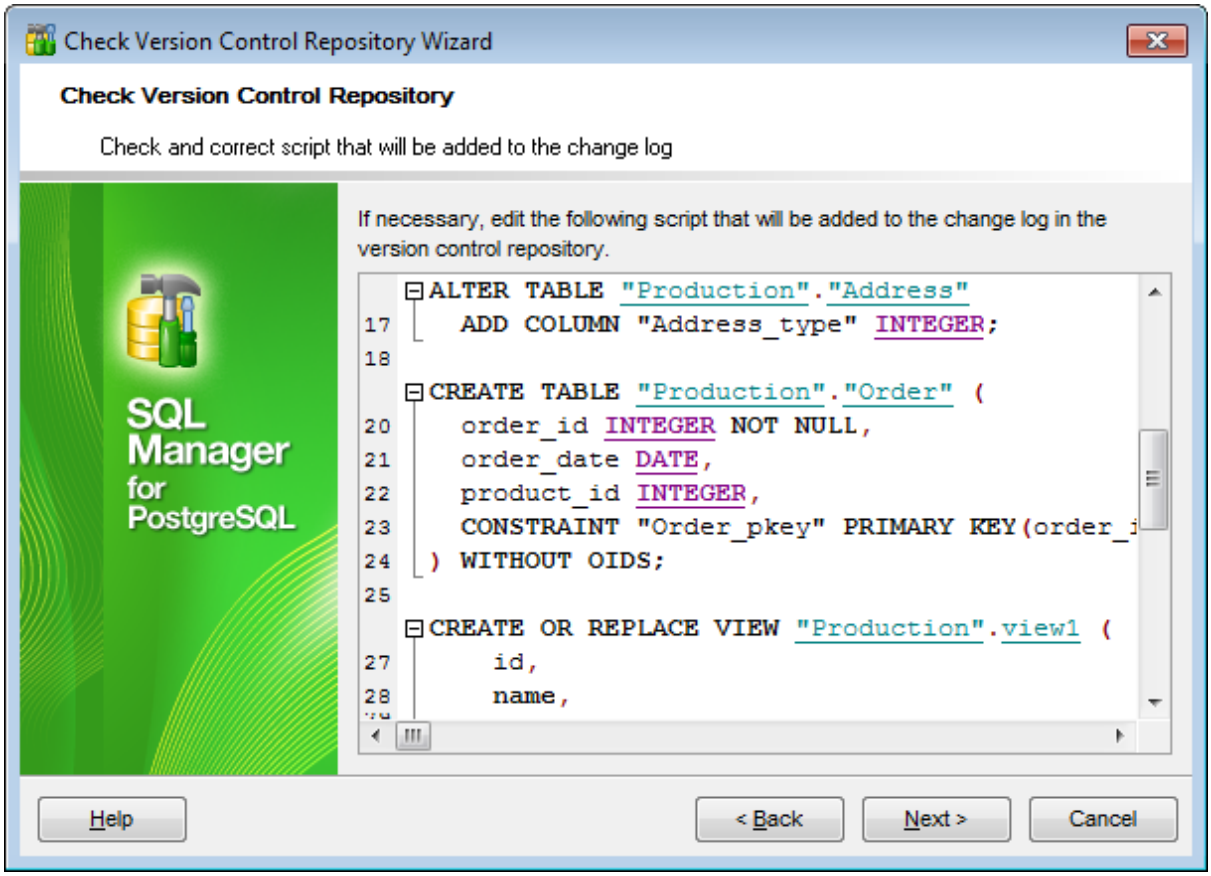
6.2.6 Checking and correcting script

This step allows you to view and correct script with changes selected at the previous steps.
In this editor you can use all the features available in Query Data 415: syntax highlight, code completion etc.

Note: This script will not be executed. It will be added to the database history 406 in the version control repository. If database history already contains commands that caused such changes in the database, remove corresponding commands from the script.



Click the **Next** button to proceed to the Adding comments 364 step of the wizard.

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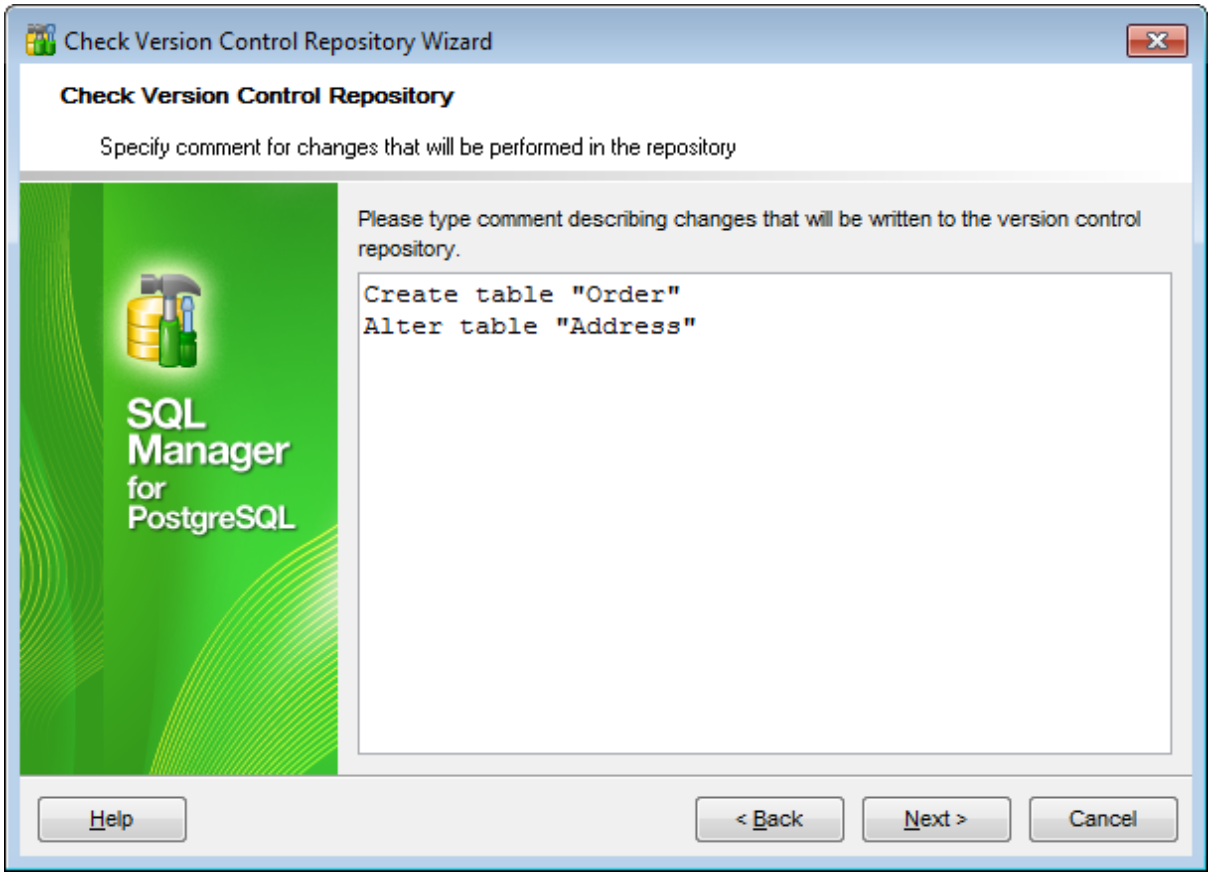
6.2.7 Adding comments

Use this step to bind commentaries to the changes that will be made to the version control repository.

Changes that will be applied to the repository you can find in the Specifying action for each difference[361] and Selecting objects to remove from the repository[362] steps of the wizard.



Click the **Next** button to proceed to the final[365] step.

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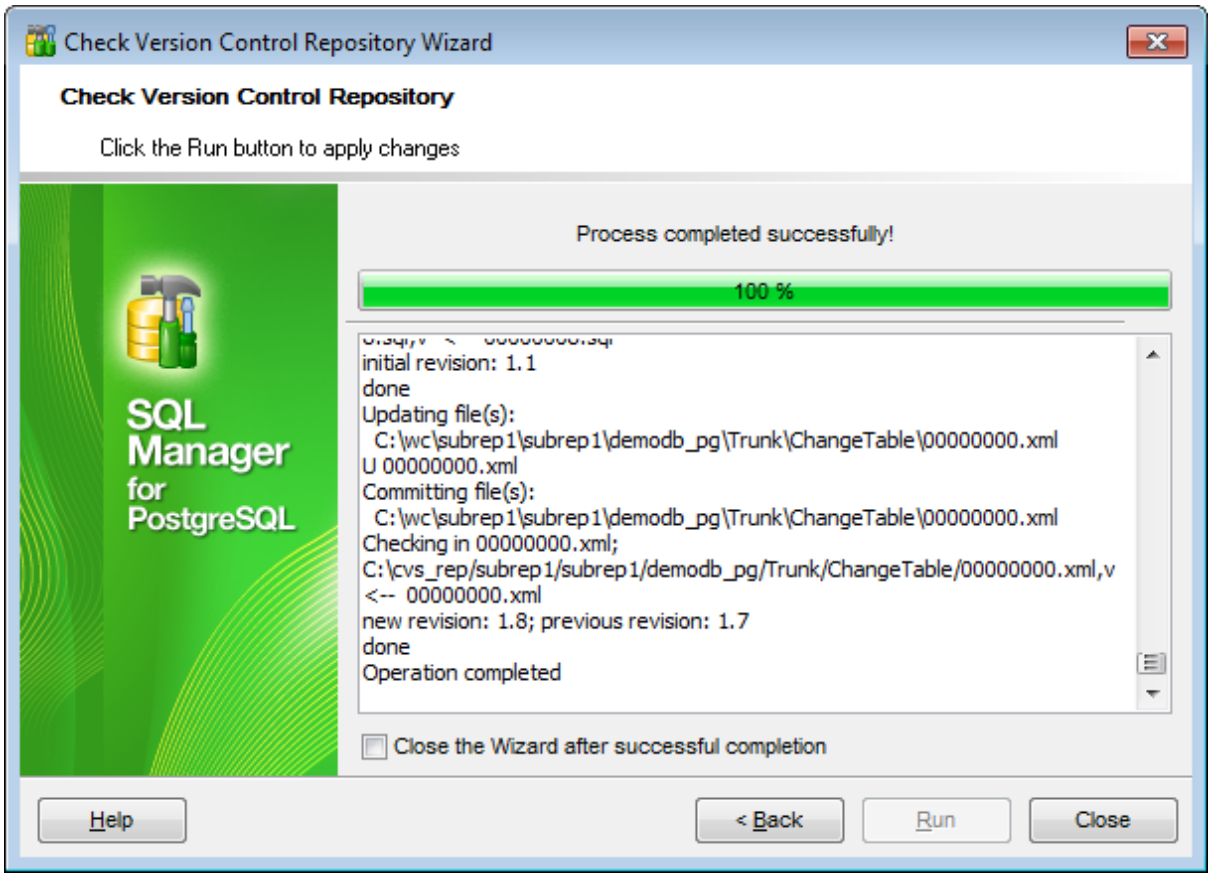
6.2.8 Performing operation

This step informs you that all necessary settings are defined and changes can be applied.

The log area allows you to view the log of operations and errors (if any).



Click the **Run** button to apply changes defined at the previous steps.

To close the wizard after successful completion of the operation use the corresponding option.

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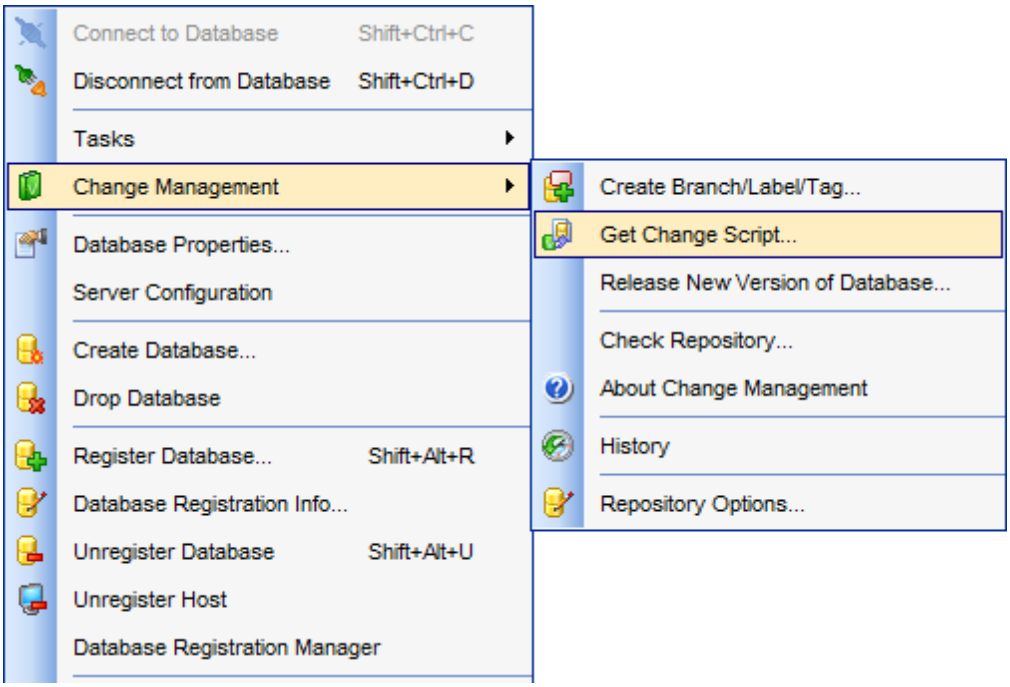
6.3 Get change script wizard

Get change script wizard generates script that reflects differences between two database states. This script can be used to bring database to the required state. Any database state existing in its version control history can be taken as start or end point.

To launch the wizard use the **Change management |** **Get change script...** item of database context menu 54 (or any database object context menu), or use the **Tools | Change management |** **Get change script...** main menu item.



- Selecting source database 368
- Selecting script generation method 369
- Specifying start and end points for the script 370
- Specifying comments 372
- Specifying script destination 373
- Performing operation 374

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Create branch/label/tag wizard 348
Check repository wizard 356
Release new version of database

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375
History 406

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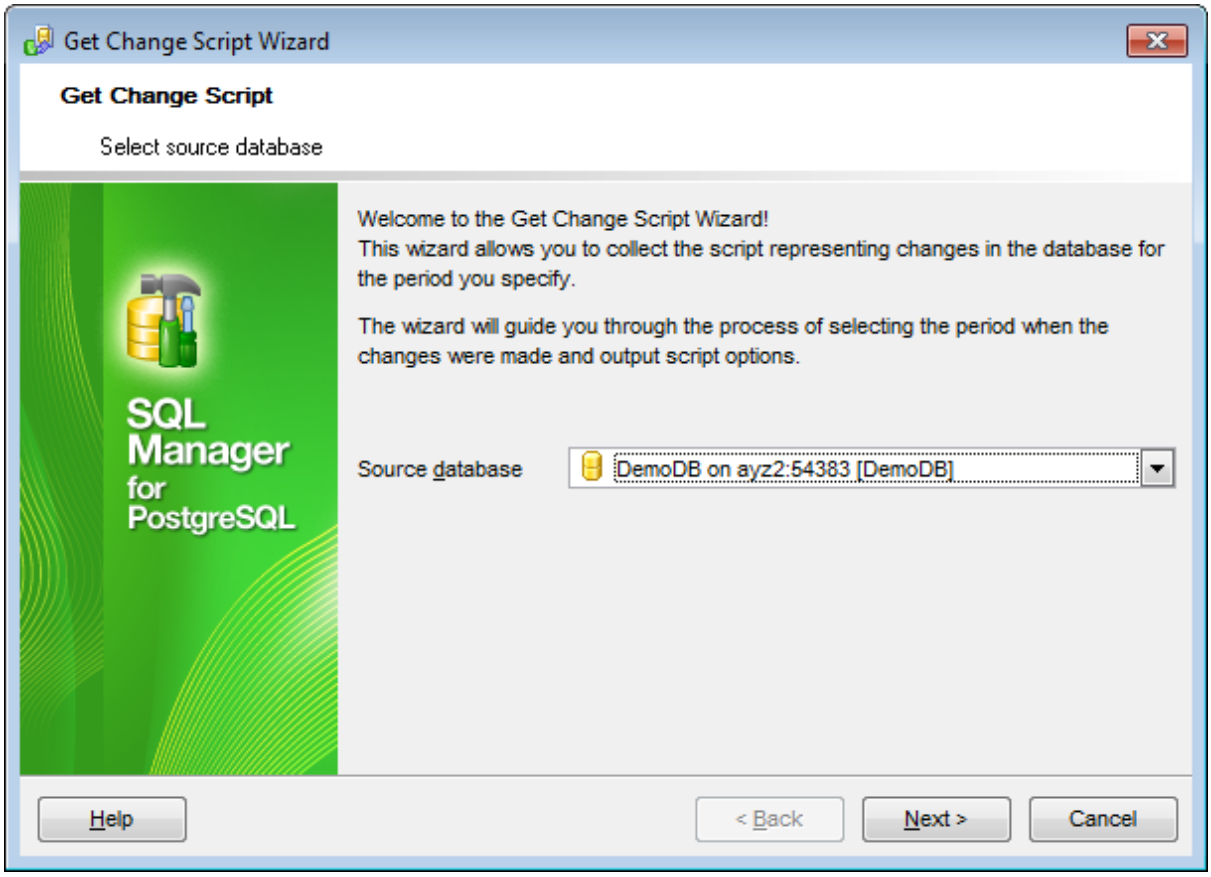
6.3.1 Selecting source database

Use this step to select source database to get change script. Proceeding to the next step is allowed only if VCS is enabled for the selected database.



Use the **Source database** drop-down list for the purpose.

Click the **Next** button to proceed to the Selecting script generation method 369 step.

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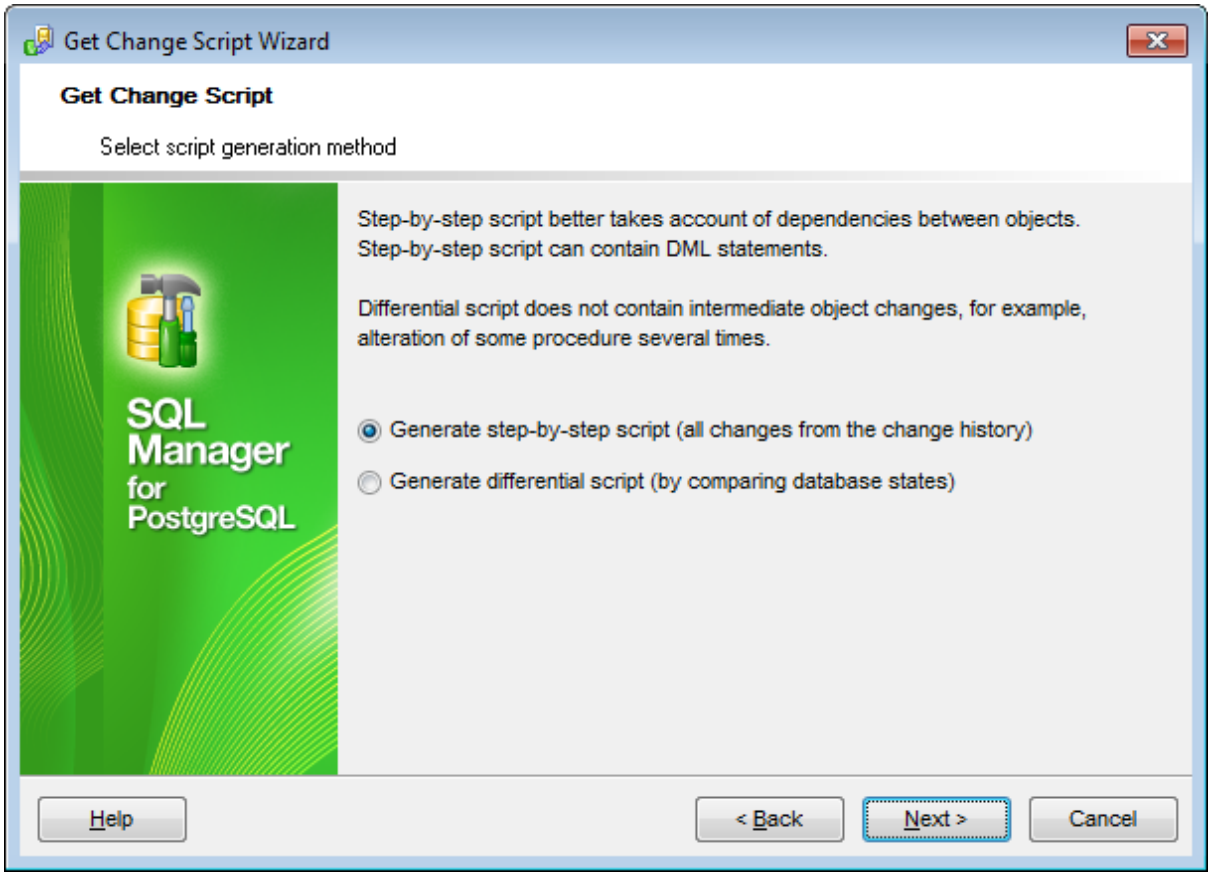
6.3.2 Selecting script generation method

This step allows you to select script generation method.



Generate step-by-step script
Use this method to generate script that reflects consecutive changes made to database during the period defined at the next 370 step.

Note: This script can't be used to rollback to the initial state of the database (start point).

Generate differential script
Using this method the program generates script reflecting difference between two database states.

Note: Script generated using this method never contains intermediate changes of an object.

Click the **Next** button to proceed to the Specifying start and end points for the script 370 step of the wizard.

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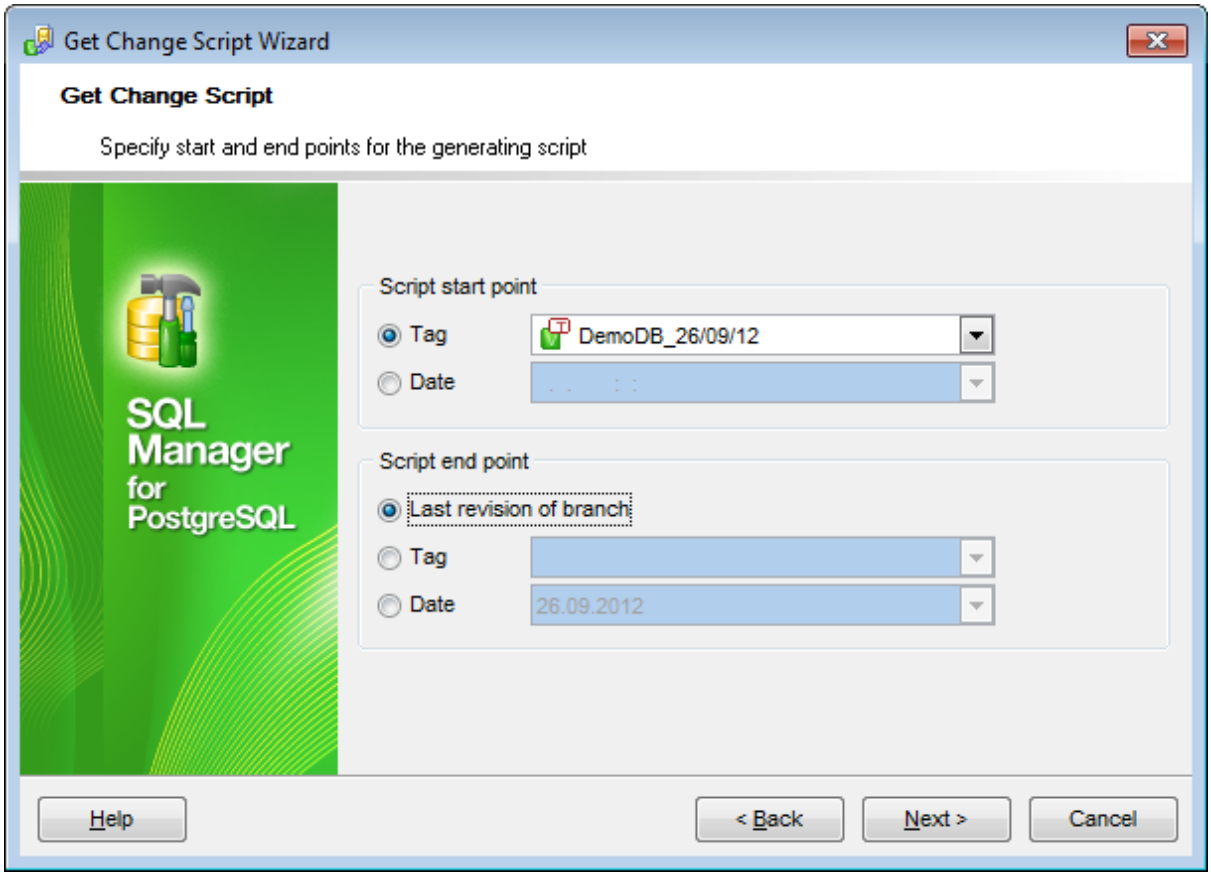
6.3.3 Specifying start and end points for the script

This step allows you to define the period. Generated script will consider changes made in this period.



Script start point
First select start point type: **Tag** or **Date**. Then either select tag[348] from the drop-down list, or specify date. **Last revision of branch** can be selected as start point only when getting differential script.

Script end point
First select end point type: **Last revision of branch** (current database state), **Tag** or **Date**. Then either select tag from the drop-down list, or specify date.

Note: When the Step-by-step method of script generation is selected the Tag list will contain all tags/labels from current and parent branches. Tags/labels from parent branches appear in the list only if these branches heads are located in VCS tree structure higher than last revision the of branch.

Script end point
First select end point type: **Last revision of branch** (current database state), **Tag** or **Date**. Then either select tag from the drop-down list, or specify date.

Note: If the step-by-step mode is selected in the previous step[369], start point must be

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earlier then end point.

Click the **Next** button to proceed to the Specifying comments 372 step of the wizard.

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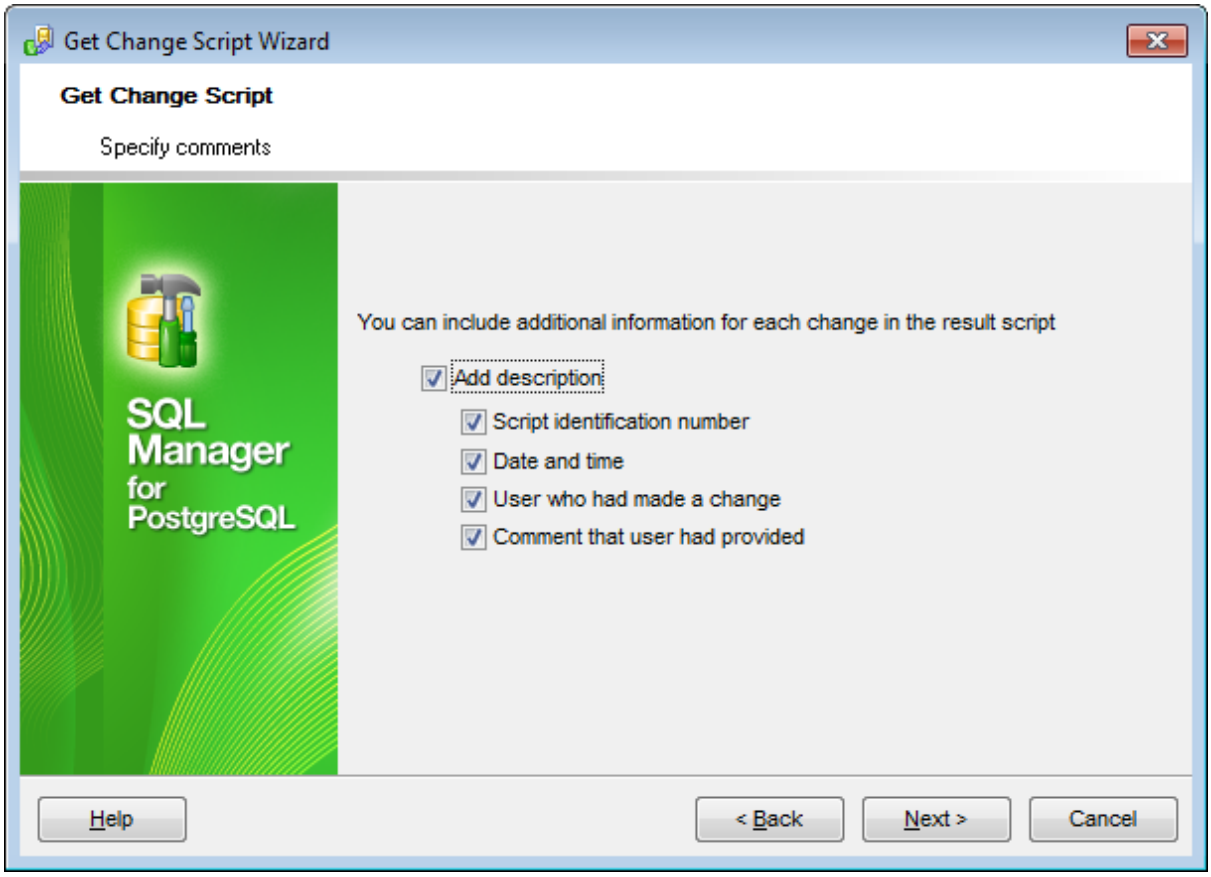
6.3.4 Specifying comments

This step allows you to select comments to be added to each statement script of the script. When getting differential script this step is unavailable.



Check the needed options to add corresponding comment to each script statement.

To disable comments uncheck the ☑ **Add description** option.

Click the **Next** button to proceed to the Defining script destination 373 step of the wizard.

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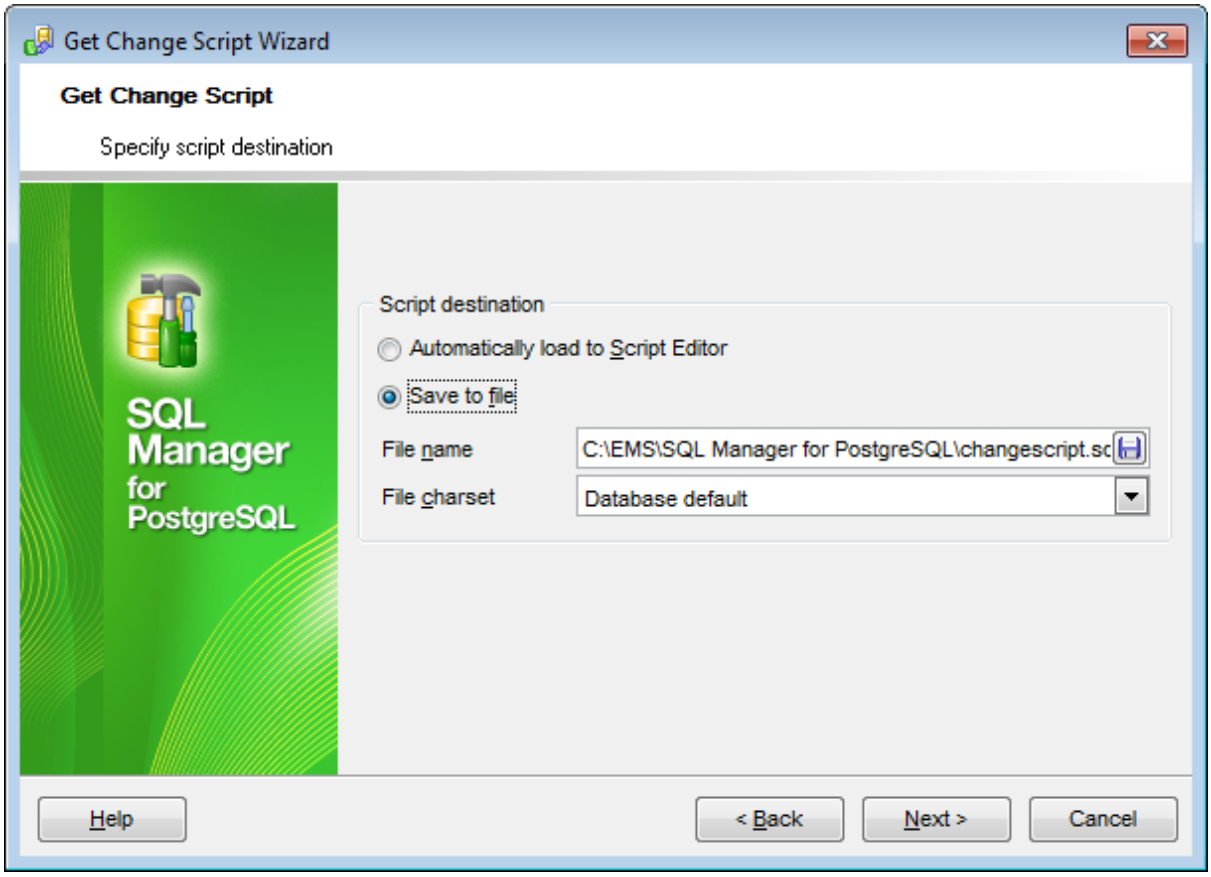
6.3.5 Specifying script destination

In this step you need to set script destination.



Automatically load to Script Editor
With this option enabled the generated script will be opened in **Script Editor** where you can execute it at once.

Save to file
Use this option to save script to a file for future use. File name and its location is defined in the **File name** field.

Regardless of the script destination selected you need to define **Script character set**.

Click the **Next** button to proceed to the final 374 step of the wizard.

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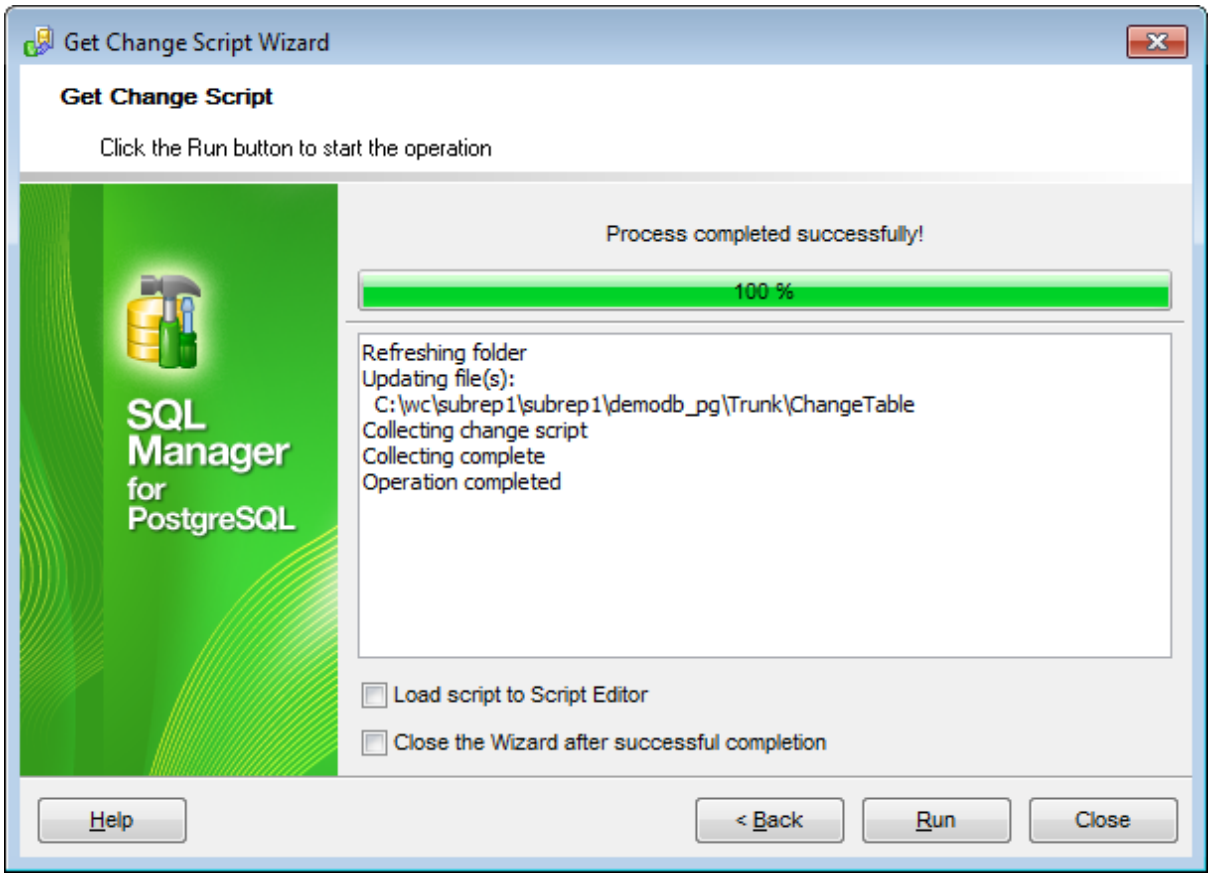
6.3.6 Performing operation

This step informs you that all necessary settings are defined and change script can be generated.

The log area allows you to view the log of operations and errors (if any).



Click the **Run** button to generate change script.

☑ **Load script to Script Editor**
Enable the option to open the result script within the Execute Script Editor 646.

To close the wizard after successful completion of the operation use the corresponding option.

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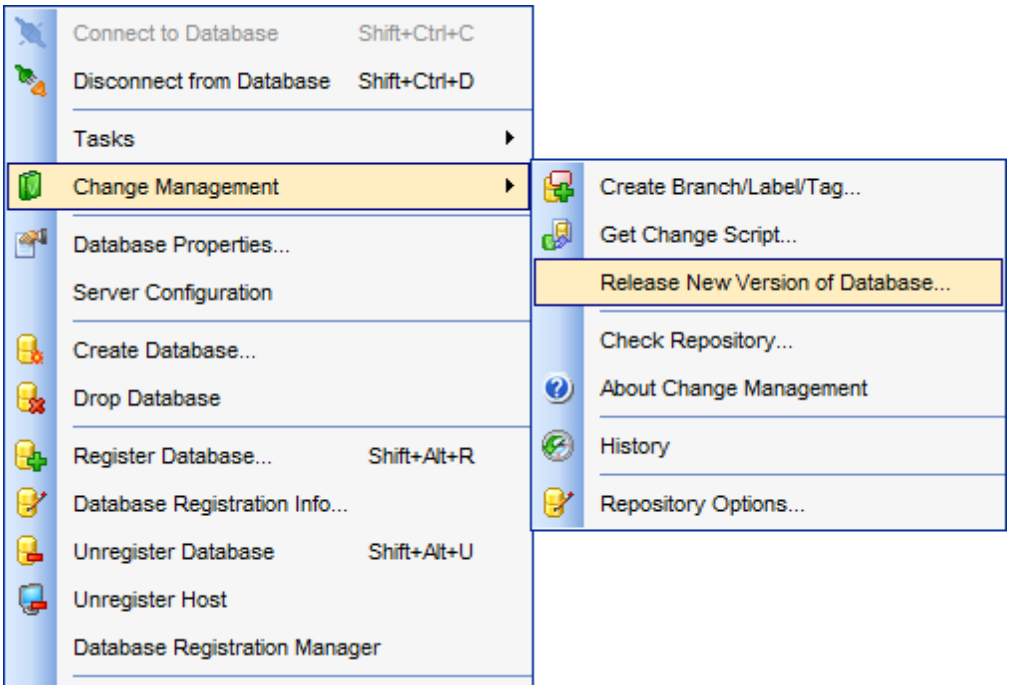
6.4 Release new version of database

Release new database wizard provides automatic performing of all necessary operations that required for new database release.
It allows you to get script with database changes from previous state to current one and to test it on the previous database state.
The wizard consists of the following operations:
1. VCS repository is checked to define whether it contains the exact description of current database state (similar to the Check repository wizard 356).
2. Actual position of the database in VCS repository is labeled/tagged. This provides possibility to get script with the additional changes made after this point if such changes appear.
3. The script containing changes from previous database state to current is generated.
4. Test database is created from previous state label/tag. Change script is tested on this database. Then the result database is compared to current version.

To launch this wizard use the **Change Management | Release New Version of Database** item of the host 52 or database context menu 54.
You can also use the **Tools | Change management | Release New Version of Database** item of the main menu 961.



Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

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Create branch/label/tag wizard 348
Check repository wizard 356
Get change script wizard 366
History 406

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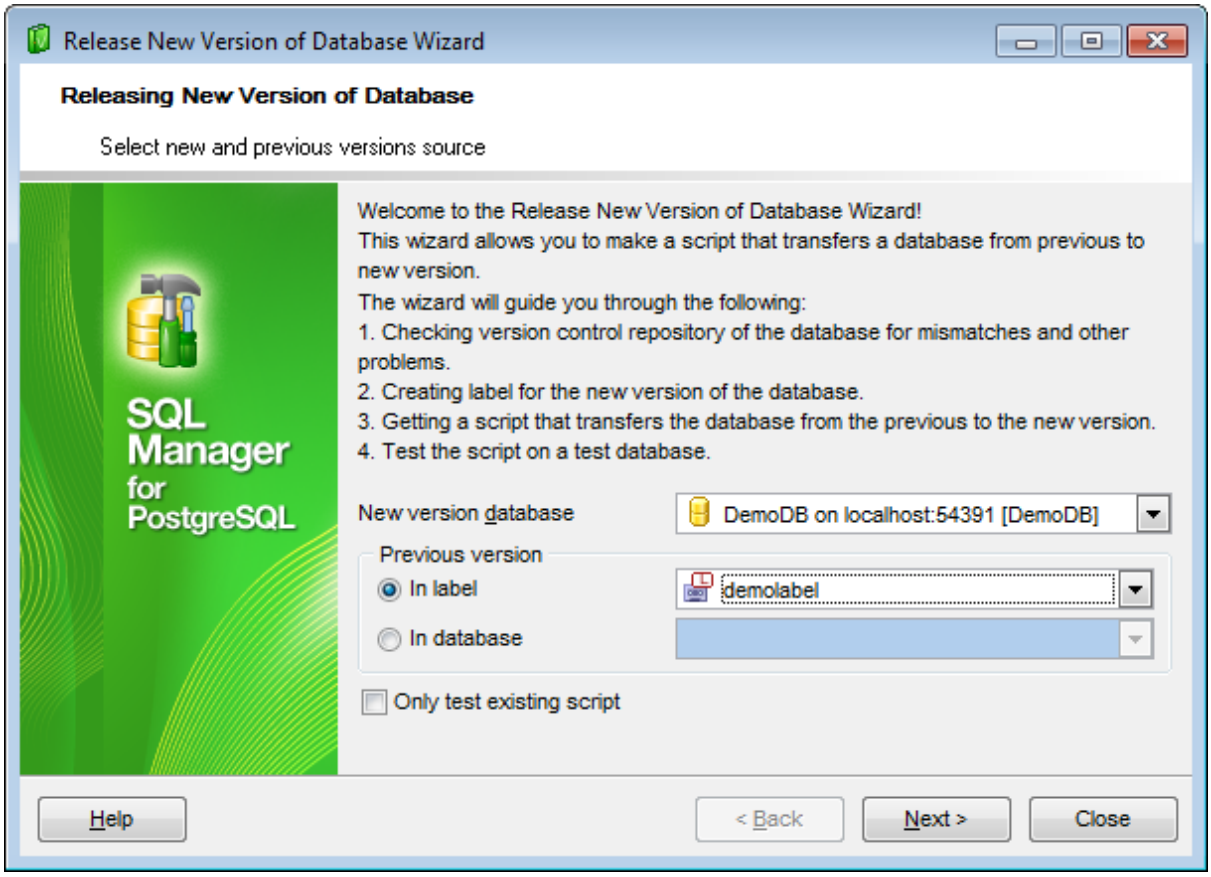
6.4.1 Selecting versions source

This step allows you to select the database to release and it's previous version.



Select the **new version database** from the appropriate drop-down list.

Previous version
This section defines previous version parameters.
In label
Use this mode to get previous database version from an existing label.
In database
This mode allows you to get previous database version from a database.

Select the needed object from the list.

Only test existing script
This option defines whether to generate new change script. Enable the option to proceed to the step where you can select an existing script file and test it.

Click the **Next** button to proceed to the Checking repository 378 step.

If the **Only test existing script** is selected, then you will proceed to the Checking repository 378 step.

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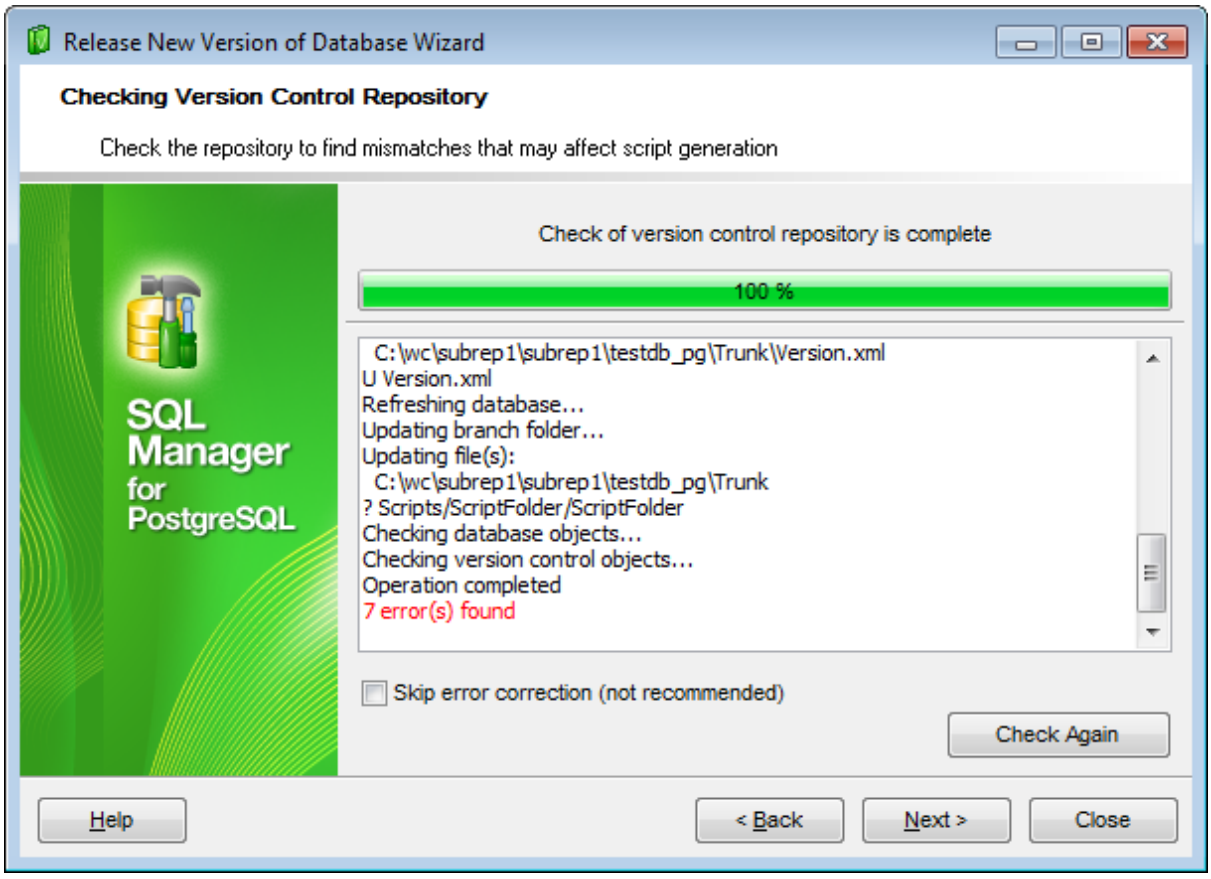
6.4.2 Checking repository

Click the **Run** button to check repository of the selected database.

The log area allows you to view the log of operations and errors (if any). Errors state for differences between database objects and their description in the repository.



If errors were found, then the repository should be changed in order to correspond with current state of the database.

You can repeat repository checking clicking the **Check Again** button.

☑ **Skip error correction**
Enable the option to skip repository errors correction, but it is not recommended.

Click the Next button to proceed to the next step.

If no errors found you will proceed with the Creating label/tag 384 step. Otherwise the Creating label/tag 384 step will be the next.

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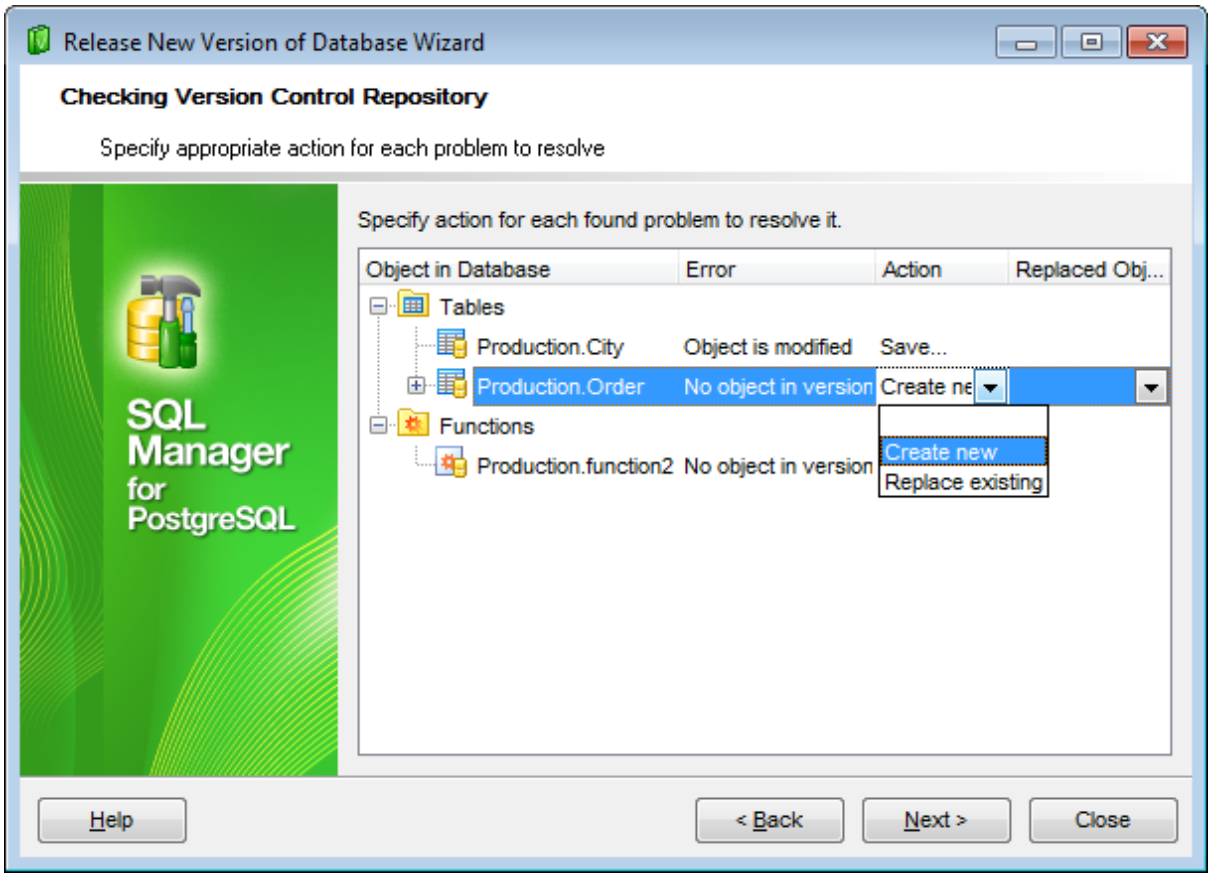
6.4.3 Specifying actions for problems to resolve

In this step you can view objects that have been changed and whose changes are not reflected in the repository.

Use the Action column to define action for the selected object.

Save
This action is available only for objects that exist in database and are described in VCS repository but whose description is not up to date. Use the option to add changes to the object description.

Create New/Replace Existing
This actions appear for objects that exist in database but have no description in the database VCS repository. Use the **Create New** option to add new description, or the **Replace Existing** to substitute the existing description. If the **Replace Existing** option is selected, the **Replacement** should be defined. Note that the Replacement field contains the list of similar objects that are described in the repository but are absent from the database.



Click the **Next** button to proceed to the Selecting objects to delete from repository 380 step.

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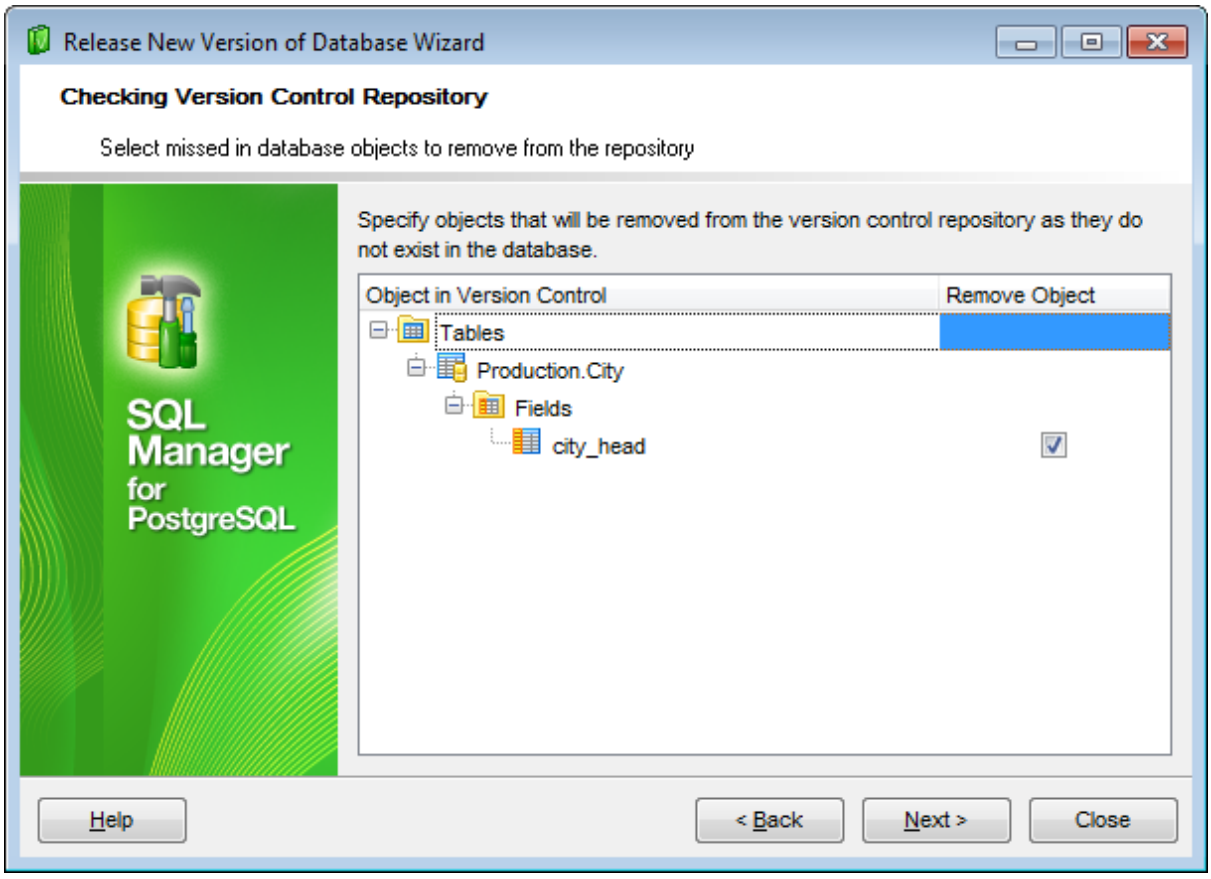
6.4.4 Selecting objects to delete from repository

Use this step to mark objects to remove its description from the repository.

Table contains only objects whose descriptions exist in VCS repository but are absent from the database.



Click the **Next** button to proceed to the Checking and correcting script 381 step.

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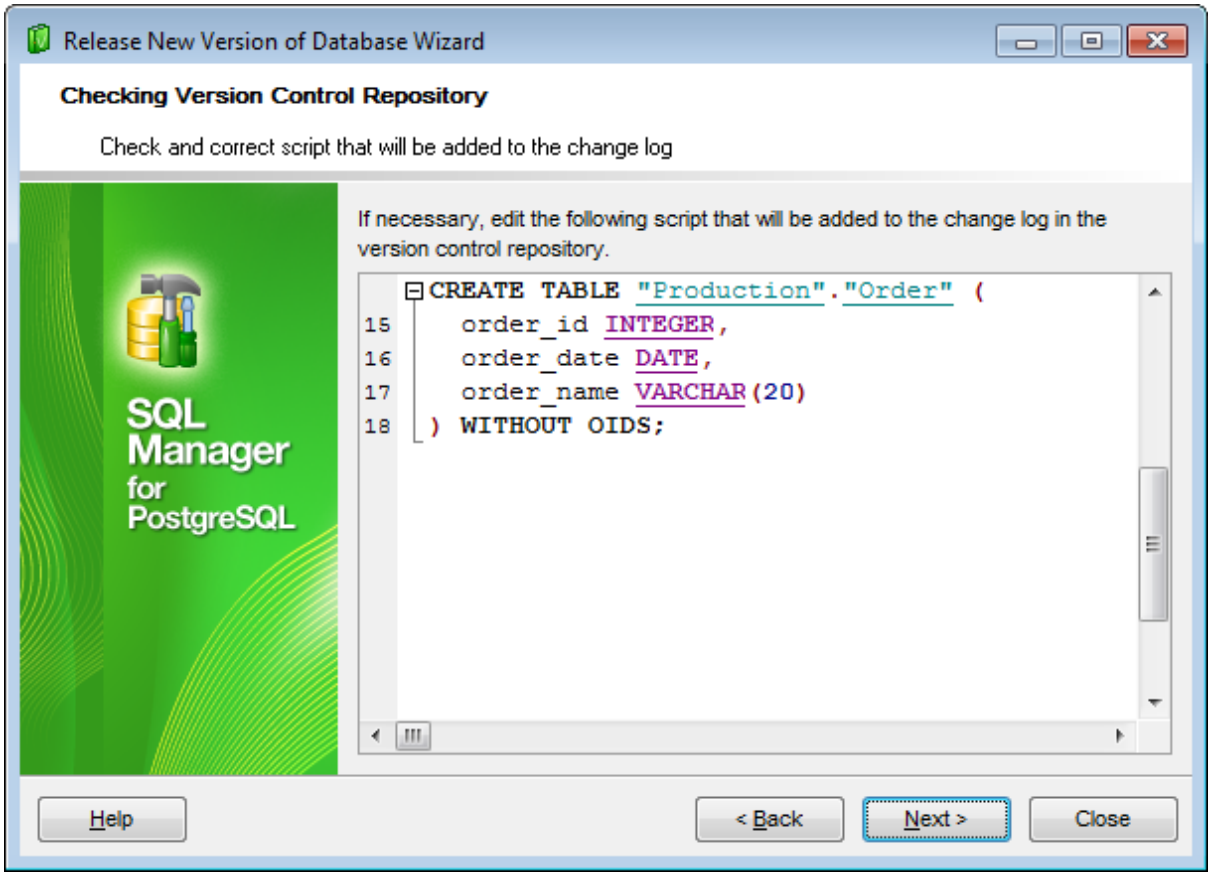
6.4.5 Checking and correcting script

This step allows you to view and correct script with changes selected at the previous steps.
In this editor you can use all the features available in Query Data 415: syntax highlight, code completion etc.

Note: This script will not be executed. It will be added to the database history 406 in the version control repository. If database history already contains commands that caused such changes in the database, remove corresponding commands from the script.



Click the **Next** button to proceed to the Specifying comments 382 step.

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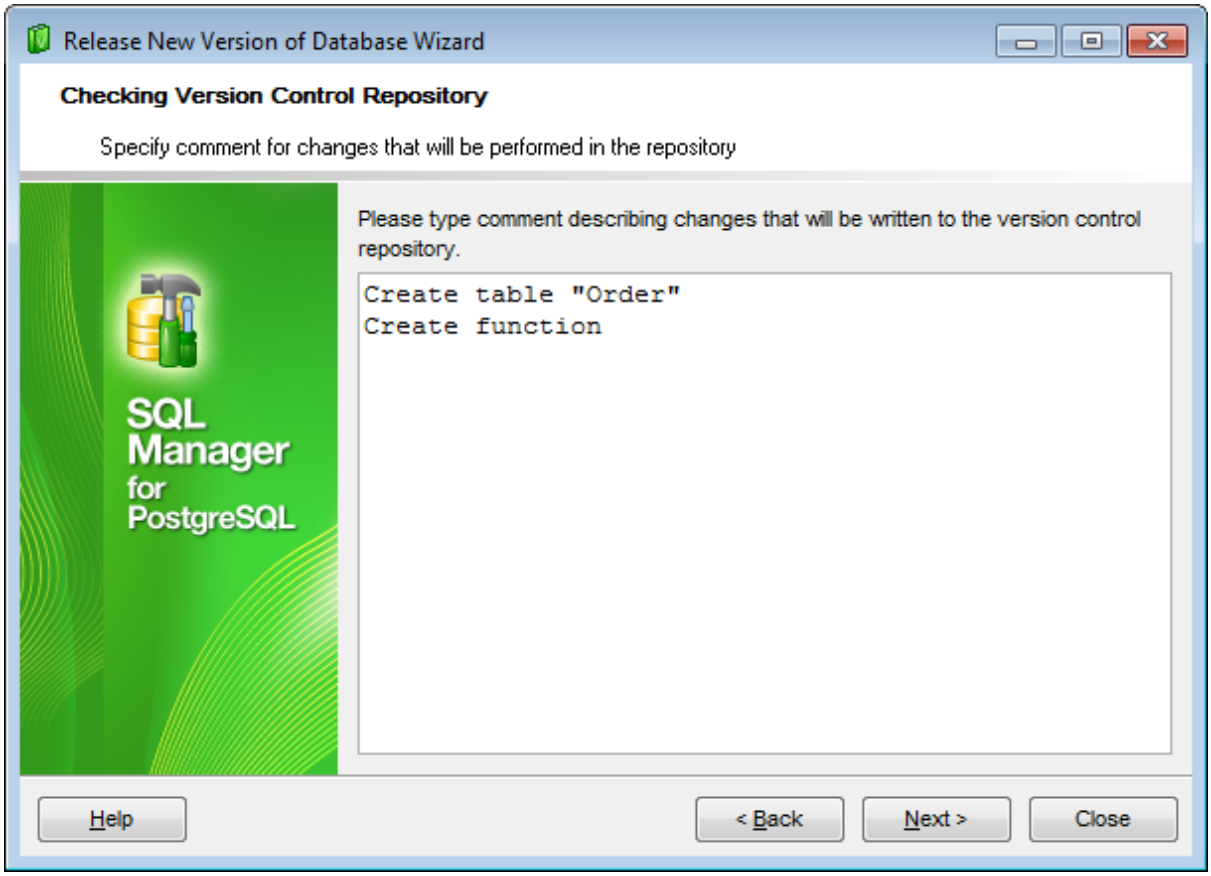
6.4.6 Specifying comments

Use this step to bind commentaries to the changes that will be made to the version control repository.

Changes that will be applied to the repository you can find in the Specifying action for each difference 379 and Selecting objects to remove from the repository 380 steps of the wizard.



Click the **Next** button to proceed to the Performing repository correction 383 step.

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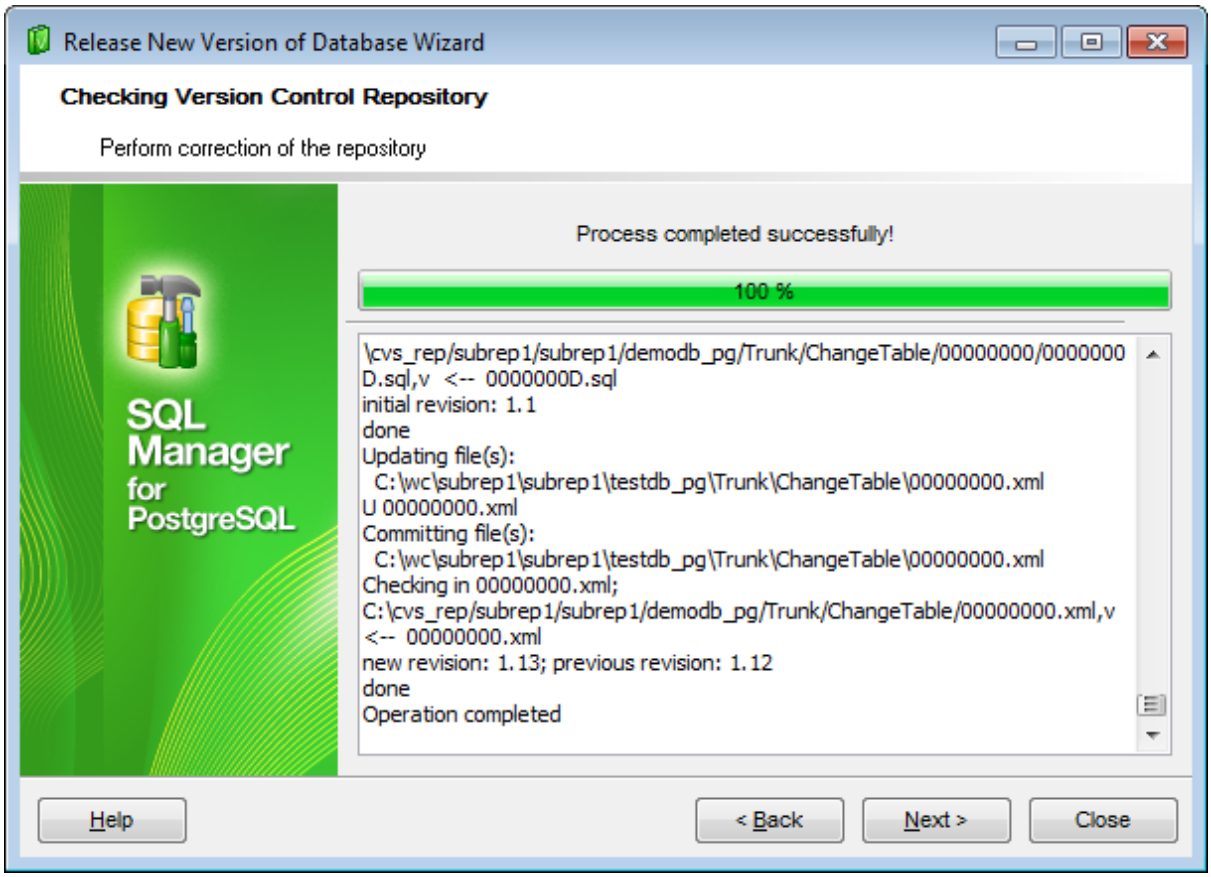
6.4.7 Performing repository correction

This step informs you that all necessary settings are defined and changes can be applied.

The log area allows you to view the log of operations and errors (if any).



Click the **Next** button to return to the Checking repository 378 step. Repository re-checking is necessary to make sure that no errors persist.

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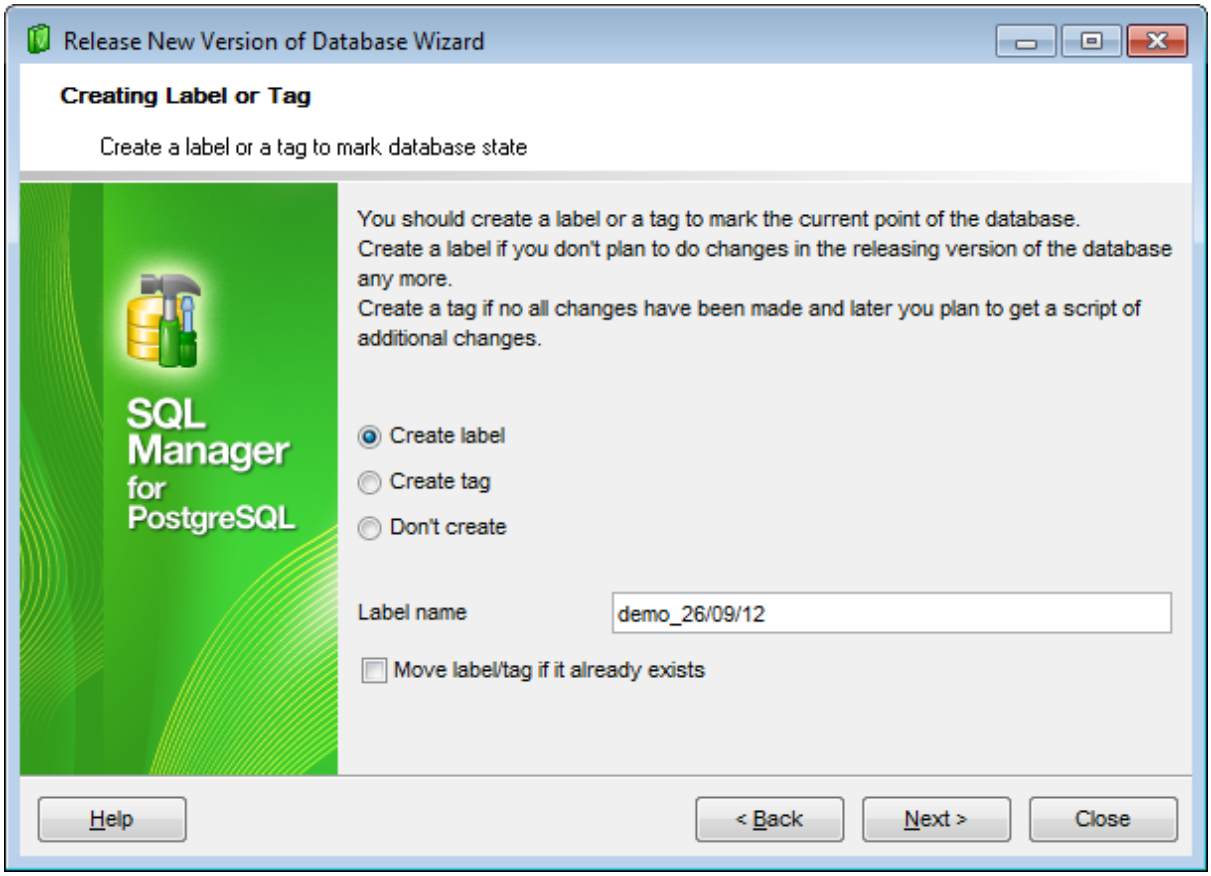
6.4.8 Creating label/tag

Creating of label or tag is necessary for marking current database state.

Use the **Create label** option if you are not planning to make changes to the released database version.
Use the **Create tag** option if not all the changes were applied and it is planned to get change script with further changes.



Don't create
Use this option to skip label/tag creation.

Label/Tag name
Specifies name for created tag or label.

Move label/tag if it already exists
Enable the option to move the existing object with the new one if their names coincide.

Depending on the option selected the you will proceed to different steps:
For **Create label** selected - the next step will be Specifying label options 385;
For **Create tag** selected - the next step will be Performing label creation 386;
For **Don't create** selected - the next step will be Generating change script 387.

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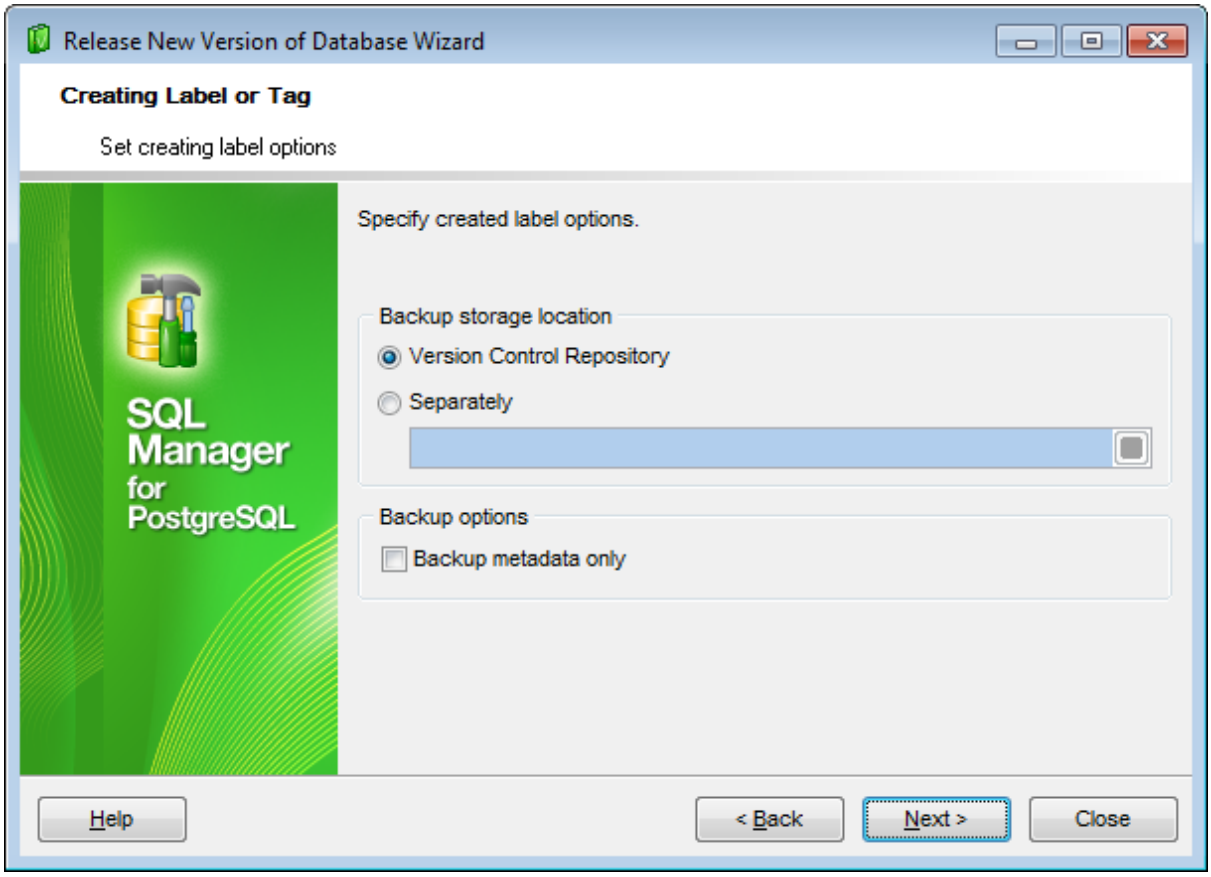
6.4.9 Specifying label options

This step appears only when label is created. Use this step to define label parameters.



Backup storage location

Version Control Repository
Database backup copy will be stored in the VCS repository folder.

Separately
Database backup copy will be stored in the folder specified below.

Backup metadata only
Disable the option if you need full database backup to be created with the label.

Click the **Next** button to proceed to the Performing label creation 386 step.

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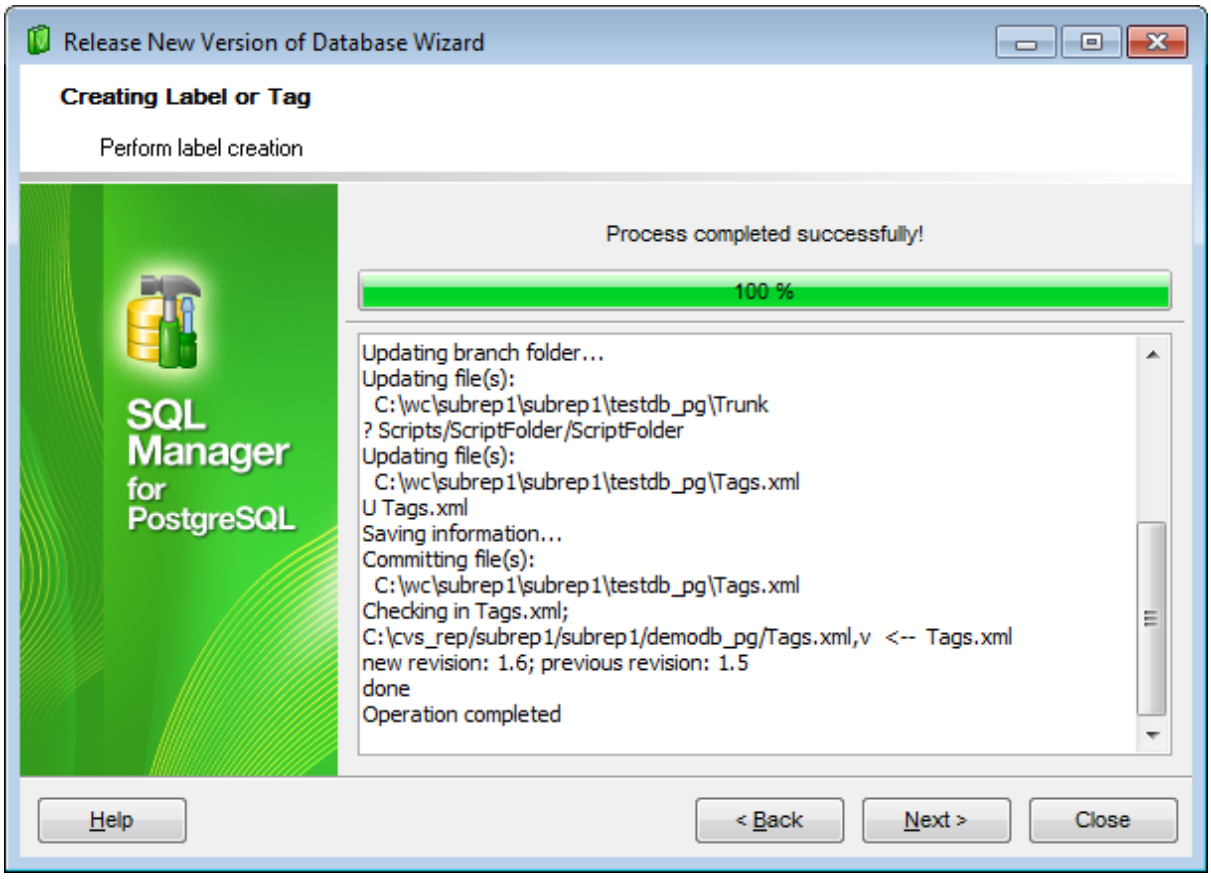
6.4.10 Performing label creation

This step is intended to inform you that all necessary settings have been defined and you can perform tag or label creation.

The log area allows you to view the log of operations and errors (if any).



Click the **Run** button to create label/tag.

After the operation is successfully finished, **Next** button appears instead of **Run**. Click the button to proceed to the Generating change script 387 step.

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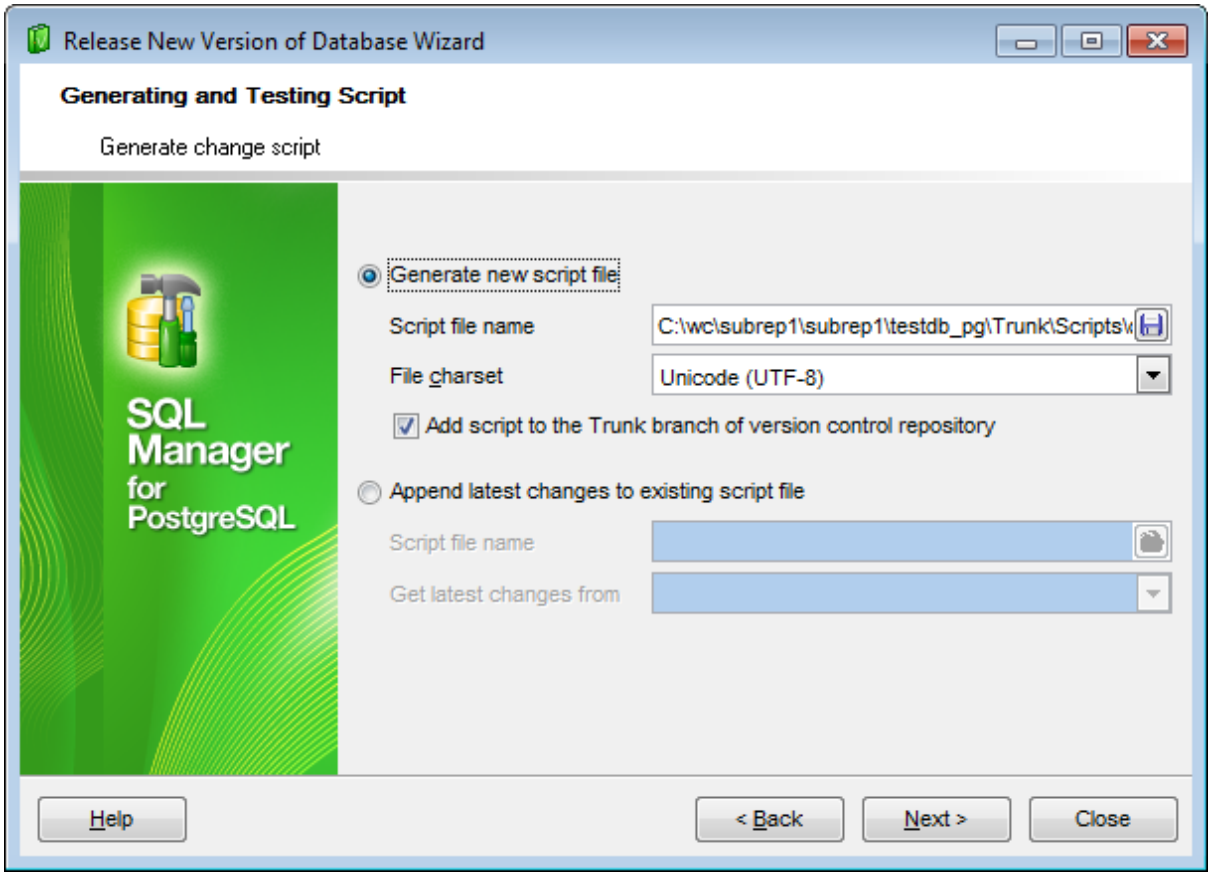
6.4.11 Generating change script

Use this step to define change script creation parameters.



Generate new script file
For the new script you need to define its location and file name. Use the corresponding field for this purpose.
You also need to select **File charset** from the drop-down list.

Add script to version control repository
Enable the option to add created script to the database VCS repository. The option can be enabled only if specified script file location is the same as the local repository folder directory where shared scripts are stored.

Append latest changes to existing script file
Use this mode if change script has been already generated by the **Release New Version of Database Wizard**, but then changes were added to the released database. It is supposed that label have been created after previous script generation.

Script file name
Select existing script file within this field. Use the **Save As** button to open dialog window to ease file selecting.

Get latest changes from
Select tag or label from this drop-down list. Only latest changes will be added to the script selected in the **Script file name** field. In this case the **Previous version**

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selected at the first step[377] will be used only for providing information concerned test database, but not for script generation.

If the **Generate new script file** mode is selected, the next step will be Selecting method of script generation[389].

Otherwise the wizard will proceed with the Specifying test database location[394] step.

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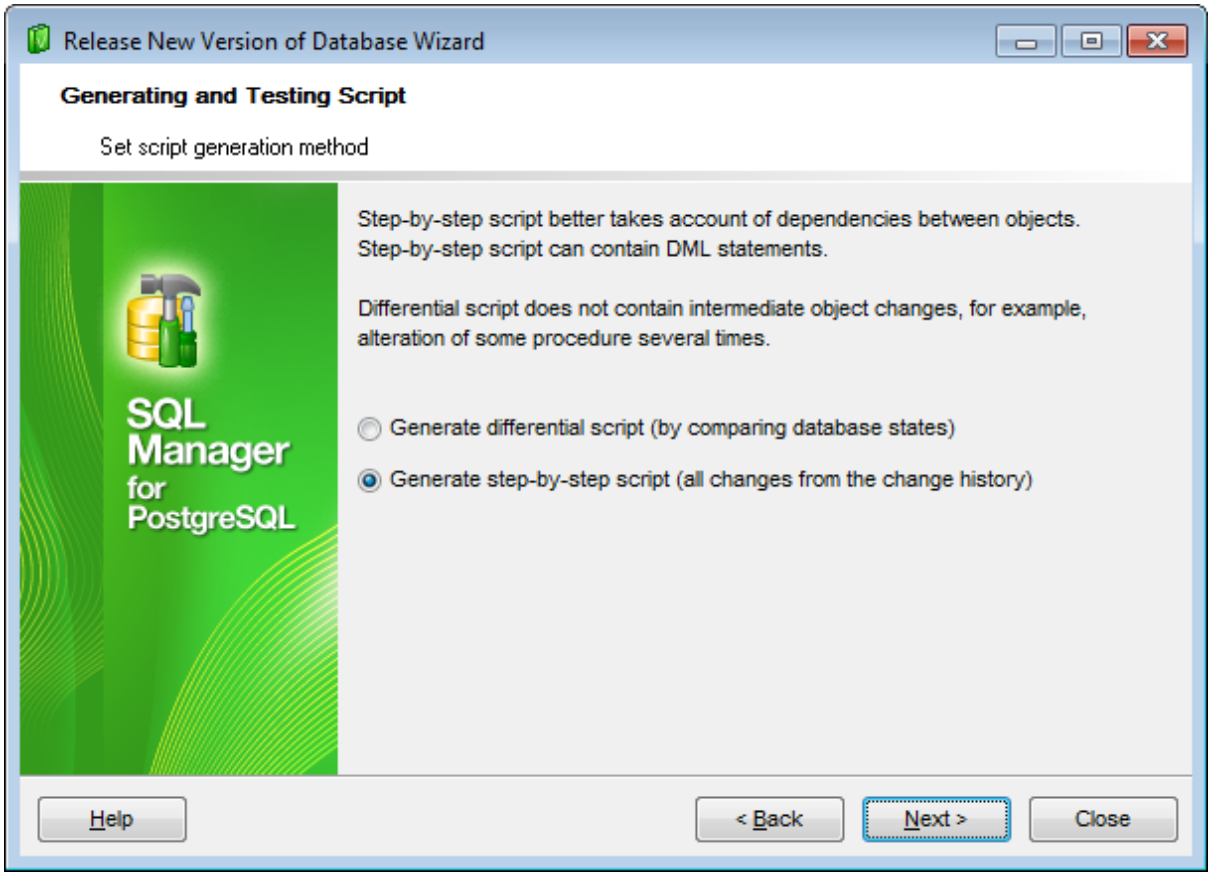
6.4.12 Selecting method of script generation

Use this step to select generated script type.



Generate differential script (by comparing states)
Using this method the program generates script reflecting difference between two database states.

Note: Script generated using this method never contains intermediate changes of an object.

Generate step-by-step script (all changes from the change history)
Use this method to generate script that reflects consecutive changes made to database. Script will contain all statements from VCS history 406 between its previous and actual states.

For *differential script generation* the next step will be the Performing script generation 391; for *step-by-step* - Specifying comments 390.

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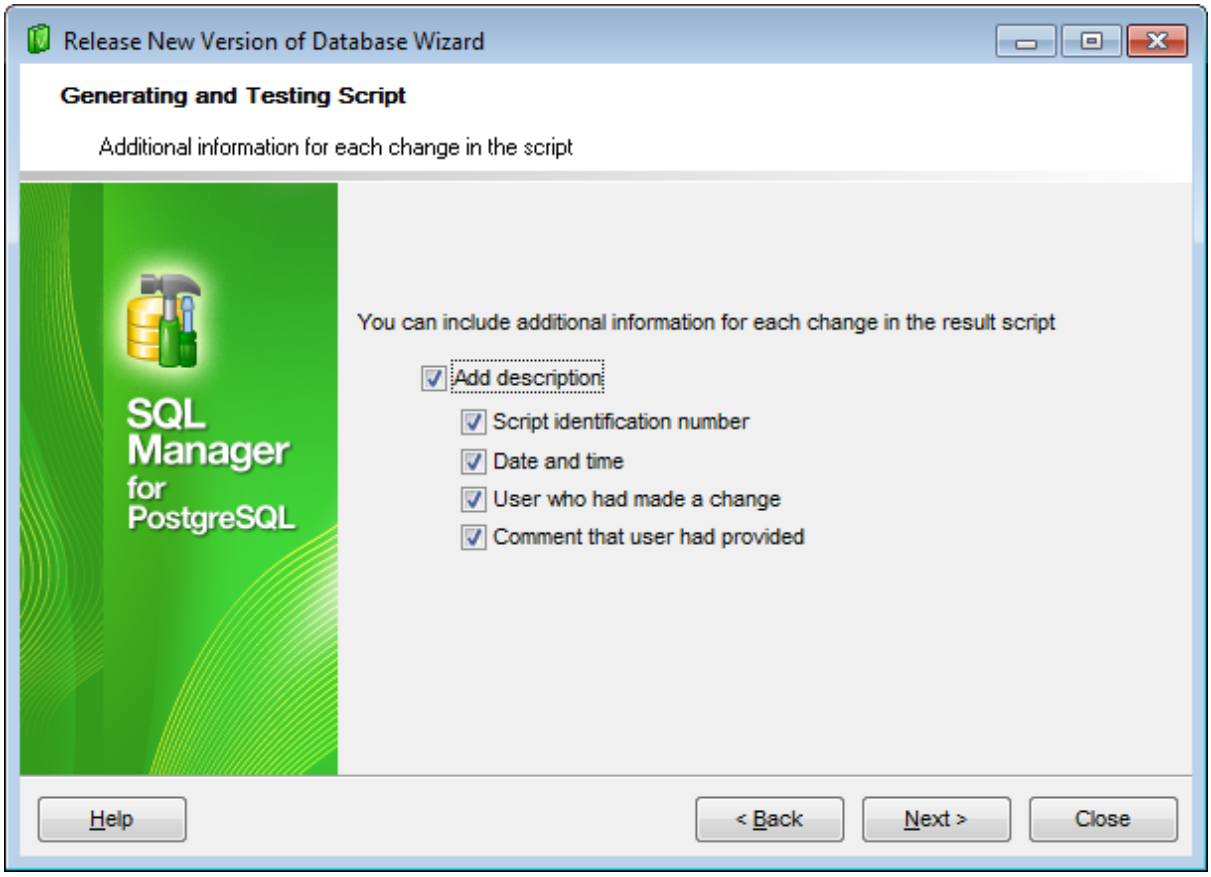
6.4.13 Specifying comments

This step allows you to select comments to be added to each statement script of the script. When getting differential script this step is unavailable.



Check the needed options to add corresponding comment to each script statement.

To disable comments uncheck the ☑ **Add description** option.

Click the **Next** button to proceed to the Performing script generation 391 step.

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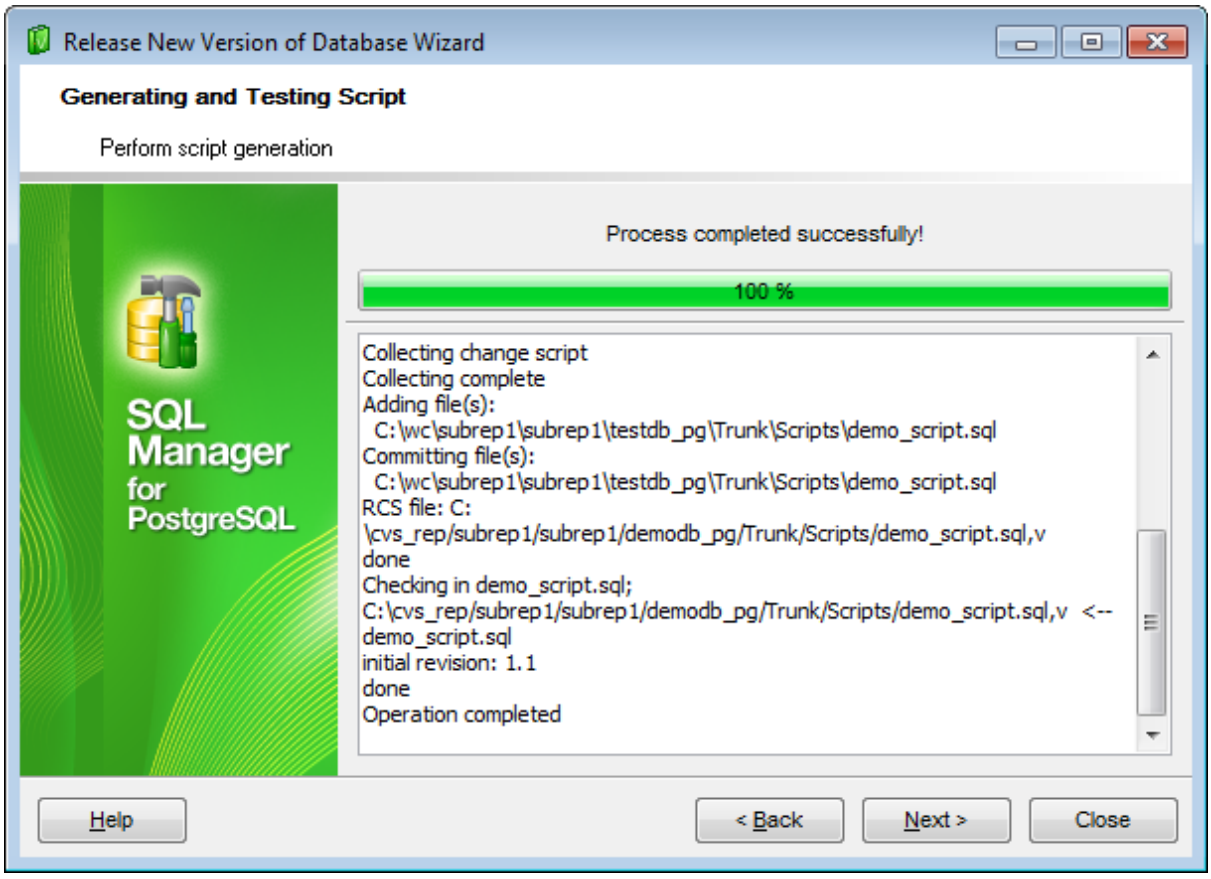
6.4.14 Performing script generation

This step informs you that all necessary settings are defined and change script can be generated.

The log area allows you to view the log of operations and errors (if any).



Once the operation is performed, the **Next** button appears. Click the button to proceed to the Specifying test database location 394.

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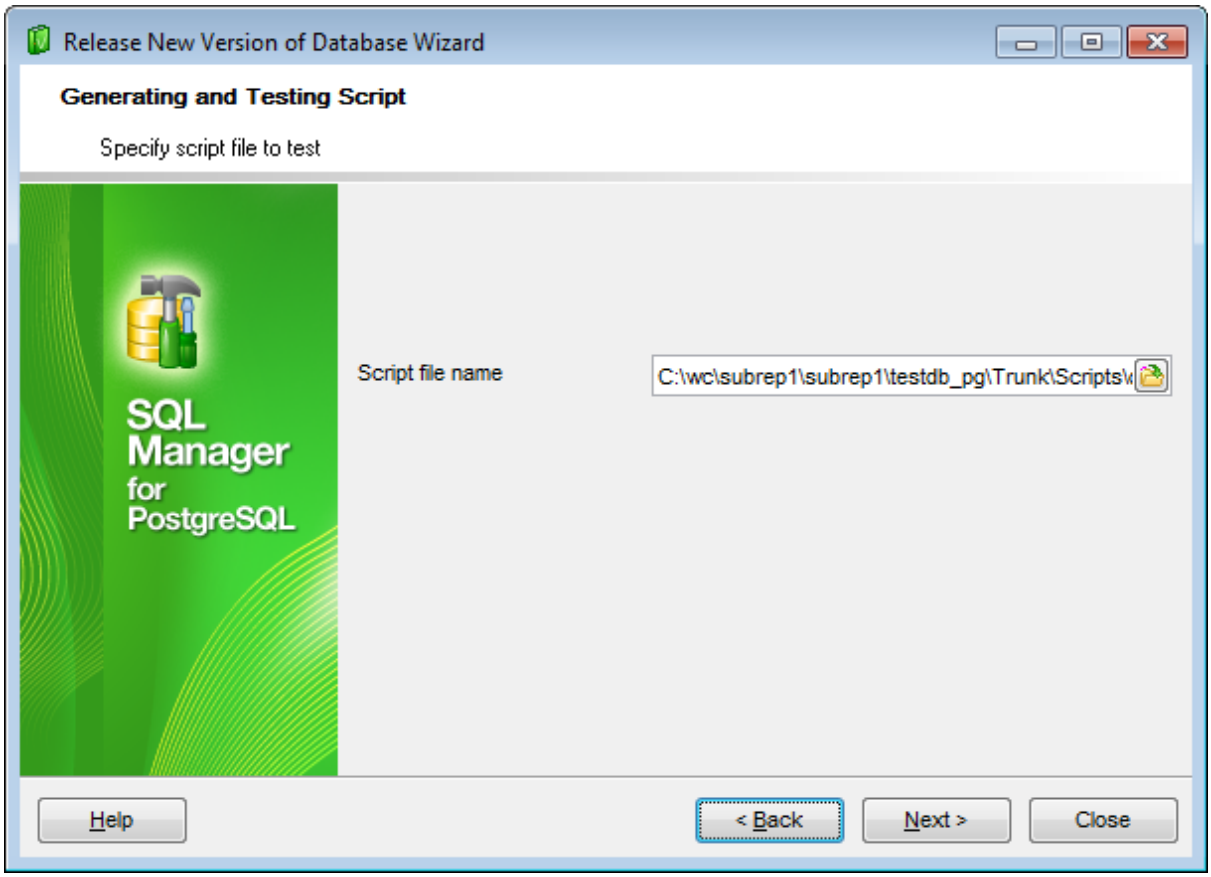
6.4.15 Specifying script to test

This step appears if the ☑ **Only test existing script** option was enabled at the first step 377.
Use this step to define name of script file to be checked.



Script file name
Use the field to define file name and location.

If program can't define file encoding, then clicking the **Next** button opens the **Script Conversion** dialog where script encoding can be defined manually.

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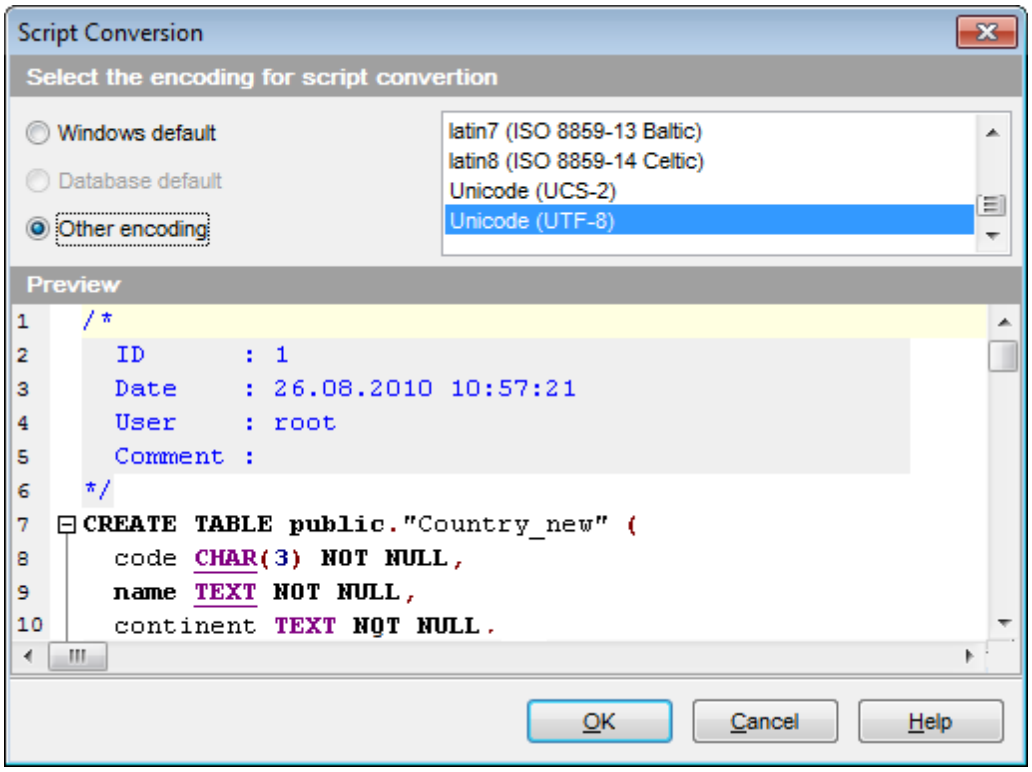

When encoding is defined click **OK** to proceed to the Selecting the way of getting test database 394 step.

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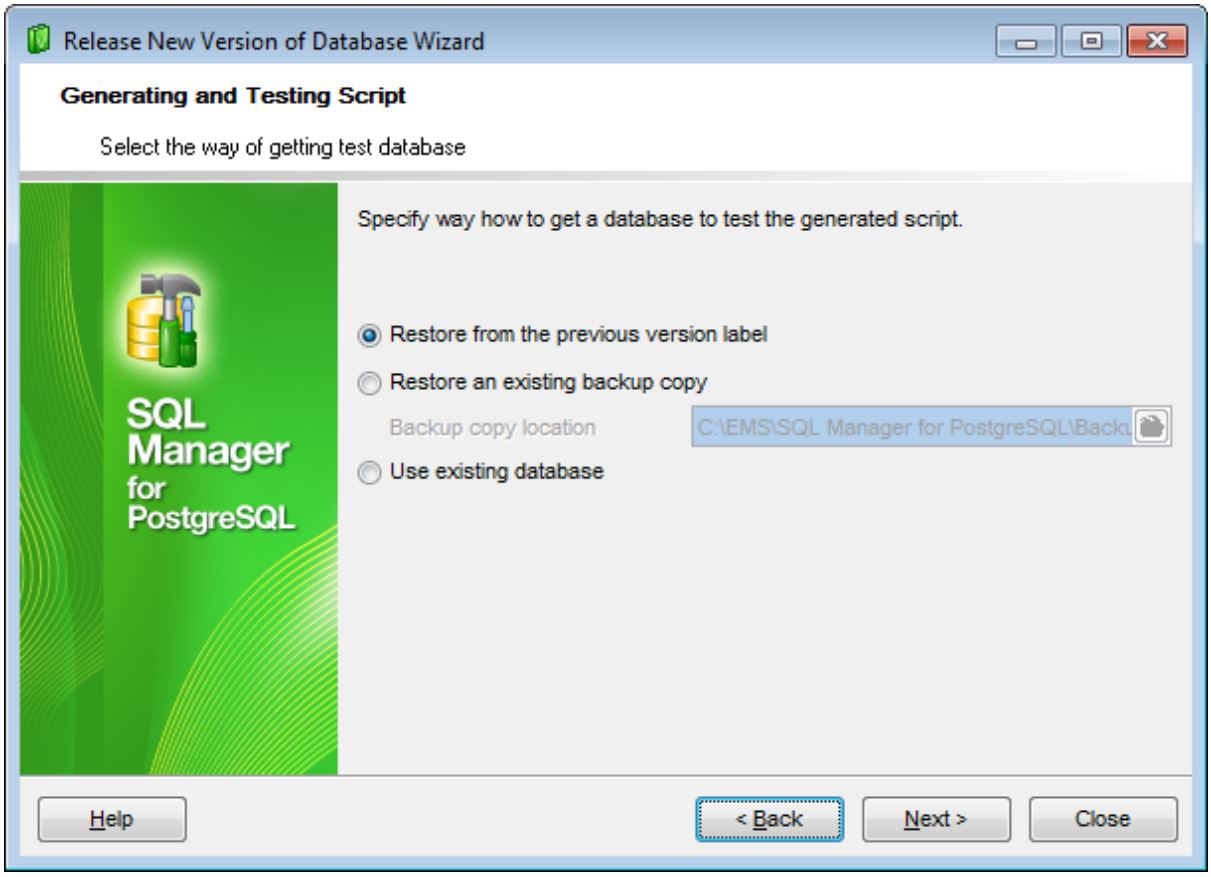
6.4.16 Selecting the way of getting test database

In this step you need to define the way of getting test database.



Restore from the previous version label or **Backup/restore the previous version database**
Use this mode to get test database by restoring from label backup or from previous version of database respectively.

Note: Option name depends on the *previous version* source selected in the first step 377.

Restore an existing backup copy
Select this mode to get test database by restoring from a backup copy.

Backup copy location

Define backup copy location within this field. Use the **Open** button locate backup file using standard dialog.

Use existing database
Use an existing database as a test one. You can define connection properties in the next step.

Click the **Next** button to proceed to the Specifying test database location 395 step.

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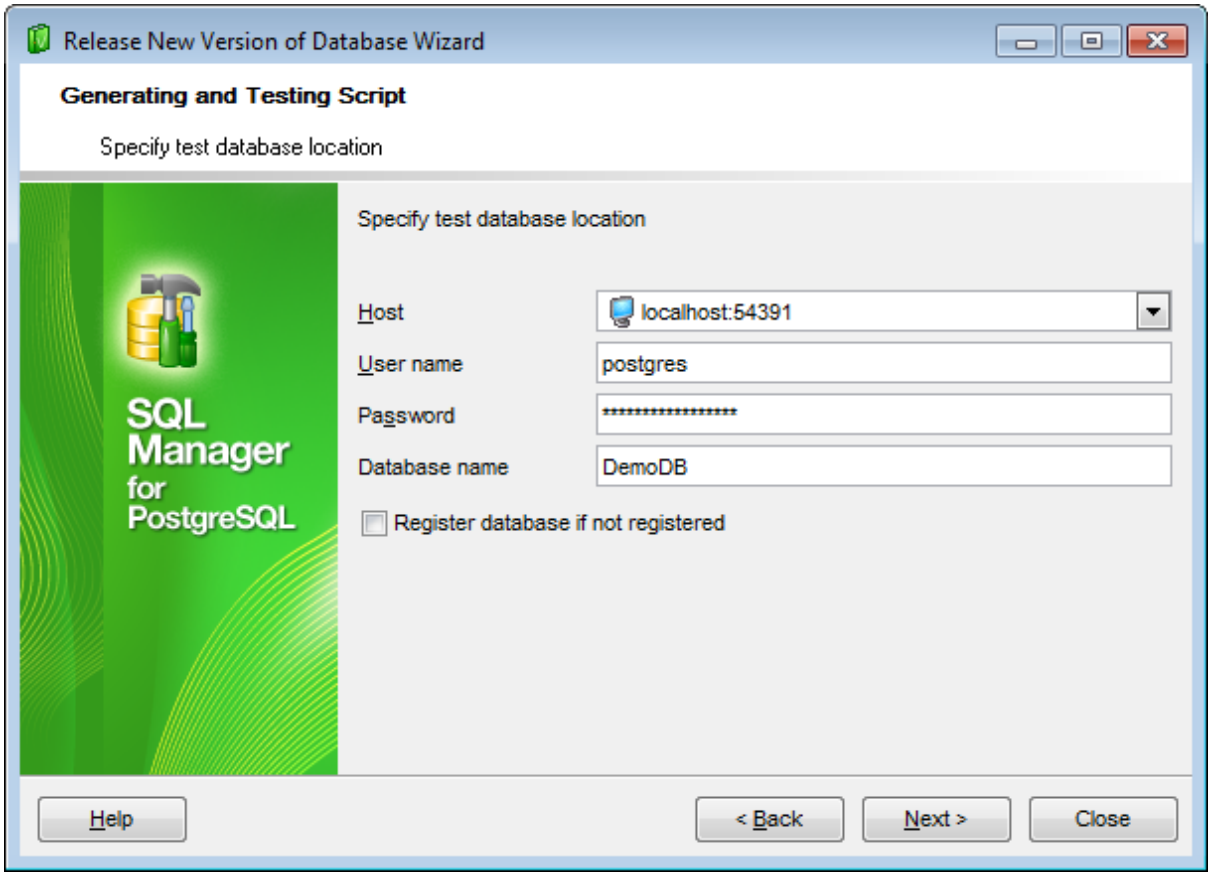
6.4.17 Specifying test database location

Use this step to define test database connection parameters.



Host
Use the drop down list to select one of the registered hosts where database is located.

Specify **User name** and **Password** to be used for connection.

Specify the **Database name** to be created/registered.

☑ **Register database if not registered**
Enable the option to register the database if it is not registered yet.

If the ◉ **Use existing database** option was selected in the previous step 394, the wizard will proceed with the Confirming checking test database 397 step. Otherwise the next step will be Performing test database creation 396.

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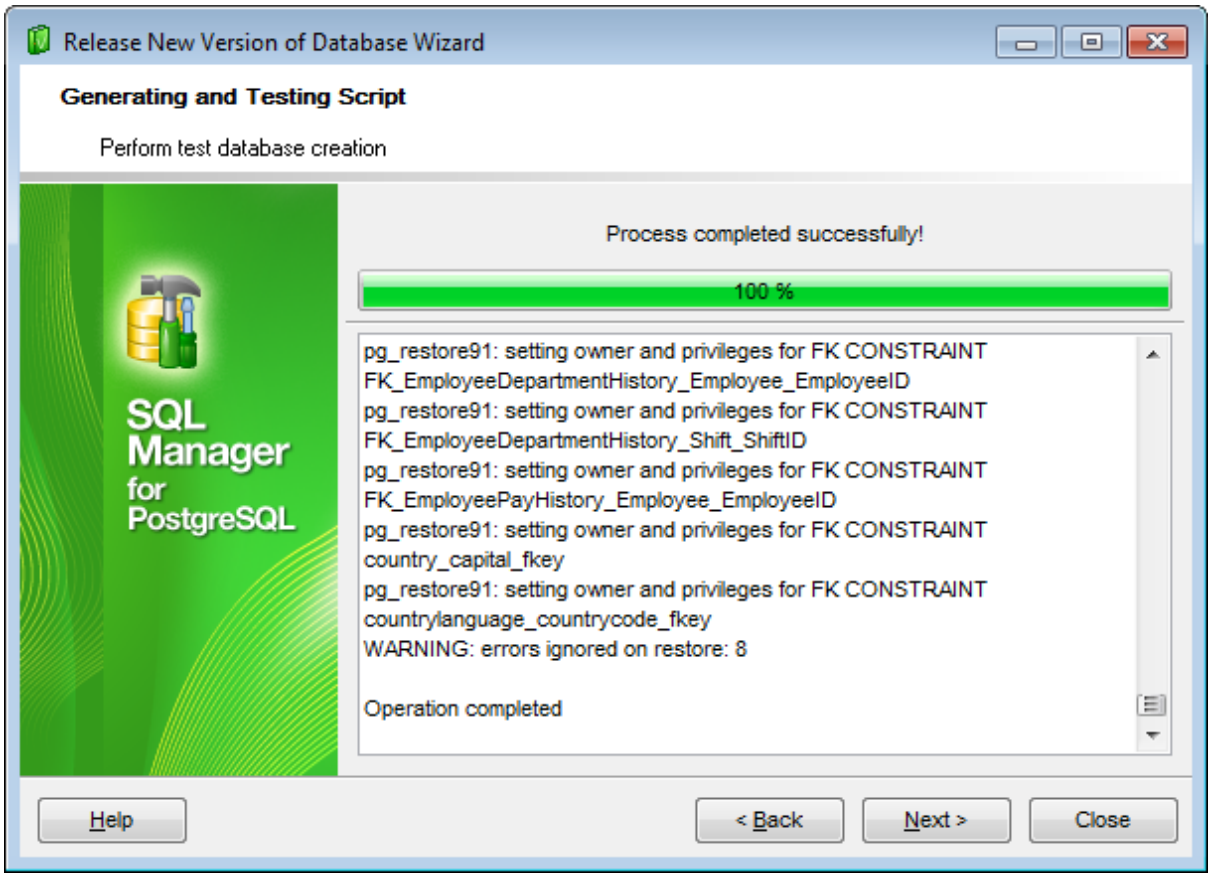
6.4.18 Performing test database creation

This step informs you that all necessary settings are defined and test database can be created.

Click the **Run** button to perform the operation.
The log area allows you to view the log of operations and errors (if any).



After the operation is completed the Database Registration Info 108 dialog appears. It allows you to check and modify database registration information.

Run button also changes to **Next**. Click the button to proceed to the Confirming checking test database 397 step.

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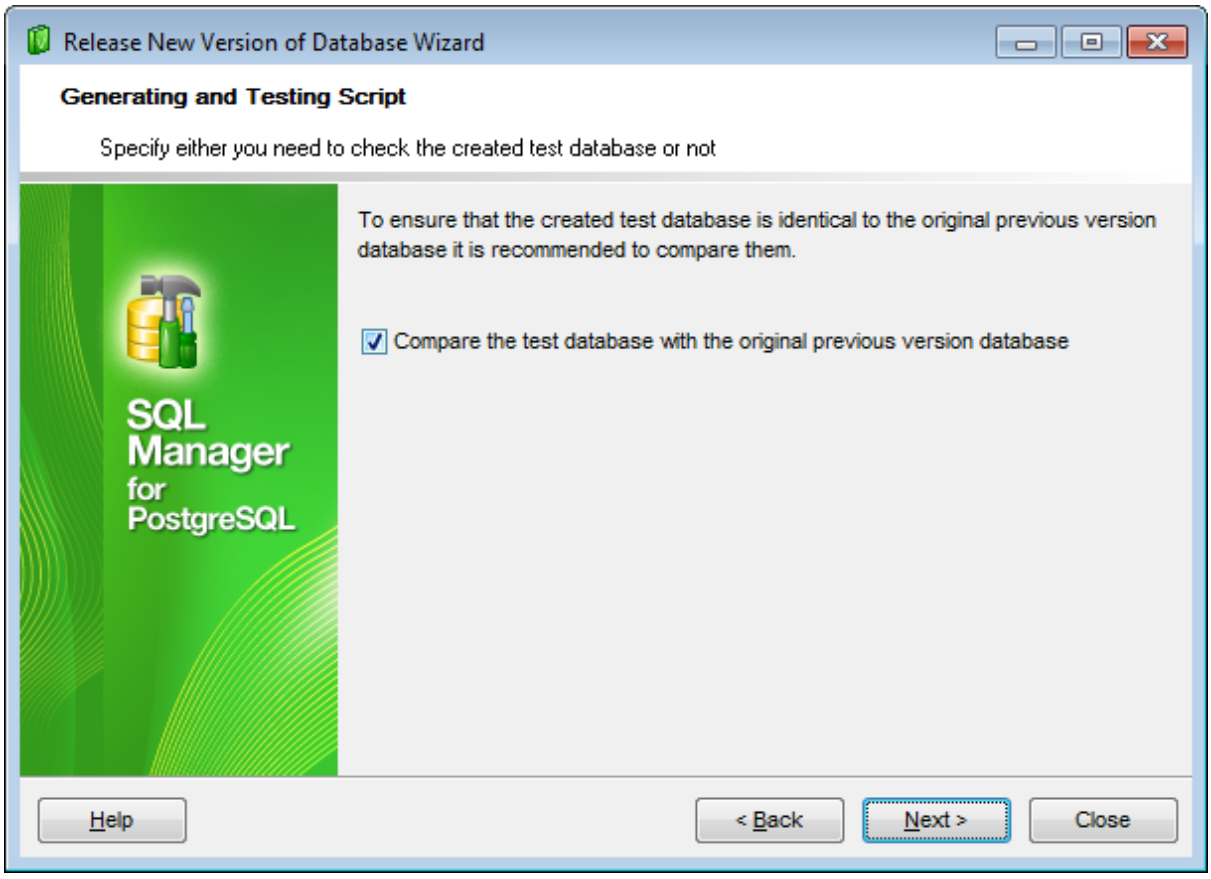
6.4.19 Confirming checking test database

Use this step to define whether to ☑ **Compare the test database with the original previous version database**.

During this process complete metadata of two databases is compared.



If you enable the option, the wizard will proceed with the Perform comparison of test database with new version of database 398. Otherwise, the next step will be Executing change script on test database 401.

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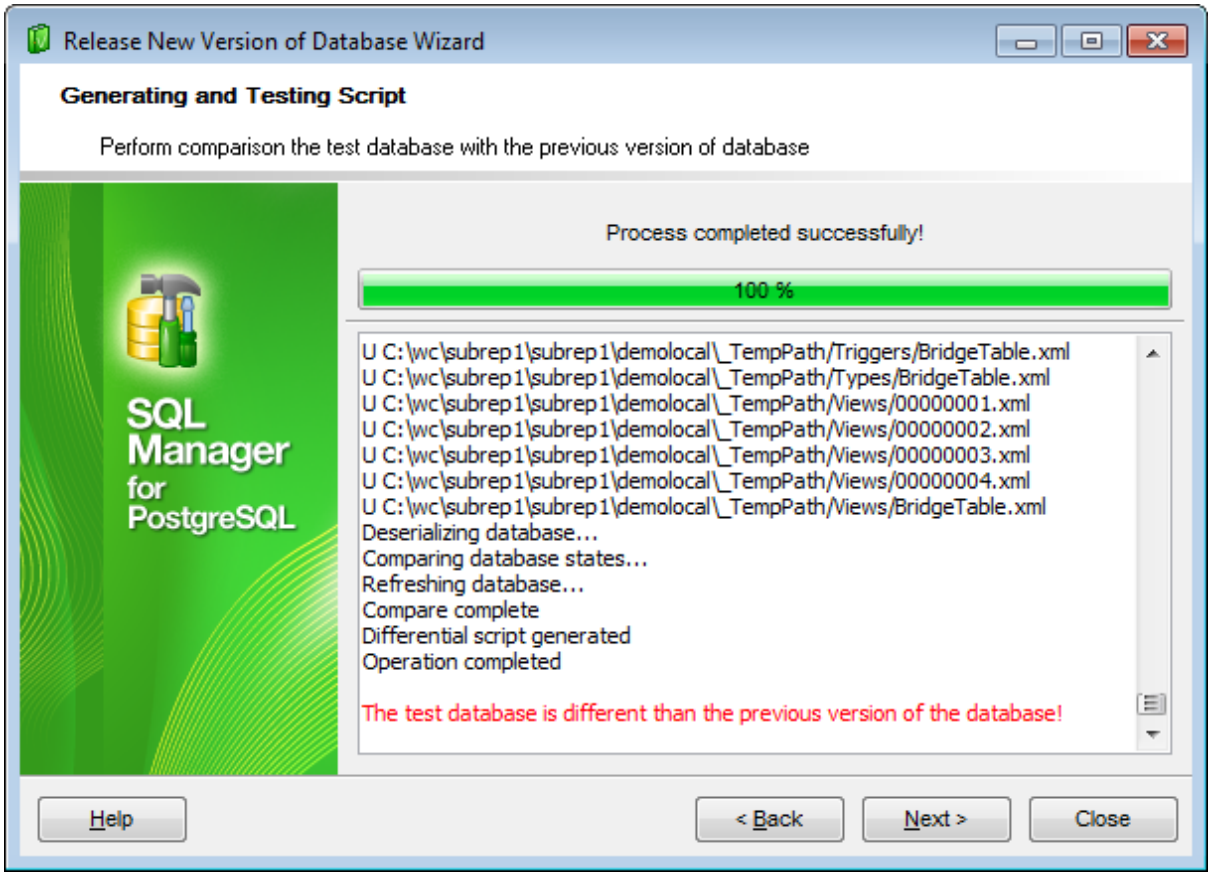
6.4.20 Performing comparison of test database with the previous version of database

In this step test database will be compared with the previous version of the database.



To start the process click the **Run** button.

The log area allows you to view the log of operations and errors (if any).

Click the **Next** button to proceed to the Executing change script on test database 401 step.

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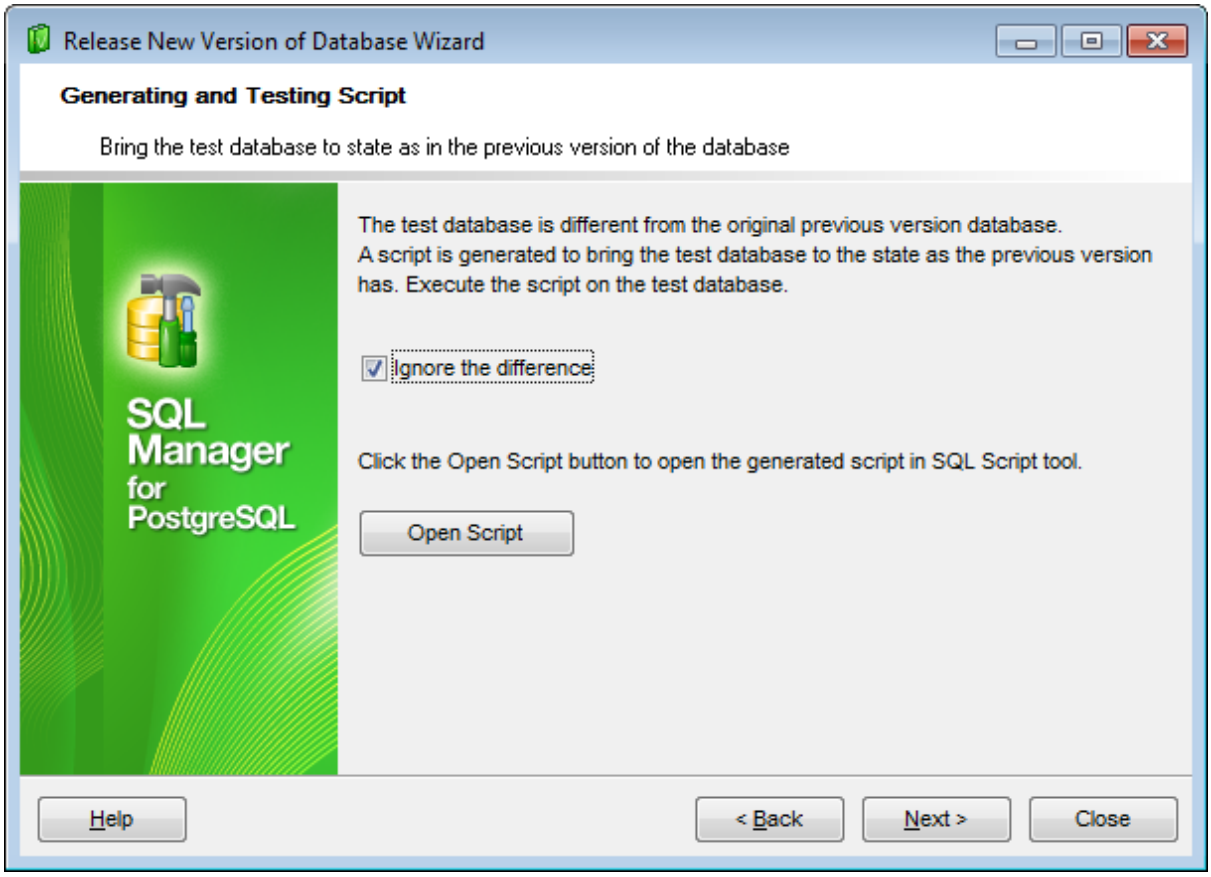
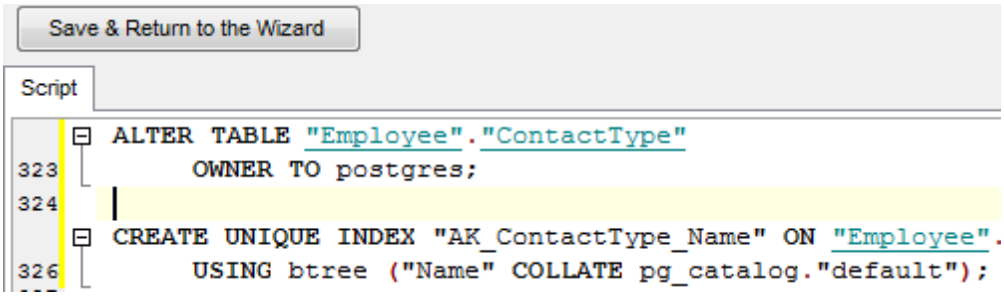
6.4.21 Bringing test database to previous version of database state

This step appears if comparison of test database and previous version of database revealed differences.



Ignore the difference
Enable the option to skip re-comparing test database and previous version of database. It is recommended to leave the option disabled.

The **Open Script** button launches the Execute Script 646 with change script loaded. You can execute this script on test database to bring it to correspondence with previous version of database.
Correct the script if needed, then execute it on test database and return to the wizard by clicking the **Save&Return to Wizard** button.



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If the **Ignore the difference option** is enabled, the wizard will take you to the Executing change script on test database 401 step.
Otherwise you will return to the Performing comparison of test database with the previous version of database 398 step.

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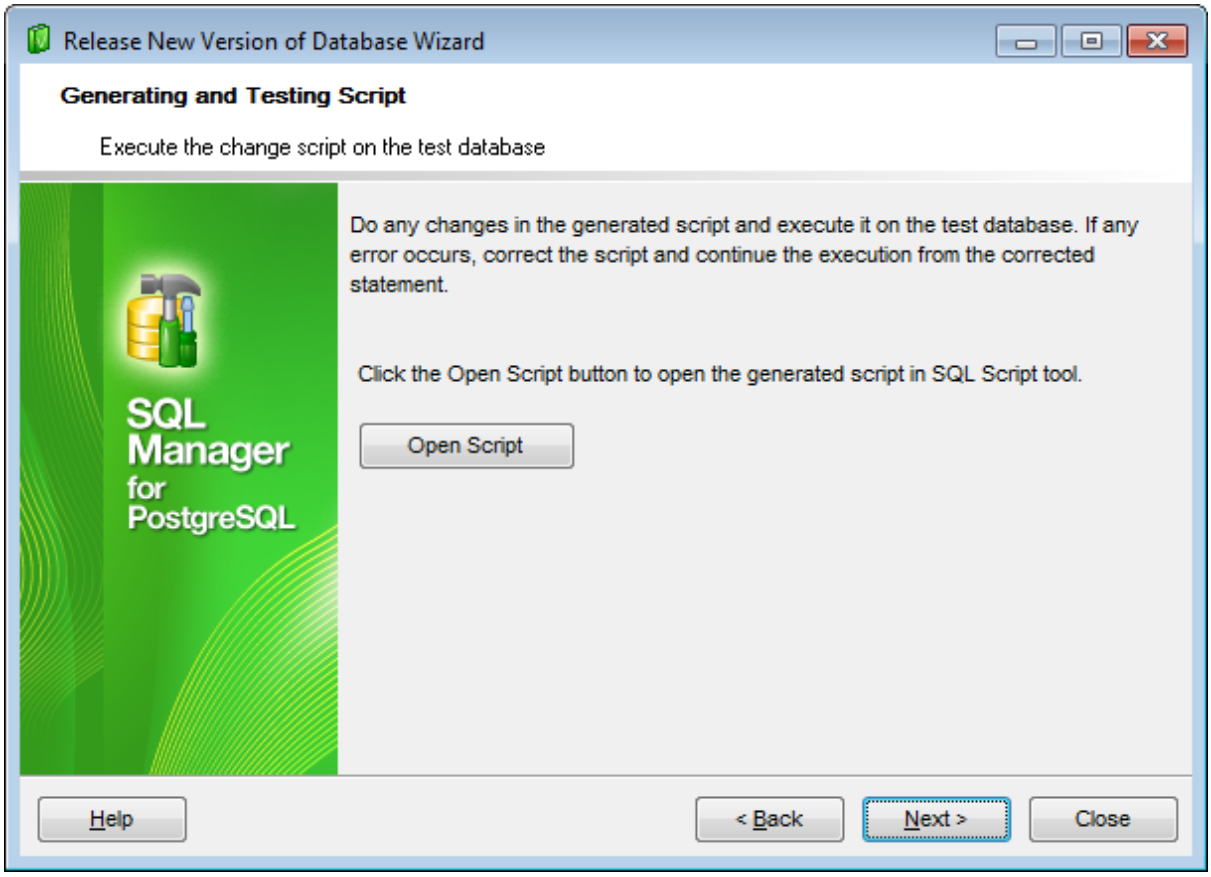
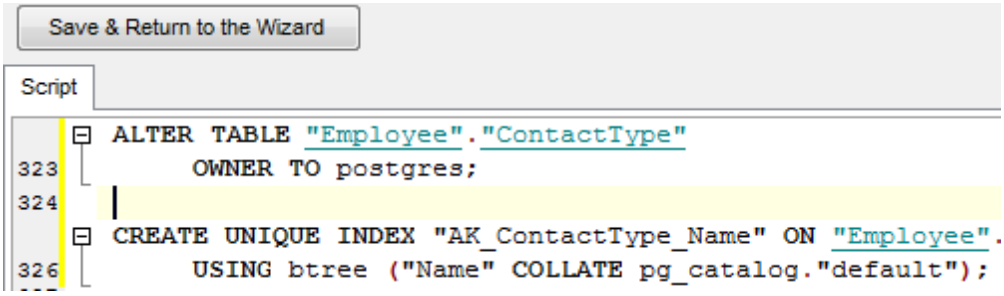
6.4.22 Executing change script on test database

In this step the corrections can be added to the generated change script. Moreover this script can be executed on test database.



Open Script
The **Open Script** button launches the Execute Script 646 with change script loaded. You can execute this script on test database to bring it to correspondence with previous version of database.
Correct the script if needed, then execute it on test database and return to the wizard by clicking the **Save&Return to Wizard** button.



If the script is not executed on test database, the wizard will take you back to the

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Perform comparison of test database with the previous version of database 398 step. Otherwise, you will proceed to the Specify how to test the generated additional change script 403 step.

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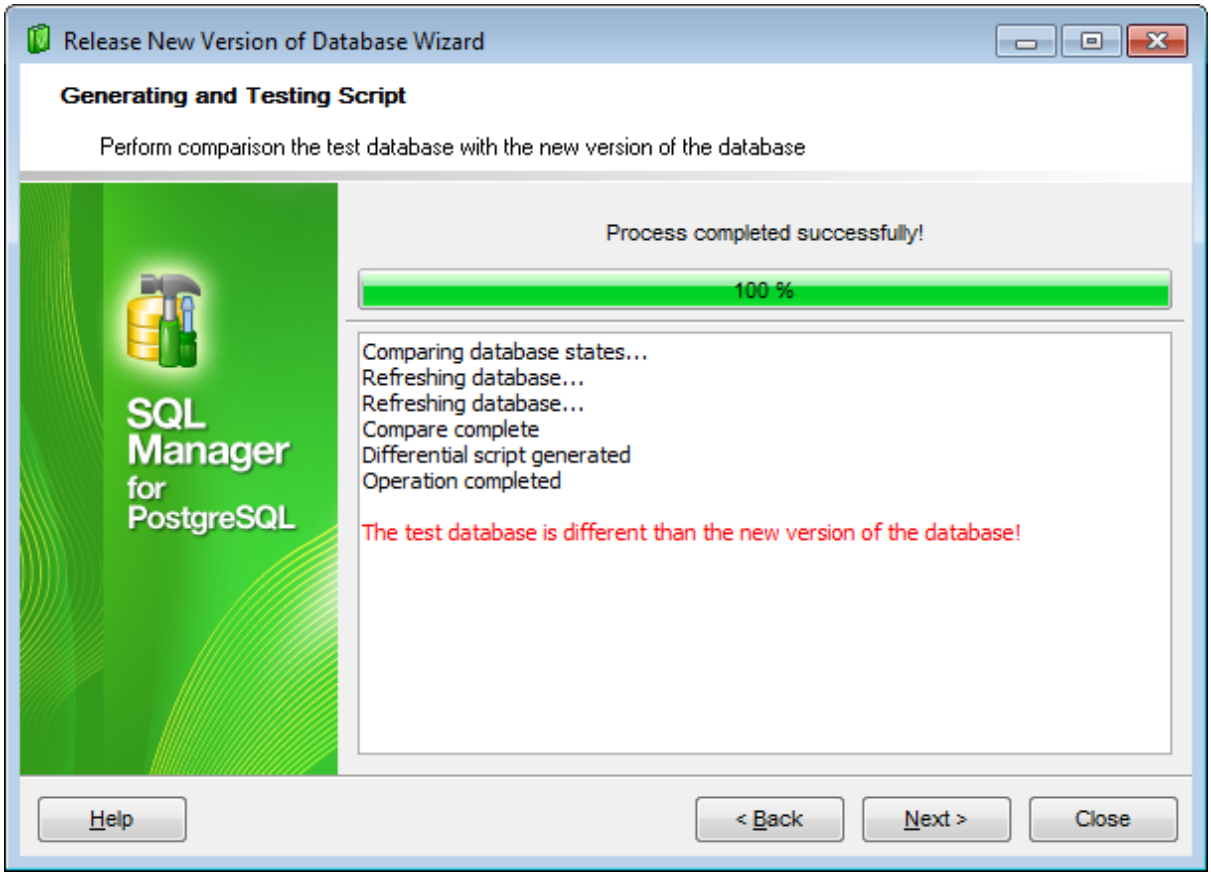
6.4.23 Performing comparison of test database with the new version of database

Use this step to perform comparison of test database with new version of database.



To launch the process click the **Run** button.

The log area allows you to view the log of operations and errors (if any).

Click the **Next** button to proceed to the final 405 step. If the operation completed unsuccessfully, you will be taken to the Specify action for the test database 404 step.

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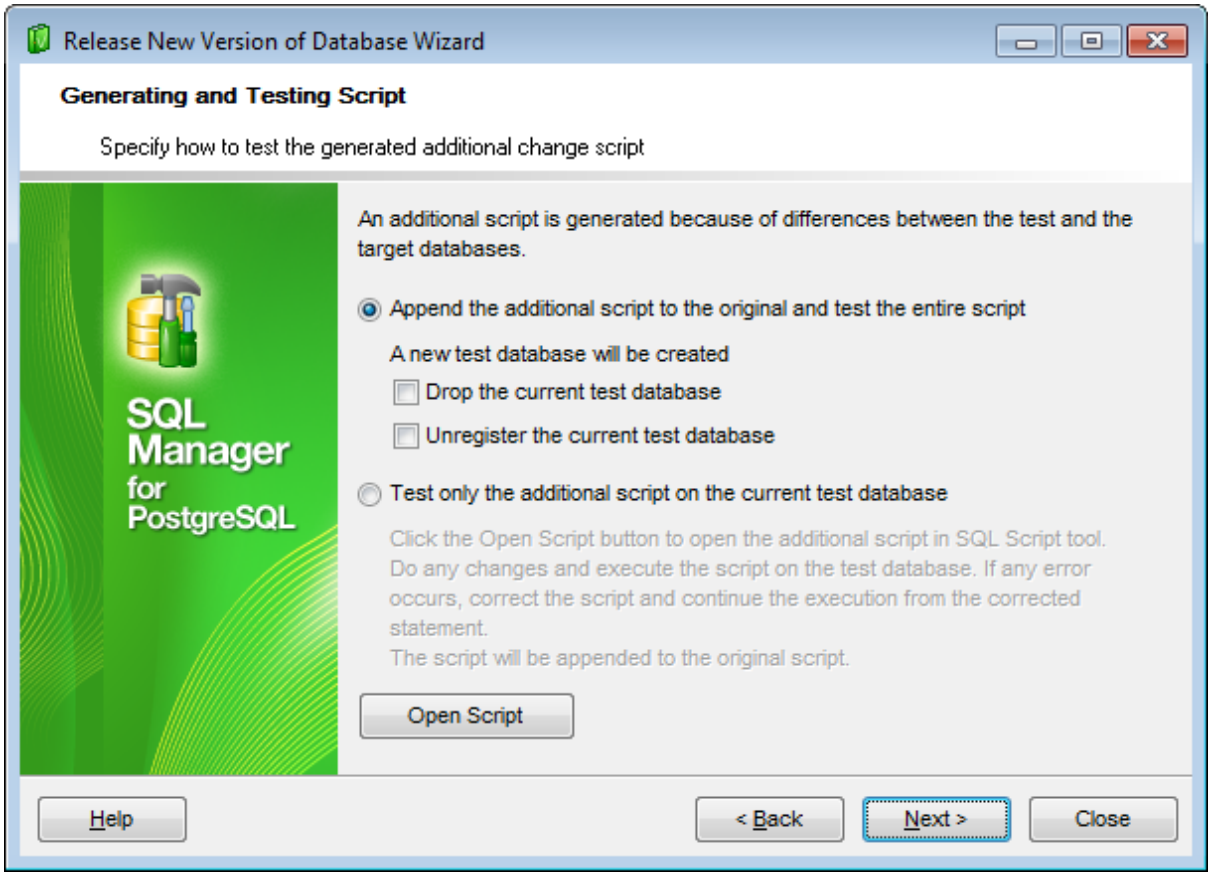
6.4.24 Specify action for the test database

This step appears when additional script was generated because of differences found between test and target databases.



Append the additional script to the original and test the entire script
Select this option to add update change script and test it on new test database.

Use the corresponding options to **Drop the test database** and/or **Unregister the test database**. These actions will be applied to the previously created test database.

Test only the additional script on the current test database
Use this mode to test only additional statements of differential script. Statements will be tested on the previously created test database. The script file will be opened in Execute Script Editor on clicking the **Next** button.

Click the **Open Script** button to view the additional script in the Execute Script Editor 646.

If the **Append the additional script to the original and test the entire script** option is selected, the wizard will take you back to the Selecting the way of getting test database 394 step. Otherwise, you will proceed to the Performing comparison of test database with the new version of database 403 step of the wizard.

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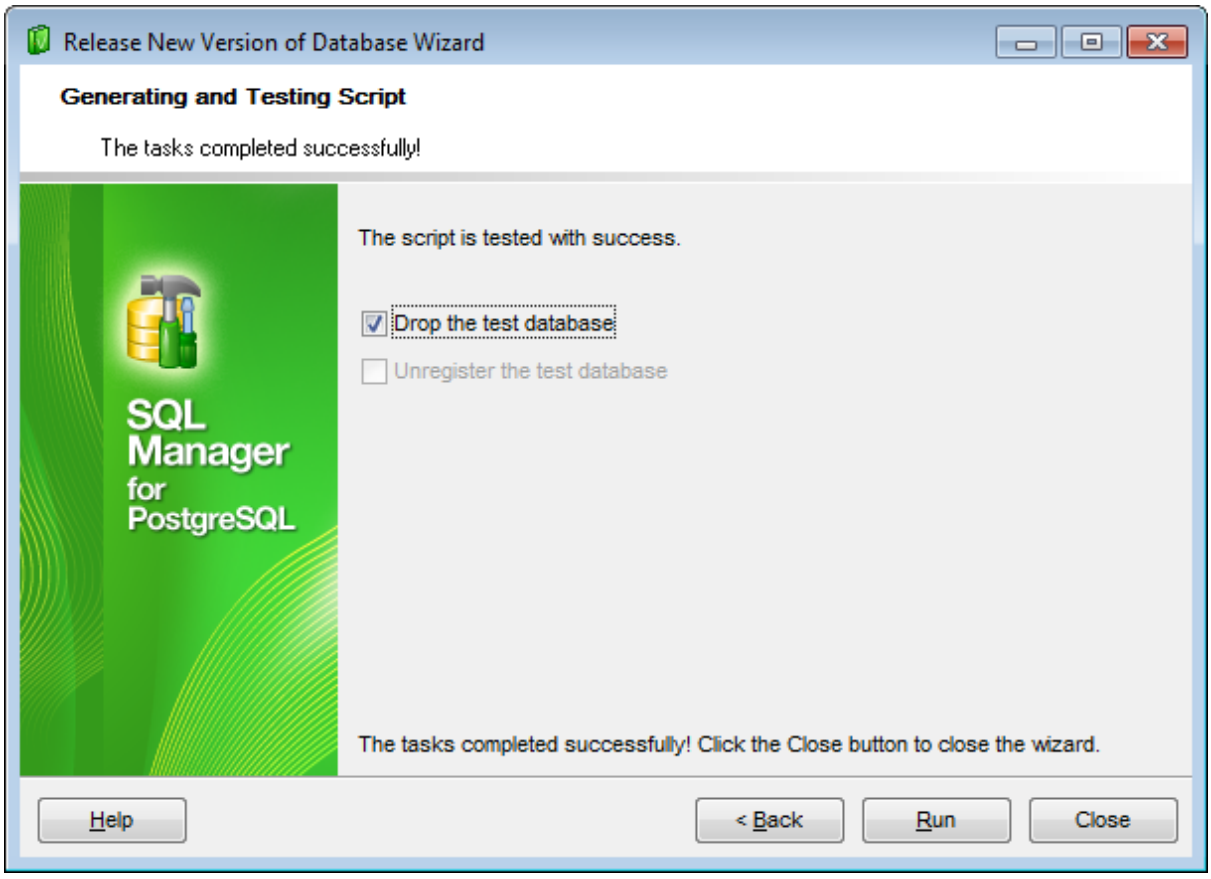
6.4.25 Finishing the operation

This is the final step of the wizard. Script has been created and tested successfully. No differences have been found between test database and new version of database.

If needed, you can drop and unregister test database using respective options.



Click **Run** to drop and/or unregister test database, or **Close** to exit the wizard.

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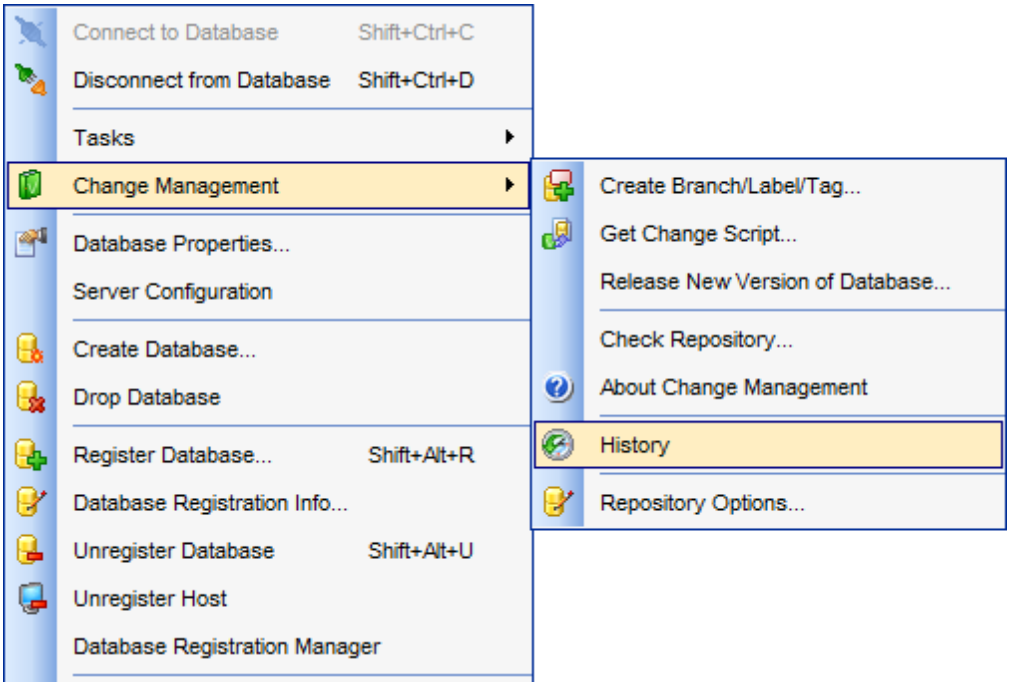
6.5 History

With this tool you can view all the changes made to database/object.

To open database/object history use the **Change management** | **History** item of database/object context menu 54, or select the **Tools** | **Change management** | **History** item of main menu.



- Database history 407
- Object history 408
- Comparing object versions 409

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Create tag wizard 348
Check repository wizard 356
Get change script 366

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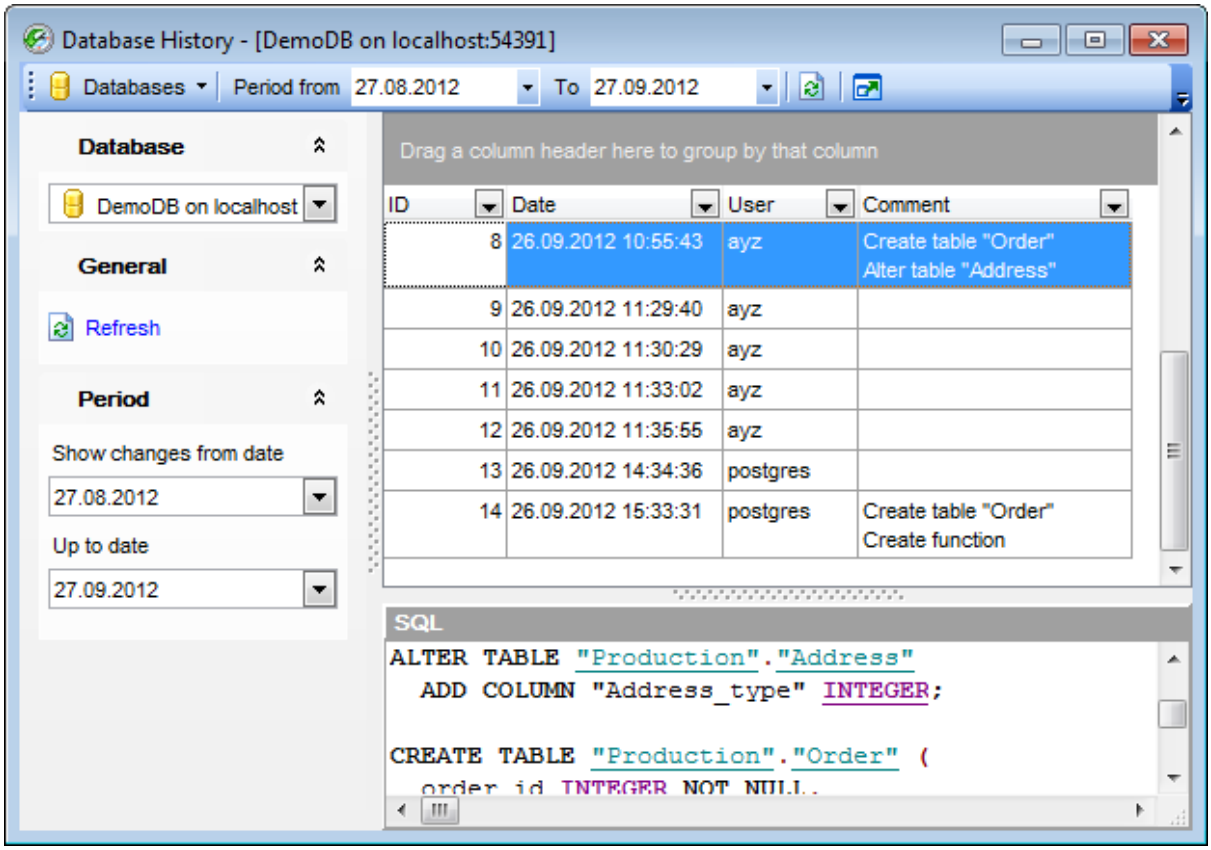
6.5.1 History of database changes

Use the navigation bar to select **Database**. Define the **Period** within the corresponding section. Changes made in this period will be displayed in the working area.



At the top of the window you can find a table that displays information about changes made in the specified period. It displays transaction *ID*, *Date* when transaction was made, name of the *User* who made changes and *Comment* to a transaction if any.

Note: You can customize grouping[460] and filtering[463] within this table.

In the bottom part of the window you can view SQL statement of the selected action.

See also:
Object history[408]
Comparing object versions[409]

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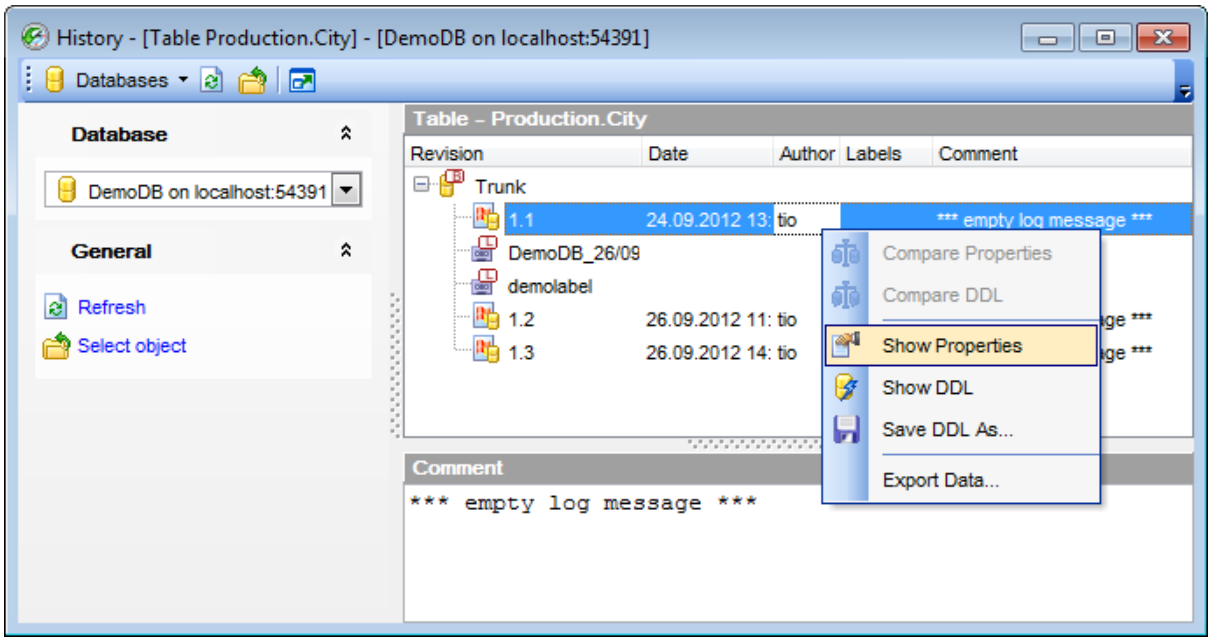
6.5.2 Object history

You can browse change history of any object.

To open object history use the **Change management** | **History** item of object context menu[57].



History of object changes is displayed as table. In this table you can find the following information: database *Revision* and *Date* when object was changed. The *Author* of changes made to object is also displayed.

Comment part of the window displays comments to the selected object modification.

The navigation bar of this window allows you to *select database*, to *refresh data* and to *select object*.

See also:
History of database changes[407]
Comparing object versions[409]

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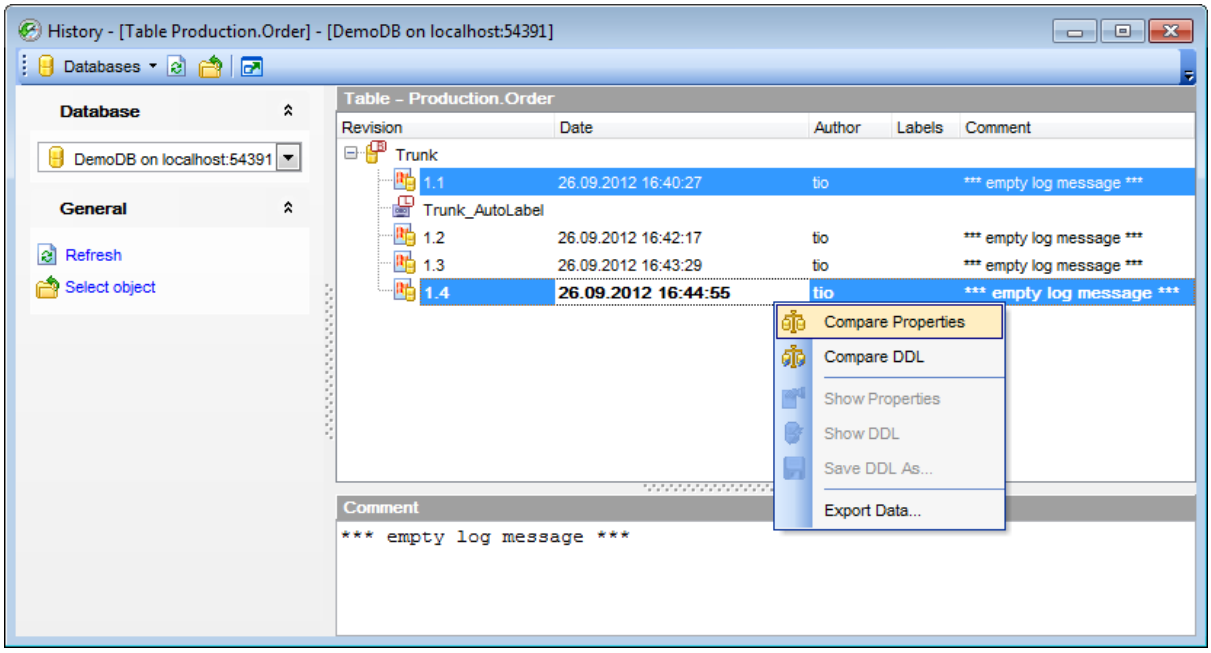
6.5.3 Comparing object versions

You can view differences between two object versions.



Select two object revisions you need to compare. Right-click any of the objects to call the context menu and select the Compare Properties 410 or Compare Scripts 411 item to view differences as table of properties or as object script respectively.

The window displaying progress of the operation will appear. Close it to view the results of the operation.

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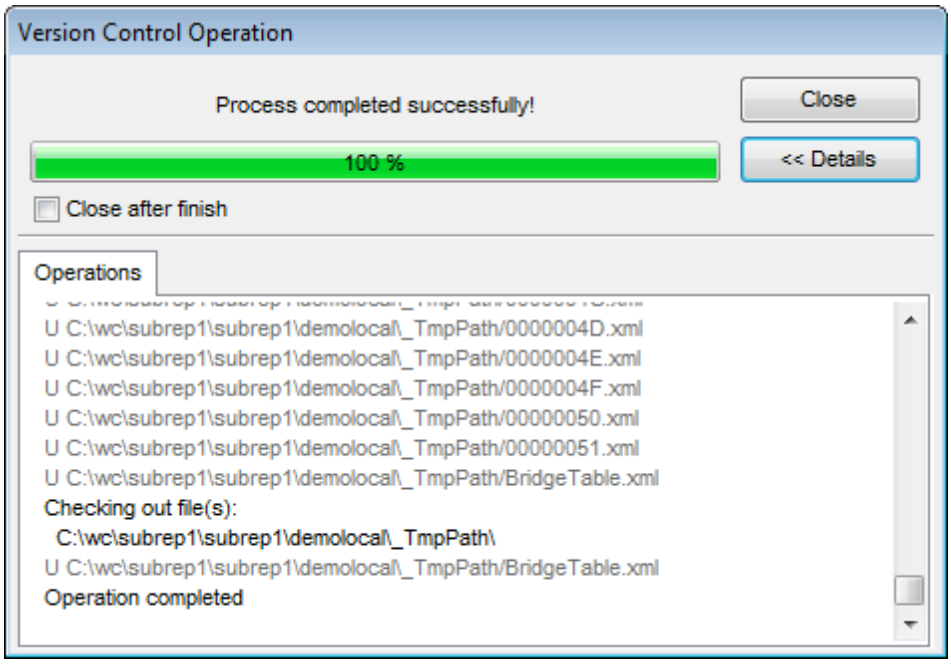
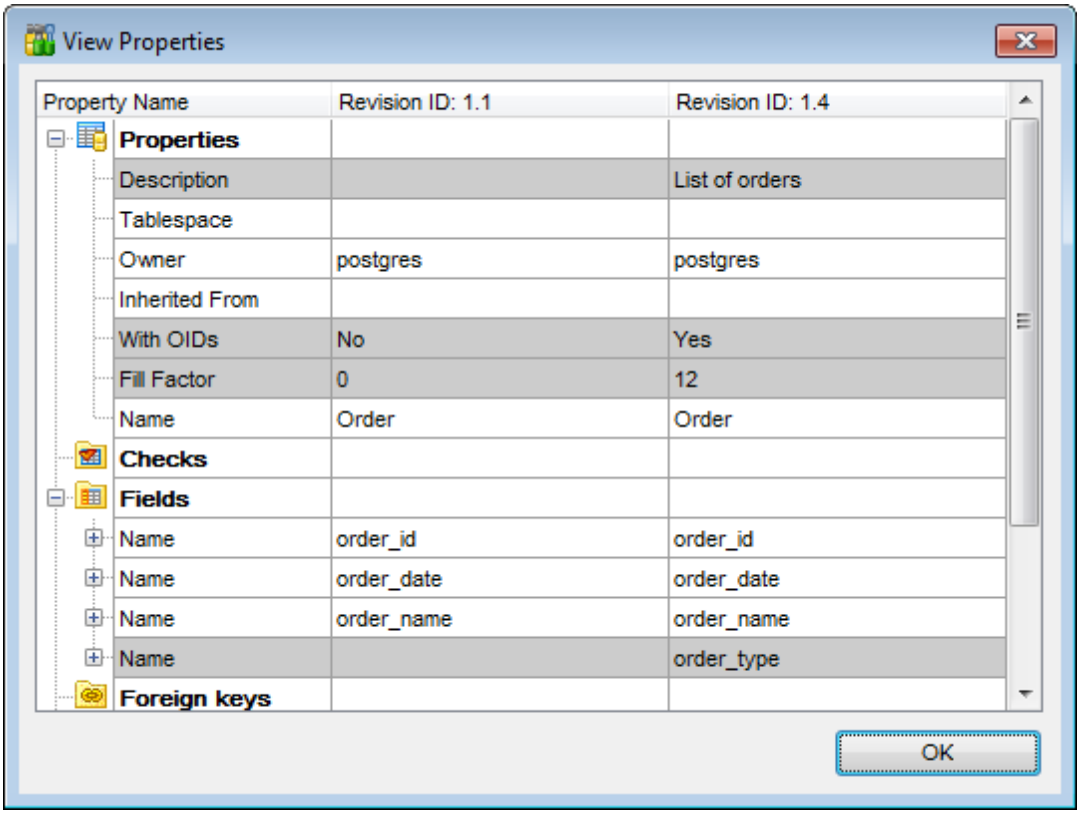


Check the ☑ **Close after finish** flag if you need the results window appear once the operation is finished.

Viewing properties comparison results:



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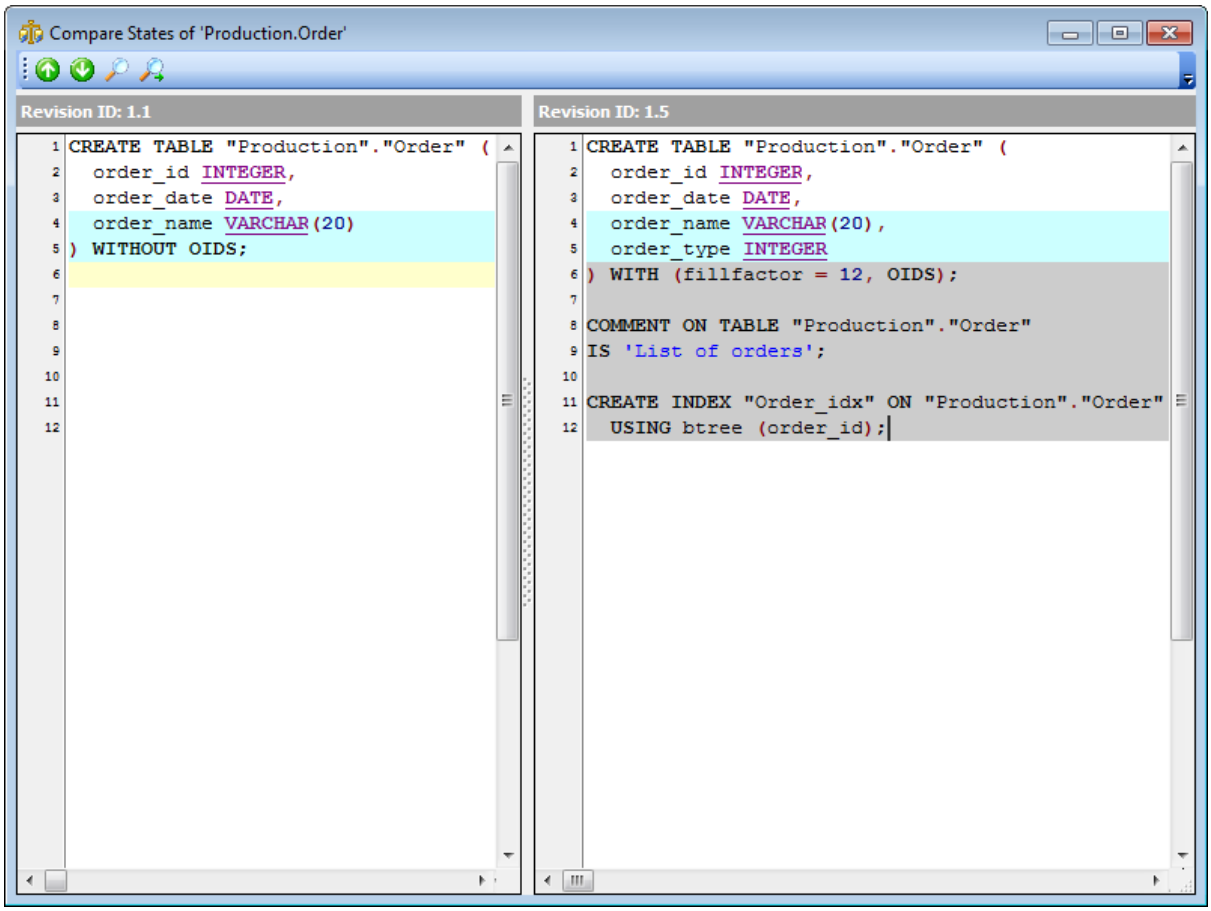
Window contains table where you can see all object properties and its value in compared revisions. Properties with different values are highlighted with grey.

Viewing script comparison results:



Window contains DDL of objects revisions. Extra lines in an early revision script are red, in latter revision - grey. Lines for pasting absent lines are yellow and different lines are blue. Use the toolbar buttons to move cursor to **Previous** difference or to **Next** one, to **Find** word or statement or to **Find next** one.

See also:
History of database changes 407
Object history 408

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Part VII

7 Query Management Tools

When using SQL Manager for PostgreSQL, you are provided with two basic tools you may need to manage your SQL queries: Query Data[415] for editing SQL query text directly and Design Query[431] for building queries visually. Find the list of common SQL query management operations below.

Creating New Queries

In order to create a new query in *Query Data*:

- select the **Tools | Query Data** main menu[961] item or use the corresponding toolbar[963] button;
- click the **Add new query** item of the Navigation bar[416];
- edit the query text within the **Query** tab of Query Data[415].

In order to create a new query in *Design Query*:

- select the **Tools | Design Query** main menu[961] item or use the corresponding toolbar[963] button;
- build the query visually within the **Builder** tab of Query Designer[431].

Editing Queries

In order to open a query in *Query Data*:

- select the **Tools | Query Data** main menu[961] item or use the corresponding toolbar[963] button;
- use the numbered tabs at the bottom of the editor window to switch between previously edited queries. The last edited query is displayed automatically on opening the editor;
- edit the query text within the **Query** tab of Query Data[415].

In order to open a query in *Design Query*:

- select the **Tools | Design Query** main menu[961] item or use the corresponding toolbar[963] button;
- the last edited query is displayed automatically on opening Design Query;
- to load a previously saved diagram, click the **Load diagram** item of the Navigation bar[432];
- to load a query from an **.sql* file, open the **Query** tab and click the **Load SQL** button of the Navigation bar;
- edit the query visually within the **Builder** and/or the **Query** tabs of **Design Query**.

In order to load a query from an **.sql* file:

- select the **Tools | Query Data** main menu[961] item or use the corresponding toolbar[963] button;
- click the **Load from file** item of the Navigation bar[416];
- browse for the query file using the **Open SQL File** dialog;
- edit the query text within the **Query** tab of Query Data[415].

Executing Queries

- *create a new query* or *open an existing one*;
- click the **Execute** item of the Navigation bar[416] or use the *F9* hot-key to execute the query;
- view/edit the returned data within the **Results** tab of Query Data[415].

Saving Queries

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- *create a new query* or *open an existing one*;
- click the **Save to file** Navigation bar 416 item (in Query Data) or the **Save SQL** Navigation bar 432 item (in Design Query), or use the *Ctrl+S* shortcut 1001 to save the query using the **Save as...** dialog;
- click the **Save diagram** Navigation bar 432 item in Design Query 431 to save the designed diagram;

or

- use the **Save all** Navigation bar 416 item in Query Data 415 if you need to save all the queries to one file.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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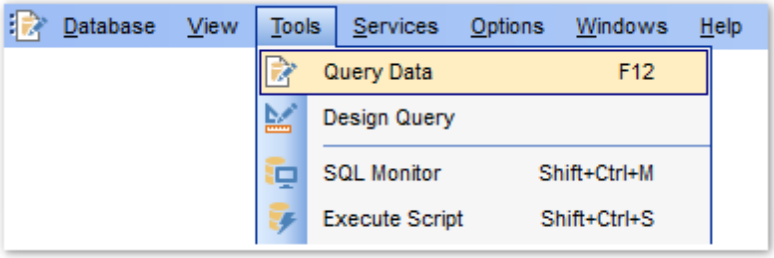
7.1 Query Data

Query Data is the basic tool of SQL Manager for PostgreSQL for creating and executing queries. The tool allows you to create and edit the SQL text of a query, prepare and execute queries and view the results of query execution.

To open Query Data select the **Tools | Query Data** main menu[961] items or use the corresponding / toolbar[963] buttons. You can also use the *Shift+F12* / *F12* shortcuts[1001] for the same purpose.



- Using Navigation bar and Toolbar[416]
- Working with Query Data area[418]
- Using the context menu[420]
- Viewing query plan[422]
- Using object links[425]
- Executing queries and viewing results[426]
- Viewing query logs[428]
- Favorites editor[429]

See also:

Design Query[431]

Query parameters[449]

Execute Script editor[646]

Editor Options[925]

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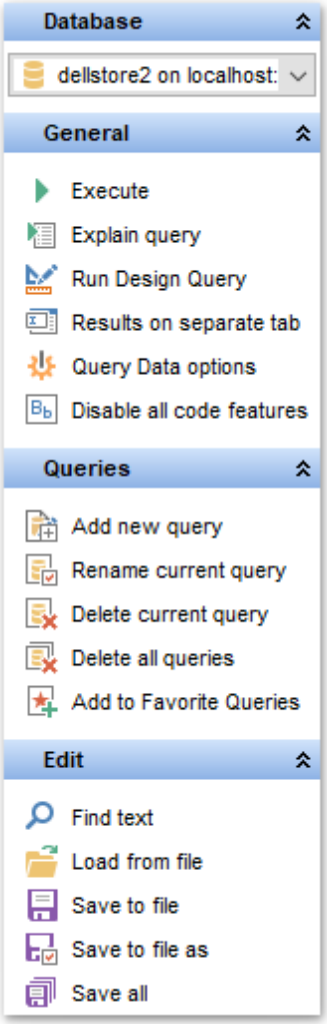
7.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Query Data**.



Database
select a database for the query

General
execute the current query
view estimated query execution plan 422
run Design Query 431 to design the query as a diagram
switch the results representation mode: *on Edit tab* or *on separate tab*
configure Query Data editor at Environment Options 871 dialog
restore the default size and position of the editor window
disable/enable all code features

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Queries

add a new query (note that the current query text will not be lost)
rename the current query
remove the query
remove all queries from the editor
edit the query text using Favorites editor[429] and add the query to the Favorite Queries[85] list

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with queries:

Edit

activate the Find Text[971] dialog
load a query from an *.sql file using the **Open SQL File** dialog
save the query to an *.sql file
save the query to an *.sql file using the **Save as...** dialog
save all queries to an *.sql file

Logs

activate the Find Text[971] dialog
save the query log to a file
clear logs

Data Management

commit transaction
rollback transaction
Note: These actions are available if the ☑ **Use transactions in object editors, Query Data and Design Query** option is checked in the Database Registration Info | Data options[124] dialog.
export the returned dataset using Export Data Wizard[536]
export the returned dataset as SQL Script using the Export as SQL Script[608] wizard
import data[582]

NB: You can enable\disable Toolbars and Navigation bars at Environment options[877].

See also:

Working with editor area[418]
Viewing query plan[422]
Executing queries[426]
Viewing query logs[428]
Favorites editor[429]

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7.1.2 Working with Query Data area

The **Editor area** of Query Data editor is available within the Query tab and is provided for working with SQL queries in text mode.

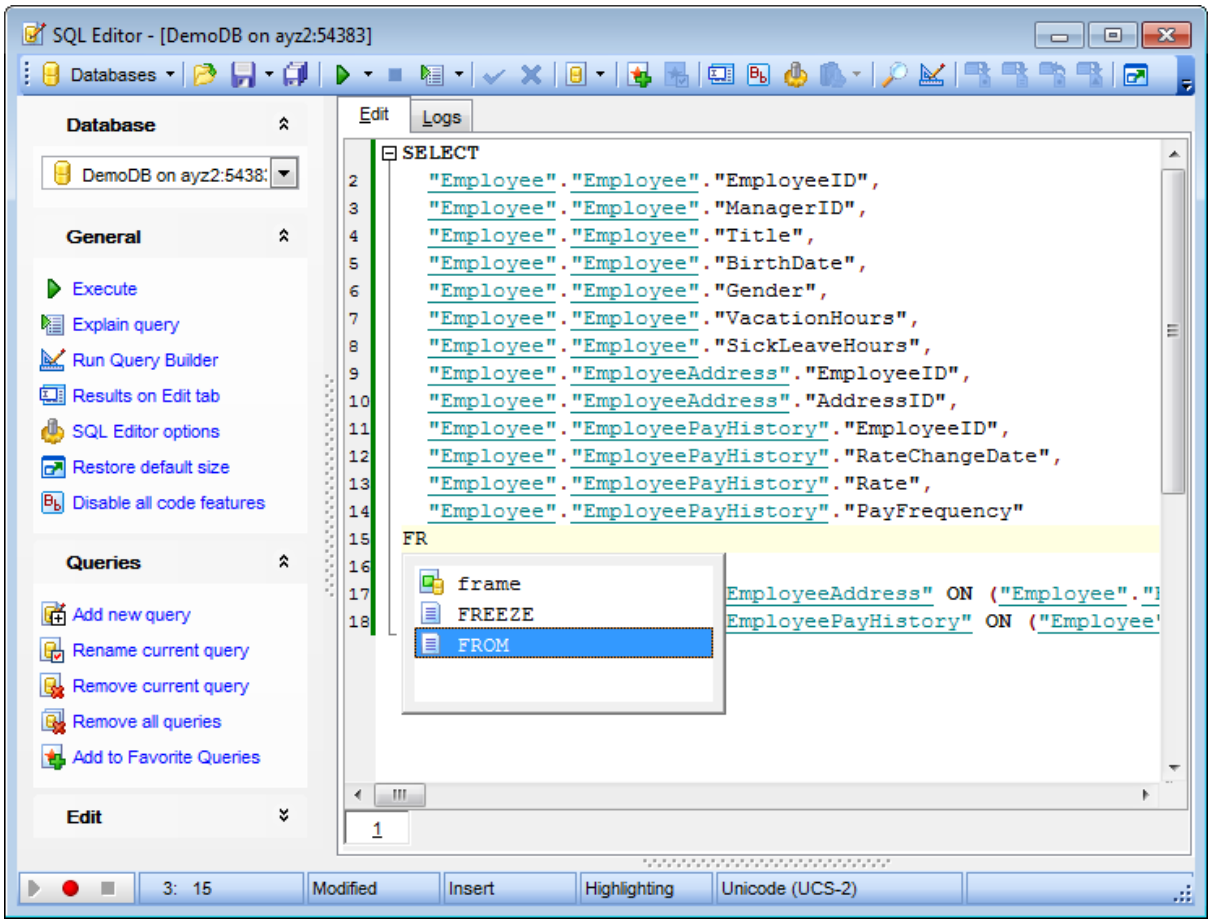
For your convenience the **syntax highlight**, **code completion** and a number of other features for efficient SQL editing are implemented:

- using object links[425] allowing you to open the object in the associated editor;
- ability to display line numbers;
- code folding for statements and clauses;
- customizable margins and gutters;
- formatting code for better representation

and more.

If necessary, you can enable/disable or customize most of Query Data editor features using the Editor Options[925] dialog.

The example of code completion is illustrated in the picture below. You can set the delay within the Quick code[935] section of the Editor Options[925] dialog or activate the completion list manually by pressing the *Ctrl+Space* shortcut[1001].



For your convenience the possibility to use macros is implemented.
To *start recording* a macro, click the ● **Record** button available in the status bar area, or use the *Shift+Ctrl+R* shortcut.

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To *stop recording*, click the **Stop** button, or use the *Shift+Ctrl+R* shortcut.
To *call* the recorded macro, use the **Play** button, or use the *Shift+Ctrl+P* shortcut.

Hint: To use a keyboard template 953, type the template name and press the *Ctrl+J* shortcut 1001: the text associated with the template will be inserted automatically.

If necessary, you can **print** the SQL text of your query using the corresponding item of the context menu 420.

See also:

Using Navigation bar and Toolbar 416
Using the context menu 420
Editor Options 925
Keyboard Templates 953
Favorites editor 429
Find Text dialog 971
Replace Text dialog 973

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7.1.3 Using the context menu

The **context menu** of Query Data area contains execution commands, most of the standard text-processing functions (*Cut*, *Copy*, *Paste*, *Select All*) and functions for working with the query as a whole, e.g. you can *move the cursor to a particular line*, *change the case* of selected text, view the query *properties* or *print* the text of the query. Each of these operations can be also performed with the corresponding hot keys used.

Implementation of the Find Text 971 / Replace Text 973 dialogs and Incremental search 964 bar contributes to more efficient work with the SQL code.

Find the complete list of Query Data context menu items below. The context menu allows you to:

- add the selected text to dictionary or correct text (see Spell checking 942 for details);
- execute the query/selected text/text under cursor, and reset execution point (if necessary);
- manage markers: *Drop Marker*, *Collect Marker*, *Swap Marker*;
- toggle bookmarks allowing you to navigate through the query text and jump to a line with a particular number;
- perform editing operations: *Undo/Redo*, *Cut*, *Copy*, *Paste*, *Select all*;
- perform search 971 and replace 973 operations;
- save/load a query to/from an external **.sql* file;
- perform preview/print operations;
- use the *Quick code* group allowing you to format the selected code using *SQL Formatter* to make the code easier to read, toggle comments for code fragments, change case of the selected text, indent/unindent code lines;
- add the query to the Favorite Queries 85 list;
- open the Editor Options 925 dialog.

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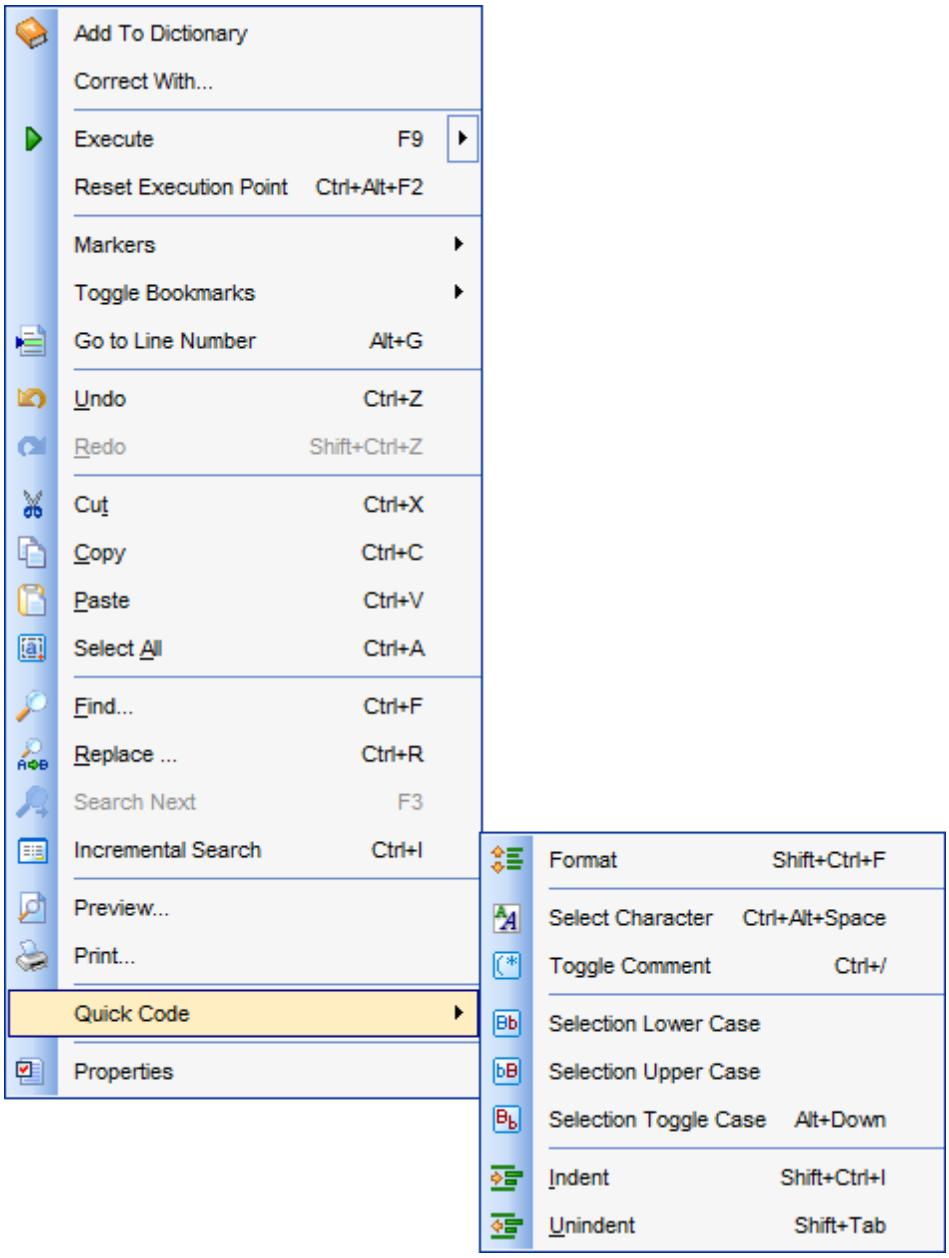

See also:

Working with Query Data area 418
Executing queries 426

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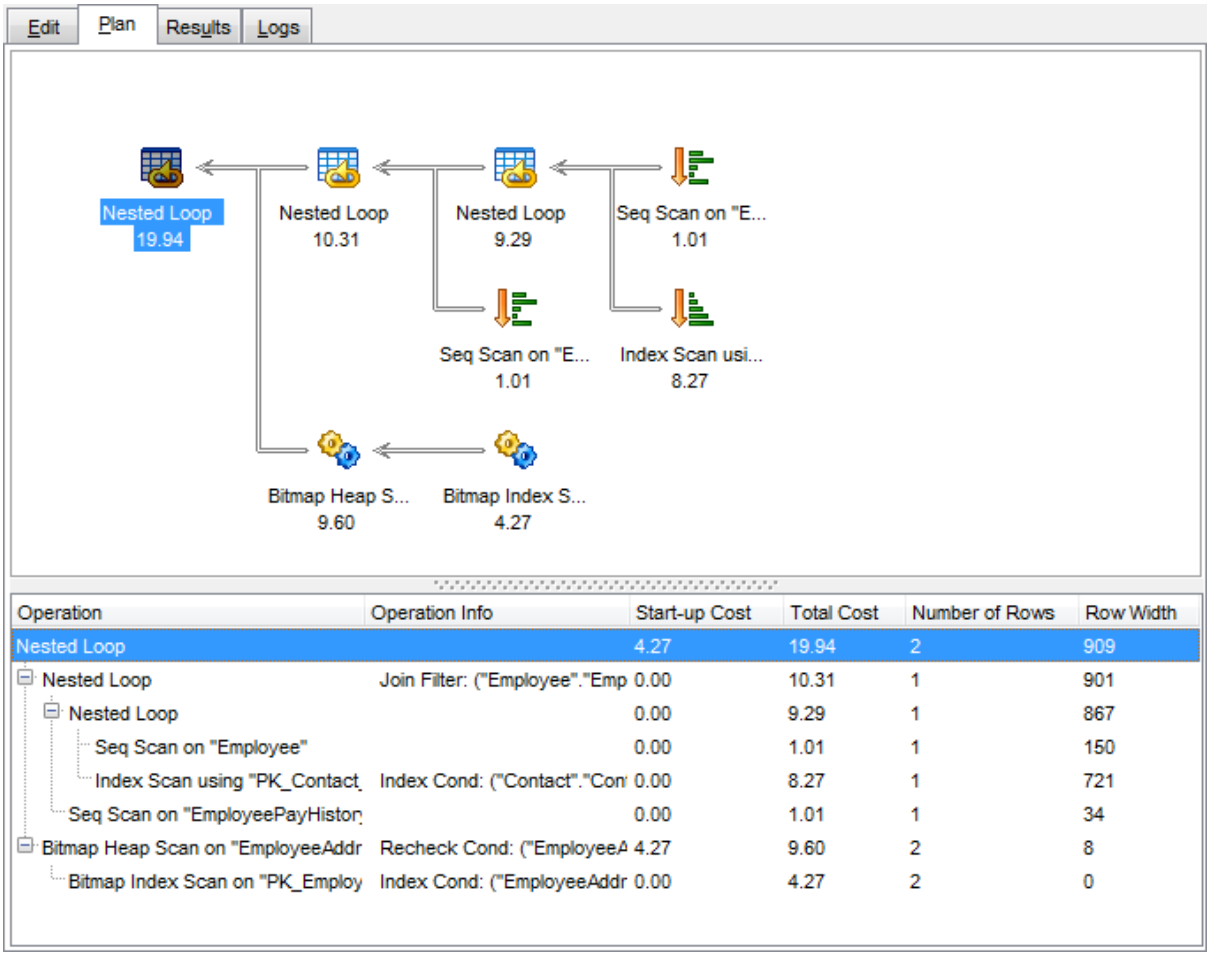
7.1.4 Viewing query plan

Using SQL Manager for PostgreSQL, you can view **the plan** for each of the queries created and executed in the application. The query plan is available within the corresponding **Plan** tab.

To view the **Plan** of a query, open the query in **Query Data** and use the **Explain query** item of the Navigation bar[416] or toolbar[416].

The **Plan** tab allows you to view the sequence of actions performed by the database server in the process of the query execution, and the amount of system resources used for the query execution.



The **Operation** panel below displays the operations as a tree list with the following columns: *Operation Info*, *Operation*, *Start-up Cost*, *Total Cost*, *Number of Rows*, *Row Width*, *Startup Time*, *Total Time*, *Real Number of Rows*, *Loops*.
Right-click within the panel to display the **context menu** allowing you to configure the set of *visible columns* or export[536] the plan to any of supported formats[983].

If necessary, you can specify that the **Plan** tab appears automatically upon query execution in Query Data: select the **Explain query on execution** option available

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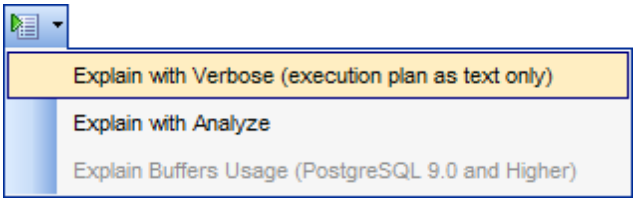
within the Tools | Query Data 888 section of the Environment Options 871 dialog.

You can also view the execution plan *as text* at the bottom of the current tab: select the **Verbose** option available in the **Explain query** menu on the toolbar 416 of Query Data.



The menu also allows you to enable the **Analyze** option to make the query execution plan more detailed (with execution time included).

See also:

Query Data options 888

Executing queries 426

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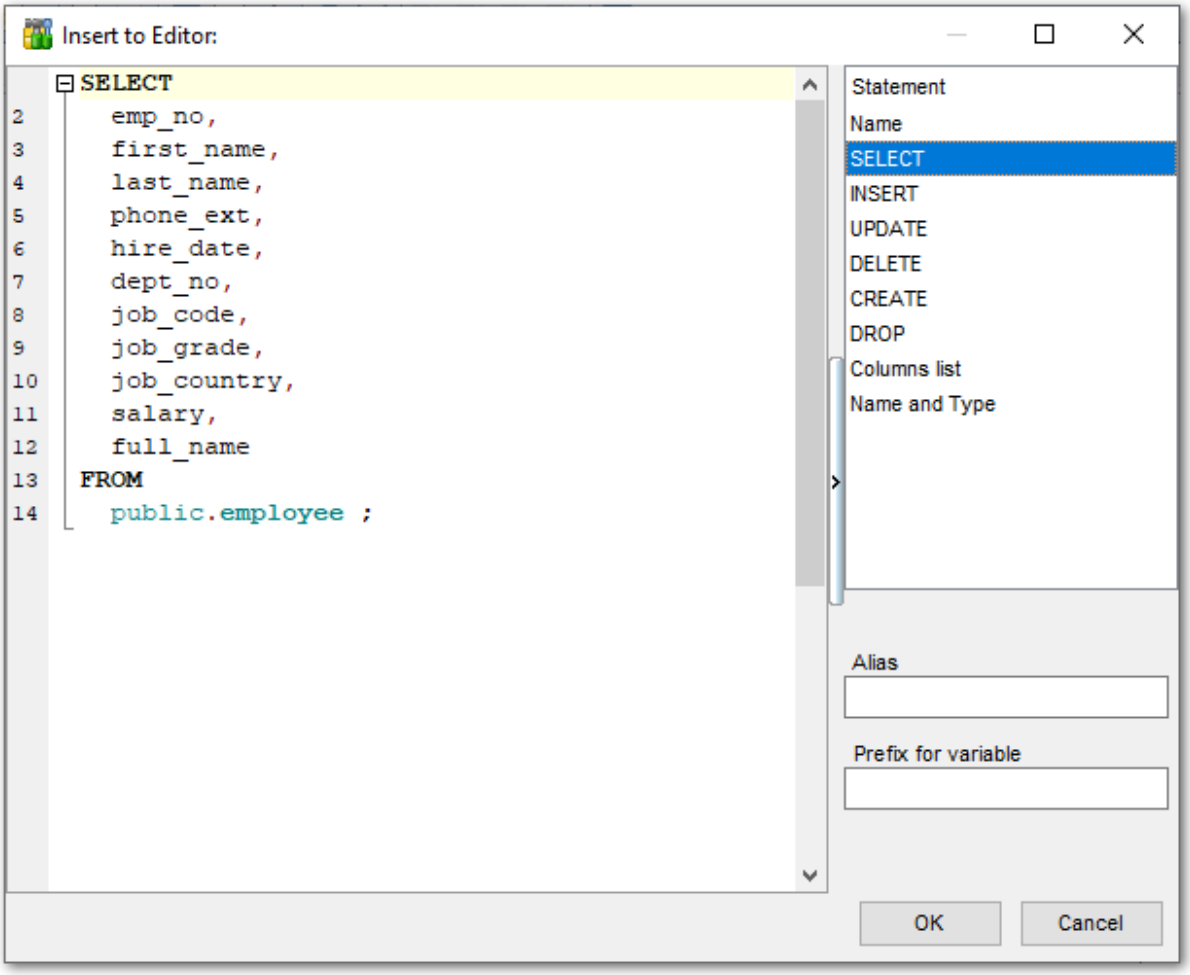
7.1.5 Adding objects to query

An object can be placed to query from DB Explorer 65. Just drag-and-drop the required object from DB Explorer tree or from SQL Assistant 81 to editor. Define statement for the object in the appeared window.
Note: You can drag-and-drop objects from DB Explorer 65 to Query Designer 431 too.



Use the Statement list to define statement for the object: *Name*, *SELECT*, *INSERT* (parameters 449 are used instead of values), *UPDATE*, *DELETE*, *CREATE*, *DROP*, *Columns List*, *Name and Type*.

You can define *alias* for an object and *prefix for variable* in the respective fields.

See also:
Query parameters 449
Query Designer 431

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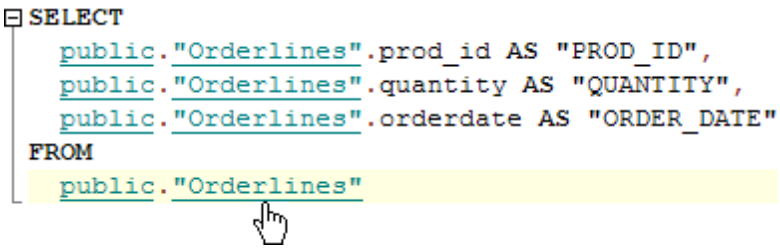
7.1.6 Using object links

Objects that exist in the database are highlighted in the text as hyperlinks. You can open an object in the appropriate editor by clicking the object name in the text with the *Ctrl* key pressed.



Please note that you can change the way highlighted objects look in the editor: use the Color 933 section of the Editor Options 925 dialog.

See also:

Working with Query Data area 418

Editor Options 925

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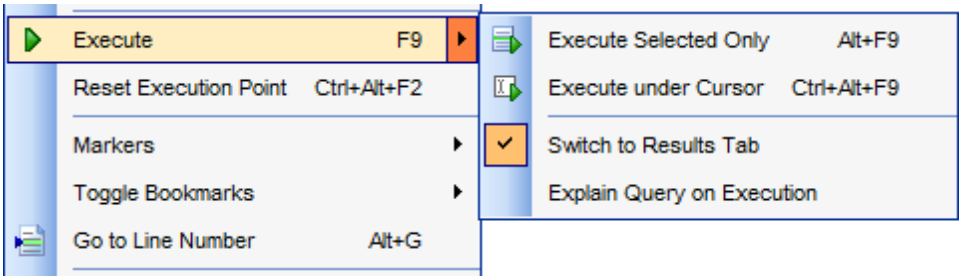
7.1.7 Executing queries

When all the query parameters are set, you can immediately **execute the query** in Query Data editor.

To execute a query, click the **Execute** item of the Navigation bar[416]. You can also use the context menu[420] or *F9* hot key for the same purpose.

If the SQL syntax is correct, the query is executed and, in case the query statement is supposed to return data (e.g. as SELECT statement), the returned dataset appears within the **Results** tab. The position of the tab depends on the **Results on Edit tab / Results on separate tab** selection in the Navigation bar[416].
Hint: *Ctrl+D* enables/disables the **Results on Edit tab** option.
If SQL syntax of the query contains any errors, the query execution is stopped and the corresponding error message is displayed in the status bar area at the bottom of the editor window.



By default, data returned by a query are displayed as a grid (see Data View[453] for details). The context menu[466] of the grid allows you to Export Data[536], Export as SQL Script[608].

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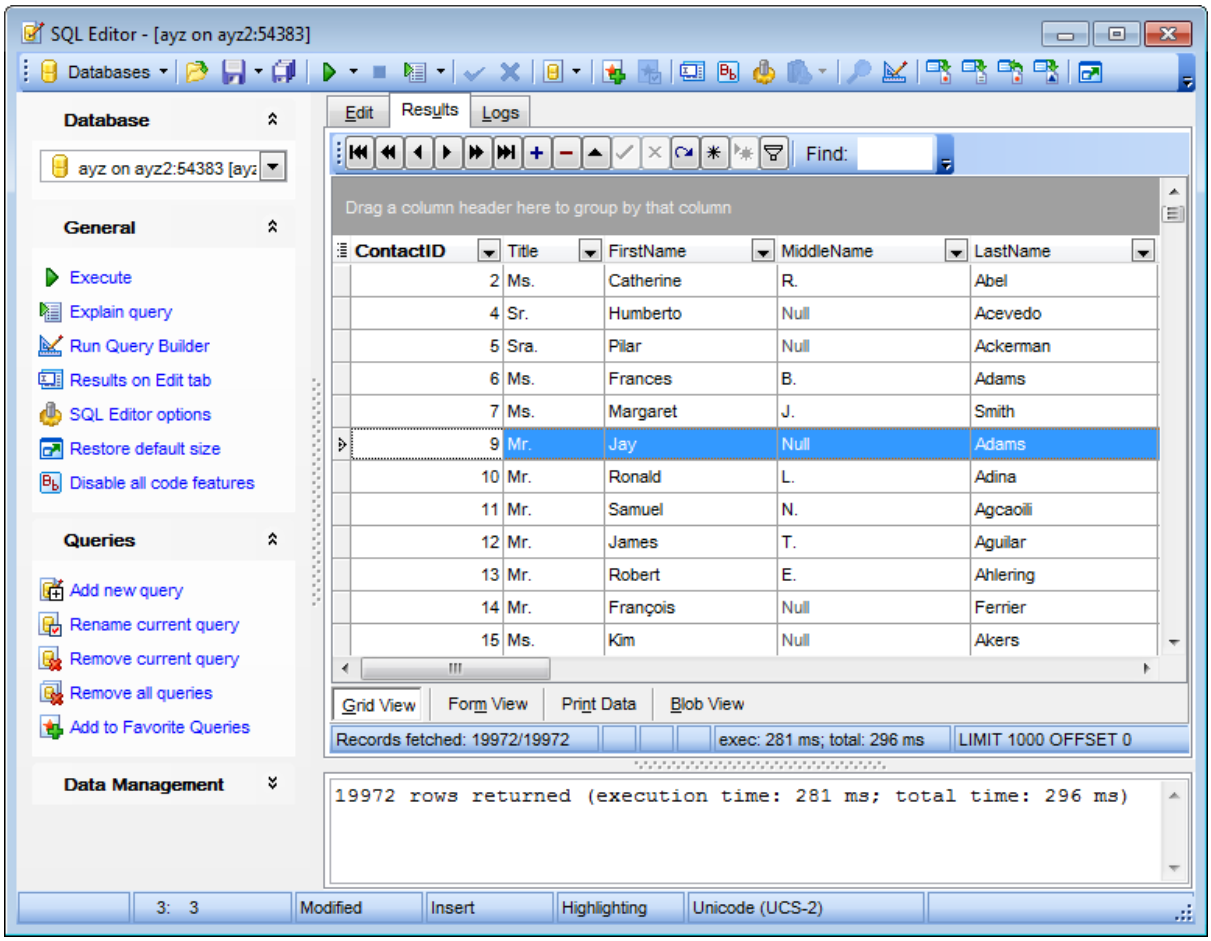

See also:

Data View 453

Export Data 536

Export as SQL Script 608

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7.1.8 Viewing query logs

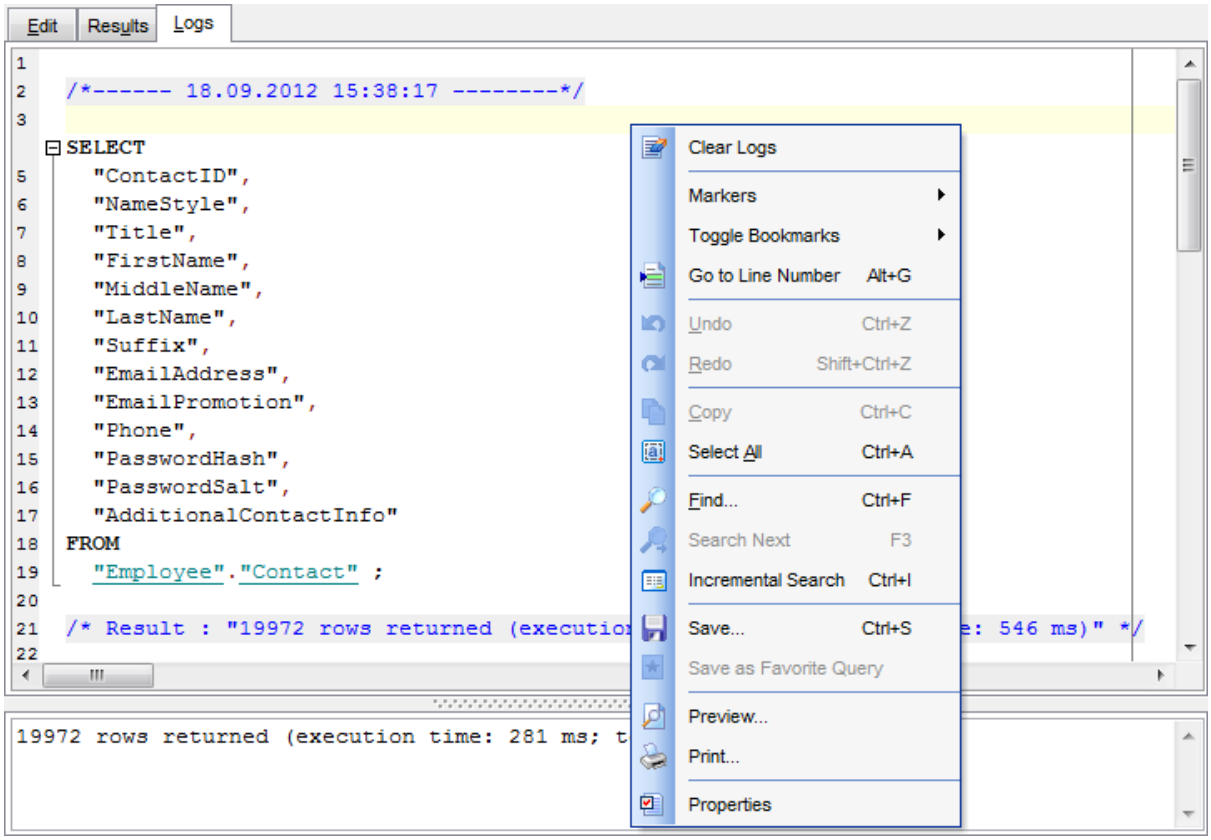
This tab allows you to view the query **log**. The log is available within the **Logs** tab of Query Data editor.

Using this tab you can view *log entries* containing the following details:

- date and time of the query execution;
- text of the query;
- number of rows fetched and fetch time, or the text of the error (if any).

Date/time and the execution result information are embedded as code comments conforming with the rules of SQL.

With the help of the **context menu** the log can be *printed*, *saved* to file or *cleared*. You can also use a number of Query Data editor context menu[420] generic functions.



See also:

Executing queries[426]

Using the context menu[420]

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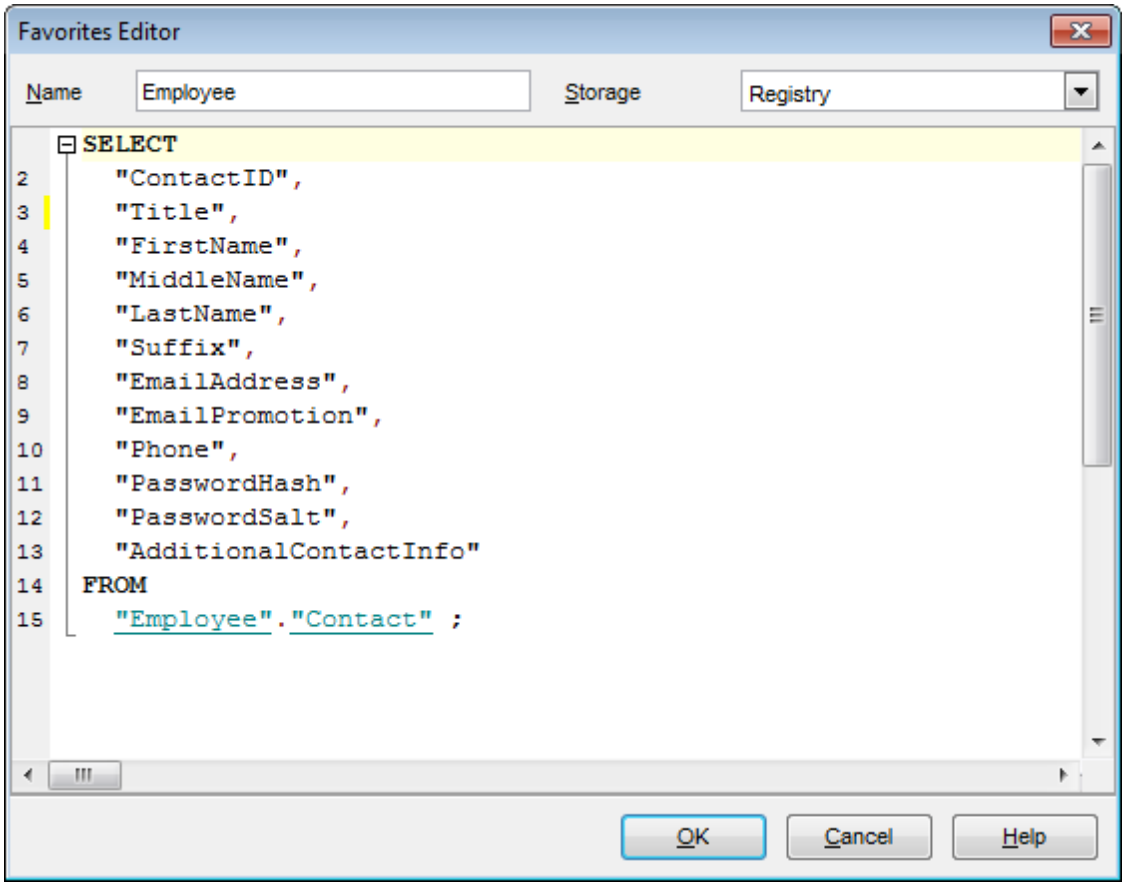
7.1.9 Favorites editor

For your convenience the **Favorite Queries** list is implemented in SQL Manager for PostgreSQL. This list is available within the **Favorite Queries** node of Database Explorer 85 and allows you to store the most frequently used SQL queries in one location.

To add a query to the **Favorite Queries** list, use the **Add to Favorite Queries** Navigation bar 416 item in **Query Data**. The corresponding item is also available in the context menu 420 of Query Data working area.

You can edit any of your Favorite Queries using **Favorites editor**.



Name
Set the name of the Favorite query.

Storage
Specify where the Favorite query will be stored: in *Windows Registry* or in the *Database*. In case of *Database* storage "public"."pgmfavorites" table is created to store queries.

NB: If you store Favorite queries in the *Windows Registry* then they can be lost after the Windows reinstall. To avoid this problem save the registry branch or store Favorite queries in a database.

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See also:

Managing Favorite queries 85
Working with Query Data area 418

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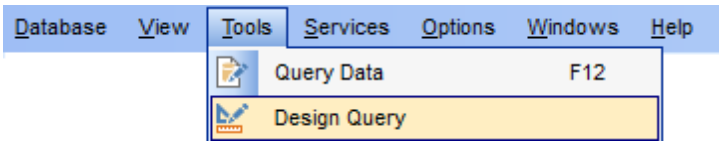
7.2 Design Query

Query Designer is implemented in SQL Manager for PostgreSQL for building queries visually. The tool allows you to create and edit queries without deep knowledge of SQL. You can also prepare and execute queries, and view the results of their execution.

To open Visual Design Query, select the **Tools | Design Query** main menu[961] items or use the corresponding toolbar[963] buttons.



- Using Navigation bar and Toolbar[432]
- Working with diagram area[434]
- Joining two database objects by fields[436]
- Setting the selection criteria[438]
- Setting output fields for selection[440]
- Setting the grouping criteria[442]
- Setting parameters of sorting[443]
- Working with editor area[444]
- Executing queries and viewing results[445]
- Viewing query plan[447]

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix[22] page.

See also:

Query Data[415]
Query parameters[449]
Design Query options[894]

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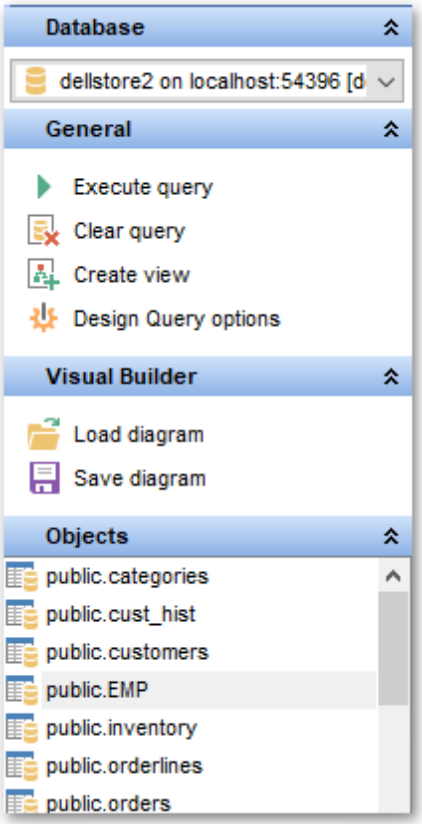
7.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Design Query**.



Database
select a database for the query

General
execute the current query
view estimated query execution plan 447
clear the query
create a view 229
configure Design Query with the Design Query Options 894 page of the Environment Options 871 dialog
restore the default size and position of the builder window

Objects
browse objects of the database; you can also add tables and views to the diagram using drag-and-drop operations

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with queries:

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Visual Builder

load a diagram from a **.vqb* file using the **Open diagram** dialog
save the diagram to a **.vqb* file using the **Save diagram as...** dialog

Edit

load a query from an **.sql* file using the **Open SQL File** dialog
save the query to an **.sql* file

Data Management

commit transaction
rollback transaction

Note: These actions are available if the **Use transactions in object editors, Query Data and Design Query** option is checked in the Database Registration Info | Data options 124 dialog.

export the returned dataset using Export Data Wizard 536
export the returned dataset as SQL Script using the Export as SQL Script 608 wizard

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

See also:

Working with diagram area 434
Query execution 445

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7.2.2 Working with diagram area

The main working area of **Design Query** editor is the diagram area available within the **Builder** tab. Here you can create a query by placing the database tables[169] and views[229] onto the area, and edit it by selecting the required data fields and setting links between objects.

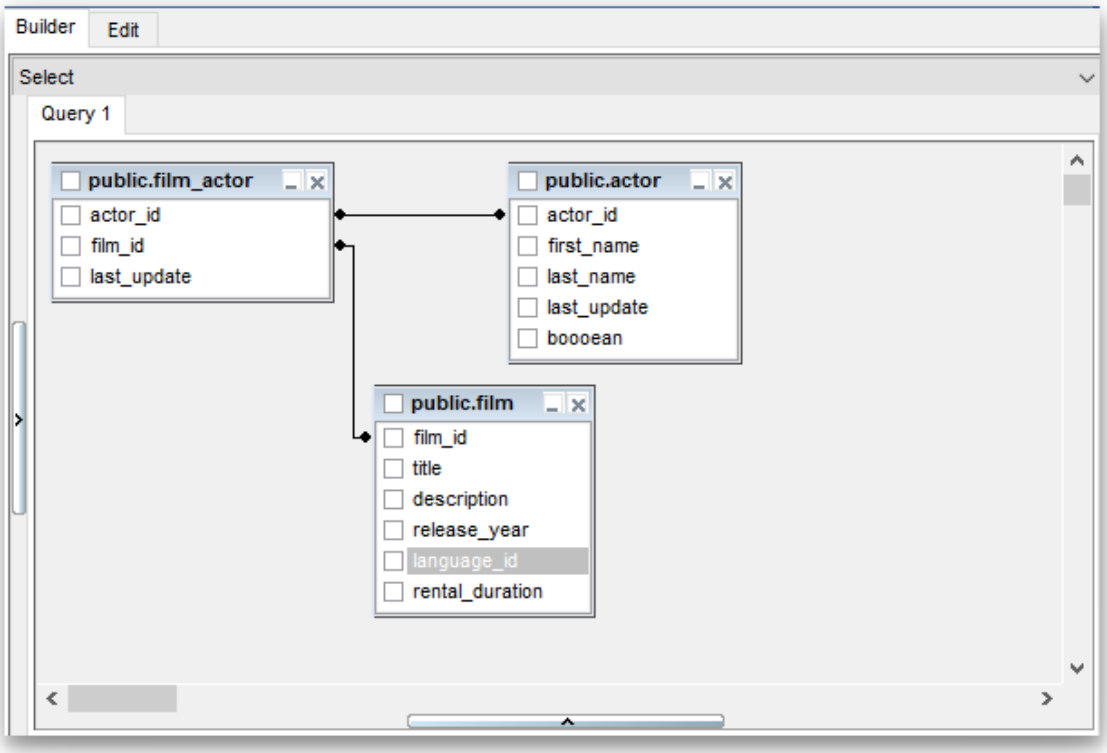
To add an object to the query, you can simply drag it from the DB Explorer[70] tree to the diagram area.

To include a field in the query, check the corresponding box located to the left from the field name in the list, or just double-click it. To include all fields of the table/view, check the box located to the left of the table/view caption. If you do not check any fields, the SQL statement is generated as *SELECT * FROM <table/view_name>*, i.e. all the fields are included in the query.

To *collapse/expand* the list of table/view fields, click the minimize/maximize button at the object caption.

To exclude a field from the query, uncheck the respective box. In order to remove the entire table/view from the query, close it by clicking the corresponding cross-button at the object caption, or right-click the object and select **Delete** from the context menu. You can also select the object and press the **Del** key.

To edit the alias of a table/view, double-click the object caption and enter the new name, or right-click the object and select **Rename** from the context menu.



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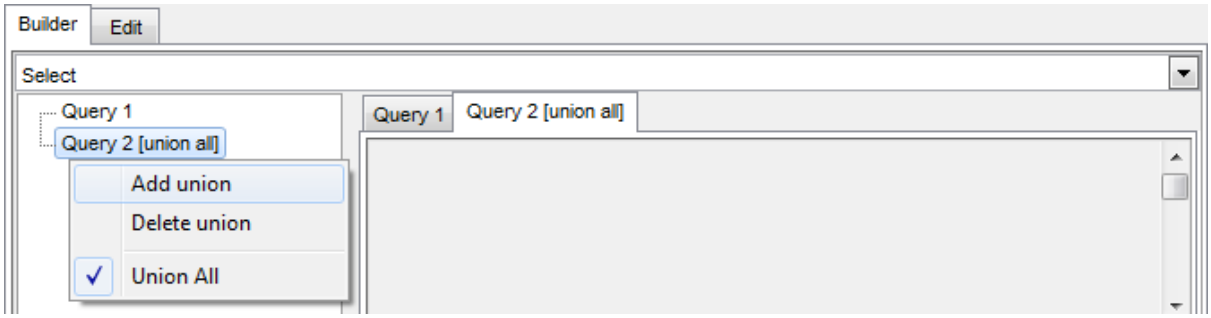
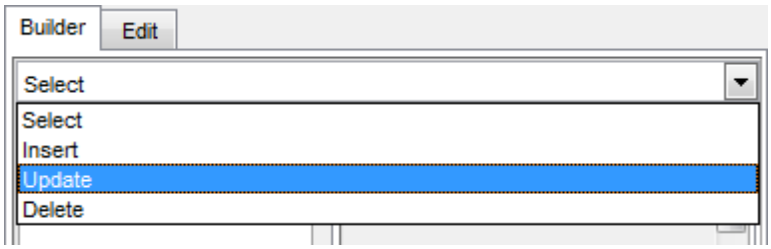
Design Query allows you to create complex queries consisting of two or more queries combined in one with the *UNION* operator, or add nested queries. The panel to the left of the diagram area displays the **tree of subqueries**.
To add a query, right-click within the **tree of subqueries** area and select **Add union** from the context menu. A tab for the new query will appear in the diagram area.
To remove a query from the tree, right-click the query and select **Delete union** from the context menu.
To add the *UNION ALL* operator to the query, right-click the newly added query and select the corresponding context menu item.



Note: Depending on which query type you need to execute, you can select one from the drop-down list above the tree of subqueries: *Select*, *Insert*, *Update*, or *Delete*.



See also:

Joining two objects 436
Working with the editor area 444
Query execution 445

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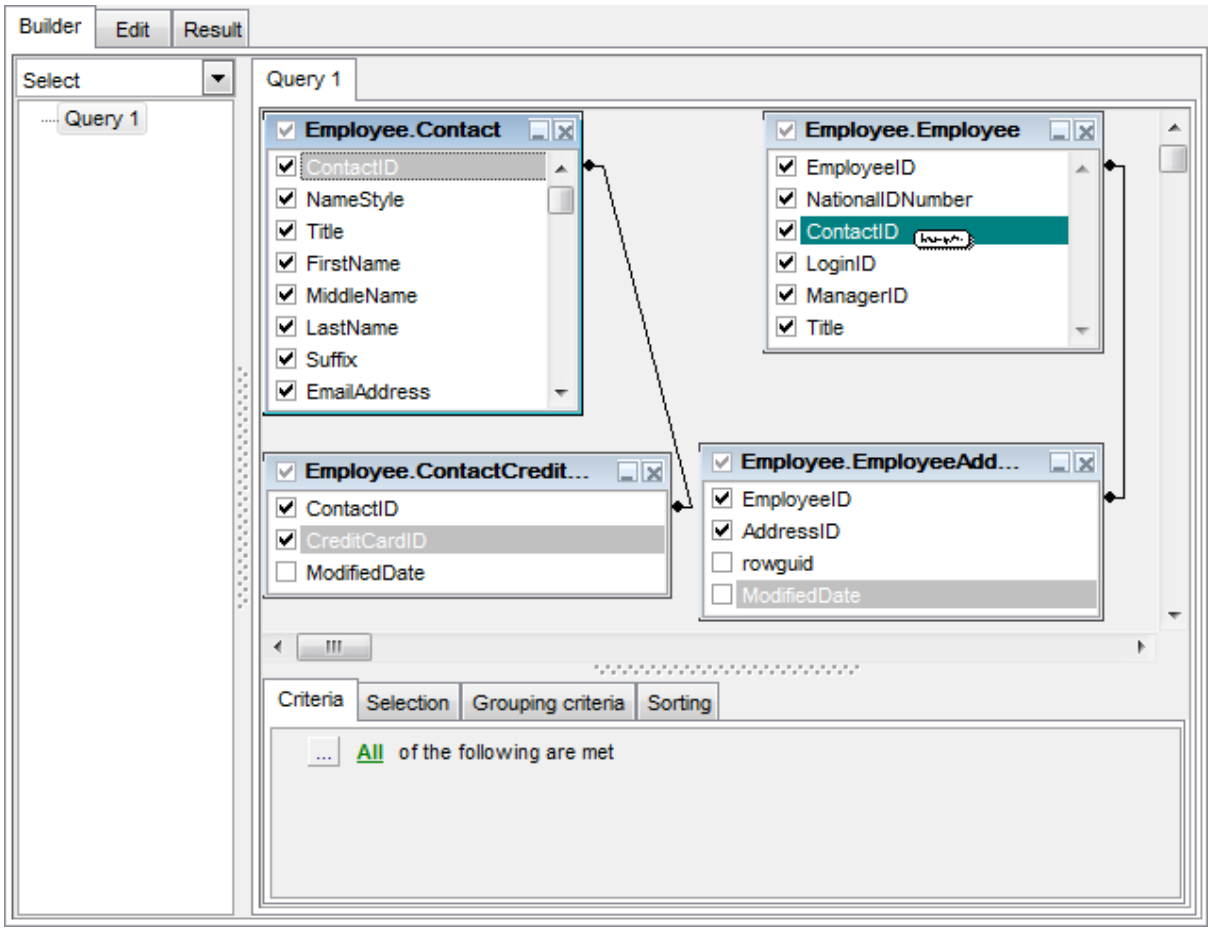
7.2.3 Joining two objects

The **diagram area** allows you to associate two objects by their columns: this operation is performed by dragging a field from one object list to another. This will set a link between these objects by the selected fields. It is indicated by a bidirectional arrow between the linked fields.



You can *view the link properties* of objects association: set the mouse cursor over the linking arrow, and a hint containing the association condition will popup after a short delay.

To edit the link properties, double-click the linking arrow or right-click it and select the **Property** popup menu item. The **Link properties** dialog allows you to change the association condition by choosing it from the drop-down list (=, >, <, >=, <=, <>).

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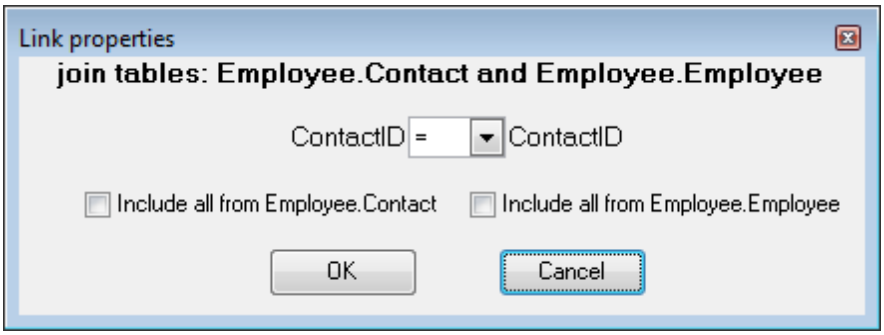
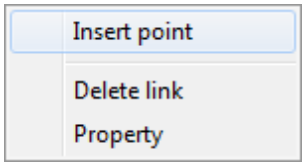


For your convenience the **Include all** option is available for each object of the association:
if the option is enabled for the left table, the *LEFT JOIN* operator will be used for the association;
if the option is enabled for the right table, the *RIGHT JOIN* operator is used for the association;
if the option is enabled for neither of the tables, the *INNER JOIN* operator is used for the association.
if the option is enabled for both of the tables, the *FULL OUTER JOIN* operator is used for the association.

Click **OK** to apply the changes you have made.

To remove a link between objects, right-click the linking arrow and select the **Delete link** popup menu item.

To add a point to the link line, right-click the linking arrow and select the **Insert point** popup menu item. Using the point you can move the link line easily. The point does not cause any changes to the query, it is only used for the diagram representation and makes visual building handy and more comprehensible.



See also:

Working with diagram area 434
Setting criteria 438

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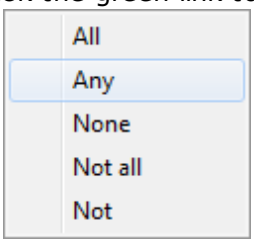
7.2.4 Setting criteria

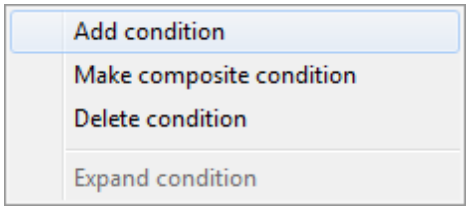
Use the **Criteria** tab to set the selection conditions.

The way the conditions are used is set in the upper string of the area (*All*, *Any*, *None* or *Not all of the following are met*). Click the green link to change it.



To add a condition, click the ellipsis button on the left, and select the **Add condition** popup menu item.

Edit the condition by clicking the elements of the condition pattern and setting the necessary values. Clicking the numbered button to the left of the condition string activates the popup menu which allows you to *add a new condition* at the same enclosure level, *make composite condition* by adding a new enclosure level, *delete the current condition*, *expand* or *collapse* enclosure levels of the condition (if the condition is composite).



A simple condition pattern contains three elements: *an argument*, *a condition operator* and *a second argument* (if required for the condition).

Clicking each element field allows you to set its value. You can add a field by drag-and-dropping it from the working area to Criteria, Selection, Grouping criteria or Sorting tabs. When clicking an argument field, you can edit the argument as a text string: set an object name or a certain value in this field. Right-clicking the field in the edit mode activates the popup menu with the **Insert field** (also called by the *Shift+Enter* shortcut; this item allows you to select a field from the list of all the table fields) and **Insert query** (this item adds a nested query) items.

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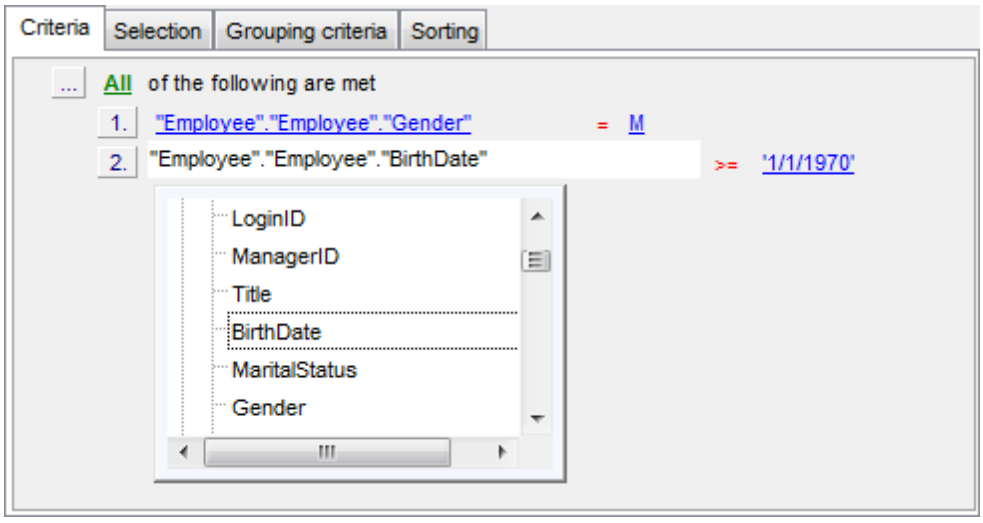
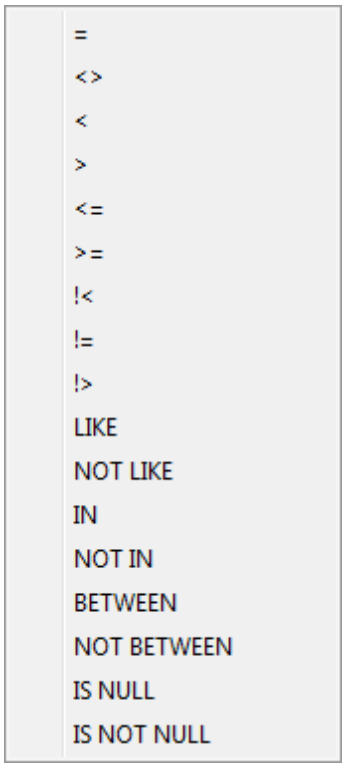


Clicking the condition operator field activates the popup menu from which you can select the operator you need.



See also:

Setting output fields 440
Setting grouping criteria 442
Setting sorting parameters 443

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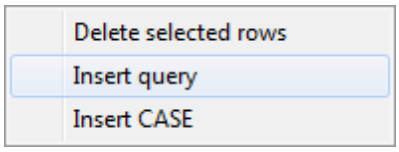
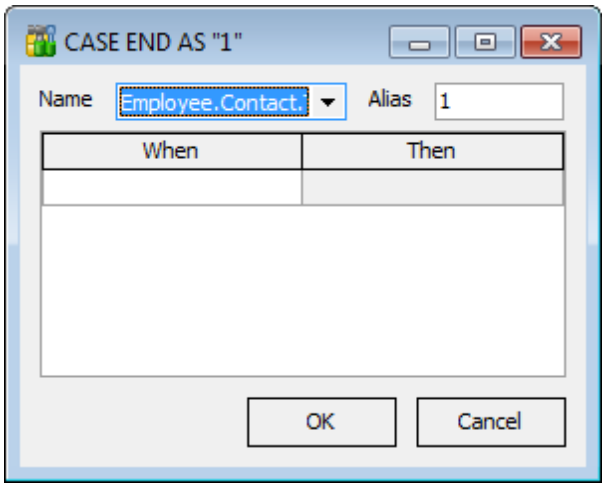
7.2.5 Setting output fields

The **Selection** tab displays the output fields of the query as a grid.

The grid allows you to edit the names of the query output fields, specify their display order and set the aggregate functions for each field. To remove a field from the list, right-click the field row and select the **Delete current row** popup menu item.



The popup menu also allows you to *insert a nested query* and add a *CASE* clause. To edit the CASE clause, use the **CASE END AS** dialog.



To change the *input query field*, click it and then type the field name or select it from the drop-down list.
To change the *output query field* name, set the cursor at the corresponding column and type the required field name.

To reorder fields in the list, use the buttons.

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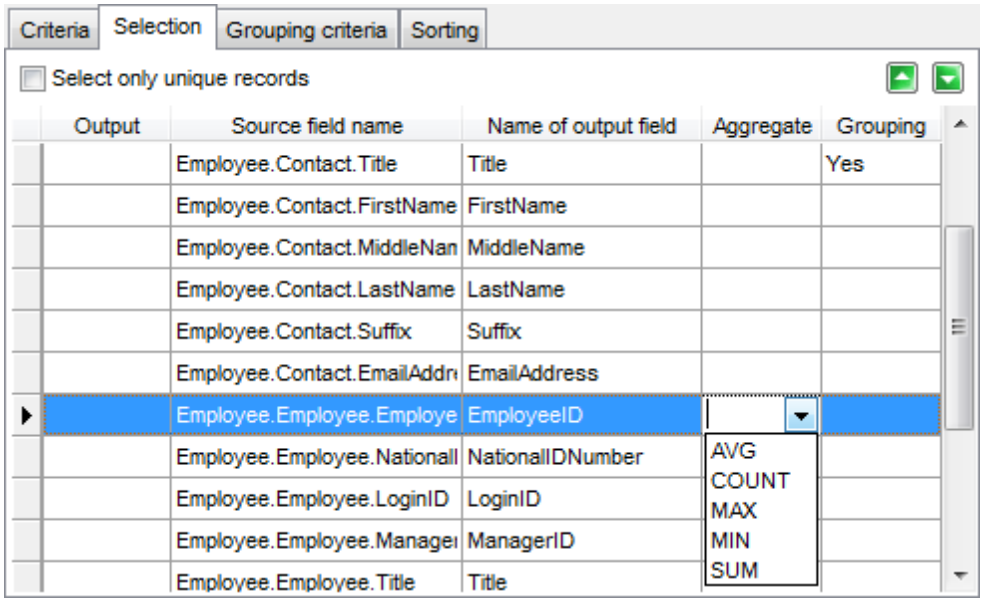

To set an aggregate function for a field, click the field row within the **Aggregate** column, and then type in the function name or select one from the drop-down list (*SUM*, *MIN*, *MAX*, *AVG*, or *COUNT*).

The **Grouping** column displays the grouping state for each of the output fields.

☑ **Select only unique records**
If you check this option, the duplicate records (if any) are not included into the query result (i.e. the *DISTINCT* keyword is added to the SQL query text).

See also:

Setting criteria 438
Setting grouping criteria 442
Setting sorting parameters 443

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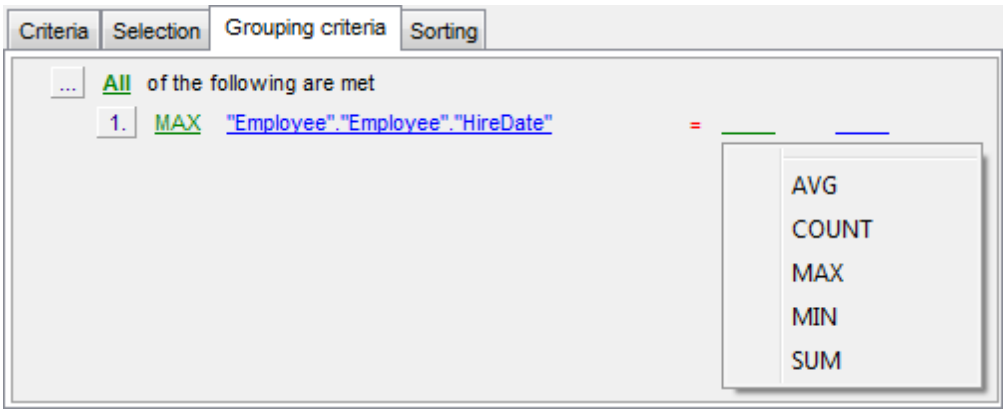
7.2.6 Setting grouping criteria

The **Grouping criteria** tab allows you to set conditions for grouping query records.

The grouping condition pattern fields are set in the same way as those of the Criteria 438 pattern.



These conditions will be included in the *HAVING* statement of the generated SQL query.

See also:

Setting criteria 438

Setting output fields 440

Setting sorting parameters 443

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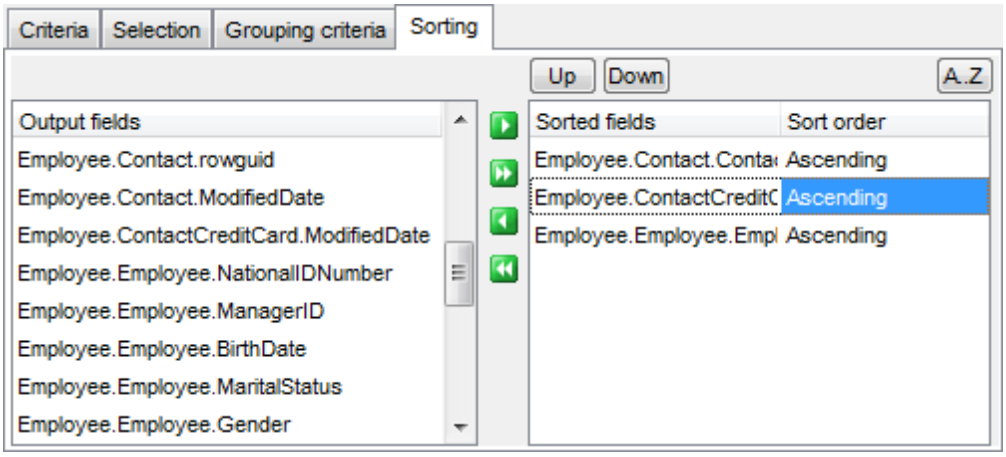
7.2.7 Setting sorting parameters

The **Sorting** tab allows you to set sorting parameters for the records returned by the query.

The working area contains the **Output fields** list (at the left) which represents all fields of the objects used in the query, and the **Sorted fields** list (at the right) which contains the fields to sort records by.
To move a field from one list to another, drag the selected field or use the **Add** and **Remove** buttons: .

To change the sorting order for a sorted field, select the field in the **Sorted fields** list and move it using the **Up** and **Down** buttons.

To change the sorting direction, select the field in the **Sorted fields** list and switch the direction (*Ascending*, *Descending*) using the corresponding **A..Z**/**Z..A** button.



See also:

Setting criteria 438
Setting output fields 440
Setting grouping criteria 442

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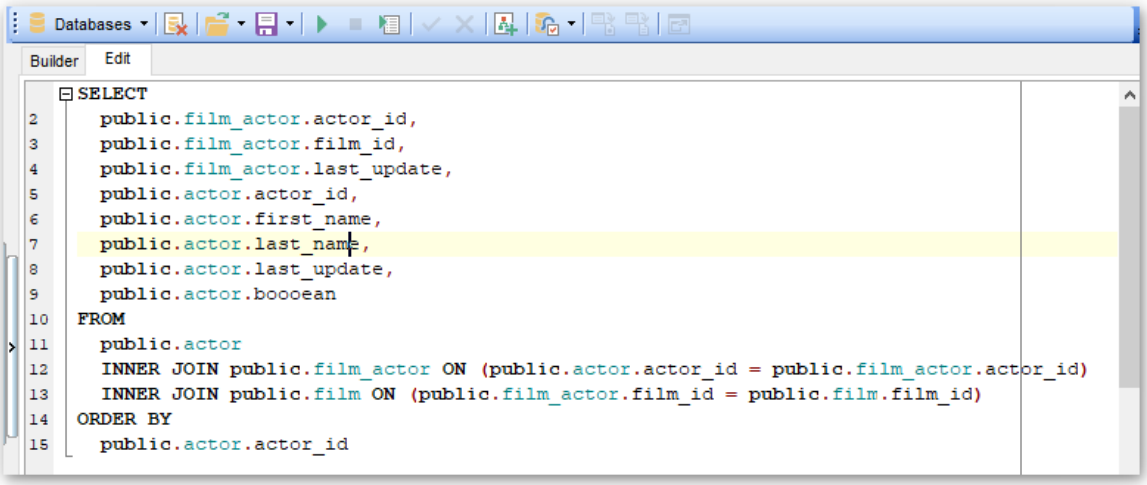
7.2.8 Working with the editor area

The **Editor area** of Query Designer is available within the **Edit** tab and is provided for working directly with the SQL query text which is generated automatically while you build the query visually.

You can edit this text according to the rules of SQL, and all the changes will be displayed within the **Builder** tab respectively.

To learn more about the Query Data features available within the **Edit** tab, see Working with Query Data editor area 418.



See also:

Working with diagram area 434
Query execution 445
Query Data 415

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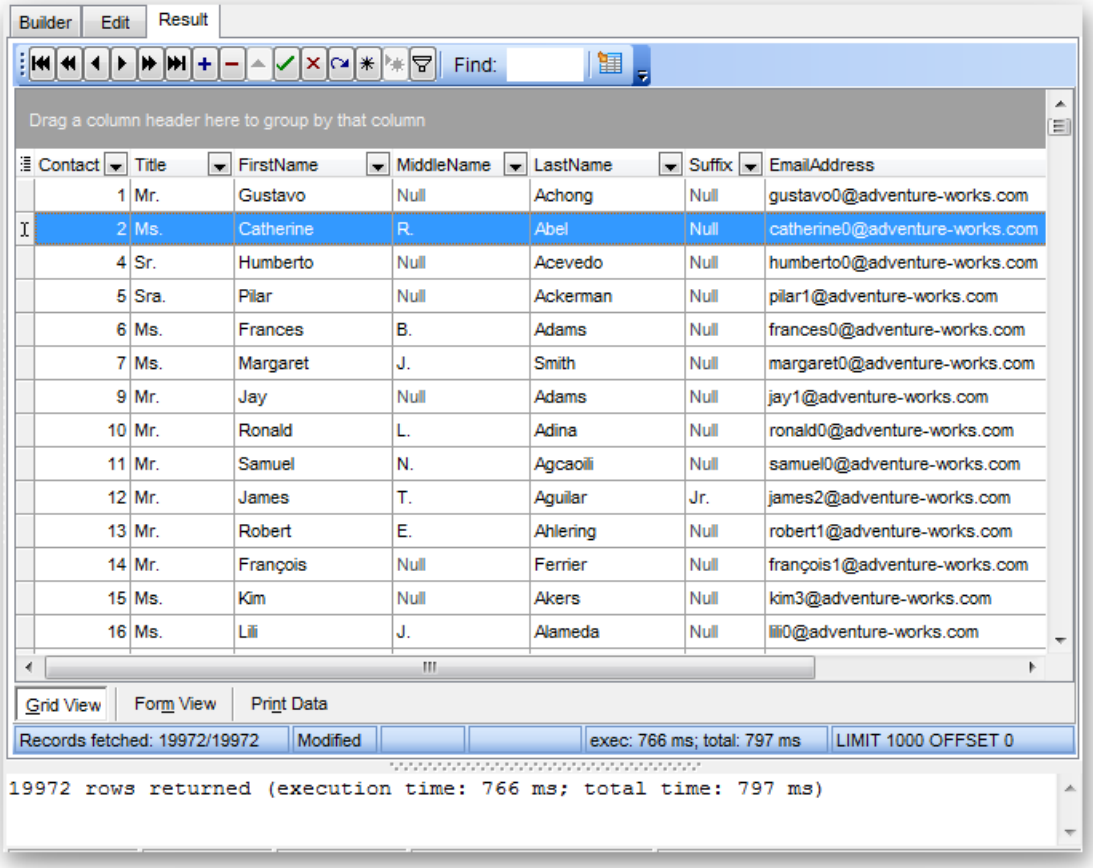
7.2.9 Query execution

When all the query parameters are set, you can immediately **execute the query** in **Design Query editor**.

To execute a query, click the **Execute query** item of the Navigation bar[432]. You can also use the *F9* hot key for the same purpose.

If the query parameters are specified correctly, the query is executed and, in case the query statement is supposed to return data (e.g. as *SELECT* statement), the returned dataset appears within the **Result** tab.
If SQL syntax of the query contains any errors, the query execution is stopped and the corresponding error message is displayed in the status bar area at the bottom of the Design Query window.

By default, data returned by a query are displayed as a grid (see Data View[453] for details). The context menu[466] of the grid allows you to Export Data[536], Export as SQL Script[608].



See also:

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Working with diagram area 434
Working with the editor area 444
Data View 453

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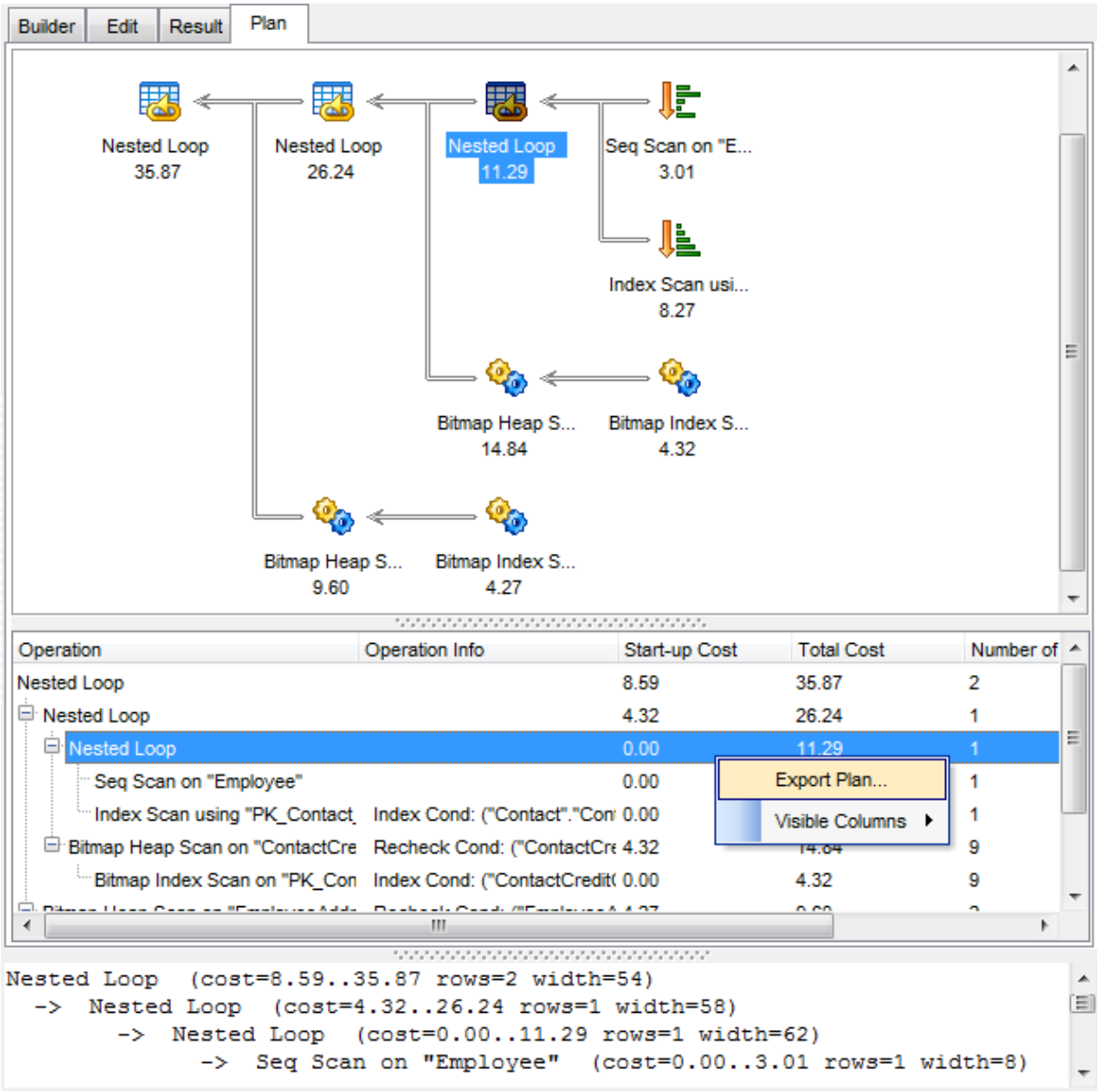
7.2.10 Viewing query plan

Using SQL Manager for PostgreSQL, you can view **the plan** for each of the queries created and executed in the application. The query plan is available within the corresponding **Plan** tab.

To view the **Plan** of a query, open **Design Query** and use the **Explain query** item of the Navigation bar or toolbar.

The **Plan** tab allows you to view the sequence of actions performed by the database server in the process of the query execution, and the amount of system resources used for the query execution.



The **Operation** panel below displays the operations as a tree list with the following columns: *Operation Info*, *Operation*, *Start-up Cost*, *Total Cost*, *Number of Rows*, *Row*

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Width, *Startup Time*, *Total Time*, *Real Number of Rows*, *Loops*.
Right-click within the panel to display the **context menu** allowing you to configure the set of *visible columns* or export 536 the plan to any of supported formats 983.

The area at the bottom displays the execution plan *as text*.

See also:

Query execution 445

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7.3 Query parameters

Both Query Data 415 and Design Query 431 support parameters usage inside the query text. A parameter is a kind of variable for which a value can be specified just before the query execution. In the query text the parameter should appear as an identifier with a colon (':') at the beginning, e.g.

```
SELECT * FROM MYTABLE WHERE ID = :param1;
```

Note: The **Allow using of parameters in query text** option should be checked on the Tools 879 page of the Environment Options 871 dialog for this feature to be enabled.

See also:

Query Data 415

Design Query 431

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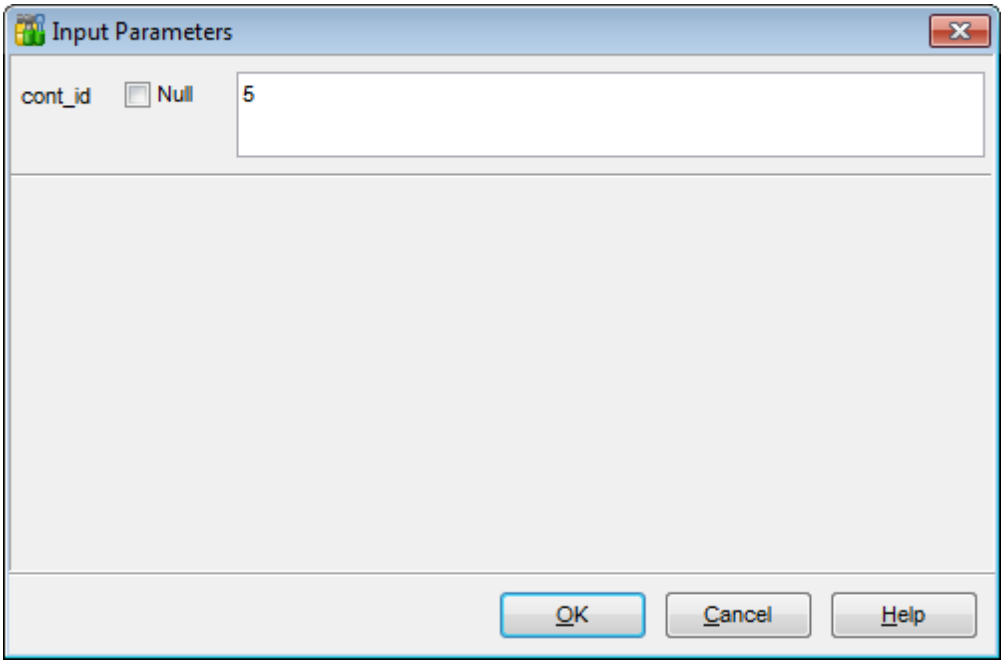
7.3.1 Input parameters dialog

The **Input Parameters** dialog is used to specify the query parameters as well as values of the input parameters of the query before execution.



Click **OK** button to apply the values and execute the query or click **Cancel** button to abort execution.

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Part

8 Data Management

Table data and query results are displayed on the **Data** or **Results** tab of Table Editor 177, Query Data 415, Design Query 431 editors, etc.

Data can be displayed in one of the following modes: **Grid View**, **Form View**, **Print Data**, **BLOB View**. See Data View 453 to learn more about these modes. You are also provided with a number of filtering tools 463 when working with your data.

- Data View 453
- Custom Filter 522
- Filter Builder dialog 524

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Import/Export Tools 535
Database Tools 636
Services 771
Options 870
How To... 1006

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8.1 Data View

SQL Manager for PostgreSQL provides you with powerful tools for **viewing, editing and printing data** from tables and queries:

- table / view data are available within the **Data** tab of Table Editor 177 / View Editor 229 correspondingly;
- upon a query execution 426 the returned dataset appears within the **Result(s)** tab of Query Data 415 / Design Query 431 (in Query Data the position of the tab depends on the **Results on Edit tab / Results on separate tab** selection in the Navigation bar 416).

The data can be displayed in one of four available **modes**: *Grid View*, *Form View*, *Print Data* and *BLOB View*. The **status bar** at the bottom displays the number of records in the current dataset, the time the records were fetched by the application and the status of the records (whether the data are read-only or editable).

Please see the succeeding chapters to learn how to work with your data in the simplest and most efficient way.

- Using Navigation bar and Toolbars 454
- Grid View 457
- Form View 479
- Print Data 481
- BLOB View 507
- Applying changes 521

See also:

Custom Filter 522

Filter Builder dialog 524

Table Editor 177

View Editor 229

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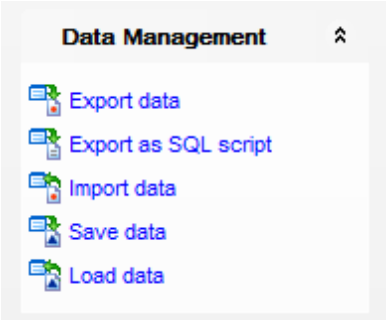
8.1.1 Using Navigation bar and Toolbars

When the **Data** tab (in Table Editor[177], View Editor[229]) or the **Result(s)** tab (in Query Data[415], Design Query[431]) is selected, the Navigation bars[961] of these tools contain the **Data Management** group which allows you to:



- export data[536]
- export data as SQL script[608]
- import data[582] (in *Table Editor*, *View Editor* only)
- save data[617] (in *Table Editor* only)
- load data[626] (in *Table Editor* only)

Items of the **Navigation bar** are also available on the **ToolBar**. To enable the toolbar[963], open the Environment Options[871] dialog, proceed to the Windows[877] section there and select *Toolbar* (if you need the toolbar only) or *Both* (if you need both the toolbar and the Navigation bar[961]) in the **Bar style for child forms** group.

The **Navigation pane** contains toolbars allowing you to:

- go to the first record of the dataset;
- go to the previous page;
- go to the previous record;
- go to the next record;
- go to the next page;
- go to the last record of the dataset;
- insert a new record (in *Table Editor* only);
- delete the selected record (in *Table Editor* only);
- edit the selected record (in *Table Editor* only);
- post[521] edit (in *Table Editor* only);
- cancel edit (in *Table Editor* only);
- refresh data;
- set bookmark;
- go to saved bookmark;
- call the Filter Builder[524] dialog;
- search for a string in the currently selected column data;
- enable/disable including data of descendant tables;

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- specify the maximum number of records (record limit) for displaying data (in *Table Editor*, *View Editor* only);
- navigate within the dataset using the specified record limit (in *Table Editor*, *View Editor* only).

The **Toolbar** of the Print Data 481 mode allows you to:

- customize the report using Report Formatter 490 and the Report Options 501 dialog;
- load a report from an external **.rps* file;
- save the current report to an external **.rps* file;
- print the report using the default printer;
- set printing options using the standard Print 506 dialog;
- call the Page Setup 483 dialog;
- show/hide report thumbnails;
- customize the Report Title 501;
- add Date and Time 503, Page Numbering 503, show/hide empty pages;
- shrink the report to the page;
- specify background color;
- zoom in/out, setup zoom 504, zoom page width, whole page, two/four/multiple pages;
- select the active page of the report;
- go to first/previous/next/last page of the report.

The **Toolbar** of the BLOB View 507 mode allows you to:

- select a BLOB column;
- select encoding (*ANSI*, *UTF-8*, *UNICODE-16*);
- load BLOB content from an external file;
- save the BLOB column content to an external file;
- cut/copy/paste selected text to/from clipboard (enabled for the *Text* and *Rich Text* tabs only);
- undo changes;
- print the text (enabled for the *Text*, *Rich Text* and *HTML* tabs only);
- select font to be applied to the selected text (enabled for the *Rich Text* tab only);
- select font size to be applied to the selected text (enabled for the *Rich Text* tab only);
- make the selected text bold/italic/underlined (enabled for the *Rich Text* tab only);
- align left/center/right (enabled for the *Rich Text* tab only);
- add/remove list bullets (enabled for the *Rich Text* tab only).

See also:

Grid View 457
Form View 479
Print Data 481
BLOB View 507

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Applying changes 521
Customize toolbars and menus 988

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8.1.2 Grid View

By default, data returned by a query is displayed as a grid. It is indicated by the **Grid View** tab selected on the View mode panel at the bottom of the **Results** area of the window.

When in the **Grid View** mode, the columns correspond to the columns and the rows correspond to the records.
If more convenient, you can change the order[459] of the columns by dragging their headers horizontally. Clicking the column caption sorts data by the values of this column in the ascending or the descending mode. The navigation pane[454] at the top of the grid allows you to browse the data quickly, to insert, update and delete records, and to set a filter[463] for the records using the Filter Builder[524] dialog and other tools.

The Navigation bar[454] of the parent window, toolbars[455] and the context menu[466] of the grid provide you with a number of data management functions: Export Data[536], Import Data[582], Export as SQL Script[608] and more.

- Customizing columns[459]
- Grouping and sorting data within the grid[460]
- Filtering records[463]
- Using the context menu[466]
- Working in multi-level mode[468]
- Browsing data in card view[476]
- Column Summary[477]
- Copying records[478]

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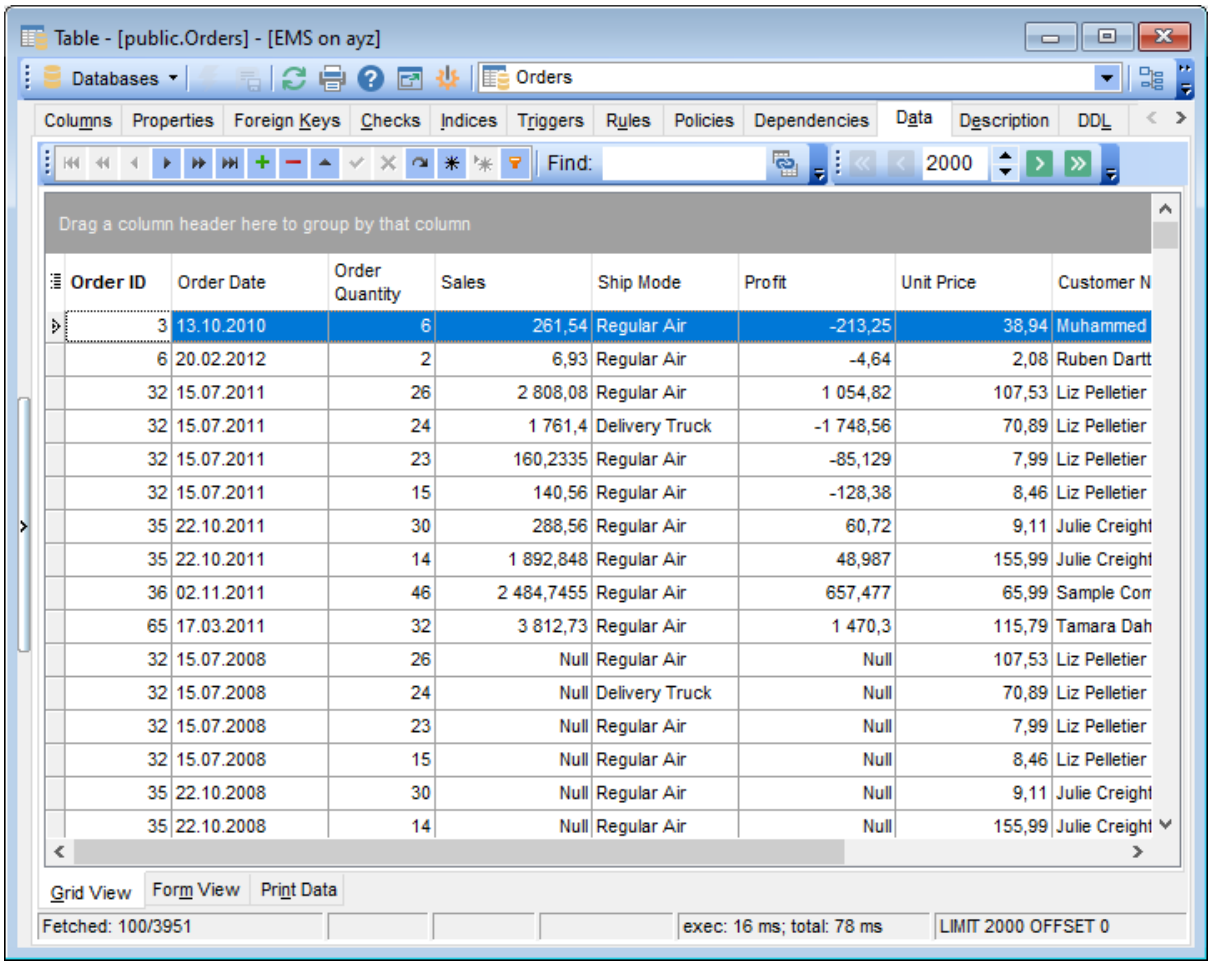

Hint: To increase the speed of opening tables and views with extremely large number of records, you can use options of the **Limit options in table and view editors** group available in the Grid | Data Options 912 section of the Environment Options 871 dialog.

See also:

Using Navigation bar and Toolbars 454
Form View 479
Print Data 481
BLOB View 507
Applying changes 521

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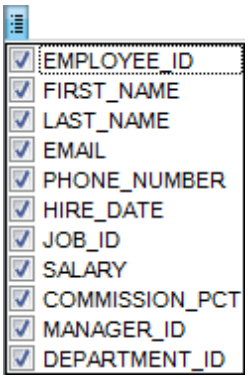
8.1.2.1 Customizing columns

Selecting visible columns

When working in the **Grid View** mode, you can specify which columns of the current dataset will be visible. Click the button available in the top left corner of the data grid and select/deselect columns in the drop-down list to specify their visibility/invisibility.



Changing columns order

For your convenience the possibility to *change the order* of the columns in the data grid is available. To reorder columns, drag a column header horizontally to a place in between two other column headers indicated with green arrows.

See also:

Grouping data 460
Filtering records 463
Working in multi-level mode 468
Working in card view mode 476
Column Summary 477

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8.1.2.2 Grouping and sorting data

In order to **sort data**, do the following:
open data at the **Data** or **Results** tab, choose the column by which you need to sort data and click the column title.
If the column was not sorted, the first click will sort it in the ascending order and the second one - in the descending order.

Clear Sorting
To cancel the sorting, open the context menu by right-clicking the necessary column and choose the **Clear Sorting** item, or press the *Ctrl* button and click the column title.

If necessary, you can **group the data in grid** by any of the columns.

This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. In order to display this area, select the ☑ **Show "Group by" box** option available in the Grid 909 section of the Environment Options 871 dialog.

When grouping by a column is applied to the grid, all the records are displayed as subnodes to the grouping row value as displayed in the screenshot below. The grouping row can contain the column summary information specified in the **Group header** group of the Column Summary 477 dialog.

To reverse grouping, just drag the column header back.
Hint: While dragging the column header back, you can also change the column position 459 .

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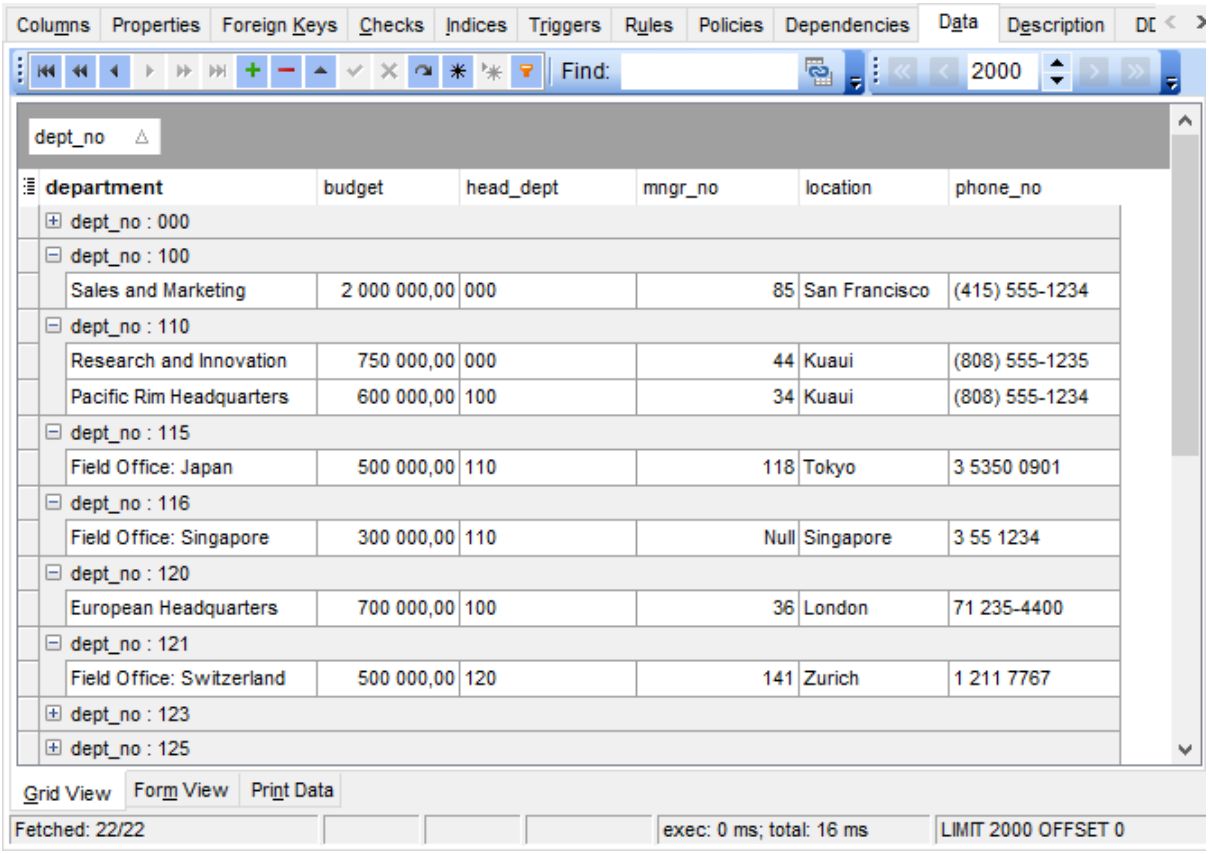

If necessary, you can group data by two or more columns. In this case column headers are displayed hierarchically, and data are grouped by these columns in the order the column headers appear in the **"Group by"** area.

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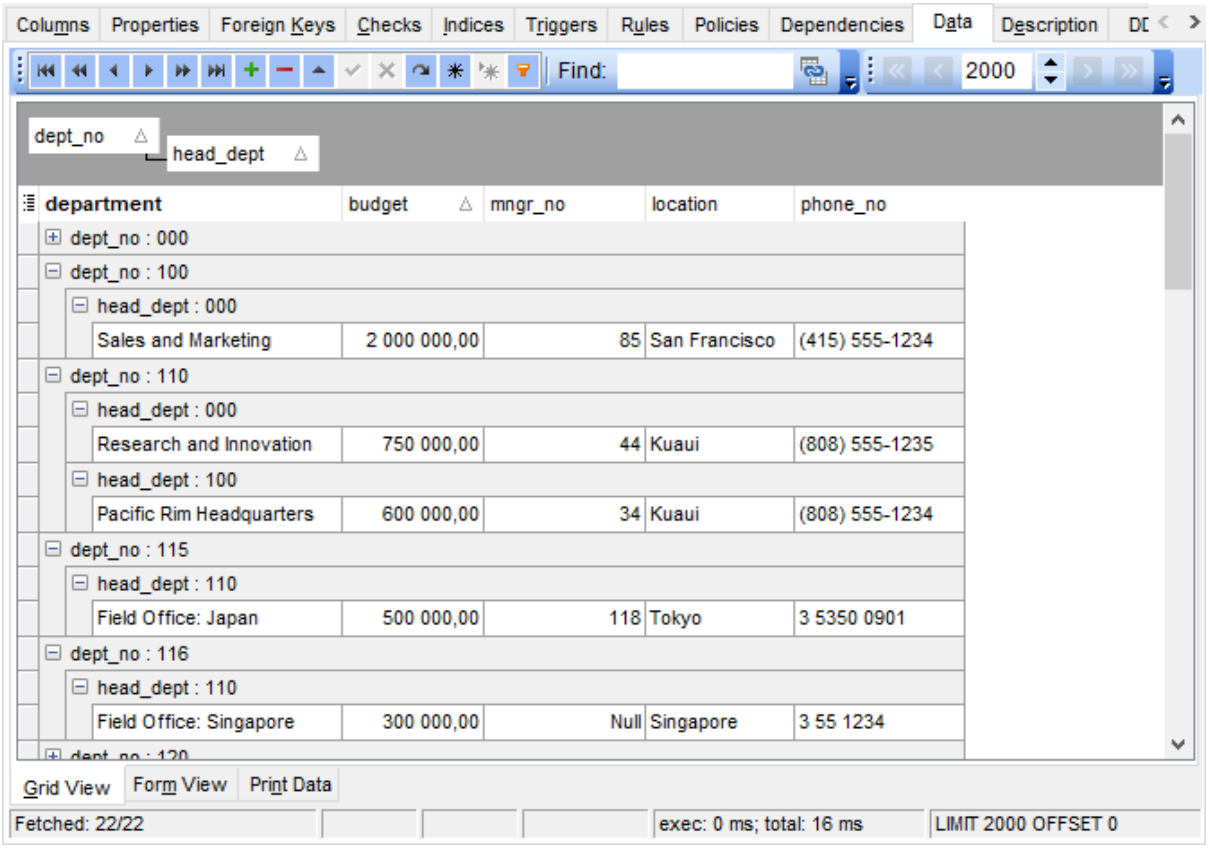

See also:

Customizing columns 459
Filtering records 463
Working in multi-level mode 468
Working in card view mode 476
Column Summary 477

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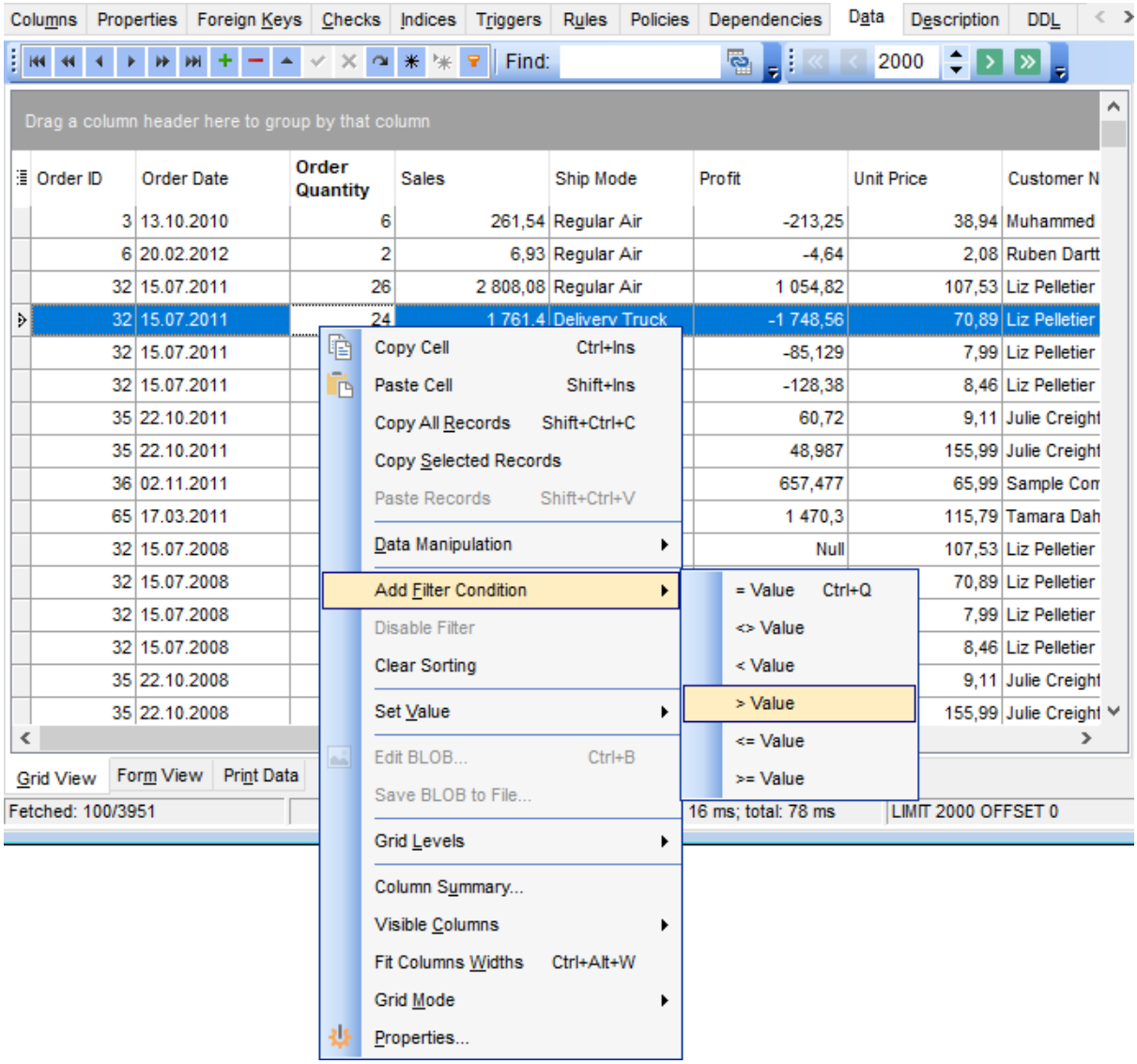
8.1.2.3 Filtering records

A number of **filtering** facilities are implemented in the grid for your convenience. You can filter records in the grid in either of the following ways:

- right-click a row and select the **Quick Filter** context menu item to filter records by the current value of the selected column;



- click the Arrow-Down button next to the column caption to display the drop-down list and select any of the column values to filter records by this value of the selected column;

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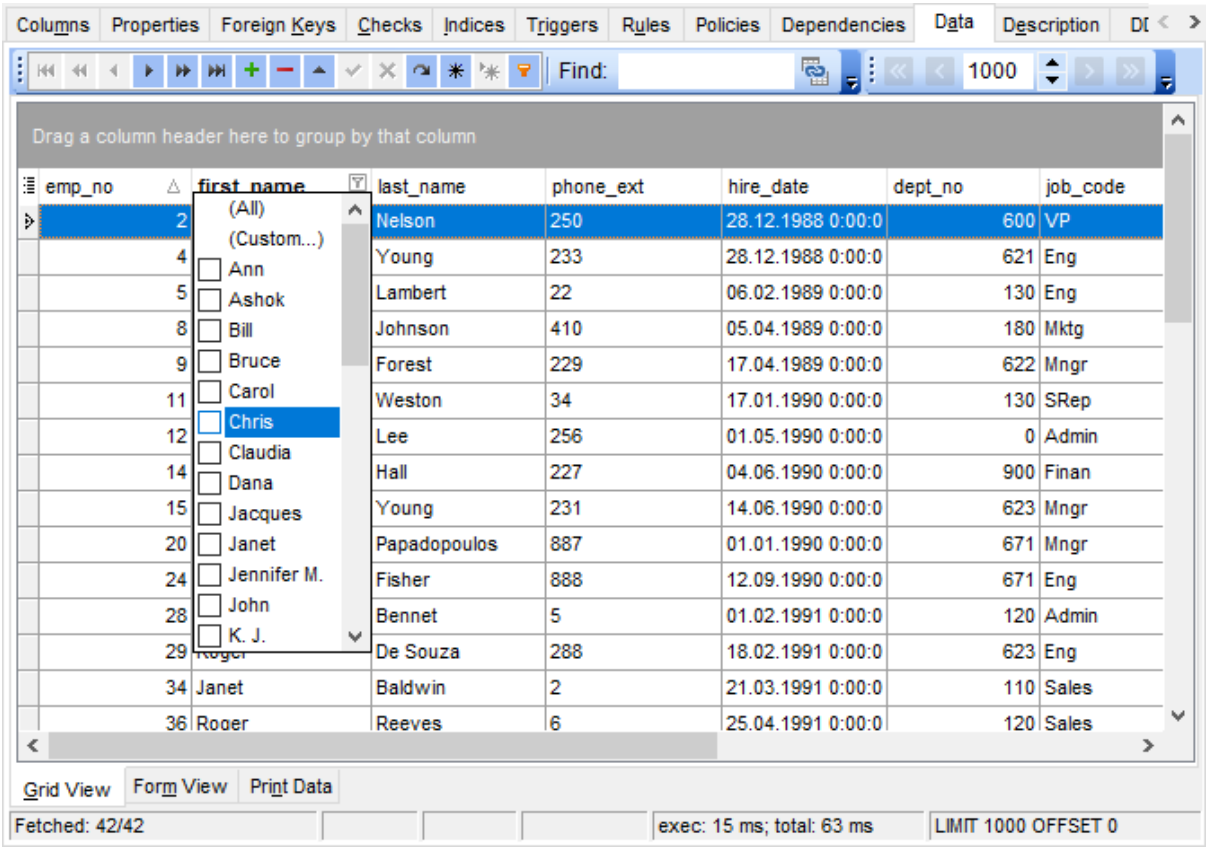
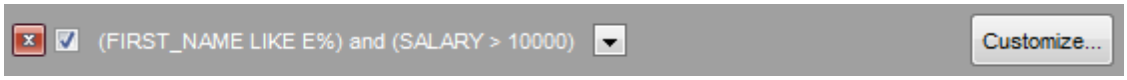


or

- click the Arrow-Down button next to the column caption to display the drop-down list, then select the **Custom** item and build a simple filter using the Custom Filter 522 dialog;
- use the **Set filter** button on the navigation pane 454 to invoke the Filter Builder 524 dialog and create a composite filter using the dialog.

After the filter is set, the gray **filtering panel** becomes visible at the bottom of the grid. This panel allows you to see the active filtering condition and easily enable or disable it using the checkbox on the left. The Arrow-down button opens the drop-down menu which allows you to browse the filter history for this dataset.
If necessary, you can click the **Customize...** button on the right to customize your filter and add more complicated filtering conditions within the Filter Builder 524 dialog.



To remove the current filter, click the **Close** button.

See also:

Customizing columns 459
Grouping and sorting data 460

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Custom Filter 522
Filter Builder dialog 524

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8.1.2.4 Using the context menu

The **context menu** of the grid is aimed at facilitating your work with data: you can perform a variety of operations using the context menu items:

- copy the selected cell value to Windows clipboard;
- paste the clipboard content to the currently selected cell;
- copy/paste multiple records;
- data manipulation: Export Data 536 from the table, Import Data 582 to the table, Export Data as SQL Script 608, Save Data 617, Load Data 626;
- set/disable Quick Filter 463;
- clear sorting;
- set a value for the selected cell: *NULL*, *Empty string* (for string columns), *Now* (for TIME columns), *"Zero"* (for DATE columns);
- edit the BLOB value or save the BLOB to file using BLOB viewer/editor 507;
- expand/collapse grid levels 468 and navigate within the tabs;
- manage grid levels: add a new grid level 469, delete the current grid level (this item is enabled only when the detail level exists and is currently focused);
- switch to the Card View 476 mode;
- view Column Summary 477;
- select visible/invisible columns of the dataset;
- fit column width for better representation;
- specify the grid mode: *Load All Rows*, *Load Visible Rows*, *Default*;
- view/edit grid properties 909.

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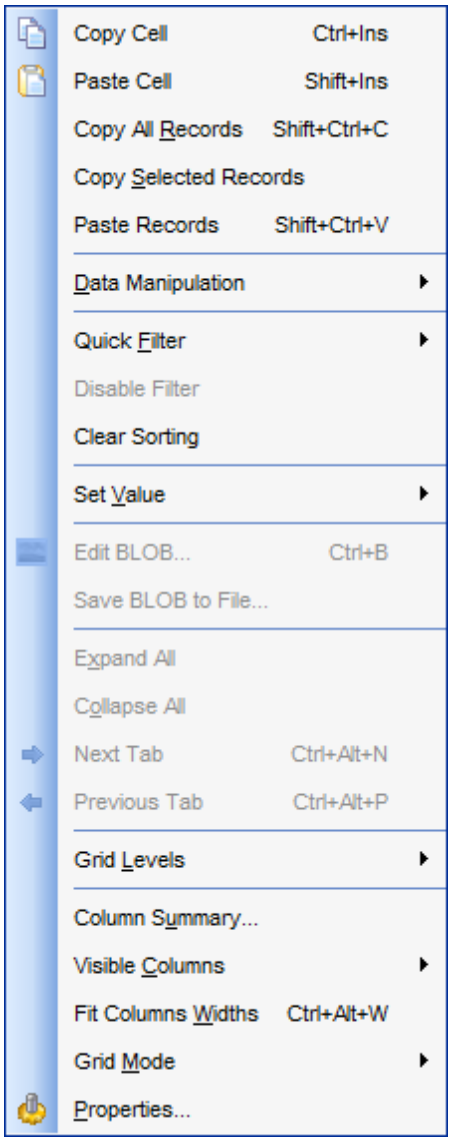

Note: If the **Show editor immediately** and **Always show editor** options on the Environment options | Grid 909 tab are checked then the context menu of a grid can be evoked by selecting the necessary cell and right-clicking the table header. Otherwise, right-clicking the cell evokes the cell editing menu.

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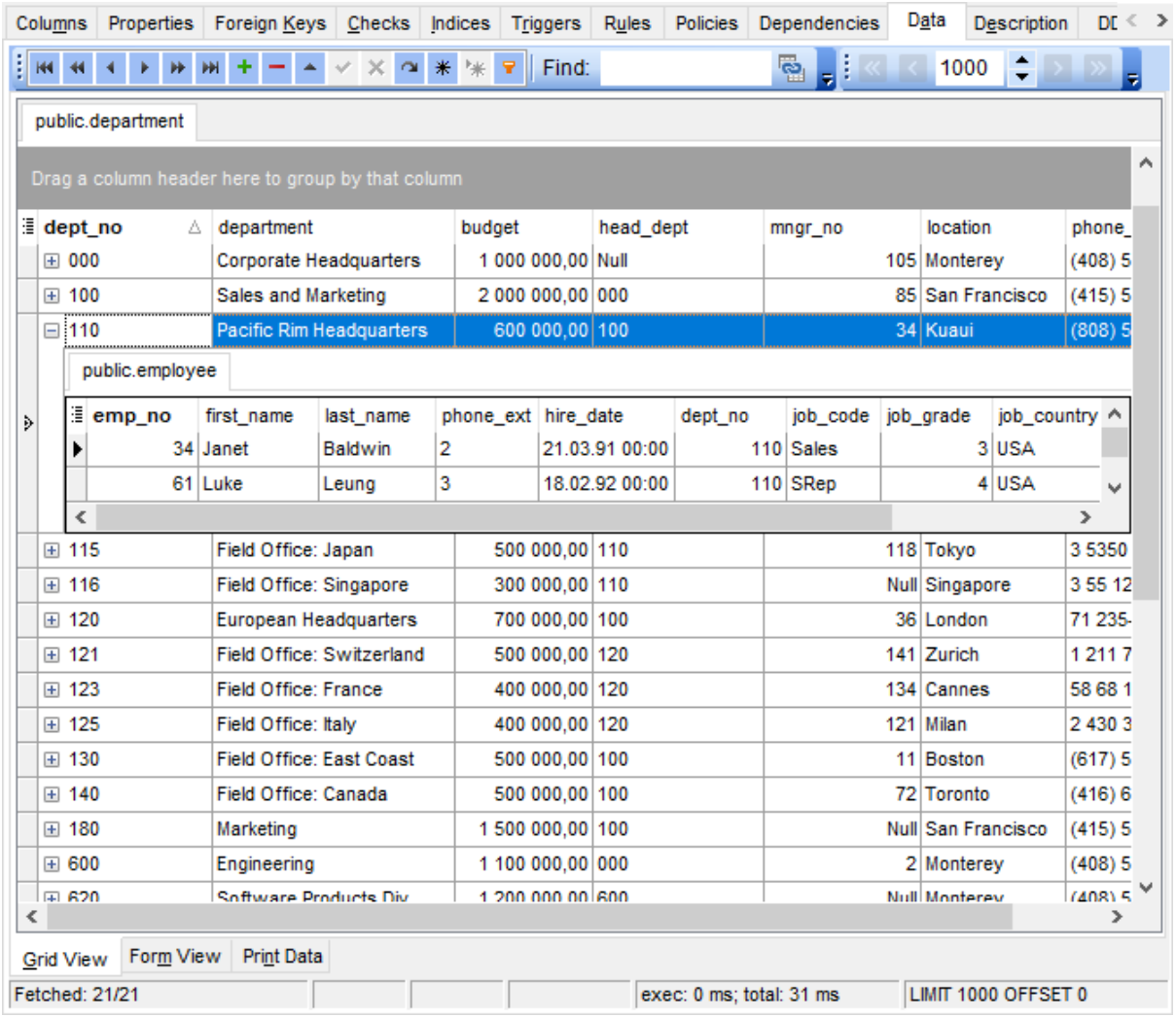
8.1.2.5 Working in multi-level mode

One of unique features of SQL Manager for PostgreSQL is the ability to work with data in multi-level mode to view and modify data in several related tables simultaneously.

To manage grid levels, right-click the grid and select the **Grid Levels** context menu[466] group. Items of this group allow you to:

- add a new grid level using Create Grid Level Wizard[469];
- delete the current grid level;
- switch between the ordinary *Table View* and the Card View[476] modes.



See also:

Using the context menu[466]

Create Grid Level wizard[469]

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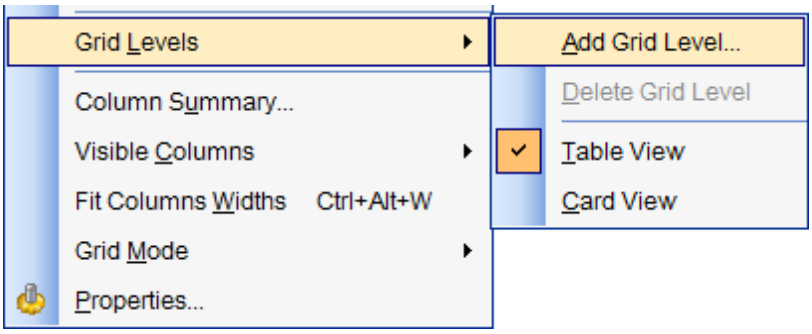
8.1.2.5.1 Create Grid Level wizard

Create Grid Level Wizard allows you to add a new detail level to the grid in order to get master-detail representation of your data.

To start the wizard, right-click the grid, select the **Grid Levels** context menu[466] group and proceed to the **Add Grid Level...** item within this group.

- Specifying master level[469]
- Selecting source table[470]
- Binding master and detail levels[472]
- Query parameterization[473]
- Setting additional parameters[474]



8.1.2.5.1.1 Specifying master level

Use the drop-down list to select the table of the **master level** to which a new level will be added.

Source of new level data
Select the source type of the new level data: *Table* or *Query*.

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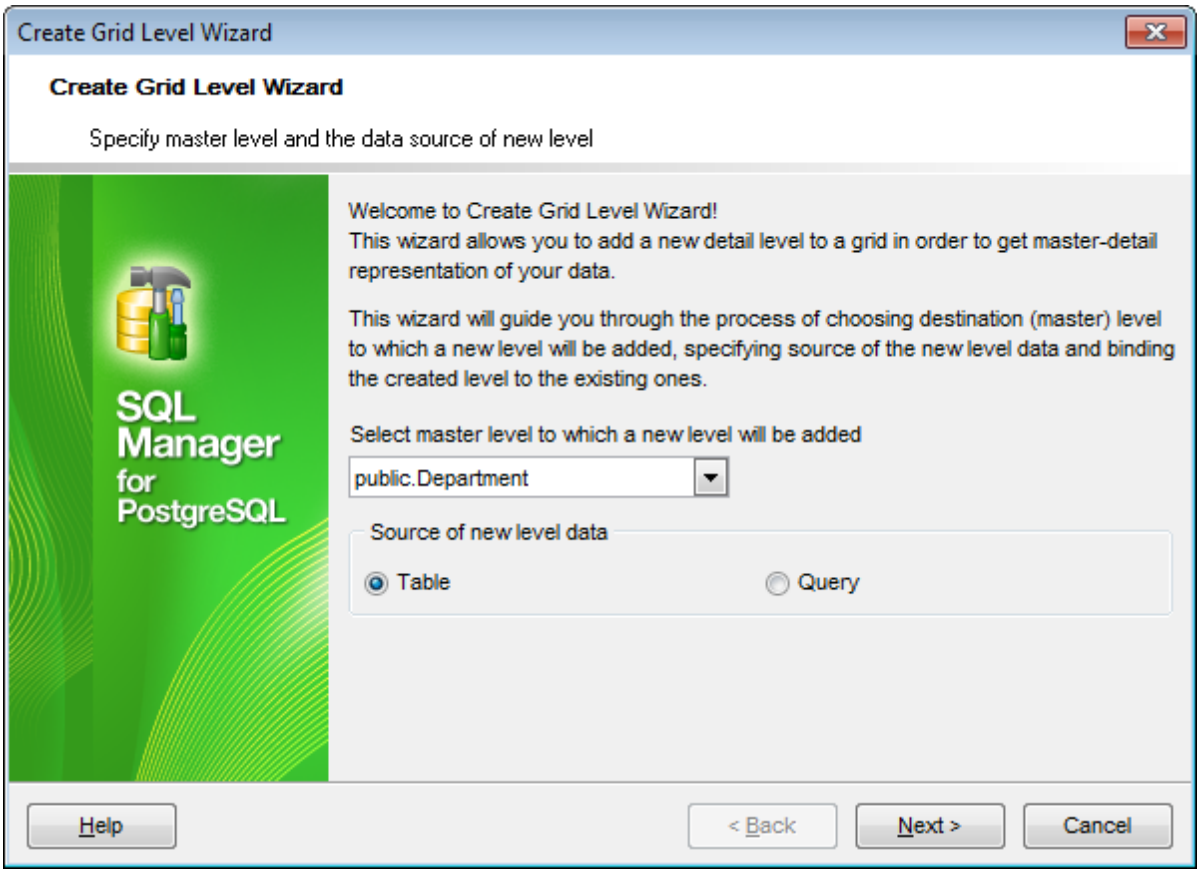

Click the **Next** button to proceed to the Defining source for detail level 470 step to select a table for the detail level or input a query, depending on whether the **Table** or the **Query** option has been selected.

8.1.2.5.1.2 Defining source for detail level

If the **Table** option has been selected at the previous step 469, you should now specify a table for the detail view using the **Table name** drop-down list. Set the **Show tables related by foreign keys only** option to narrow the list of tables by including only tables linked by Foreign keys.

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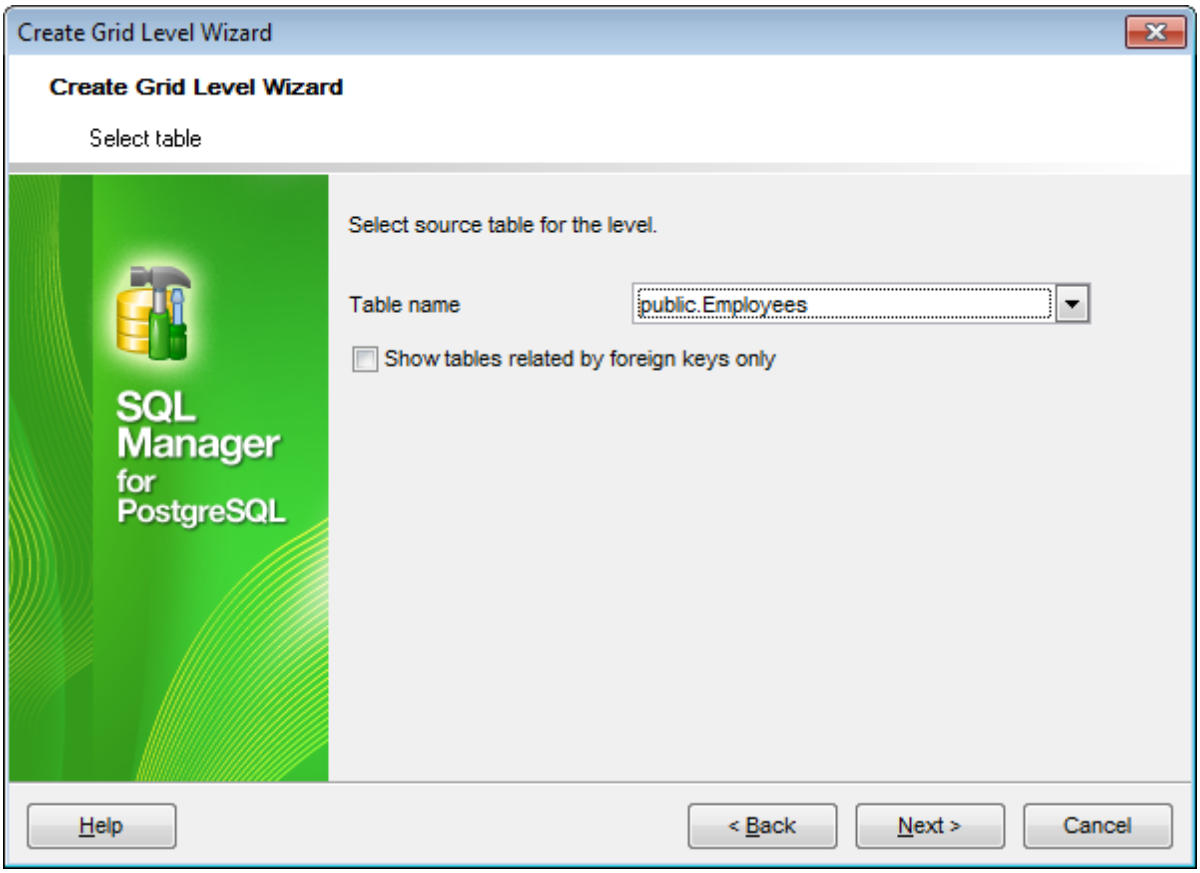

If the **Query** option has been selected at the previous step[469], you should now enter a query that will be used as the source of the new grid level. If necessary, you can use Design Query[431] to build the SQL query visually.

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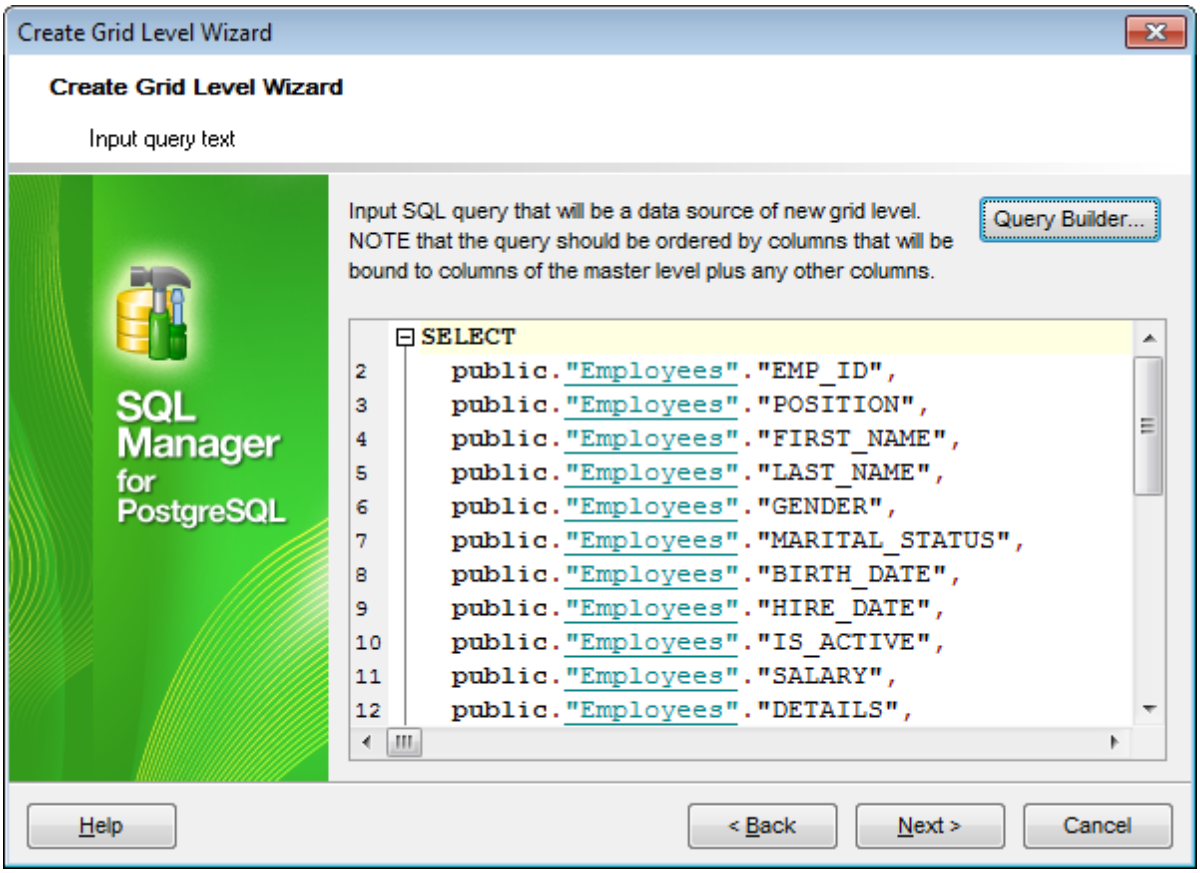

Click the **Next** button to proceed to the Binding master and detail levels 472 step of the wizard.

8.1.2.5.1.3 Binding master and detail levels

Define pairs of columns to link the Master Level and the Detail Level data sources:

- select a column in the **Master Level Key Columns** list;
- select a corresponding column in the **Detail Level Key Columns** list;
- click **Add** to set correspondence between the selected columns.

The newly created correspondences are listed in the **Links Between Master and Detail Levels** area. If necessary, you can delete any correspondence using the **Remove** button.

The **From Foreign Key...** menu is available if the ☑ **Show tables related by foreign keys only** option has been selected at the previous step 470. This menu allows you to select the foreign key 212 to be used for identifying master-detail levels (if the table has more than one foreign key relation).

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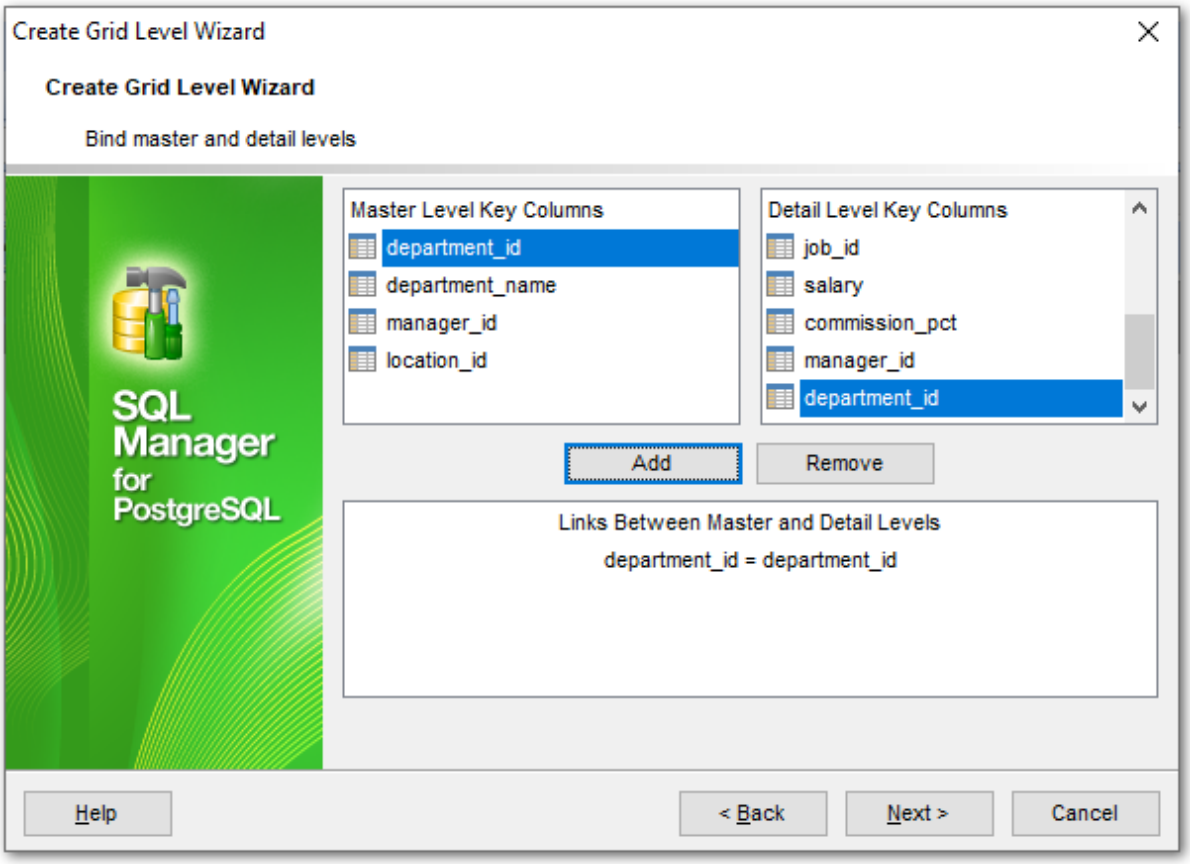

Click the **Next** button to proceed to the Setting additional parameters 474 step or to the Query parameterization 473 step of the wizard if **Query** was selected at the Specifying master level 469 step of the wizard.

8.1.2.5.1.4 Query parameterization

If **Query** was selected at the Specifying master level 469 step of the wizard, you should now transform the query to a parameterized form that will be used in the 'Load visible rows' Grid Mode (see the Grid | Data Options 912 section of the Environment Options 871 dialog to get more information about grid modes offered by SQL Manager).

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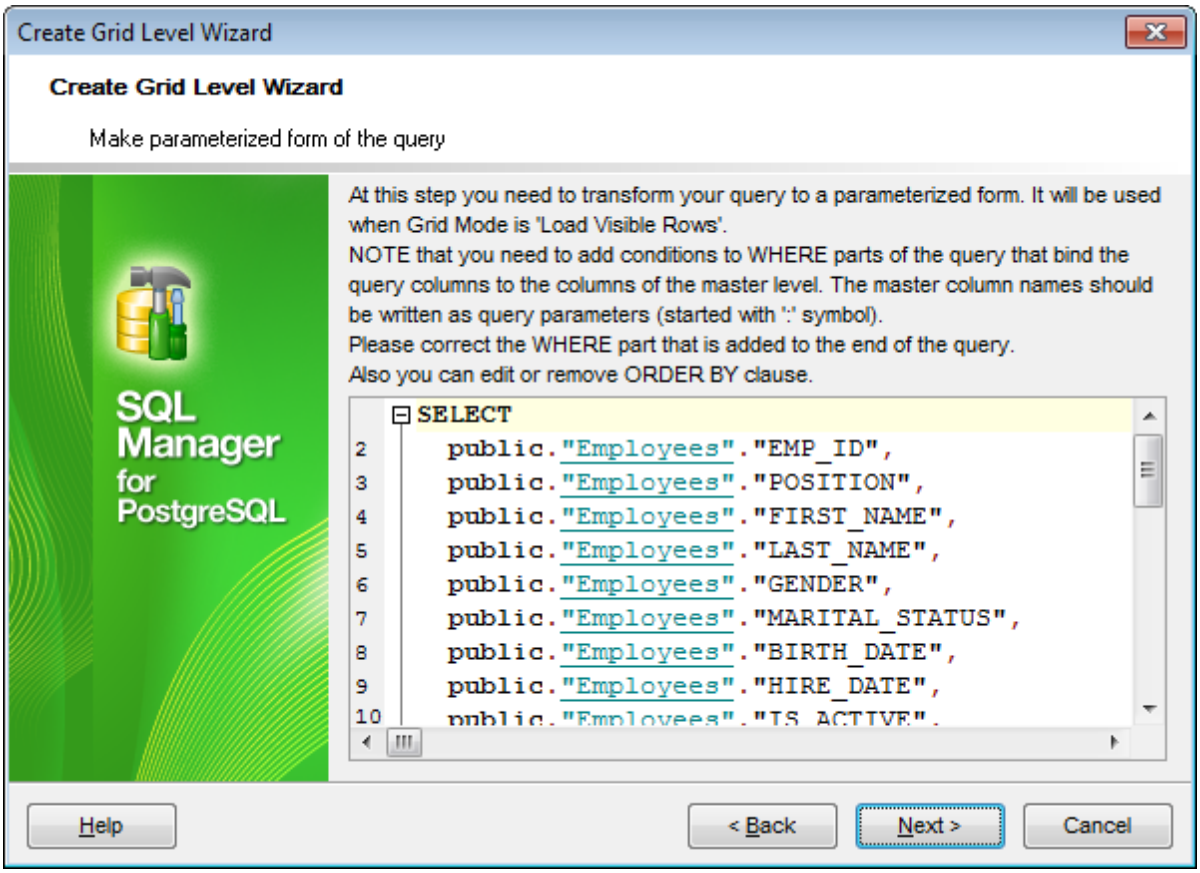

Click the **Next** button to proceed to the Setting additional parameters 474 step of the wizard.

8.1.2.5.1.5 Setting additional parameters

Level caption
Set the caption to be used for the new level in the grid.

Level type
Select the type of view you wish to be applied to the grid level: ◉ *Table view* or ◉ *Card view*.

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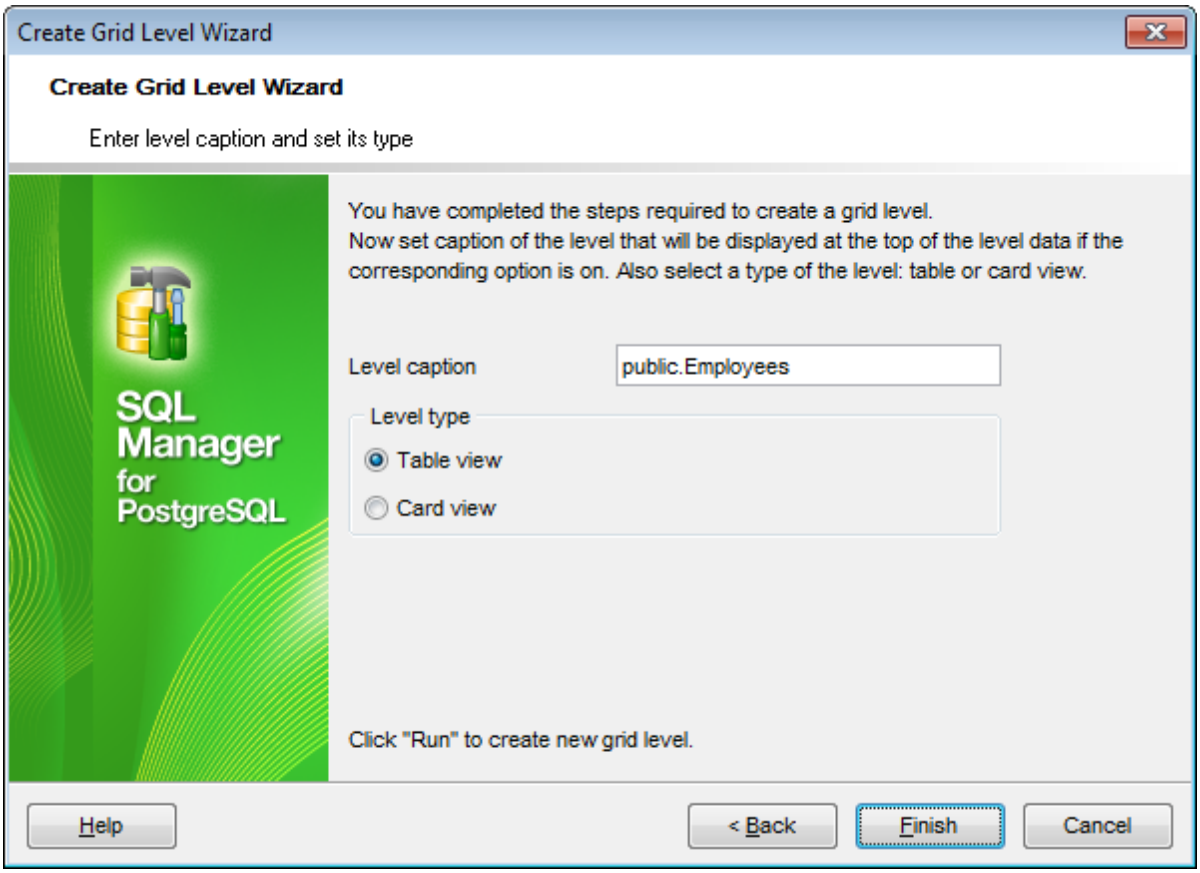

When you are done, click the **Run** button to complete the operation.

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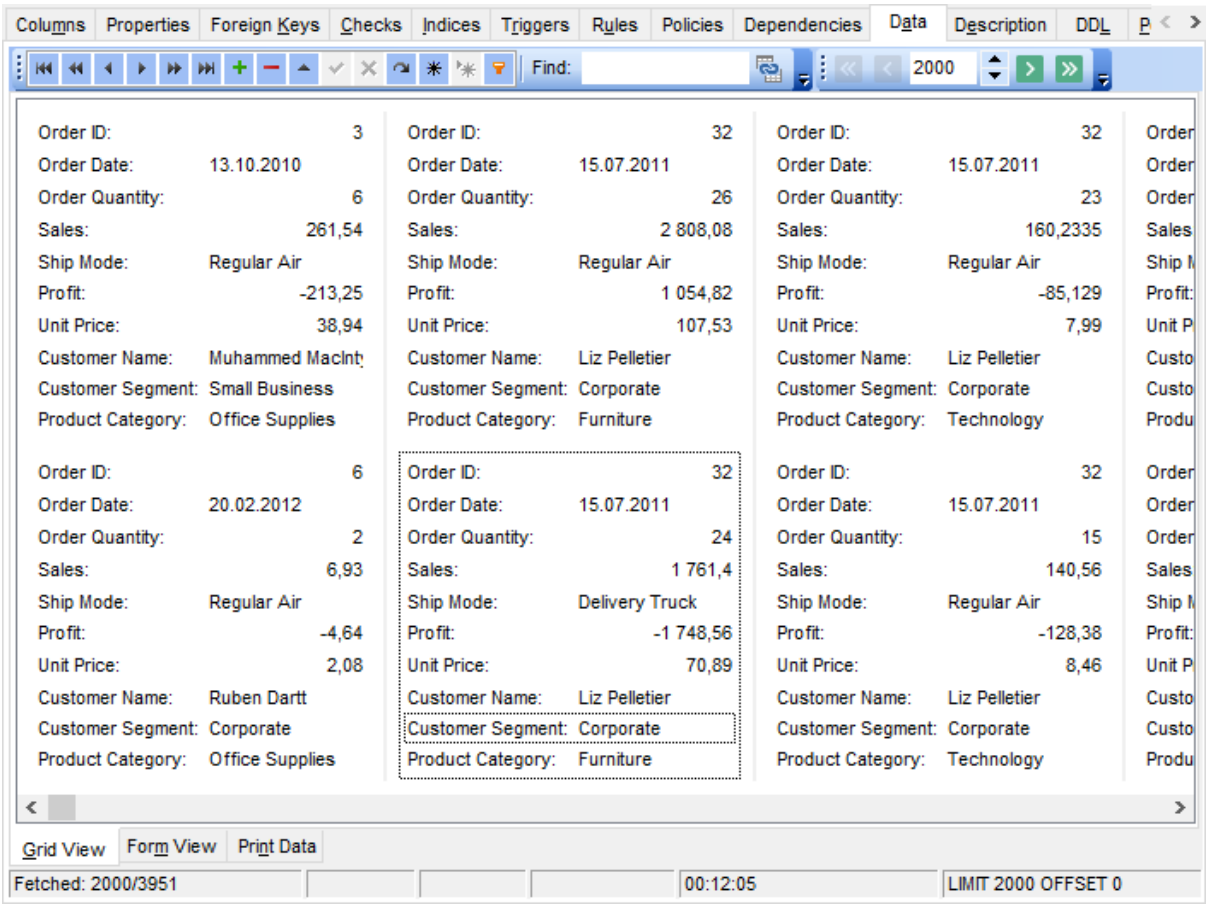
8.1.2.6 Working in card view mode

Depending on your preferences, you can represent data in the **Table View** or in the **Card View** modes.

To switch to the **Card View** mode of data representation, right-click the grid, expand the **Grid Levels** context menu[466] group and select the **Card View** item within this group.



See also:

Using the context menu[466]

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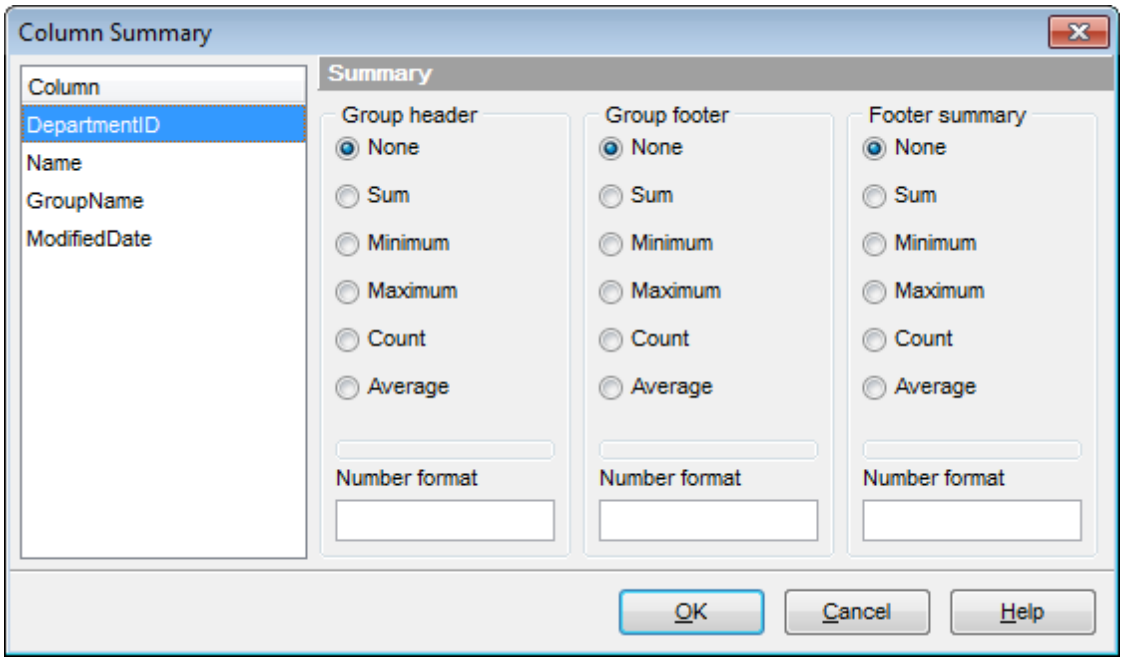
8.1.2.7 Column Summary

If necessary, you can select the **Column Summary...** context menu[466] item to open the **Column Summary** dialog which allows you to set the summary for each particular column that will be displayed in the grid *footer*, *group header* and *group footer* areas.



The **Column** list displays all columns of the dataset. Select a column and specify which information should be displayed in the grid as summary for this column:

- *None*
- *Sum* (for numeric types only)
- *Minimum* (for numeric and date/time types only)
- *Maximum* (for numeric and date/time types only)
- *Count*
- *Average* (for numeric types only)

Use the **Number format** edit boxes in each group to specify the preferable format[978] for summary info representation.

See also:

Using the context menu[466]

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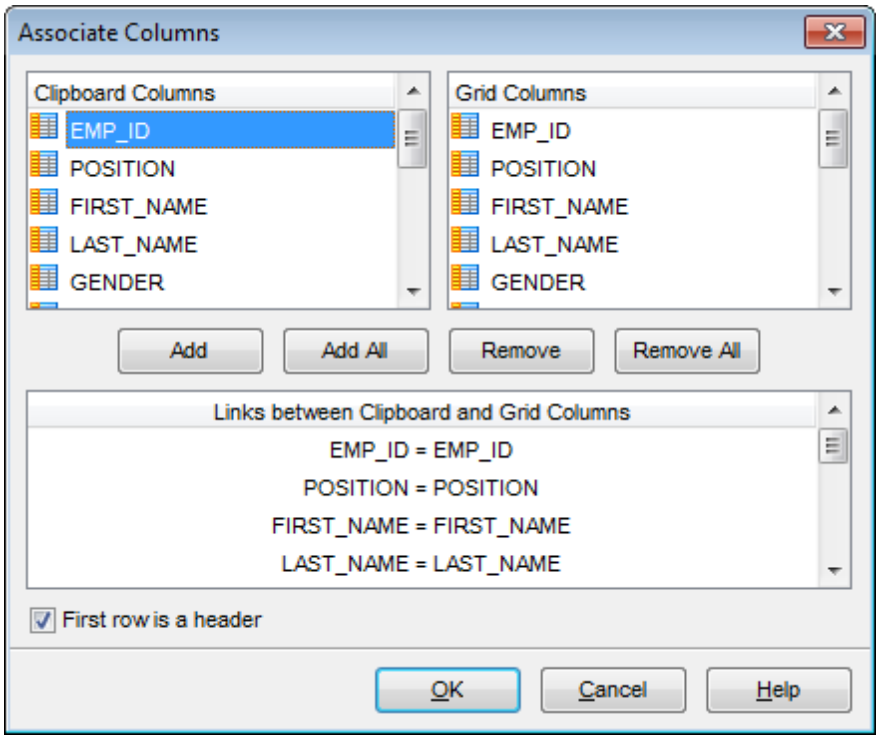
8.1.2.8 Copying records

When you copy several records to clipboard and paste them into the grid, you are offered to set correspondence between columns of the clipboard and columns of the target PostgreSQL table using the **Associate Columns** dialog.



The **Clipboard Columns** and **Grid Columns** lists display the source and target dataset columns respectively. Set correspondence between the source clipboard columns and the table columns:

- select a source clipboard column in the **Clipboard Columns** list;
- select the corresponding column the target table in the **Grid Columns** list;
- click the **Add** button to set correspondence between the selected columns;
- the pair of columns appears in the **Links between...** list below;
- repeat the operation for all the columns you need copy.

Use the **Add All** button to add all columns to the **Links between...** list on the basis of their order.

To remove a correspondence, select the pair of columns in the **Links between...** list and press the **Remove** button.
To remove all correspondences, press the **Remove All** button.

☑ **First row is a header**
This option specifies that the first row of the associated columns will be taken as the column header.

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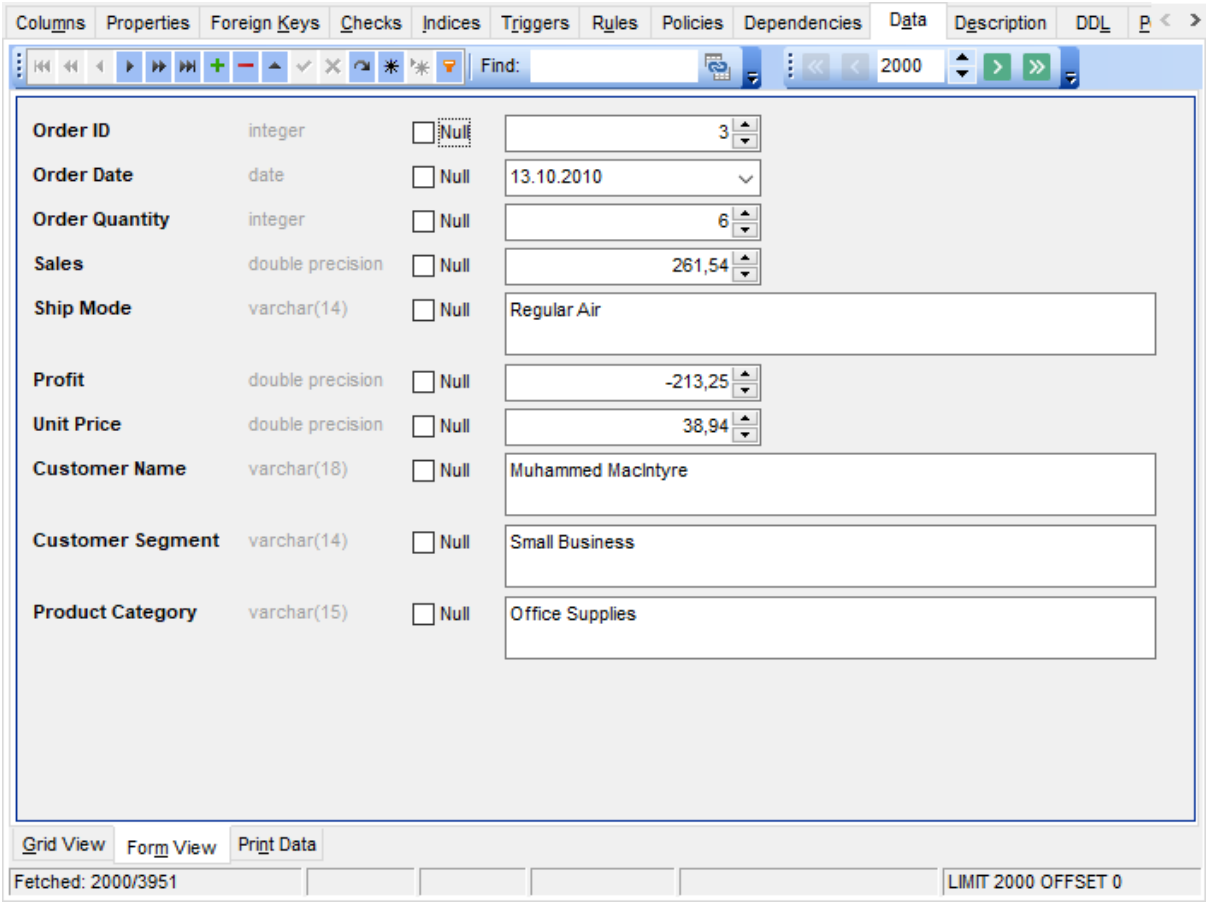
8.1.3 Form View

The **Form View** tab allows you to view data as a form. To activate this type of data view, select the **Form View** tab on the View mode panel at the bottom of the window.

The form displays the current record: field names on the left and the corresponding values on the right. If the fields are available for editing, you can edit the record directly on this form. The navigation pane[454] at the top of the form allows you to browse the data quickly, to insert, update and delete records, and to set a filter for the records using the Filter Builder[524] dialog.



Each field has a ☑ **Null** checkbox which allows you to clear the field value and set it to NULL (if the field is nullable).

See also:

Using Navigation bar and Toolbars[454]
Grid View[457]
Print Data[481]
BLOB View[507]
Applying changes[521]

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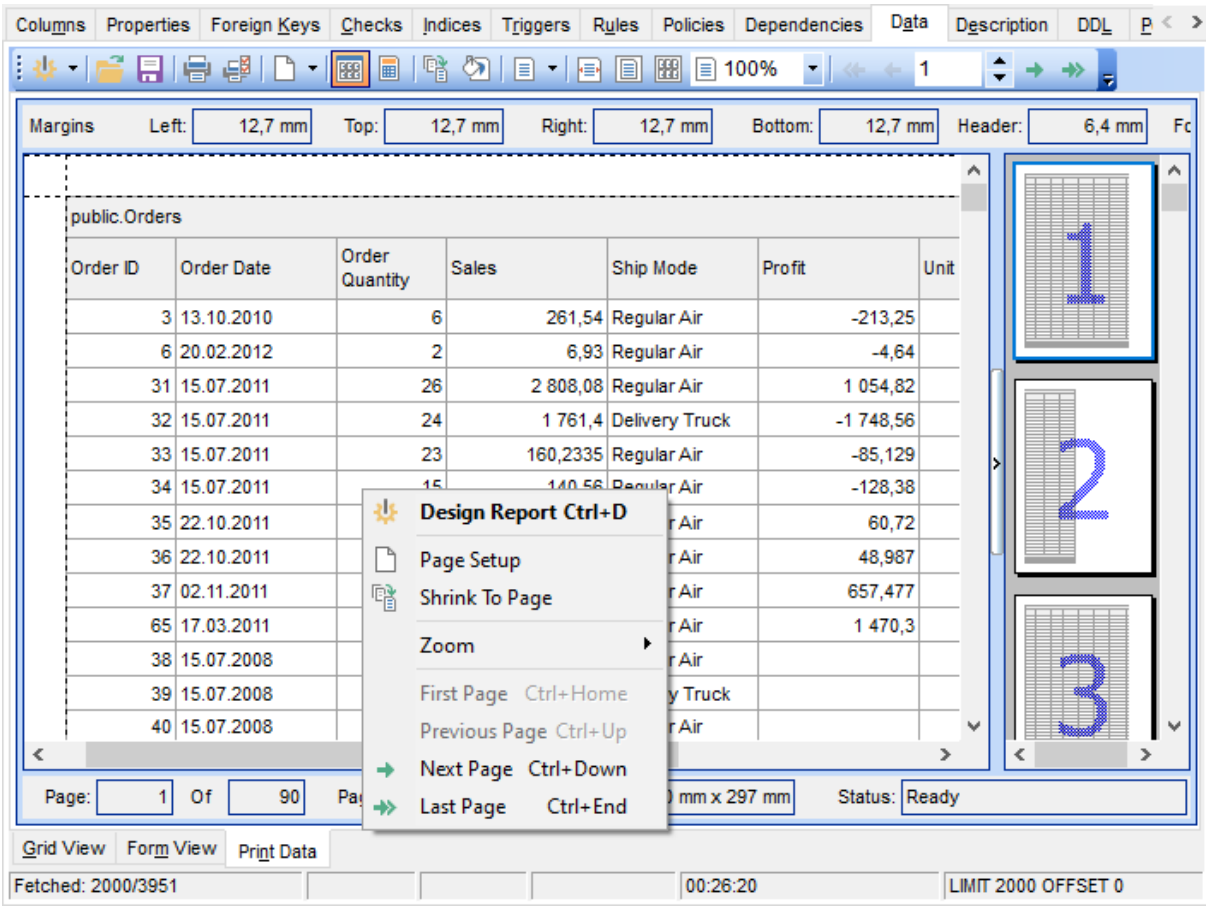
8.1.4 Print Data

Using the **Print Data** tab you can view data in the way they are printed, in WYSIWYG mode.

When in **Print Data** mode, you are provided with a powerful *context menu* and toolbar[455] allowing you to design a report, change the view scope, save reports and load previously saved ones, set report options[501], and specify a number of printing[506] parameters using Report Formatter[490] and the Page Setup[483] dialog.



Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix[22] page.

See also:
Using Navigation bar and Toolbars[454]
Grid View[457]
Form View[479]

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BLOB View 507
Applying changes 521

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8.1.4.1 Page Setup

The **Page Setup** dialog allows you to specify a number of settings pertaining to the report page.

To open the dialog, use the **Page Setup** button available on the toolbar[455].

Use the following tabs of the **Page Setup** dialog:

- Page[484]
- Margins[486]
- Header/Footer[487]
- Scaling[489]

When you are done, you can click the **Print...** button at the bottom to call the Print[506] dialog.

See also:

Report Formatter[490]

Setting report options[501]

Print dialog[506]

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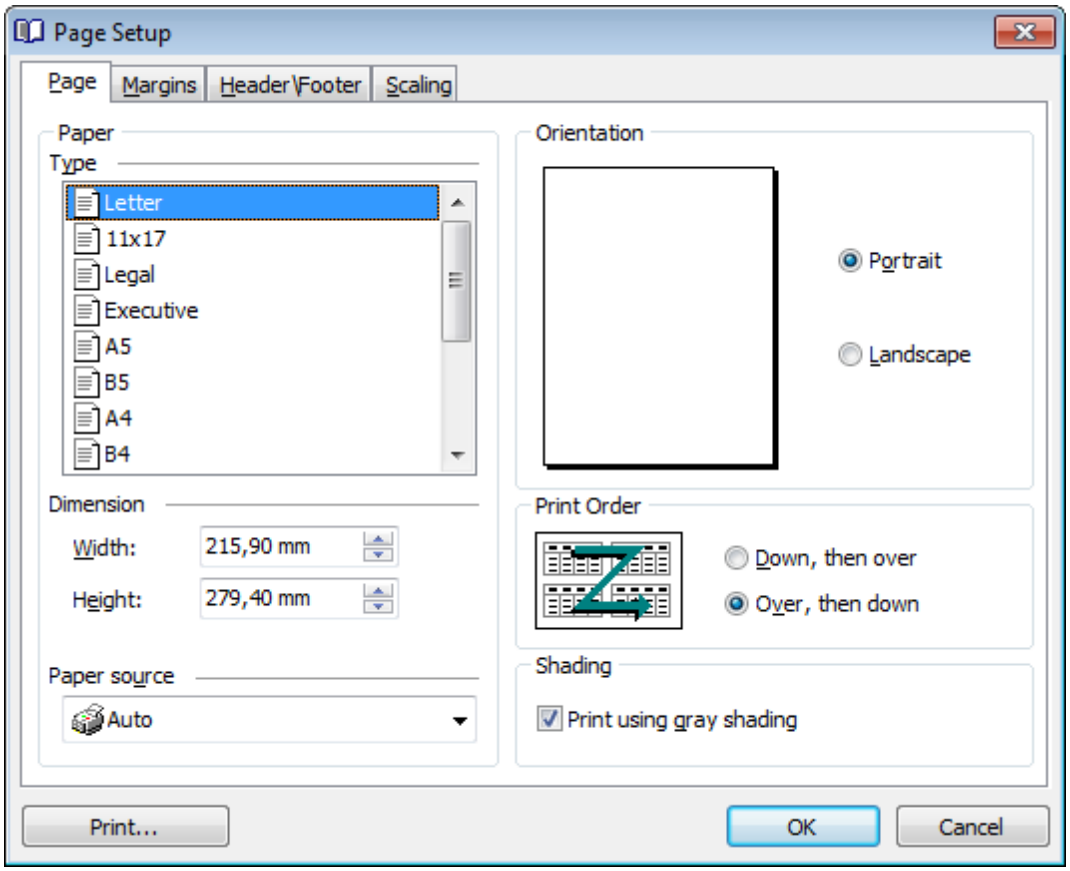
8.1.4.1.1 Page

The **Page** tab of the **Page Setup** dialog allows you to specify the *paper*, page *orientation*, *print order* and *shading* settings.



Paper

Select one of the standard paper types in the **Type** list, or specify custom *width* and *height* using the **Dimension** group (in inches or millimeters, depending on the *unit of measure* specified in the Options 501 dialog).

Use the **Paper source** drop-down list to select the paper feed type.

Orientation

Select the preferable page orientation (your selection is illustrated in the chart on the left):
- *Portrait*
- *Landscape*

Print Order

Select the preferable order for printing report pages (your selection is illustrated in the chart on the left):

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- *Down, then over*
- *Over, then down*

Shading

☑ **Print using gray shading**
If this option is selected, gray shading (along with black and white) will be used for printing the report.

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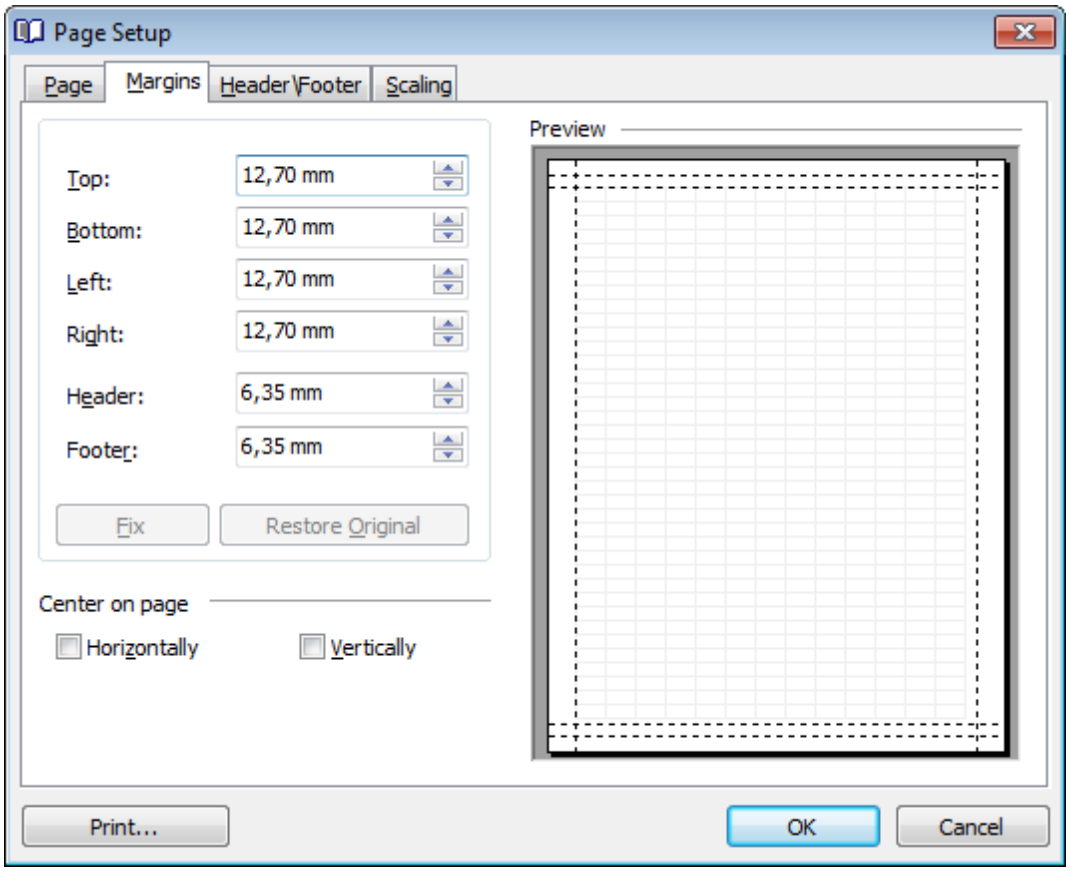
8.1.4.1.2 Margins

The **Margins** tab of the **Page Setup** dialog allows you to specify the size of the *margins* and *running titles*.



Use the spinner controls to specify the size of **top** / **bottom** / **left** / **right** margins and **header** / **footer** (in inches or millimeters, depending on the *unit of measure* specified in the Options 501 dialog). The **Preview** area on the right illustrates the changes you have made.

If you have specified an improper value, you can click the **Fix** button to correct it.
To restore the default size values, click the **Restore Original** button.

Center on page
This group allows you to specify whether the text should be centered **horizontally** and/or **vertically** on the page.

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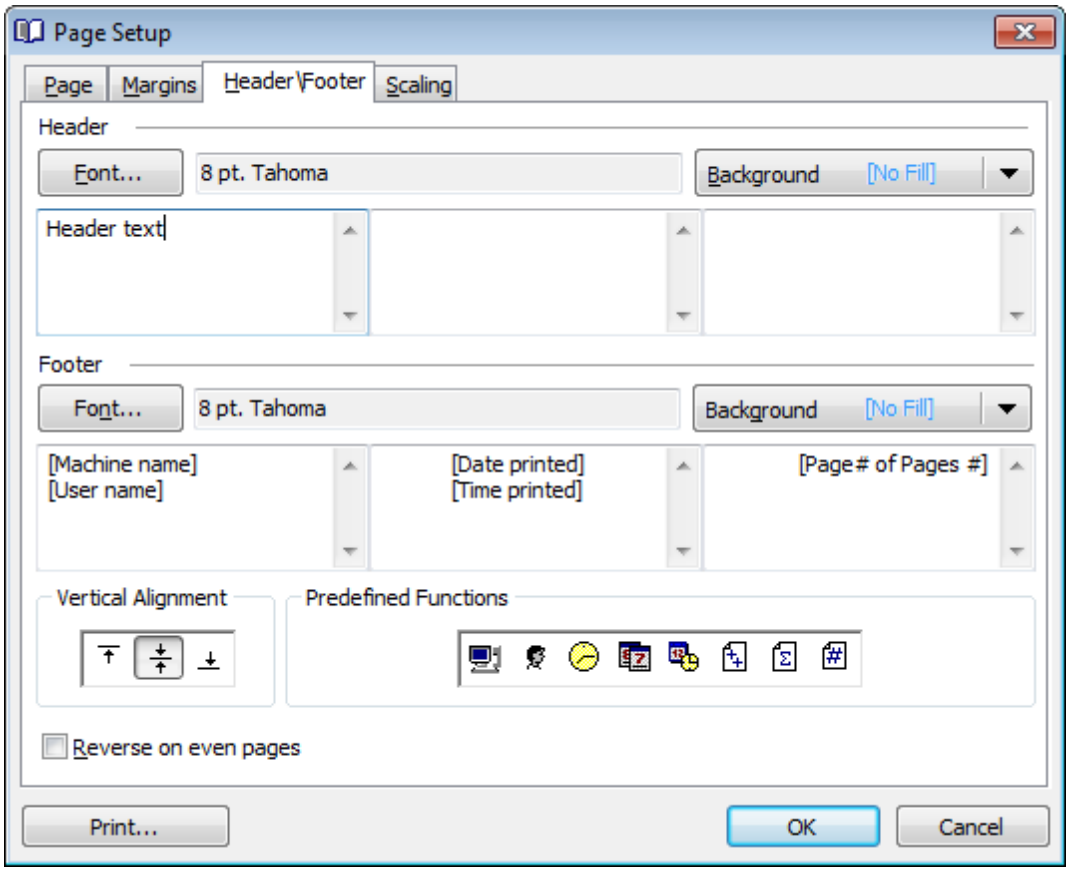
8.1.4.1.3 Header/Footer

The **Header/Footer** tab of the **Page Setup** dialog allows you to specify properties of the *header* and *footer* running titles.



Header / Footer

Click the **Font...** button to specify font properties using the standard **Font** dialog. The font name and size are displayed in the gray area next to the **Font...** button.
Use the **Background** drop-down list to select the background color that will be applied to the page header/footer, or to customize the color using the **Color** and **Fill Effects** dialogs.

For each of the running titles you are provided with three separate text editing fields. You can use any, all or none of the fields to enter the header and footer text.

The **Vertical Alignment** group allows you to specify vertical alignment for the header/footer text according to any of the three available patterns.

Predefined Functions
This group allows you to add the following standard functions to the header and footer:
[Machine Name]
[User Name]
[Time Printed]

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[Date Printed]
[Date & Time Printed]
[Page # of Pages #]
[Total Pages]
[Page #]

Reverse on even pages
If this option is selected, the header and footer text will be reversed on even pages of the printing report.

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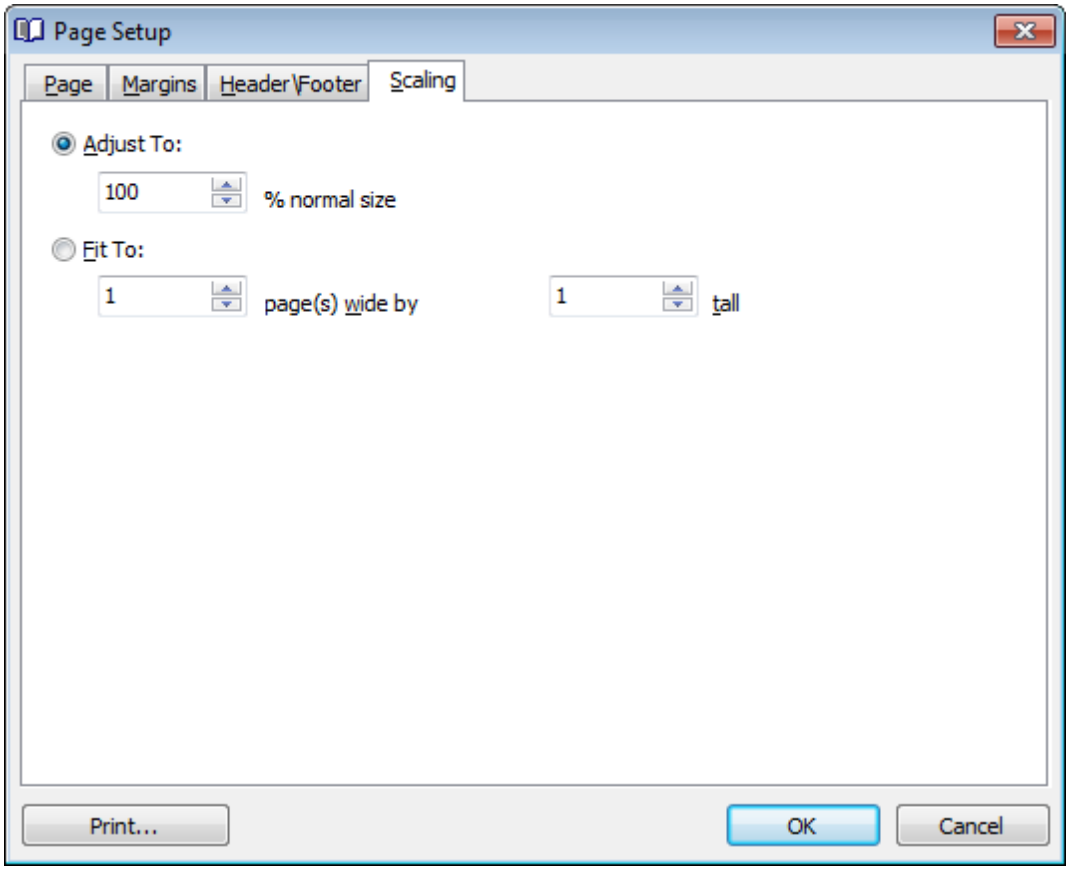
8.1.4.1.4 Scaling

The **Scaling** tab of the **Page Setup** dialog allows you to specify the page *scaling* options.



Select the preferable scaling mode:

Adjust to ... % normal size
Use the spinner control to set the percentage of the regular page size to which the page size will be adjusted.

Fit to ... page(s) wide by ... tall
Use the spinner controls to set the maximum number of pages (by width and by height) on one page to fit its size.

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8.1.4.2 Report Formatter

Report Formatter allows you to specify a number of settings pertaining to the printing form of the report.

To open the tool, click the **Design Report** button available on the toolbar[455], or use the *Ctrl+D* shortcut[1004].

Use the following tabs of the **Format Report** dialog:

- View[491]
- Behaviors[492]
- Formatting[493]
- Styles[495]
- Preview[497]
- Cards[498]
- Charts[500]

The **Title Properties...** button allows you to customize the report title using the Report Title[501] dialog.

See also:

Page Setup[483]

Setting report options[501]

Print dialog[506]

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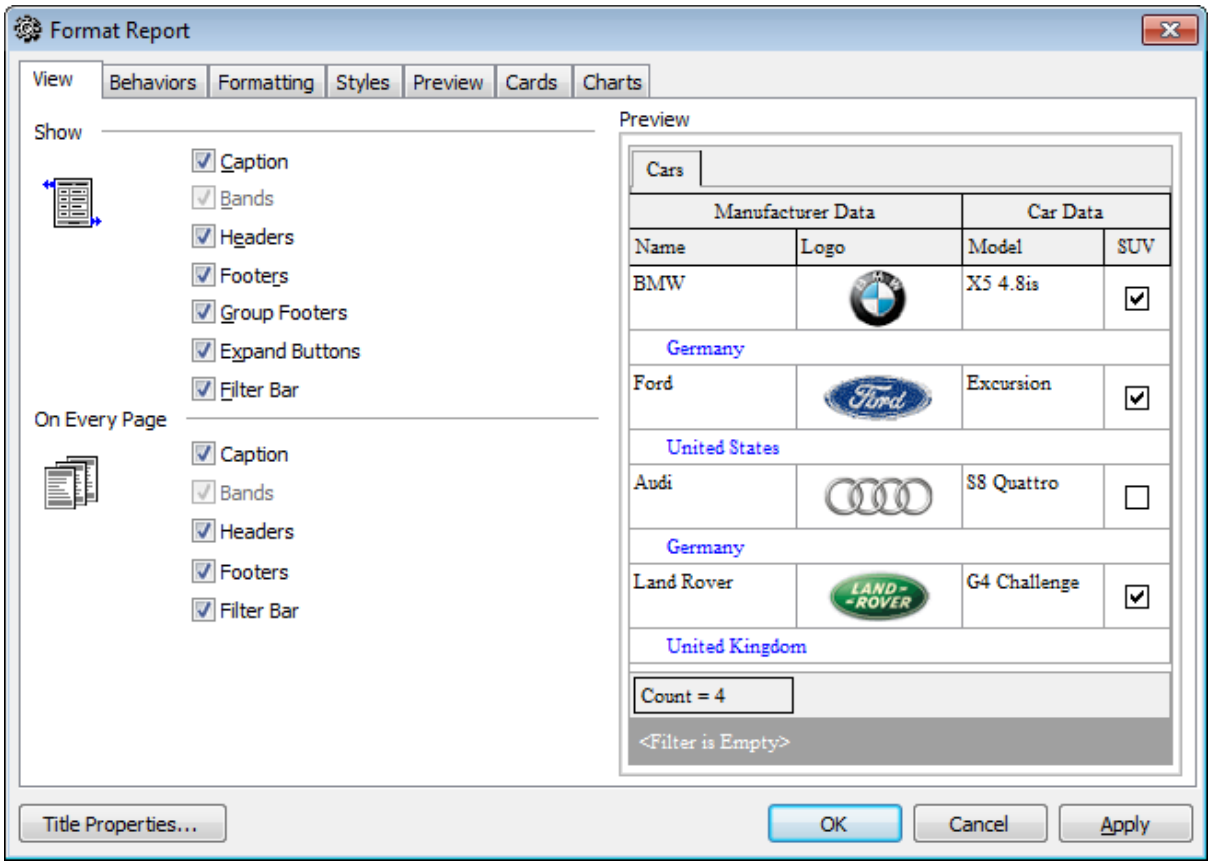
8.1.4.2.1 View

The **View** tab of the **Format Report** dialog allows you to specify report elements to show in the report.



Tick off the elements to **show** in the report (*caption*, *bands*, *headers*, *footers*, *group footers*, *expand buttons*, *filter bar*) and **on every page** of the report (*caption*, *bands*, *headers*, *footers*, *filter bar*).

The **Preview** area on the right illustrates the changes you have made.

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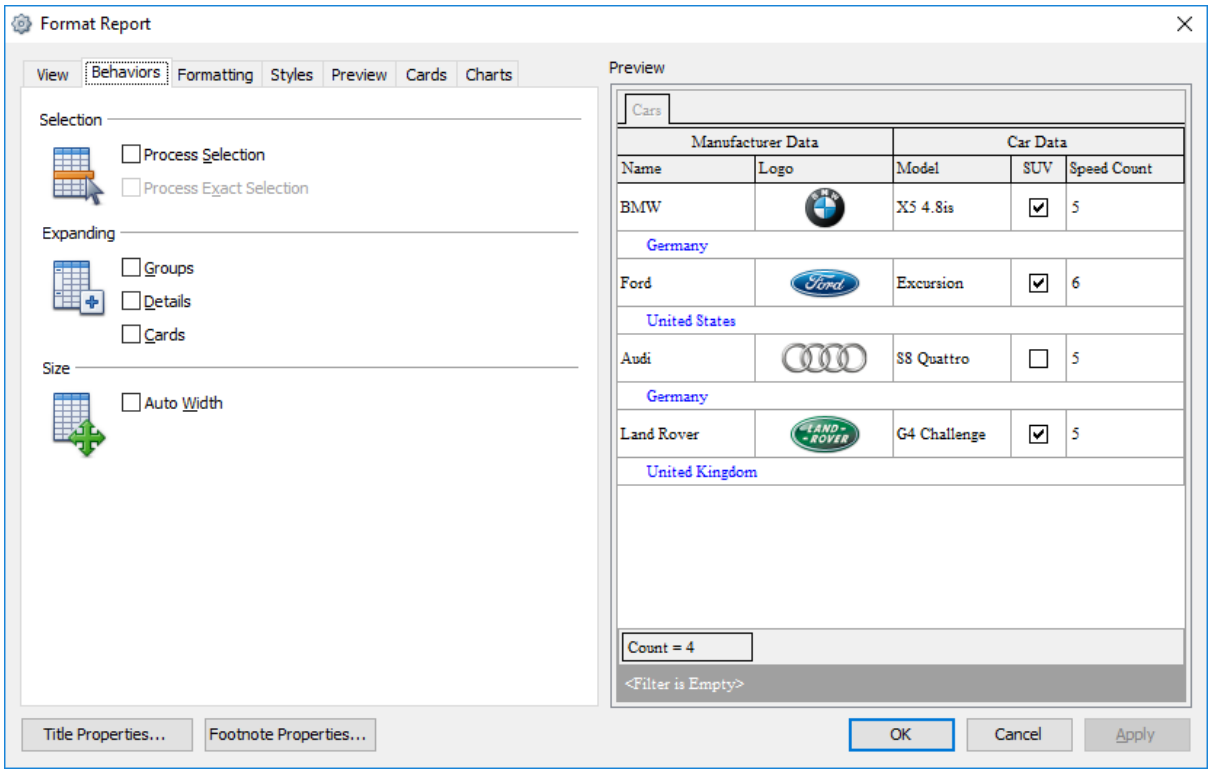
8.1.4.2.2 Behaviors

The **Behaviors** tab of the **Format Report** dialog allows you to specify the way (behavior) the report elements will appear on the printing form.



Selection

☑ **Process selection** / ☑ **Process exact selection**
Specify whether the text selection should or should not be processed (precisely) for the printing form.

Expanding

Tick off the elements to expand in the report: *groups*, *details*, *cards*.

Size

☑ **Auto Width**
If this option is selected, the table will be resized automatically to fit the page by width.

The **Preview** area on the right illustrates the changes you have made.

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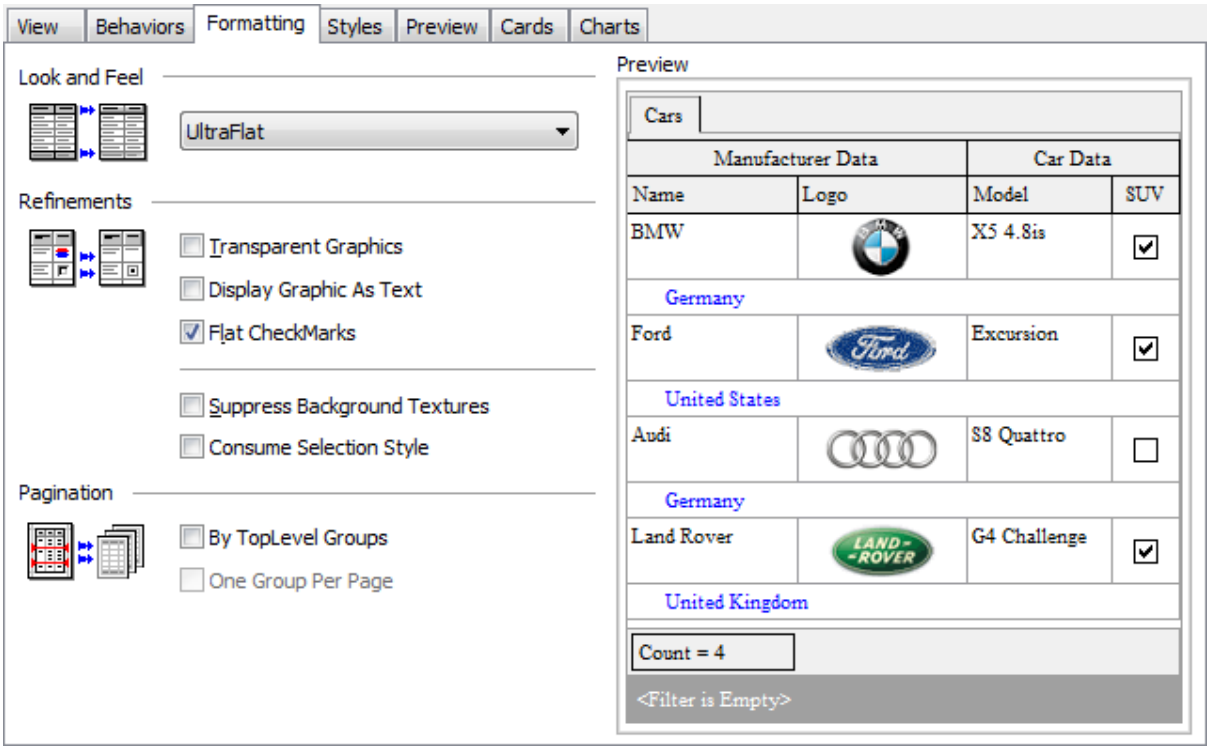
8.1.4.2.3 Formatting

The **Formatting** tab of the **Format Report** dialog allows you to specify *Look and Feel*, *Refinements* and *Pagination* options.



Look and Feel
This setting determines the manner in which the cells are painted. Use the drop-down list to select the painting style that will be applied to the cells on the printing form:
Flat
Standard
UltraFlat

Refinements
Options of this group allow you to reduce the report size.

☑ **Transparent graphics**
If this option is selected, the images will be drawn transparent in the report.

☑ **Display graphic as text**
If this option is selected, text will be displayed instead of the images.

☑ **Flat CheckMarks**
If this option is selected, the checkboxes will be drawn flat.

Pagination
Specify the way pagination will be performed for the report: **By TopLevel groups** or **One group per page**.

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The **Preview** area on the right illustrates the changes you have made.

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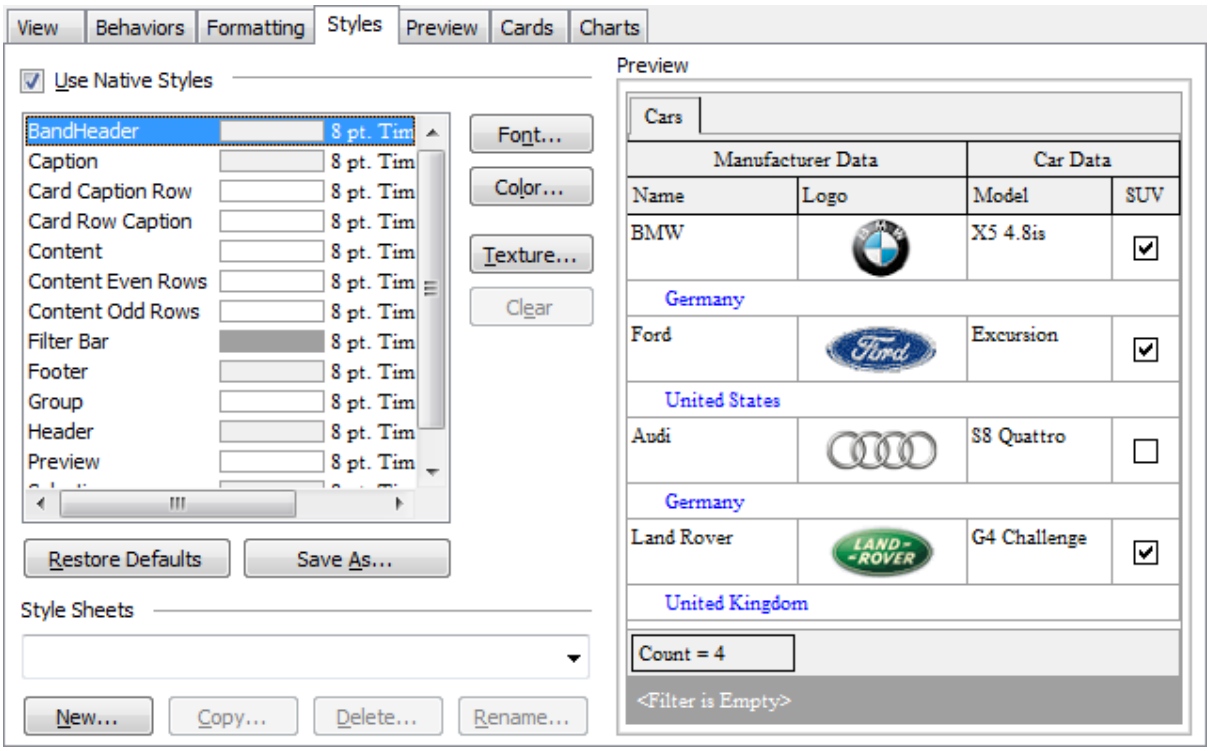
8.1.4.2.4 Styles

The **Styles** tab of the **Format Report** dialog allows you to specify styles to be applied to the report elements.



Use native styles
This option determines whether the native Windows style will be applied to the report elements.

Note: The **Native style** option is currently supported for the Windows® XP operating system only.

The elements list displays the names of all report elements, with background color and font properties specified by default. You can **Use native styles** for them or customize them according to your preferences.

To edit an element, select it in the list and use the buttons to the right to edit the style for it.
Click the **Font...** button to specify font properties using the standard **Font** dialog.
Click the **Color...** button to customize the background color using the standard **Color** dialog.
Click the **Texture...** button to load an image that will be used as the texture for the element.
To rollback the changes, click the **Clear** button.
To restore the default stylesheet properties, click the **Restore Defaults** button.
If you need to save the current style sheet, you can click the **Save as...** button.

These items are also available through the **context menu** of the elements list.

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Style Sheets
Use the drop-down menu to select the style sheet you need. To manage the style sheets, use the corresponding buttons below: **New...**, **Copy...**, **Delete...**, **Rename...**

The **Preview** area on the right illustrates the changes you have made.

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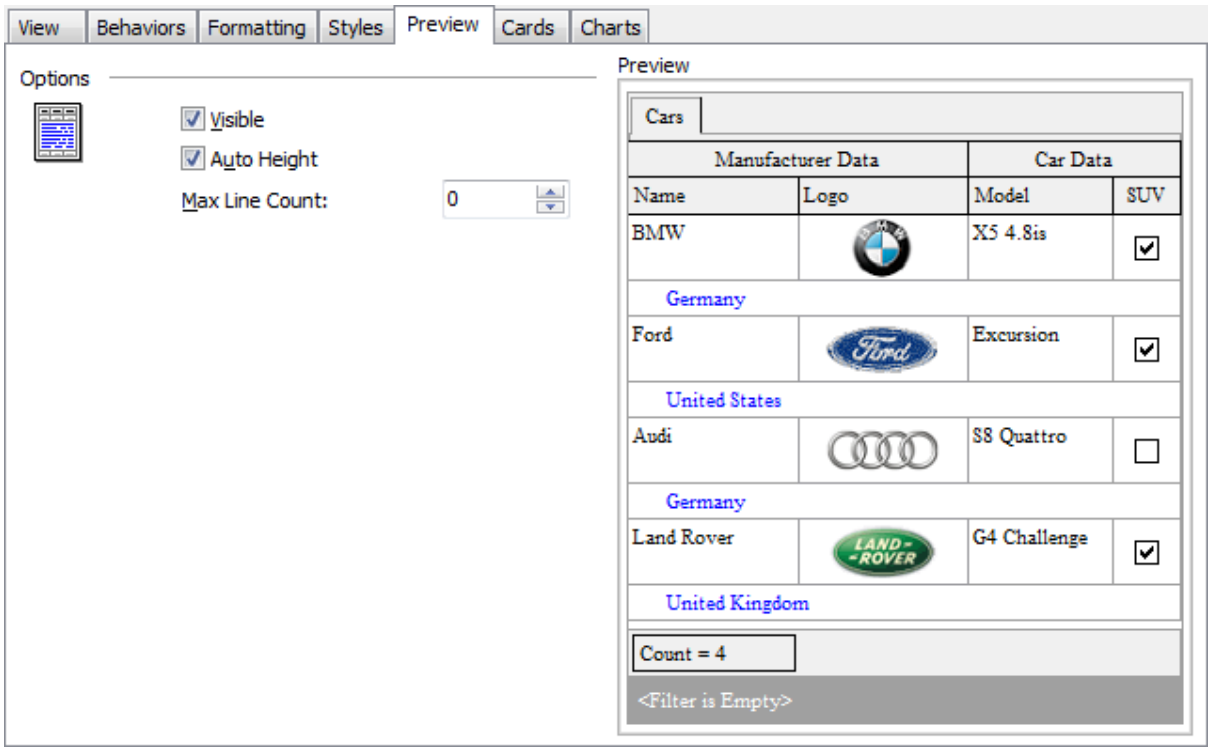
8.1.4.2.5 Preview

The **Preview** tab of the **Format Report** dialog allows you to specify report preview options.



Visible
This option specifies visibility of the grouping rows.

Auto height
If this option is selected, the table will be resized automatically to fit the page by height.

Max line count
Use the spinner control to specify the maximum possible number of lines.

The **Preview** area on the right illustrates the changes you have made.

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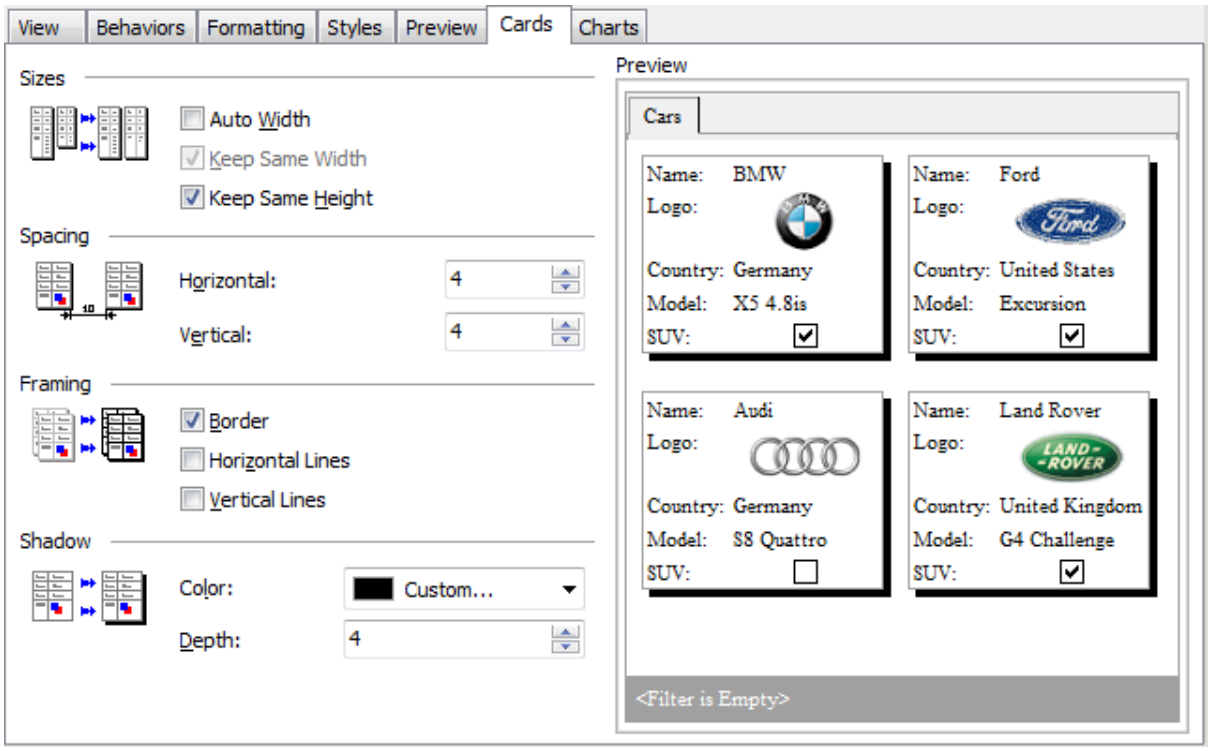
8.1.4.2.6 Cards

The **Cards** tab of the **Format Report** dialog allows you to specify properties for the card view.



Sizes

Auto Width
If this option is selected, the cards will be resized automatically to fit the page by width.

Keep same width
Select this option to keep the card width fixed.

Keep same height
Select this option to keep the card height fixed.

Spacing

This group allows you to specify **horizontal** and **vertical** spacing between cards.

Framing

Border
This option specifies visibility of the card borders.

Horizontal lines
This option specifies visibility of the horizontal lines (row delimiters) within cards.

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Vertical lines
This option specifies visibility of the vertical lines (column delimiters) within cards.

Shadow

Use the **Color** drop-down list to select the color that will be applied to the card shadows. If necessary, specify the color **depth** using the corresponding spinner control.

The **Preview** area on the right illustrates the changes you have made.

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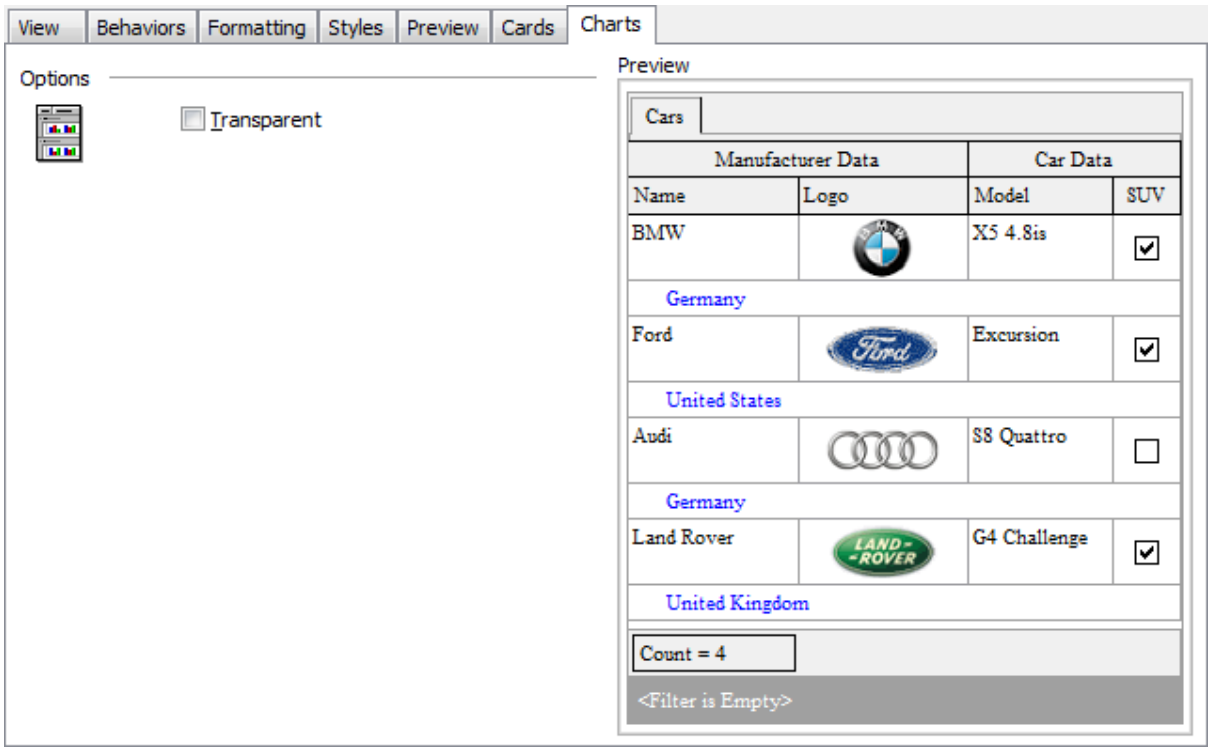
8.1.4.2.7 Charts

The **Charts** tab of the **Format Report** dialog allows you to specify options for the charts used in the report.



Transparent
If this option is selected, the charts will be drawn transparent in the report.

The **Preview** area on the right illustrates the changes you have made.

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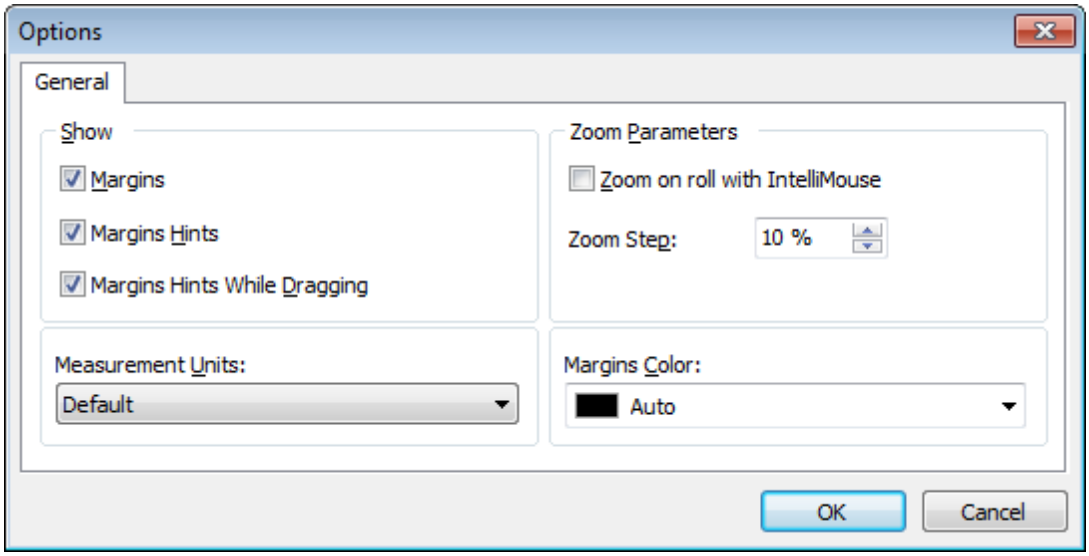
8.1.4.3 Setting report options

Options dialog

The **Options** dialog allows you to specify a number of settings pertaining to the printing report.

To open the dialog, open the **Design Report** menu available on the toolbar[455] and select the **Preferences** item.



Show
Tick off the elements to **show** in the printing report (*margins*, *margins hints*, *margins hints while dragging*).

Use the **Measurement Units** drop-down list to select the unit of measure that will be used in report settings: *default*, *inches*, or *millimeters*.

Zoom Parameters

Zoom on roll with IntelliMouse
If this option is selected, you can zoom in/out by scrolling up/down (with a Microsoft® mouse or a compatible mouse used).

Zoom Step
Use the spinner control to specify the percentage of the original page size to be considered as one zoom step.

Use the **Margins Color** drop-down list to select the color that will be applied to the report margins.

Report Title dialog

The **Report Title** dialog allows you to specify the report title text and properties.

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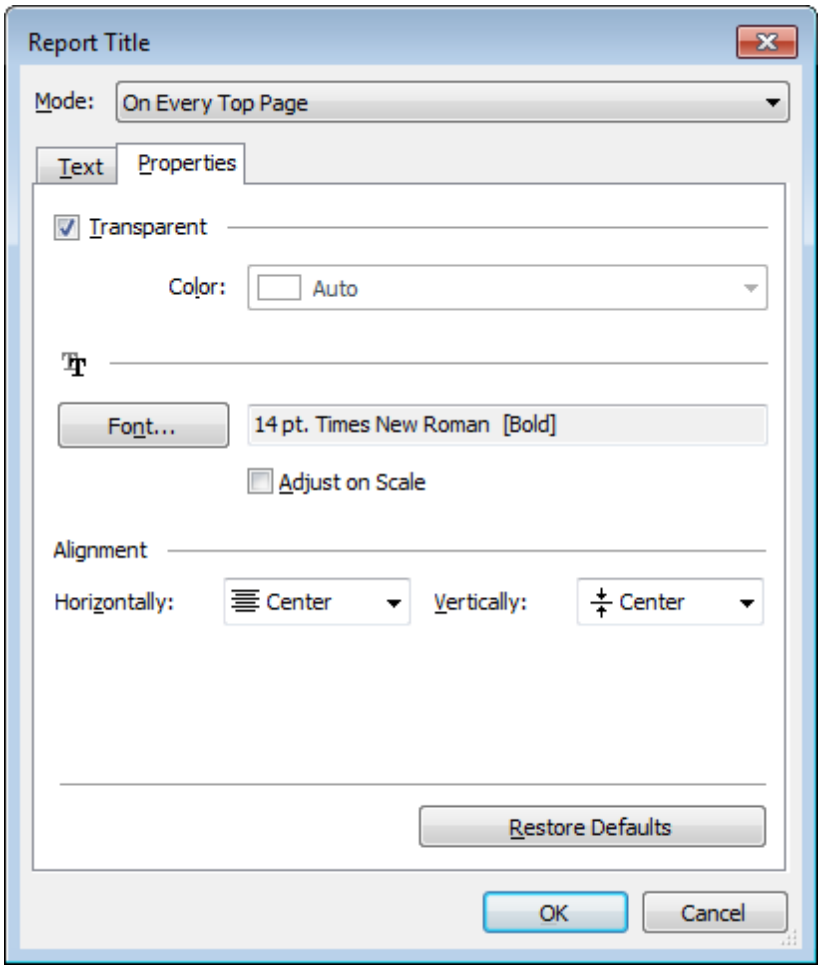
To open the dialog, use the **Title...** button available on the toolbar[455].



Mode
Use the drop-down list to select where the report title should be displayed *on the first page*, *on every top page*, or *not displayed* at all.

Text
Use the edit box to enter the text of the report title.

Properties

Transparent
If this option is selected, the report title will be drawn transparent.

Use the **Color** drop-down list to select the color that will be applied to the report title (enabled if the **Transparent** option is not selected).

Click the **Font...** button to specify title font properties using the standard **Font** dialog. The font name and size are displayed in the gray area next to the **Font...** button.

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Adjust on scale
If this option is selected, the title can be adjusted on scale.

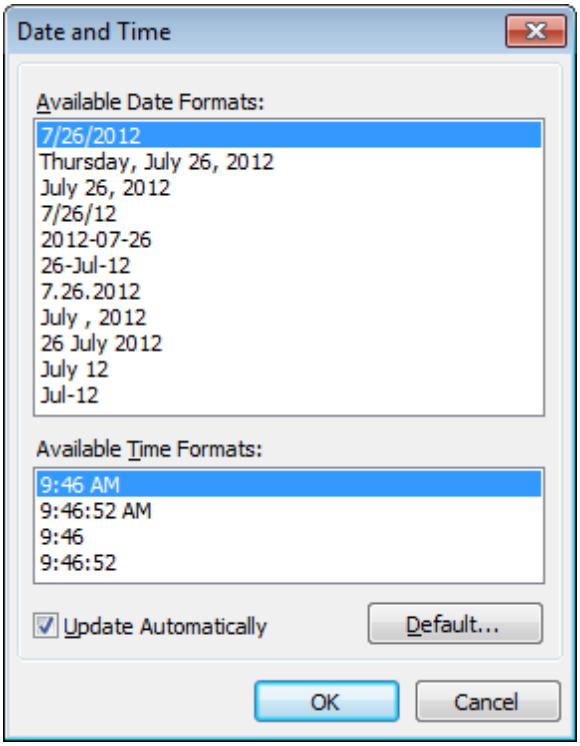
Alignment
Use the **Horizontally** drop-down list to select the type of horizontal alignment to be applied to the report title: *Left*, *Center*, or *Right*.
Use the **Vertically** drop-down list to select the type of vertical alignment to be applied to the report title: *Top*, *Center*, or *Bottom*.

To restore the default title properties, click the **Restore Defaults** button.

Date and Time dialog

The **Date and Time** dialog allows you to specify the date/time formats to be used in the report.

To open the dialog, open the **Title...** menu available on the toolbar[455] and select the **Date and Time...** item.



Select the preferable values from the **Available Date Formats** and the **Available Time Formats** lists. If necessary, you can specify that the date/time will be *updated automatically*.

To apply the default date/time format, click the **Default...** button.

Page Number Format dialog

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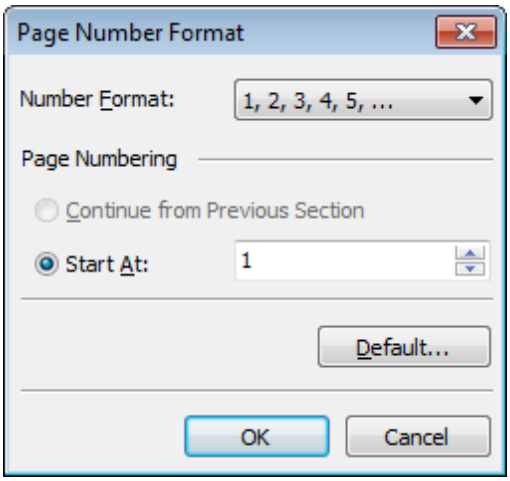
The **Page Number Format** dialog allows you to specify the formats for page numbers to be used in the report.

To open the dialog, open the **Title...** menu available on the toolbar and select the **Page Numbering...** item.



Select the preferable number format from the **Number Format** drop-down list.

Use the **Page Numbering** section to specify whether page numbering should *continue from the previous section* (if any) or *start at the specified number*.

To set the default numbering values, click the **Default...** button.

Zoom dialog

The **Zoom** dialog allows you to zoom the report page more better representation.

To open the dialog, open the **Zoom** menu available on the toolbar and select the **Setup zoom...** item.

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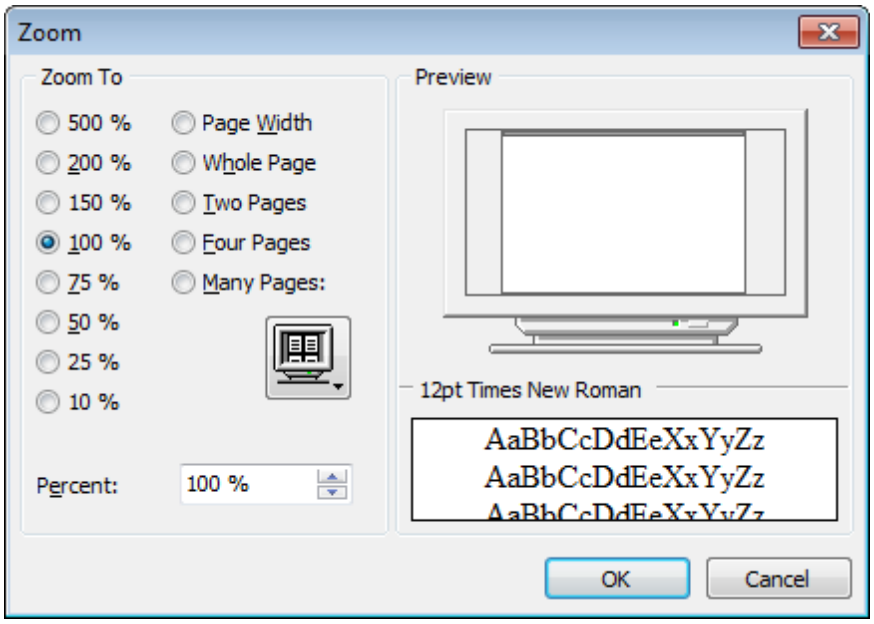

Select the preferable percentage of zoom value (*500%*, *200%*, *150%*, *100%*, *75%*, *50%*, *25%*, *10%*) or specify one of frequently used values:

- *Page Width*
- *Whole Page*
- *Two Pages*
- *Four Pages*
- *Many Pages* (click the chart below and select the item you need)

If necessary, you can set a custom percent value using the **Percent** spinner control below.

The **Preview** area on the right illustrates the changes you have made.

See also:

Page Setup 483
Report Formatter 490
Print dialog 506

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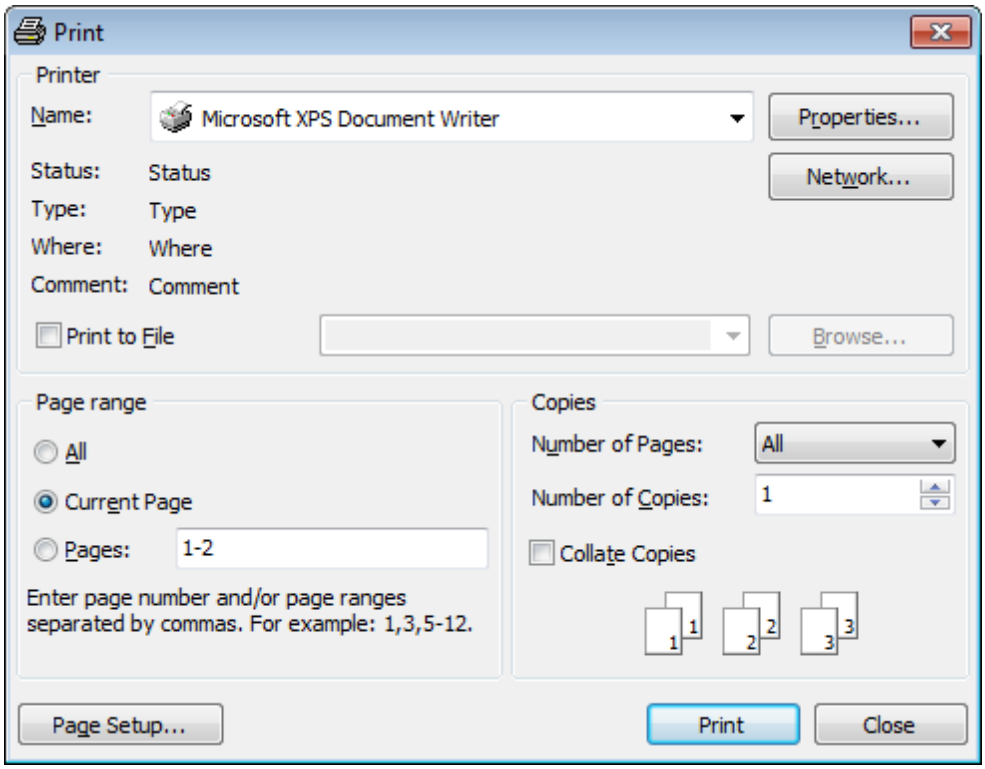
8.1.4.4 Print dialog

The standard **Print** dialog allows you to specify printing settings for the report in groups: *printer*, *page range*, *copies*.

To open the dialog, click the **Print dialog** button available on the toolbar[455], or use the *Ctrl+P* shortcut[1004].



When you are done, click the **Print** button to start printing.

If you need to change any page settings before printing, you can click the **Page Setup...** button at the bottom to call the Page Setup[483] dialog.

See also:

Page Setup[483]

Report Formatter[490]

Setting report options[501]

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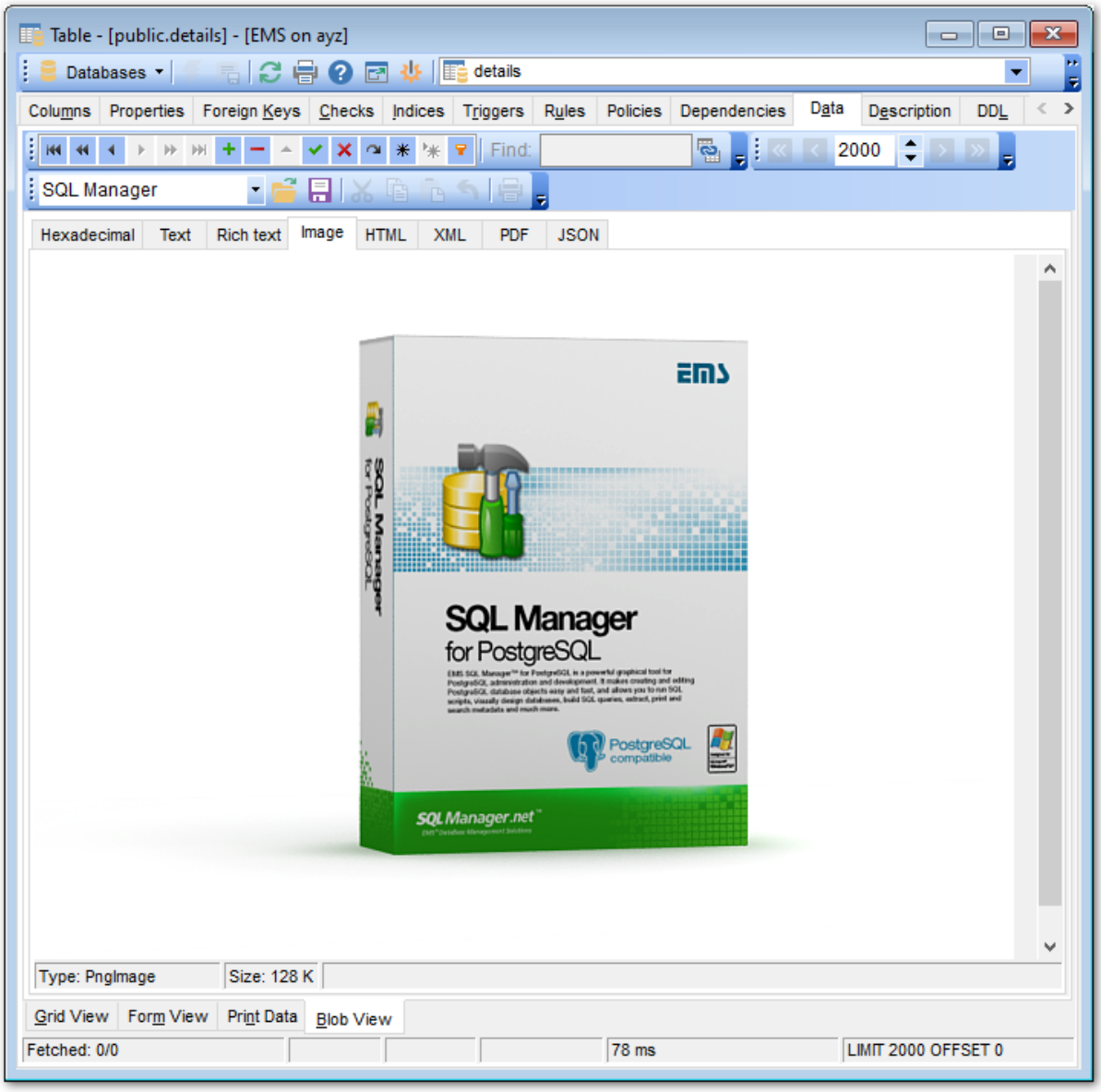
8.1.5 BLOB View

SQL Manager for PostgreSQL provides BLOB Viewer/Editor to view and edit BLOB (Binary Large Object) columns content. The BLOB Viewer/Editor can be invoked from the data grid within Table Editor 177, Query Data 415, Visual Design Query 431, etc.

- Navigation within the BLOB Viewer/Editor 509
- Viewing/Editing BLOB column as Hexadecimal dump 510
- Viewing/Editing BLOB column as plain Text 511
- Viewing/Editing BLOB column as Rich Text (RTF) 512
- Viewing/Editing BLOB column as Image 513
- Viewing/Editing BLOB column as HTML 515
- Viewing/Editing BLOB column as XML 516
- Viewing/Editing BLOB column as PDF 518
- Viewing/Editing BLOB column as JSON 519



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Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Using Navigation bar and Toolbars 454
Grid View 457
Form View 479
Print Data 481
Applying changes 521

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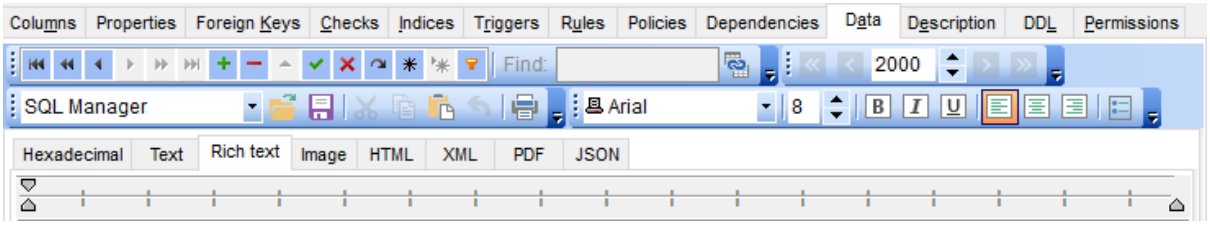
8.1.5.1 Navigation within BLOB Editor

The **BLOB Viewer/Editor** provides an ability to navigate within the records using **DB Navigation** buttons on the navigation pane[454] at the top of the viewer window.

Using items of the navigation pane[454] and the drop-down menu you can browse the data quickly, insert, update and delete records, set a filter for the records using the Filter Builder[524] dialog, load new BLOB content and save the current content to files.

The toolbar[455] allows you to switch the columns and perform a number of editing operations. The set of toolbar items depends on the current selection and view mode.



See also:

Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Rich Text[512]
Editing as Image[513]
Editing as HTML[515]
Editing as XML[516]
Editing as PDF[518]
Editing as JSON[519]

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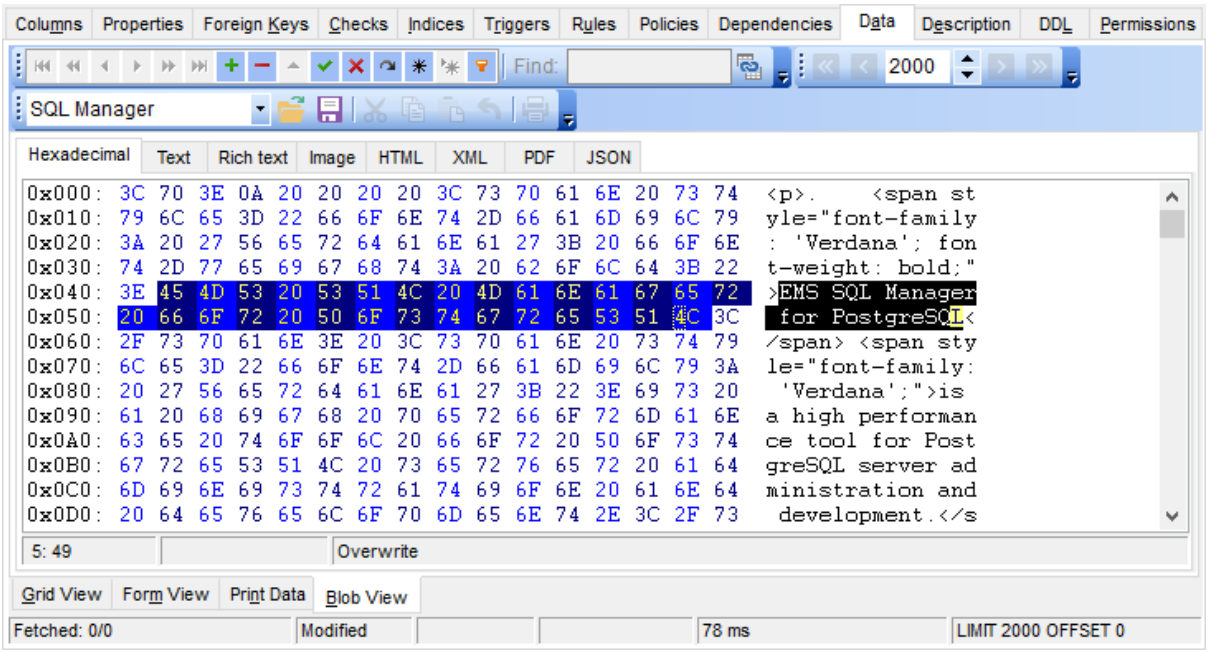
8.1.5.2 Editing as Hexadecimal

The **Hexadecimal** tab allows you to view/edit the BLOB data as hexadecimal.

The toolbar455 provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the hexadecimal data to a file, or load data from a file.

Use the *Ins* key to switch between the Insert and Overwrite modes.



See also:

Navigation within BLOB Editor509
Editing as Text511
Editing as Rich Text512
Editing as Image513
Editing as HTML515
Editing as XML516
Editing as PDF518
Editing as JSON519

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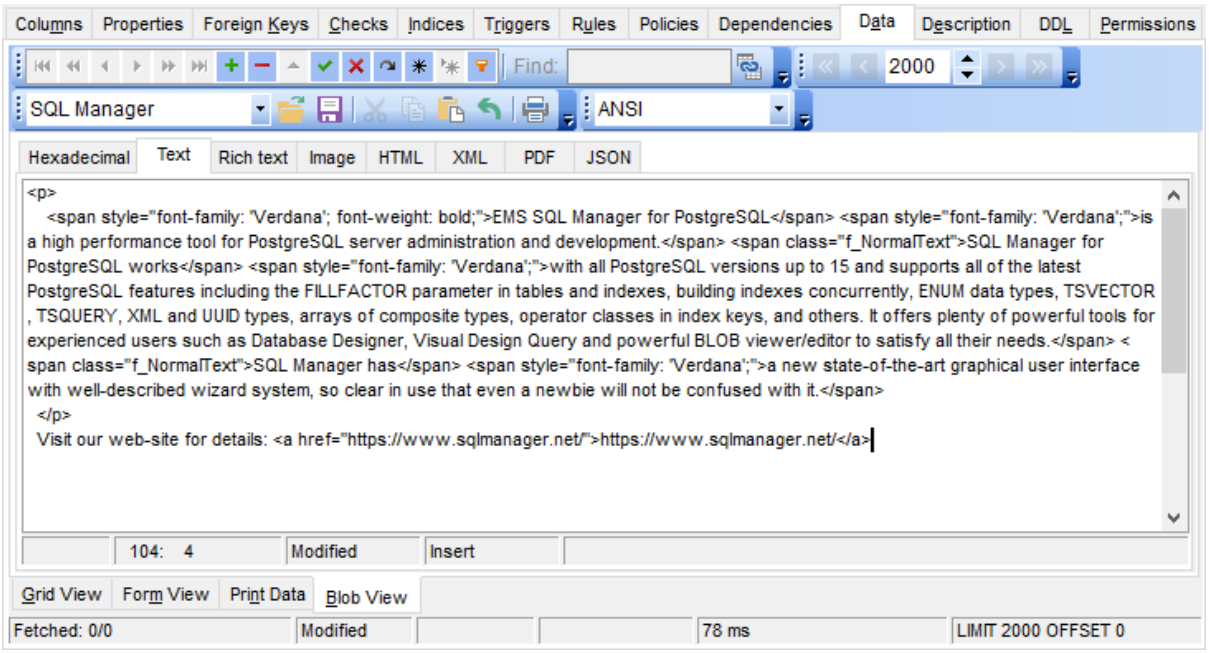
8.1.5.3 Editing as Text

The **Text** tab allows you to view/edit the BLOB data as plain text.

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the text to a **.txt* file, or load text from a file. Additionally, you can use the *Cut*, *Copy*, *Paste*, *Select All*, *Undo*, *Word Wrap* context menu items for editing the text efficiently, and the **Print** context menu item to print the content of the **Text** tab.



See also:

Navigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Rich Text[512]
Editing as Image[513]
Editing as HTML[515]
Editing as XML[516]
Editing as PDF[518]
Editing as JSON[519]

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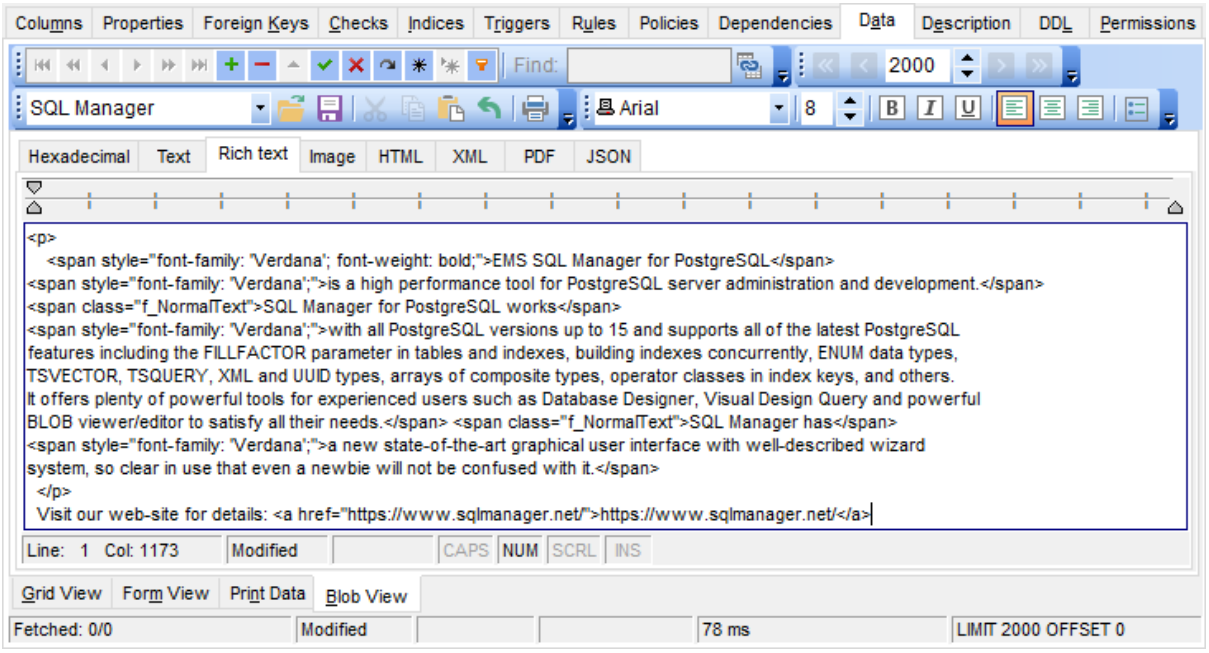
8.1.5.4 Editing as Rich Text

The **Rich Text** tab allows you to view/edit the BLOB data in Rich Text format (RTF).

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the Rich Text to a **.rtf* file, or load text from a file. Additionally, you can use the *Cut*, *Copy*, *Paste*, *Select All*, *Undo* context menu items for editing the text efficiently, and the **Print** context menu item to print the content of the **Rich Text** tab.



See also:

Navigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Image[513]
Editing as HTML[515]
Editing as XML[516]
Editing as PDF[518]
Editing as JSON[519]

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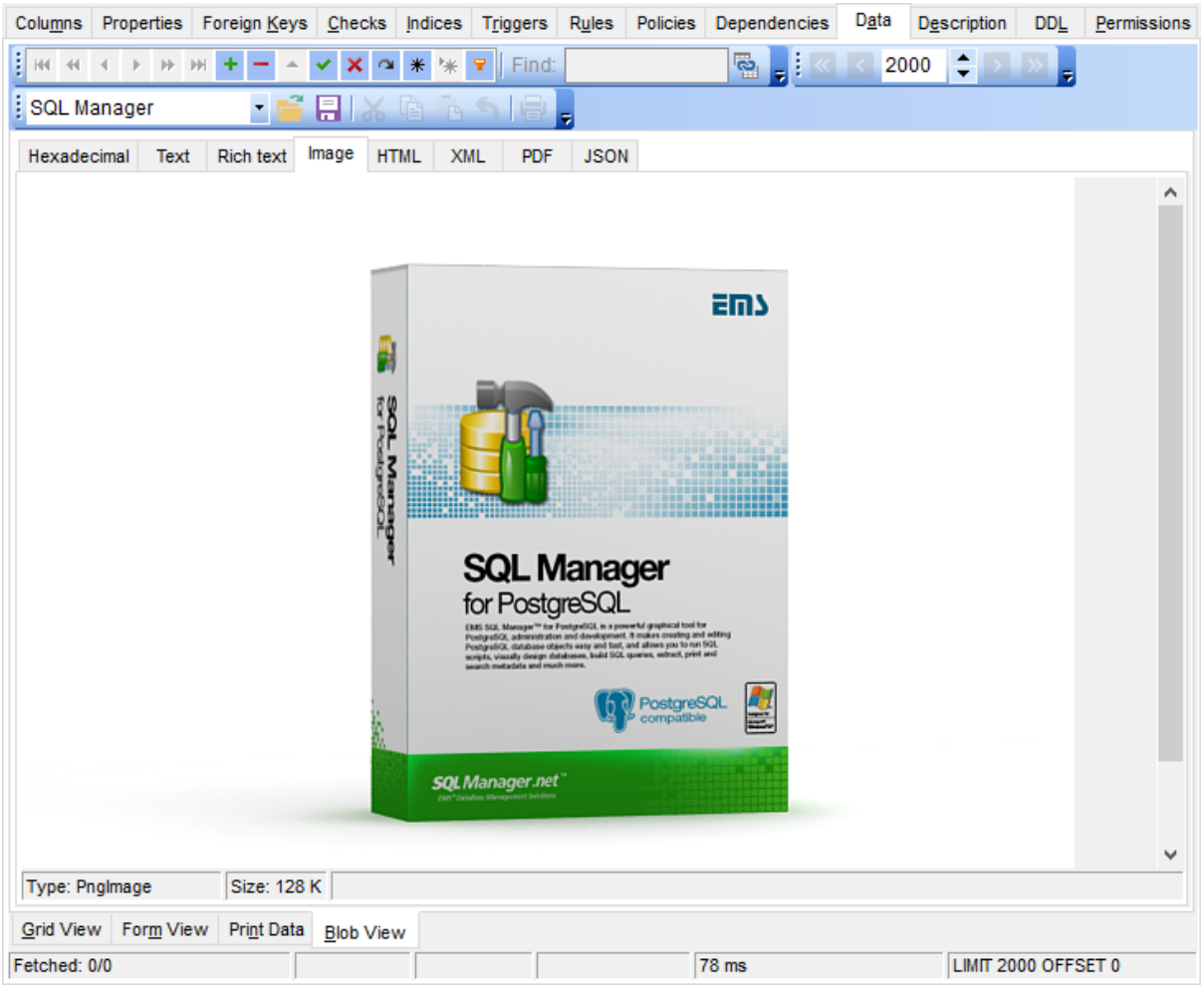
8.1.5.5 Editing as Image

The **Image** tab allows you to view the BLOB data as image.

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the image to a **.png*, **.wmf*, **.ico* or **.jpg* file, or load an image from a file.



See also:

Na vigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Rich Text[512]
Editing as HTML[515]
Editing as XML[516]
Editing as PDF[518]
Editing as JSON[519]

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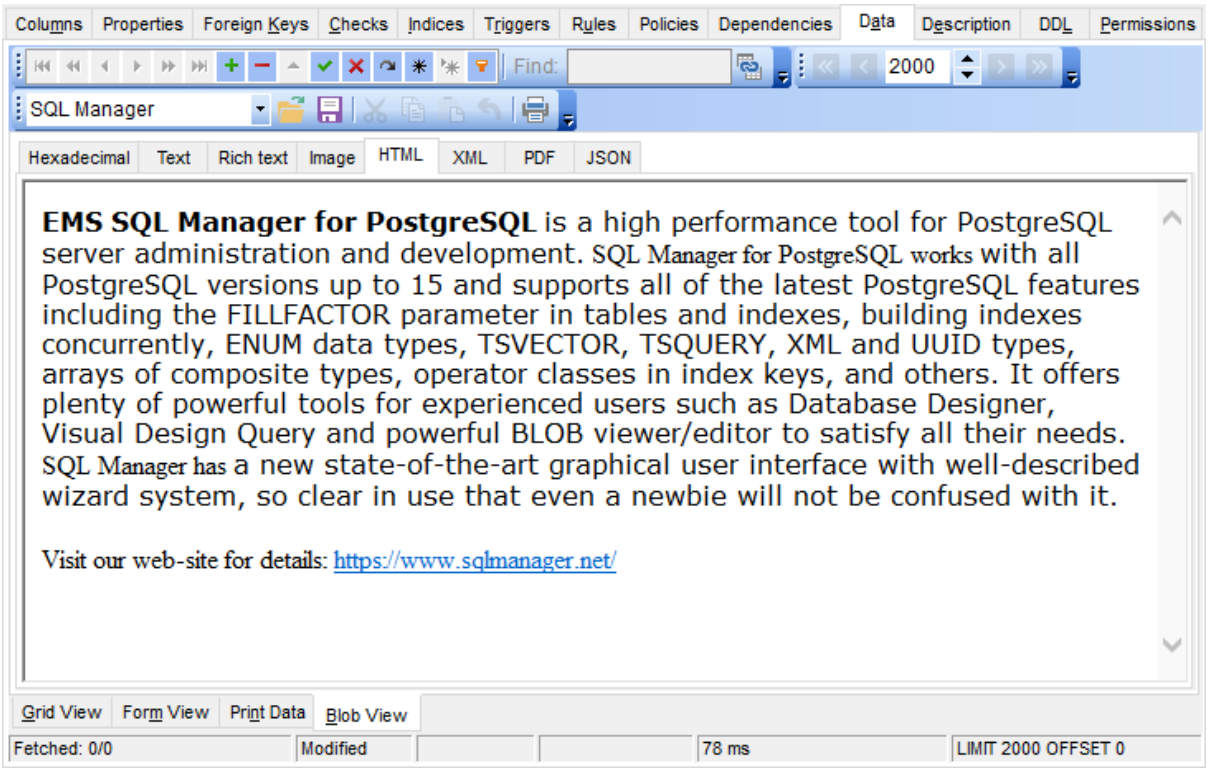
8.1.5.6 Editing as HTML

The **HTML** tab allows you to view the BLOB data as HTML (Hyper-Text Markup Language format) - in the way this data would be displayed by your Internet browser.

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the content as a **.html*, or **.htm* file, or load content from a file.



See also:

Navigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Rich Text[512]
Editing as Image[513]
Editing as XML[516]
Editing as PDF[518]
Editing as JSON[519]

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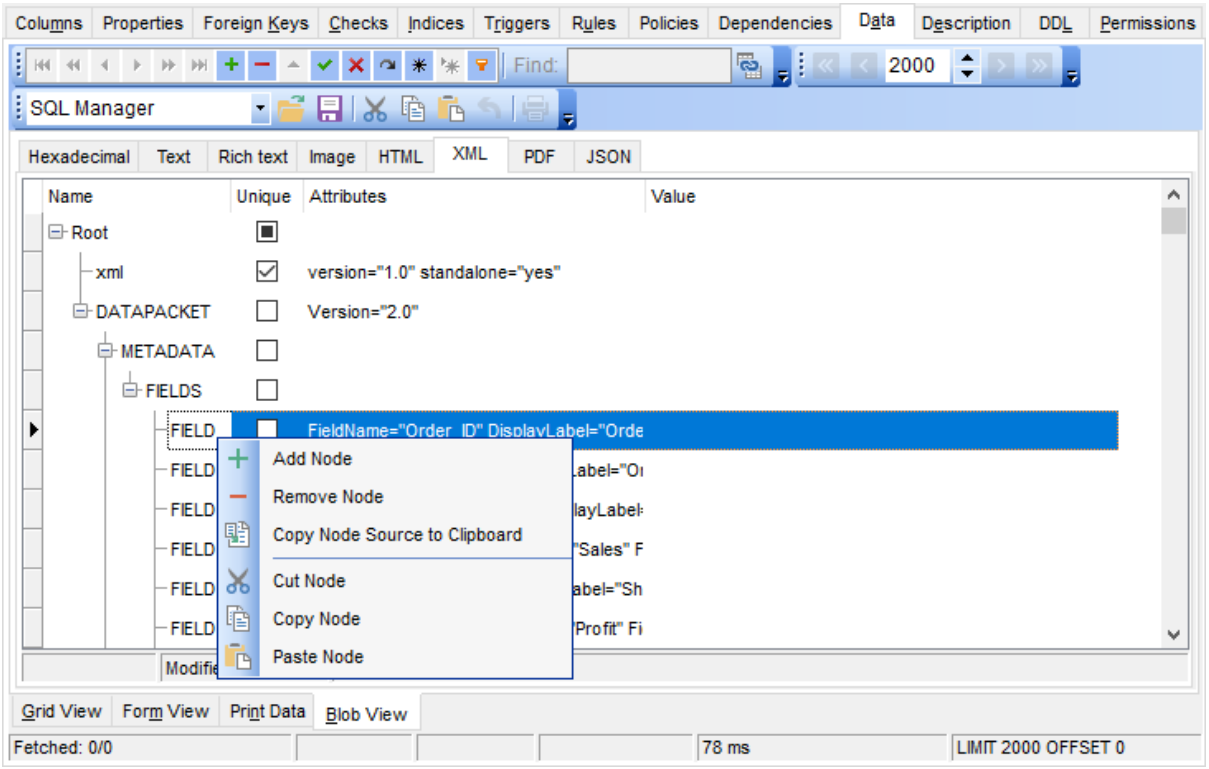
8.1.5.7 Editing as XML

The **XML** tab allows you to view/edit the XML (eXtensible Markup Language) data.

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the content as **.xml* or load XML content from a file.



The XML content is represented as a tree-like structure consisting four editable fields: **Name**, **Unique**, **Attributes** and **Value**. You can edit data and modify the structure using drag-n-drop operations and items of the context menu.

Hint: Hold the **Shift** key when you drag-and-drop a node to insert it as a child one.

The **context menu** allows you to:

- add a node (a child node relatively to the selected one);
- remove the selected node;
- copy the selected node source to clipboard;
- cut the selected node;
- copy the selected node;
- paste a node from clipboard.

Press the **Item attributes** button in the editing mode of an **Attribute** item to add or edit attributes.

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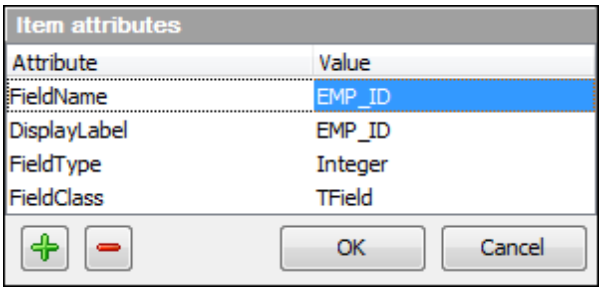

Use the buttons to add or remove an attribute. Click the required attribute name or value to edit.

See also:

Navigation within BLOB Editor 509
Editing as Hexadecimal 510
Editing as Text 511
Editing as Rich Text 512
Editing as Image 513
Editing as HTML 515
Editing as PDF 518
Editing as JSON 519

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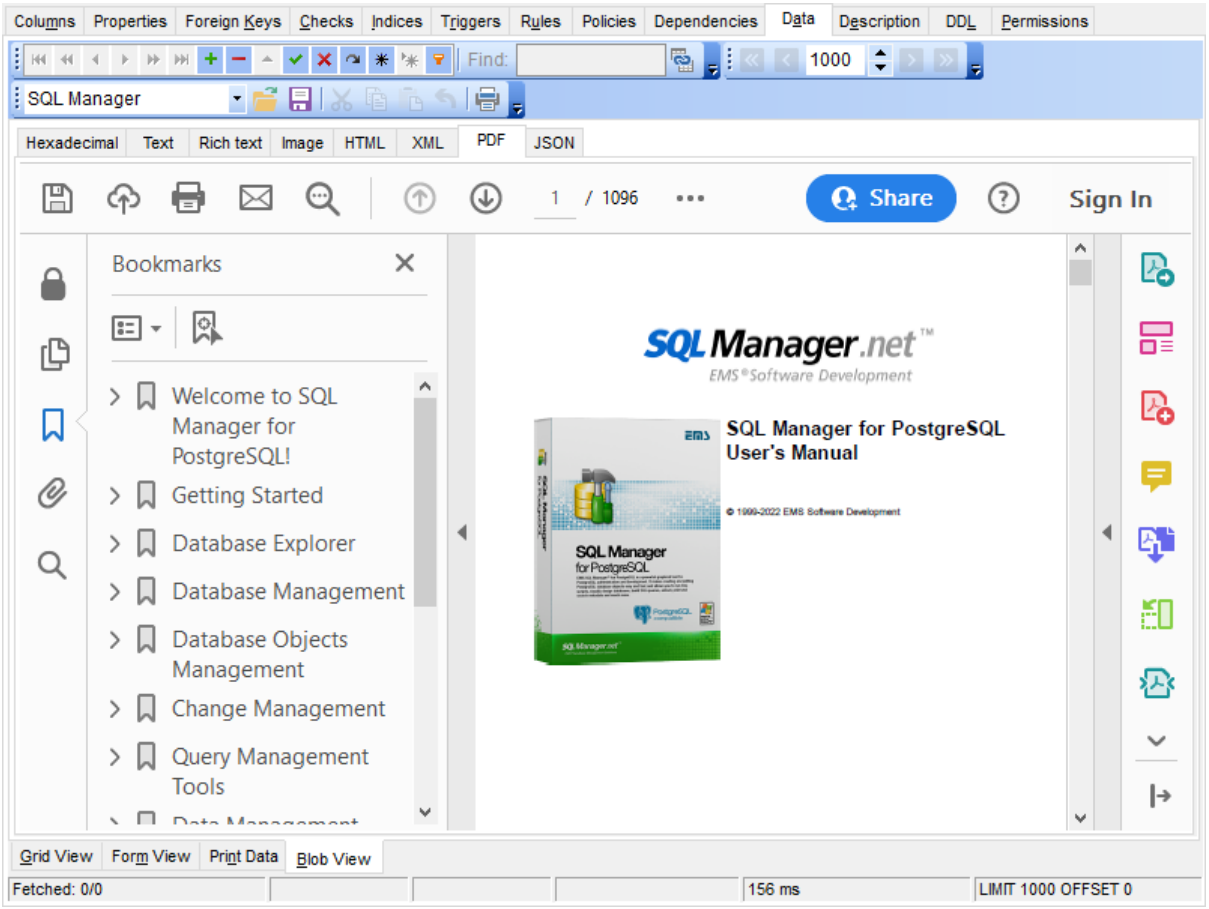
8.1.5.8 Editing as PDF

The **PDF** tab allows you to view the BLOB data as PDF.

The toolbar[455] provides additional functionality for PDF Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the image to a **.pdf* file, or load file.



See also:

Navigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Rich Text[512]
Editing as Image[513]
Editing as HTML[515]
Editing as XML[516]
Editing as JSON[519]

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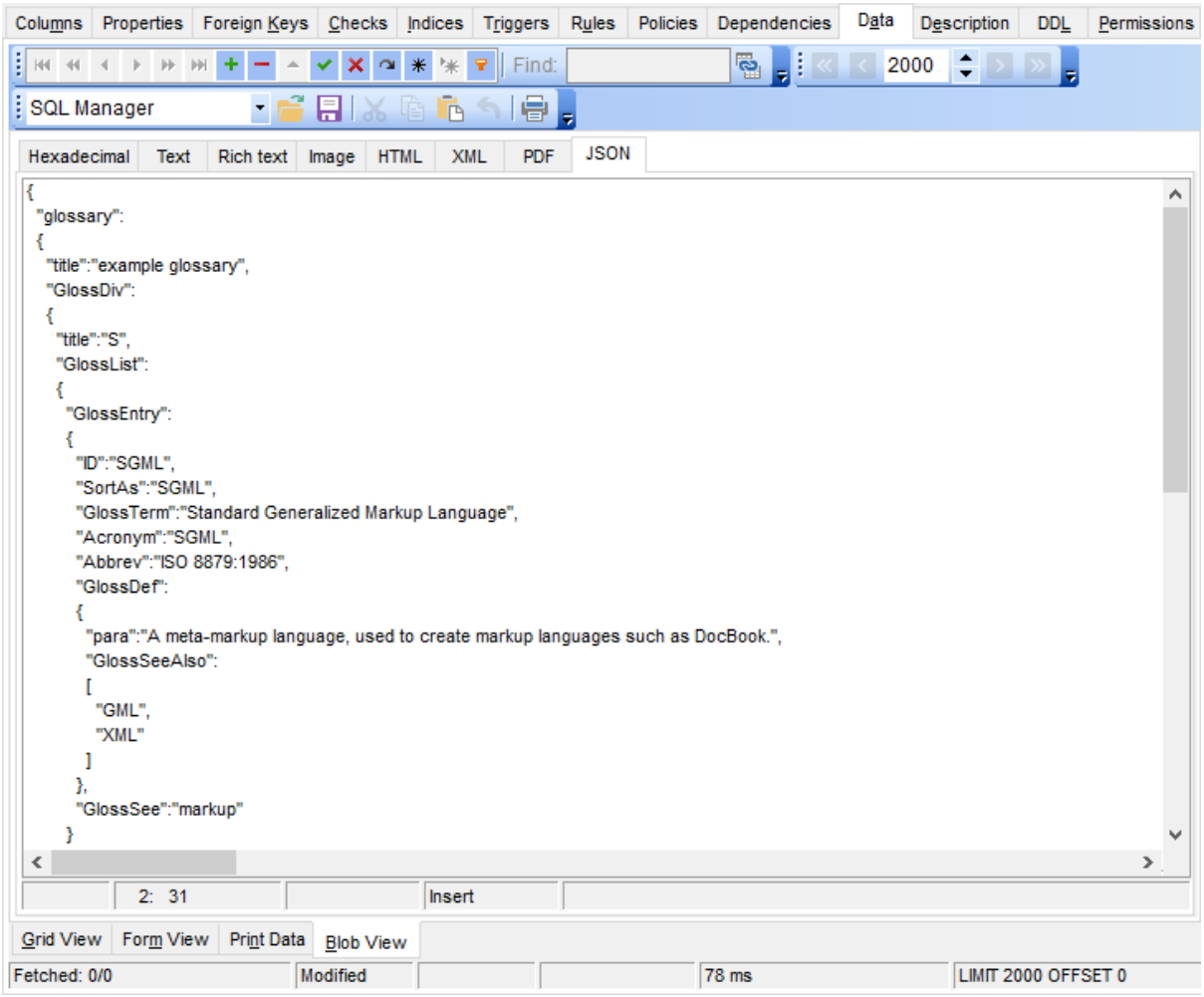
8.1.5.9 Editing as JSON

The **JSON** tab allows you to view the BLOB data as JSON.

The toolbar[455] provides additional functionality for BLOB Viewer/Editor: use the **Save to file** and the **Load from file** toolbar buttons to save the Rich Text to a **.txt* file, or load text from a file. Additionally, you can use the *Cut*, *Copy*, *Paste*, *Select All*, *Undo* context menu items for editing the text efficiently, and the **Print** context menu item to print the content of the **JSON** tab.



See also:

Navigation within BLOB Editor[509]
Editing as Hexadecimal[510]
Editing as Text[511]
Editing as Rich Text[512]
Editing as Image[513]
Editing as HTML[515]

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Editing as XML 516
Editing as PDF 518

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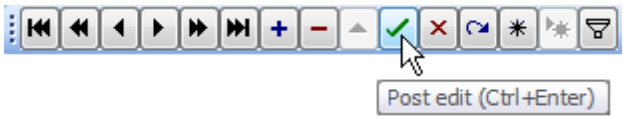
8.1.6 Applying changes

After changes are done, click the **Post Edit** button on the navigation pane[454] to apply the changes or the **Cancel Edit** button to discard the changes.



See also:

Using Navigation bar and Toolbars[454]
Grid View[457]
Form View[479]
Print Data[481]
BLOB View[507]

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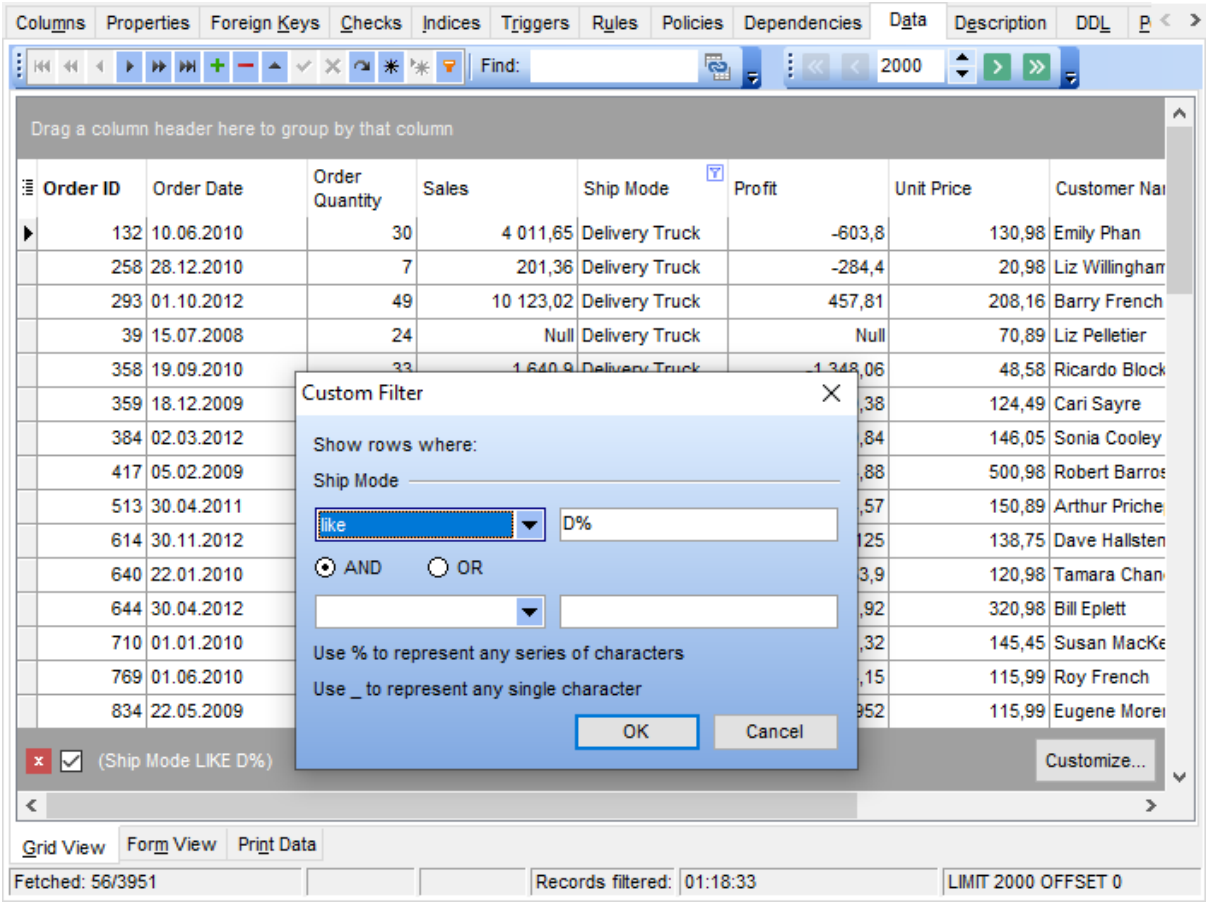
8.2 Custom Filter

The **Custom Filter** dialog is one of the filtering[463] facilities implemented in Data View[453] for your convenience.

To open the dialog, click the Arrow-Down button next to the column caption, and select the **Custom** item from the drop-down list.

Select a logical operator for checking the column values (*like*, *is less than*, *is greater than*, etc.) and set a value to be checked by this operator in the corresponding box on the right.



If necessary, you can set the second condition and specify the relation between the two conditions: whether both of them should be satisfied (*AND*) or just any of them (*OR*). Use the '_' character to represent any single symbol, and use the '%' character to represent any series of symbols in the condition string.

See also:

Data View[453]

Filter Builder dialog[524]

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8.3 Filter Builder dialog

The **Filter Builder** dialog is a powerful filtering[463] tool implemented in Data View[453] for your convenience.

The dialog is aimed at facilitating the procedure of creating and applying complex filter criteria for data. In addition, the tool allows you to save filter criteria to an external **.flt* file for future use.

To open the **Filter Builder** dialog, use the **Set filter** button on the navigation pane available within the Data[194] tab of Table Editor[177] and the **Result(s)** tabs of Query Data[415] and Design Query[431].

- Invoking the Filter Builder dialog[525]
- Adding a new condition to the filter[527]
- Setting filter criteria[528]
- Setting filter operator[529]
- Setting filter criteria values[530]
- Adding a new group[531]
- Setting group operator[532]
- Applying filter conditions[533]

See also:

Data View[453]

Custom Filter[522]

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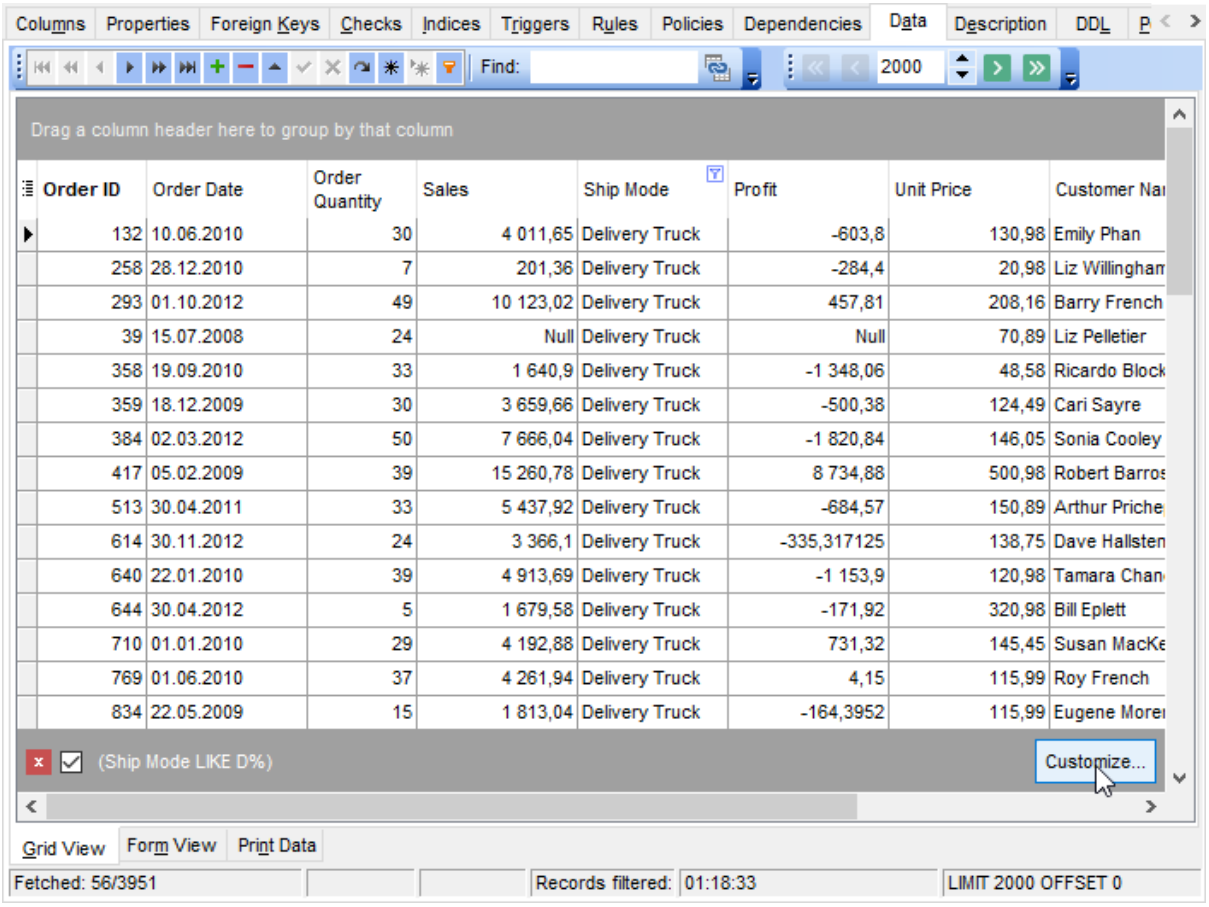
8.3.1 Invoking the Filter Builder dialog

The **Filter Builder** dialog can be invoked in either of the following ways:

- if a simple filter 463 or the Custom Filter 522 is being used, click the **Customize...** button on the gray **filtering panel**;



- use the **Set filter** button on the navigation pane 454 and create a composite filter using the dialog.

The succeeding pages of this chapter are intended to illustrate usage of the **Filter Builder** dialog. Please see the instructions below to learn how to perform various operations in the easiest way.

See also:

Adding a new condition 527
Setting filter criteria 528
Setting filter operator 529
Setting filter criteria values 530

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Adding a new group 531
Setting group operator 532
Applying filter conditions 533

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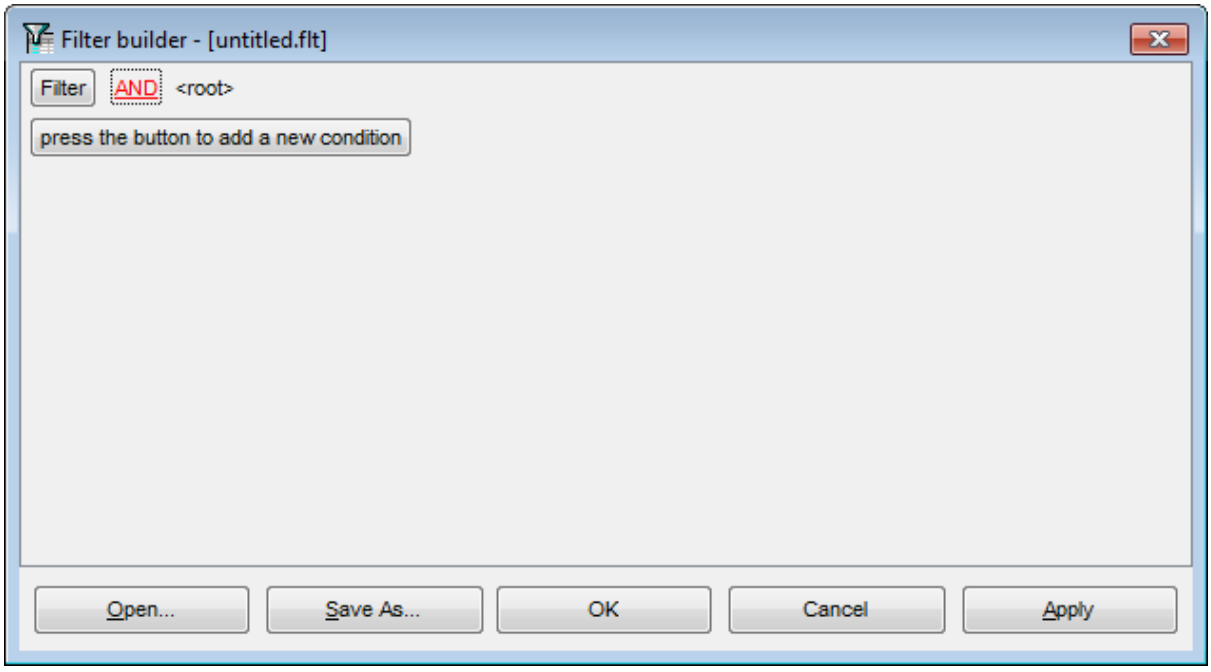
8.3.2 Adding a new condition

Suppose we need to select data from the sample table *Employee* to view the list of male engineers belonging to the *Engineering* and *Tool Design* departments that were hired after *10/1/2007*. These criteria are applied to the *Gender*, *HireDate*, *Position* and the *DepID* columns.

Click **press the button to add a new condition** - this will add a new condition to the criteria. Alternatively, you can click the **Filter** button and select the **Add Condition** popup menu item.



See also:

Invoking the Filter Builder dialog 525
Setting filter criteria 528
Setting filter operator 529
Setting filter criteria values 530
Adding a new group 531
Setting group operator 532
Applying filter conditions 533

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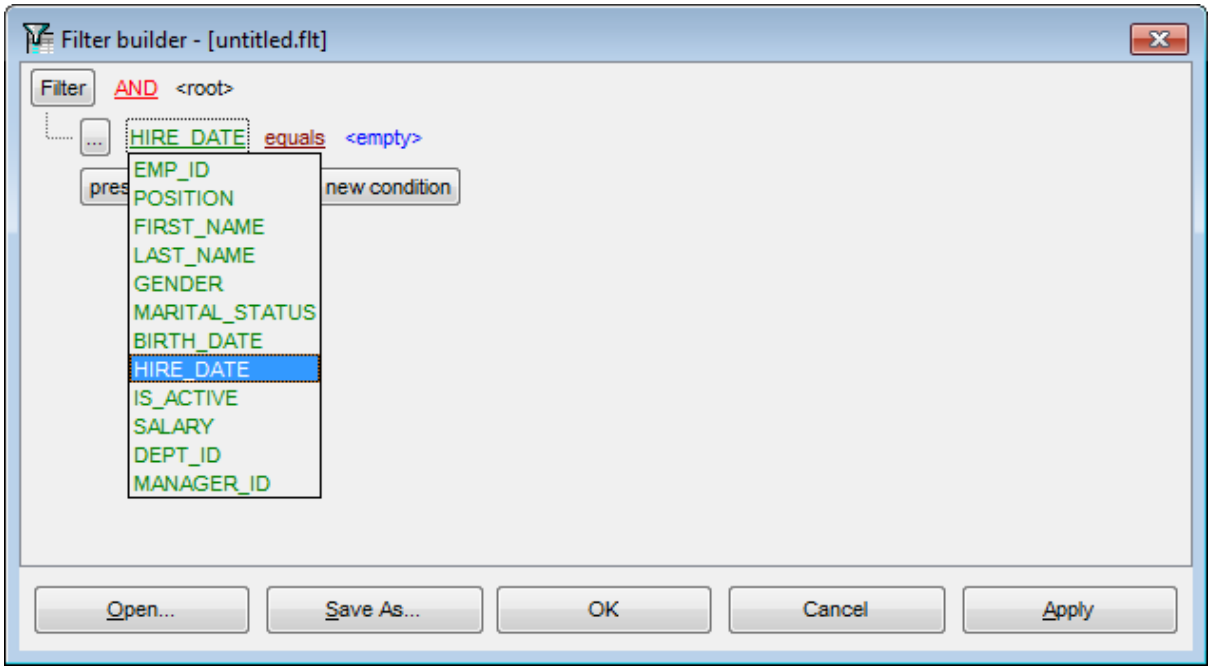
8.3.3 Setting filter criteria

As we need to apply the filter criteria to the *HireDate* column, we click the column box (next to the ellipsis button) to open the drop-down list displaying the available column names and select the *HireDate* item.



See also:

Invoking the Filter Builder dialog 525
Adding a new condition 527
Setting filter operator 529
Setting filter criteria values 530
Adding a new group 531
Setting group operator 532
Applying filter conditions 533

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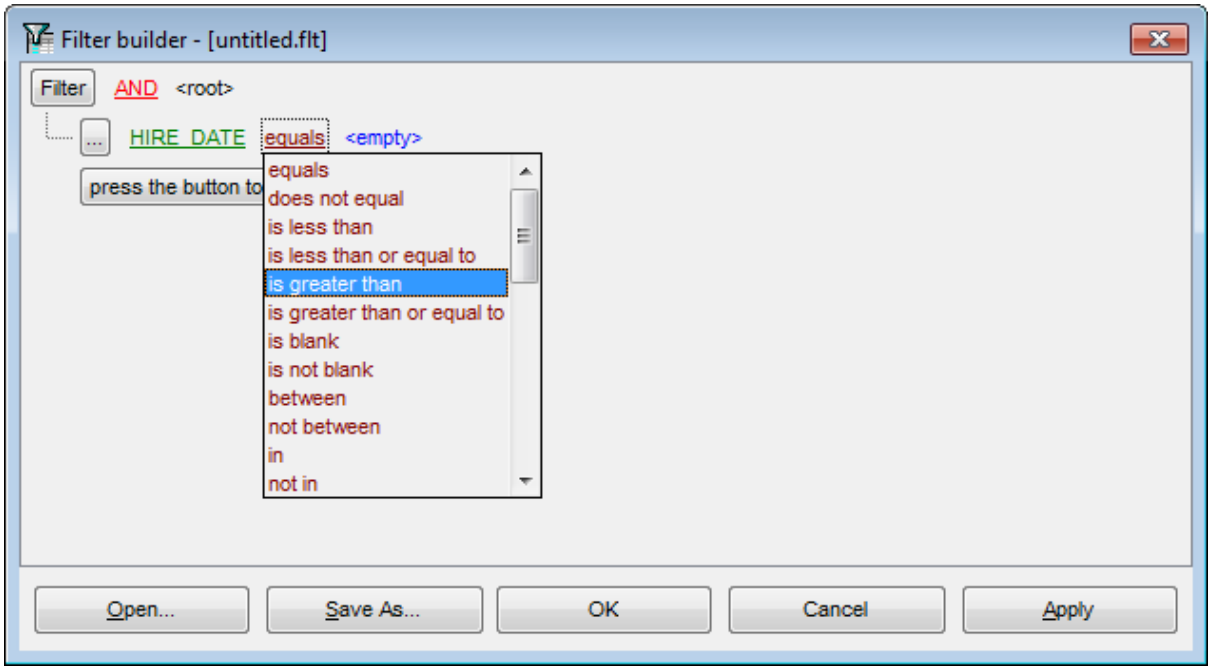
8.3.4 Setting filter operator

Since we need the list of employees hired after *10/1/2007*, we need to select the *IS GREATER THAN* operator from the corresponding drop-down list.



See also:

Invoking the Filter Builder dialog 525
Adding a new condition 527
Setting filter criteria 528
Setting filter criteria values 530
Adding a new group 531
Setting group operator 532
Applying filter conditions 533

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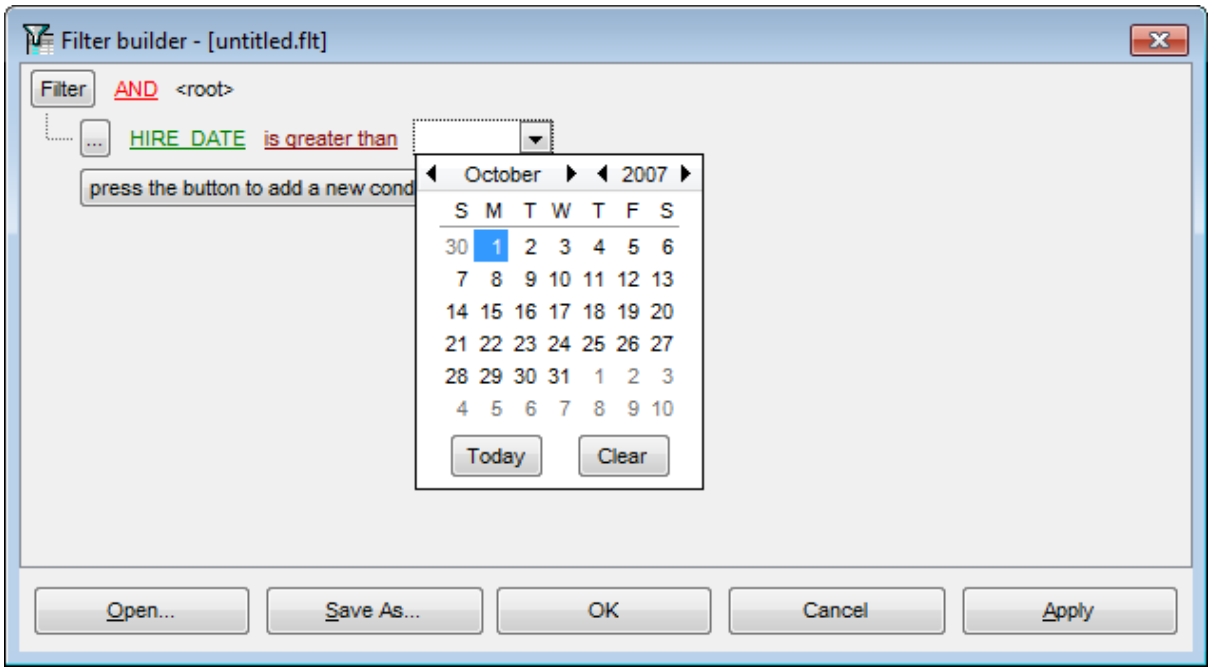
8.3.5 Setting filter criteria values

Next, we need to specify value *'10/1/2007'* for the *IS GREATER THAN* operator.

Similarly, if, for example, we need to get the list of employees hired during the *9/1/2007 - 10/1/2007* term, we set the *BETWEEN* filter operator[529] (this will add two empty value boxes to specify the inclusive range for the *BETWEEN* condition) and specify the range for the operator, i.e. the *'9/1/2007'* and the *'10/1/2007'* values in the corresponding value boxes.

It is possible to set the date value **manually** by typing it in, or using the **date editor** which is activated when you click the value box.



Editors used in value boxes are determined by the **data type** assigned to the corresponding columns.

See also:

Invoking the Filter Builder dialog[525]
Adding a new condition[527]
Setting filter criteria[528]
Setting filter operator[529]
Adding a new group[531]
Setting group operator[532]
Applying filter conditions[533]

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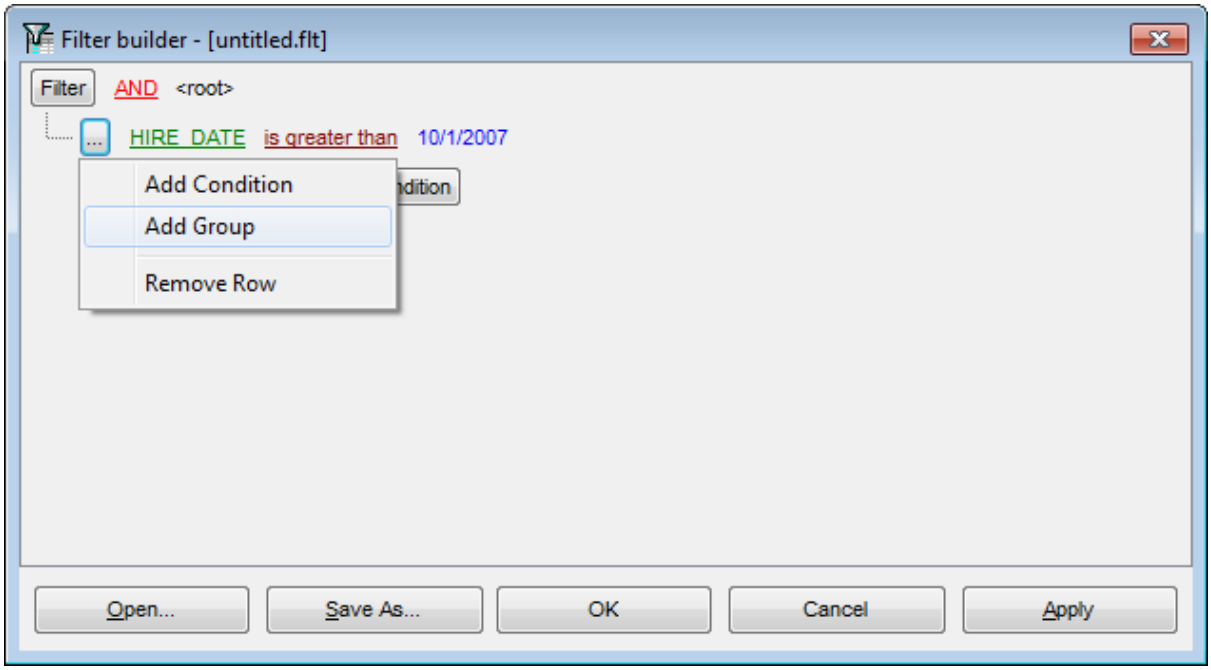
8.3.6 Adding a new group

Since we also need to get the list of male specialists-engineers (i.e. those registered in the *Engineering* and *Tool Design* departments and having an engineering-oriented position), we can add a complex filter condition combining simple conditions with the *AND* operator. (However, in this particular case we can just add them at the same root level as for the existing condition).

If you need to add a group of conditions, click the ellipsis button for the *HIRE_DATE* condition and select the **Add Group** popup menu item.



See also:

Invoking the Filter Builder dialog 525
Adding a new condition 527
Setting filter criteria 528
Setting filter operator 529
Setting filter criteria values 530
Setting group operator 532
Applying filter conditions 533

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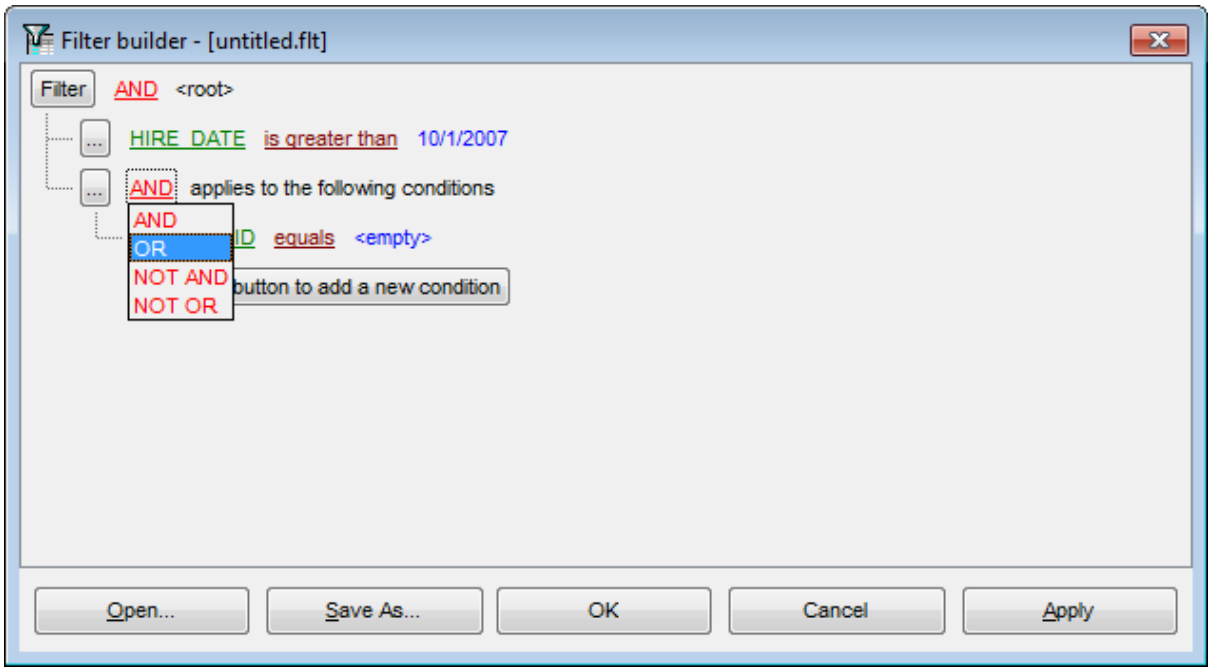
8.3.7 Setting group operator

Conditions of complex criteria can be combined with any of the four logical operators used: *AND*, *OR*, *NOT AND*, *NOT OR*.

In our case it is enough to click the **group operator** box and select the *AND* item from the drop-down menu.



See also:

Invoking the Filter Builder dialog 525
Adding a new condition 527
Setting filter criteria 528
Setting filter operator 529
Setting filter criteria values 530
Adding a new group 531
Applying filter conditions 533

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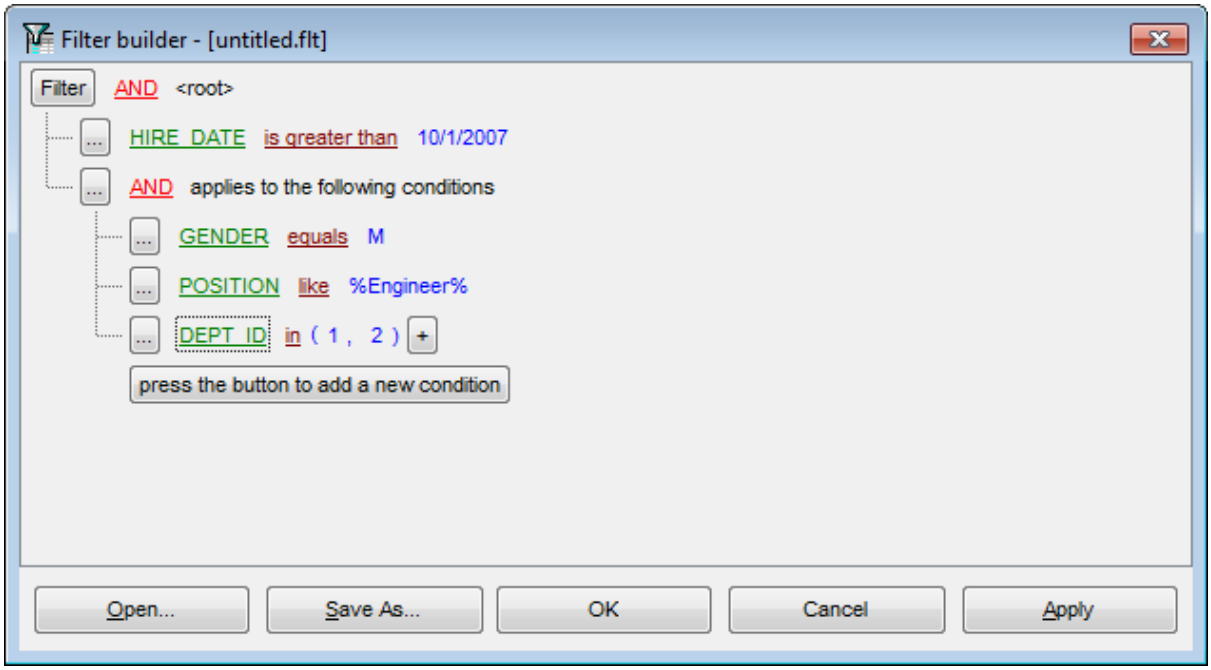
8.3.8 Applying filter conditions

Suppose we have created a condition within the new group. If we need, we can add more conditions[527] at the same level and specify the required values using the value boxes. When the operation is completed, the **Filter Builder** dialog will look like in the screenshot below.

Click the **Apply** button to see the result of the filtering you have made, and click **OK** or **Cancel** to close the dialog with or without saving your filter conditions respectively.



The **Filter Builder** dialog allows you to save filter criteria to and load them from external files. Clicking the **Save As...** or the **Open...** buttons activates the corresponding dialogs. Filter settings are stored in **.flt* files.
Please be informed that a column in the file is referenced by its position within a view, hence filter settings cannot be correctly restored if columns have been deleted from the view after saving the filter to a file.

See also:

Invoking the Filter Builder dialog[525]
Adding a new condition[527]
Setting filter criteria[528]
Setting filter operator[529]
Setting filter criteria values[530]
Adding a new group[531]
Setting group operator[532]

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Part

9 Import/Export Tools

Using SQL Manager for PostgreSQL you are provided with powerful tools to import and export data to/from your PostgreSQL database.

Export Data Wizard 536
Exports data to various supported formats including *MS Excel*, *MS Access*, *RTF*, *HTML*, *PDF*, *CSV*, *XML* and more.

Import Data Wizard 582
Imports data from any of supported formats: *MS Excel*, *MS Access*, *DBF*, *TXT*, *CSV*, *XML* and more.

Export Data as SQL Script 608
Exports data to an SQL script as a number of INSERT statements.

Save Data Wizard 617
Saves data to an external file with the COPY statement used.

Load Data Wizard 626
Loads data from an external file with the COPY FROM statement used.

Using templates 982
Facilitates using import/export wizards.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Database Tools 636
Services 771
Options 870
How To... 1006

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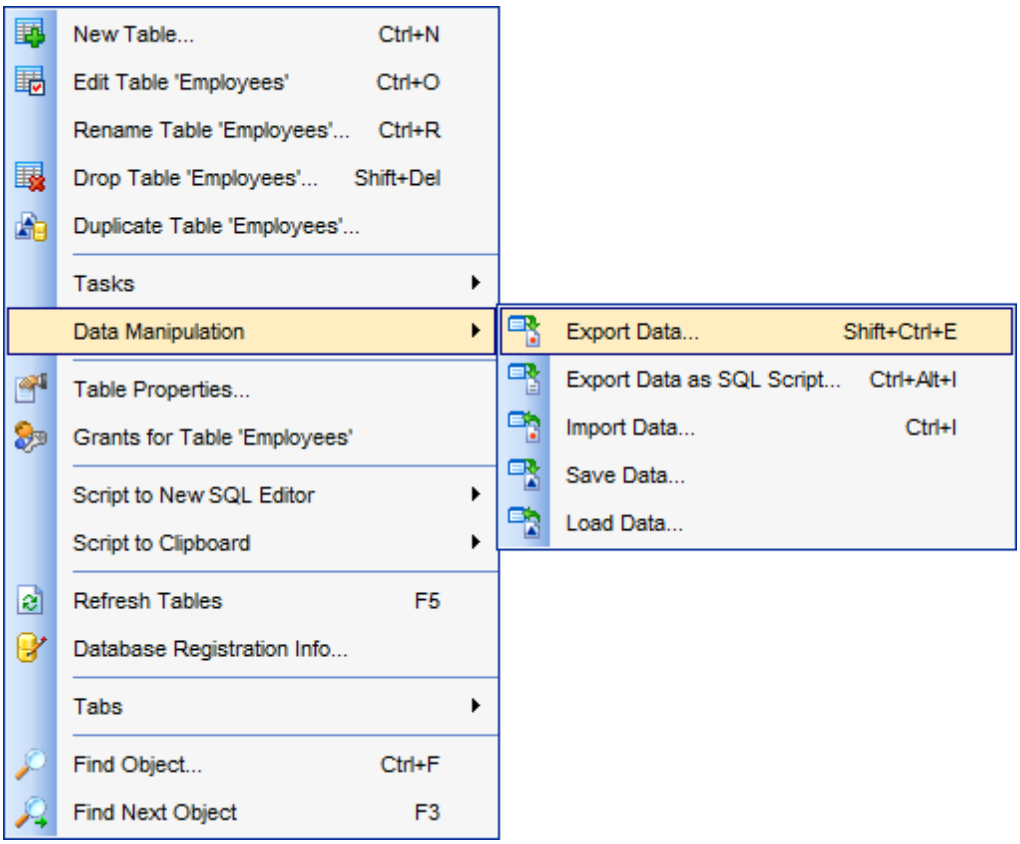
9.1 Export Data Wizard

Export Data Wizard allows you to export data from a table 169 / view 229 or from a query result to any of supported formats (*MS Excel*, *MS Access*, *MS Word*, *RTF*, *HTML*, *PDF*, *TXT*, *CSV*, *XML*, *DBF*, etc.). You can save your settings as a template 982 any time for future use.

To start the wizard, right-click the object in DB Explorer 65 and select the **Data Manipulation | Export Data...** context menu 57 item.
Alternatively, you can open the **Data** tab of Table Editor 177 / View Editor 229 or the **Result (s)** tab of Query Data 415 / Design Query 431, right-click the grid 457 there and select the **Data Manipulation | Export Data of <object_name>...** context menu 466 item.



- Setting name and format for the destination file 538
- Selecting columns for export 539
- Adjusting formats applied to exported data 540
- Setting header and footer text for the destination file 541
- Setting format-specific options 542
- Setting common export options 579
- Exporting data 581

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**

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Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Import Data Wizard 582
Export as SQL Script 608
Save Data Wizard 617
Load Data Wizard 626
Using templates 982

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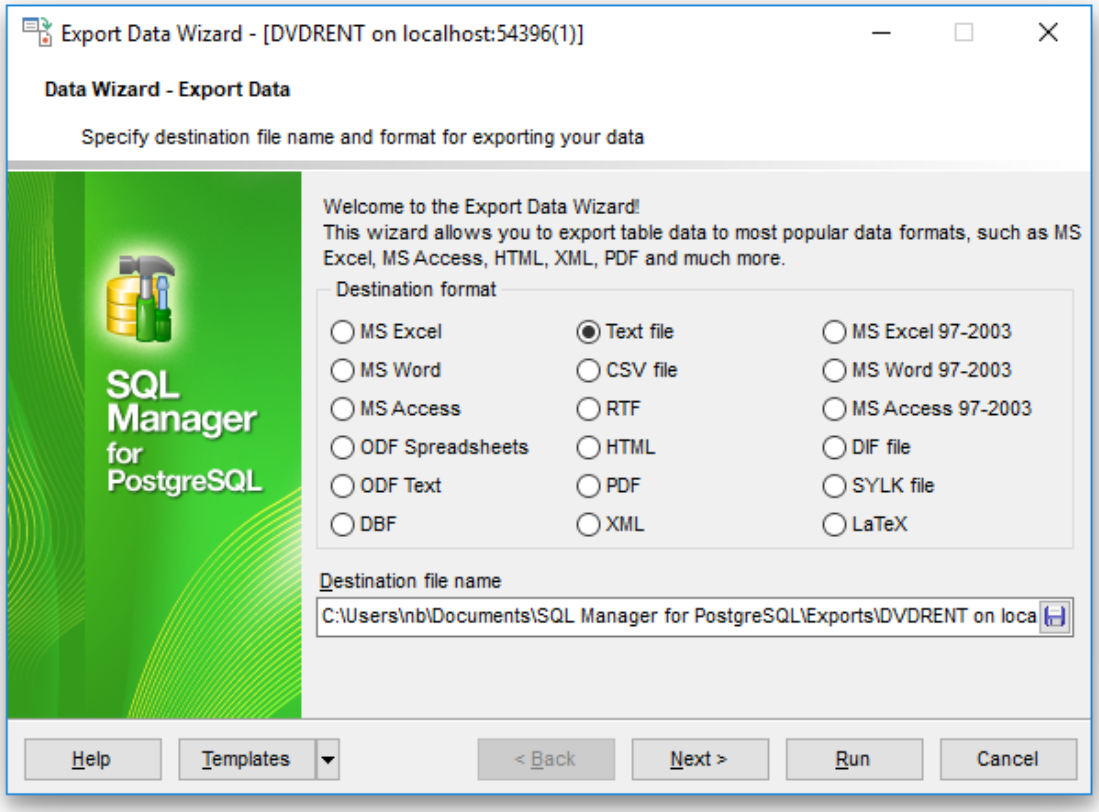
9.1.1 Setting destination file name and format

This step of the wizard allows you to select the destination file format you need to export data into.

Destination format

Specify the format of the destination file. For details refer to Supported file formats 983.

Click the **Next** button to proceed to the Selecting columns for export 539 step of the wizard.



Destination file name

Type in or use the button to specify the path to the file using the **Save as...** dialog. The file name extension changes automatically according to the selected **Destination format**.

Note: If the target file already exists, the application will show a warning 998 dialog where you can choose the action you need.

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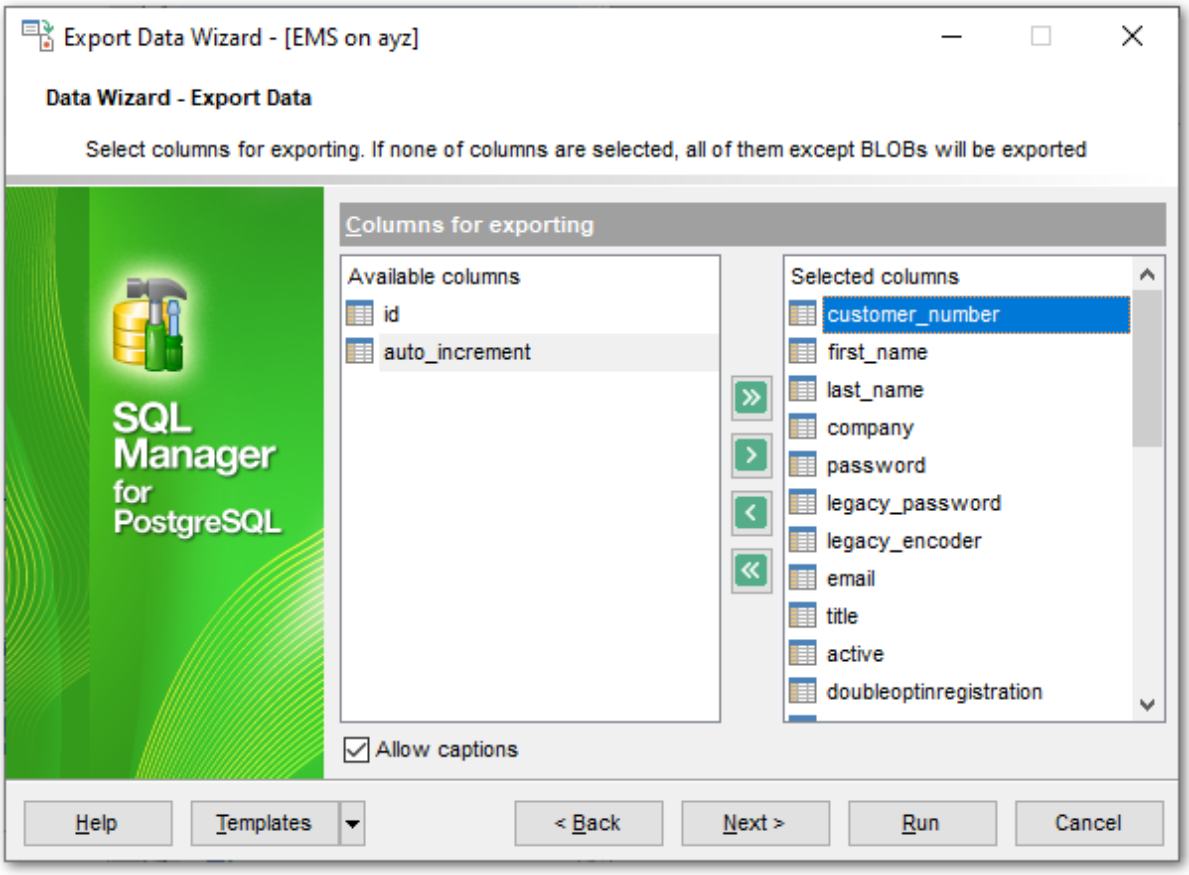
9.1.2 Selecting columns for export

This step of the wizard allows you to select the table column(s) to be exported. To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.



If you leave all the columns in the **Available columns** list, all columns of the table (except BLOBs) will be exported.

Allow captions
Check this option if you need to export the column captions as well.

Click the **Next** button to proceed to the Adjusting data formats 540 step of the wizard.

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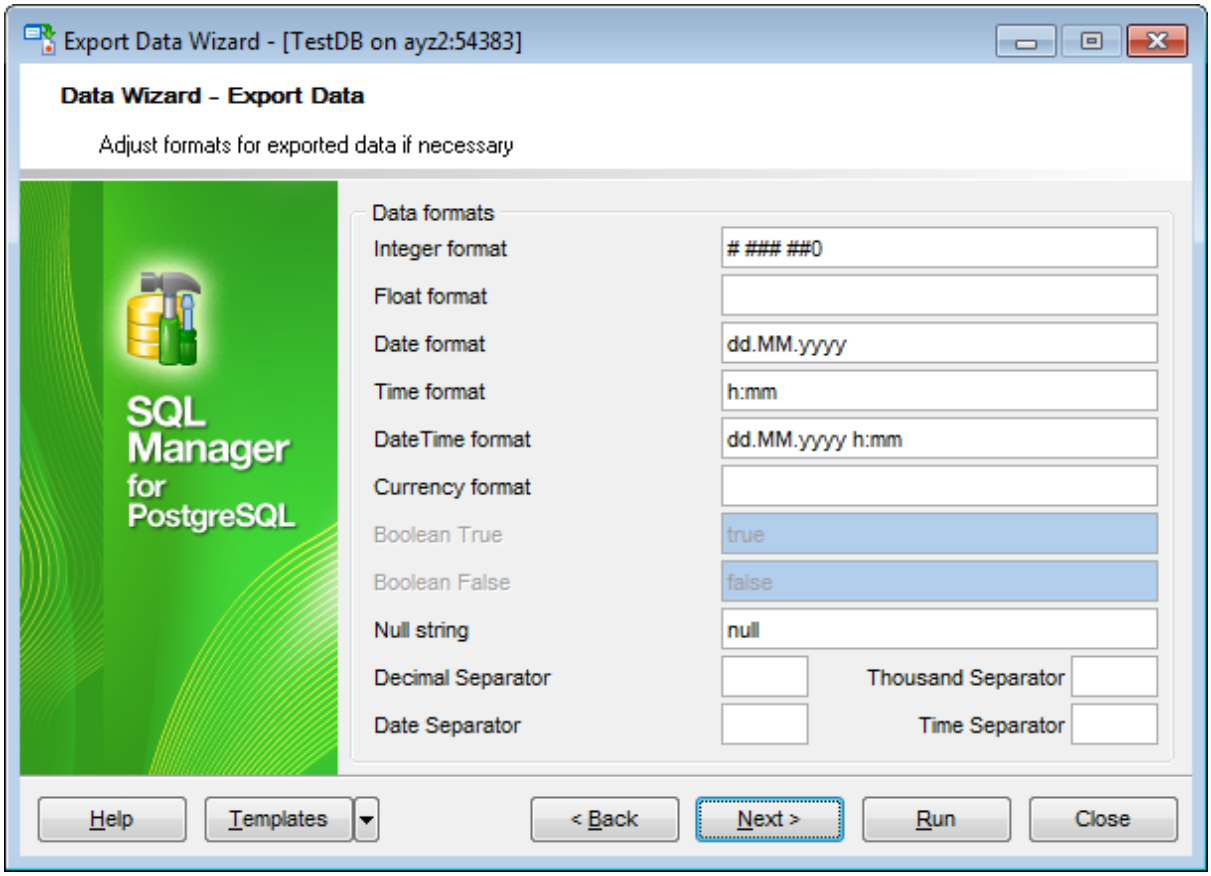
9.1.3 Adjusting data formats

This step allows you to customize formats applied to exported data.

Data formats
Edit the format masks to adjust the result format in the way you need: *Integer*, *Float*, *Date*, *Time*, *DateTime*, *Currency*, *Boolean True*, *Boolean False*, *NULL string*, *Decimal separator*, *Thousand separator*, *Date separator*, *Time separator*.



Hint: The formats used by default are specified in the Data Export 906 section of the Environment Options 871 dialog.

For more details refer to Format specifiers 978.

Click the **Next** button to proceed to the Setting header and footer 541 step of the wizard.

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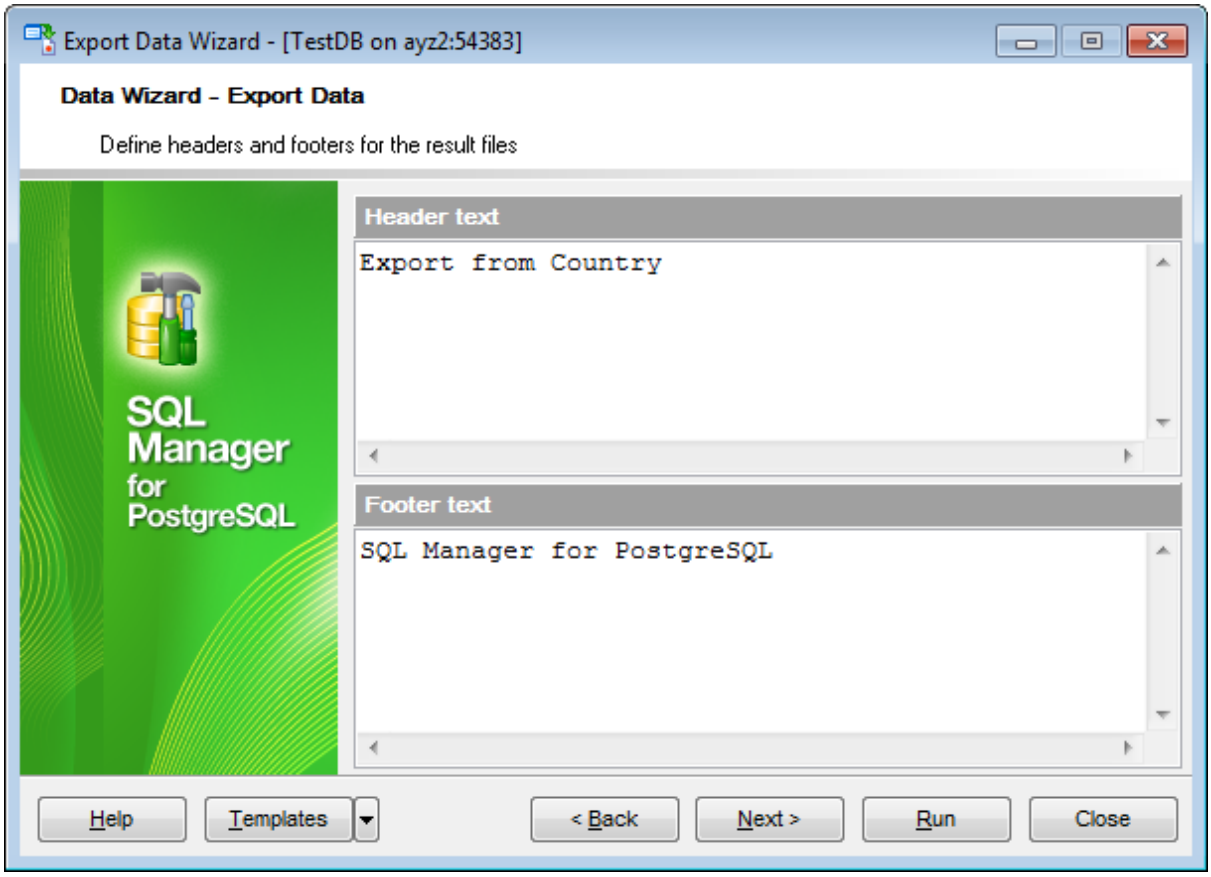
9.1.4 Setting header and footer

Set **Header text** and **Footer text** for the result file. This text will appear at the beginning and at the end of the result file respectively.



Click the **Next** button to proceed to Setting format-specific options 542.

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9.1.5 Setting format-specific options

This step of the wizard allows you to customize **Format-specific options**:

- Excel 97-2003 options 543
- Access options 558
- RTF options 559
- HTML options 562
- PDF options 568
- TXT options 570
- CSV options 571
- XML options 572
- MS Excel / ODS options 573
- MS Word / ODT options 576

To get more information about the file formats, see the Supported file formats 983 page.

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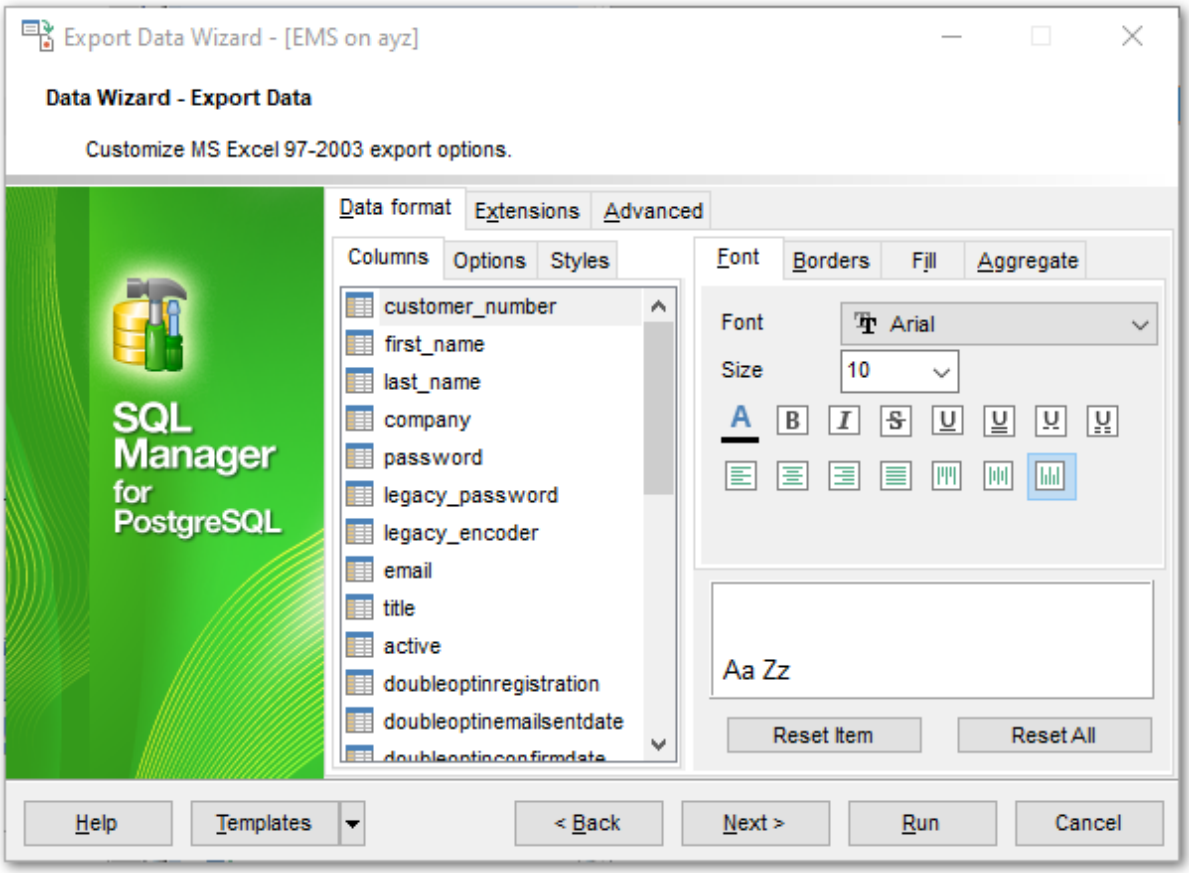
9.1.5.1 Excel 97-2003 options

This step allows you to set options for the target **MS Excel 97-2003** (*.xls) file.

You can customize **Data format**, **Extensions** and set **Advanced** options available within the corresponding tabs:

- Data format 544
- Extensions 548
- Advanced 557



When you are done, click the **Next** button to proceed to Setting common export options 579.

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9.1.5.1.1 Data format

The **Data Format** tab contains general options which allow you to adjust the format for each kind of Excel cells. This means that you can specify such parameters as *font*, *borders*, *filling color* and *method*, etc. for each entity (such as *data column*, *header*, *footer*, *caption*, *data*, *hyperlink* and so on) separately. Also it is possible to create *styles* to make the target Excel file striped by columns or rows.

- Columns 544
- Options 546
- Styles 547

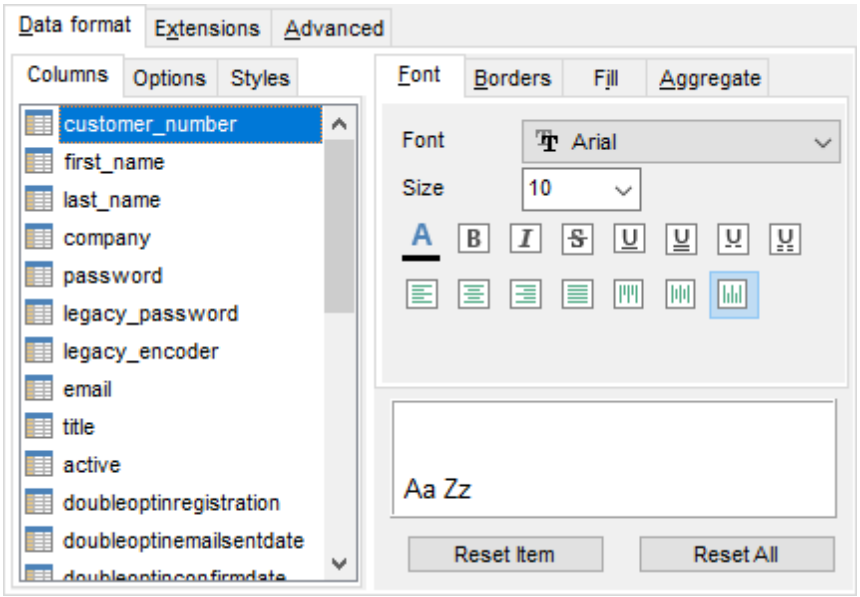
For your convenience the previews illustrating the changes are displayed in the **Sample Group** area on each page of **Data Format** tab.

9.1.5.1.1.1 Columns

Using the **Columns** tab you can set *font* options, *border* and *fill* options and *aggregate functions* for all the **columns** you want to export.

The **Font** tab allows you to specify properties of the font that will be used in the output Excel file cells.

Use the **Font** and **Size** drop-down lists to select the *font* and *size* to be applied to the output text.
Use the buttons below to set *font color*, make text *bold*, *italicized*, *strikethrough* text, set *underline* effects, specify text *horizontal* and *vertical align*.



The **Borders** tab allows you to specify properties of the borders of the output Excel file cells.

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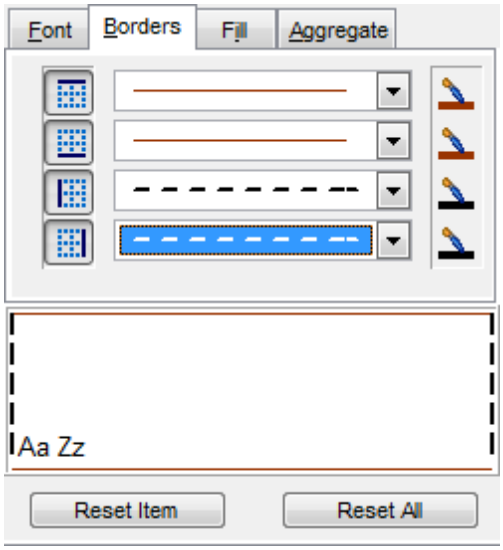
Press the buttons on the left to show/hide the borders they indicate.

Use the drop-down list for each border to select the *line type* and the button on the right to select the *line color* for each border.

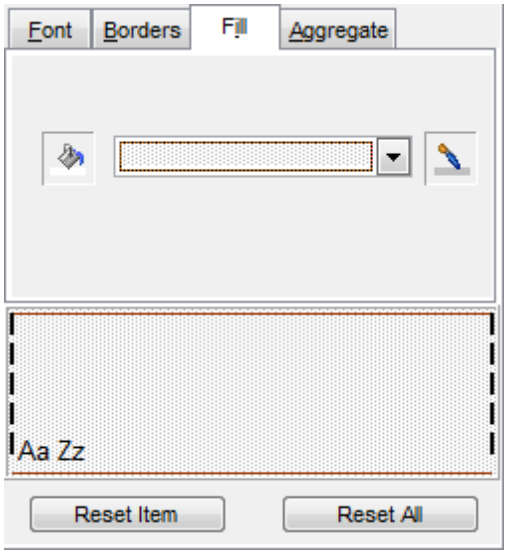


The **Fill** tab allows you to specify the fill pattern for the output Excel file cells.

Use the drop-down list to select the preferable fill pattern type.

Press the button on the left to set the background color for the fill pattern.

Press the button on the right to set the foreground color for the fill pattern.



The **Aggregate** tab allows you to specify an aggregate function for the field in the output Excel file.

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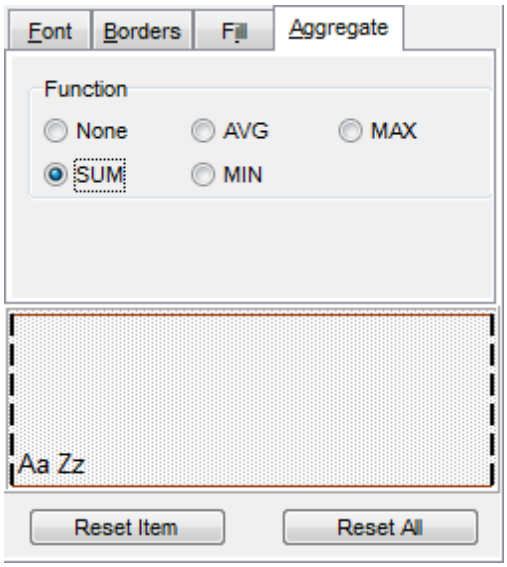
Select a **function** that will be applied to the field:

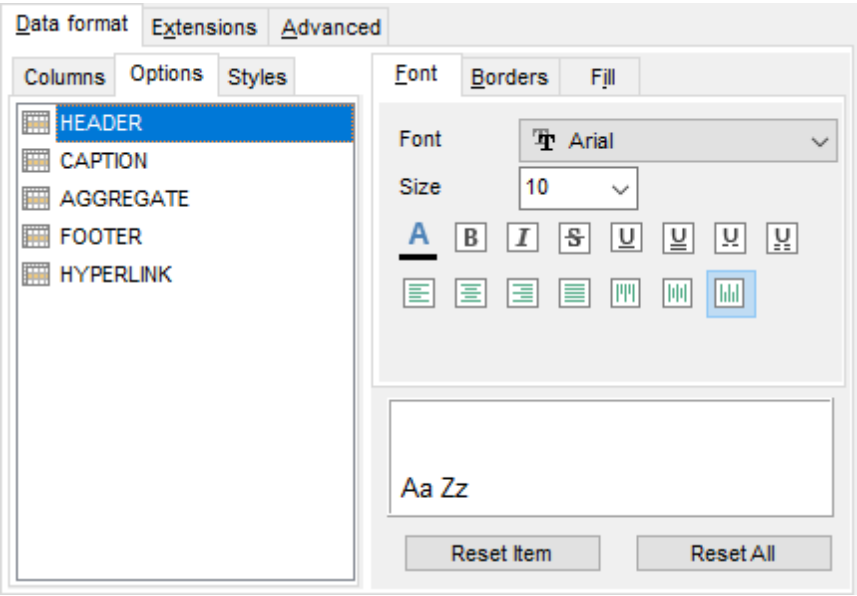
- *None*
- *AVG*
- *MAX*
- *SUM*
- *MIN*



You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

9.1.5.1.1.2 Options

Using the **Options** tab you can set *font* options, *border* and *fill* options for all **elements** of the Excel sheet (*header*, *caption*, *footer*, *aggregates* and *hyperlinks*).



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The **font**, **borders** and **fill** options are specified in the same way as for output **Columns**. For details refer to the Columns[544] page.

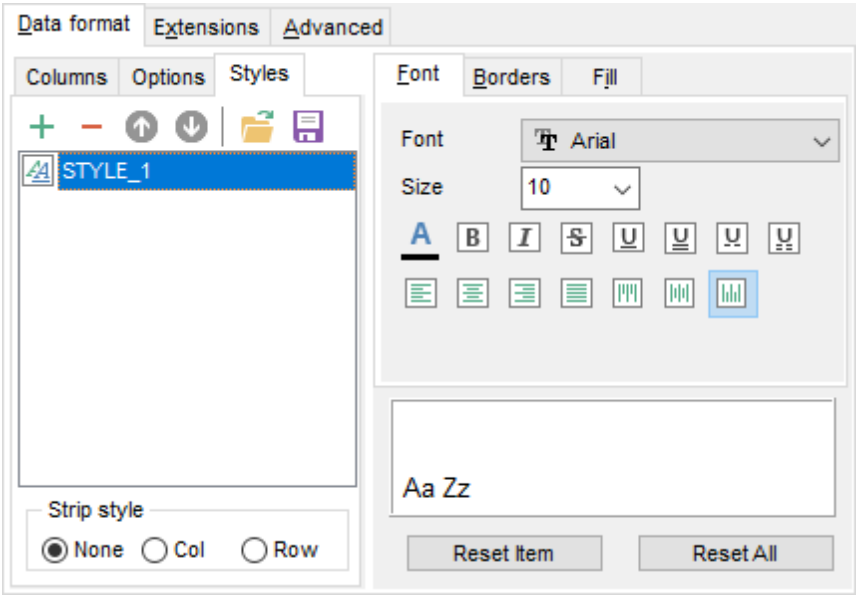
You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

9.1.5.1.1.3 Styles

Using the **Styles** tab you can make a style template: set *font* options, *border* and *fill* options and save them.

To add a style template, click the **Plus** button.
To delete a style template, select it and click the **Minus** button.
To reorder style templates in the list, use the buttons.
To load a style template, click the button.
To save the current style template, click the button.

If you have created or loaded more than one style template, they can be ignored, or used *column-by-column* or *row-by-row* (it depends on the **Strip type** selection).



The **font**, **borders** and **fill** options are specified in the same way as for output **Columns**. For details refer to the Columns[544] page.

You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

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9.1.5.1.2 Extensions

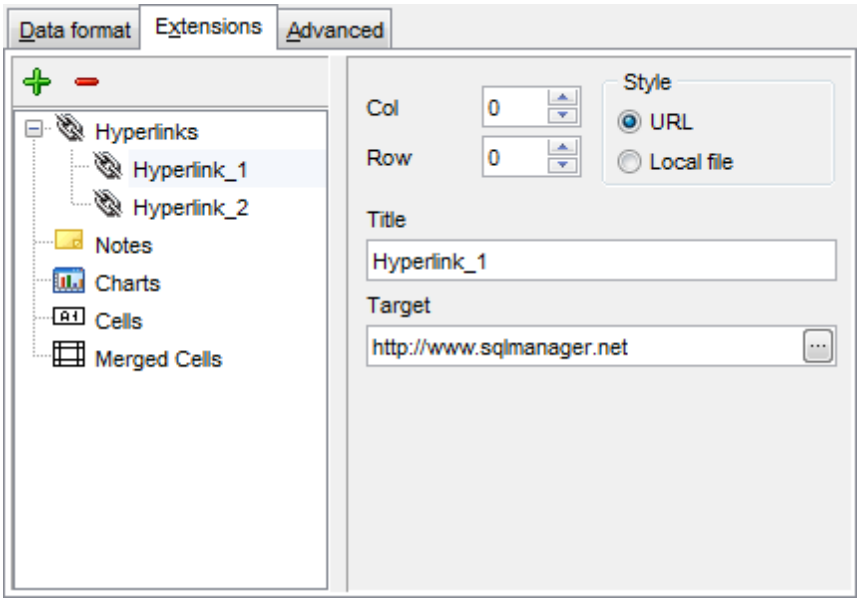
The **Extensions** tab provides an ability to add hyperlinks[548] and notes[549] and to any cell of the target file, to specify a value of a cell, to create a chart[551] and to merge cells[555].

Click the **Plus** button to add an element;
click the **Minus** button to delete an element.

- Hyperlinks[548]
- Notes[549]
- Charts[551]
- Cells[554]
- Merged Cells[555]

9.1.5.1.2.1 Hyperlinks

If you need to create a **hyperlink**:
- set the cell coordinates (*Col* and *Row*);
- specify whether this is a *local* link or *URL*;
- enter the *title* of the hyperlink;
- specify the *target* file location or address.



Use the **Col** and **Row** spinner controls to specify the column and row for the hyperlink in the output file.

The **Style** group allows you to select the preferable hyperlink style:
- *URL*
- *Local file* (i.e. the file is located on your local machine or on a machine in the LAN)

Use the **Title** box to specify the hyperlink name.

The **Target** box lets you enter the path to the target file or URL. Use the button to

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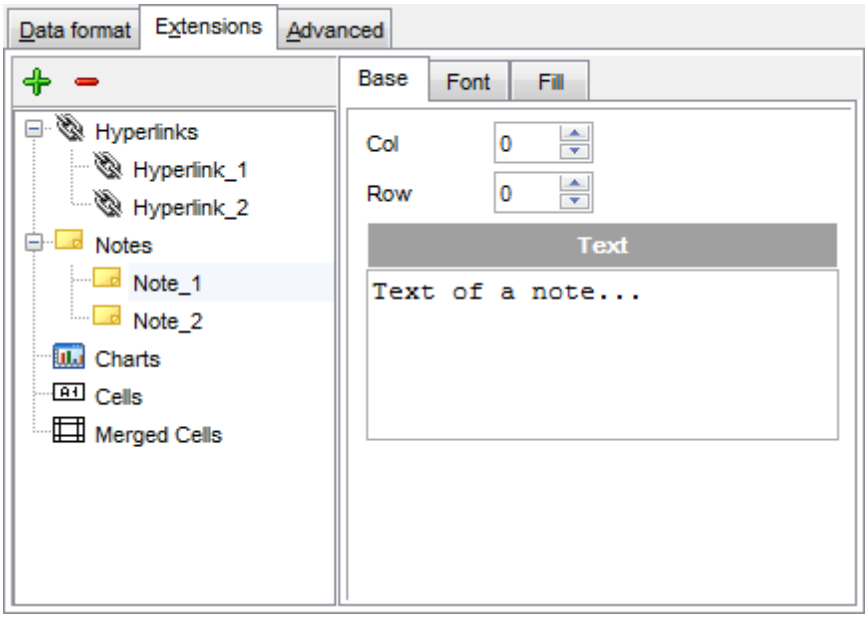
check whether the specified location is available.

9.1.5.1.2.2 Notes

If you need to create a **note**:
- set the cell coordinates (*Col* and *Row*);
- enter *text* of a note for the cell;
- set the *font* and *fill* properties using the corresponding tabs.

The **Base** tab allows you to specify basic properties of the note to be added to the output Excel file.

Use the **Col** and **Row** spinner controls to specify the column and row for the note in the file.
Use the edit-box below to enter the text of the note.



The **Font** tab allows you to specify properties of the font that will be used for the note.

Use the **Font** and **Size** drop-down lists to select the *font* and *size* to be applied to the output text.
Use the buttons below to set *font color*, make text *bold*, *italicized*, *strikethrough* text, set *underline* effects, specify text *horizontal* and *vertical align*.

The **Orientation** group allows you to select the note text orientation:
- *No rotation*
- *Top to bottom*
- *Counterclockwise*
- *Clockwise*

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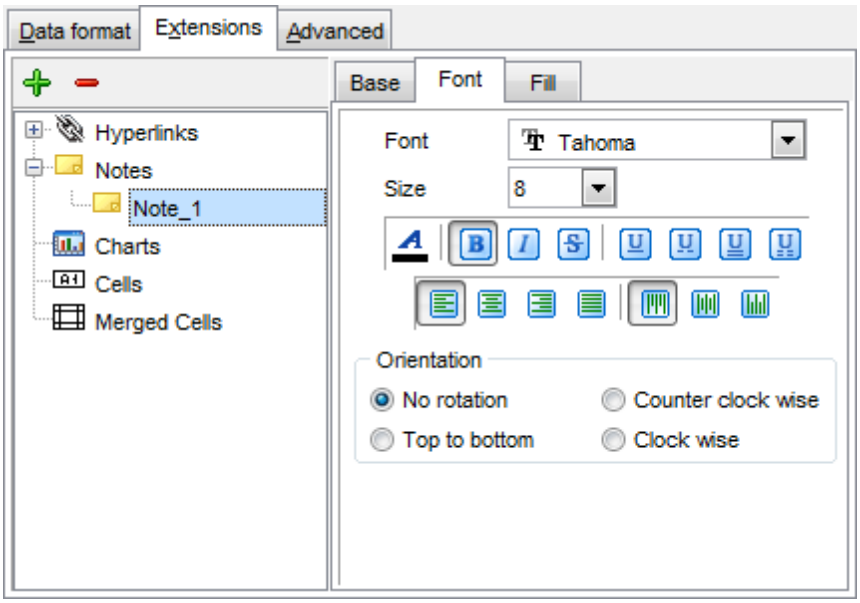

The **Fill** tab allows you to specify the fill type and transparency for the note.

The **Fill Type** group allows you to select whether the fill color will be **solid** or **gradient**:
- *Horizontal*
- *Vertical*
- *Diagonal up*
- *Diagonal down*
- *From corner*
- *From center*

Press the button to set the background color for the fill pattern.

Press the button to set the foreground color for the fill pattern.

The **Transparency** control allows you to set the transparency degree for the note. Move the slider between the **0%** and **100%** threshold values to select the required transparency value within this scope.

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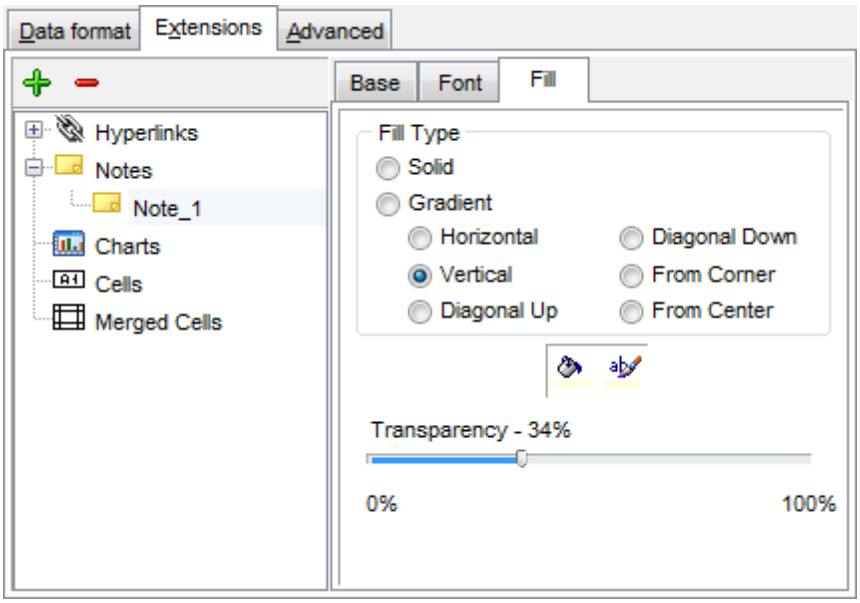

9.1.5.1.2.3 Charts

If you need to create a **chart**:

- enter the chart *title*;
- select the chart style;
- set the legend position;
- specify if you want to show the legend;
- specify if you want to set the chart color automatically;
- define the chart *position* and *category labels* using the corresponding tabs.

The **Base** tab allows you to specify basic properties of the chart to be added to the output Excel file.

Use the **Title** box to specify the chart name.
Use the **Style** drop-down list to select the preferable chart style (*Column*, *Column 3D*, *Bar*, *Bar 3D*, *Line*, *Line Mark*, *Line 3D*, etc.).

The **Legend position** group allows you to specify position of the chart legend:

- *Bottom*
- *Top*
- *Left*
- *Corner*
- *Right*

Show legend
This options specifies whether the chart legend will be visible or not.

Auto color
If this option is selected, each series will be automatically differentiated with different colors on the chart, otherwise one color will be applied for all series.

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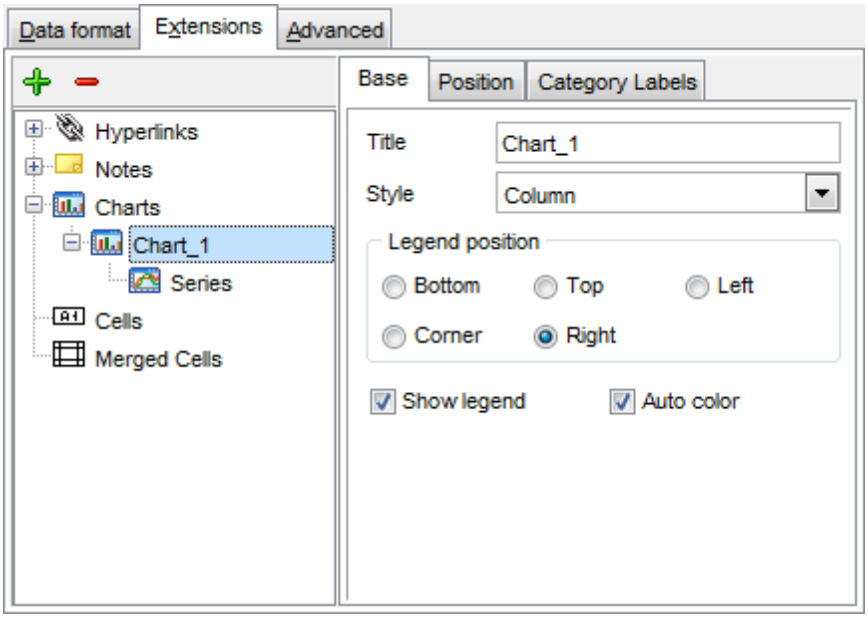

The **Position** tab allows you to specify properties pertaining to the chart position on the output file sheet.

Auto
Specifies automatic position of the chart.

The **Placement** group allows you to specify the chart position relative to the data:
Bottom
Right

Use the **Left** and **Top** spinner controls to specify the spacing between the chart and data at the left and at the top respectively.
Use the **Height** and **Width** spinner controls to specify the chart *height* and *width* respectively.

Custom
Specifies absolute position of the chart (irrelative to the data). Use the spinner controls to set the coordinates you need.

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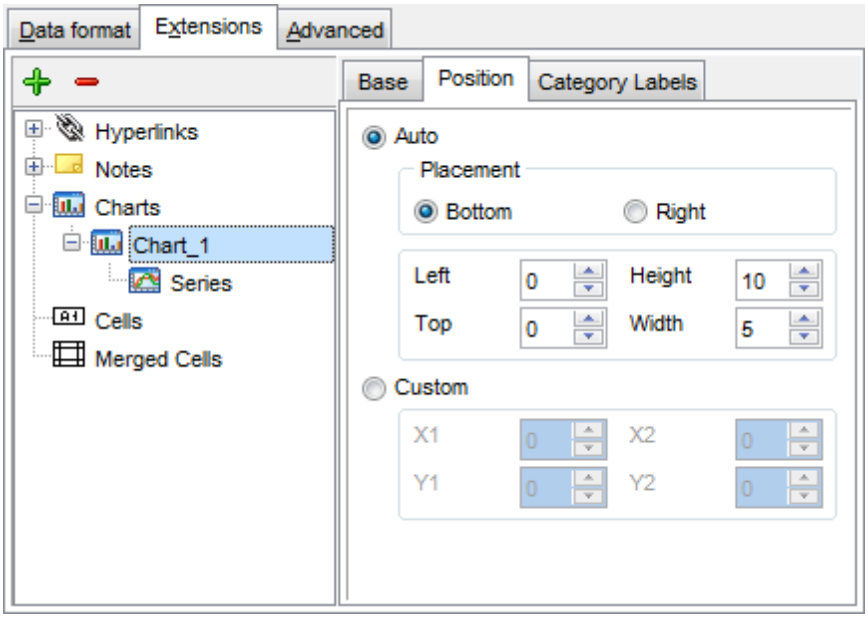
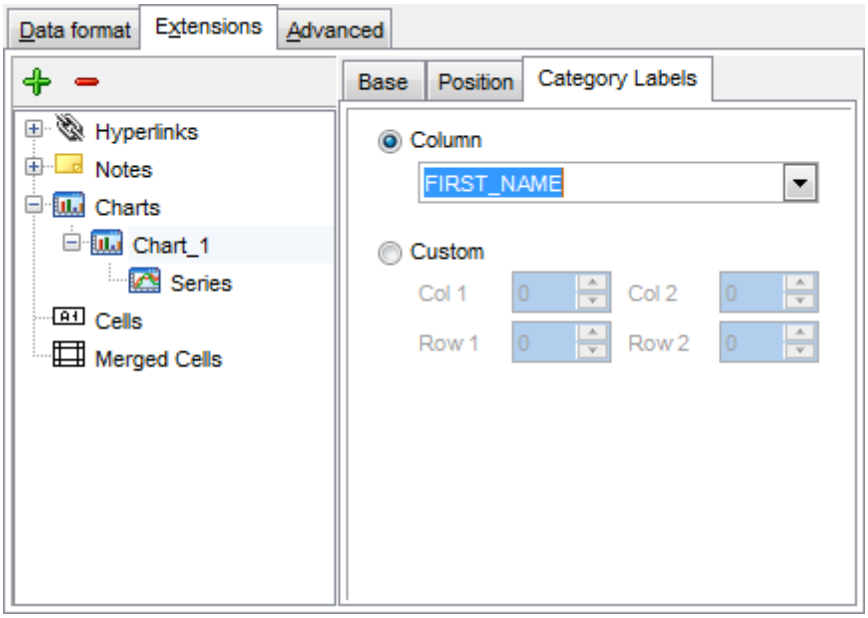


The **Category Labels** tab allows you to specify in which rows and columns the chart will be built.

Column
Use the drop-down list to select the column that will be used to take values for x-axis.

Custom
Specify the range of cells from which x-axis values will be taken. Use the spinner controls to set the range you need.



To build a chart, you also need to create **series** that will be used to take values for y-

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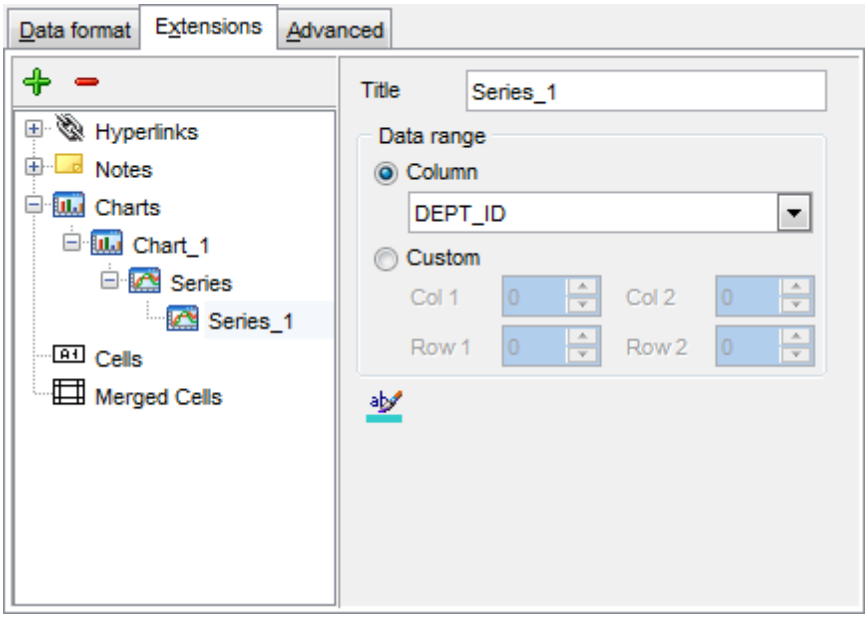
axis. To add **series** for the chart:
- add one or more series using the + button;
- enter the *titles*;
- set data ranges (select a column from the drop-down list or set the custom range);
- define colors for all the graphs.

Use the **Title** box to specify the series name.

Data range

Column
Use the drop-down list to select the column that will be used to take values for the series.
Custom
Specify the range of cells from which the series will be formed. Use the spinner controls to set the range you need.

Press the button to set the color for the series.



9.1.5.1.2.4 Cells

If you need to add a value in a specific cell:
- set the cell coordinates (*Col* and *Row*);
- select the cell type;
- enter a *value*;
- if you are adding a numeric or a date/time value, you can set the cell *format;*
- set the *font*, *borders* and *fill* properties using the corresponding tabs.

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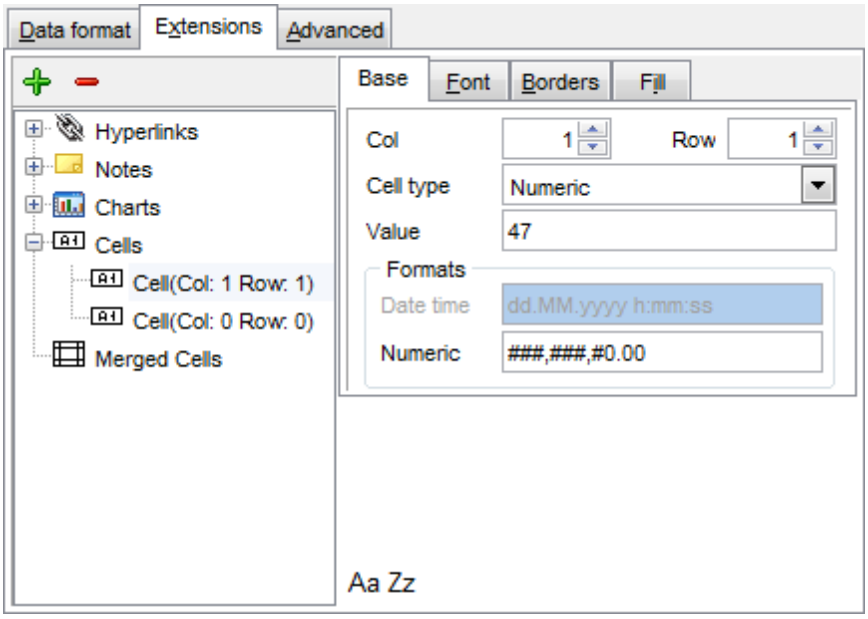

The **Base** tab allows you to specify basic properties of the cell.

Use the **Col** and **Row** spinner controls to specify the column and row denoting the cell.
Use the **Cell type** drop-down list to select the data type for the cell (*Boolean*, *DateTime*, *Numeric* or *String*).
Set the required value in the **Value** edit box.

The **Formats** group allows you to specify data format for numeric or a date/time types.

The **font**, **borders** and **fill** options are specified in the same way as for output **Columns**. For details refer to the Columns 544 page.

9.1.5.1.2.5 Merged Cells

If you want to merge two or more cells, set the range of cell coordinates: *First col*, *Last col*, *First row*, *Last row*. Use the spinner controls to set the range you need.

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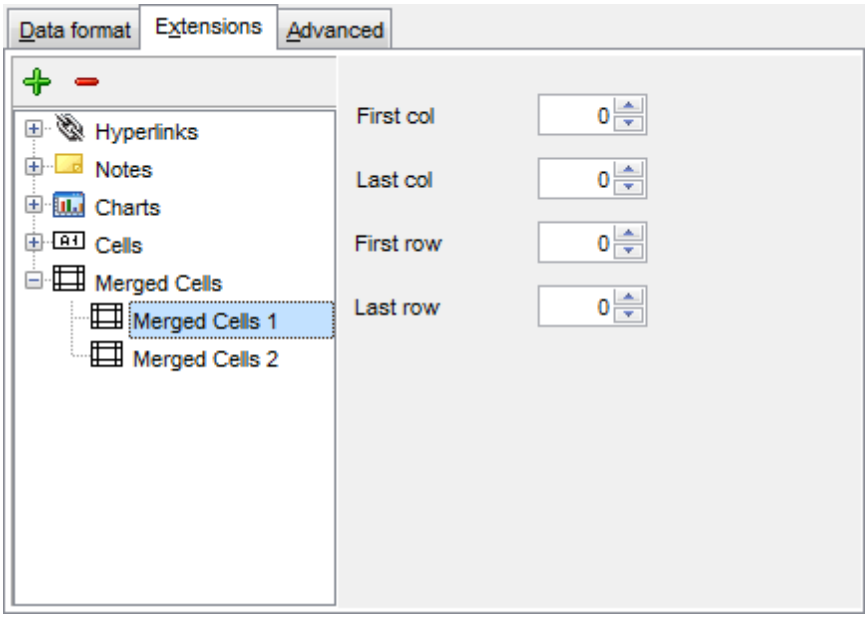

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9.1.5.1.3 Advanced

The **Advanced** tab allows you to set a number of advanced options to be applied to the result MS Excel file.

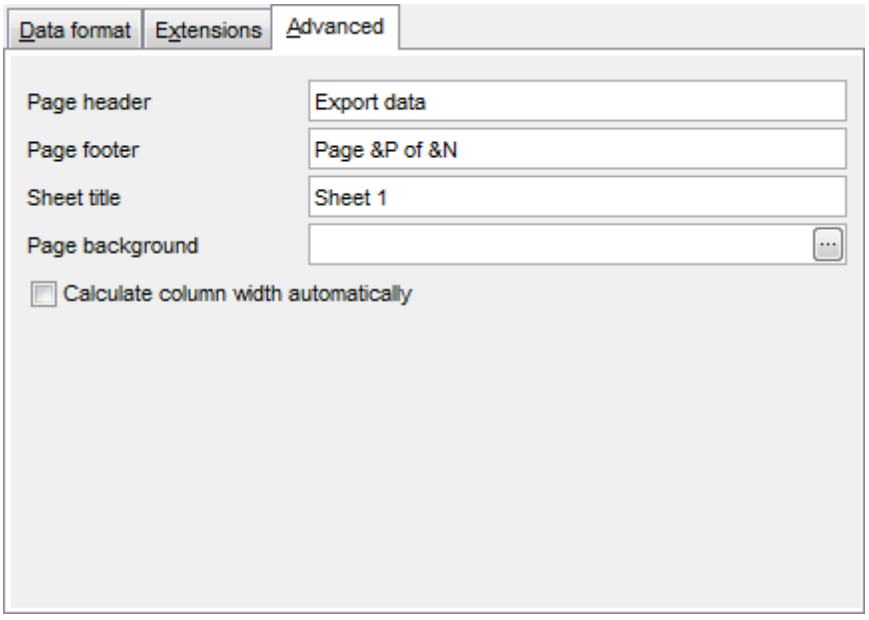
Page header
If necessary, enter some text for the page header.

Page footer
If necessary, enter some text for the page footer.

Hint: It is also possible to set macros in the **Page header** and **Page footer** fields:
&N stands for the quantity of pages;
&P - the number of the current page.

Sheet title
Specify the sheet title for the target file.

Page background
If necessary, use the **Ellipsis** button to browse for a graphical file to be applied as the page background.



Calculate column width automatically
This option allows the wizard to determine column width in the target file automatically according to column size.

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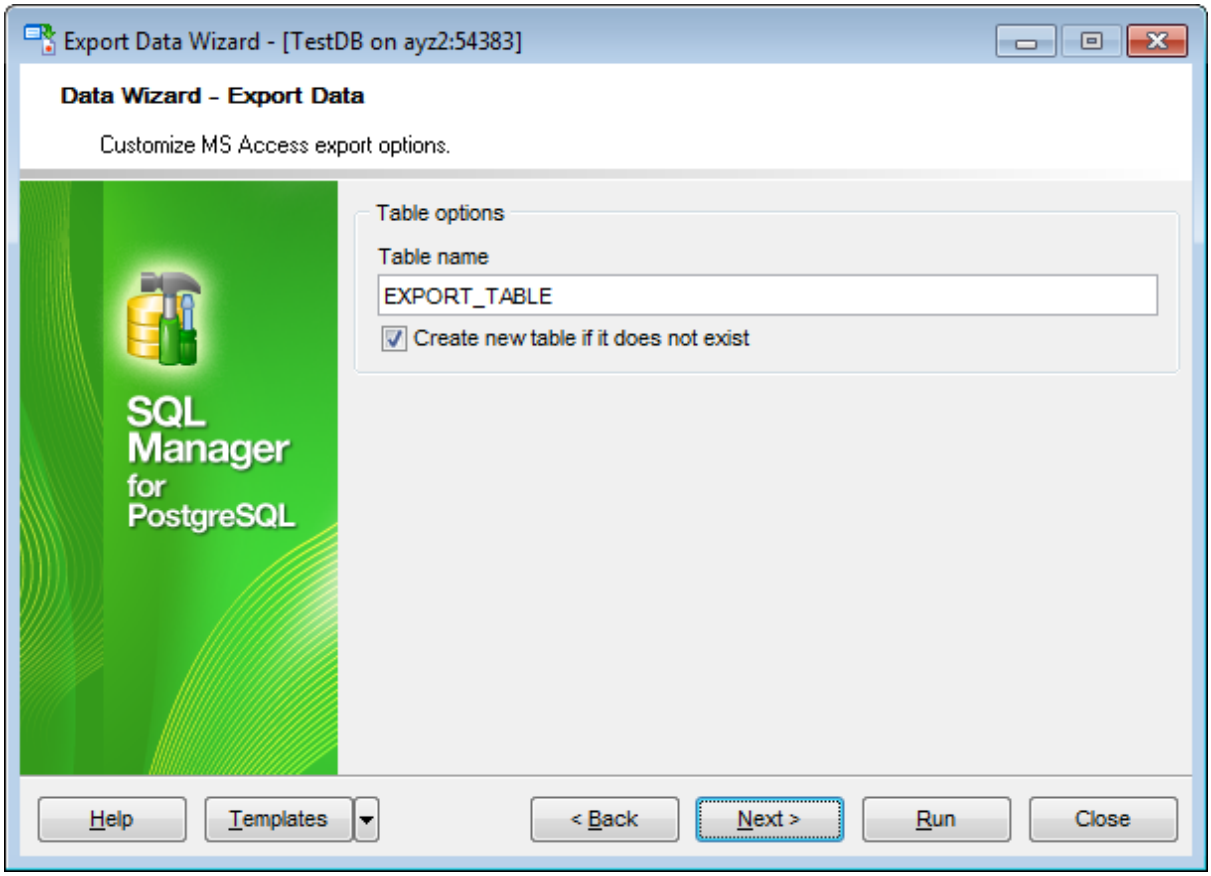
9.1.5.2 Access options

This step allows you to set options for the target **MS Access** (**.mdb, *.accdb*) file.

Set the name for the target table and specify whether the wizard should **create a new table** in the MS Access database if it does not exist yet, or use the existing table to export data into.



When you are done, click the **Next** button to proceed to Setting common export options 579.

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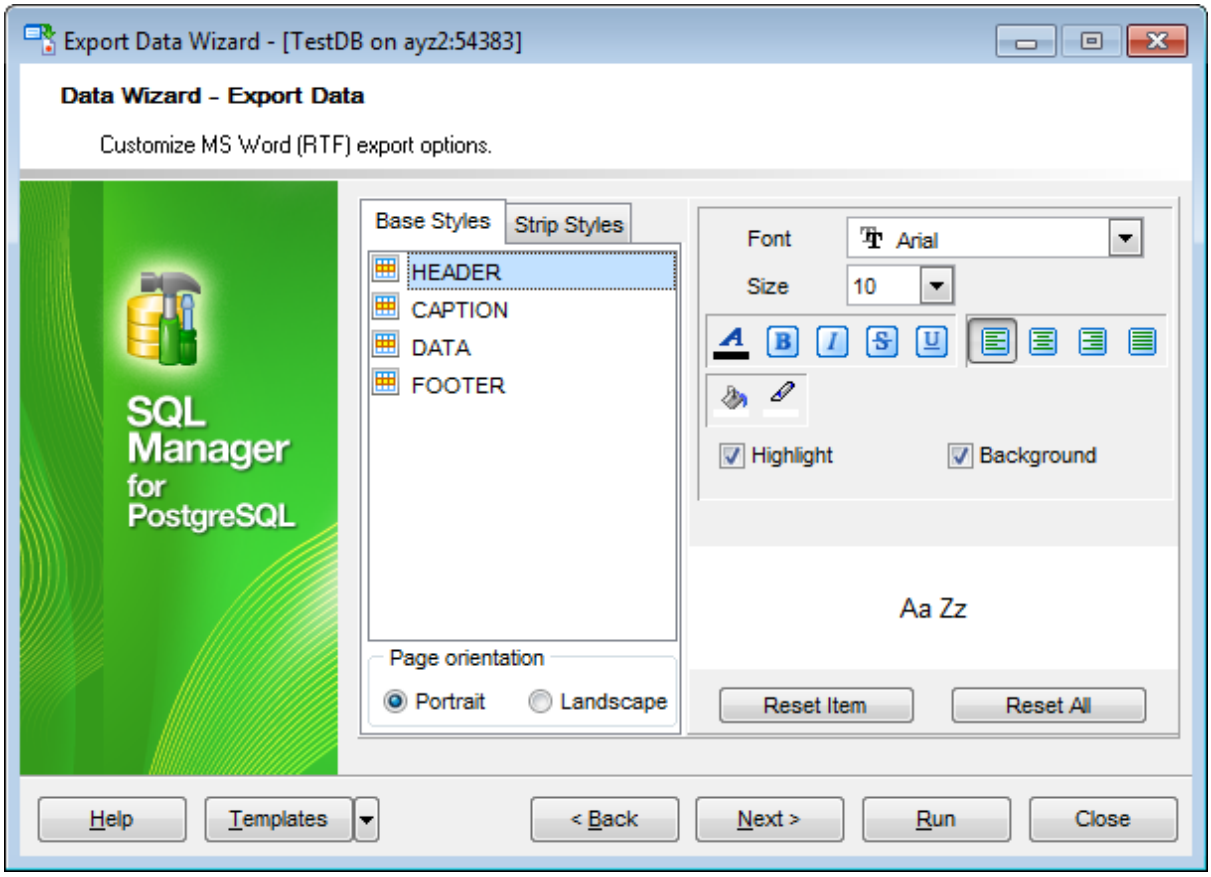
9.1.5.3 RTF options

This step allows you to set options for the target **Rich Text Format** (**.rtf*) files.

- Base Styles 560
- Strip Styles 561

For your convenience the previews illustrating the changes are displayed in the **Sample Group** area within the *Base Styles* and the *Strip Styles* tabs.



When you are done, click the **Next** button to proceed to Setting common export options 579.

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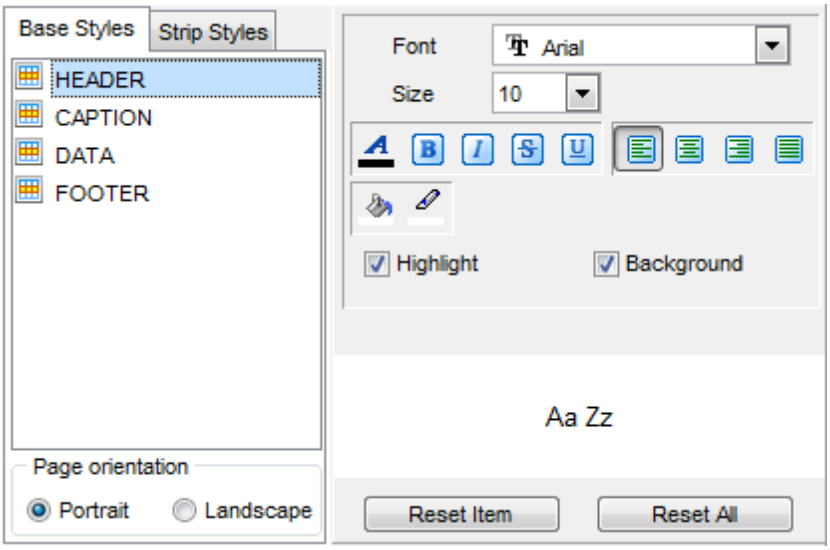
9.1.5.3.1 Base Styles

The **Base Styles** tab contains the list of target file entities: *HEADER*, *CAPTION*, *DATA*, *FOOTER*. You can customize style options, such as *font* and *size*, *background* and *foreground colors*, *text alignment*, etc. for each of them by clicking the corresponding item in the list and setting the options in the right-side panel. You can also switch **page orientation** for the target Word/RTF file using this tab.



Use the **Font** and **Size** drop-down lists to select the *font* and *size* to be applied to the text.
Use the buttons below to set *font color*, make text *bold*, *italicized*, *underlined*, *strikethrough* text, specify *horizontal align*.

Highlight
Enables/disables text highlight.

Background
Enables/disables background for text.

Press the button to set the background color for the text.
Press the button to set the highlight color for the text.

You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

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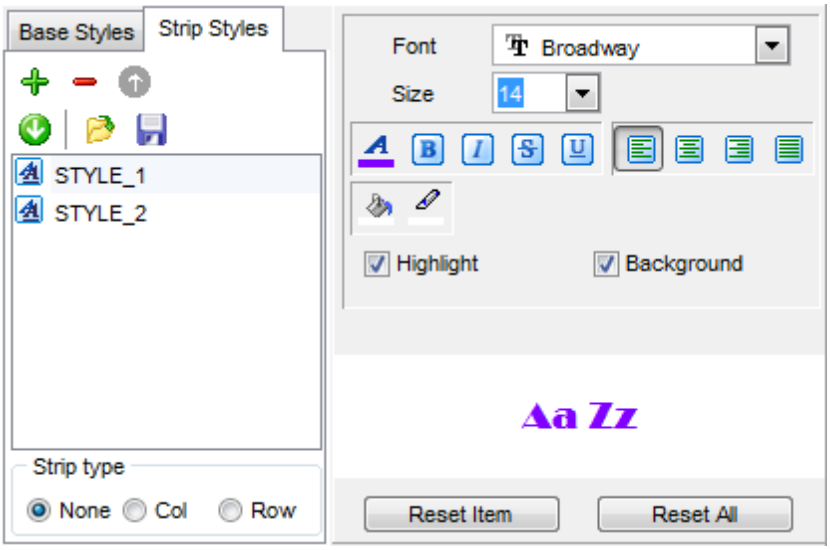
9.1.5.3.2 Strip Styles

Using the **Strip Styles** tab you can create a style template: set *font*, *size*, *background* and *foreground colors*, *text alignment*, *highlight* and save them.

To add a style template, click the **Plus** button.
To delete a style template, select it and click the **Minus** button.
To reorder style templates in the list, use the buttons.
To load a style template, click the button.
To save the current style template, click the button.

If you have created or loaded more than one style template, they can be ignored, or used *column-by-column* or *row-by-row* (it depends on the **Strip type** selection).



You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

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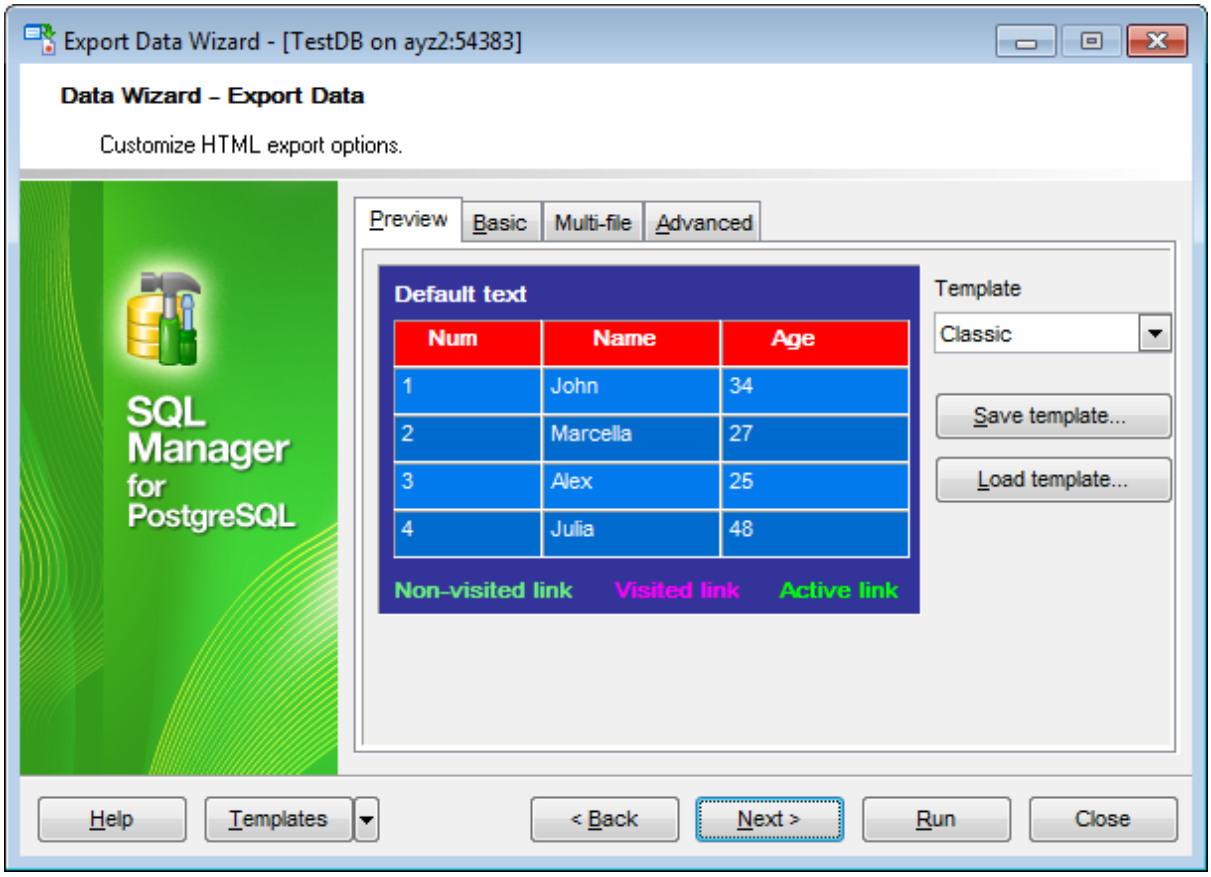
9.1.5.4 HTML options

This step allows you to set options for the target **HTML** (**.html*) file.

- Preview 563
- Basic 564
- Multi-file 565
- Advanced 567



When you are done, click the **Next** button to proceed to Setting common export options 579.

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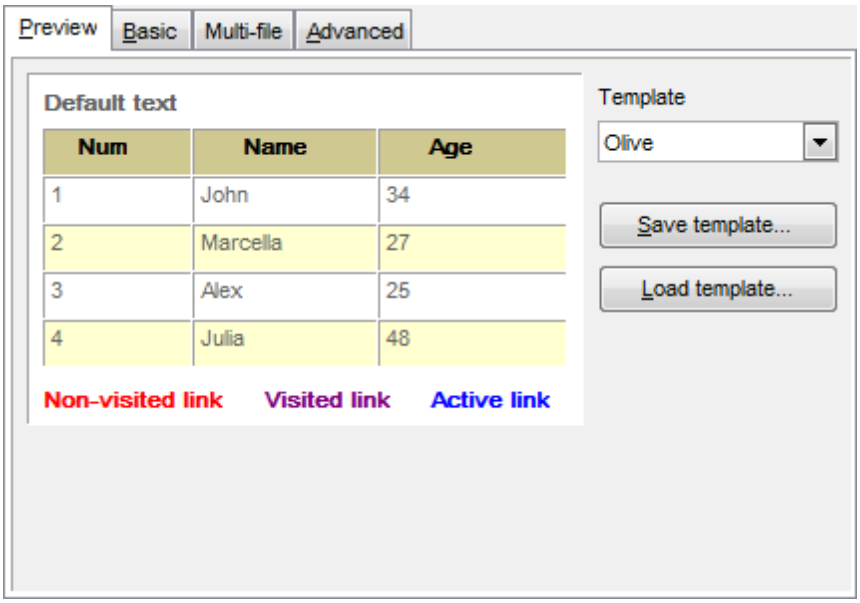
9.1.5.4.1 Preview

The **Preview** tab allows you to customize the style that will be applied to the target HTML file using a number of built-in templates provided in the **Templates** drop-down list.



You can select any of the pre-defined templates and customize it by clicking objects in the preview panel, and save the settings as a custom template using the **Save template...** button. Use the **Load template...** button to load a previously saved custom template from your hard disk.

Click on an element of the table to select the color that will be applied for this element (*background*, *font*, *header row*, *odd row*, *even row*, *non-visited link*, *visited link*, *active link*).

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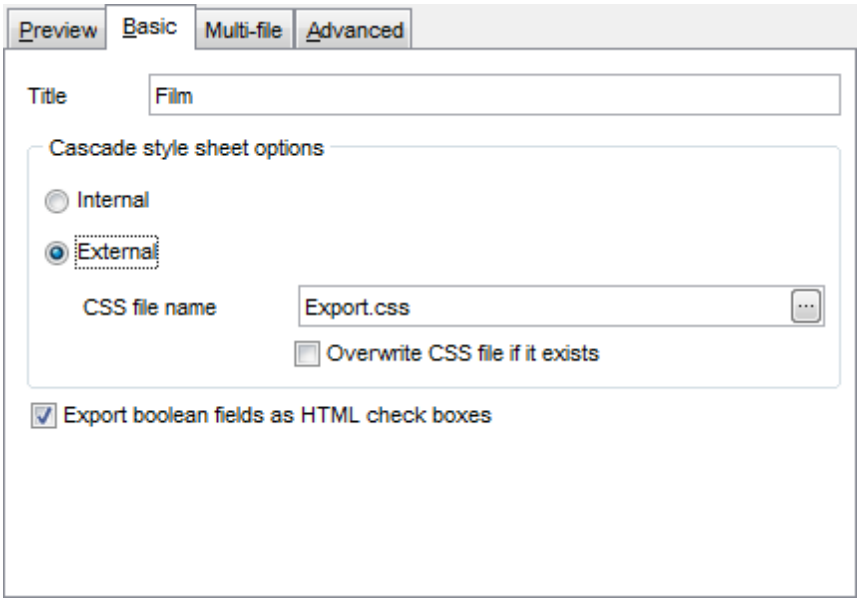
9.1.5.4.2 Basic

The **Basic** tab allows you to specify the basic parameters of target HTML file:

- specify the title of the result file;
- select whether the cascade style sheet (CSS) should be internal or external (the **Ellipsis** button to browse for a **.css* file);
- determine whether boolean columns of the table should be exported as HTML check boxes.



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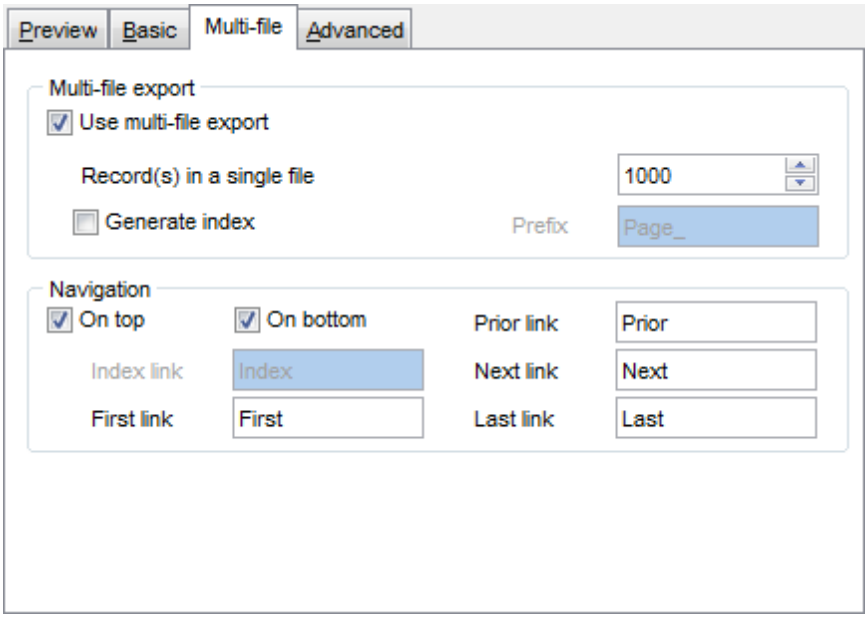
9.1.5.4.3 Multi-file

The **Multi-file** tab provides you with an ability to split the target HTML file into several separate files. This tab allows you to specify the *record count* for a single file, set an option *to generate an index HTML file*, and add an ability to navigate between the exported files.



Multi-file export

Use multi-file export
Enables/disables the multi-file export feature.

Record(s) in a single file
Use the spinner controls to specify the number of records to be exported into each of the files.

Generate index
Specifies that an index file containing links to all the data files will be generated. Use the edit-box next to the checkbox to set a name for the index file.

Navigation

This group allows you to specify properties for navigation elements, i.e. the elements that provide quick access to pages of the multi-file document. Navigation is implemented as a set of hyperlinks.

On top
Specifies that the hyperlinks will be placed at the top of the page.

On bottom
Specifies that the hyperlinks will be placed at the bottom of the page.

Use the **Index link**, **First link**, **Prior link**, **Next link** and **Last link** boxes to specify

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captions for the corresponding navigation elements.

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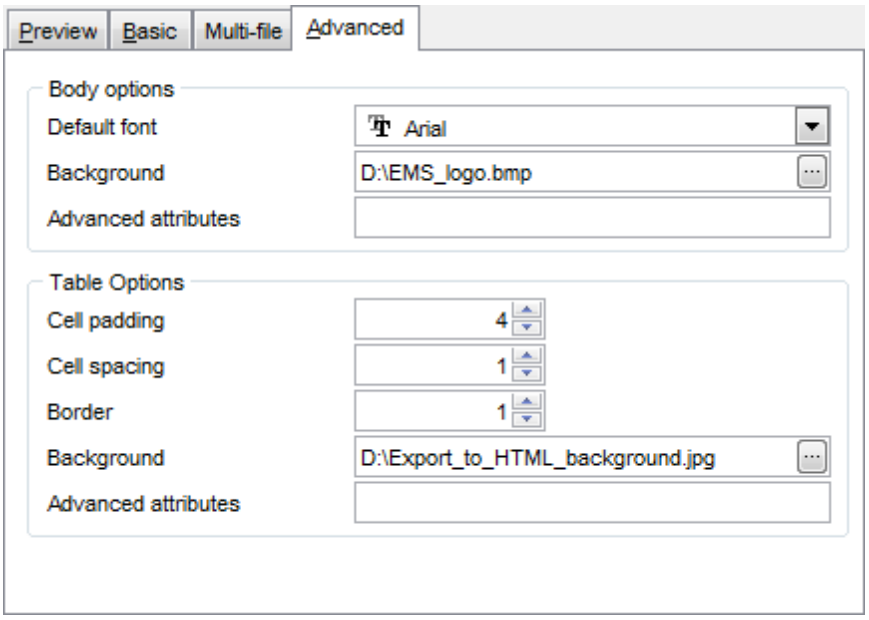
9.1.5.4.4 Advanced

The **Advanced** tab allows you to set a number of advanced options to be applied to the result HTML file.



Body options

Default font
Use the drop-down list to select the font that will be used in the result file by default.

Background
If necessary, use the **Ellipsis** button to browse for a graphical file to be applied as the page background.

Table options

Use the spinner controls to specify common table options: **cell padding**, **cell spacing**, **border**.

Background
If necessary, use the **Ellipsis** button to browse for a graphical file to be applied as the table background.

It is also possible to define **advanced attributes** for both the HTML body and table.

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9.1.5.5 PDF options

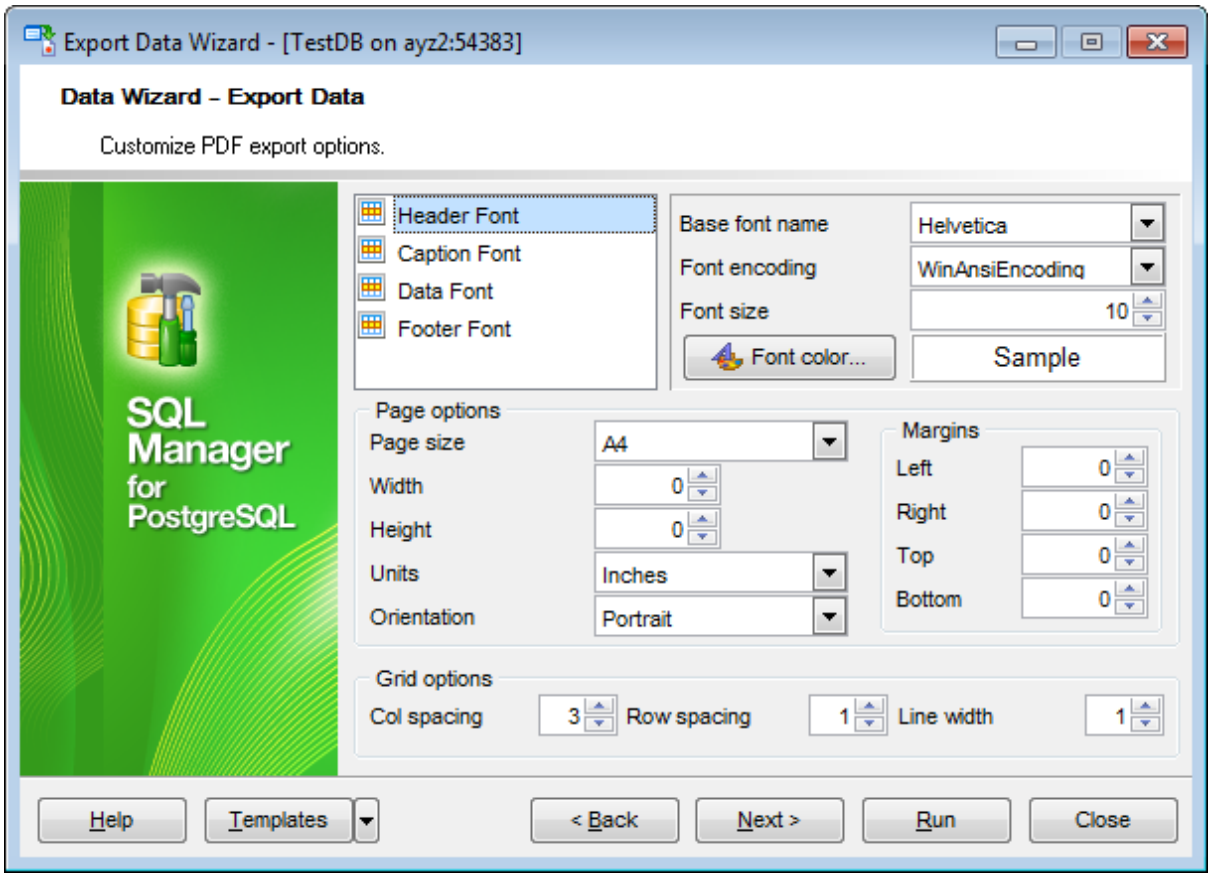
This step allows you to set options for the target **PDF** (**.pdf*) file.

Fonts
This group of options allows you to customize fonts for the *header*, *caption*, *data*, *footer* of the result file.

Use the **Base font name** and **Font encoding** drop-down lists to select the preferable font (*Helvetica*, *Courier*, *Times Roman*, etc.) and encoding (*Standard*, *WinANSI*, *MacRoman*, *PDFDoc*) respectively, and the **Font size** spinner control to specify the font size.

Click the **Font color...** button to select the color to be applied to the font.

For your convenience the preview illustrating the changes is displayed in the **Sample** area.



Page options
Use the **Page size** drop-down list to select one of the standard page formats (*Letter*, *Legal*, *A3*, *A4*, etc.).
Use the **Width** and **Height** spinner controls to specify the page *width* and *height* respectively.
Use the **Units** drop-down list to select the unit of measure that will be used in report

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settings: *inches*, *millimeters*, or *dots*.
Use the **Orientation** drop-down list to select the preferable page orientation: *portrait* or *landscape*.

Margins
Use the **Left**, **Right**, **Top**, **Bottom** spinner controls to specify the corresponding page margins for the output PDF file.

Grid options
Use the **Col spacing**, **Row spacing**, **Line width** spinner controls to specify spacing for grid columns, rows, and grid line width respectively.

When you are done, click the **Next** button to proceed to Setting common export options 579.

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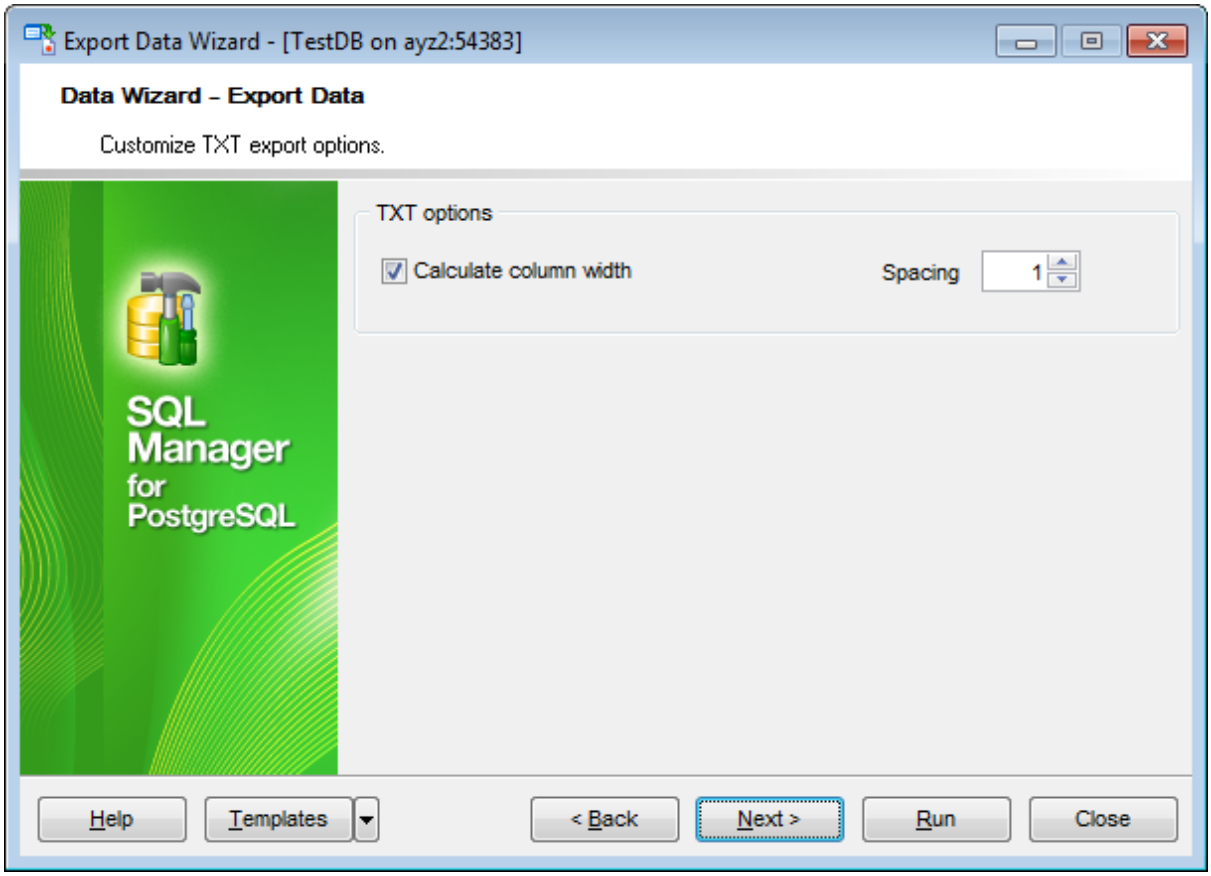
9.1.5.6 TXT options

This step allows you to set options for the target **text** (**.txt*) file.

Set the **Calculate column width** option on if you want each column of the target file to be adjusted to the maximum number of characters in it. The **Spacing** option specifies the number of spaces between columns in the target file.



When you are done, click the **Next** button to proceed to Setting common export options 579.

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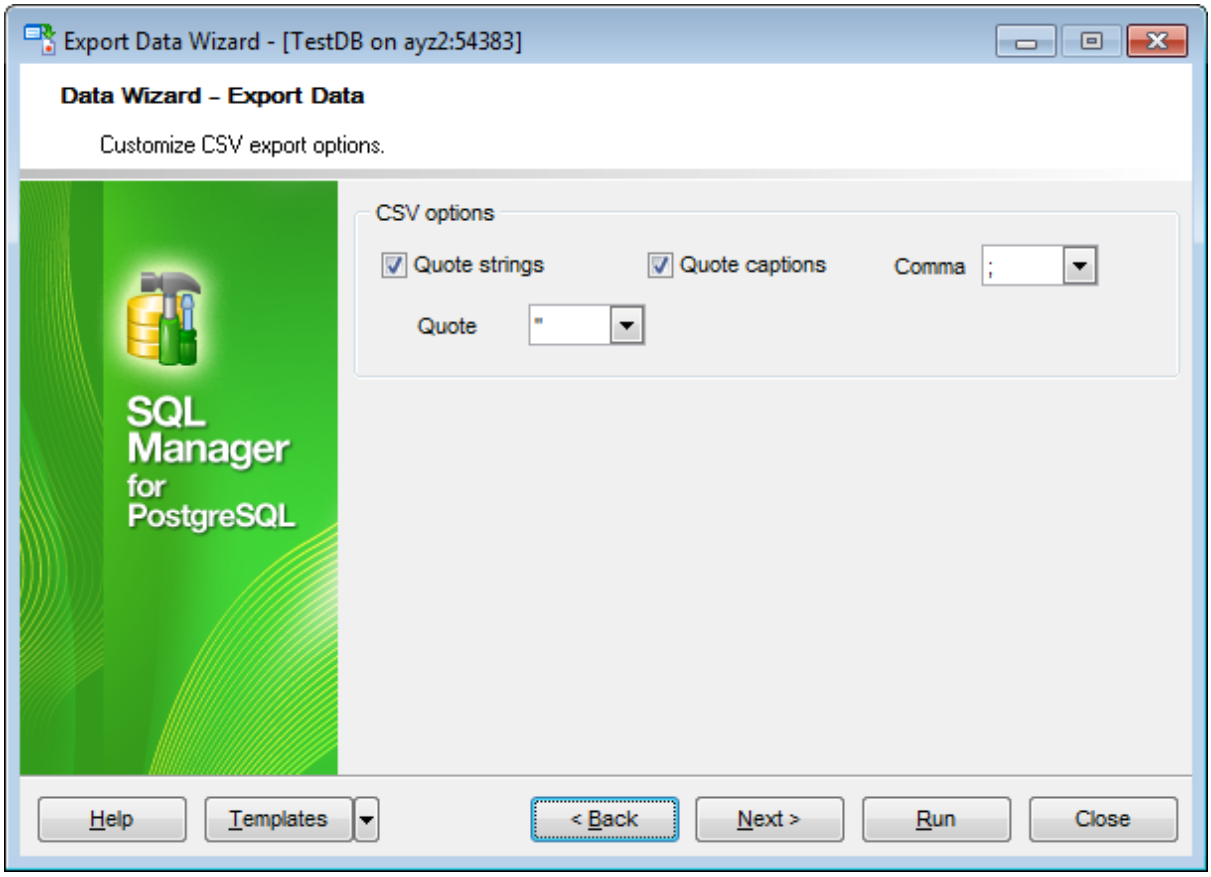
9.1.5.7 CSV options

This step allows you to set options for the target **CSV** (**.csv*) file.

Quote strings
Check this option to apply quoting for string values in the target file.

Specify the column separator using the **Comma** drop-down list and the preferable quote character using the **Quote** drop-down list.



When you are done, click the **Next** button to proceed to Setting common export options 579.

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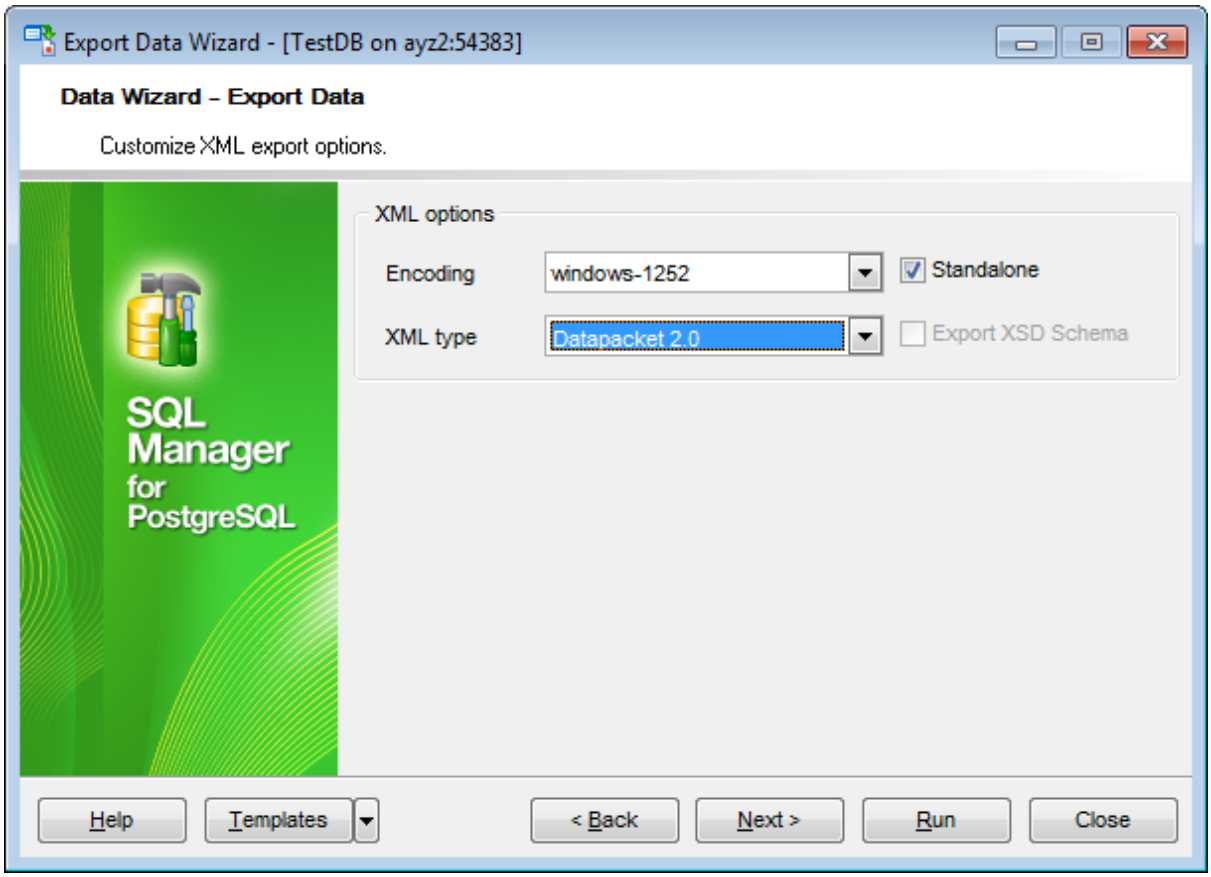
9.1.5.8 XML options

This step allows you to set options for the target **XML** (**.xml*) file.

Specify XML document encoding in the **Encoding** edit box and set the **Standalone** option on if you intend to create a standalone XML document (*standalone="yes"*).

XML type
Select the type of the result XML document: *Datapacket 2.0* or *Access*.
Conversion between generic XML documents and documents of the *XML-Datapacket (CDS)* format can be performed with the help of XML Mapper by Borland®.



When you are done, click the **Next** button to proceed to Setting common export options 579.

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9.1.5.9 MS Excel / ODS options

This step allows you to set options for the target **MS Excel** (**.xlsx*) or **ODF Spreadsheets** (**.ods*) file.

Using the **Base Styles** tab you can set *font* and *border* options for all **elements** of the Excel / ODS sheet (*HEADER*, *CAPTION*, *DATA*, *FOOTER*). You can customize style options, such as *font* and *size*, *background* and *foreground colors*, *text alignment*, etc. for each of them by clicking the corresponding item in the list and setting the options in the right-side panel.

If necessary, you can also specify the **sheet name** for the target Excel / ODS file.

Use the **Font** and **Size** drop-down lists to select the *font* and *size* to be applied to the text.
Use the buttons below to set *font color*, make text *bold*, *italicized*, *underlined*, specify *horizontal* and *vertical align*.

☑ **Background**
Enables/disables background for text.

Press the button to set the background color for the text.
Press the **Wrap Text** button to enable/disable the text wrapping feature.

☑ **Use border**
Select border location

For your convenience the previews illustrating the changes are displayed in the **Sample Group** area within the *Base Styles* and the *Strip Styles* tabs.

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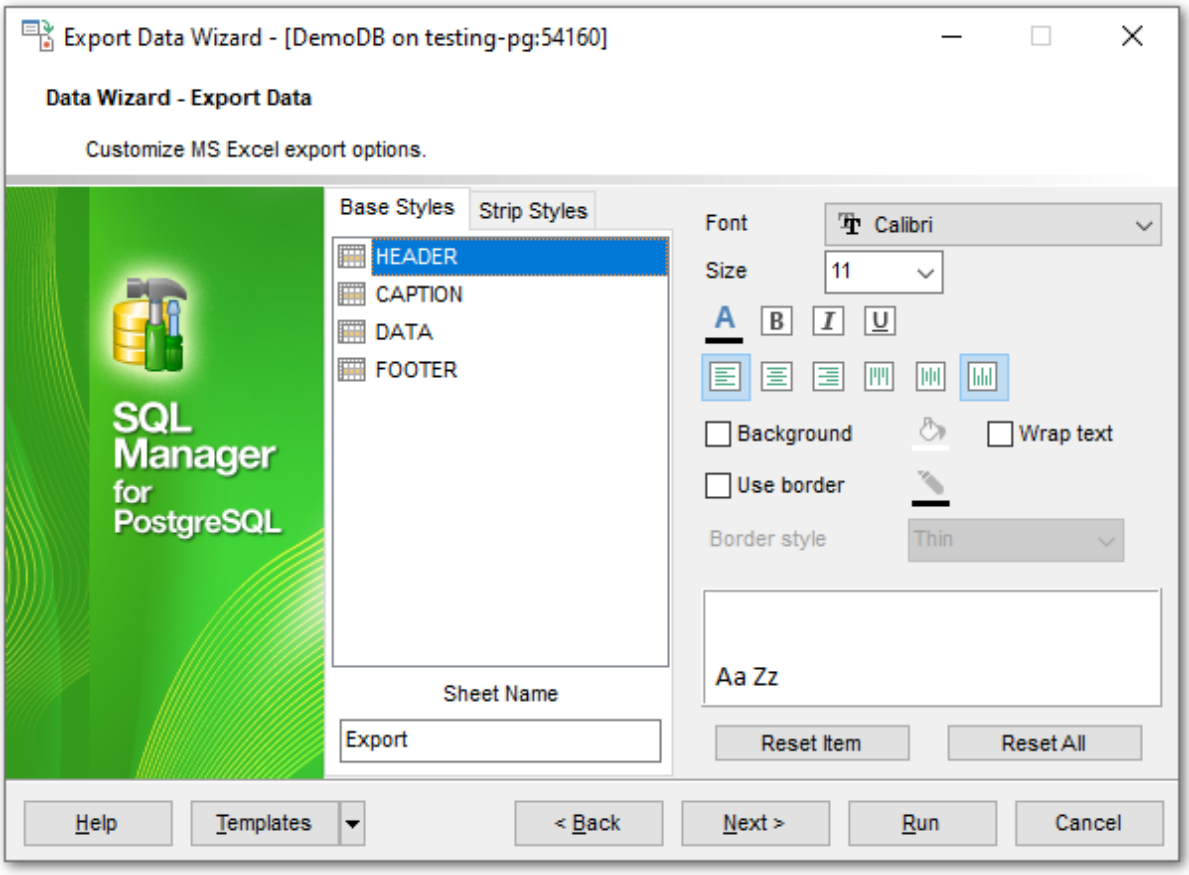

Using the **Strip Styles** tab you can create a style template: set *font*, *size*, *background color*, *text alignment*, *wrap text* options and save them.

To add a style template, click the **Plus** button.
To delete a style template, select it and click the **Minus** button.
To reorder style templates in the list, use the buttons.
To load a style template, click the button.
To save the current style template, click the button.

If you have created or loaded more than one style template, they can be ignored, or used *column-by-column* or *row-by-row* (it depends on the **Strip type** selection).

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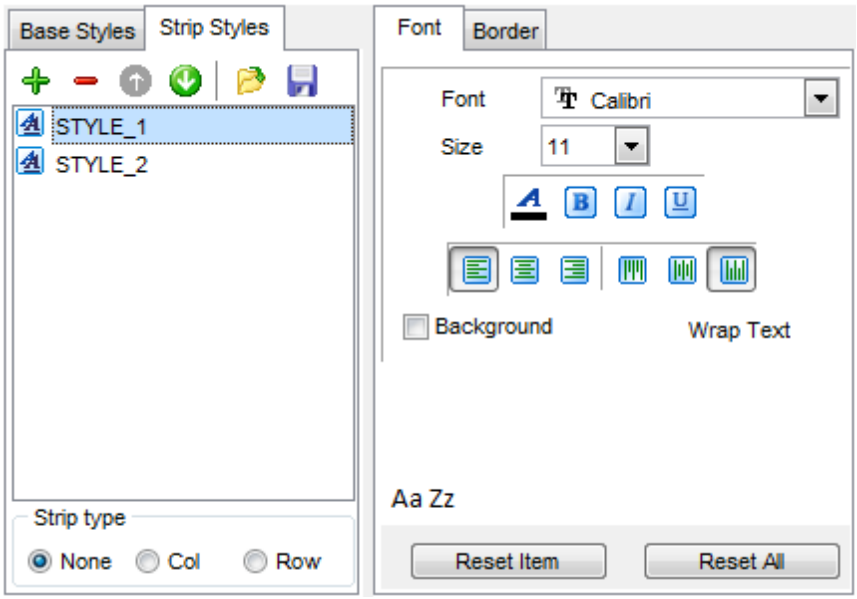
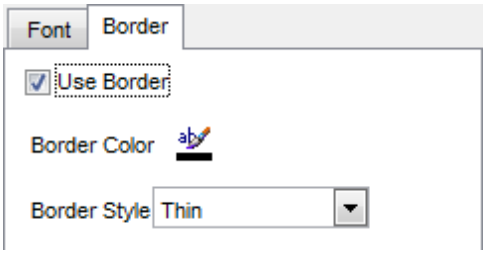


You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

The **Border** tab allows you to specify properties of the borders of the output Excel / ODS file cells.

Use border
Enables/disables borders in the output file.

Press the button to set the color to be applied to the borders.
Use the **Border Style** drop-down list to select the preferable style that will be used for borders (*thin*, *dashed*, *dashdot*, *dotted*, etc.).



When you are done, click the **Next** button to proceed to Setting common export options 579.

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9.1.5.10 MS Word / ODT options

This step allows you to set options for the target **MS Word** (**.docx*) or **ODF text** (**.odt*) file.

Using the **Base Styles** tab you can set *font* options for all **elements** of the Word / ODT document (*HEADER*, *CAPTION*, *DATA*, *FOOTER*). You can customize style options, such as *font* and *size*, *background* and *foreground colors*, *text alignment*, text *highlight*, etc. for each of them by clicking the corresponding item in the list and setting the options in the right-side panel.

Use the **Font** and **Size** drop-down lists to select the *font* and *size* to be applied to the text.
Use the buttons below to set *font color*, make text *bold*, *italicized*, *underlined*, *strikethrough* text, specify *horizontal align*.

☑ **Background**
Enables/disables background for text.
Press the button to set the background color for the text.

☑ **Highlight**
Enables/disables text highlight.
If this option is enabled, you should select the preferable highlight color from the drop-down list.

For your convenience the previews illustrating the changes are displayed in the **Sample Group** area within the *Base Styles* and the *Strip Styles* tabs.

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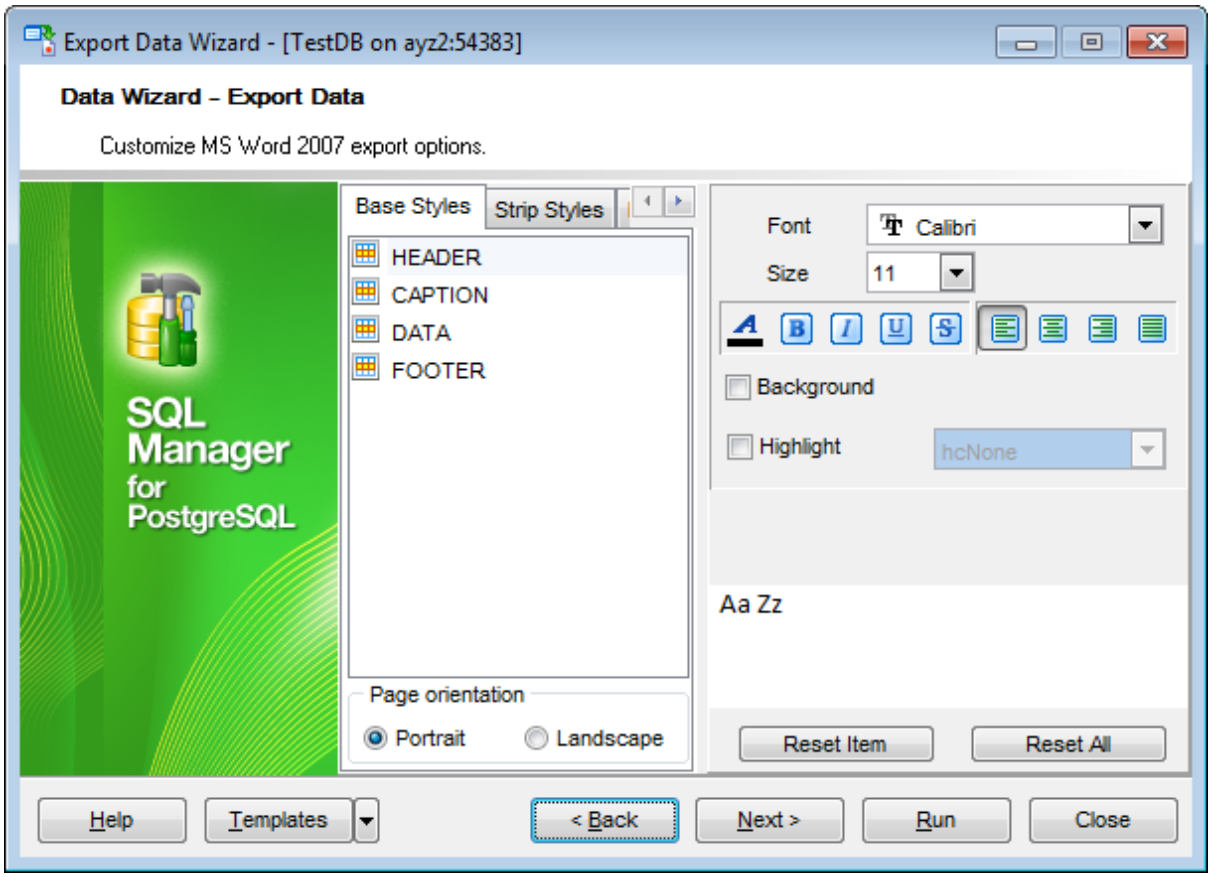

Using the **Strip Styles** tab you can create a style template: set *font*, *size*, *background color*, *text alignment*, *highlight* options and save them.

To add a style template, click the **Plus** button.
To delete a style template, select it and click the **Minus** button.
To reorder style templates in the list, use the buttons.
To load a style template, click the button.
To save the current style template, click the button.

If you have created or loaded more than one style template, they can be ignored, or used *column-by-column* or *row-by-row* (it depends on the **Strip type** selection).

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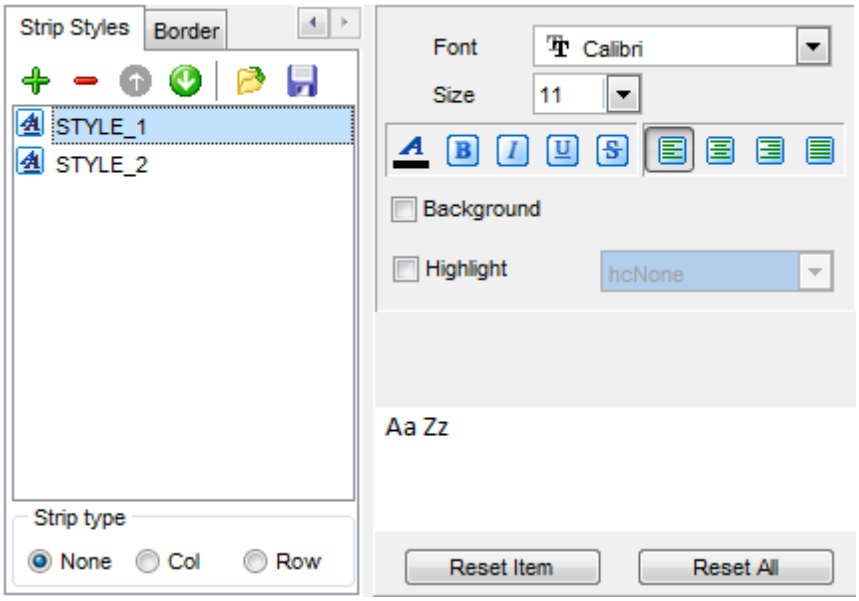
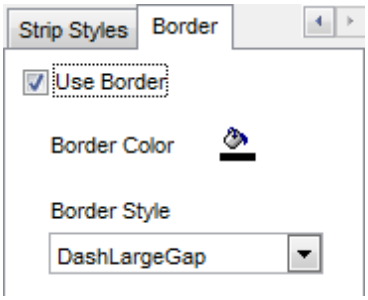


You can reset the changes any time using the **Reset Item** and the **Reset All** buttons.

Using the **Border** tab you can enable borders in the result Word 2007 / ODT document and customize them.

Use border
Enables/disables borders in the output file.

Press the button to set the color to be applied to the borders.
Use the **Border Style** drop-down list to select the preferable style that will be used for borders (*single*, *thick*, *double*, *hairline*, etc.).



When you are done, click the **Next** button to proceed to Setting common export options 579.

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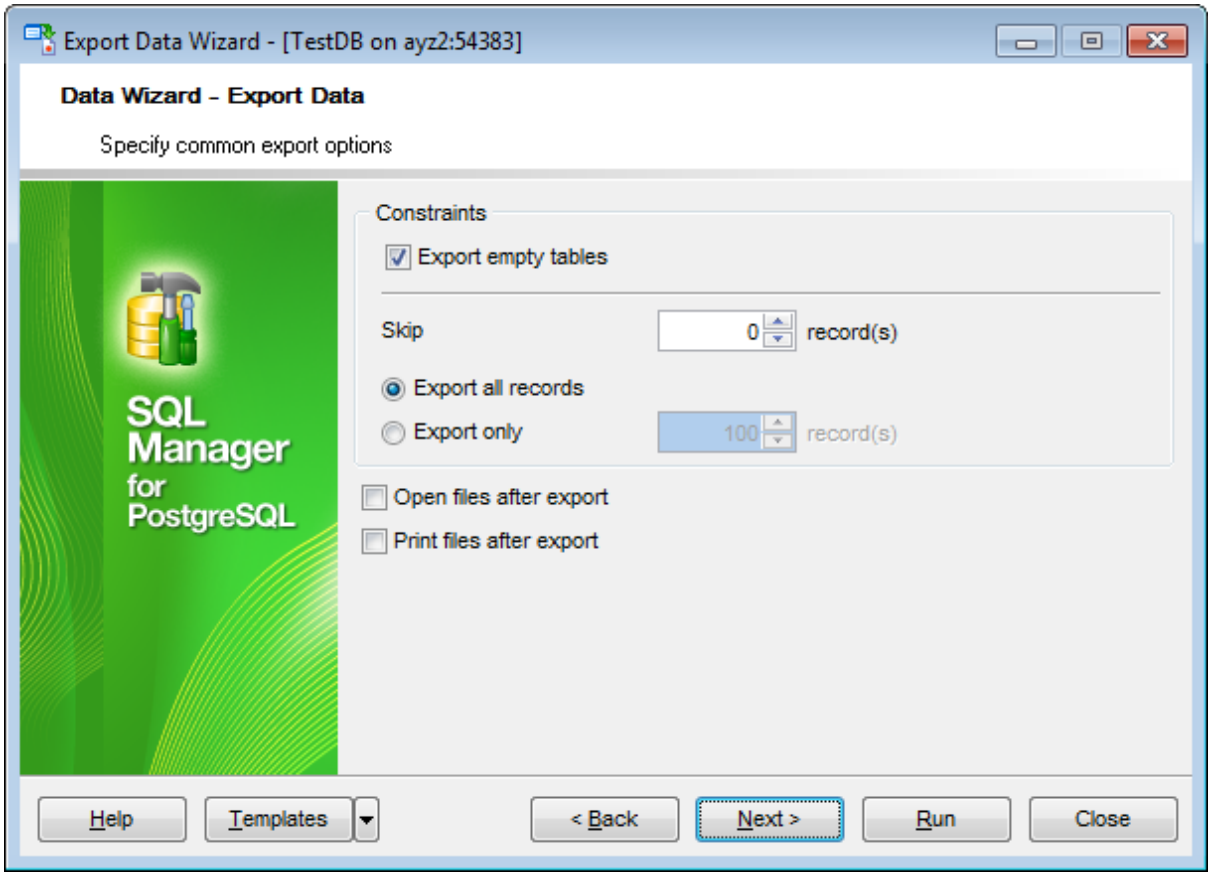
9.1.6 Setting common export options

Use this step of the wizard to set common export options. The detailed description of these options is given below.



Constraints

Export empty tables
If checked, you can export the table even if it does not contain any data.

Skip ... record(s)
Specifies the number of records to be skipped before export starts.

Export all records
Specifies that all records of the table will be exported.

Export only ... record(s)
Specifies the number of records to be exported.

Open files after export
If this option is checked, the result file will be opened with the currently associated program after the export operation is completed.

Print files after export
If this option is checked, the result file will be sent to the default printer after the export operation is completed.

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When you are done, click the **Next** button to proceed to the last step[581] of the wizard.

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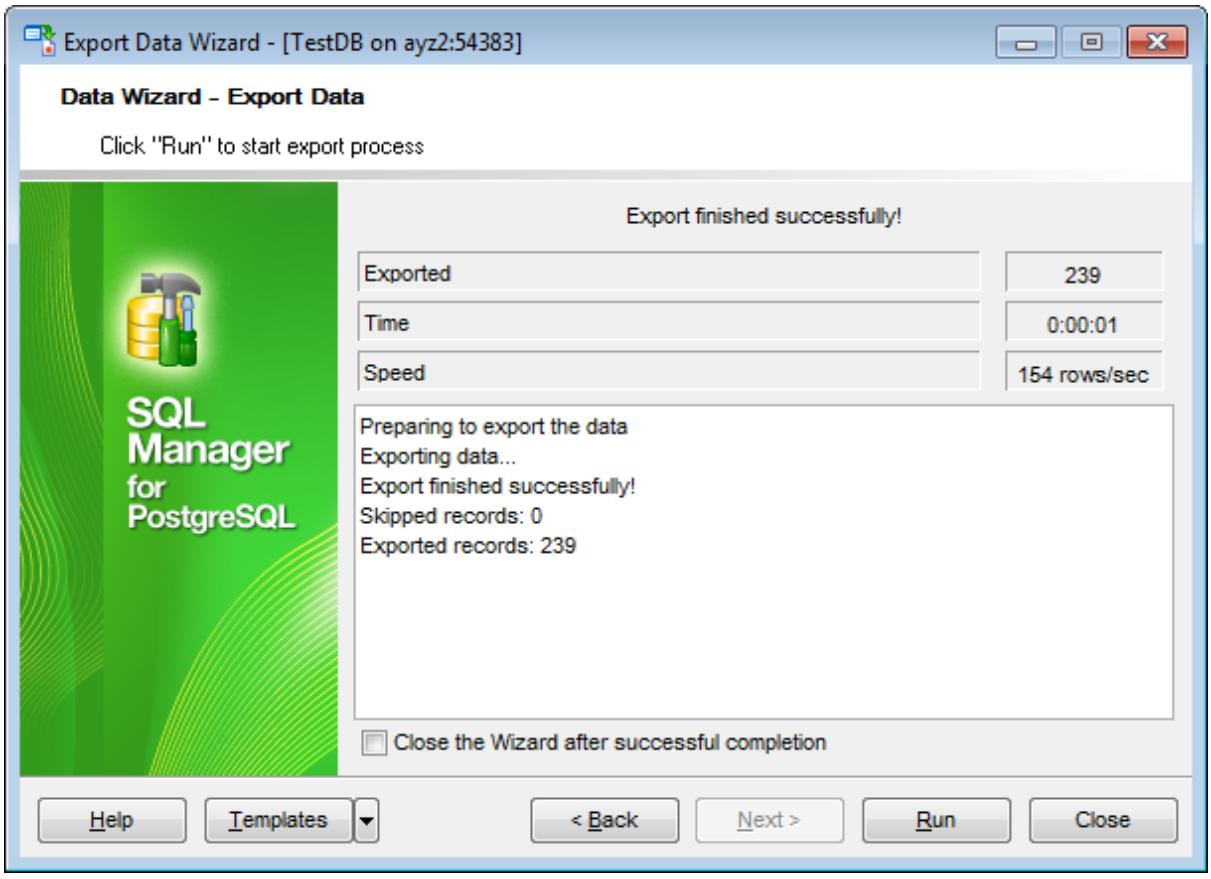
9.1.7 Exporting data

This step of the wizard is intended to inform you that all export options have been set, and you can start the export process.

The log area allows you to view the log of operations and errors (if any).



☑ **Close the Wizard after successful completion**
If this option is selected, the wizard is closed automatically when the export process is completed.

If necessary, you can save a template 982 for future use.

Click the **Finish** button to run the export process.

After the operation is completed, you can view the number of *exported* records, elapsed *time*, estimated export *speed*, and the *log* of operations and errors (if any).

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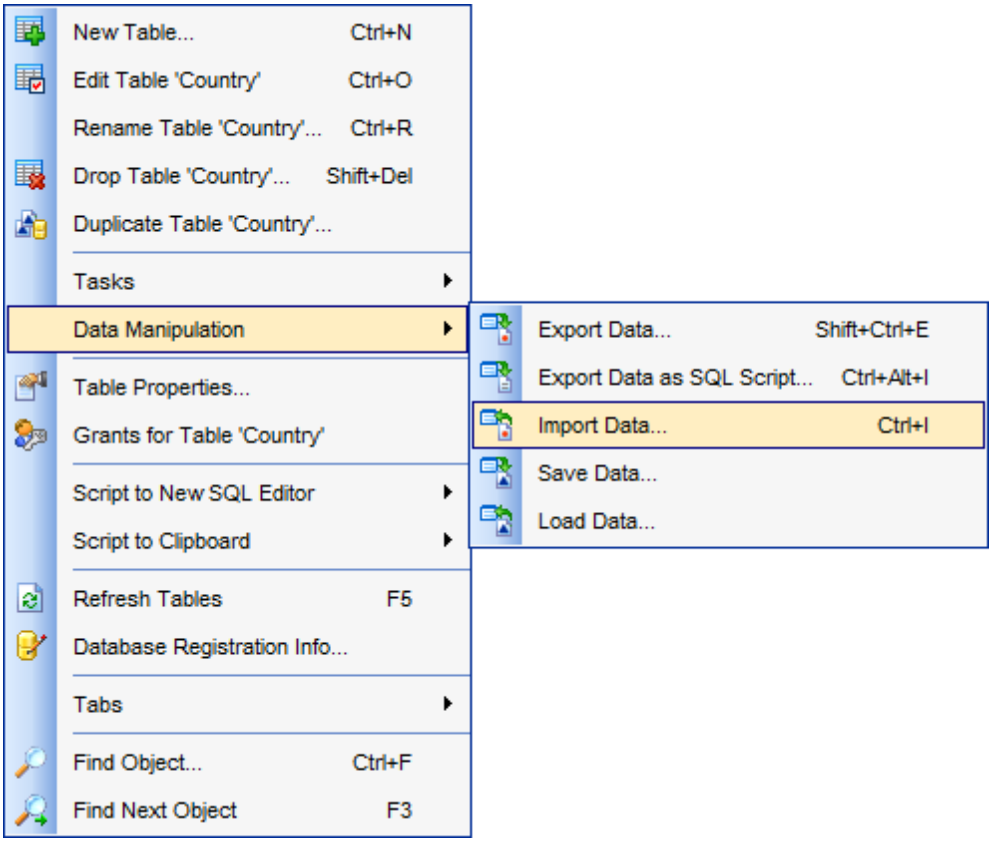
9.2 Import Data Wizard

Import Data Wizard allows you to import data to a table / view from any of supported formats (*MS Excel*, *MS Access*, *DBF*, *XML*, *TXT*, *CSV*, *HTML*, *ODF*). You can save your settings as a template any time for future use.

To start the wizard, right-click the table/view in DB Explorer, select the **Data Manipulation | Import Data...** context menu item.
Alternatively, you can open the **Data** tab of Table Editor / View Editor, right-click the grid there, then select the **Data Manipulation | Import Data to <object_name>...** context menu item.



- Setting source file name and format
- Selecting the source to import data from
- Setting correspondence between the source and target columns
- Adjusting common data formats
- Setting advanced column formats
- Setting import mode and data write type
- Customizing common import options
- Importing data

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to

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the Feature Matrix 22 page.

See also:

Export Data Wizard 536
Export as SQL Script 608
Save Data Wizard 617
Load Data Wizard 626
Using templates 982

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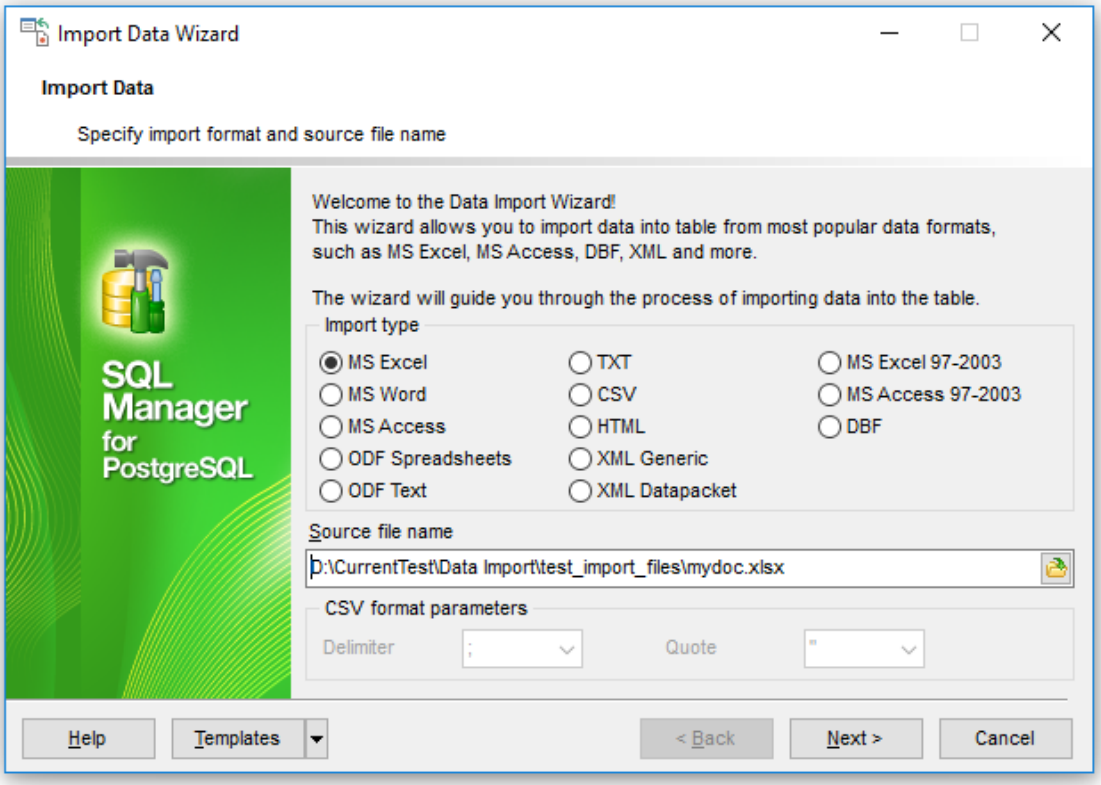
9.2.1 Selecting source file name and format

This step of the wizard allows you to select the source file format you need to import data from.

Import type

Specify the format of the source file. For details refer to Supported file formats 983.



Source file name

Type in or use the button to specify the path to the file using the **Open file...** dialog. The file name extension changes automatically according to the selected **Import Type**.

CSV format parameters

For CSV 592 import you should define **Delimiter** and **Quote** settings using the corresponding drop-down lists.

Click the **Next** button to proceed to the Setting columns correspondence 586 step or to the Selecting data source 585 step of the wizard if you have selected **MS Access** as the source file format.

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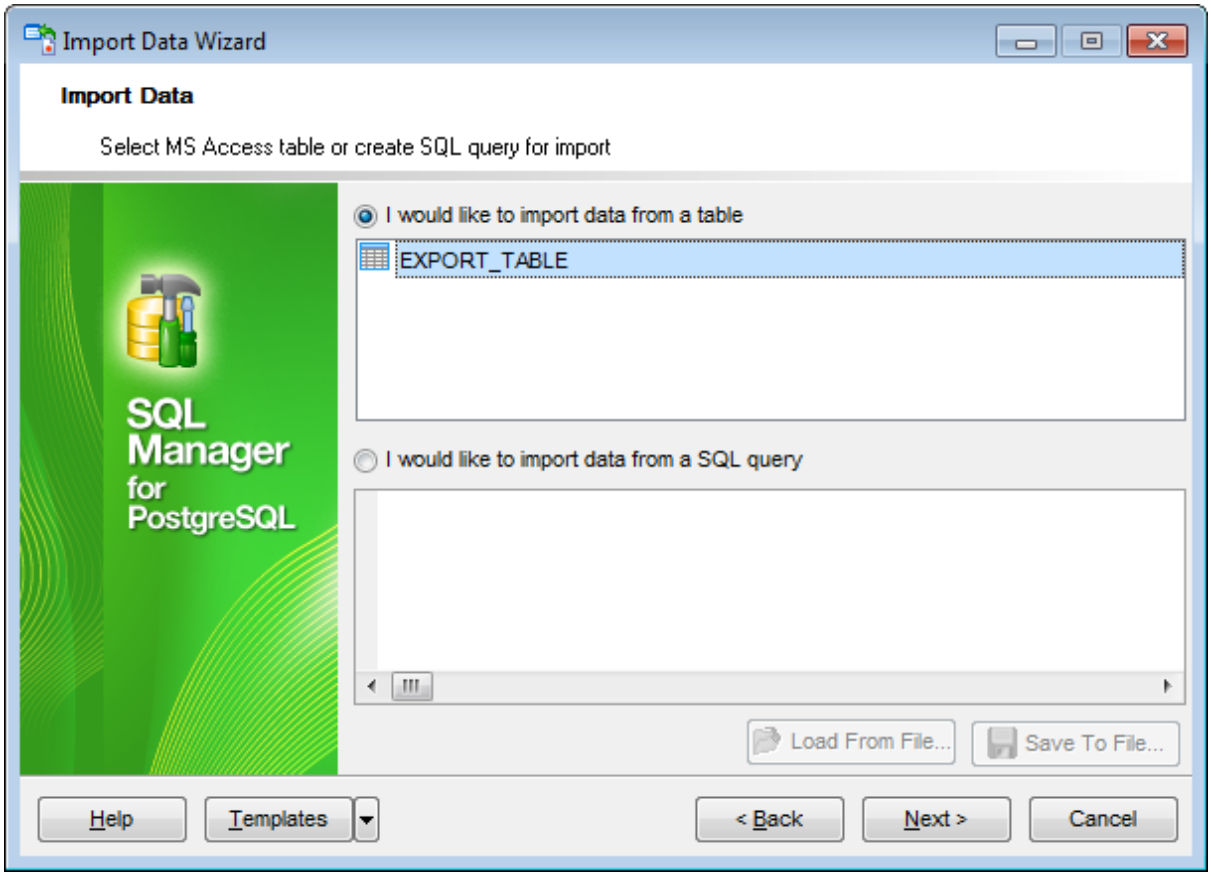
9.2.2 Selecting data source

This step of the wizard is only available when you are importing data from *MS Access*. Select a **table** from the table list or input a **query** in the corresponding text boxes to specify the data source.

If you choose a query as the data source, you also can load a SQL query from a **.sql* file or save the current query text to a file using the **Load from File...** and the **Save to File...** buttons correspondingly.



Click the **Next** button to proceed to the Setting columns correspondence 586 step of the wizard.

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9.2.3 Setting columns correspondence

This step of the wizard allows you **to set correspondence** between columns of the source file and columns of the target PostgreSQL table.

- MS Excel 97-2003 587
- MS Access, DBF, XML Datapacket 590
- TXT 591
- CSV 592
- HTML 594
- XML Generic 596
- MS Excel/Word, ODF 598

To get more information about the file formats, see the Supported file formats 983 page.

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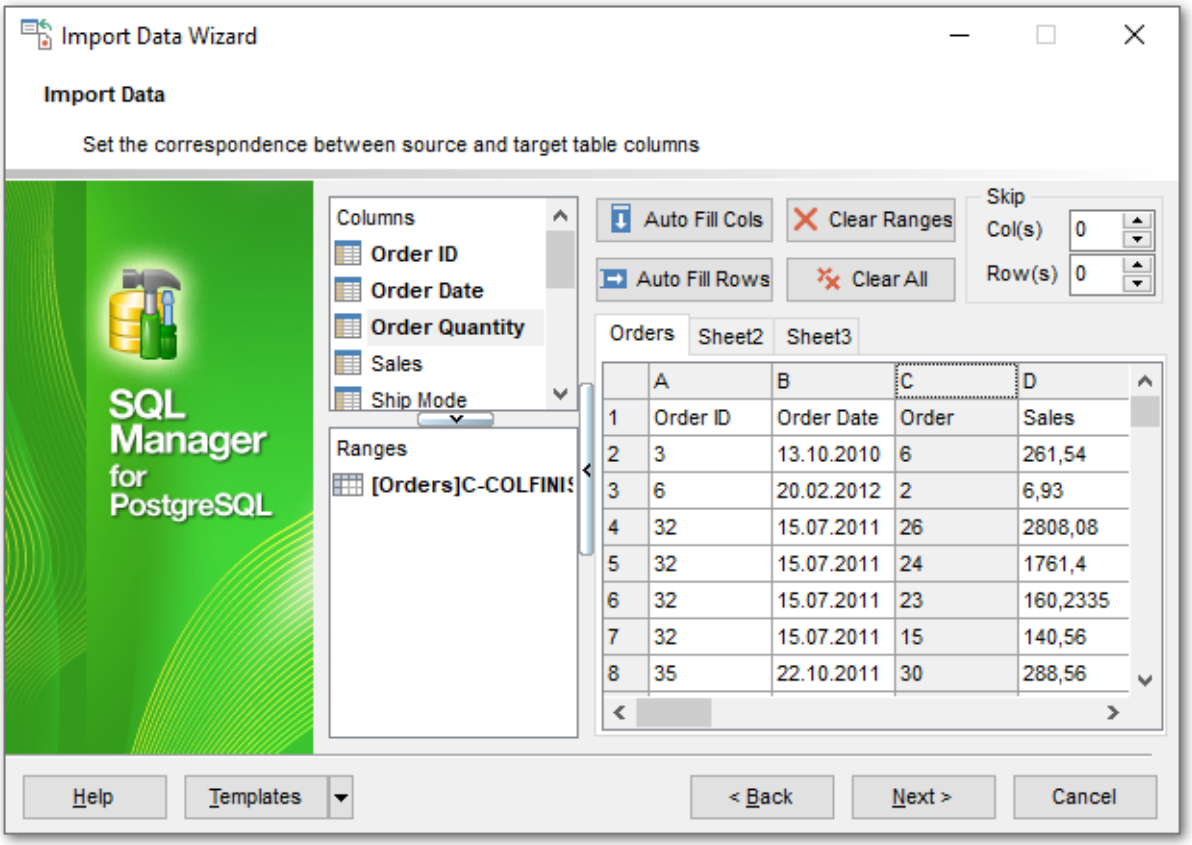
9.2.3.1 Excel 97-2003

Specify ranges in the grid for the target and source columns:

- select a column of the target PostgreSQL table in the **Columns** list;
- proceed to the **Sheet** grid: click a column caption to select the whole column or click the row number to select the whole row;
- the selected column/row of the source file gets green highlight, and a new range indicating the source and target columns correspondence appears in the **Ranges** list;
- repeat the operation for all the columns you need to be included in the import process.

If the source Excel file and the destination PostgreSQL table have the same order of columns or rows, you can use the **Auto Fill Cols** or the **Auto Fill Rows** buttons to set correspondence between them automatically.

If necessary, you can choose to **skip** a defined number of the source file columns and/or rows using the **Col(s)** and **Row(s)** spinner controls of the **Skip** group (e.g. if you need to exclude column headers from the imported data range).



To clear ranges for a column, select the column in the **Columns** list and press the **Clear Ranges** button.
To clear all ranges specified for the target table columns, press the **Clear All** button.

Right-click a range in the **Ranges** list to call its popup menu. Using the popup menu you can *add* or *edit* ranges manually, *remove* them or change their *order*.

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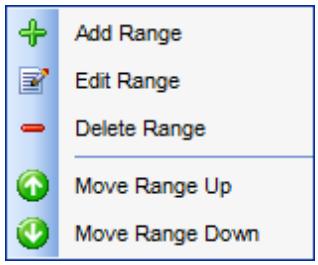

The **Range** dialog allows you to edit the data range for import manually.

Range Type
Use the drop-down list to select whether a *column*, a *row*, or a *cell* of the source Excel file will be mapped to the target table column.
Depending on the selected range type you should specify the column (e.g. *B*), the row (e. g. *2*) or the cell (e.g. *A2*).

Start / **Finish**
These groups allow you to set the precise data range for import: select **Where data started** / **finished** or use the spinner control to specify the **start**/**finish row** (or **start**/**finish column**).

Direction
Use this group to select the direction for importing data of the specified range: *Down* or *Up*.

Sheet
Use this group to define whether the specified range will be taken from the **default** Excel sheet or from a **custom** sheet (select **sheet number** or **sheet name** using the corresponding drop-down lists).

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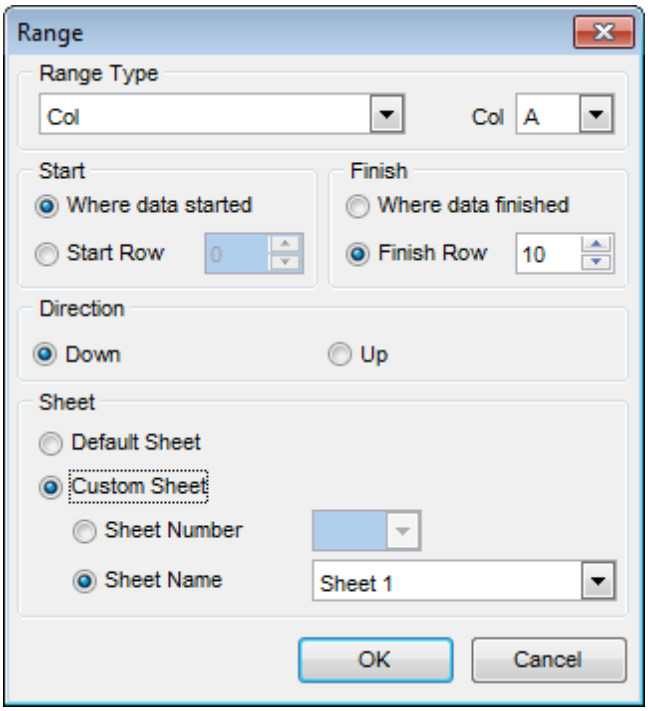

Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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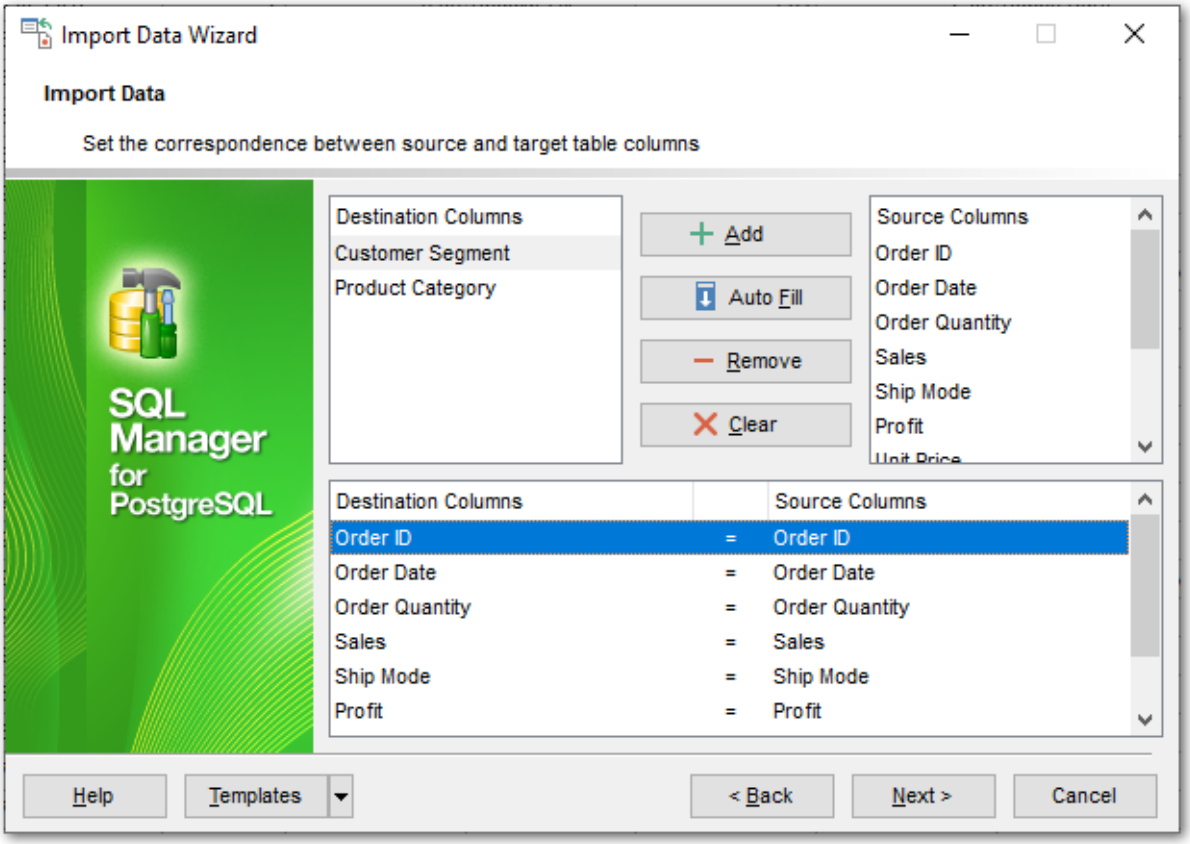
9.2.3.2 Access, DBF, XML Datapacket

Set correspondence between the source MS Access columns and the target PostgreSQL table columns:

- select a column of the target PostgreSQL table in the **Destination Columns** list;
- select the corresponding column of the source MS Access table in the **Source Columns** list;
- click the **Add** button to set correspondence between the selected columns;
- the pair of columns appears in the list below;
- repeat the operation for all the columns you need to be included in the import process.

Use the **Auto Fill** button to set correspondence between the source and target columns automatically on the basis of their order.



To remove a correspondence, select the pair of columns in the list below and press the **Remove** button.
To remove all correspondences, press the **Clear** button.

Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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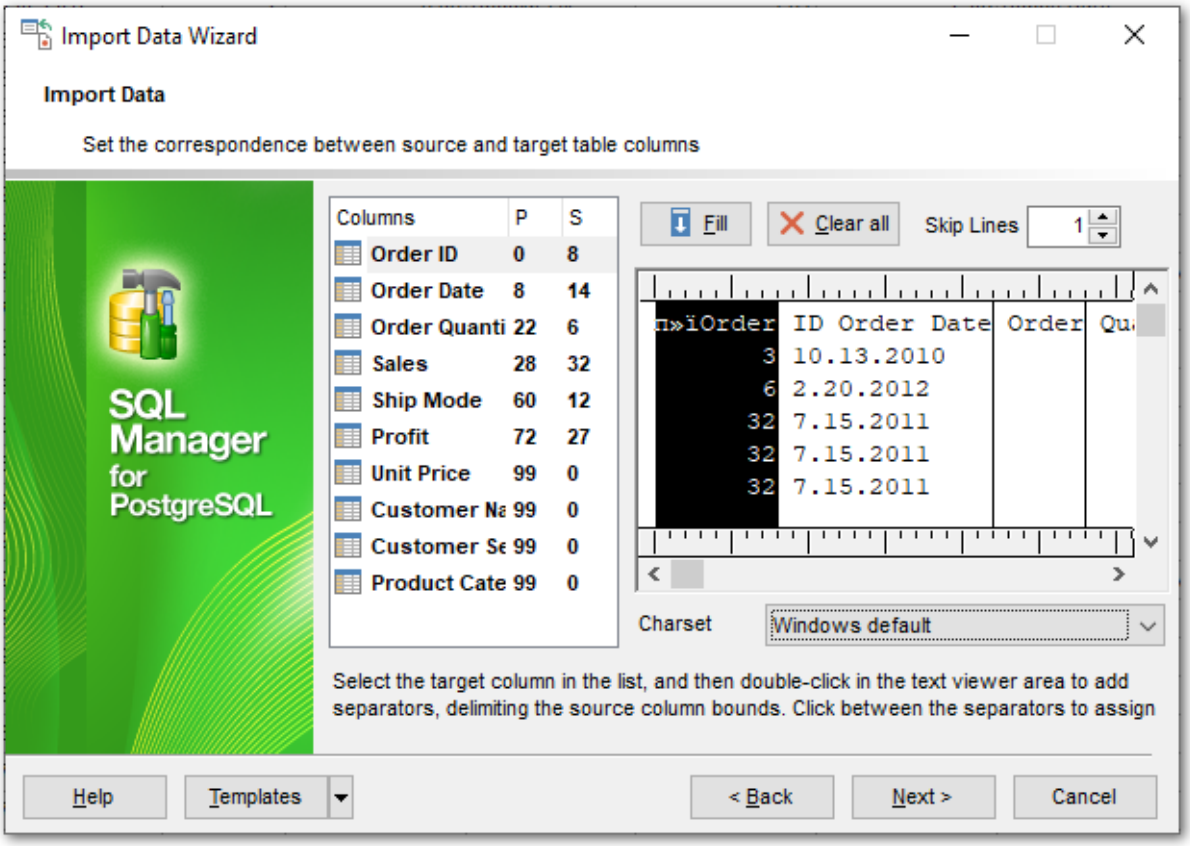
9.2.3.3 TXT

Set correspondence between the source text file columns and the target PostgreSQL table columns:

- select a column of the target PostgreSQL table in the **Columns** list;
- double-click in the text viewer area to add vertical separators delimiting the source column bounds;
- click the area between the separators to assign the column to the selected target table column - the selected source column gets black highlight;
- repeat the operation for all the columns you need to be included in the import process.

If necessary, you can choose to **skip** a defined number of the source file lines using the **Skip Lines** spinner control (e.g. if you need to exclude column headers from the imported data range).



To clear all correspondences, press the **Clear** button.

Note: if you cannot see the content of the source text file properly, you should select the appropriate **Charset** to be used for processing data.

Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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9.2.3.4 CSV

Set correspondence between the target table columns and the source CSV file columns:

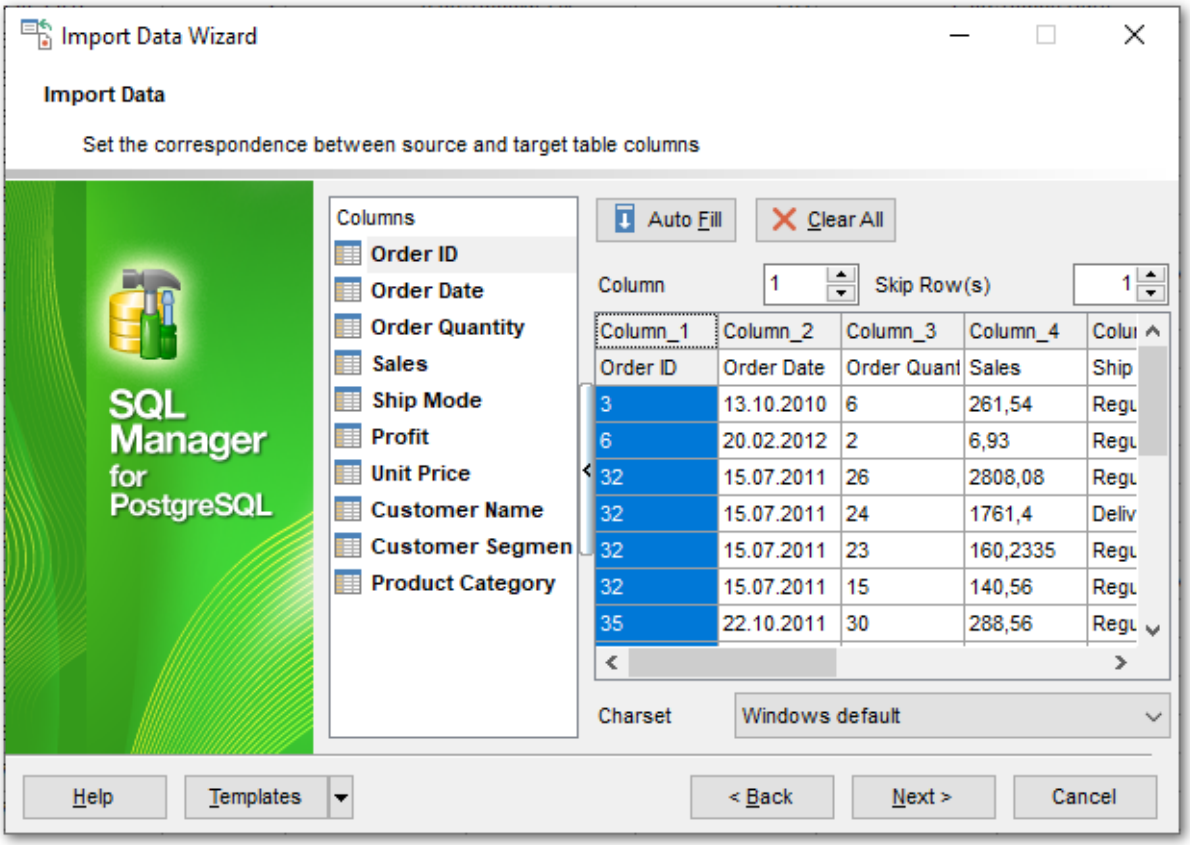
- select a column of the target PostgreSQL table in the **Columns** list;
- proceed to the source grid viewer area: click a caption to assign the column to the selected target table column;
- the selected column of the source file gets gray highlight;
- repeat the operation for all the columns you need to be included in the import process.

If the source CSV file and the destination PostgreSQL table have the same order of columns, you can use the **Auto Fill** button to set correspondence between them automatically.

Note that the CSV delimiter is specified at the Selecting source file name and format 584 step of the wizard.

The **Col(s)** control indicates the currently selected source file column. You can also use this spinner control for quick column selection.

If necessary, you can choose to **skip** a defined number of the source file rows using the **Row(s)** spinner control of the **Skip** group (e.g. if you need to exclude column headers from the imported data range).



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To remove a correspondence, select the column in the **Columns** list and press the **Clear** button.

Note: if you cannot see the content of the source text file properly, you should select the appropriate **Charset** to be used for processing data.

Click the **Next** button to proceed to the Adjusting data formats step of the wizard.

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9.2.3.5 HTML

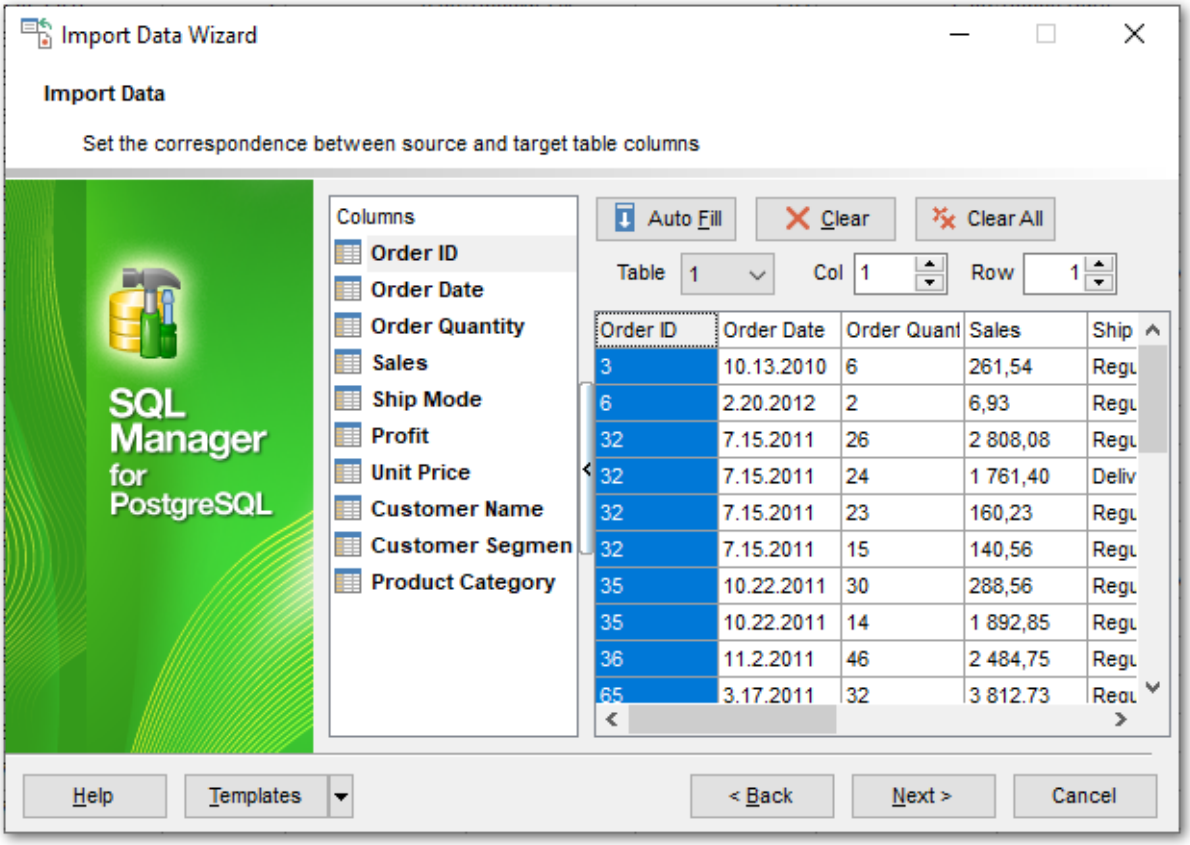
Set correspondence between the target table columns and the source HTML file columns:

- select a column of the target PostgreSQL table in the **Columns** list;
- proceed to the source grid viewer area: select the **Table** from which you intend to import data and click a column to assign the column to the selected target table column;
- the selected column of the source file gets gray highlight;
- repeat the operation for all the columns you need to be included in the import process.

If the source HTML file and the destination PostgreSQL table have the same order of columns, you can use the **Auto Fill** button to set correspondence between them automatically.

The **Col** control indicates the currently selected source file column. You can also use this spinner control for quick column selection.

If necessary, you can choose to **skip** a defined number of the source file rows using the **Row** spinner control of the **Skip** group (e.g. if you need to exclude column headers from the imported data range).



To remove a correspondence, select the column in the **Columns** list and press the **Clear** button.

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To remove all correspondences, press the **Clear All** button.

Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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9.2.3.6 XML Generic

In order to set mapping of a Generic XML document, you should enter the relative **XPath** (the path must be specified in the XPath format). Press the **Fill Grid** button to get the grid filled with text and attribute values of the selected node.

Note: if the source XML document contains huge amount of data, building the tree may take a long time.

Set correspondence between the source XML file columns and the target PostgreSQL table columns:

- select a column of the target PostgreSQL table in the **Columns** list;
- proceed to the source grid viewer area: click a column to assign the column to the selected target table column;
- the selected column of the source file gets gray highlight;
- repeat the operation for all the columns you need to be included in the import process.

You can use the **Auto Fill** button to set correspondence between the source and target columns automatically according to their order (mapping is started from the first attribute value in this case).

The **Col(s)** control indicates the currently selected source file column. You can also use this spinner control for quick column selection.

If necessary, you can choose to **skip** a defined number of the source file lines using the **Row(s)** spinner control of the **Skip** group (e.g. if you need to exclude node headers from the imported data range).

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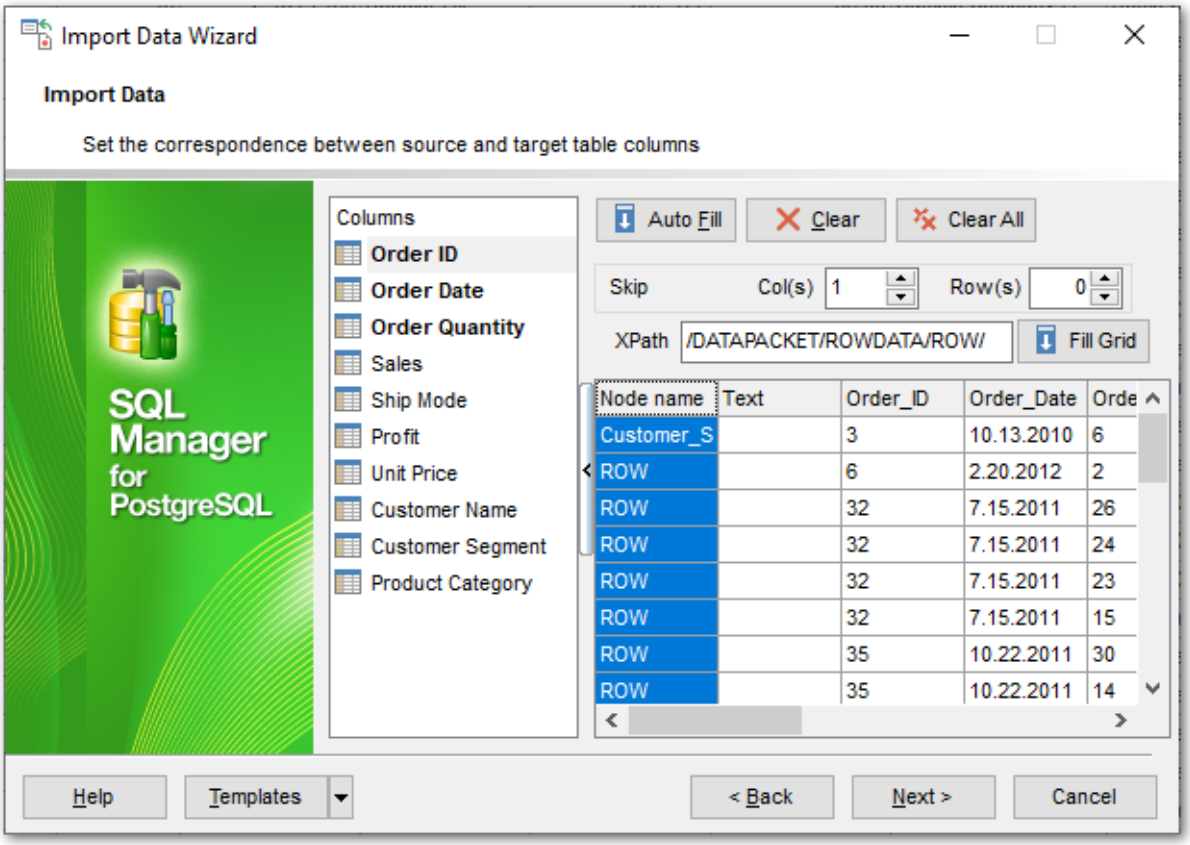

To remove a correspondence, select the column in the **Columns** list and press the **Clear** button.
To remove all correspondences, press the **Clear All** button.

Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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9.2.3.7 MS Excel/Word, ODF

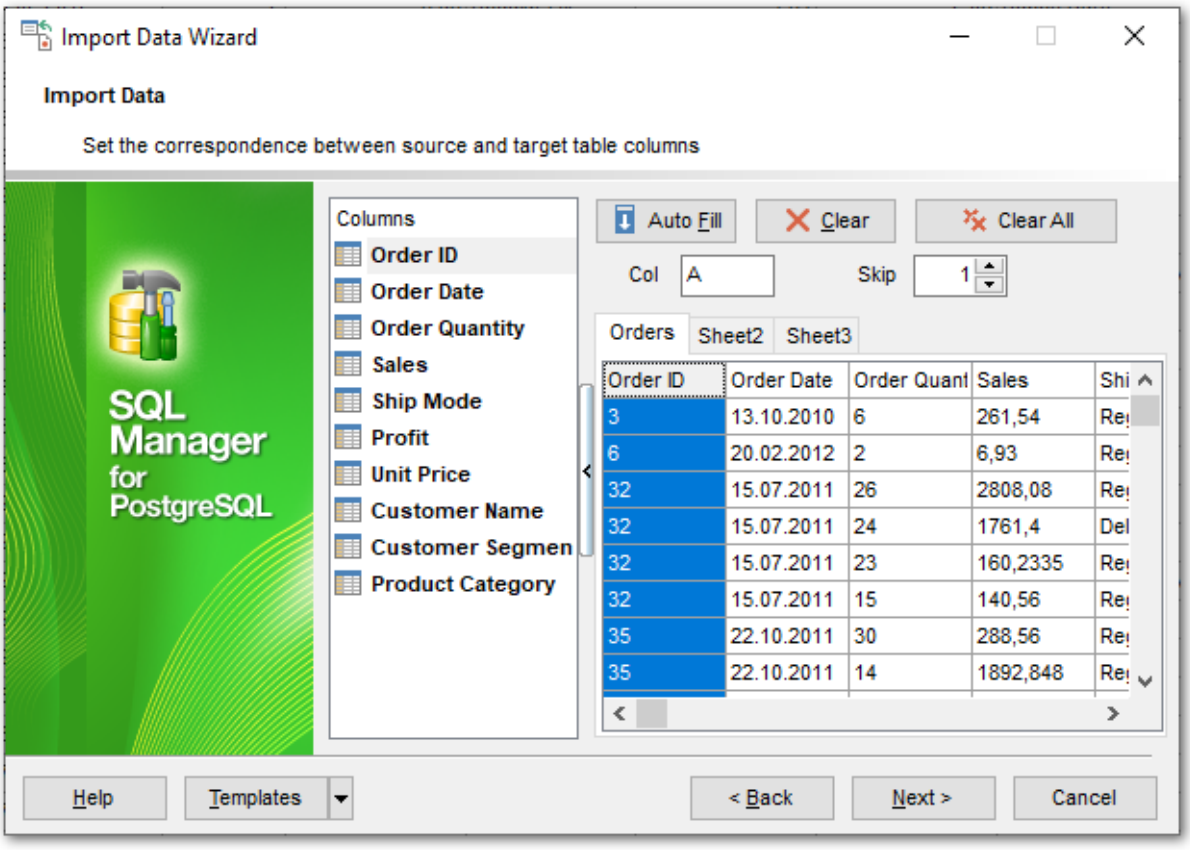
Specify ranges in the grid for the target and source columns:

- select a column of the target PostgreSQL table in the **Columns** list;
- proceed to the **Sheet** grid: click a column to assign the source column to the selected target table column;
- the selected column of the source file gets gray highlight;
- repeat the operation for all the columns you need to be included in the import process.

If the source file and the destination PostgreSQL table have the same order of columns, you can use the **Auto Fill** button to set correspondence between them automatically.

The **Col** control indicates the currently selected source file column. You can also use this control for quick column selection.

If necessary, you can choose to **skip** a defined number of the source file rows using the **Skip** spinner control (e.g. if you need to exclude column headers from the imported data range).



To remove a correspondence, select the column in the **Columns** list and press the **Clear** button.
To remove all correspondences, press the **Clear All** button.

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Click the **Next** button to proceed to the Adjusting data formats 600 step of the wizard.

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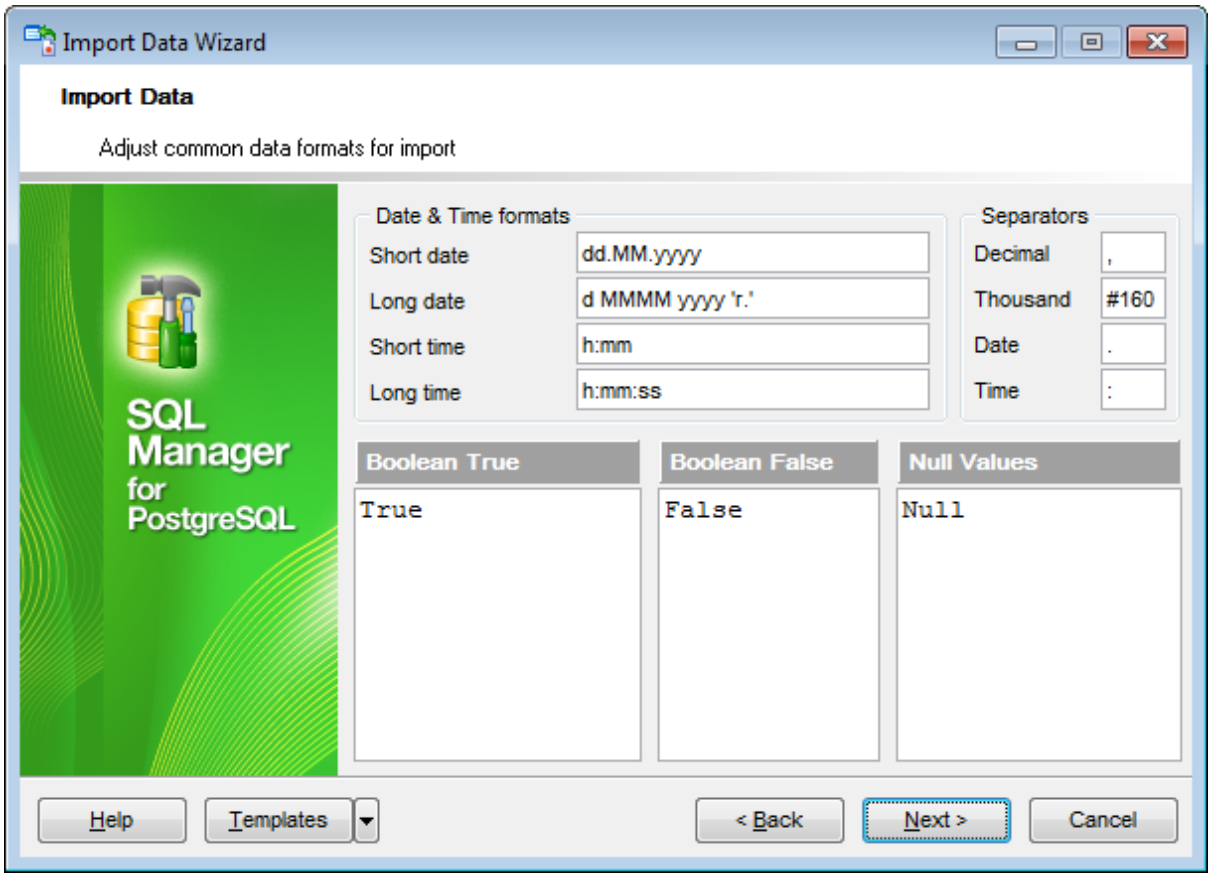
9.2.4 Adjusting data formats

This step of the wizard provides a number of options for setting common formats for all imported data:

Date & Time formats: *Short date*, *Long date*, *Short time*, *Long time*;
Separators: *Decimal*, *Thousand*, *Date*, *Time*;
Boolean True (specify the text that will be displayed for the boolean *TRUE* values);
Boolean False (specify the text that will be displayed for the boolean *FALSE* values);
NULL values (specify the text that will be displayed for the *NULL* values).

For more information refer to the Format specifiers 978 page.



Click the **Next** button to proceed to the Setting advanced column formats 601 step of the wizard.

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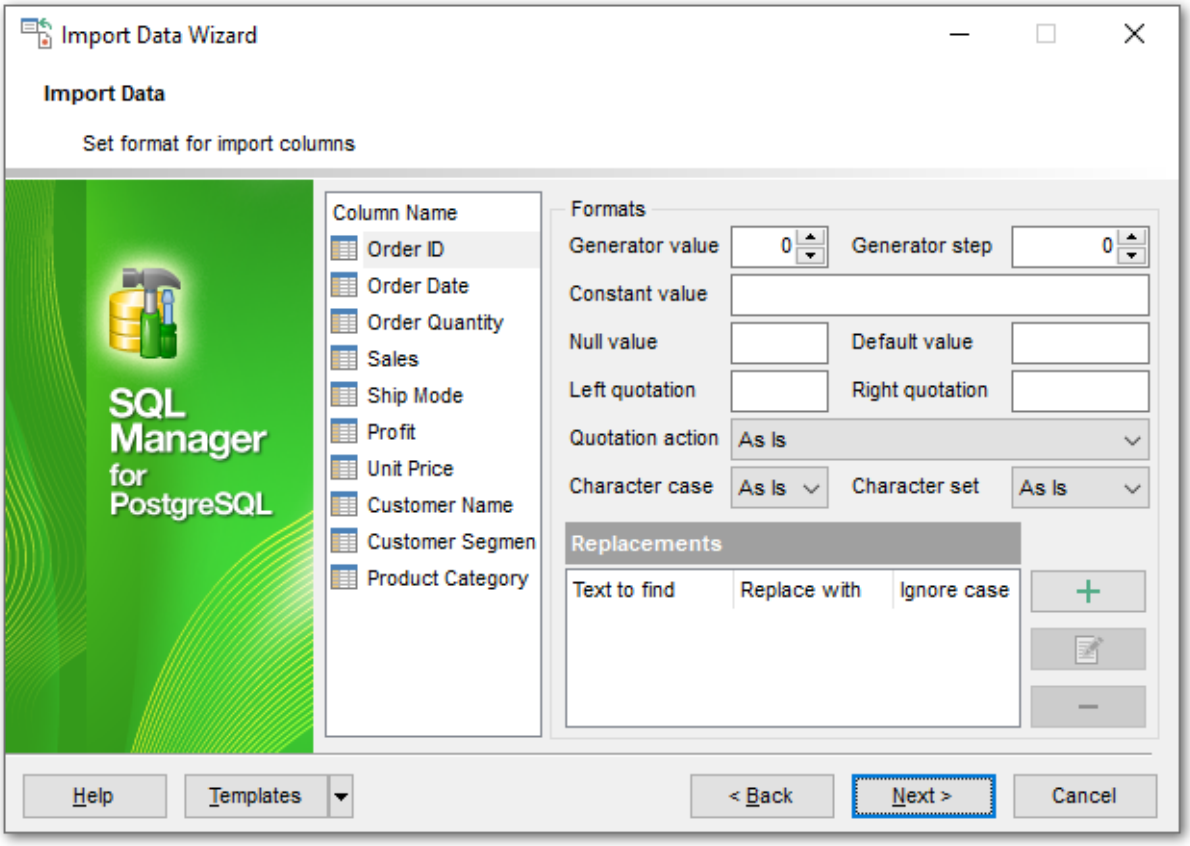
9.2.5 Setting advanced column formats

This step of the wizard allows you to set **formats** each column separately.

Select a column in the list and adjust **format options** that will be applied to this column only.



Specify **Generator value** and **Generator step** for incremental data generation into the specified column, or enter a **Constant value** which will be set for all records in the column.

Specify the **NULL value** which will be used for the records where the value is NULL.

If necessary, specify the **default value**.

Use the **Left** / **Right quotation** edit boxes to specify left/right quotation marks.
Use the **Quotation action** drop-down list to select whether the quotation marks should be *added*, *removed*, or left *'As is'*.

Use the **Character case** drop-down list to select the case that will be used for string values of the column: *Upper*, *Lower*, *UpperFirst*, *UpperFirstWord*, or *'As is'*.

Use the **Character set** drop-down list to select which charset will be used for string data in the column: *ANSI*, *OEM*, or *As is*.

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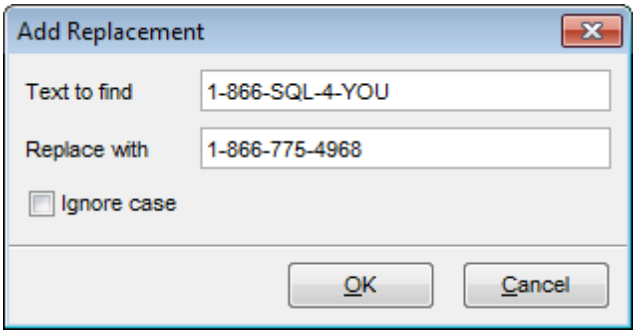
The **Replacements** area allows you to set the text you need to be replaced during data import into the selected column. Press the **Plus** button to specify a new replacement options using the **Add Replacement** dialog.



To edit a replacement, click the **Edit** button.
To remove a replacement, click the **Minus** button.

When you are done, click the **Next** button to proceed to the Setting import mode 603 step of the wizard.

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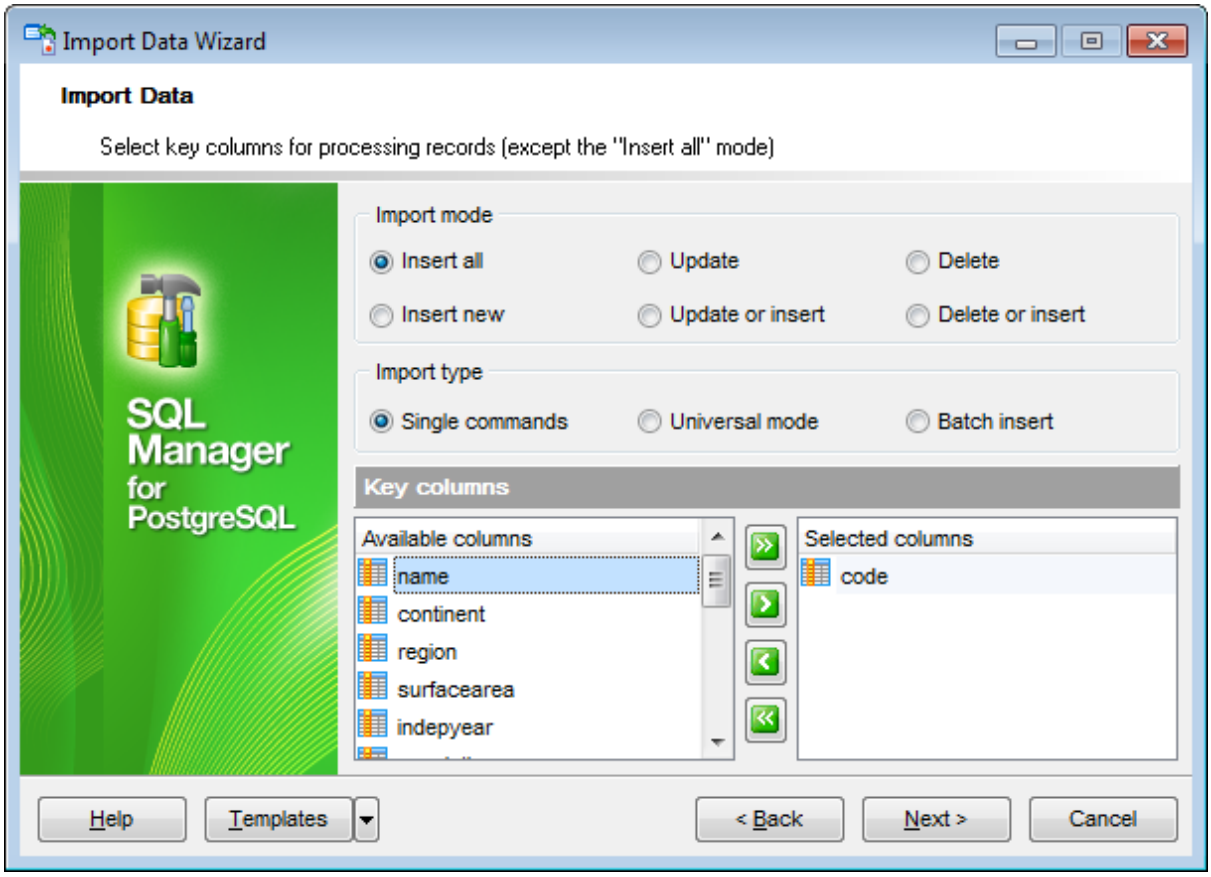
9.2.6 Setting import mode

This step of the wizard allows you to define the records processing mode as *Insert All*, *Insert New*, *Update*, *Update or Insert*, *Delete*, *Delete or Insert* mode.

Import mode

- **Insert all**: all records from the source file are inserted into the tables irrespective of whether any records exist in the destination table or not
- **Insert new**: already existing records are skipped, and new records are inserted into the destination table
- **Update**: all existing records are updated from the source file
- **Update or insert**: already existing records are updated and new records are inserted into the destination table
- **Delete**: already existing records are deleted
- **Delete or insert**: existing records are deleted and new records are inserted into the destination table



Here is an **example** of some import modes offered by Import Data Wizard:

All import modes (except for the **Insert All** mode) are based on key values information. In order to perform import operations with these modes used, you need to have matches between the source file key column(s) and the destination table key column(s).
For example, your source file contains three rows with the key values *1*, *2*, *3*, and your destination table contains three rows with the key values *1*, *2*, *4*.

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Destination table

ID	DATA
1	a
2	b
4	f

Source file data

	A	B
1	1	c
2	2	d
3	3	e

If you use the **Insert new** import mode, in this case only the row with key value *3* will be inserted into the destination table.
If you use the **Update** import mode, then the rows with key values *1*, *2* will be updated.
If you use the **Update or insert** import mode, then rows *1*, *2* will be updated and the row with key value *3* will be inserted.
It is applied to all other import modes, except for the **Insert all** mode. For all these modes (except for the **Insert all** mode) it is obligatory to select the primary key columns. This column (or columns) is used as key column to identify specific data in the target database.

Insert new

ID	DATA
1	a
2	b
3	e
4	f

Update

ID	DATA
1	c
2	d
4	f

Update or insert

ID	DATA
1	c
2	d
3	e
4	f

Delete

ID	DATA
4	f

Delete or insert

ID	DATA
3	e
4	f

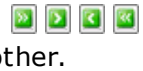
The key columns for these operations are defined in the **Key columns** area.

Import type

Single commands / **Universal mode** / **Batch insert** type
The *Single commands* import mode is performed with the Single Commands method used and serves to generate and execute single SQL commands on the server, whereas the *Batch insert* mode uses native PostgreSQL commands to import a data set as a batch. With the help of the *Single commands* import mode your data can be imported considerably faster as compared to the *Universal* mode which is used for backward compatibility.

Use **Import mode** to select whether to insert all records, or to update/delete existing ones. Note that for updating/deleting existing records in the target table you should move its key columns from the **Available columns** list to the **Selected columns** list.

Key columns

The area allows you to select the columns of the table to be used as the key columns for the import process.
To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the  buttons or drag-and-drop operations to move the columns from one list to another.

When you are done, click the **Next** button to proceed to the Customizing common options 605 step of the wizard.

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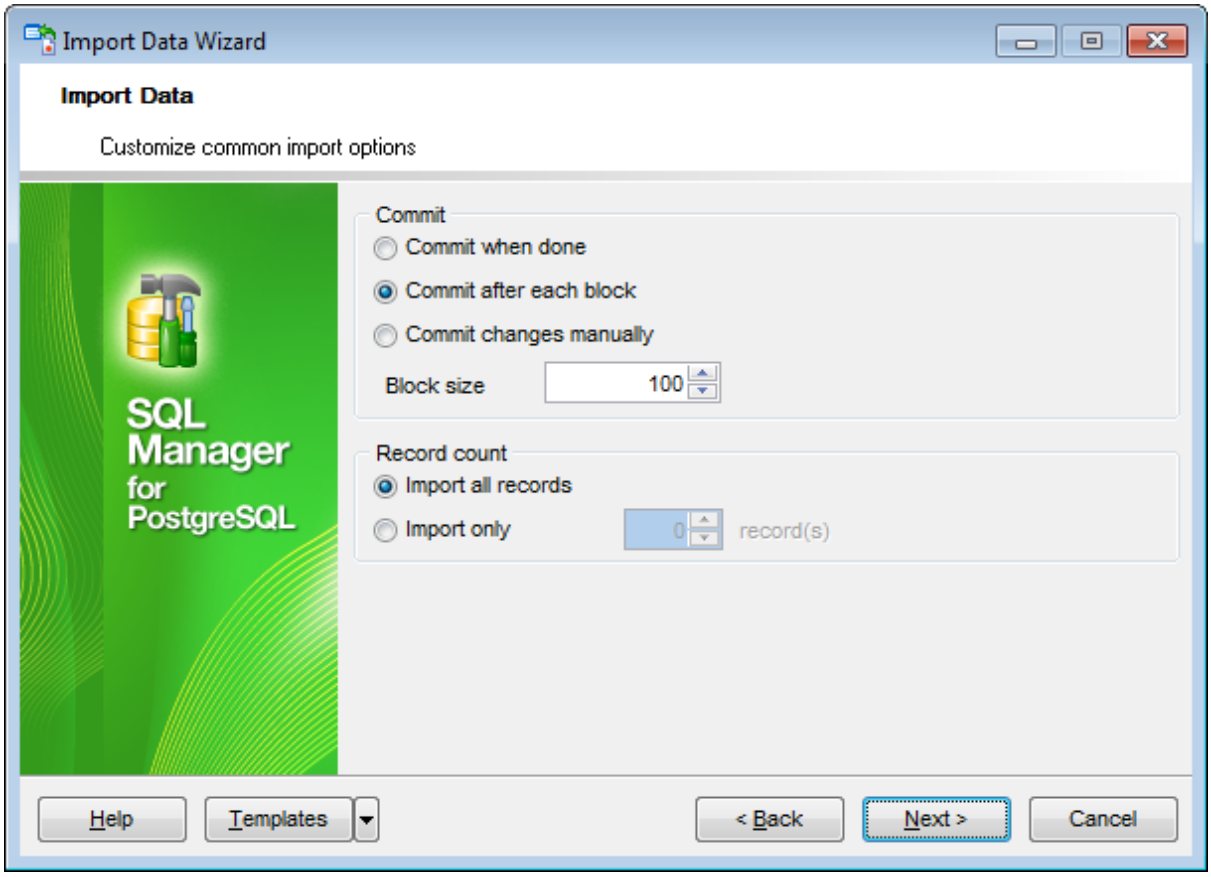
9.2.7 Customizing common options

Use this step of the wizard to set common import options. The detailed description of these options is given below.



Commit

Commit when done
Commits the transaction when all records are imported.

Commit after each block
Inserts the *COMMIT* statement after a defined number of records.

Commit changes manually
Select this option if you intend to commit the transaction manually.

Block size
Use the spinner control to define the number of records in each committed block.

Record count

Import all records
Specifies that all records of the source file will be imported.

Import only ... record(s)
Specifies the number of records to be imported.

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When you are done, click the **Next** button to proceed to the last step[607] of the wizard.

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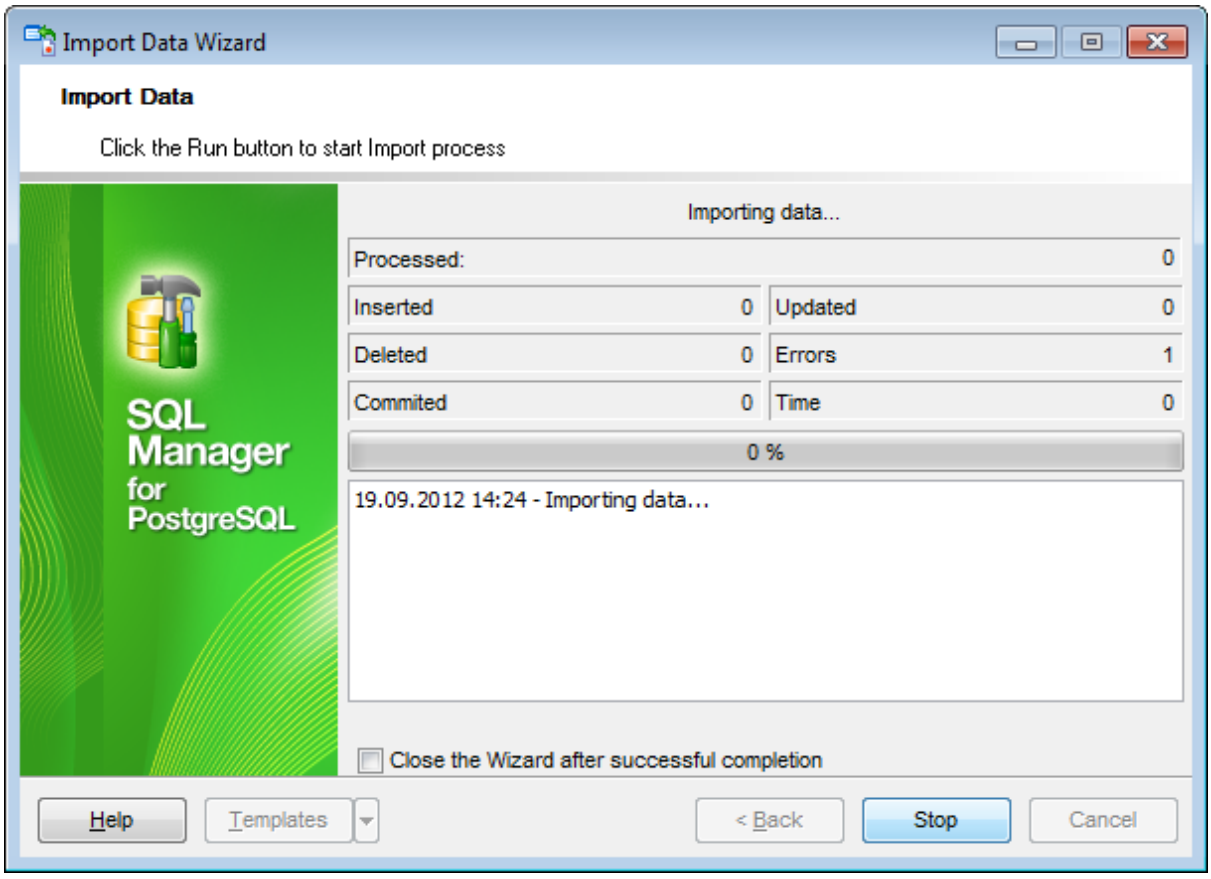
9.2.8 Importing data

This step of the wizard is intended to inform you that all import options have been set, and you can start the import process.

The log area allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the import process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the import process.

After the operation is completed, you can view the total number of *processed* records, the number of *inserted/updated/deleted* records, the number of *committed* records, the number of *errors*, elapsed *time*, and the *log* of operations and errors (if any).

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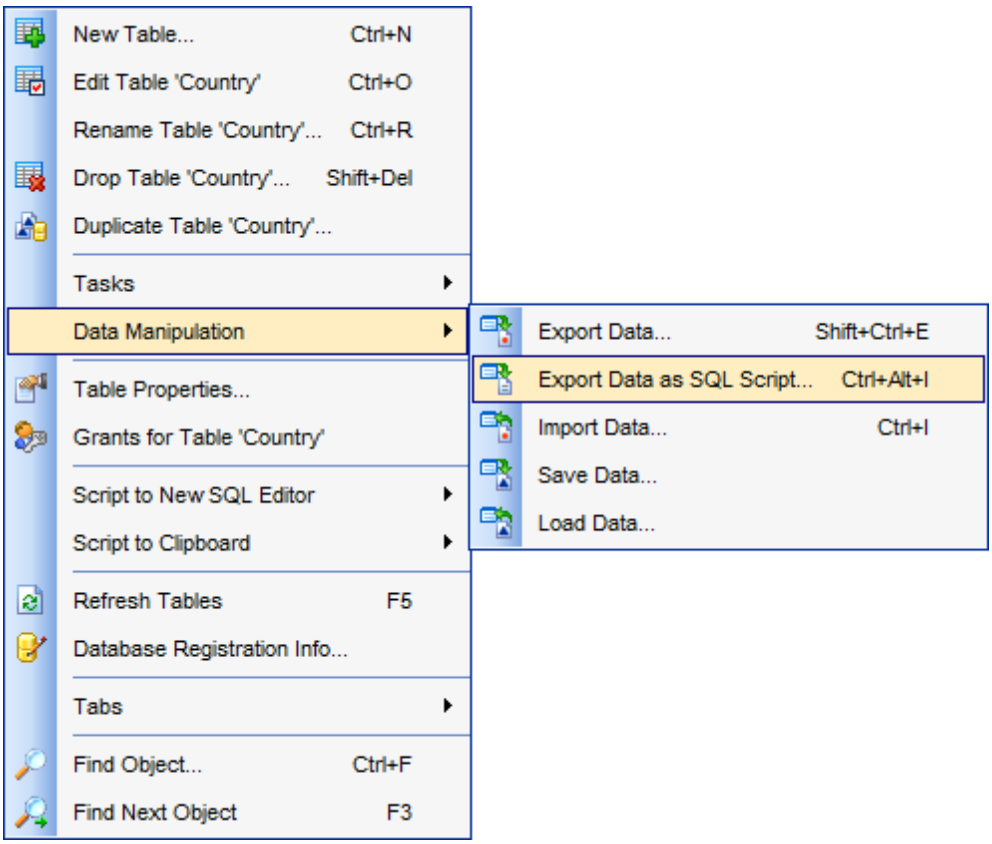
9.3 Export as SQL Script

Export as SQL Script Wizard allows you to export data from a table / view or from a query result to SQL script as a number of INSERT statements. You can save your settings as a template any time for future use.

To start the wizard, right-click the object in DB Explorer, select the **Data Manipulation | Export Data as SQL Script...**context menu item. Alternatively, you can open the **Data** tab of Table Editor / View Editor or the **Result (s)** tab of Query Data / Design Query, right-click the grid there, then select the **Data Manipulation | Export <object_name> as SQL Script...** context menu item.



- Selecting destination DBMS
- Setting destination file name
- Setting BLOB options
- Selecting column to export
- Editing the result table definition
- Setting export options
- Exporting as SQL Script

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**

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Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Export Data Wizard 536
Import Data Wizard 582
Save Data Wizard 617
Load Data Wizard 626
Using templates 982

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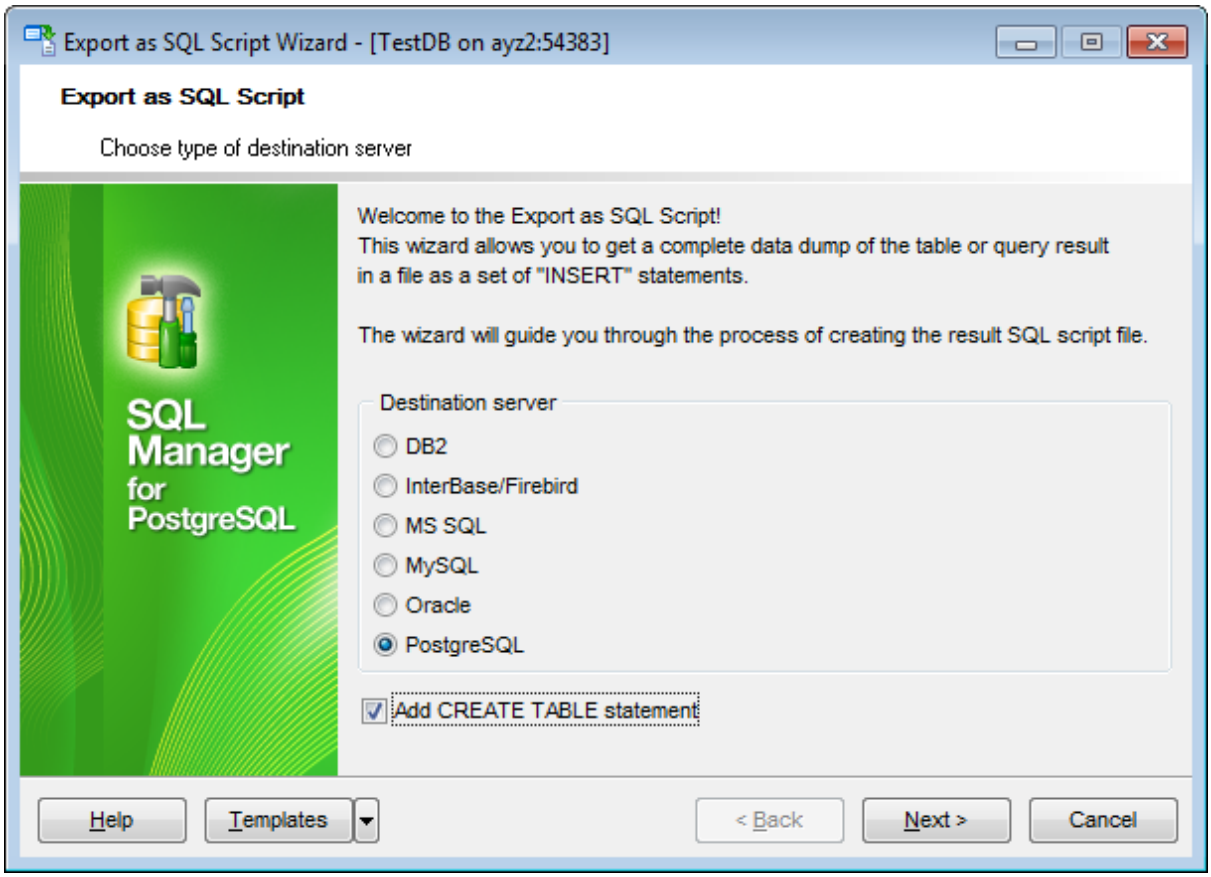
9.3.1 Selecting destination DBMS

This step of the wizard allows you to define the **destination server** you need to export data for. The result script will be generated in compliance with the specifications of the selected DBMS:

- *DB2*
- *InterBase/Firebird*
- *Microsoft® SQL Server*
- *MySQL*
- *Oracle*
- *PostgreSQL*



Add CREATE TABLE statement
Check this option to add the *CREATE TABLE* statement to the result script.

Click the **Next** button to proceed to the Setting destination file name 611 step of the wizard.

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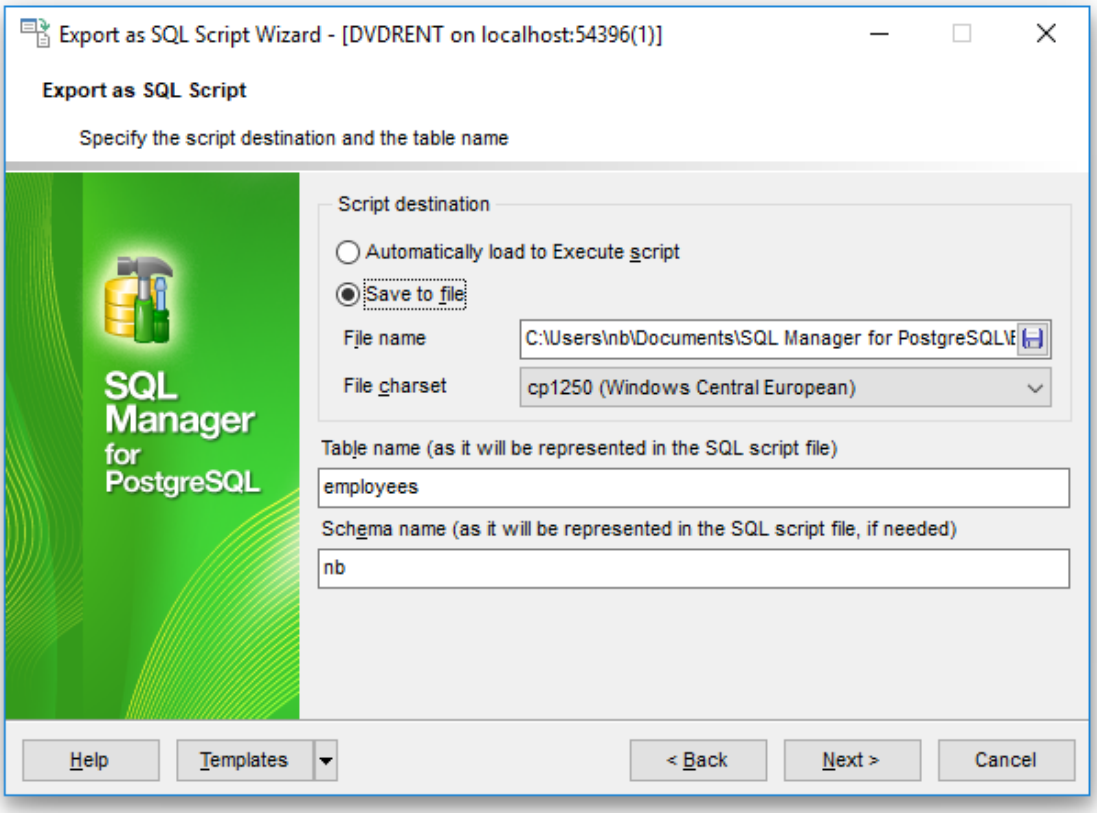
9.3.2 Setting destination file name

Specify whether the result script will be loaded to Execute Script Editor[646] or saved to a file.

File name
Type in or use the button to specify the path to the file and the file name.

If necessary, select the **File charset** using the corresponding drop-down list.

Enter the **Table name** and the **Schema name** to be included in the result SQL script. Schema name should only be specified for the DBMS in which this object is implemented.



Click the **Next** button to proceed to the Setting BLOB options[612] step of the wizard.

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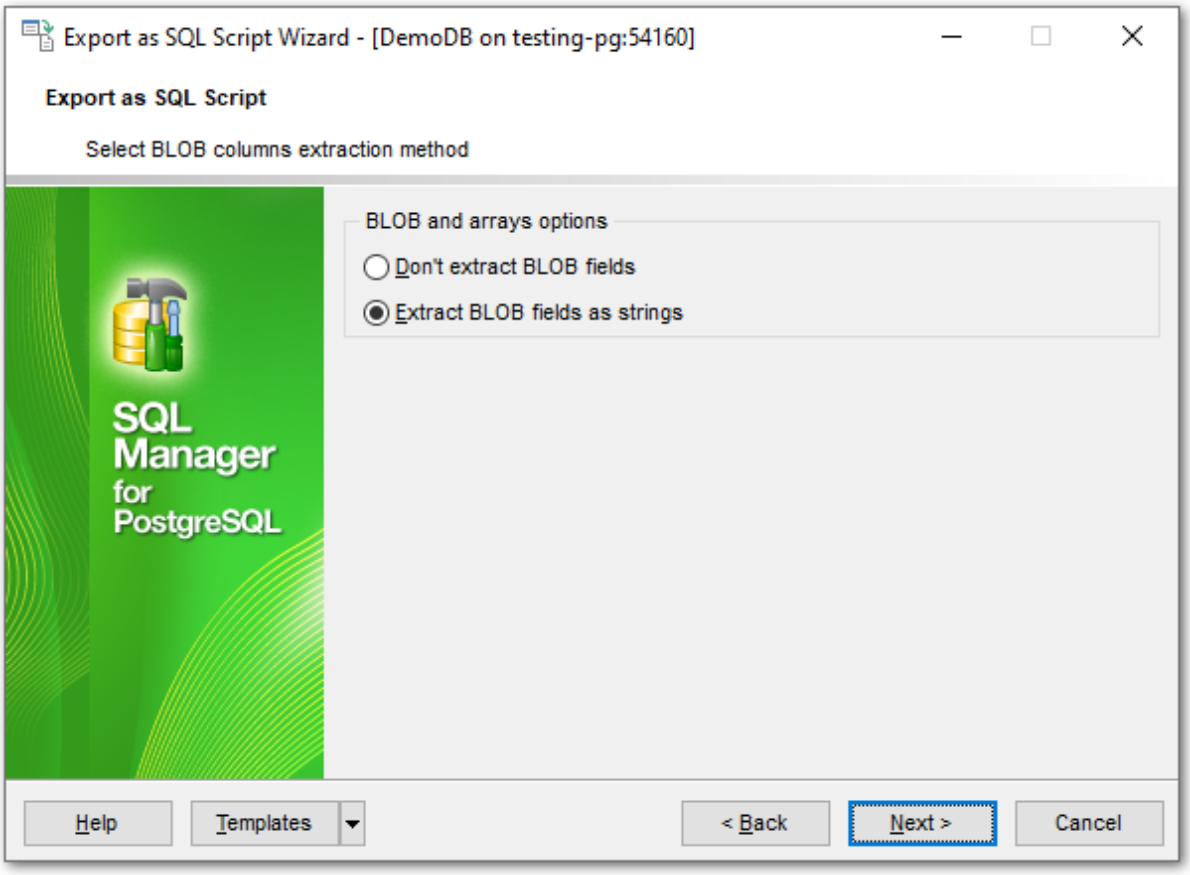
9.3.3 Setting BLOB options

BLOB and arrays options
In this group of options you can determine processing BLOB values.

Don't extract BLOB fields
BLOB values are not extracted in the script

Extract BLOB fields as strings
BLOB values are extracted as strings



Click the **Next** button to proceed to the Selecting columns to export 613 step of the wizard.

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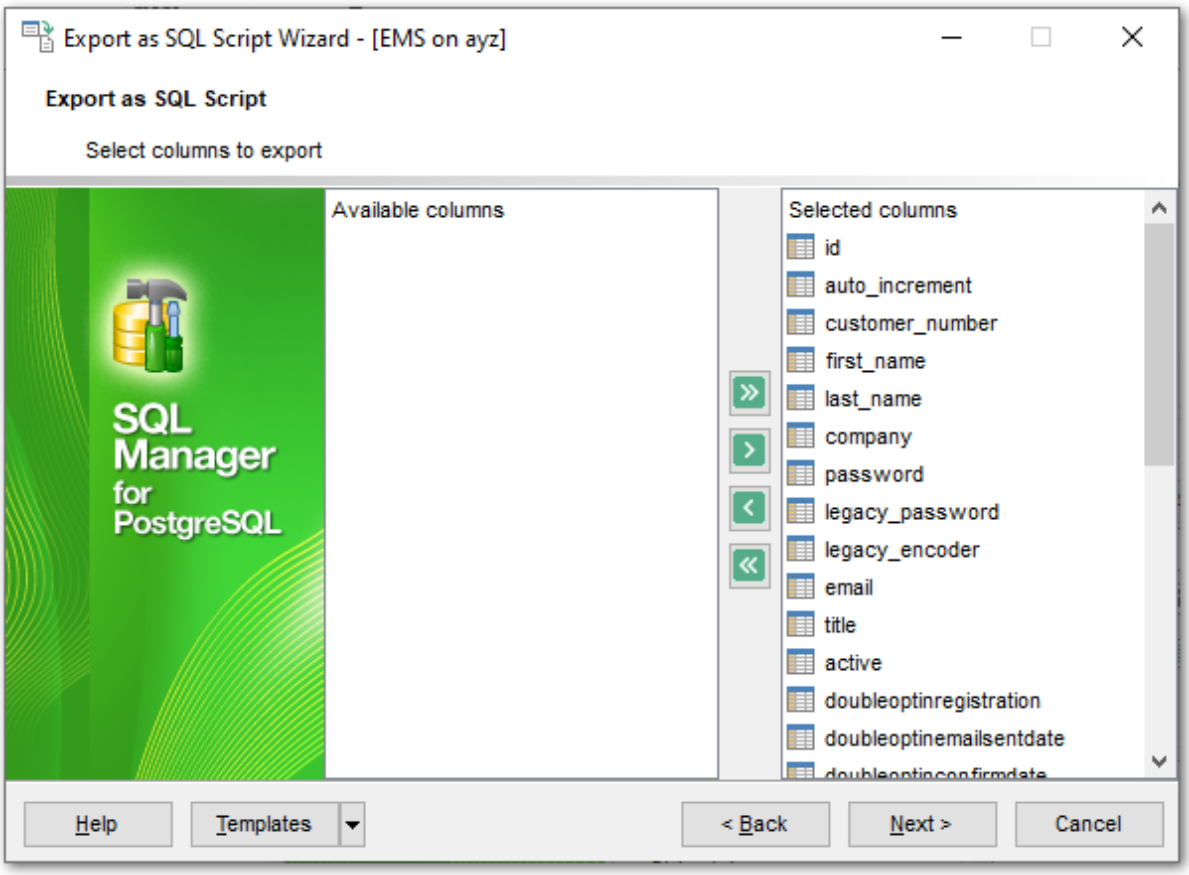
9.3.4 Selecting column to export

This step of the wizard allows you to select the table column(s) to be exported to SQL script.
To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.



Click the **Next** button to proceed to the Editing table definition 615 step of the wizard.

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9.3.5 Setting export options

Specify common export options according to your needs.

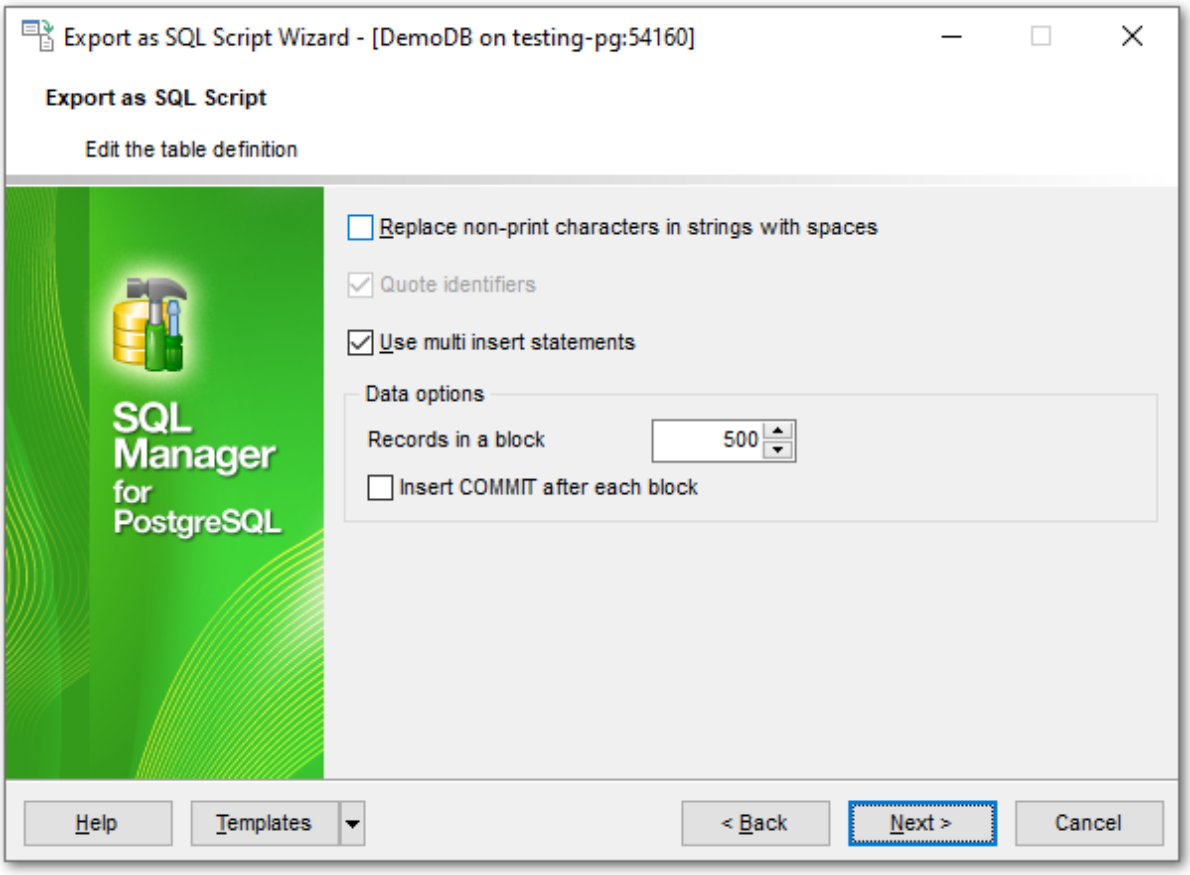
If necessary, you can choose **to replace non-print characters in strings with spaces**.

☑ **Quote identifiers**
Check this option to apply quoting for identifiers in the destination file.

☑ **Use multi insert statements**
Check this option to group insert statements.

Data options
Records in block
Use the spinner control to define the number of records in each committed block.

☑ **Insert COMMIT after each block**
Check this option to add the *COMMIT* statement after a defined number of records.



Click the **Next** button to proceed to Exporting as SQL Script 616.

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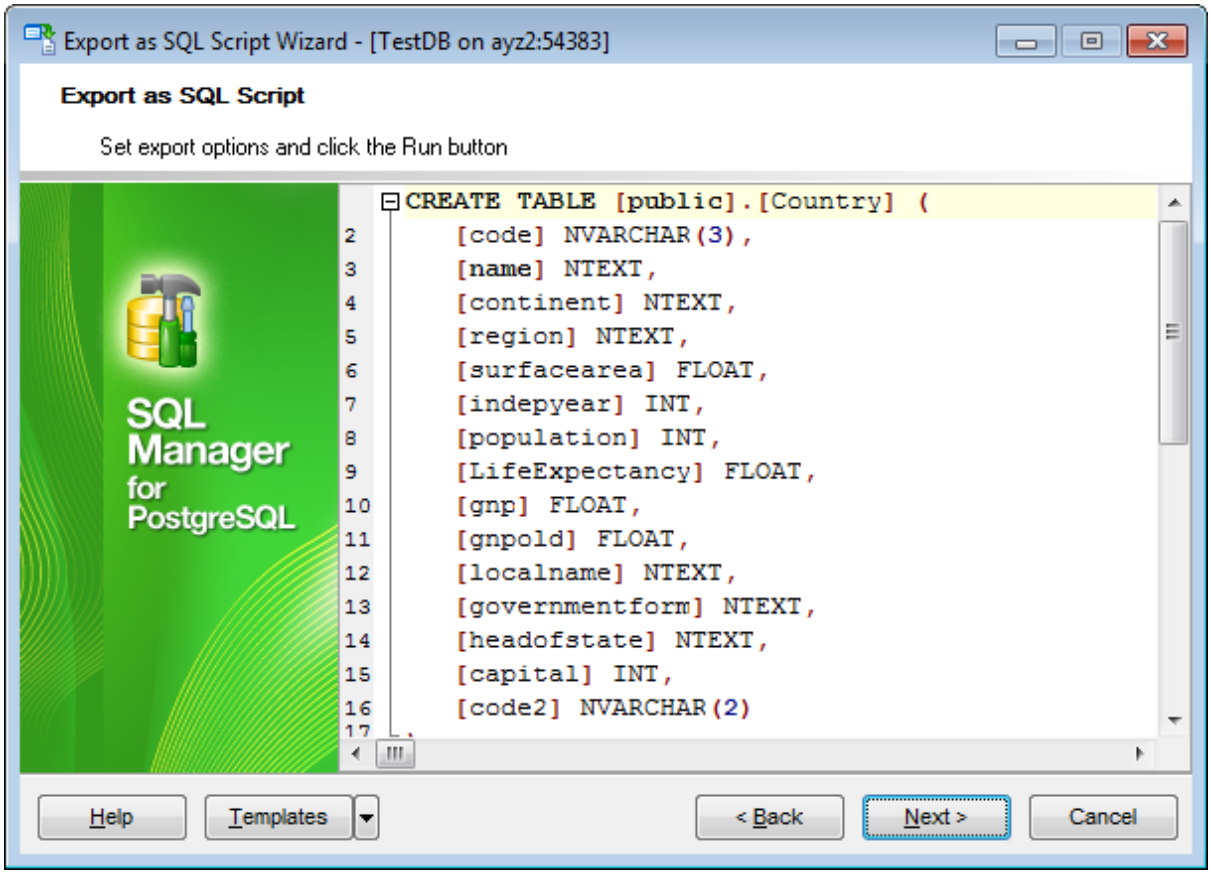
9.3.6 Editing table definition

This step is available only if the **Add CREATE TABLE statement** option was checked on the Selecting destination DBMS 610 step of the wizard. It allows you to view/edit the SQL script for creating the table.

For your convenience the **syntax highlight**, **code folding** and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area 418 and Using the context menu 420.



Click the **Next** button to proceed to the Setting export options 614 step of the wizard.

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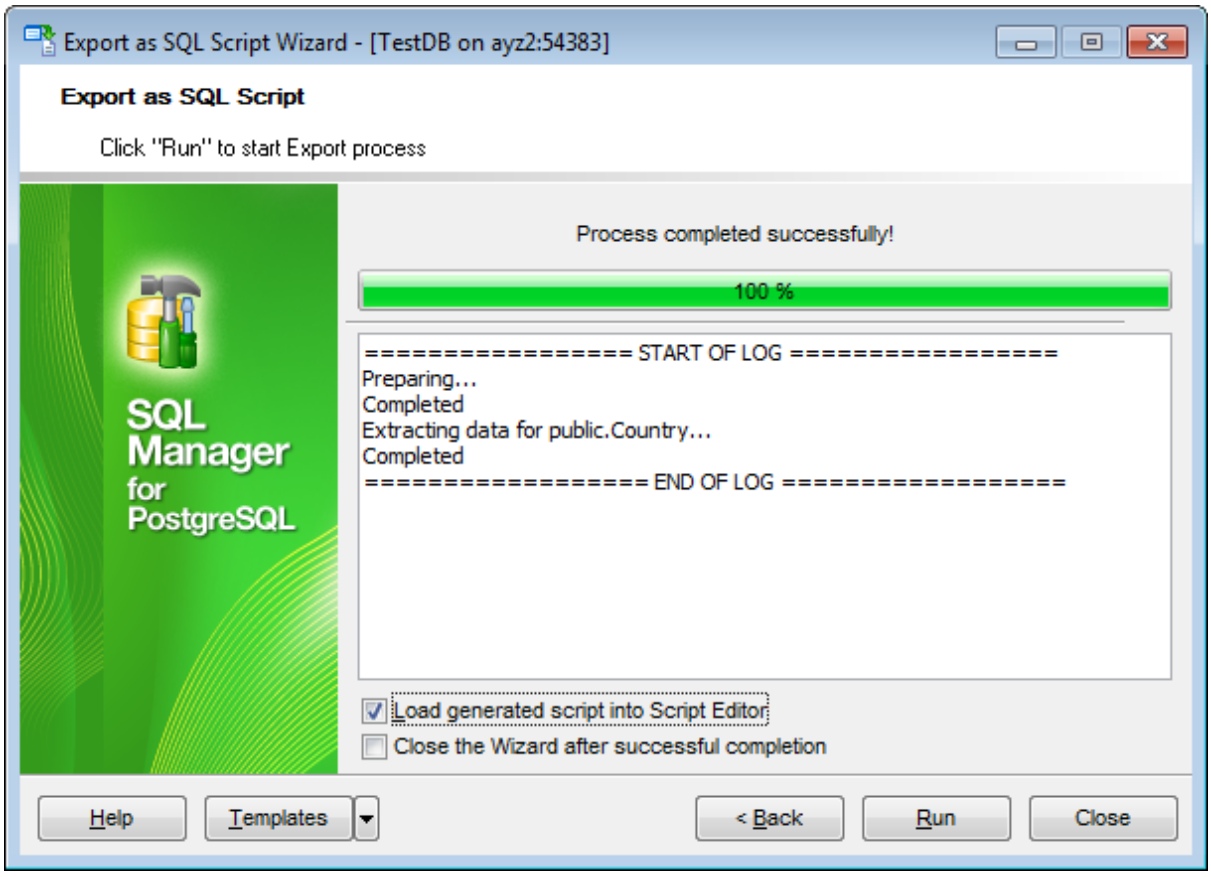
9.3.7 Exporting as SQL Script

This step of the wizard is intended to inform you that all export options have been set, and you can start the export as SQL script process.

The **Operations** tab allows you to view the log of operations and errors (if any).



Load generated script into Script Editor
Check this option to load the result script to Execute Script Editor[646].

Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the export process is completed.

If necessary, you can save a template[982] for future use.

Click the **Run** button to run the export as SQL script process.

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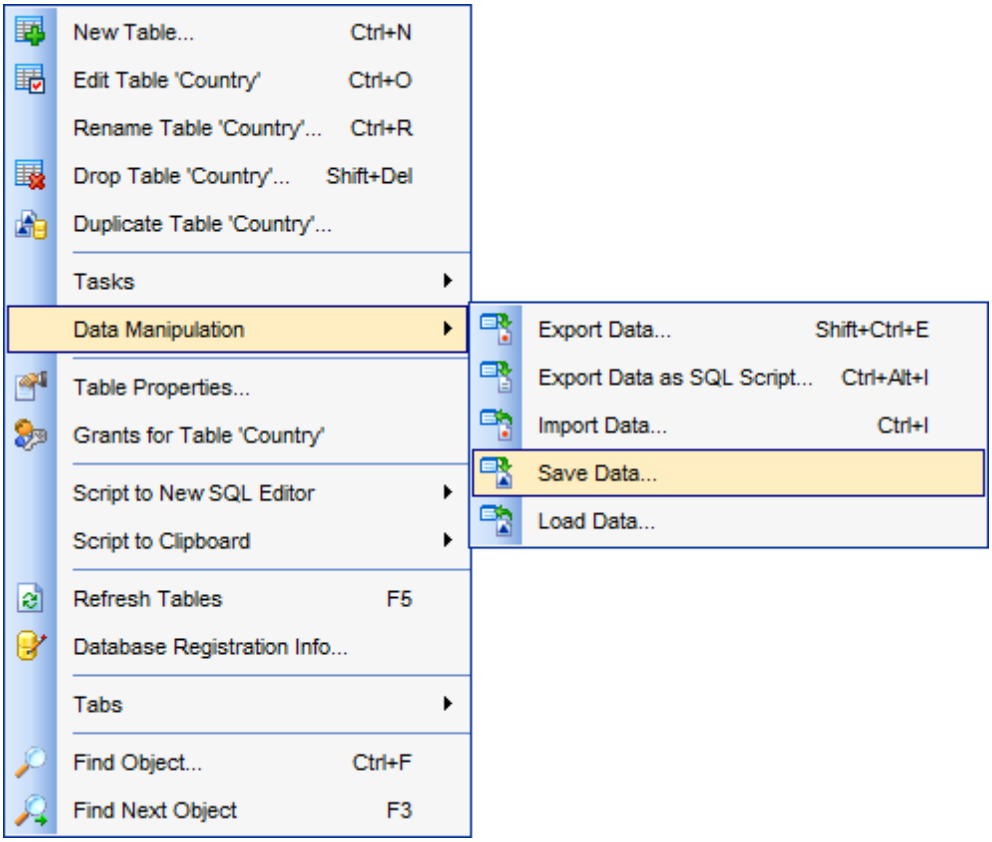
9.4 Save Data Wizard

Save Data Wizard allows you to use the *COPY* PostgreSQL statement to copy the contents of a table (or view / query result - for PostgreSQL server 8.2 and higher) to a file at a very high speed. You can save your settings as a template any time for future use.

To start the wizard, right-click the table in DB Explorer, select the **Data Manipulation | Save Data to File on Server...** context menu item.
Alternatively, you can open the **Data** tab of Table Editor / View Editor or the **Result (s)** tab of Query Data / Design Query, right-click the grid there, then select the **Data Manipulation | Save Data to File on Server...** context menu item.



- Setting output file name
- Selecting columns
- Specifying type of output file
- Setting output file parameters
- Saving data

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to

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the Feature Matrix 22 page.

See also:

Export Data Wizard 536
Import Data Wizard 582
Export as SQL Script 608
Load Data Wizard 626
Using templates 982

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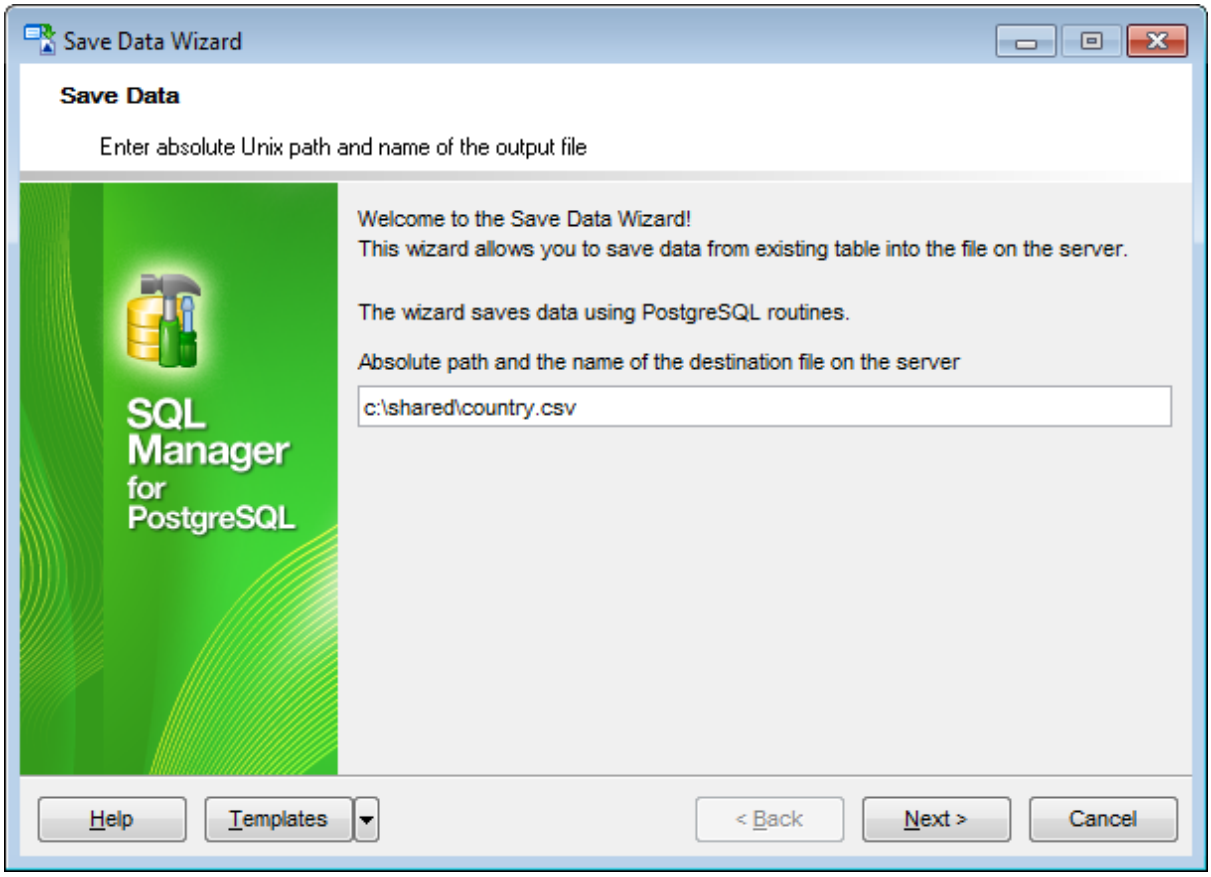
9.4.1 Setting output file name

This step of the wizard allows you to specify **absolute path and name of the output file** to save the table data into.

The file must be accessible to the server and the name must be specified from the viewpoint of the server. Note that the file will be written directly by the server, not by the client application. Therefore, it must reside on or be accessible to the database server machine, not the client.



Click the **Next** button to proceed to the Selecting columns 620 step of the wizard.

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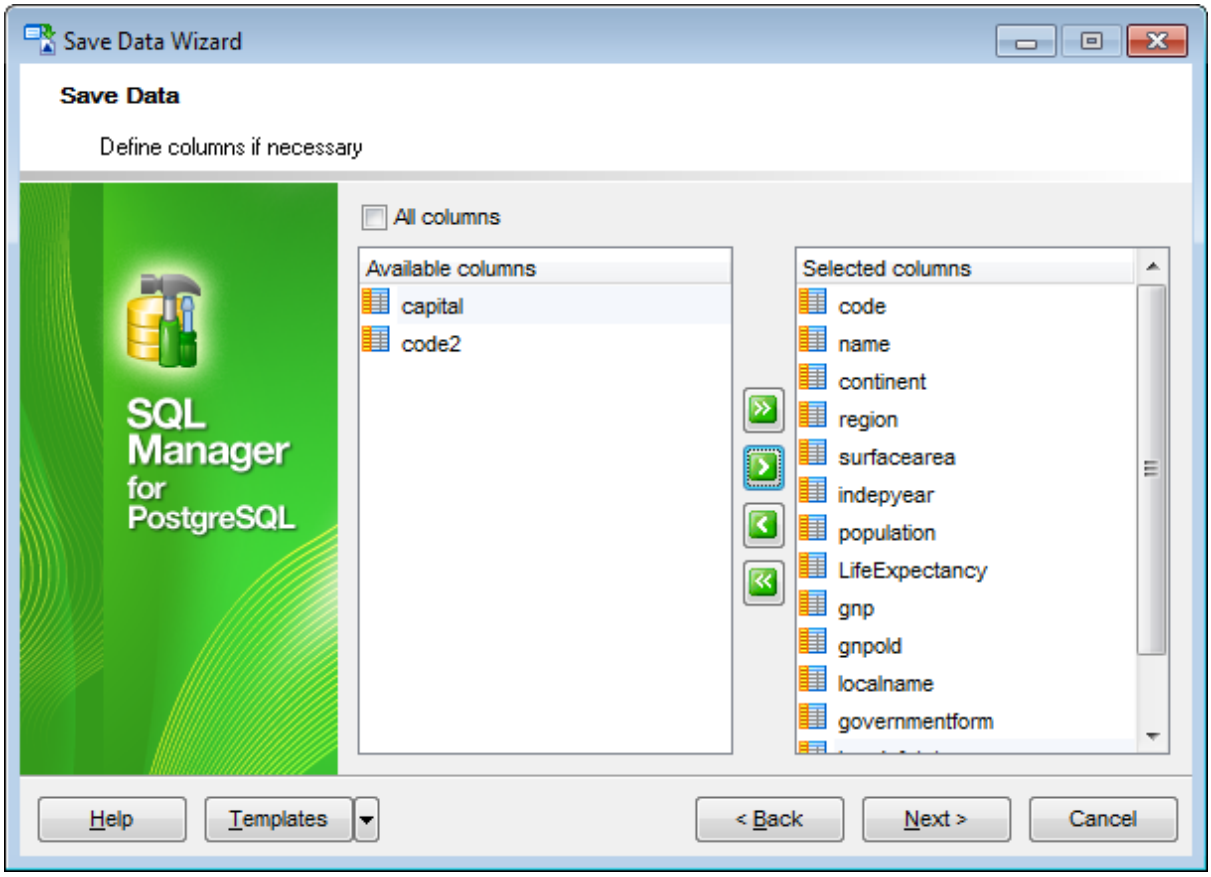
9.4.2 Selecting columns

In this step of the wizard you are to select the table columns from which the data should be saved.

To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.

If you need to copy all available columns, you can select the **All columns** option.



Click the **Next** button to proceed to the Specifying type of output file 621 step of the wizard.

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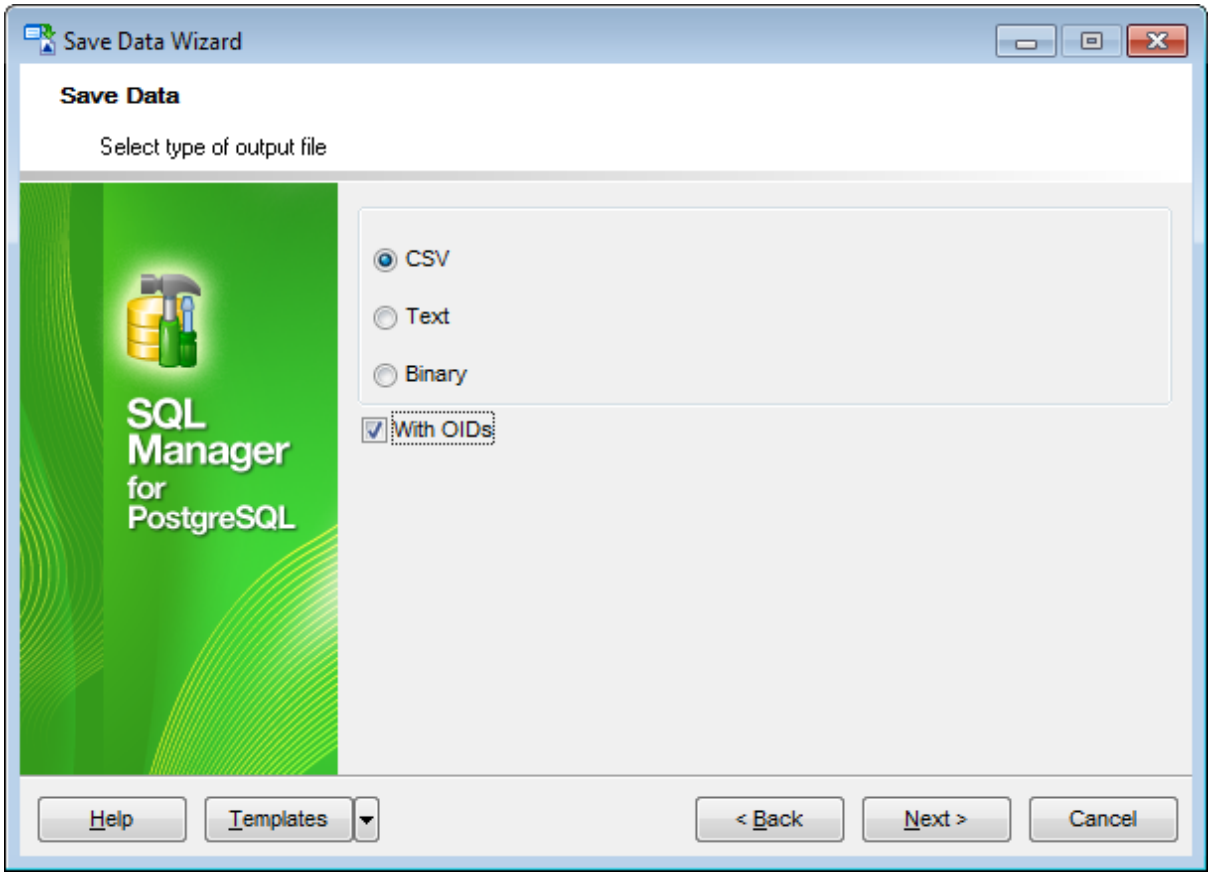
9.4.3 Specifying type of output file

Use this step of the wizard to select the type of the output file:

CSV
Specifies CSV as the output file format 983.
Text
Specifies TXT as the output file format 983.
Binary
Causes all data to be stored in binary format rather than as text. You will not need to specify the *DELIMITER* or *NULL* options 622 in binary mode.

With OIDs
This option specifies copying the OID for each row (an error is raised if this option is enabled for a table that does not have OIDs, or in the case of copying a query).



Click the **Next** button to proceed to the Setting output file parameters 622 step of the wizard.

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9.4.4 Setting output file parameters

Define the output file parameters according to the instructions below.

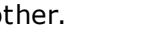
CSV file parameters

Quote
Specify the quotation character to be used in the CSV file. By default, the double-quote is used.

Escape
Specify the character that should appear before a *QUOTE* data character value in the CSV file. By default, the same character as for **Quote** is used (double-quote).

Delimiters
Specify the single character that separates columns within each row (line) of the file. By default, a comma is used.

NULL value
Specify the string that represents a NULL value. You might prefer an empty string for cases where you do not want to distinguish nulls from empty strings.

☑ **Force quote columns**
This option forces quoting to be used for all non-NULL values in each column selected below. NULL output is never quoted.
To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the  buttons or drag-and-drop operations to move the columns from one list to another.

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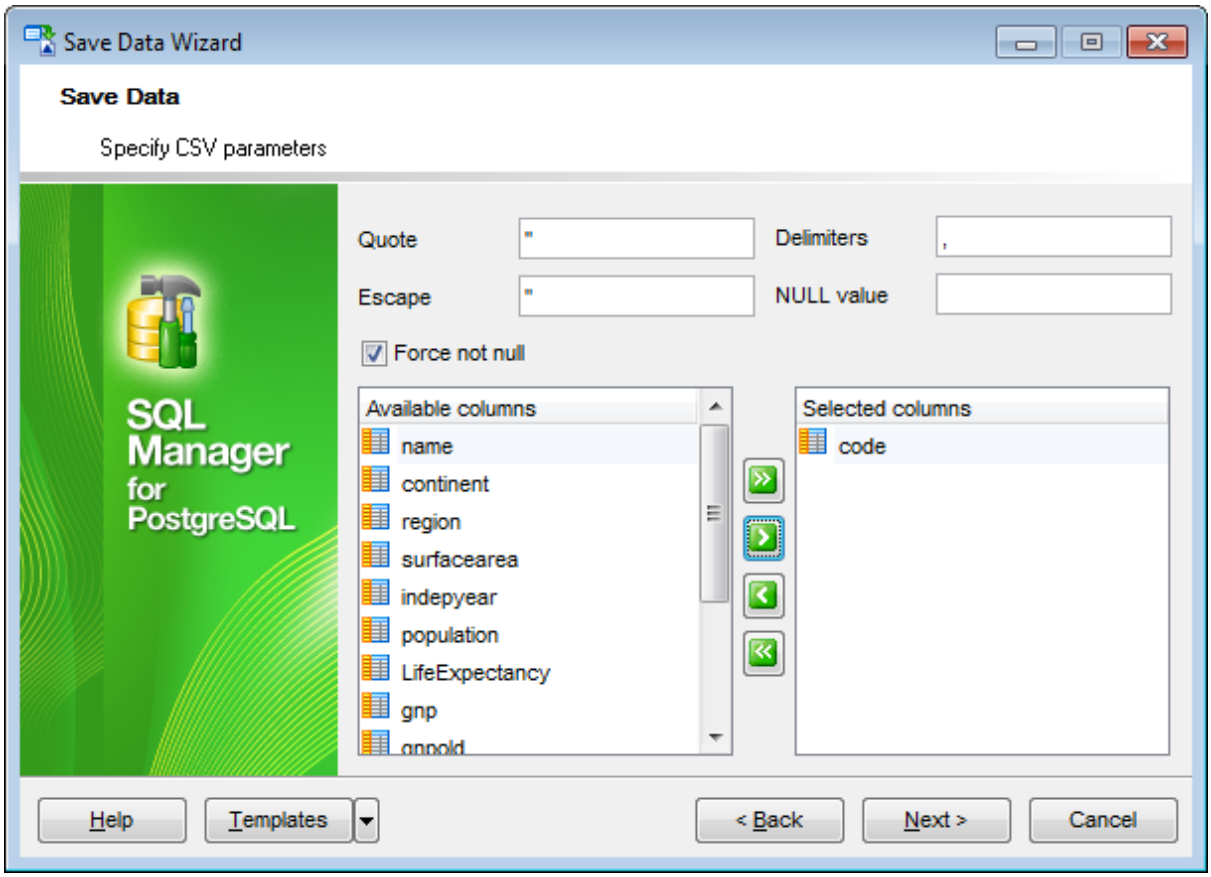

Text file parameters

Delimiters
Specify the single character that separates columns within each row (line) of the file. By default, a tab character is used.

NULL value
Specify the string that represents a NULL value. The default is "\N" (backslash-N). You might prefer an empty string for cases where you do not want to distinguish nulls from empty strings.

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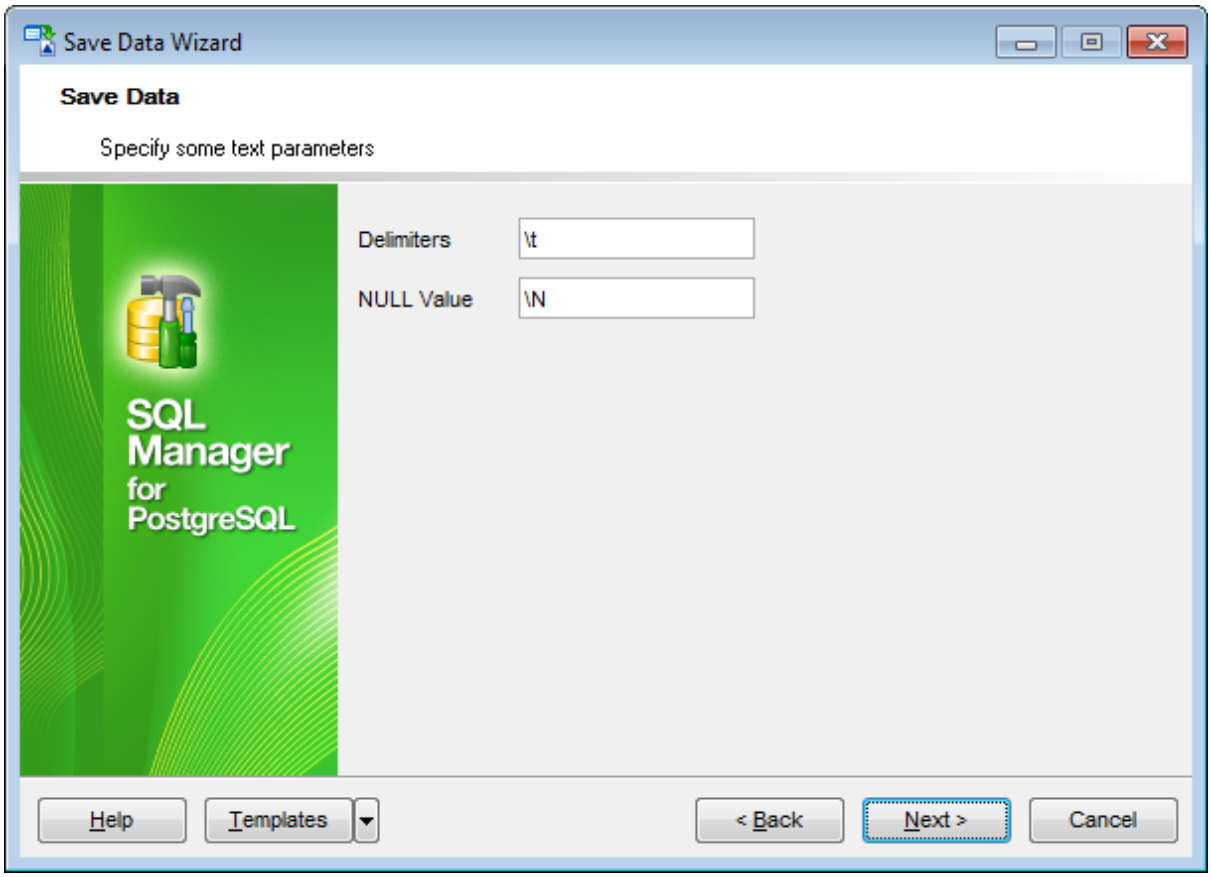

When you are done, click the **Next** button to proceed to the last step[625] of the wizard.

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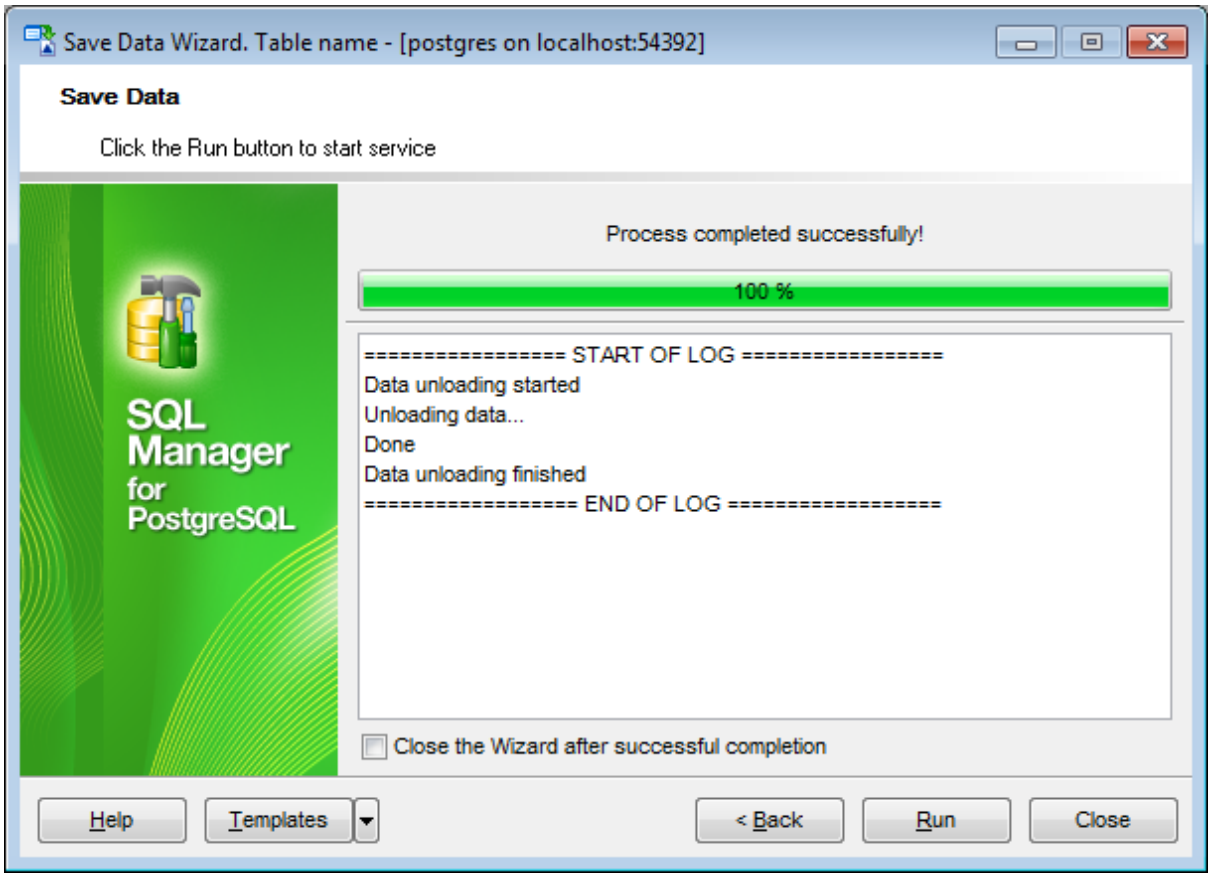
9.4.5 Saving data

This step of the wizard is intended to inform you that all *COPY* options have been set, and you can start the saving data process itself.

The **Operations** tab allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the saving data process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the saving data process.

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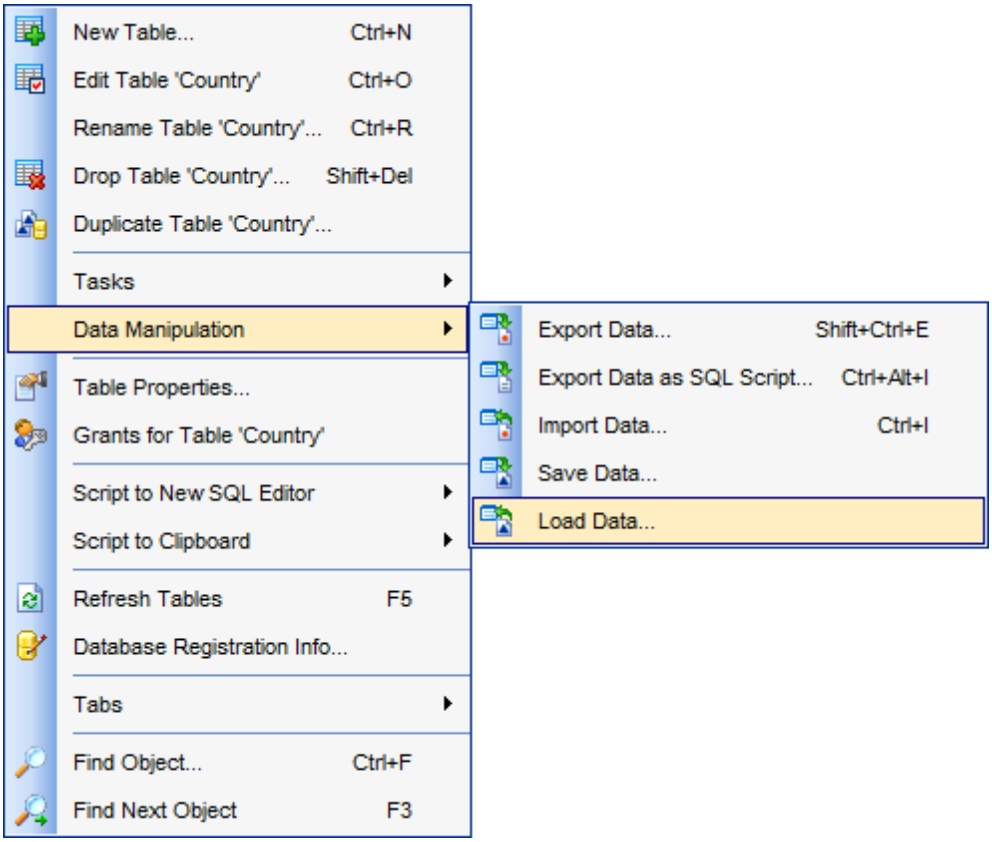
9.5 Load Data Wizard

Load Data Wizard allows you to use the *COPY FROM* PostgreSQL statement to copy data from a standard file-system file to a table[169] at a very high speed. This command copies data from a file to a table, appending the data to whatever is in the table already. The file must be accessible to the server and the name must be specified from the viewpoint of the server. You can save your settings as a template[982] any time for future use.

To start the wizard, right-click the table in DB Explorer[65], select the **Data Manipulation | Load Data...** context menu[57] item.
Alternatively, you can open the **Data** tab of Table Editor[177] / View Editor[229], right-click the grid[457] there, then select the **Data Manipulation | Load Data...** context menu[466] item.



- Setting input file name[628]
- Selecting columns[629]
- Specifying type of input file[630]
- Specifying input file parameters[631]
- Loading data[634]

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**

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Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Export Data Wizard 536
Import Data Wizard 582
Export as SQL Script 608
Save Data Wizard 617
Using templates 982

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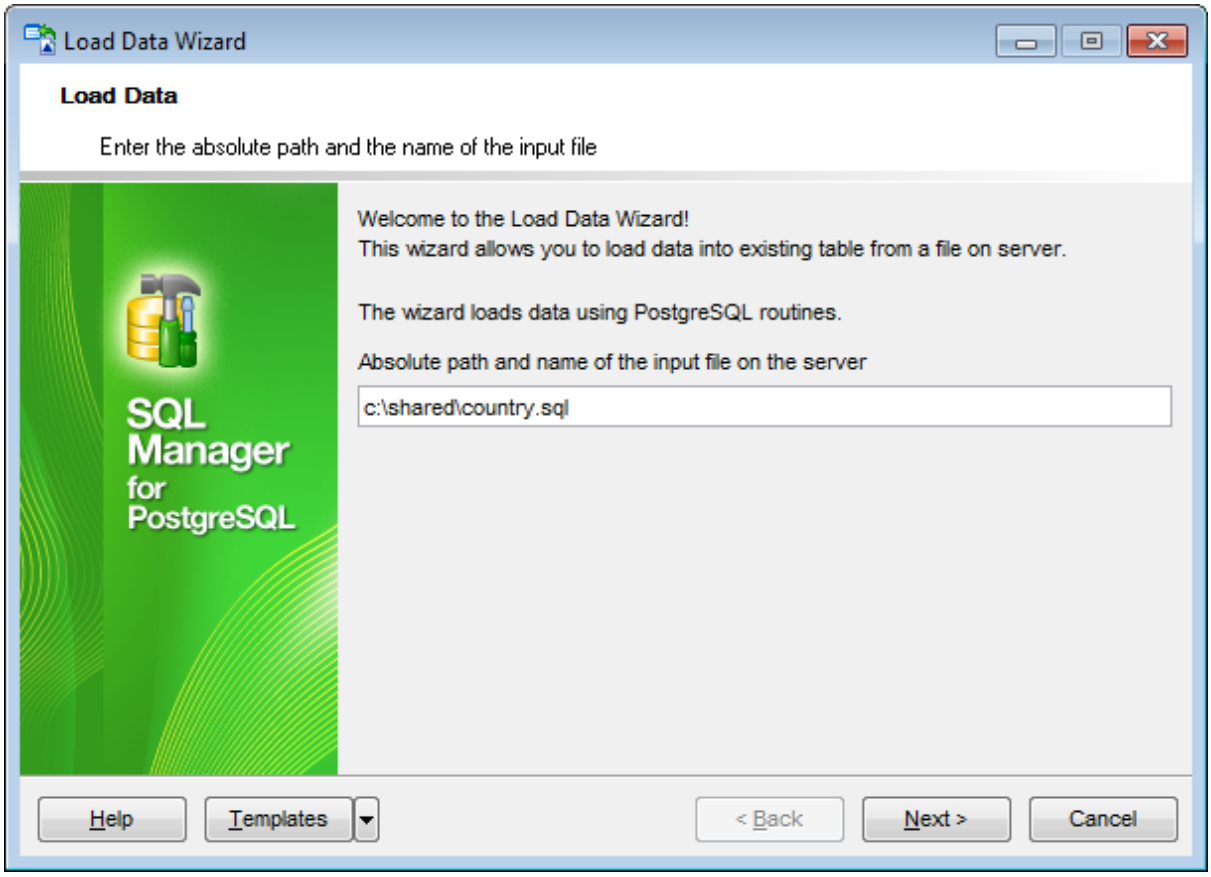
9.5.1 Setting input file name

This step of the wizard allows you to specify **absolute path and name of the input file** to load data from.

The file must be accessible to the server and the name must be specified from the viewpoint of the server. Note that the file will be read directly by the server, not by the client application. Therefore, it must reside on or be accessible to the database server machine, not the client.



Click the **Next** button to proceed to the Selecting columns 629 step of the wizard.

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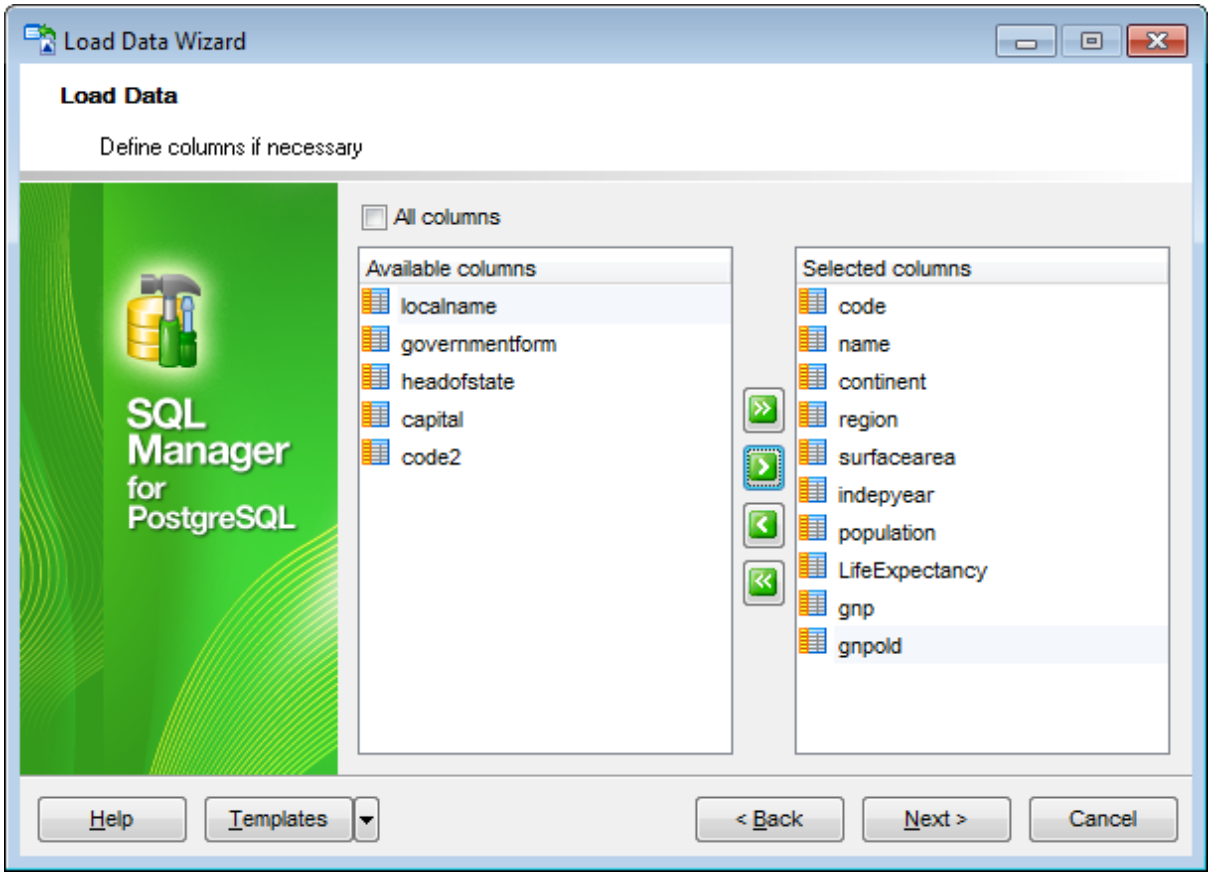
9.5.2 Selecting columns

In this step of the wizard you are to select the columns into which the data should be loaded.

To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.

If you need to copy to all available columns, you can select the **All columns** option.



Click the **Next** button to proceed to the Specifying type of input file 630 step of the wizard.

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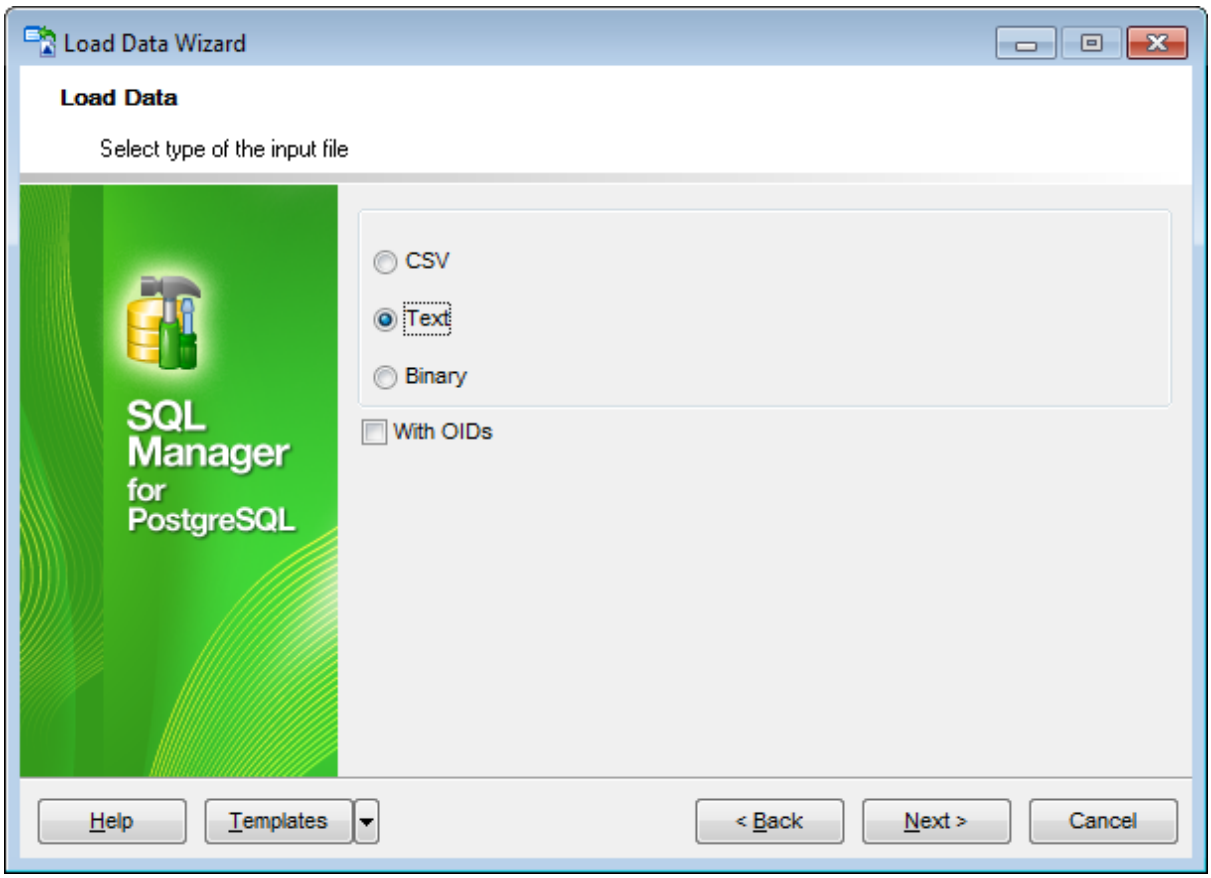
9.5.3 Specifying type of input file

Use this step of the wizard to select the type of the input file:

CSV
Specifies CSV as the input file format 983.
Text
Specifies TXT as the input file format 983.
Binary
Causes all data to be read in binary format rather than as text. You will not need to specify the *DELIMITER* or *NULL* options 631 in binary mode.

With OIDs
Specifies copying the OID for each row (an error is raised if this option is enabled for a table that does not have OIDs, or in the case of copying a query).



Click the **Next** button to proceed to the Specifying input file parameters 631 step of the wizard.

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9.5.4 Specifying input file parameters

Define the source (input) file parameters according to the instructions below.

CSV file parameters

Quote
Specify the quotation character used in the CSV file. By default, the double-quote is used.

Escape
Specify the character that appears before a *QUOTE* data character value in the CSV file. By default, the same character as for **Quote** is used (double-quote).

Delimiters
Specify the single character that separates columns within each row (line) of the file. By default, a comma is used.

NULL value
Specify the string that represents a NULL value. Note that any data item that matches this string will be stored as a null value, so you should make sure that you use the same string as you used with Save Data Wizard 617.

☑ **Force not null**
If this option is selected, each column selected below will be processed as though it were quoted and hence not a NULL value.
To select a column, you need to move it from the **Available columns** list to the **Selected columns** list. Use the buttons or drag-and-drop operations to move the columns from one list to another.

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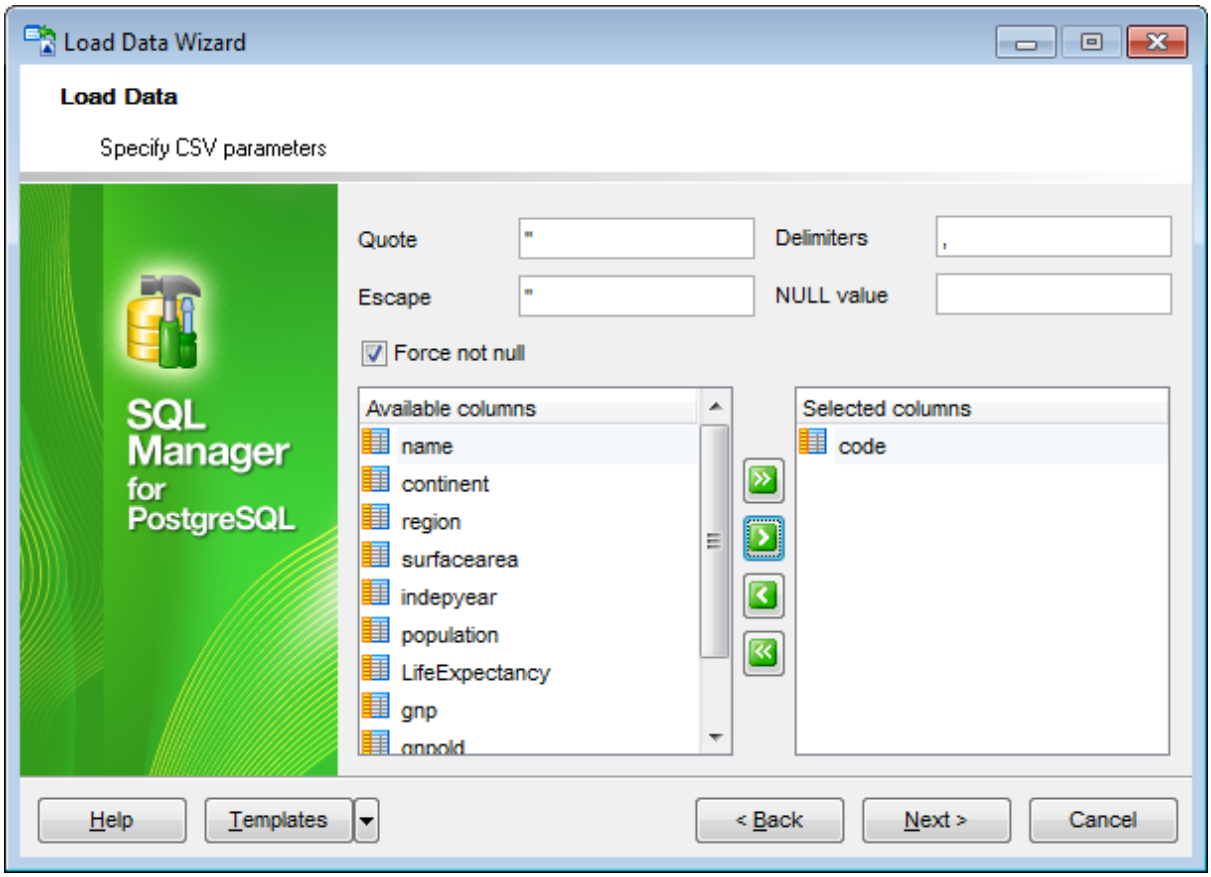

Text file parameters

Delimiters
Specify the single character that separates columns within each row (line) of the file. By default, a tab character is used.

NULL value
Specify the string that represents a NULL value. The default is "\N" (backslash-N). You might prefer an empty string for cases where you do not want to distinguish nulls from empty strings.

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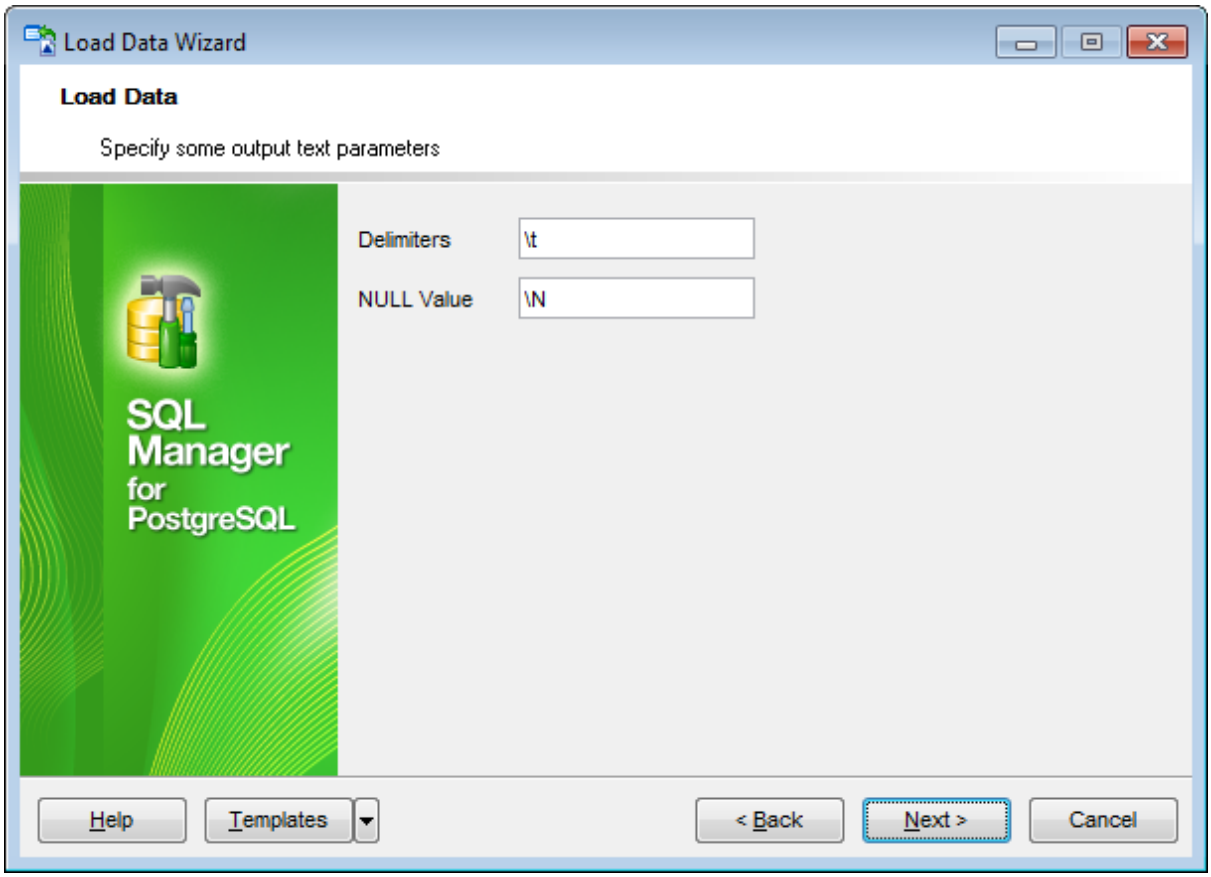

When you are done, click the **Next** button to proceed to the last step[634] of the wizard.

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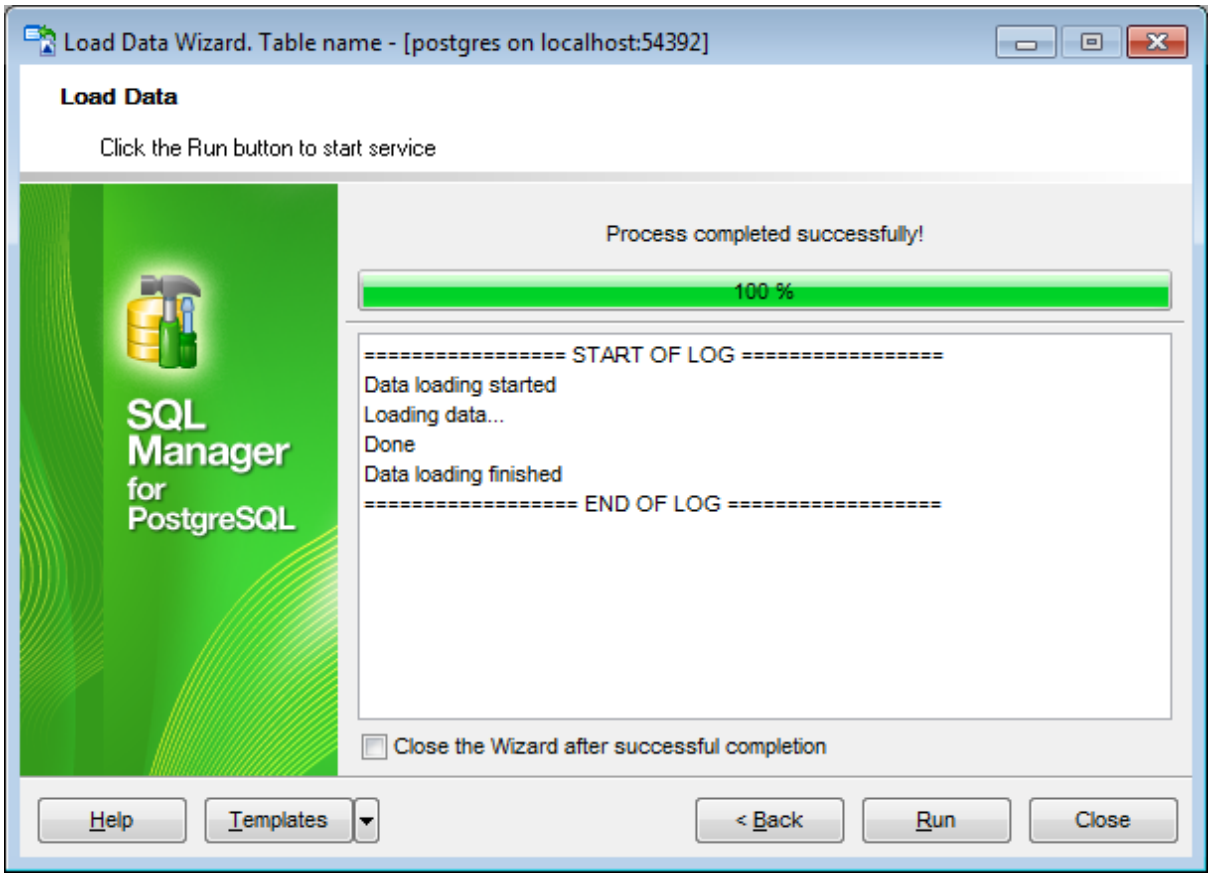
9.5.5 Loading data

This step of the wizard is intended to inform you that all *COPY FROM* options have been set, and you can start the loading data process itself.

The **Operations** tab allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the loading data process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the loading data process.

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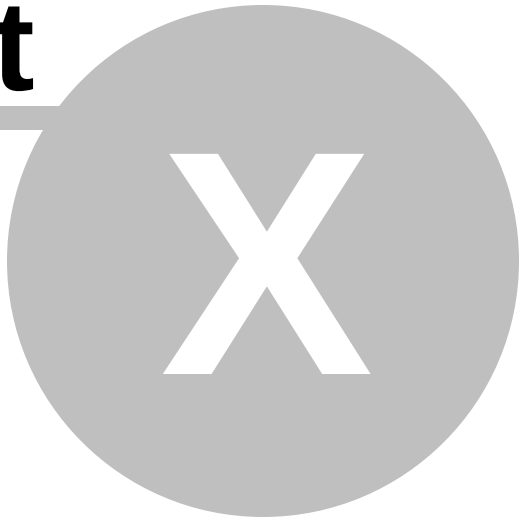
Part



10 Tools

The following *database tools* are available in SQL Manager for PostgreSQL:

Dependency Tree 638
Allows you to view all the object dependencies in one diagram.

Database Designer 720
Allows you to lay out your database schema visually.

Execute Script Editor 646
Executes SQL scripts in the database.

Extract Database Wizard 653
Extracts the table metadata and/or data to an SQL script which can be executed later on another machine to restore the database structure and/or data.

Copy Database Wizard 663
Allows you to copy database objects and/or data from one database to another.

Print Metadata 680
Creates powerful metadata reports in the WYSIWYG mode ready for printing.

HTML Report 686
Creates powerful metadata reports in the HTML format.

Reports management 692
Tools for efficient management of reports: creating, editing, viewing, printing.

SQL Monitor 643
Displays all the SQL statements executed while working in SQL Manager for PostgreSQL.

Using templates 982
Facilitates using SQL Manager wizards.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Services 771
Options 870
How To... 1006

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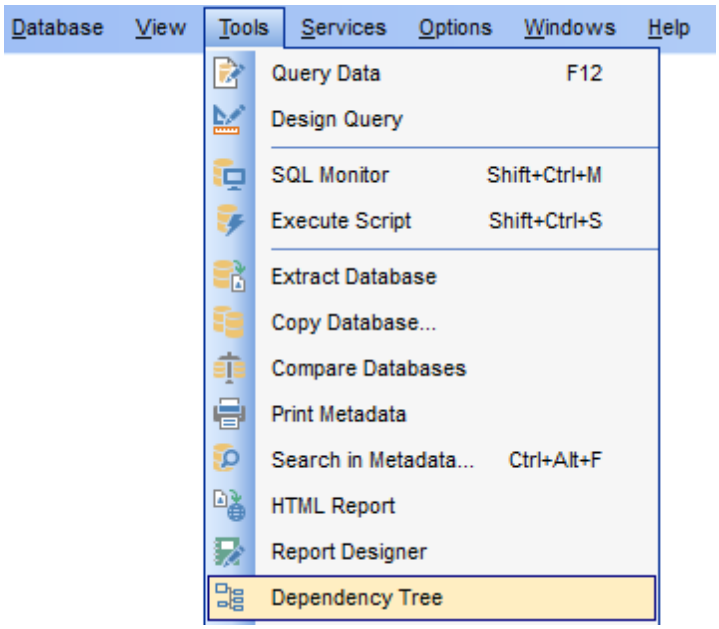
10.1 Dependency Tree

The **Dependency Tree** tool allows you to view all the object dependencies in one diagram.

To call the **Dependency Tree** window, select the **Tools | Dependency Tree** main menu961 item, or use the **Dependency Tree** button on the main toolbar963.



- Using Navigation bar and Toolbar639
- Viewing dependency tree641

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix22 page.

See also:
Database Objects Management155

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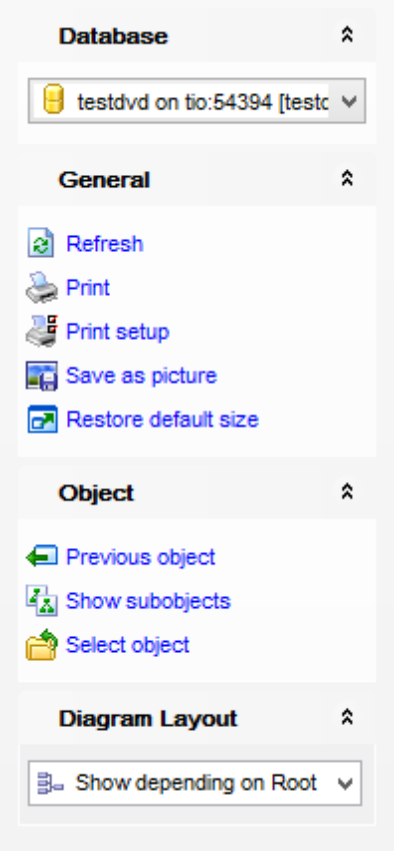
10.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Dependency Tree**.



Database
select a database for browsing object dependencies

General
refresh the currently displayed dependency tree
print the diagram
set printing options using the **Print Setup** dialog
save the current diagram as a picture
restore the default size and position of the window

Object
navigate by switching to the previous object
navigate by switching to the next object
show/hide subobjects
select a root object

Diagram Layout
show all objects
show objects depending on Root

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show Root depends on objects

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

Hint: Items of the **Object** pane of the **Navigation bar** are also available in the *context menu* of the **Dependency Tree** area.

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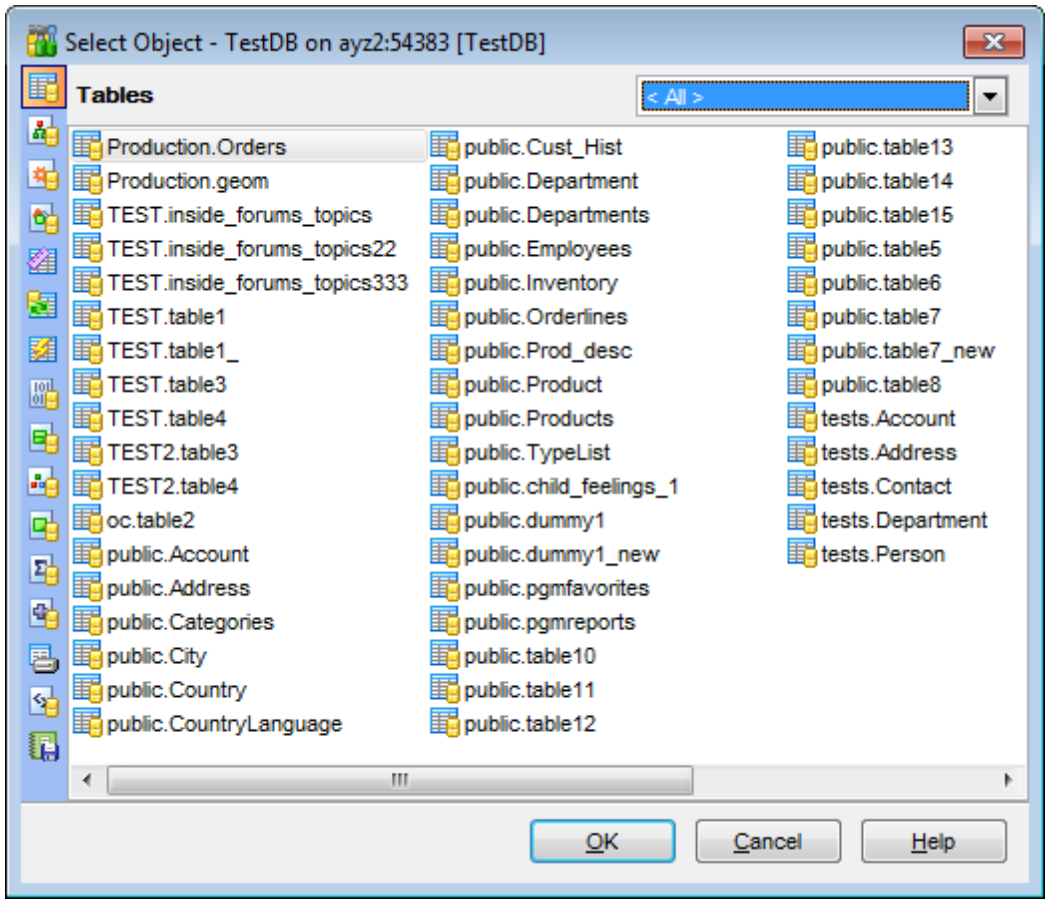
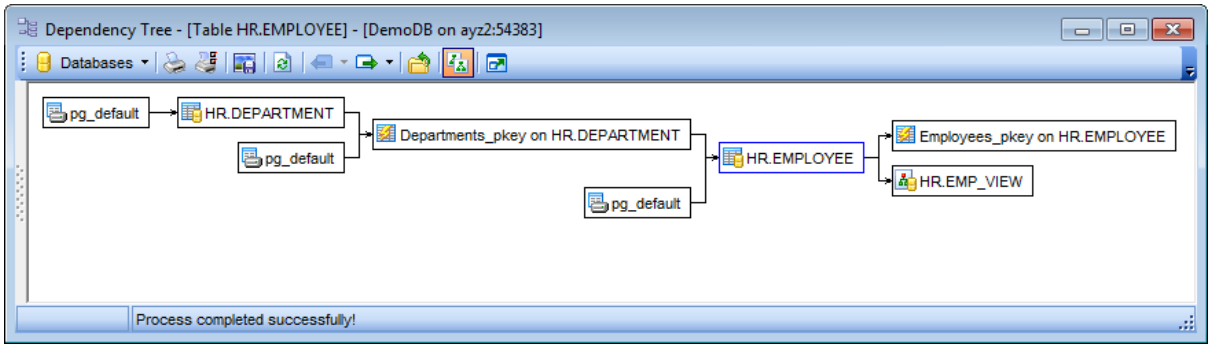
10.1.2 Viewing dependency tree

To view dependencies of an object, click the **Select object** Navigation bar[639] item. Then select the schema[164] and the required object in the **Select Object** dialog window. The dependency tree will appear in the main area of the window.



While the tree of dependencies is being built, the progress bar[963] is displayed in the status area at the bottom of the window.



The *root* object is marked out with a blue frame.

The objects that *the root object depends on* are located to the left of the root object.

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The objects that *depend on the root object* are located to the right of the root object.

Object dependencies are denoted as regular arrows from the left to the right (->).
A *cyclic dependency* (i.e. when the object already has some other depending object(s)) is denoted as a line ending with a cross (-x).

You can switch between objects by selecting them in the diagram. The selected object becomes the root object. To make an object root, you can also right-click it in the diagram area and select **Set as Root** from the **context menu**. The context menu of an object also allows you to *edit* it using the corresponding editor.

The history of selected root objects is also available: you can move back and forward through this history using the **Previous object** and the **Next object** links on the Navigation bar 639 or toolbar 639.

Hint: To show/hide subobjects (e.g. table triggers 268, foreign keys 212), click the **Show subobjects** / **Hide subobjects** item on the Navigation bar 639.

See also:

Select Object dialog 1000

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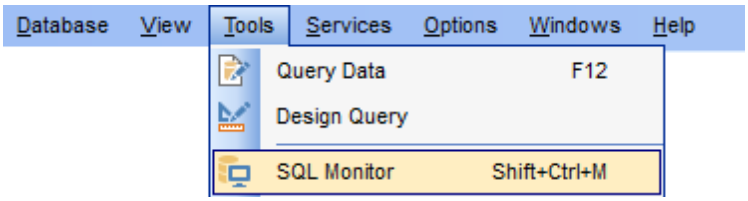
10.2 SQL Monitor

SQL Monitor allows you to view the log of all operations performed over databases and database objects in SQL Manager for PostgreSQL. The content of the window is read-only.

To open the **SQL Monitor** window, select the **Tools | SQL Monitor** main menu 961 item, or use the *Shift+Ctrl+M* shortcut 1001.



- Using Navigation bar and Toolbar 644
- Working with SQL Monitor 645

See also:

SQL Monitor options 891

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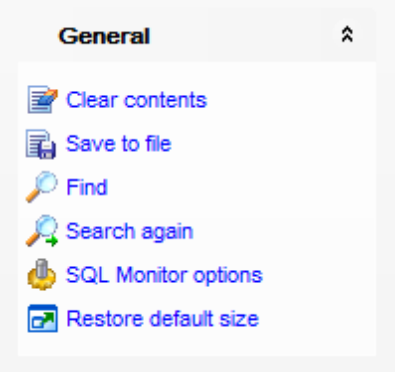
10.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **SQL Monitor**.



General

clear the content of the window

save the content to a **.txt* file using the **Save as...** dialog

search for a string using the Find Text 971 dialog

search again

configure SQL Monitor using the SQL Monitor 891 section of the Environment Options 871 dialog

restore the default size and position of the window

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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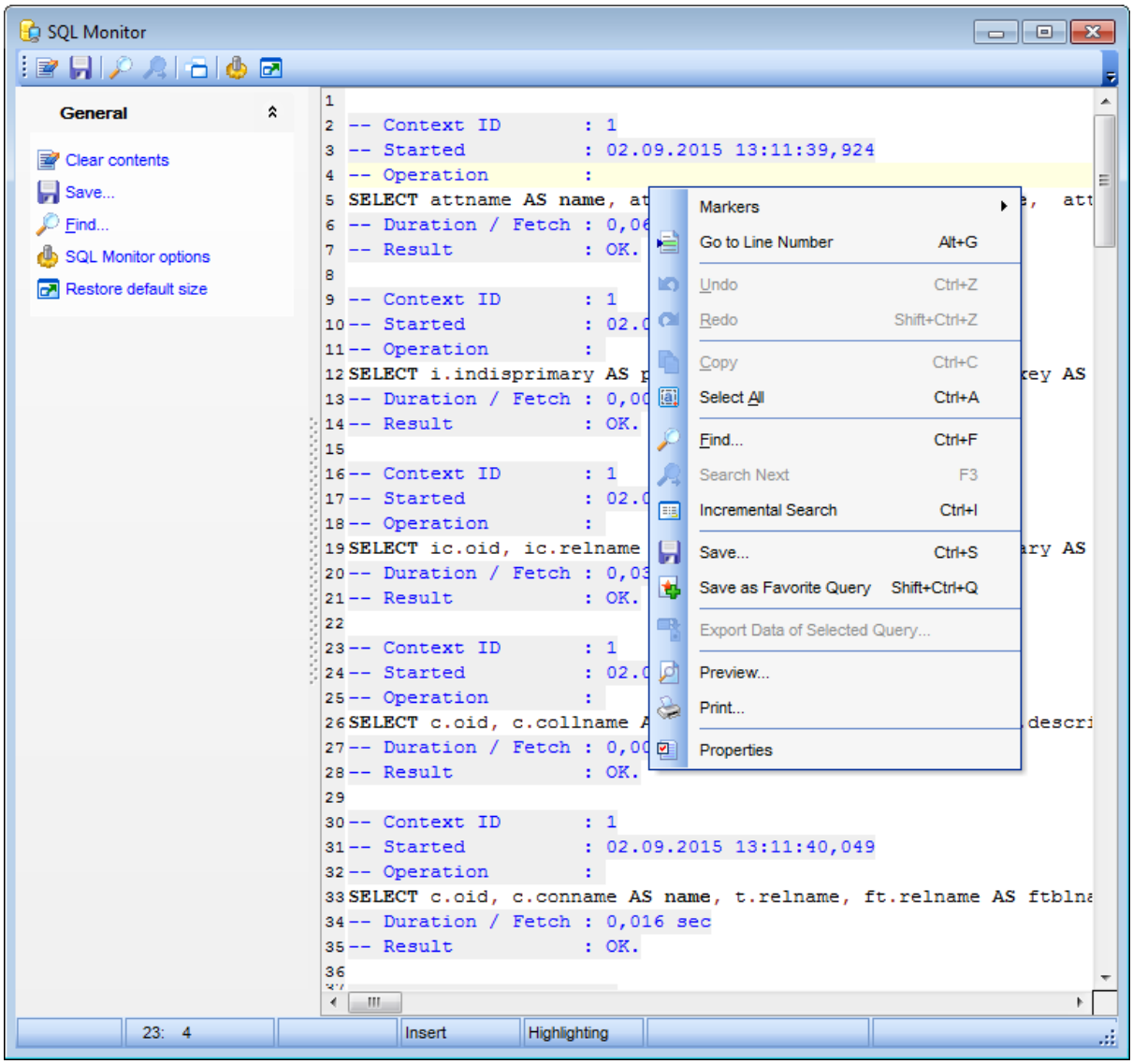
10.2.2 Working with SQL Monitor

The working area of **SQL Monitor** lists the log of database operations and SQL queries as items, each consisting of 3 parts: *Executed* (the date and time of the operation), *Operation* (SQL statement sent to the server), *Result* (the result of the operation).

Items of the **context menu** of SQL Monitor area provide access to various functions for working with the window content. The context menu contains standard text-processing functions (*Copy*, *Select All*), spelling checking[942] and functions for working with the content as a whole, e.g. you can set *markers*, *move the cursor to a particular line*, *save* the content to a file or as a favorite query[85], configure the editor using the properties[926] item or *preview/print* the content. Most of these operations can be also performed with the corresponding hot keys[1001] used.



Implementation of the Find Text[971] dialog and Incremental search[964] bar contributes to more efficient work with the content of SQL Monitor.

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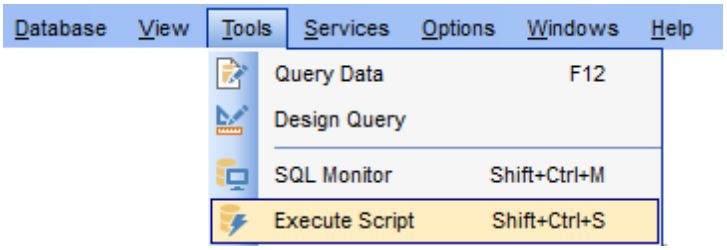
10.3 Execute Script Editor

Using **Execute Script editor** you can view, edit and execute SQL scripts.

To open the editor select the **Tools | Execute Script** main menu 961 items or use the corresponding toolbar 963 buttons. You can also use the *Shift+Ctrl+S* shortcut 1001 for the same purpose.



In the script area you can view and edit the SQL script text. For your convenience syntax highlight and code completion features are implemented.

- Using Navigation bar and Toolbar 647
- Working with Execute Script editor area 649
- Using Script Explorer 651
- Script execution 652

Note: **Execute Script Editor** does not show results returned upon SELECT queries execution. Please use Query Data 415 for that purpose instead.

See also:

Query Data 415

Execute Script options 892

Editor Options 925

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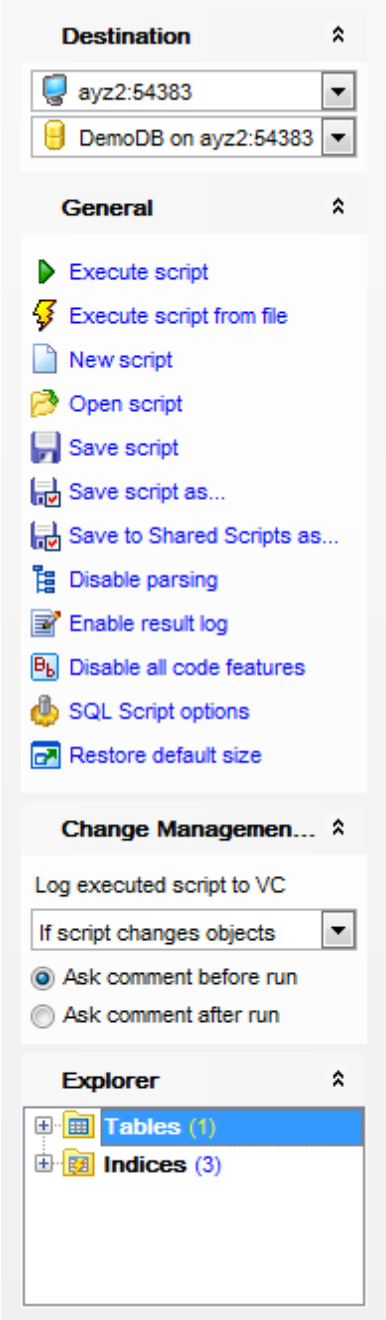
10.3.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Execute Script Editor**.



Destination

select a host

select a database for the script

General

execute 652 the current script
execute a script from file
create a new script
load a script from an *.sql file using the **Open SQL Script** dialog
save the current script
save the current script as Shared Script 336 using the **Save to Shared Scripts as...** dialog
save the script to an *.sql file using the **Save as...** dialog
enable/disable parsing of SQL code
enable/disable result log
enable/disable all code features 925
configure Execute Script Editor within the Script Options 892 section of the Environment Options 871 dialog
restore the default size and position of the editor window

Version Control

This panel is enabled if change management 126 feature is enabled for the database.
Use the drop-down list to define whether to add this transaction to version control log *always* or only *if script changes objects*.
Ask comment before run
Ask comment after run

Explorer

browse the tree objects used in the script using the Script Explorer 651 pane

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

See also:

Working with Execute Script editor area 649
Using Script Explorer 651
Script execution 652

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10.3.2 Working with Execute Script editor area

The **Editor area** of Execute Script is provided for efficient working with SQL scripts in text mode.

For your convenience the **syntax highlight**, **code completion** and a number of other features for efficient SQL editing are implemented:

- using object links 425 allowing you to open the object in the associated editor;
- ability to display line numbers;
- code folding for statements and clauses;
- customizable margins and gutters;
- formatting code for better representation

and more.

The **context menu** of Execute Script Editor area contains execution 652 commands, most of the standard text-processing functions (*Cut*, *Copy*, *Paste*, *Select All*), spelling checking 942 and functions for working with the script as a whole, e.g. you can enable/disable *parsing*, toggle *bookmarks* and *comments*, *move the cursor to a particular line*, *change the case* of selected text, *load/save* the content from/to a file or save as a favorite query 85, configure 926 the editor using the **Properties** item or *preview/print* the text of the script. Most of these operations can be also performed with the corresponding hot keys 1001 used.

Implementation of the Find Text 971 / Replace Text 973 dialogs and Incremental search 964 bar contributes to more efficient work with the SQL code.

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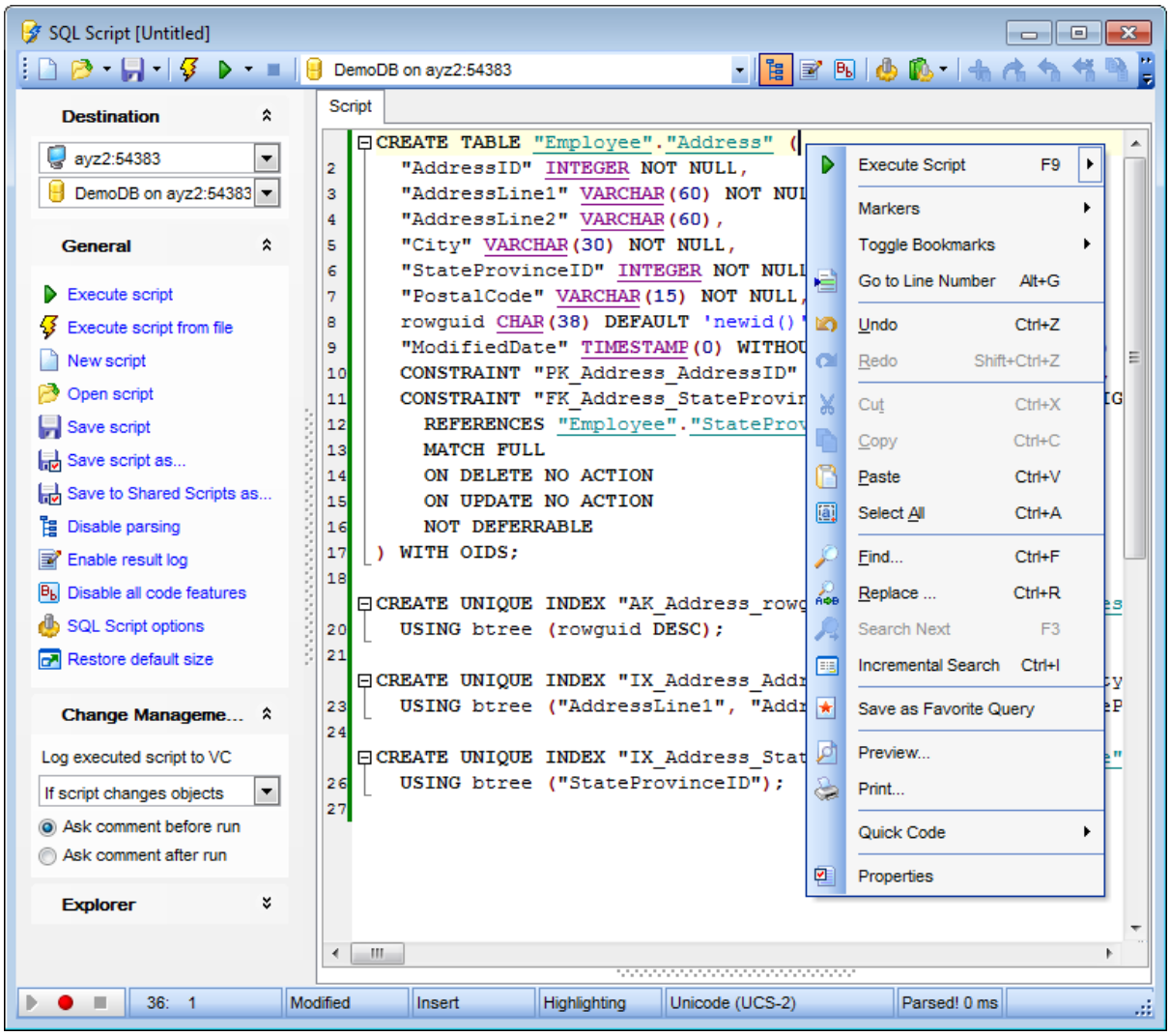
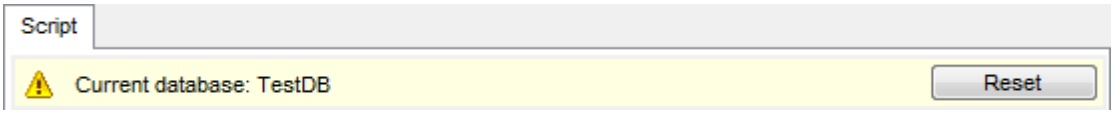


Note: If a database is selected within the navigation bar[647], but script contains the '\connect to database2' statement (where 'database2' differs from the selected one), then the **Reset** button appears. Click this button to ignore this statement. Script will be performed for the database selected within the navigation bar.



See also:

Using Navigation bar and Toolbar[647]
Using Script Explorer[651]
Script execution[652]
Managing Favorite queries[85]
Execute Script options[892]

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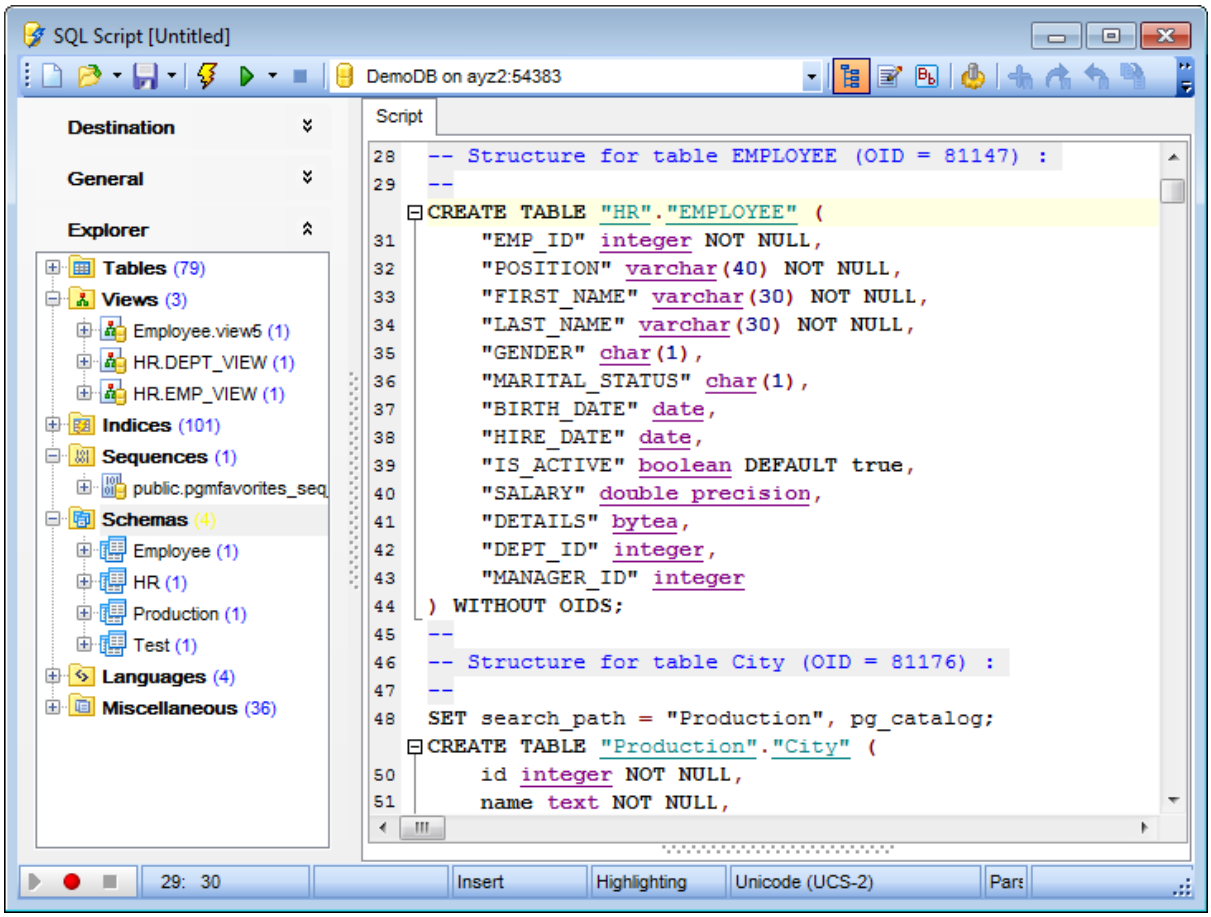
10.3.3 Using Script Explorer

The **Explorer** group on the Navigation bar[647] displays the tree of objects, used in the current script and allows you to get to the required script fragment quickly by clicking the object in the tree.



Hint: When you click a node in the **Script Explorer** tree, the corresponding SQL statement is highlighted in the editor area. If you double-click a node, the corresponding SQL statement is highlighted, and the current focus is switched to the editor area (the cursor appears after the highlighted statement).

See also:

Using Navigation bar and Toolbar[647]

Working with Execute Script editor area[649]

Database Objects Management[155]

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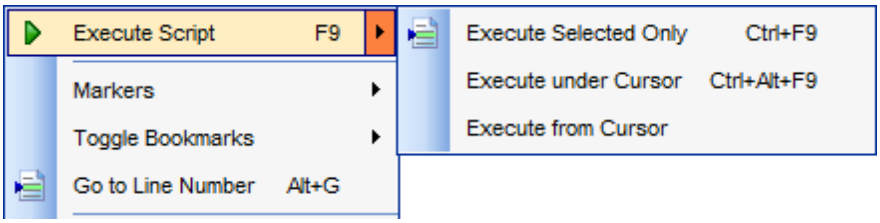
10.3.4 Script execution

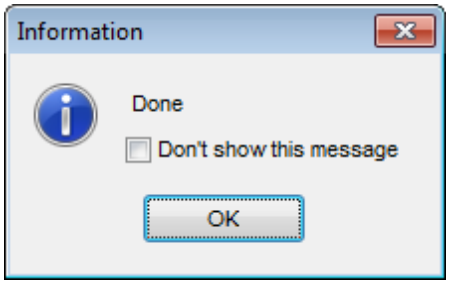
When all the script parameters are set, you can immediately **execute the script** in **Execute Script Editor**.

To execute a script, click the **Execute script** item of the Navigation bar[647] or toolbar[647]. You can also use the context menu[649] or *F9* hot key for the same purpose.



Note: If the **Execute selected text separately** option (see the Tools | Execute Script[892] section of the Environment Options[871] dialog) is enabled (by default) and a text fragment is currently selected, only this fragment is executed when you click *Execute script* on the Navigation bar[647] or press *F9*. If this option is disabled, the whole script is executed, but you can still execute the selected fragment using the corresponding *Execute Selected Only* item of the context menu[649] or by pressing *Ctrl+F9*.

If the SQL syntax is correct, the script is executed and the *'Done!'* information message appears.



If the syntax contains errors or script cannot be executed, the corresponding error message is displayed in the status bar area at the bottom of the editor window.

Hint: When you select an item from the error list (in the status bar area), the corresponding SQL statement is highlighted in the editor area. If you double-click an item, the corresponding SQL statement is highlighted, and the current focus is switched to the editor area (the cursor appears after the highlighted statement).

Note: **Execute Script Editor** does not show results returned upon SELECT queries execution. Please execute[426] such queries in Query Data[415] to see the result dataset.

See also:

Using Navigation bar and Toolbar[647]

Working with Execute Script editor area[649]

Using Script Explorer[651]

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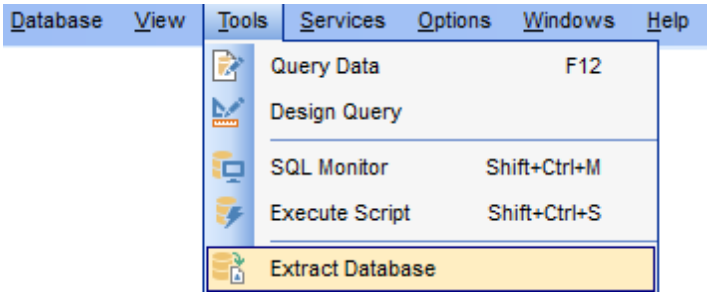
10.4 Extract Database

Extract Database Wizard allows you to extract database objects and/or data to an SQL script, e.g. for backup purposes.

To start the wizard, select the **Tools | Extract Database...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Extract Database...** item from the context menu 54.



- Selecting a database for extraction 654
- Specifying destination file name 655
- Setting extraction mode 656
- Selecting objects for metadata extraction 657
- Selecting objects for data extraction 659
- Customizing script options 660
- Start of extraction process 662

See also:

Execute Script Editor 646

Database Objects Management 155

Using templates 982

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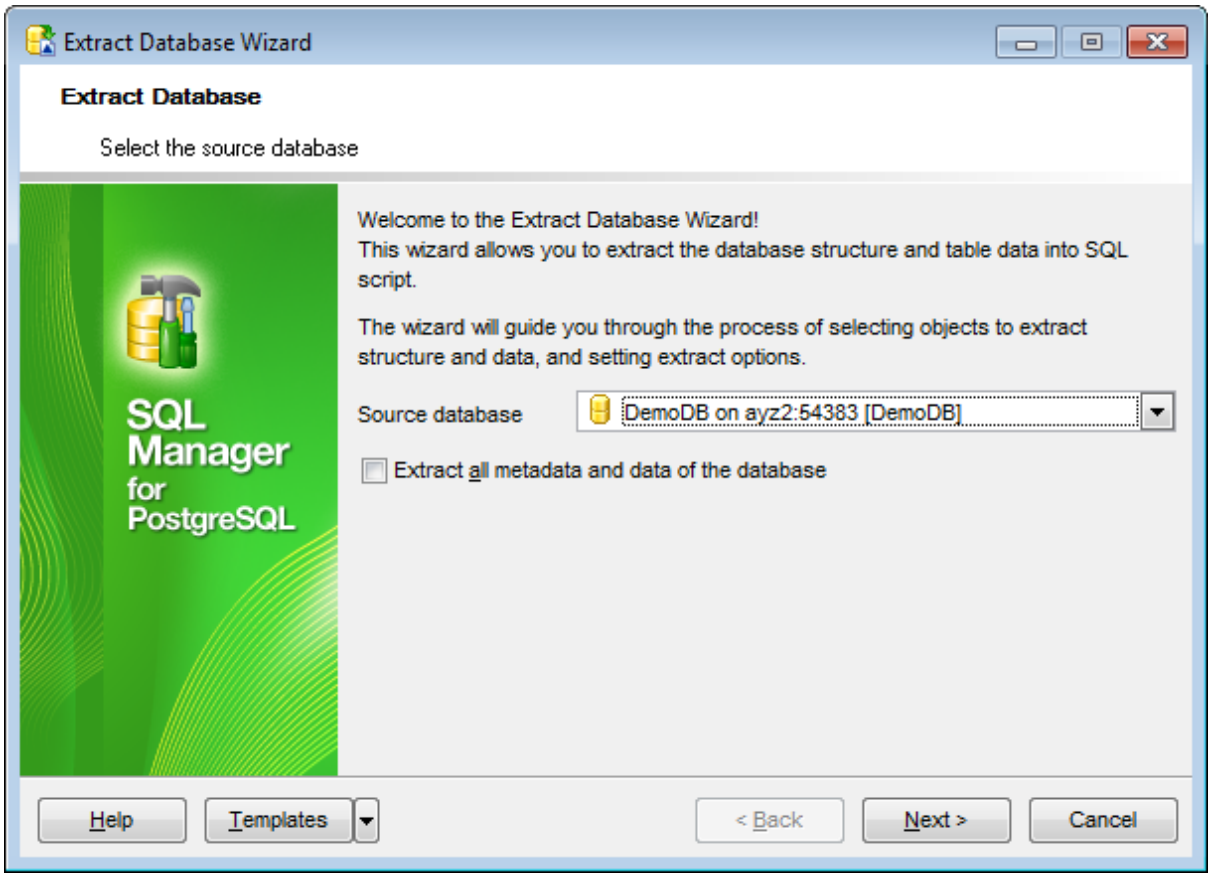
10.4.1 Selecting source database

This step of the wizard allows you to select the **source database** from which metadata and/or data are to be extracted.

If necessary, check the ☑ **Extract all metadata and data of the database** option to simplify the wizard.



Click the **Next** button to proceed to the Specifying destination file name 655 step of the wizard.

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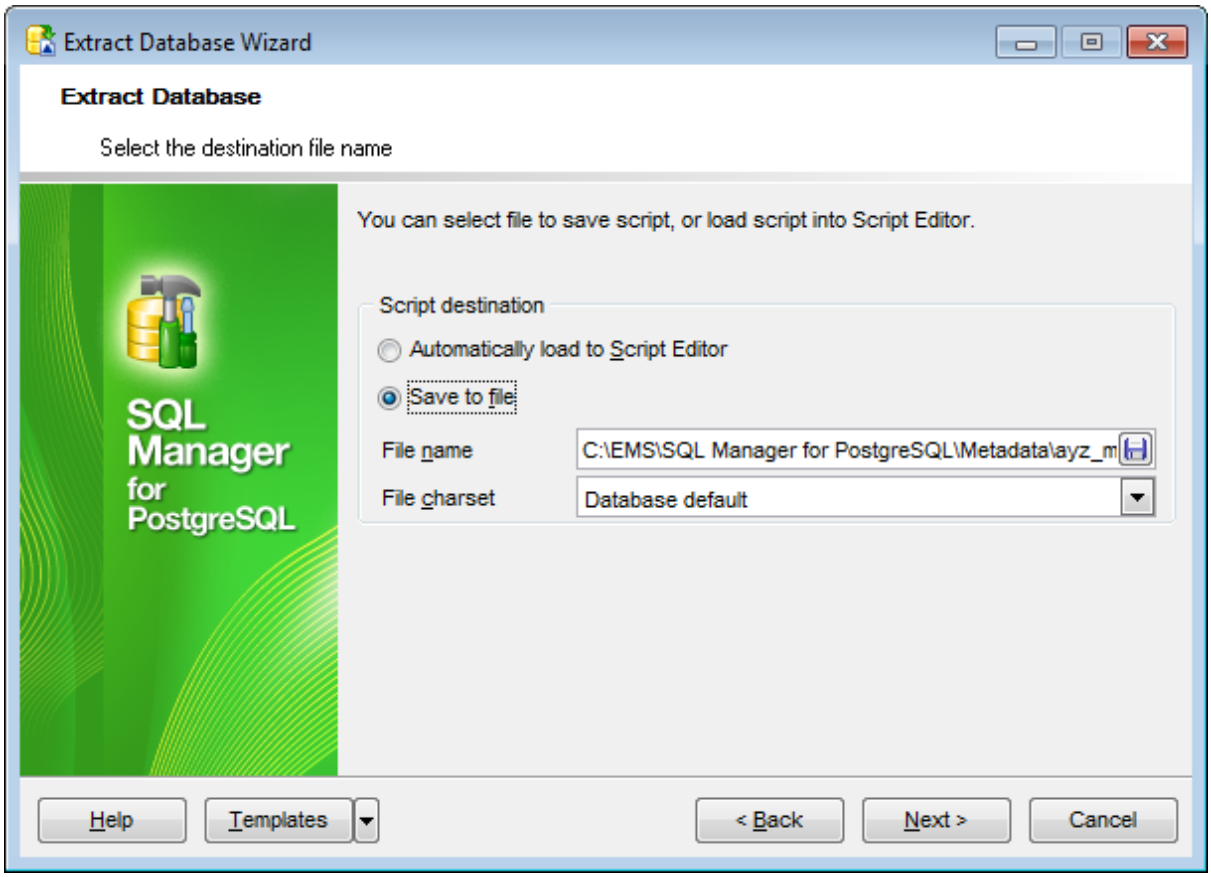
10.4.2 Specifying destination file name

Script destination

This group of options allows you to specify whether the result SQL script will be automatically loaded to Execute Script Editor[646] or saved into a file.

File name
Set a name for the result **.sql* file and type in or use the **Save as...** button to specify the path to this file on your local machine or on a machine in the LAN.

File charset
If necessary, use the drop-down list to select the character set to be applied to the output file.



Depending on whether you have checked the **Extract all metadata and data of the database** option at the Selecting source database[654] step, upon pressing the **Next** button you will either proceed to the next step of the wizard[656], or you will be immediately forwarded to the Customizing script options[660] step of the wizard.

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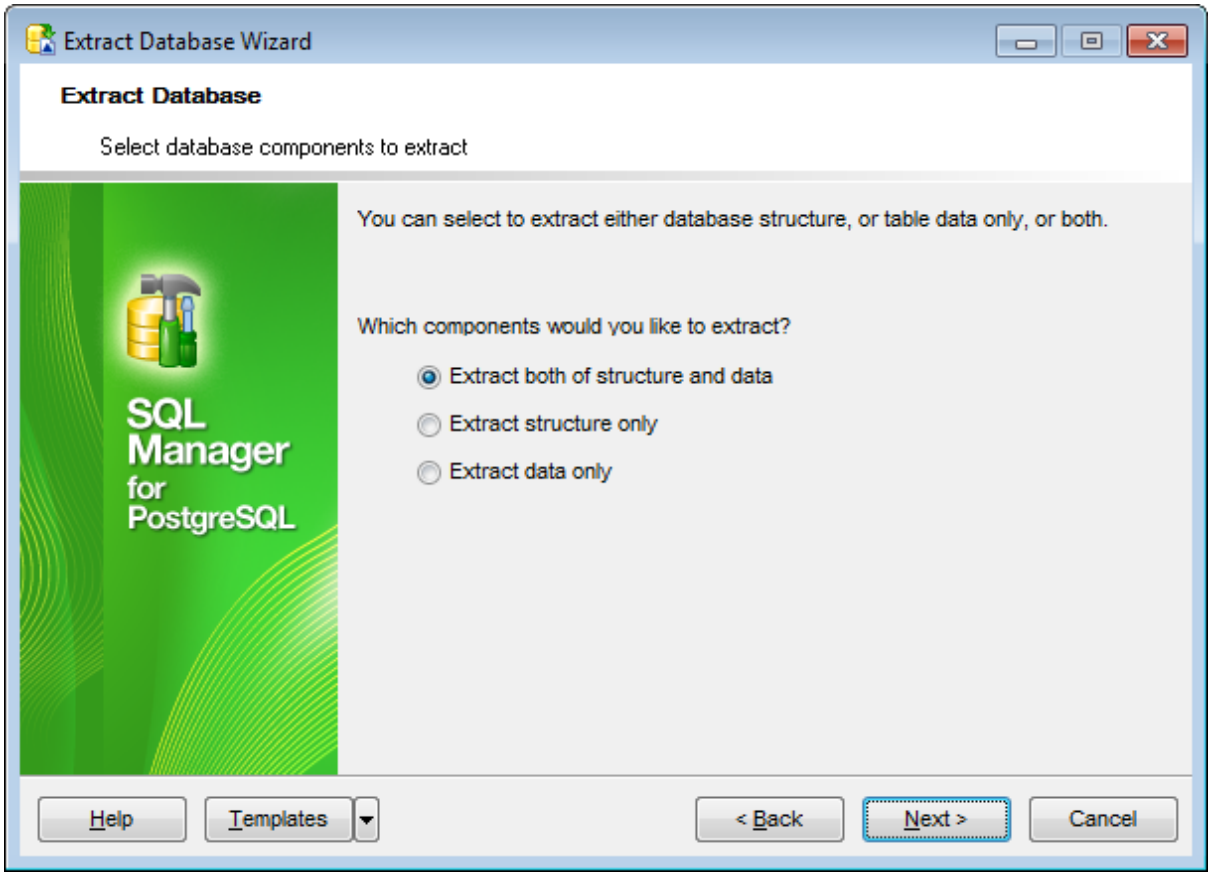
10.4.3 Setting extraction mode

This step allows you to specify the **extraction mode**: choose whether *structure only*, *data only* or *both* are to be extracted.



Click the **Next** button to proceed to Selecting objects for structure extraction 657.

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10.4.4 Selecting objects for structure extraction

This step of the wizard allows you to **select objects for metadata extraction**.

Note that this step is only available if the ☑ **Extract all metadata and data of the database** option was unchecked when selecting the source database 654.

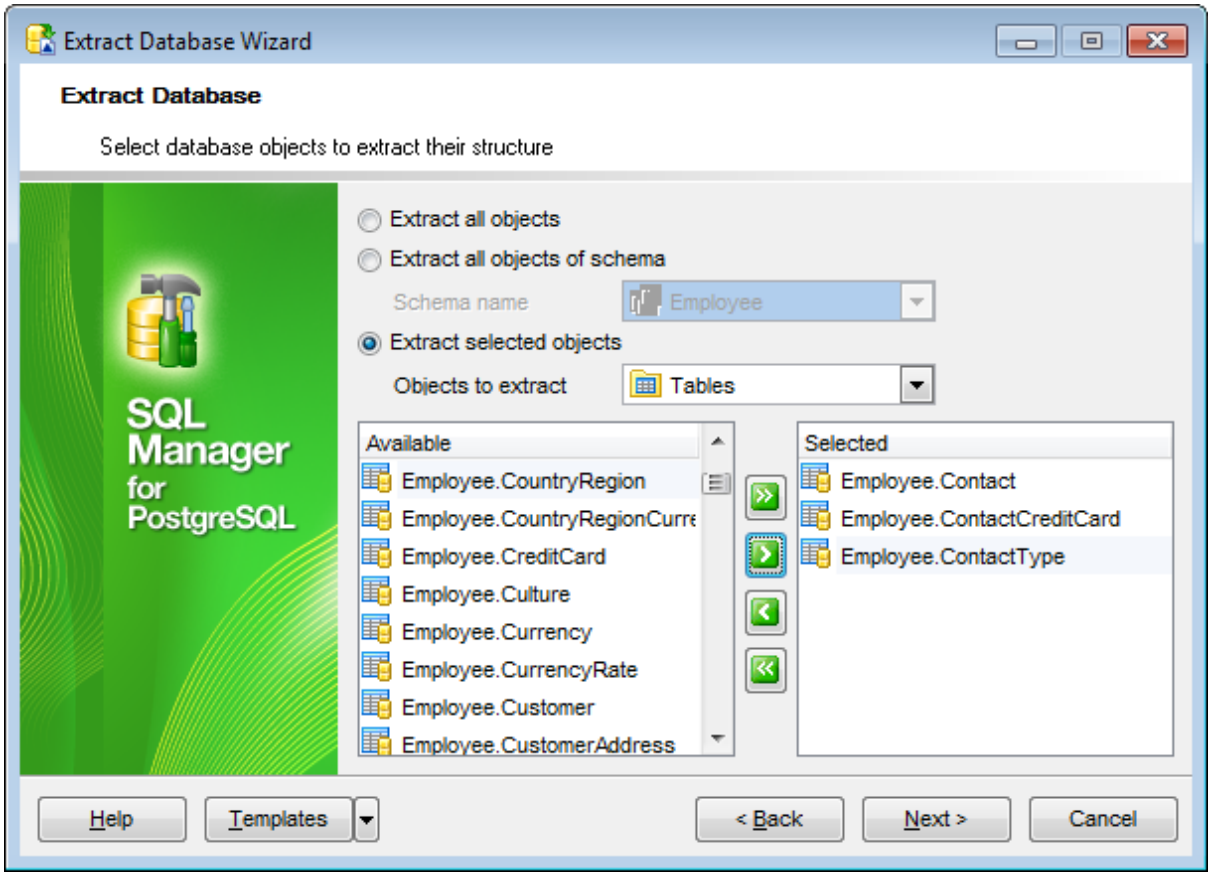
Extract all objects
Adds all objects of the database to structure extraction process.

Extract all objects of schema...
Adds all objects of a schema to structure extraction process.

Schema name
Use the drop-down list to select the schema to extract all objects from.

Extract selected objects
Adds only selected objects to structure extraction process.

Objects to extract
Use the drop-down list to select the type of objects to be extracted.
To select an object, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.



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Click the **Next** button to proceed to Selecting objects for data extraction 659.

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10.4.5 Selecting objects for data extraction

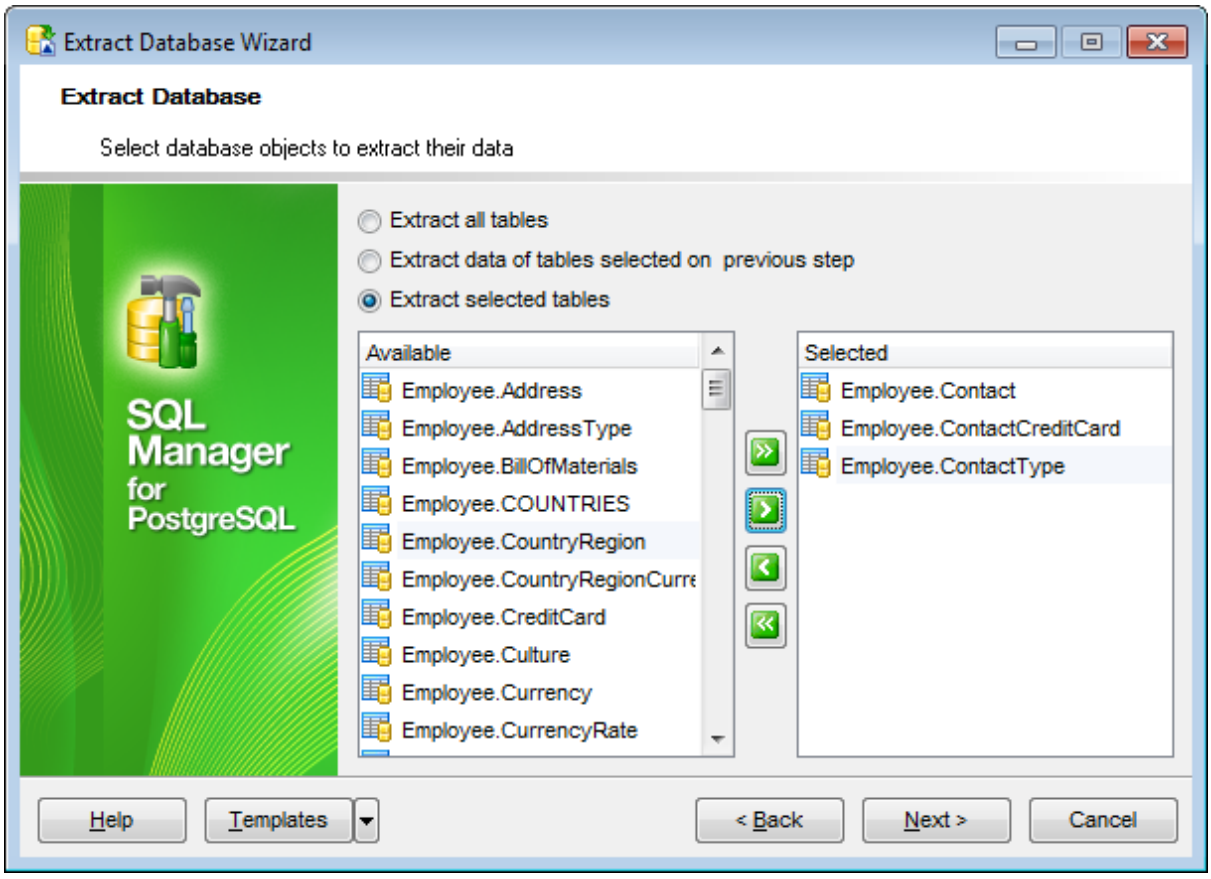
This step of the wizard allows you to **select tables for data extraction**.

Note that this step is only available if the ☑ **Extract all metadata and data of the database** option was unchecked when selecting the source database 654.

Extract all tables
Adds all tables of the database to data extraction process.

Extract data of tables selected on the previous step
Adds only the tables selected for metadata extraction 657.

Extract data of selected tables
Adds only selected tables to data extraction process.
To select a table, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.



Click the **Next** button to proceed to the Customizing script options 660 step of the wizard.

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10.4.6 Customizing script options

This step allows you to customize common **script options** and **data options** for the extraction process.

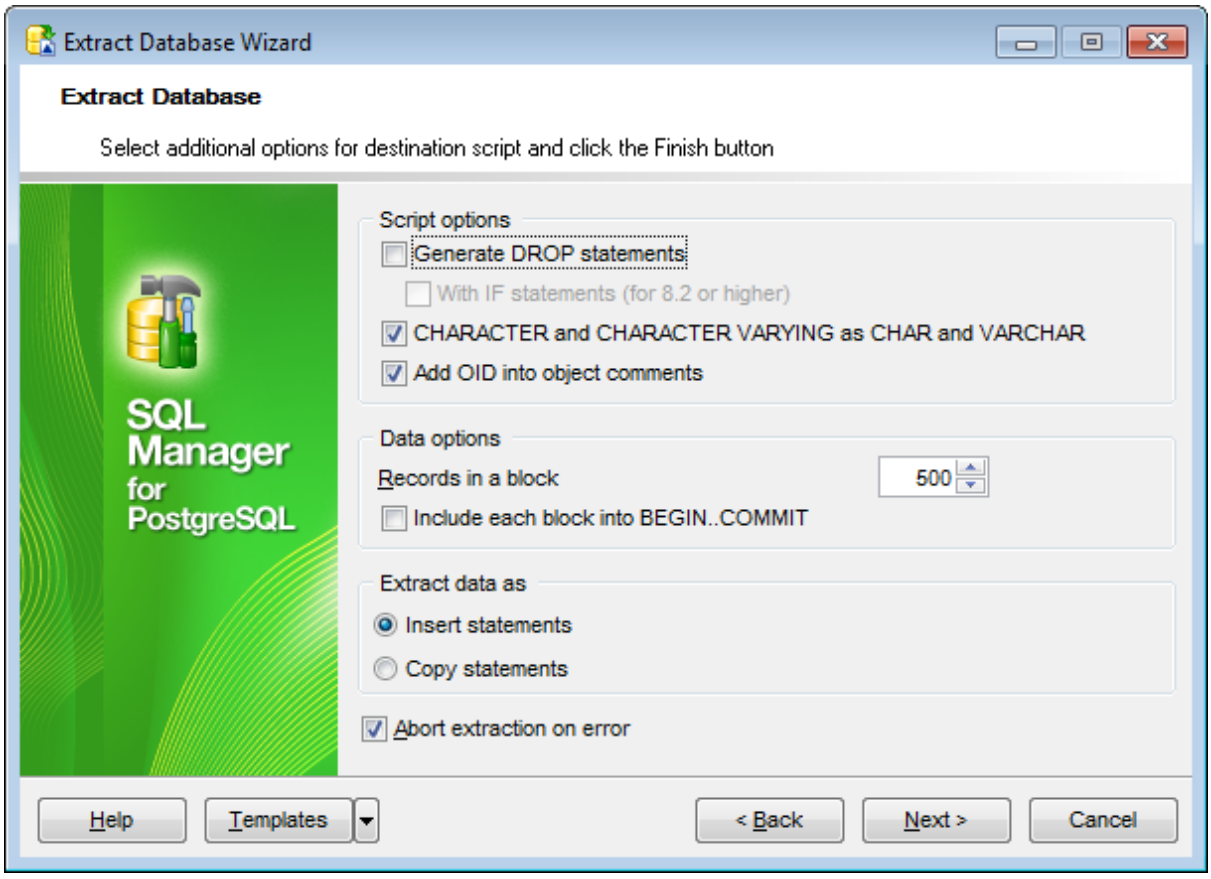
Script options

Generate DROP statements
Check the option to add the *DROP* statements for the extracted objects in the result script.

With IF statements
Check this option to add the *IF* keyword to the *DROP* statements in the result script.

CHARACTER and CHARACTER VARYING as CHAR and VARCHAR
This option specifies that the CHARACTER and CHARACTER VARYING columns will be scripted as CHAR and VARCHAR respectively.

Add OID into object comments
Enable this option to add object identifier to object comments.



Data options

Records in a block / Insert "COMMIT" statement after each block
These controls allow you to define whether the *COMMIT* statement is added to the script or not, and to specify the number of records in each block to be supplemented with this

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statement.

Extract data as

Select the preferable type of extraction statements that will be placed to the result script:

- *Insert statements*
- *Copy statements*

Abort extraction on error

This option determines whether the extraction process should be stopped or forced to continue if an error occurs.

Click the **Next** button to proceed to the last 662 step of the wizard.

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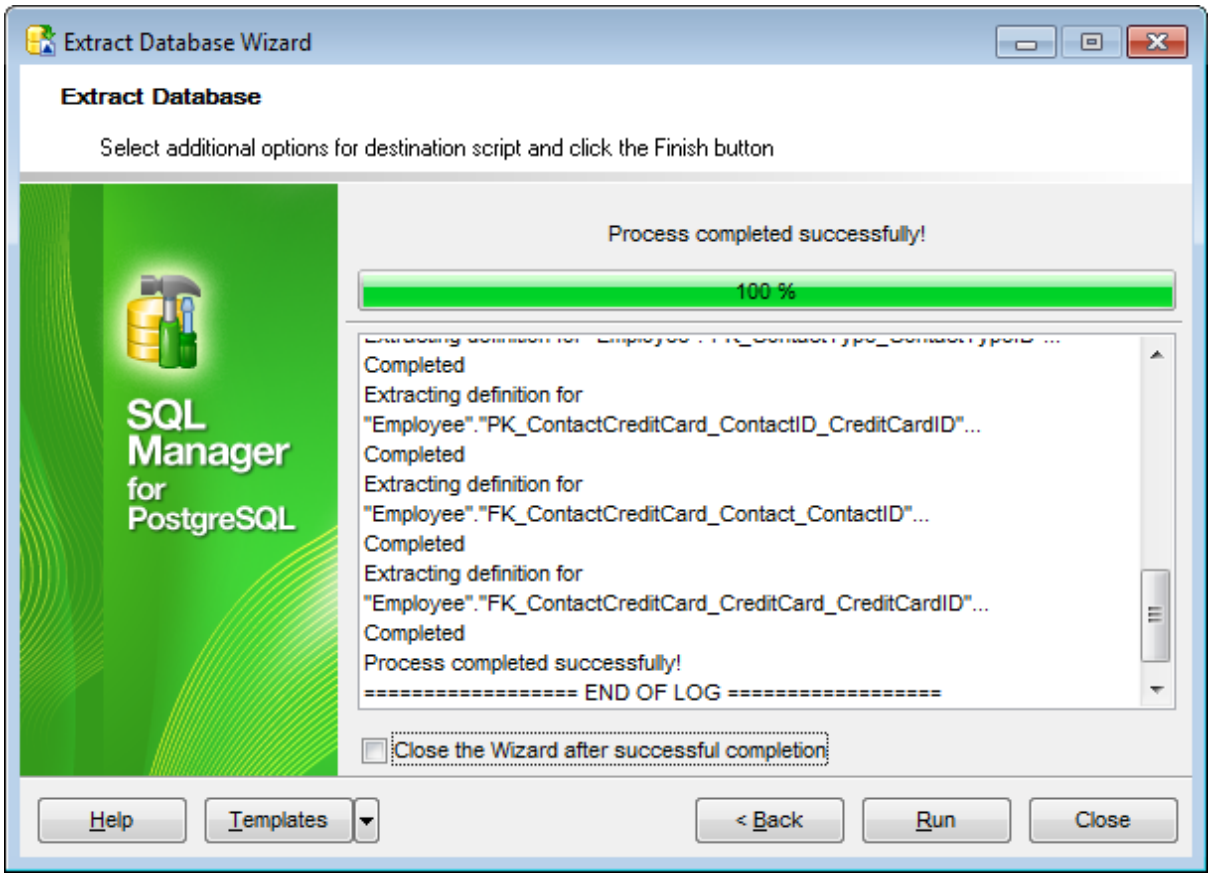
10.4.7 Start of extraction process

This step of the wizard is intended to inform you that all extraction options have been set, and you can start the extraction process.

The **Operations** tab allows you to view the log of operations and errors (if any).



☑ **Close the wizard after successful completion**
If this option is selected, the wizard is closed automatically when the extraction process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the extraction process.

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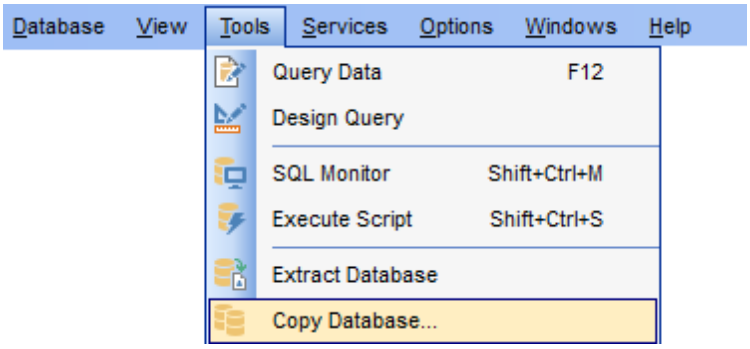
10.5 Copy Database

Copy Database Wizard allows you to transfer the entire database with its objects and data from one location to another.

To run the wizard, select the **Tools |** **Copy Database...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks |** **Copy Database...** item from the context menu 54.



- Selecting source database 664
- Specifying destination database 665
- Selecting components to copy 667
- Selecting objects to copy their structure 668
- Selecting objects to copy their data 670
- Setting additional options 671
- Copying database 673

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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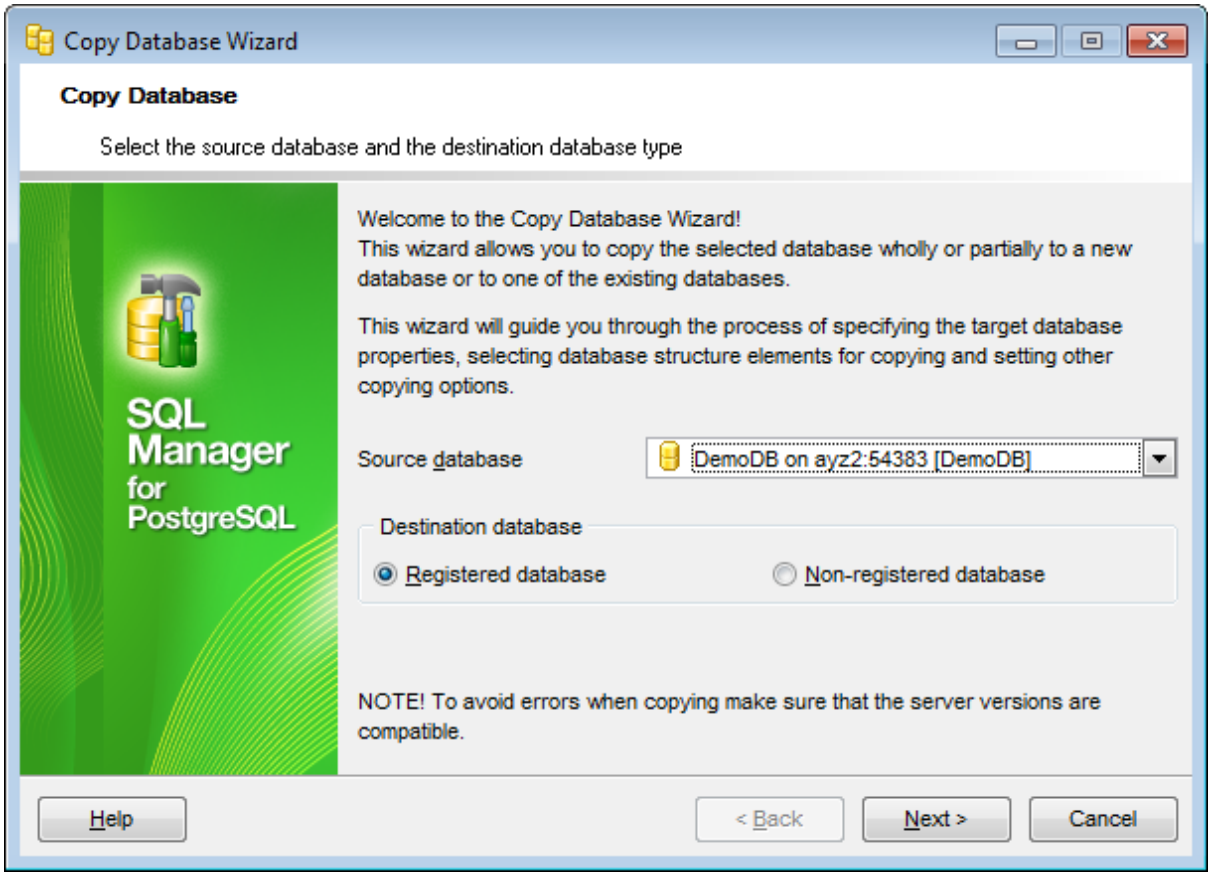
10.5.1 Selecting source database

This step of the wizard allows you to select the **source database** to copy and specify **destination database** registration status.



Source Database
Use the drop-down list of registered and currently connected databases to select the database to copy.

Destination database

Select *Registered database* if you want to copy the specified database to a registered 98 database, or select *Non-registered database* to copy the specified database to a new (non-registered) database.

Click the **Next** button to proceed to the Specifying destination database 665 step of the wizard.

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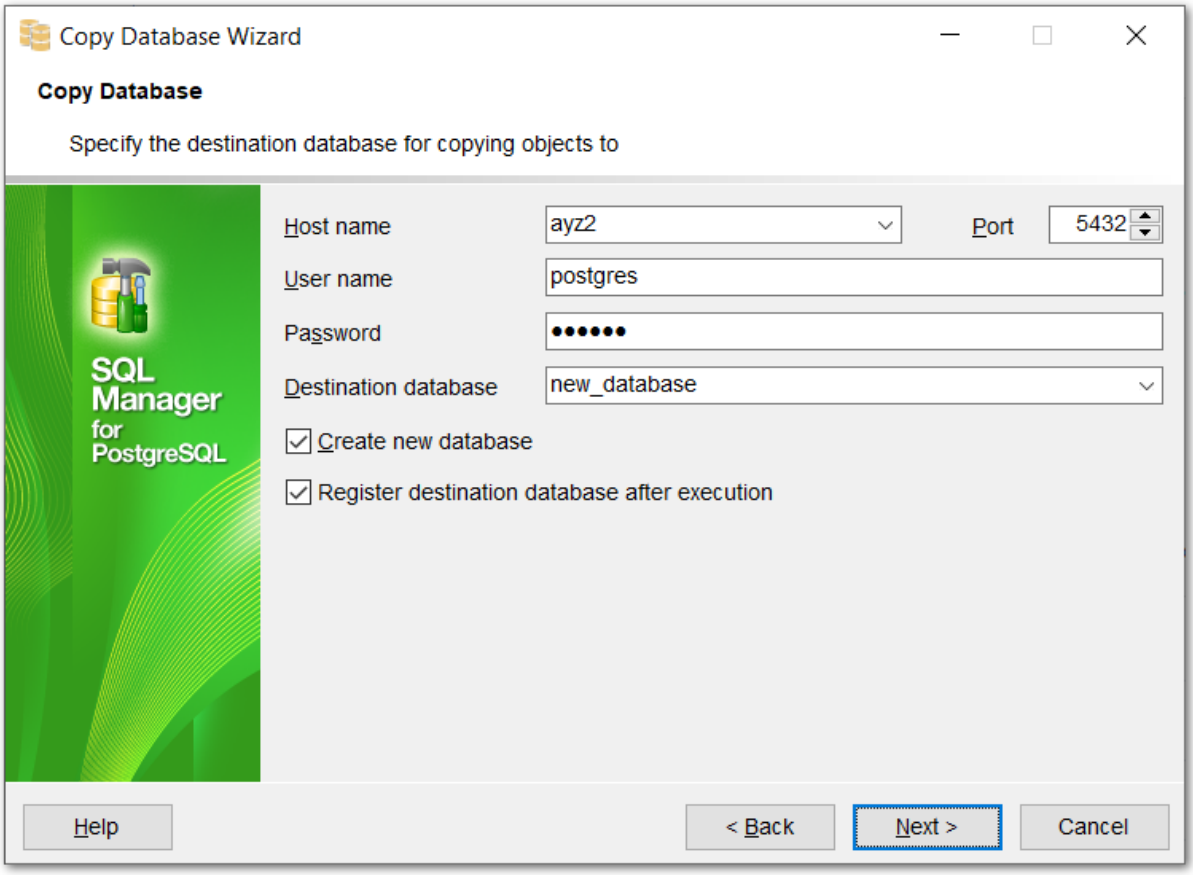
10.5.2 Specifying destination database

Use this step of the wizard to set the **destination database** for copying objects to. If the database is already registered (i.e. *Registered database* was selected at the previous step 664), then you just need to select a host and a database that resides on this host. Otherwise you should set all the connection properties using the corresponding boxes and options: *Host name*, *Port*, *User name*, *Password*, *Database* name.



Specify the host where the destination database resides: type in the host name in the **Host name** field or select one in the drop-down list.
Enter PostgreSQL port to connect through in the **Port** field and provide *authorization* settings: **User name** and **Password**.

Database
Type in the name of the database to copy objects into.

If necessary, check the ☑ **Create new database** option to create a new database for copying objects.

Check the ☑ **Register destination database after execution** option to register the newly created database in SQL Manager (the Database Registration Info dialog will be opened after database creation).

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Click the **Next** button to proceed to the Selecting components to copy 667 step of the wizard.

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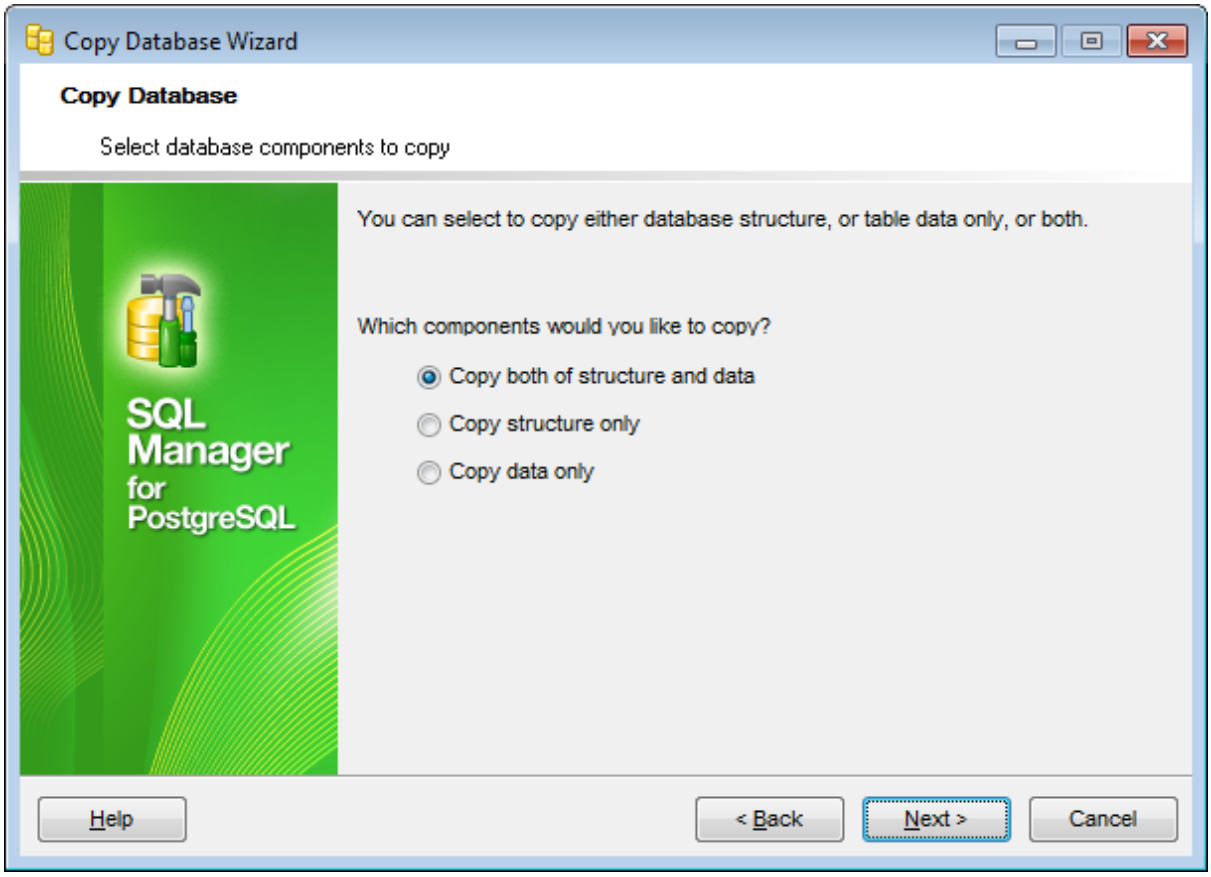
10.5.3 Selecting components to copy

This step allows you to specify the **components to copy**: choose whether *structure only*, *data only* or *both structure and data* should be copied.



Click the **Next** button to proceed to the Selecting objects to copy their structure 668 step of the wizard, or to the Selecting objects to copy their data 670 step if you have specified to *copy data only*.

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10.5.4 Selecting objects to copy their structure

This step of the wizard allows you to **select objects for copying metadata**.

Note that this step is only available if the *Copy both structure and data* or *Copy structure only* mode was specified when Selecting components to copy 667.

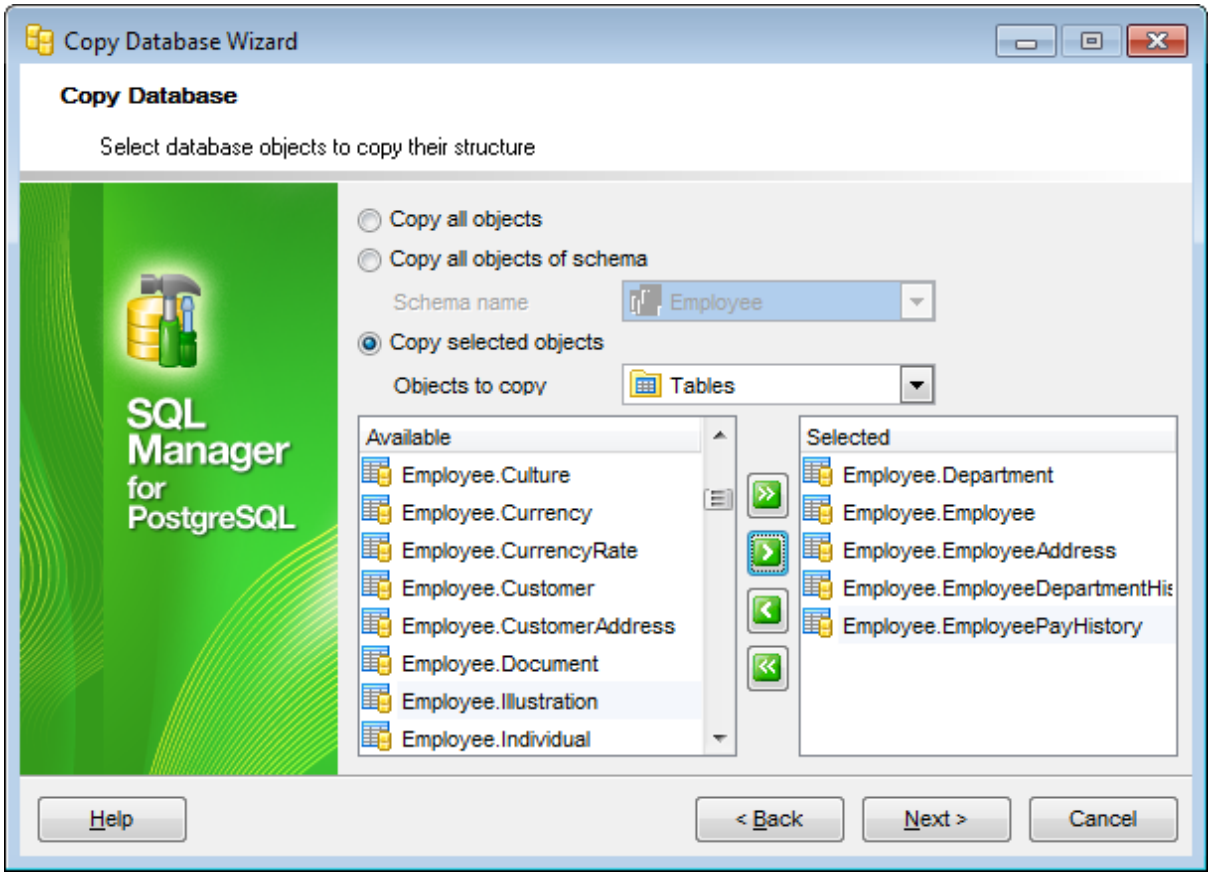
Copy all objects
Adds all objects of the source database to the Copy Database process.

Copy all objects of schema...
Adds all objects of a schema to the Copy Database process.

Schema name
Use the drop-down list to select the schema to copy all objects from.

Copy selected objects
Adds only selected objects to the Copy Database process.

Objects to copy
Use the drop-down list to select the type of objects to be copied.
To select an object, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.



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Click the **Next** button to proceed to the Selecting objects to copy their data 670 step of the wizard, or to the Setting additional options 671 step if you specified to *copy structure only* when Selecting components to copy 667.

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10.5.5 Selecting objects to copy their data

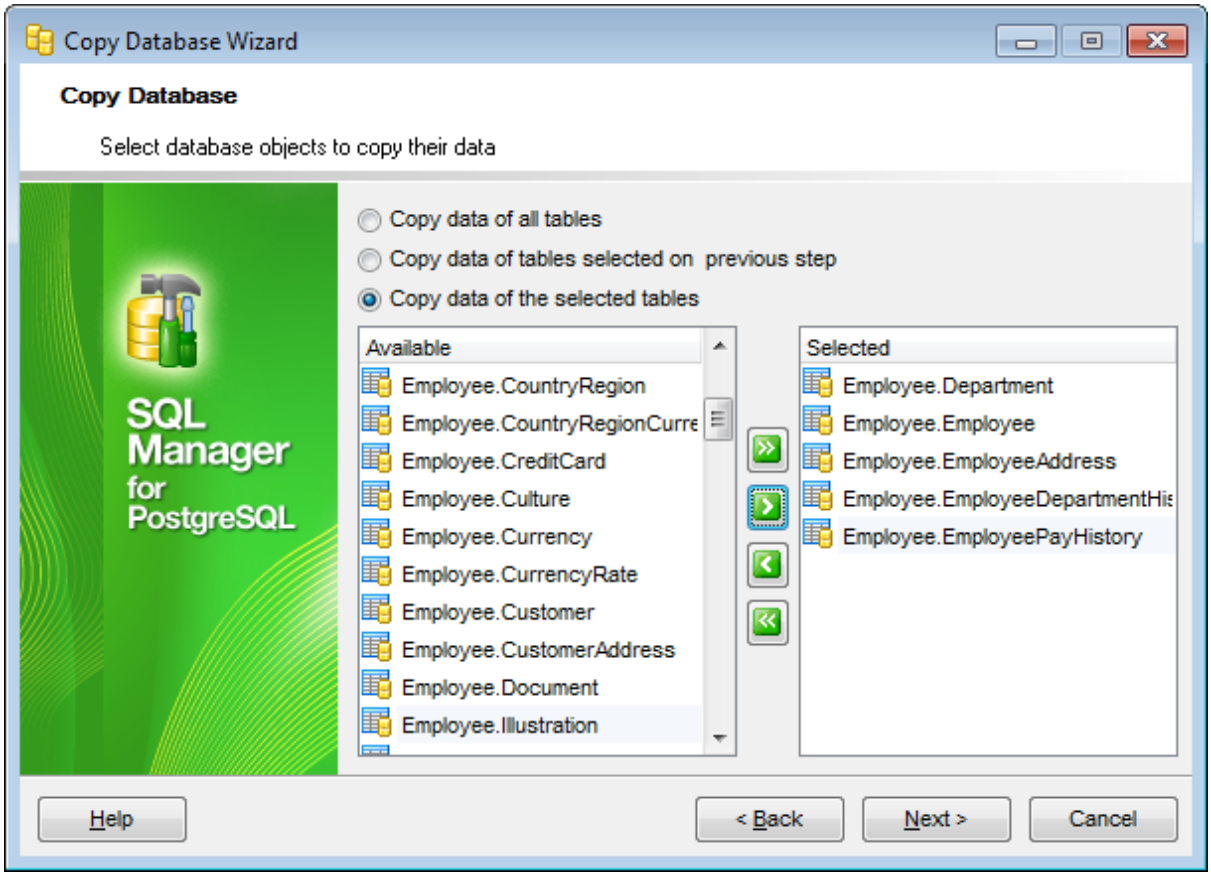
This step of the wizard allows you to **select tables for copying data**.

Note that this step is only available if the *Copy both structure and data* or *Copy data only* mode was specified when Selecting components to copy 667.

Copy data of all tables
Adds all tables of the source database to the Copy Database process.

Copy data of tables selected on the previous step
Adds only the tables selected for copying their structure 668.

Copy data of the selected tables
Adds only selected tables to the Copy Database process.
To select a table, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.



Click the **Next** button to proceed to the Setting additional options 671 step of the wizard.

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10.5.6 Setting additional options

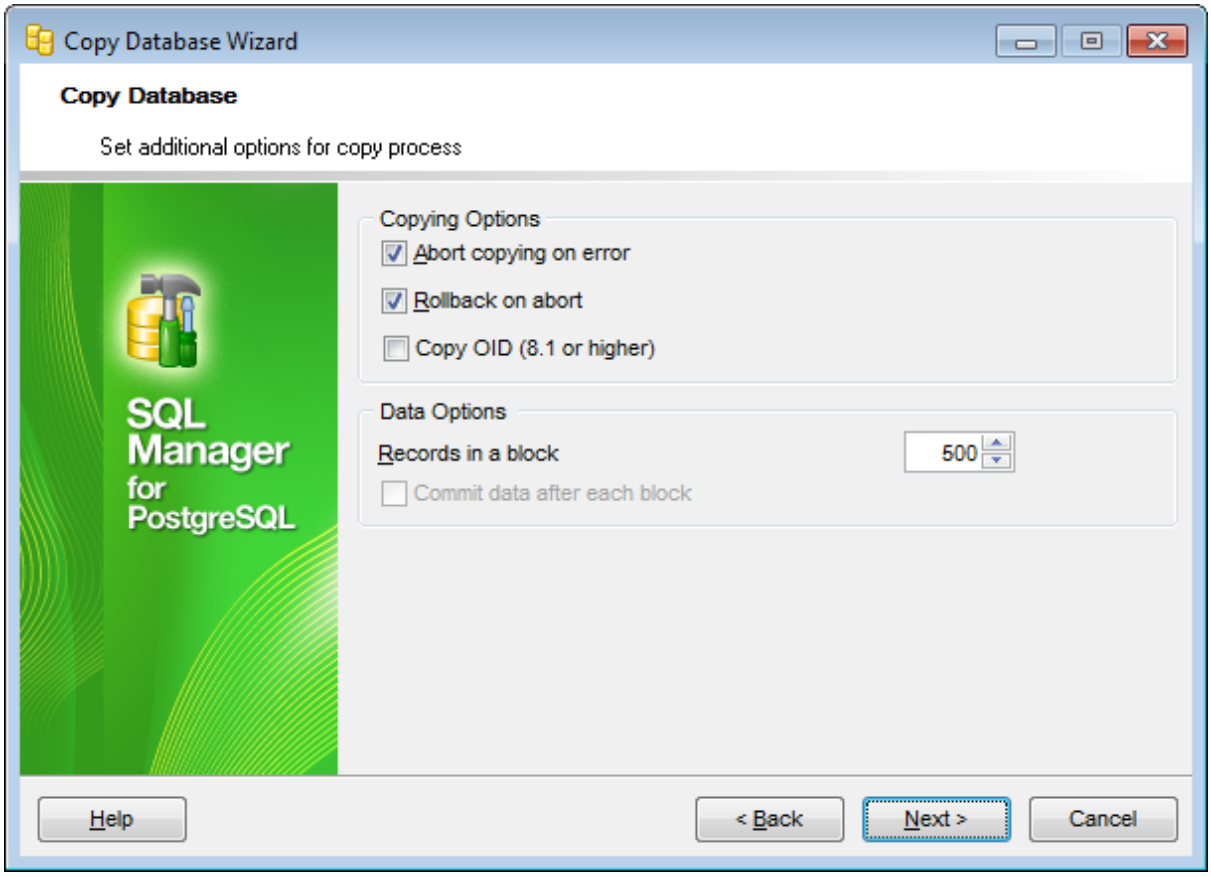
This step allows you to customize common **copying options** and **data options** for the Copy Database process.

Copying Options

☑ **Abort copying on error**
This option determines whether the copying process should be stopped or forced to continue if an error occurs.

☑ **Rollback on abort**
Check the option to roll back the transaction when copying is aborted.

☑ **Copy OID**
Check this option to copy object OIDs as well. Note that this option is only available for PostgreSQL 8.1 and higher.



Data Options

Records in block
Use the spinner control to define the number of records in each committed block.

☑ **Commit data after each block**

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Check this option to add the *COMMIT* statement after a defined number of records.

When you are done, click the **Next** button to proceed to the Copying database 673 step of the wizard.

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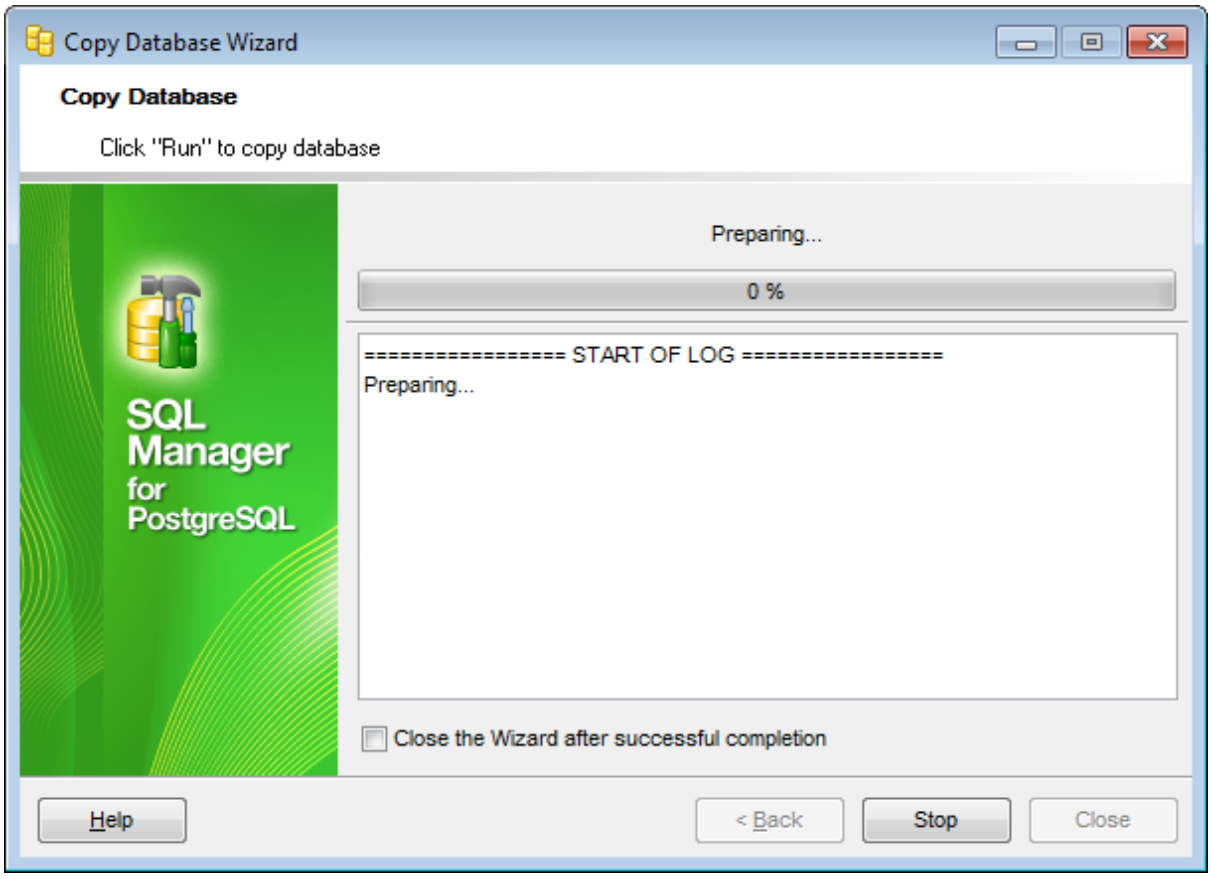
10.5.7 Copying database

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the Copy Database process.

The **Operations** tab allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

Click the **Run** button to complete the operation.

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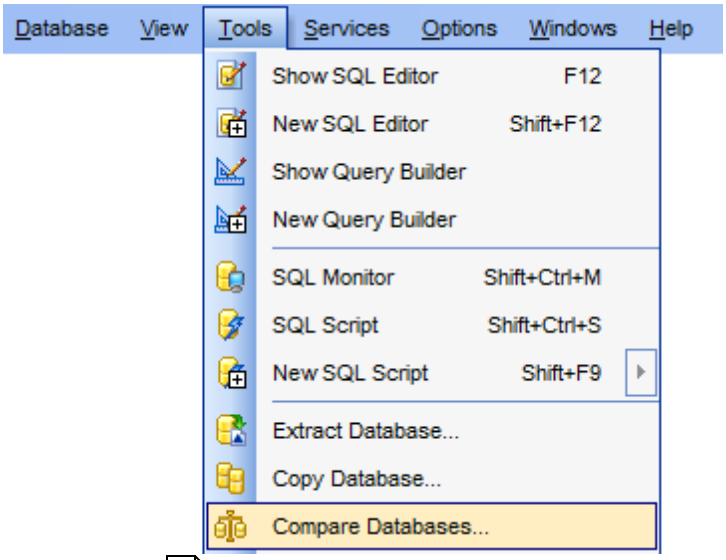
10.6 Compare Databases

Compare Databases Wizard creates an SQL script that provides database structure synchronization. To launch the wizard use the **Tools |** **Compare Databases...** item of the main menu.



- Selecting source database 675
- Selecting target database 676
- Selecting type of the synchronization script 677
- Defining options for the destination script 678
- Performing operation 679

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Copy Database Wizard 663

Backup Database 808

Restore Database 821

Using templates 982

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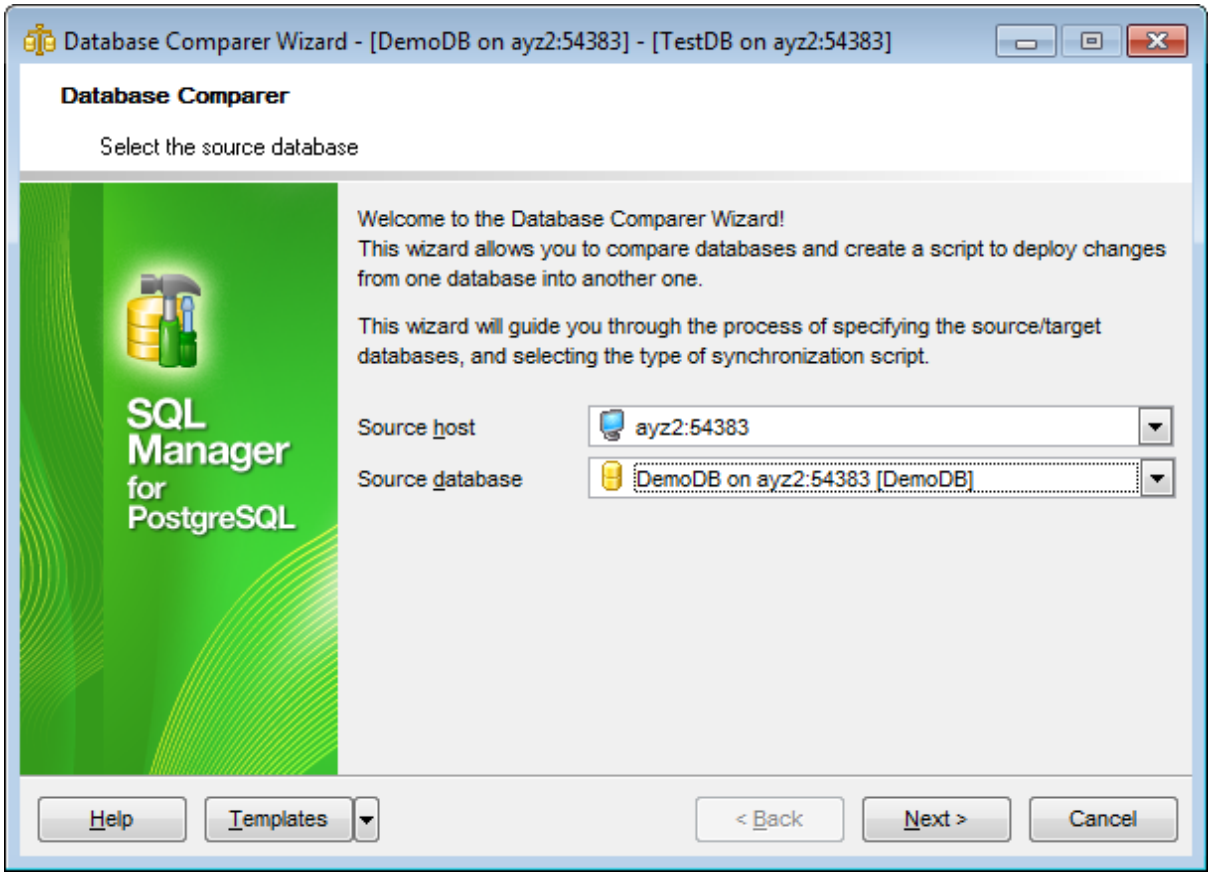
10.6.1 Selecting source database

Use this step to define source database for comparing.



Source host
Defines host where source database is located.

Source database
Select source database from the drop-down list.

Click the **Next** button to proceed to the Selecting source database 676 step.

Use the templates 982 button to save current settings to template or to restore settings from an existing template.

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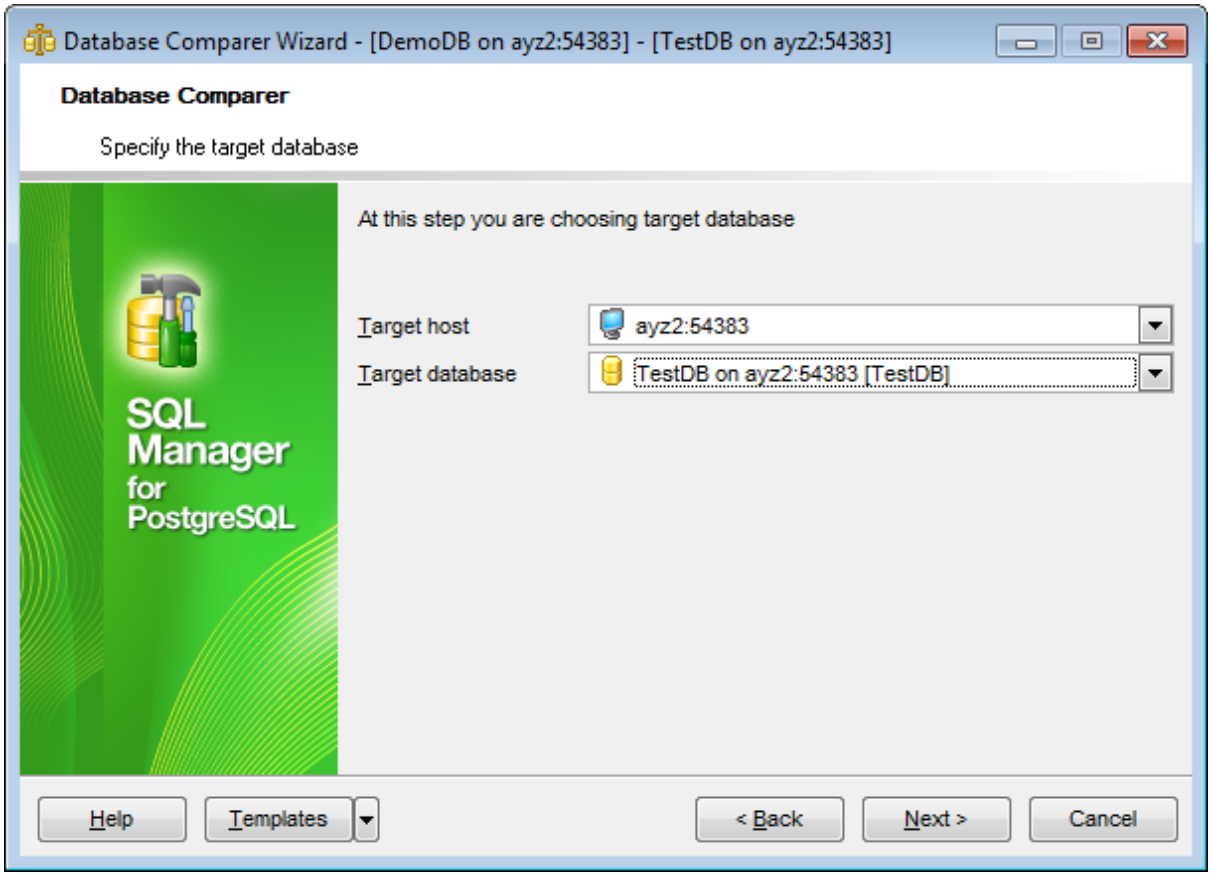
10.6.2 Selecting target database

Use this step to define target database for comparing.



Target host
Defines host where target database is located.

Target database
Select target database from the drop-down list.

Click the **Next** button to proceed to the Selecting type of the synchronization script 677 step.

Use the templates 982 button to save current settings to template or to restore settings from an existing template.

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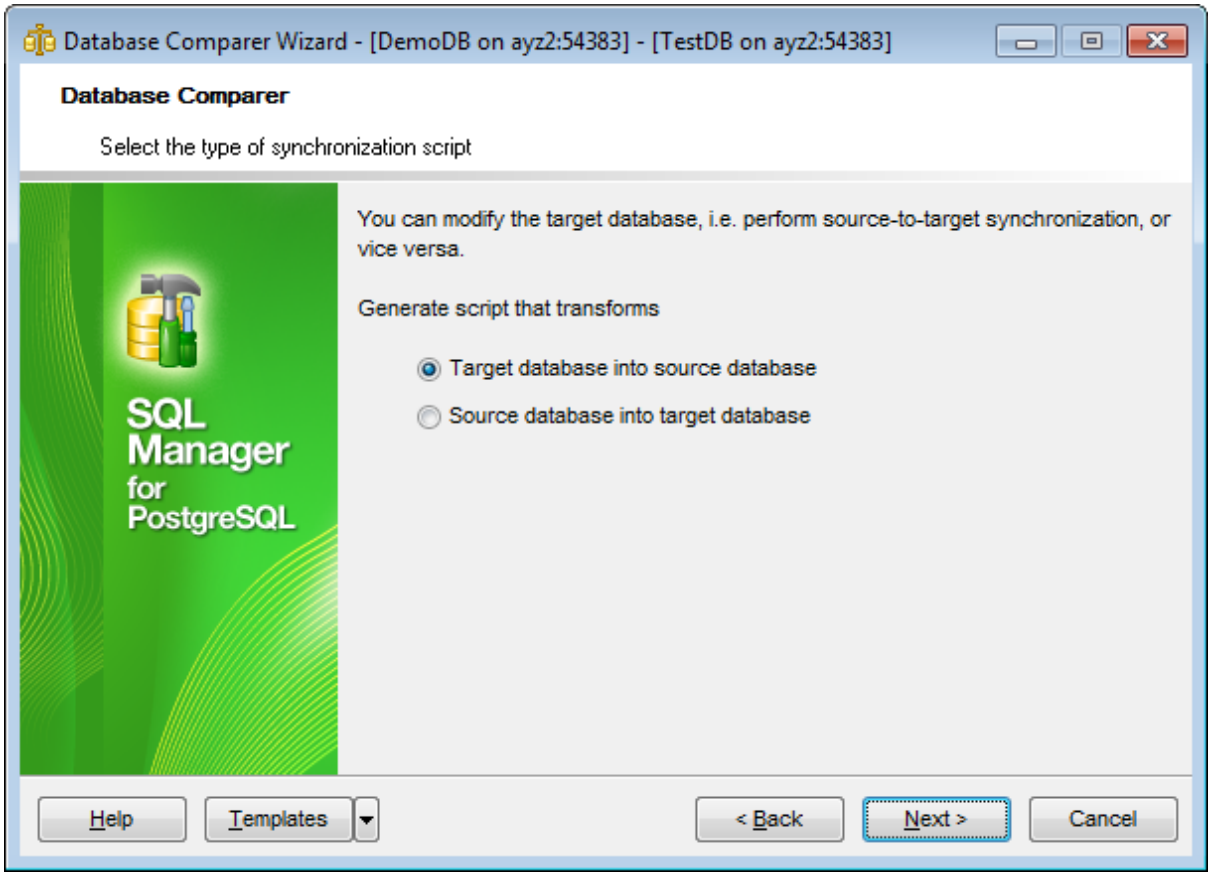
10.6.3 Selecting type of the syncrhonization script

Specify the direction of comparing selected database.



Target database into source database
Enables reverse comparing: the synchronization script will contain statements which make the target 676 database identical to the source 675 one.

Source database into target database.
Enables direct comparing: the synchronization script will contain statements which make the source 675 database identical to the target 676 one.

Click the **Next** button to proceed to the Defining options concerned destination script 678 step.

Use the templates 982 button to save current settings to template or to restore settings from an existing template.

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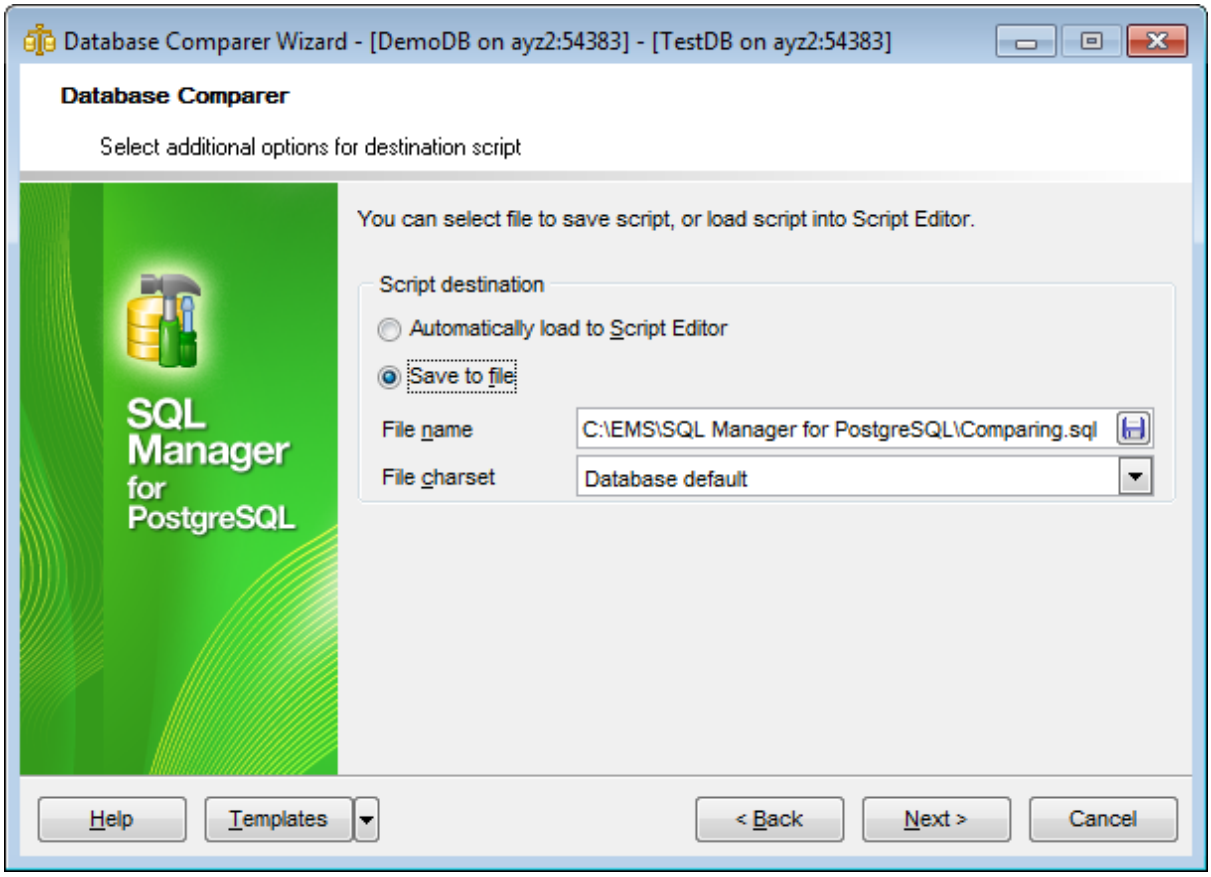
10.6.4 Defining options for destination script

Use this step to define additional option for destination script.



Automatically load to Script Editor
With this option enabled, the synchronization script will not be saved. It will be loaded to Script Editor 646.

Save to file
Use this option if you need to save the synchronization script to a file.

File name
Defines the name of the file to save the synchronization script to. Click the **Save** button to locate file using the standard dialog or type the file name and it's location manually.

File charset
Specified character set will be used when saving the script to file.

Click the **Next** button to proceed to the final step 679.

Use the templates 982 button to save current settings to template or to restore settings from an existing template.

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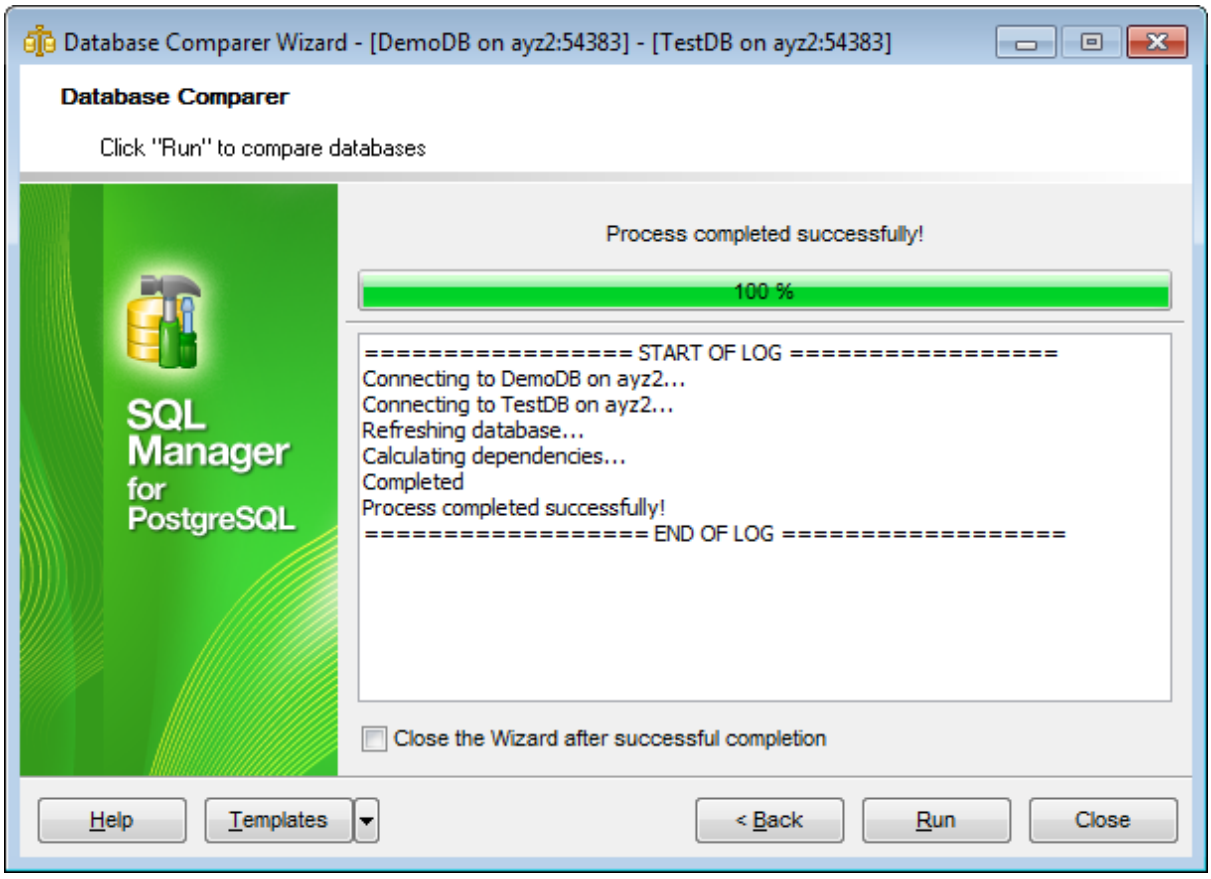
10.6.5 Performing operation

This step of the wizard is intended to inform you that all necessary options have been set, and you can start comparing databases.

The log area allows you to view the log of operations and errors (if any).



☑ **Close the Wizard after successful completion**
If this option is selected, the wizard is closed automatically when the process is completed. If the option is disabled then you can repeat the operation with the same or redefined parameters.

Click the **Run** button to run the backup database operation.

Use the templates 982 button to save current settings to template or to restore settings from an existing template.

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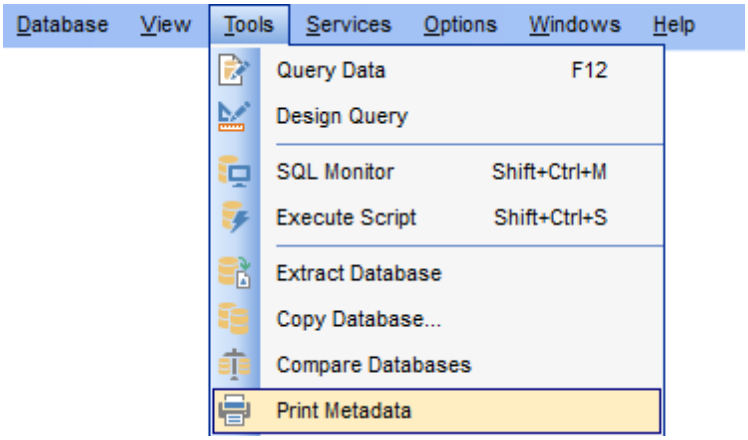
10.7 Print Metadata

Print Metadata allows you to generate and print metadata reports of any database object(s).

To open the window, select the **Tools | Print Metadata** main menu 961 item, or use the **Print Metadata** button on the main toolbar 963. Alternatively, you can right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Print Metadata** item from the context menu 54.



- Using Navigation bar and Toolbar 681
- Printing options 683
- Print Preview 684

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Database Objects Management 155
Print Metadata options 905

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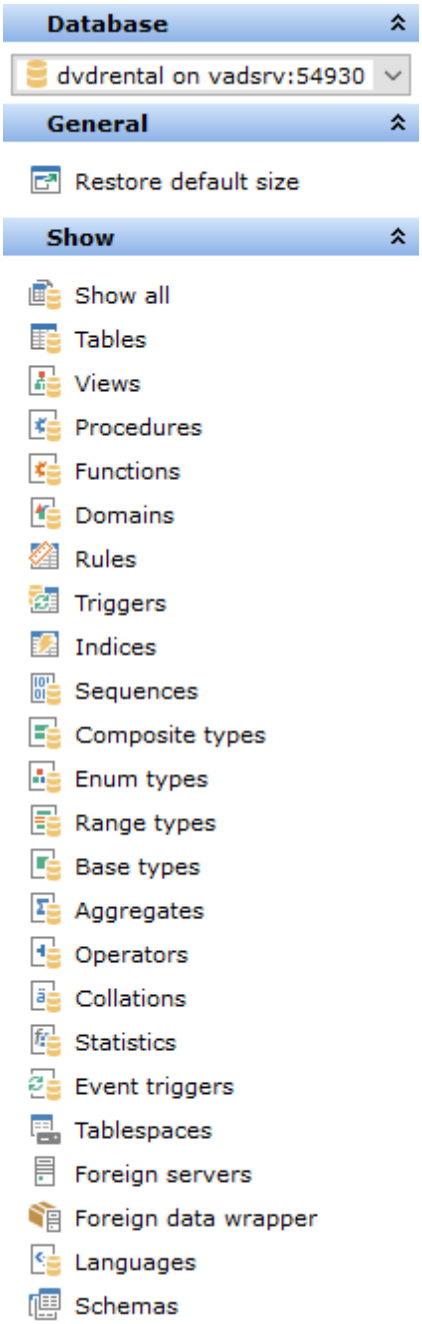
10.7.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Print Metadata**.



Database
select a database for the printing report

General
print metadata of the selected object(s)

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preview 684 the printing report
restore the default size and position of the window

Show
✓ filter database objects by type

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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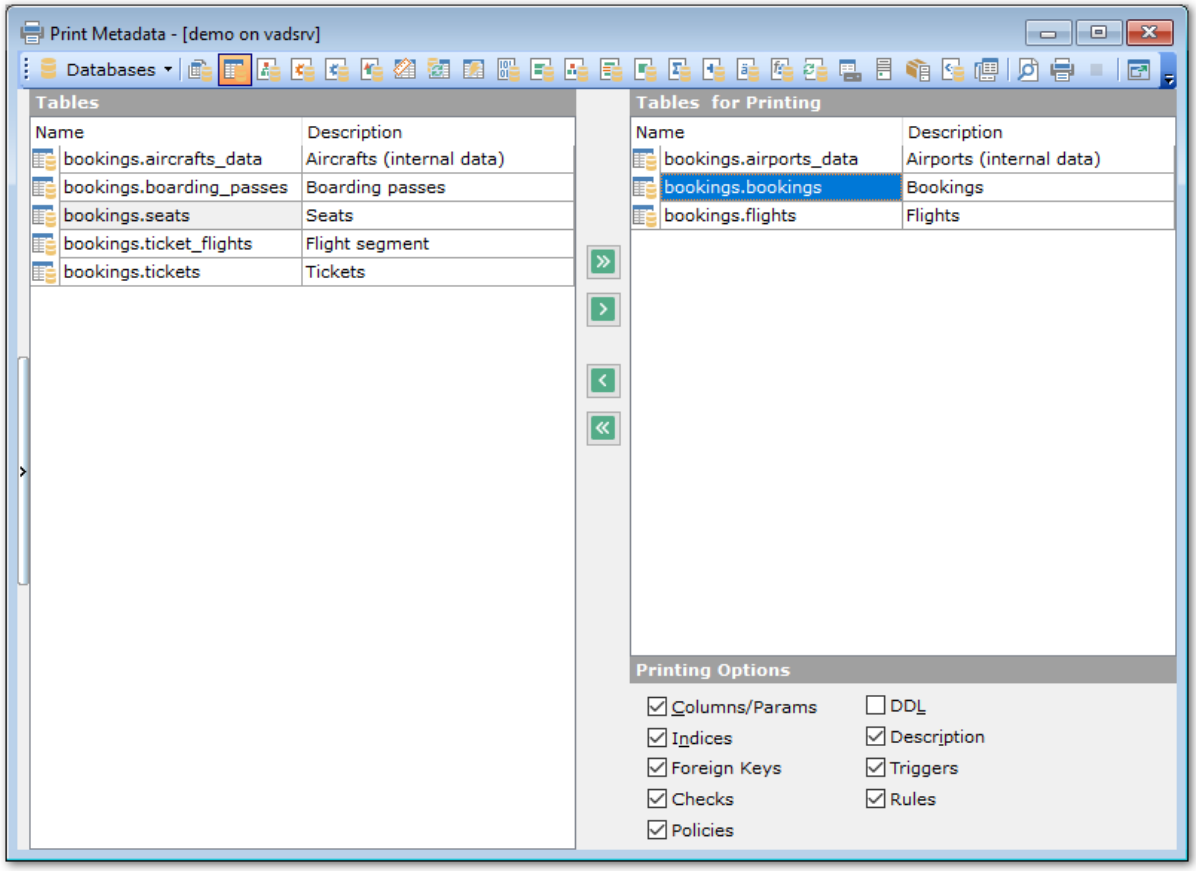
10.7.2 Printing options

The **Print Metadata** window allows you to select the database objects for printing metadata.
To select an object, you need to move it from the **Available objects** list to the **Objects for printing** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.

After you select one or several objects, the **Printing Options** pane appears at the bottom.

Printing Options
Select an object in the **Objects for printing** list and specify items to be included into the printing report: *DDL*, *Description* (for all database objects), *Columns/Params*, *Foreign Keys*, *Checks*, *Indexes*, *Triggers*, *Rules* (for tables).



See also:

Using Navigation bar and Toolbar 681
Print Preview 684

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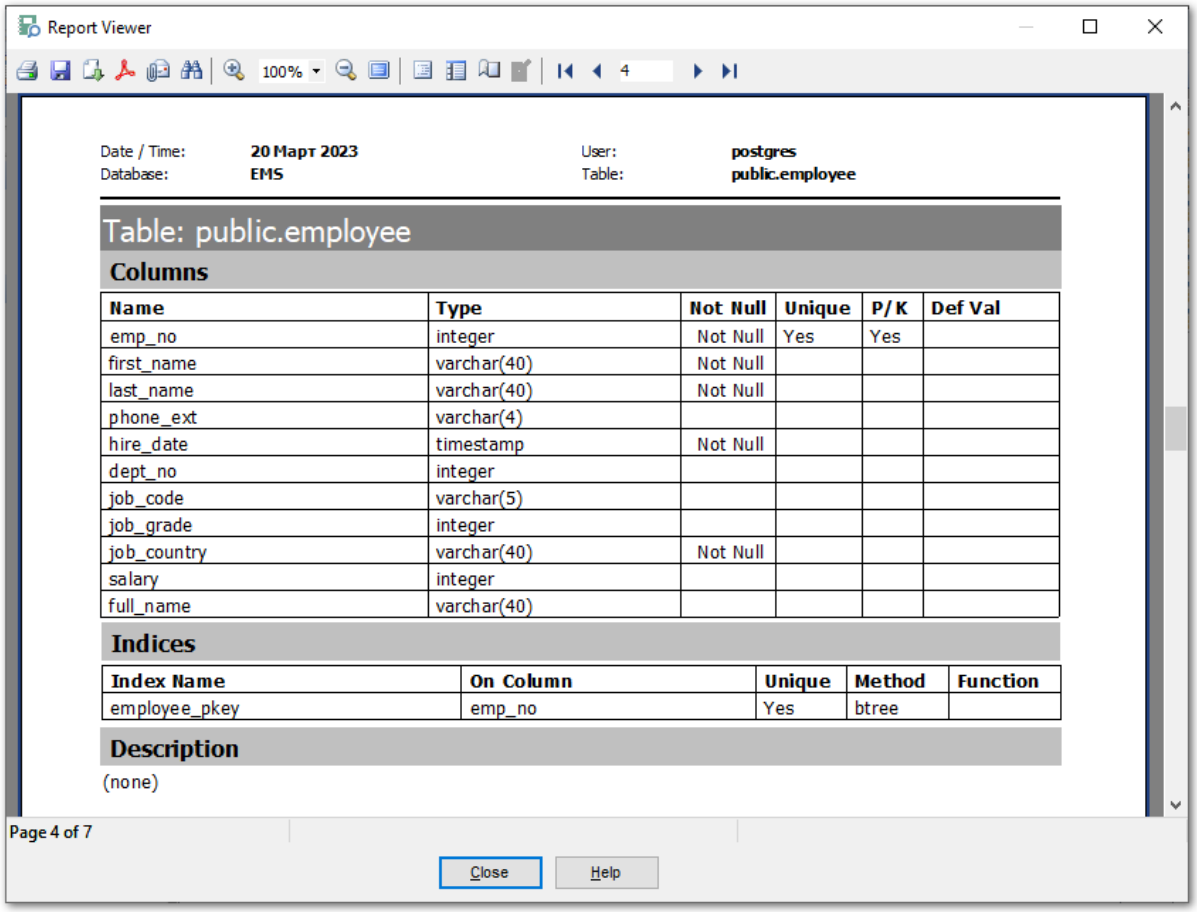
10.7.3 Print preview

You can **make a preview** of the printing report and **print metadata** for objects of the selected type using the corresponding items of the Navigation bar (or toolbar).



The toolbar of the **Preview** window allows you to:

- start printing the report;
- open a previously saved printing report;
- save the current report to an external **.fp3* file;
- save the preview content to any of the available formats: *HTML file*, *Excel file*, *Text file*, *RTF file*, *CSV file*, *HTML file*, *BMP image*, *Excel table (OLE)*, *JPEG image*, *TIFF image* (use the **Export** button for this purpose);
- search for text within the printing report;
- adjust zoom options;
- enable/disable printing report outline;
- enable/disable printing report thumbnails;
- specify page settings;
- edit the page using Report Designer;
- navigate within the printing report pages;
- close the **Preview** window.

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See also:

Using Navigation bar and Toolbar 681
Printing options 683
Report Designer 701

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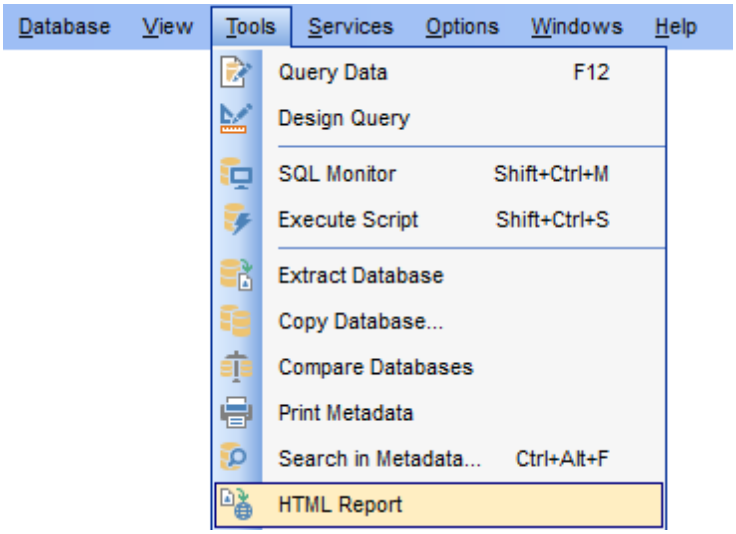
10.8 HTML Report Wizard

HTML Report wizard allows you to generate a detailed HTML report of the selected database objects.

To start **HTML Report Wizard**, select the **Tools | HTML Report** main menu 961 item, or use the **HTML Report** button on the main toolbar 963. Alternatively, you can right-click the database alias in the DB Explorer 65 tree and select the **Tasks | HTML Report...** item from the context menu 54.



- Selecting database and directory 687
- Selecting object types 688
- Specifying CSS for HTML report 689
- Setting additional report options 690
- Creating HTML report 691

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Database Objects Management 155

Using templates 982

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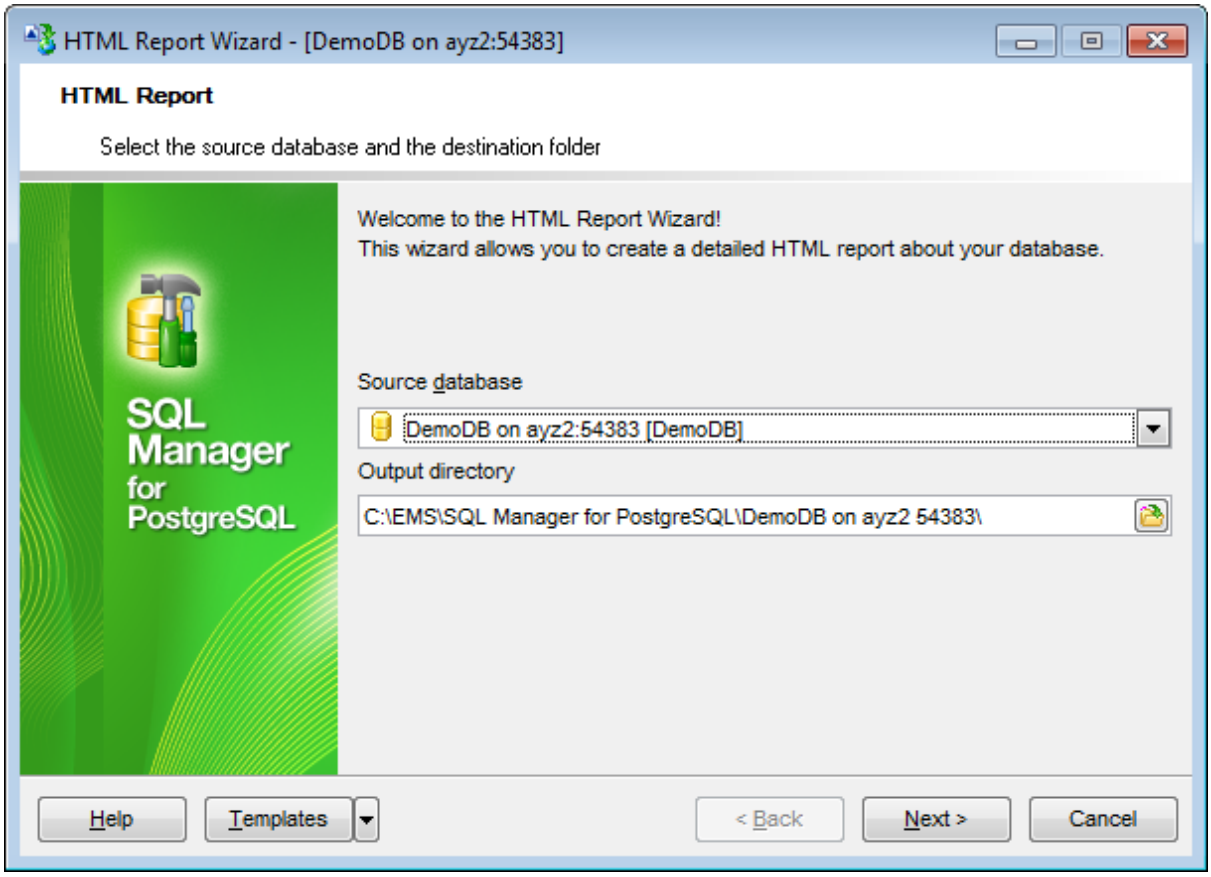
10.8.1 Selecting database and directory

In this step of the wizard you should select the **source database** and **output directory** for the HTML report.

Source database
Use the drop-down list of registered 98 and connected 68 databases to select the source database for the report.

Output directory
Type in or use the button to specify the path to the output directory for the result HTML files using the **Browse for Folder** dialog.



Click the **Next** button to proceed to the Selecting object types 688 step of the wizard.

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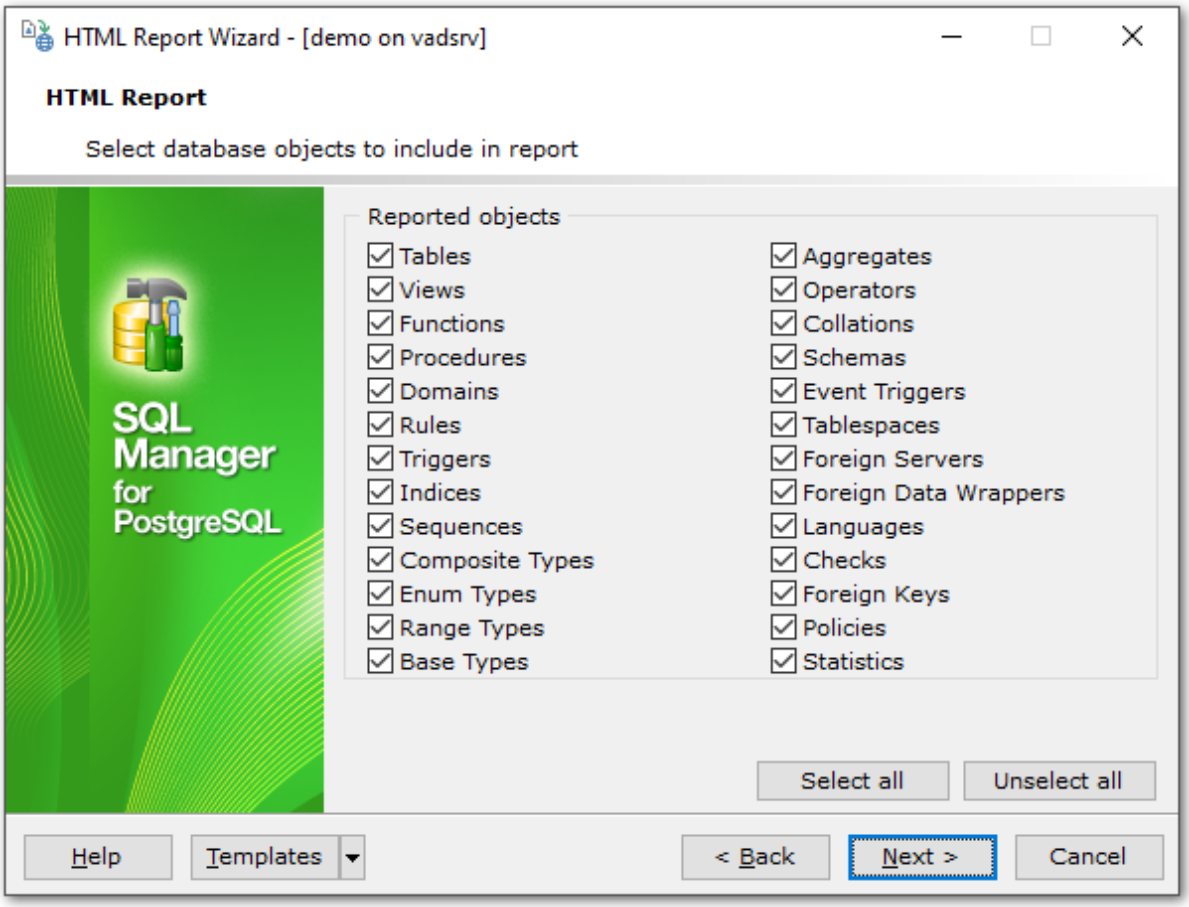
10.8.2 Selecting object types

Use this step of the wizard to select *the types of objects* to be included in the result HTML report.



For your convenience the *Select All* and *Unselect All* buttons are implemented at the bottom of the objects list area.

Click the **Next** button to proceed to the Specifying CSS 689 step of the wizard.

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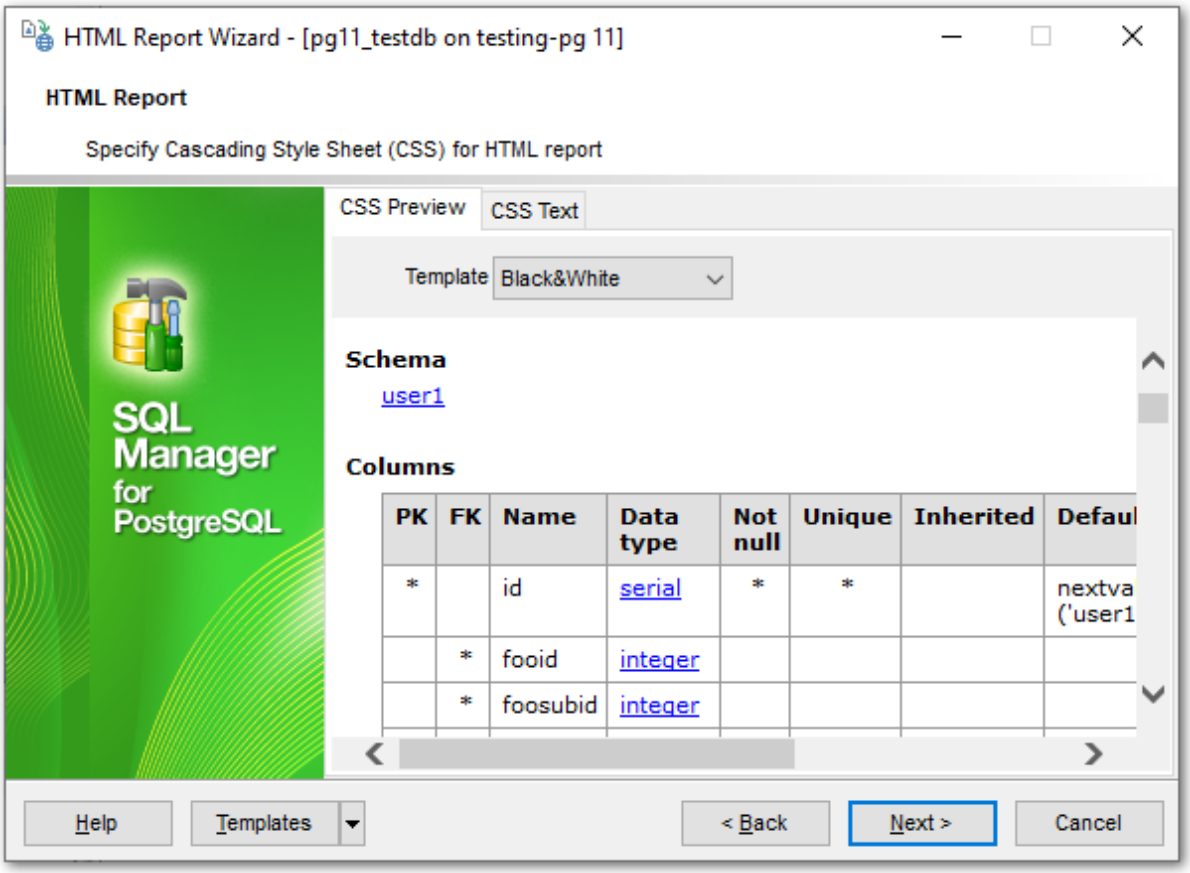
10.8.3 Specifying CSS

This step of the wizard allows you *to edit the CSS (Cascading Style Sheet) file* that will be used by the result HTML report.



Click the **Next** button to proceed to the Setting additional report options 690 step of the wizard.

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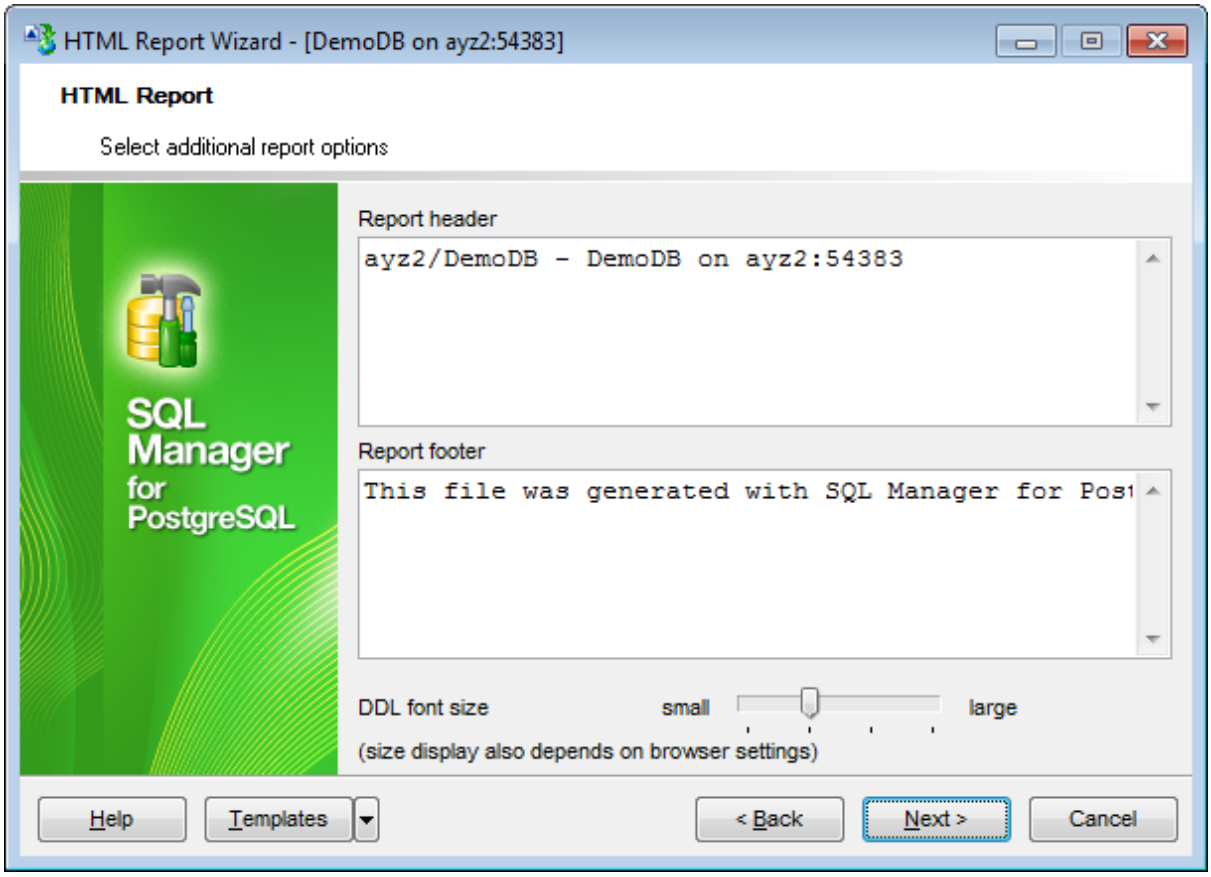
10.8.4 Setting additional report options

Use this step of the wizard to set additional HTML report options.



If needed, you can set optional text to **Report header** and **Report footer** of the result HTML report. For your convenience the default header and footer text is already available. If necessary, you can edit this text according to your needs.

DDL font size
This control allows you to set the font size for the DDL section. Move the slider between the **small** and **large** threshold values to select the required font size value within this scope. Note that the text size also depends on your browser settings.

Click the **Next** button to proceed to Creating HTML report 691.

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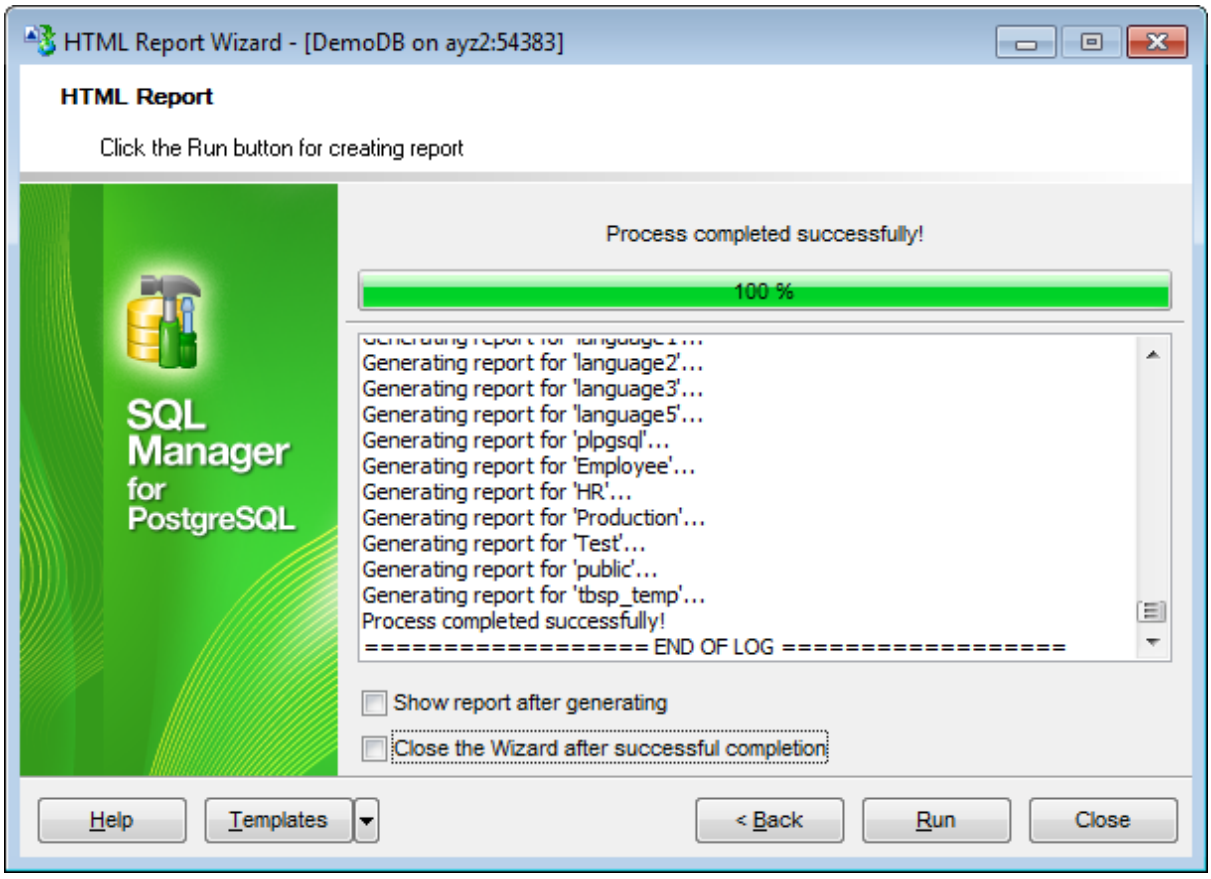
10.8.5 Creating HTML report

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the process.

The **Operations** tab allows you to view the log of operations and errors (if any).



Show report after generating
This option opens the result report in your default browser after generating.

Close the wizard after successful completion
If this option is selected, the wizard is closed automatically when the creating HTML report process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the process.

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10.9 Reports management

SQL Manager for PostgreSQL provides several tools for efficient *reports management*:

Create Report Wizard 693
This tool is used to simplify the process of creating reports.

Report Designer 701
It is a basic tool for creating powerful reports.

Report Viewer 712
Allows you to view created reports.

Reports can be stored either in the database (table *pgmreports* will be created to store them) or in a directory on your hard drive specified on the Directories 116 page of the Database Registration Info 108 dialog.

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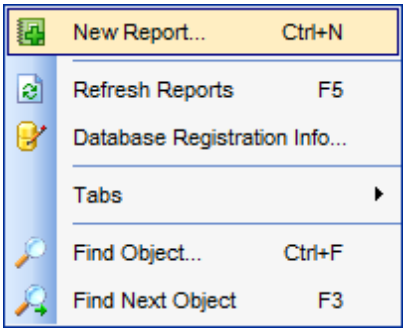
10.9.1 Create Report Wizard

Using **Create Report Wizard** you can create a report containing required datasets, bands and fields on them, with a definite report style applied.

To start the wizard, select the **Database | New Object...** main menu 961 item, then select **Report** in the Create New Object 157 dialog. Alternatively, you can right-click the **Reports** node of the DB Explorer 65 tree and select the **New Report...** item from the context menu 57.



- Specifying report name and options 694
- Selecting report bands 695
- Selecting report style 697
- Specifying paper settings 698
- Specifying margins 699
- Specifying other page settings 700

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Report Designer 701
Report Viewer 712

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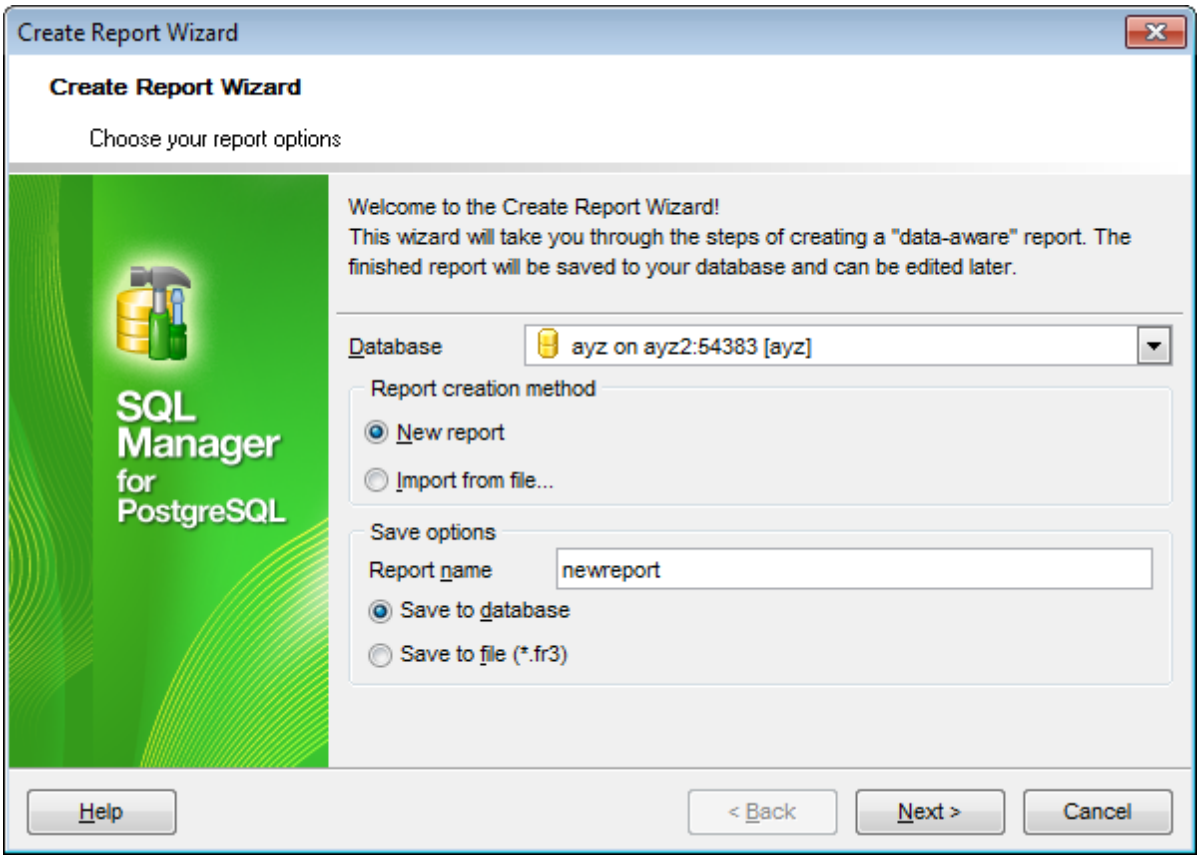
10.9.1.1 Specifying database name and report options

Select the source **database** for adding a report and choose the action you need to perform: either *create a new report* or *import an existing report from file*.

Set the **name** for the new report and specify the save options for it:

Save to database
The report will be created on the server inside the database.

Save to file
If this option is selected, the report will be saved as a **.fr3* file to the directory specified on the Directories[116] page of the Database Registration Info[108] dialog.



Click the **Next** button to proceed to the Selecting report bands[695] step of the wizard.

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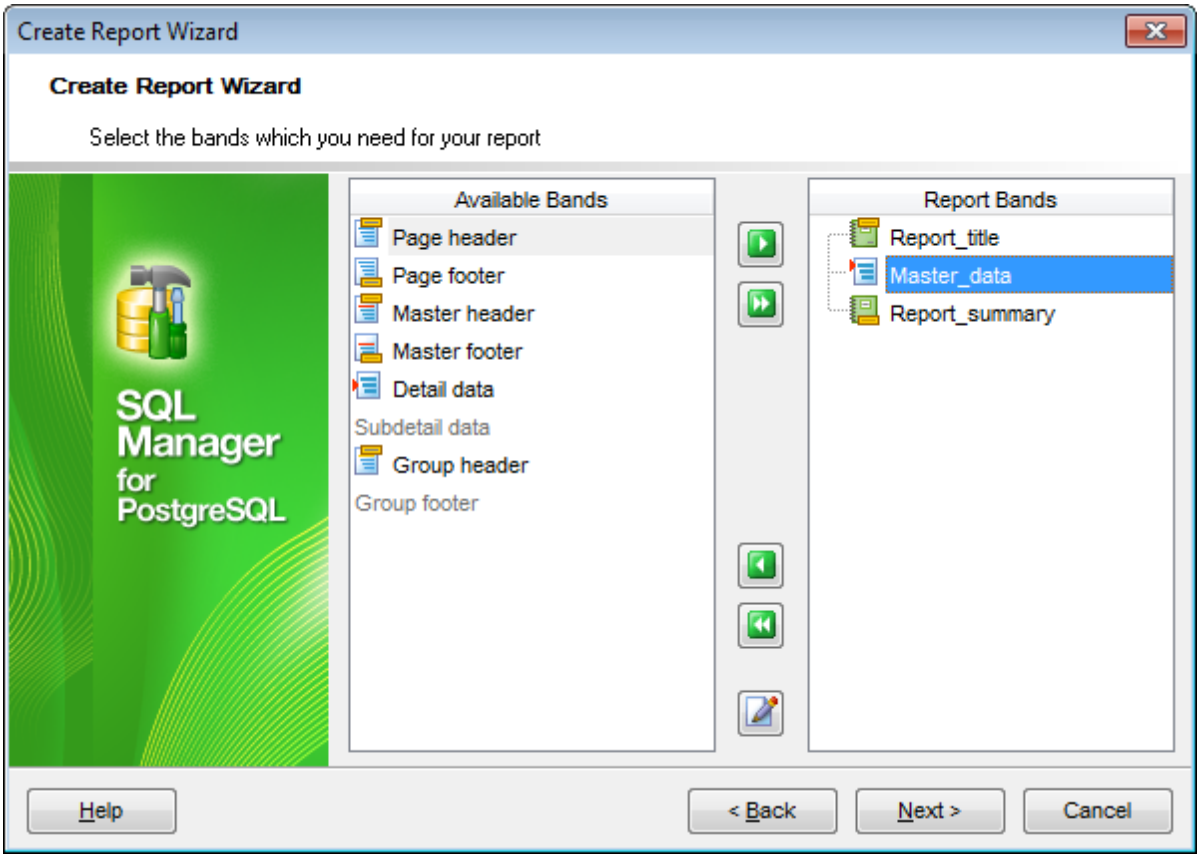
10.9.1.2 Selecting report bands

This step of the wizard allows you to select the bands to be included in the report. To select a band, you need to move it from the **Available Bands** list to the **Report Bands** list. Use the buttons or drag-and-drop operations to move the fields from one list to another.

Use the **Edit** button to create datasets for 'data' bands using Design Query 431.



Brief information about bands functionality is listed below. See **FastReport Help** for more information.

Name	Functionality
Report title	*Prints once at the beginning of report*
Report summary	*Prints once at the end of report*
Page header	*Prints at the top of each page*
Page footer	*Prints at the bottom of each page*
Master header	*Prints at the beginning of master list*
Master data	*Data rows of master list*
Master footer	*Prints at the end of master list*
Detail header	*Prints at the beginning of detail list*
Detail data	*Data rows of detail list*

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Detail footer	*Prints at the end of detail list*
Subdetail header	*Prints at the beginning of subdetail list*
Subdetail data	*Data rows of subdetail list*
Subdetail footer	*Prints at the end of subdetail list*
Group header	*Prints at the beginning of each group*
Group footer	*Prints at the end of each group*

Click the **Next** button to proceed to the Selecting report style 697 step of the wizard.

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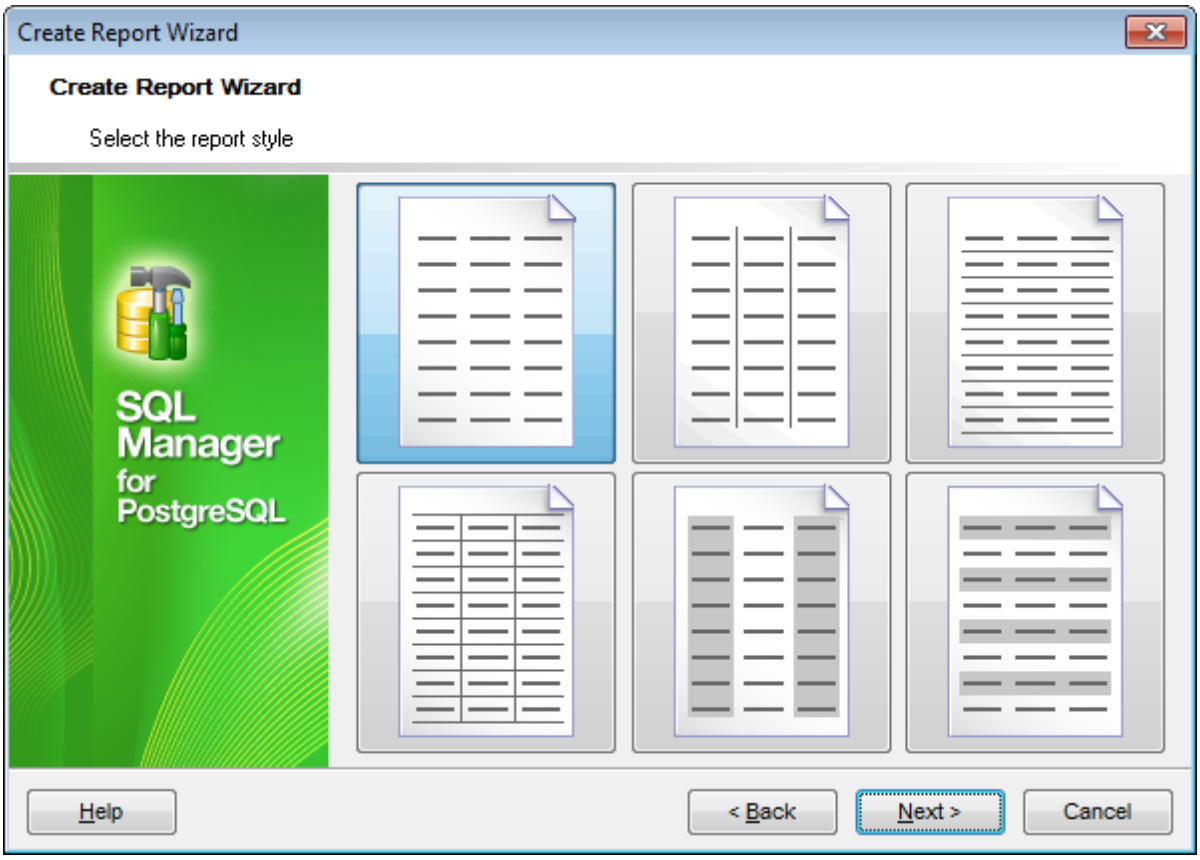
10.9.1.3 Selecting report style

Select the report style by clicking one of the images illustrating the styles available for the report.



Click the **Next** button to proceed to the Specifying paper settings[698] step of the wizard.

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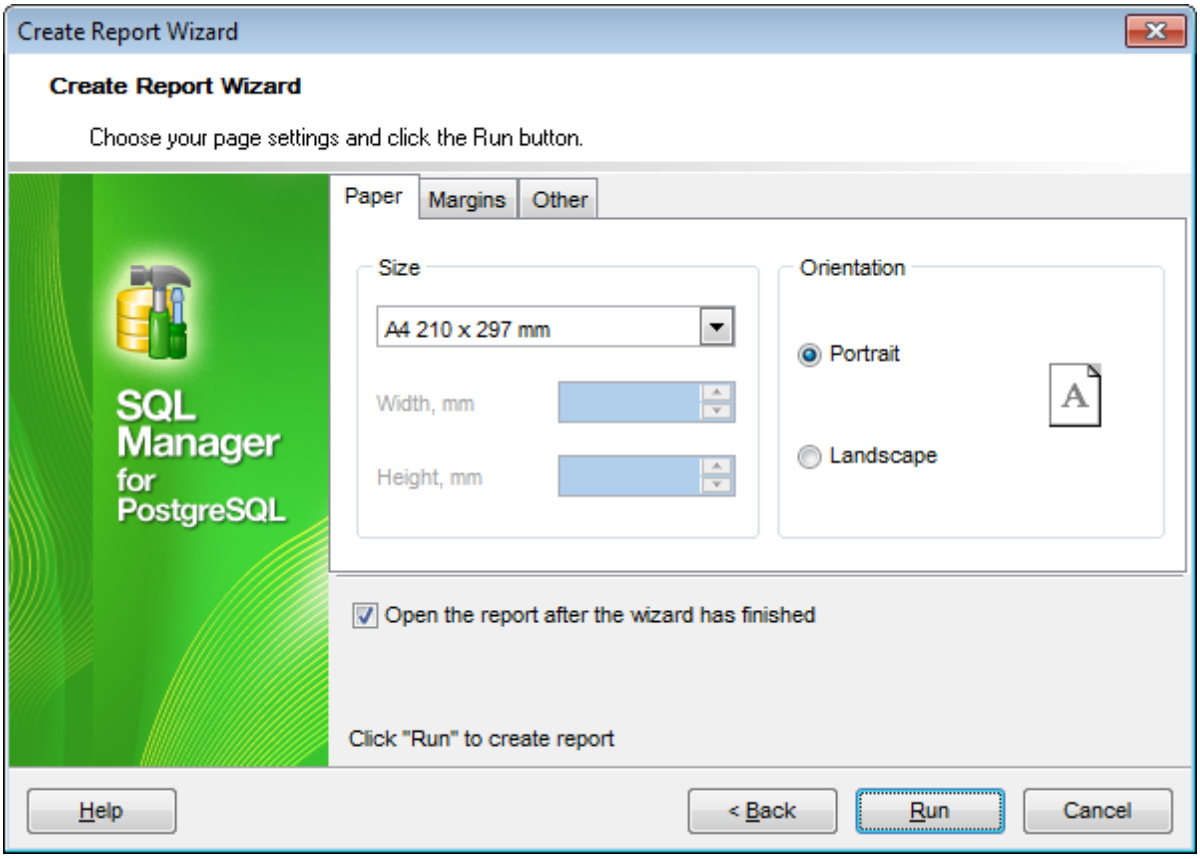
10.9.1.4 Specifying page settings

10.9.1.4.1 Specifying paper settings

Specify report options: paper *size* and *orientation*, page margins[699], other settings[700].



Use the **Margins** tab to specify margins[699] for the result report.

☑ **Open the report after the wizard has finished**
If this option is checked, the report will be opened in Report Designer[701] after generating.

When you are done, click the **Finish** button to run the report generation process.

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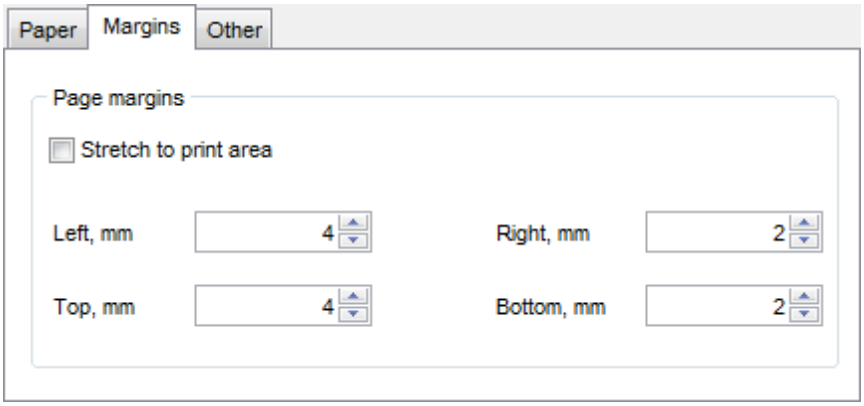
10.9.1.4.2 Specifying margins

Stretch to print area
If this option is checked, the size of report is adjusted to the print area. If this option is unchecked, you can specify the *left*, *right*, *top* and *bottom* margins (in millimeters).



Use the **Other** tab to specify other page settings[700] for the result report.

Open the report after the wizard has finished
If this option is checked, the report will be opened in Report Designer[701] after generating.

When you are done, click the **Finish** button to run the report generation process.

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10.9.1.4.3 Specifying other page settings

Options

Print to previous page
This option allows to use white space on a previous page. This option can be used in case when a report template consists of several pages or when printing batch (composite) reports.

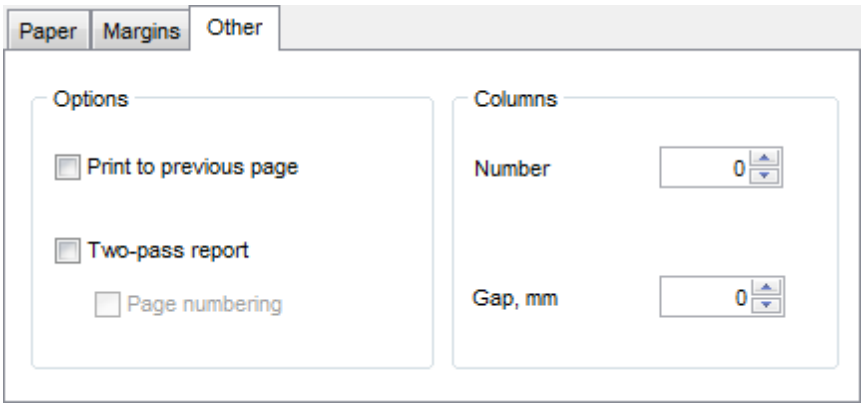
Two-pass report
If this option is selected, report's formation will be performed in two steps. During the first pass, a report is formed, and is divided into pages, but the result is not saved anywhere. During the second pass a standard report formation with saving a result in the stream is performed.

Page numbering
This option allows to print a page numbers.

Columns

Number
This parameter specifies the number of columns for multi-column reports' printing.

Gap, mm
This parameter specifies the width of the gap between columns.



Open the report after the wizard has finished
If this option is checked, the report will be opened in Report Designer[701] after generating.

When you are done, click the **Finish** button to run the report generation process.

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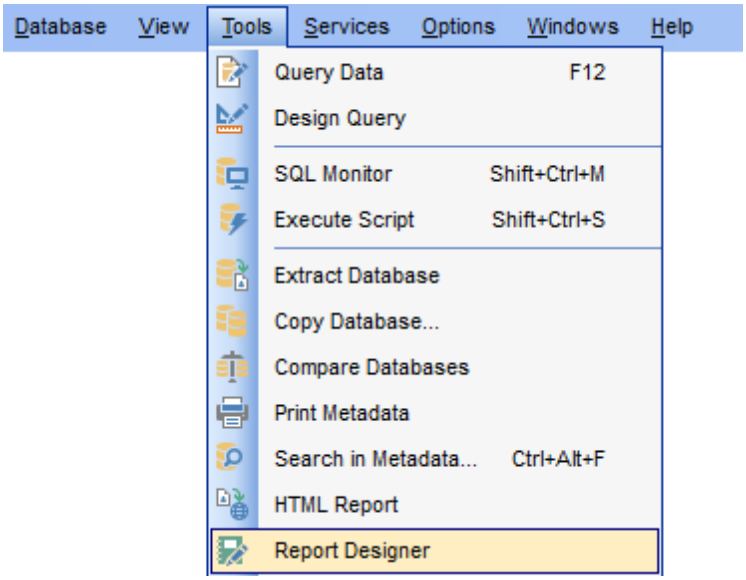
10.9.2 Report Designer

Report Designer allows you to create and edit reports. This tool can be opened after completion of Create Report Wizard 693 to design a new report.
To edit an already existing project, use the appropriate Navigation bar 713 item of Report Viewer 712.



This module is provided by Fast Reports, Inc. (http://www.fast-report.com) and has its own help system. Press **F1** key in the **Report Designer** to call the **FastReport** help.

Please find the instructions on how to create a simple report in the **Report Designer** below:

- Adding dialog form 702
- Adding database and query components 704
- Adding report data 707
- Viewing the report 709
- Saving the report 711

Note: The **Object Inspector** which allows you to edit report object properties, can be shown/hidden by pressing the **F11** key.

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Create Report Wizard 693
Report Viewer 712

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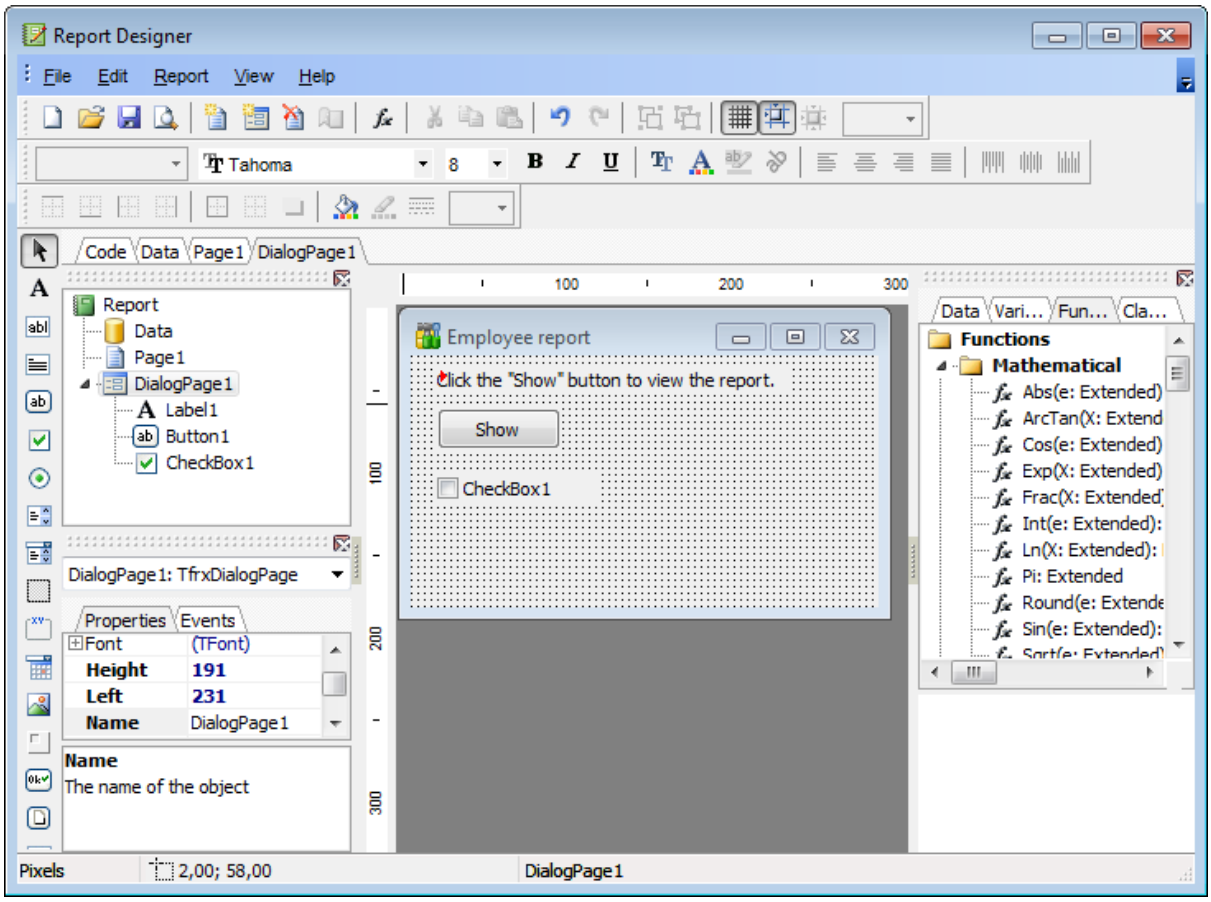
10.9.2.1 Adding dialog form

To add a dialog form, select the **File | New Dialog** main menu item in **Report Designer**.

The new dialog appears within the *DialogPage1* tab of the designer. Use the available RAD tools to add necessary interface elements to the dialog.



To call the dialog, proceed to the **Code** tab and supply the corresponding statement (*PascalScript*), e.g.

```
begin
DialogPage1.ShowModal;
end.
```

Using the **Language** drop-down list you can select the script language to be used for the event handler: *PascalScript* (by default), *C++Script*, *BasicScript*, *Jscript*.

For instance, the following C++Script code can be used as the handler for the *OnClick* event of the 'Show' button to open ZeosPgQuery[704]:

```
{
 ZeosPgQuery1.Active = true;
}
```

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See also:

Adding database and query components 704
Adding report data 707
Viewing the report 709
Saving the report 711

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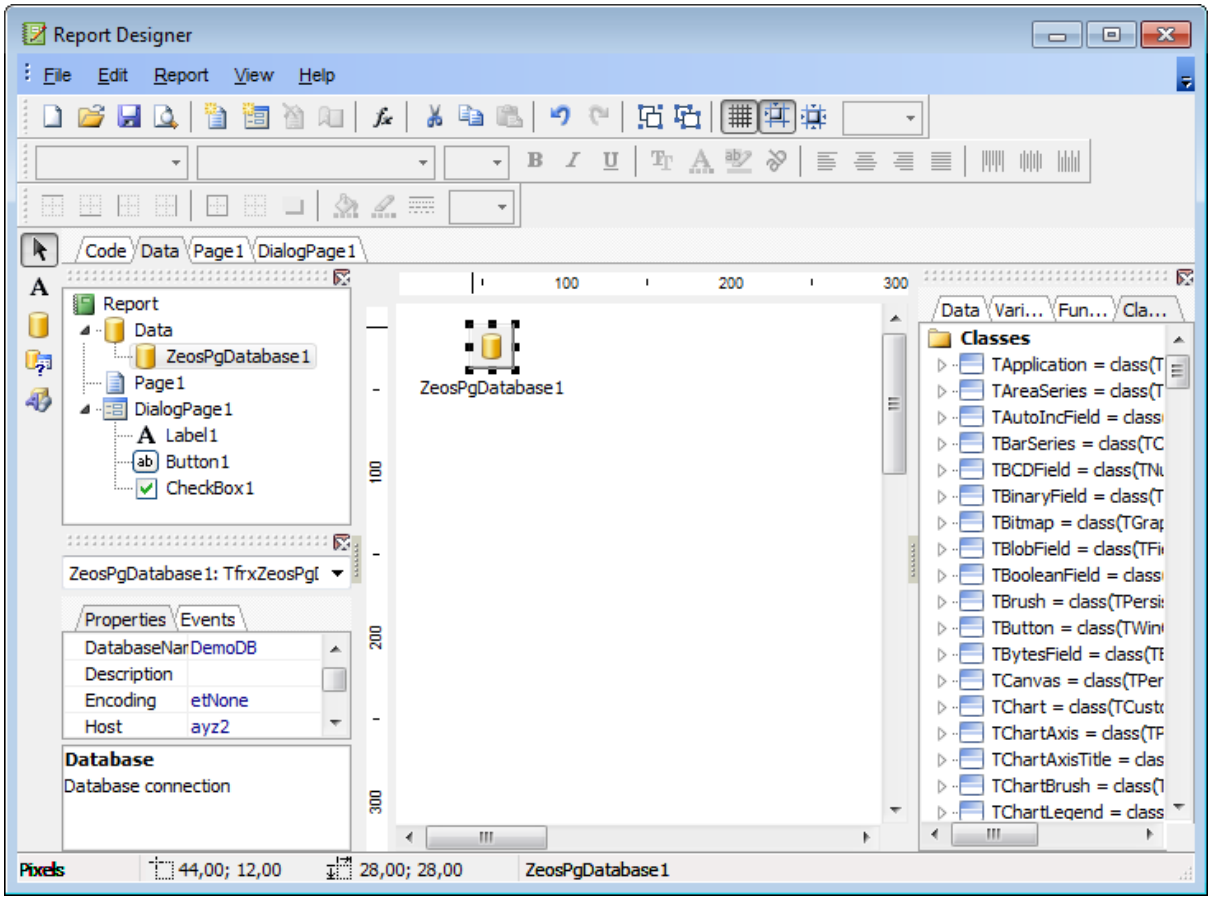
10.9.2.2 Adding database and query components

Adding database component

In order to add the *Database* component:

- proceed to the **Data** tab of **Report Designer**;
- pick the **ZeosPgSQL Database** component on the toolbar (on the left);
- click within the working area - the corresponding *ZeosPgDatabase1* icon appears in the area;
- set the database connection and authorization parameters using the **Properties Inspector**.



Adding query component

In order to add the *Query* component:

- proceed to the **Data** tab of **Report Designer**;
- pick the **Zeos PgSQL Query** component on the toolbar (on the left);
- click within the working area - the corresponding *ZeosPgQuery1* icon appears in the area;
- set the database name and authorization parameters within the **Properties Inspector** ;
- double-click the *ZeosPgQuery1* icon to open the **SQL** window;

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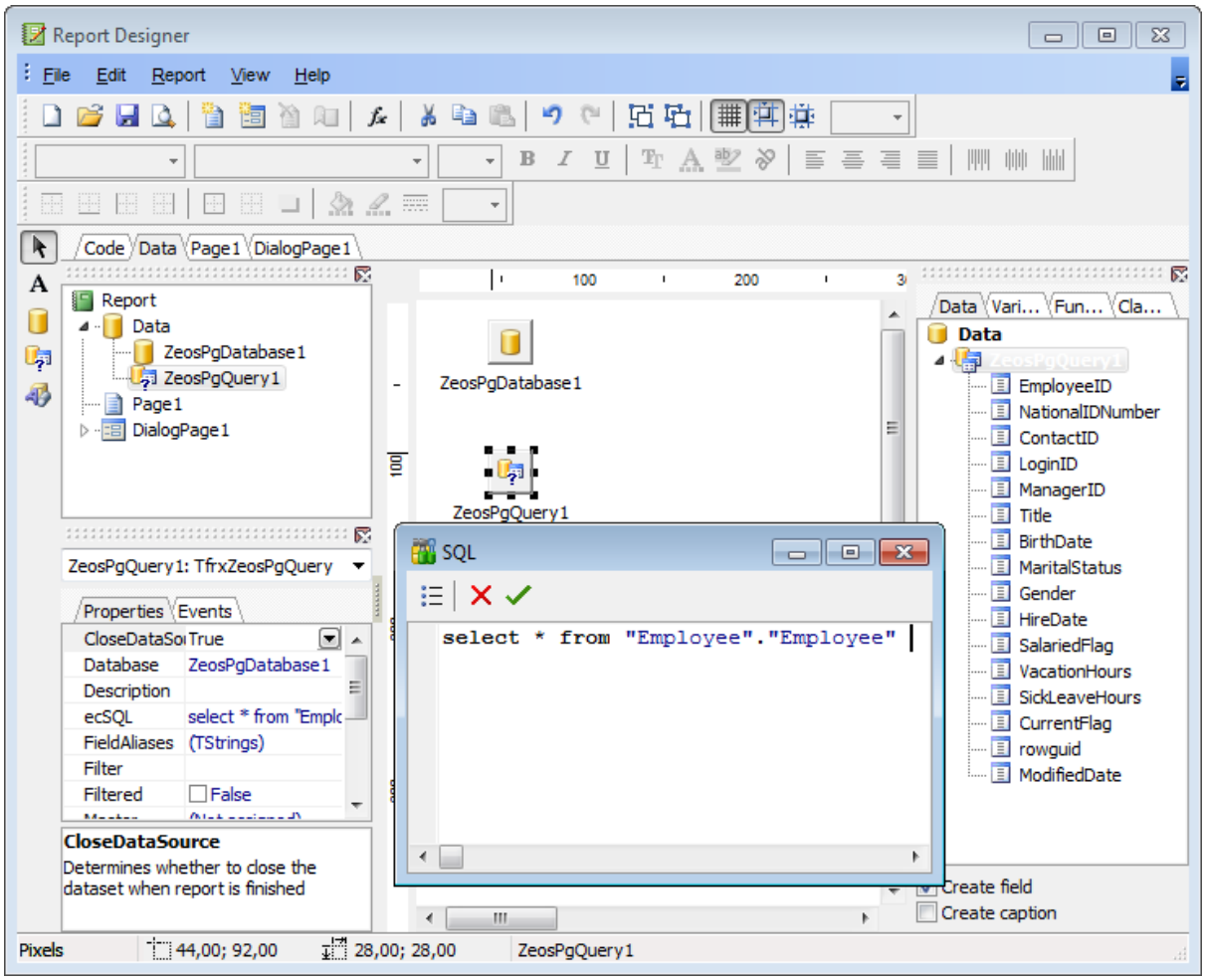
- input the SQL query that returns the required dataset and click the button;
- repeat the operation if you wish to add other query components to the report.



Note: The **Properties Inspector** panel which allows you to edit report object properties can be shown/hidden by pressing the **F11** key.

Using the above given steps you can create as many queries as you need. In order to select a dataset returned by a query, select the **Report | Data...** main menu item of **Report Designer** to call the **Select Report Datasets** dialog. Pick the required query within the dialog and press **OK**.

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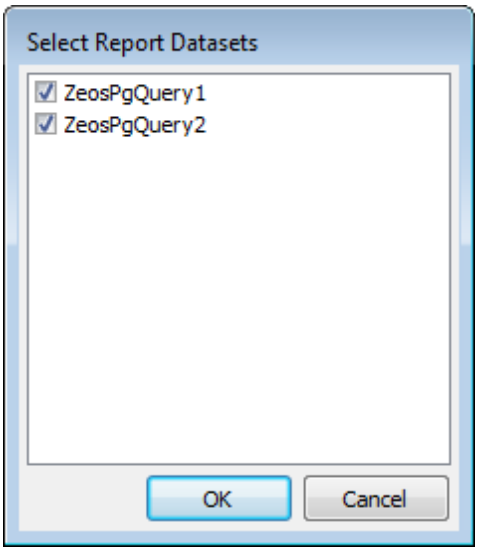

See also:

Adding dialog form 702
Adding report data 707
Viewing the report 709
Saving the report 711

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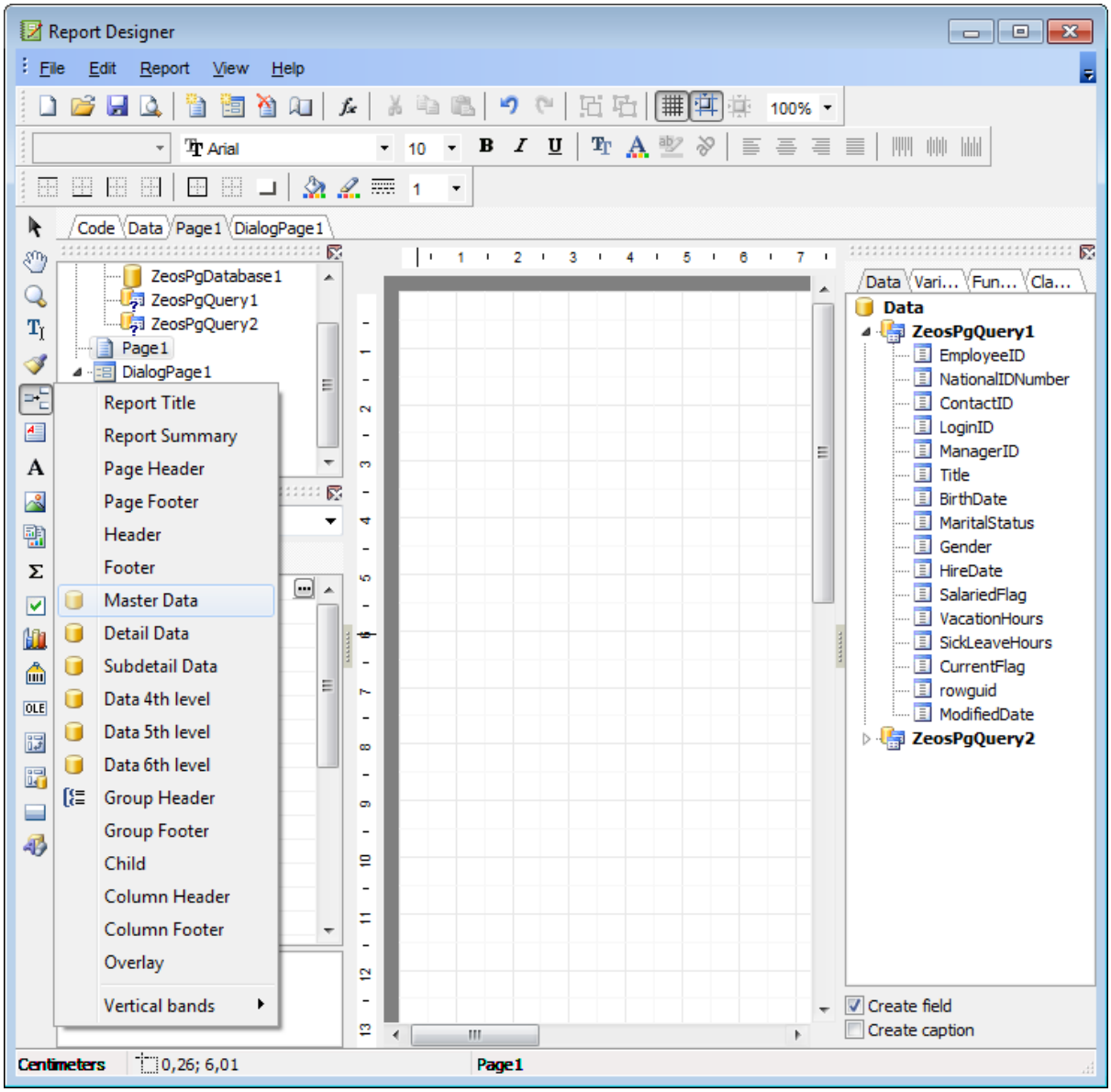
10.9.2.3 Adding report data

Adding bands

In order to add a band to the report:

- proceed to the **Page1** tab of **Report Designer**;
- pick the **Insert Band** component on the toolbar (on the left);
- select the band to be added to the report;
- click within the working area - the corresponding element appears in the area;
- set element properties within the **Properties Inspector**.



Adding report data

In order to add data to the report:

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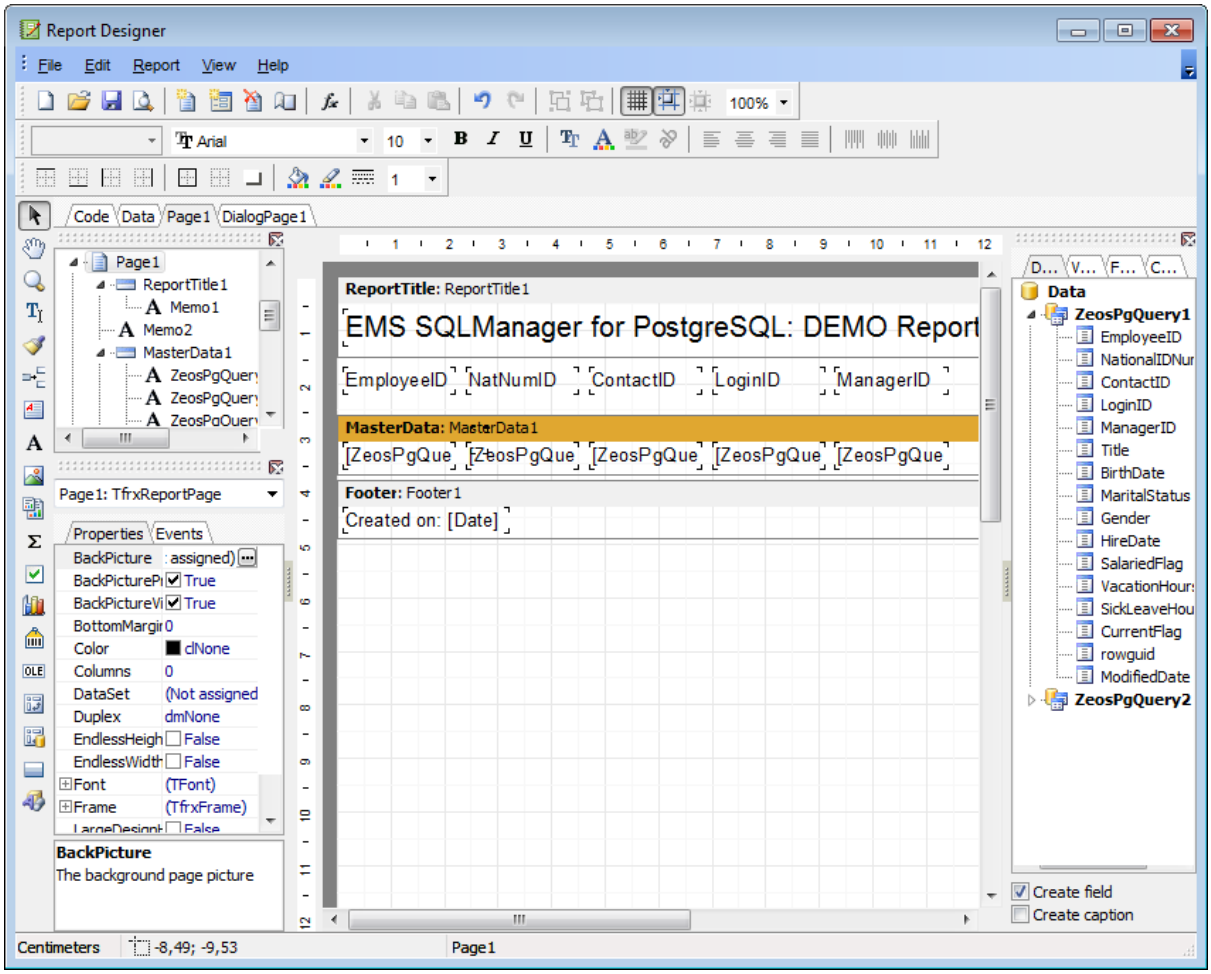
- proceed to the **Data** tab within the panel on the right side of the window;
- pick a column within the **Data** tree and drag it to the working area;
- add all necessary elements one by one using drag-and-drop operation for each of them.



Note: The **Properties Inspector** panel which allows you to edit report object properties can be shown/hidden by pressing the **F11** key.

See also:

Adding dialog form 702
Adding database and query components 704
Viewing the report 709
Saving the report 711

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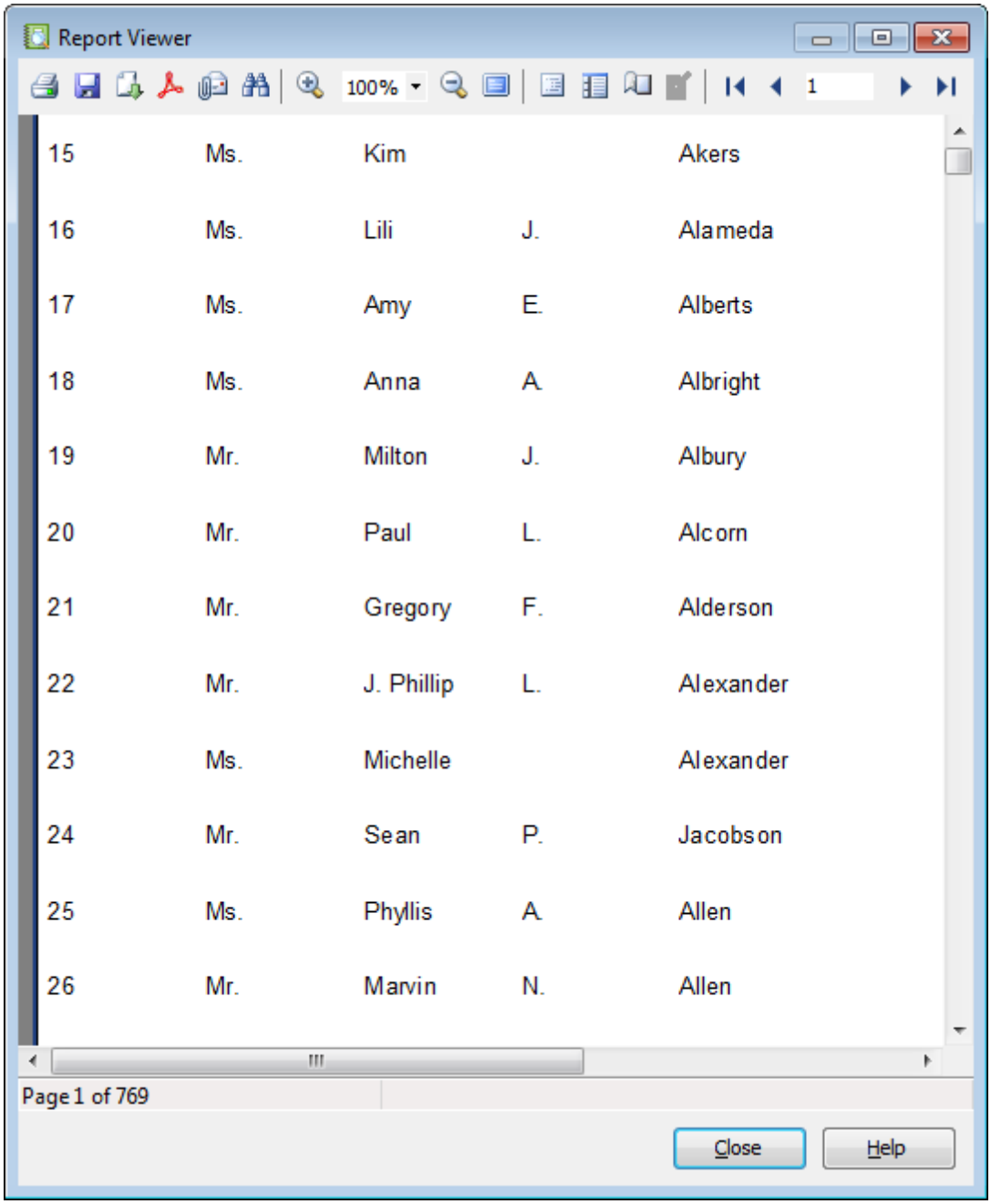
10.9.2.4 Viewing the report

Viewing the report

To preview the newly created report, select the **File | Preview** main menu item or use the corresponding **Preview** toolbar button. You can also use the *Ctrl+P* shortcut for the same purpose. This mode allows you to view, edit and print the result report.

To print the report, use the **Print** toolbar button or the corresponding context menu item.



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It is also possible to preview/print the report using Report Viewer[712].

See also:

Adding dialog form[702]
Adding database and query components[704]
Adding report data[707]
Saving the report[711]

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10.9.2.5 Saving the report

When all report parameters are set, you can save the report to an external **.fr3* file on your local machine or on a machine in the LAN.

To save the report, select the **File | Save** main menu item or use the corresponding **Save Report** toolbar button. You can also use the *Ctrl+S* shortcut[1001] for the same purpose.

If necessary, you can add the report to the database using Create Report Wizard[693] and perform preview/print operations using Report Viewer[712].

See also:

Adding dialog form[702]
Adding database and query components[704]
Adding report data[707]
Viewing the report[709]

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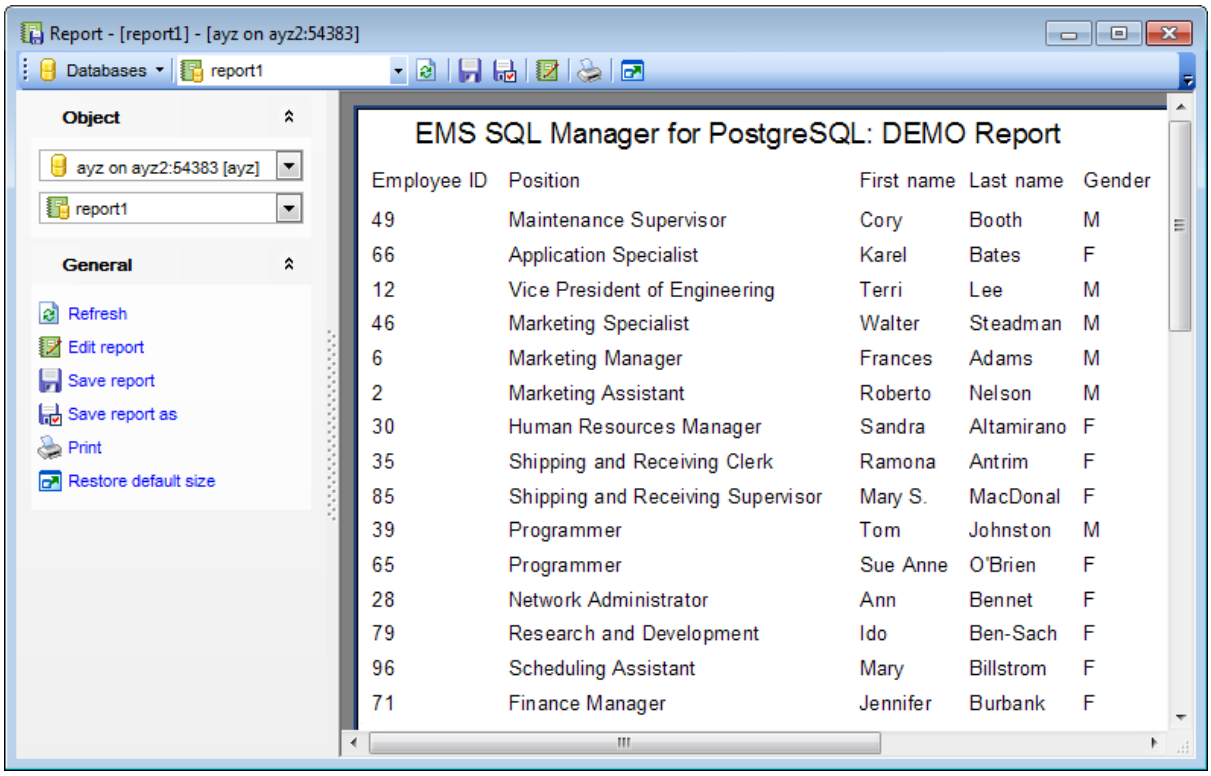
10.9.3 Report Viewer

Using **Report Viewer** you can view, edit, save and print reports.

Possible report operations are described on the Using Navigation bar and Toolbar 713 page.



Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Create Report Wizard 693
Report Designer 701

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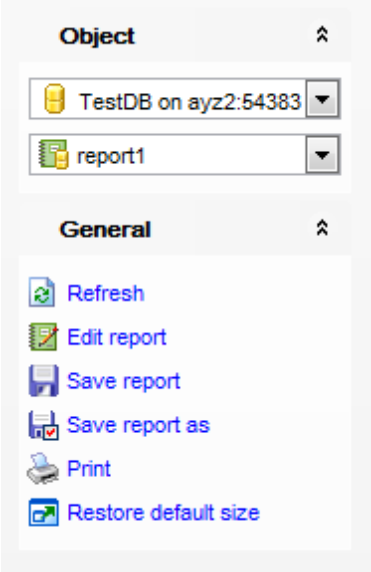
10.9.3.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Report Viewer**.



Object
select a database
select a report for viewing

General
refresh the content of the window
edit report using Report Designer 701
save the current report
save the report to a **.fr3* file using the **Save as...** dialog
print the report
restore the default size and position of the viewer window

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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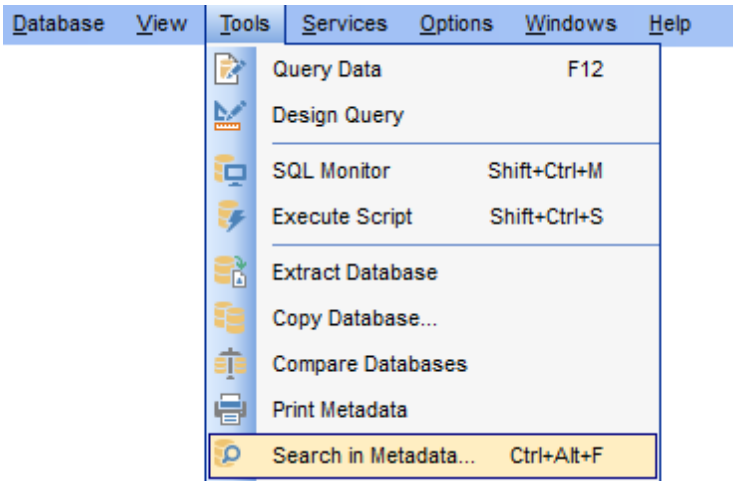
10.10 Search in Metadata

The **Search in Metadata** tool is implemented for quick search within the scope of database metadata. The tools allows you to set various search conditions and view the results.

To launch the **Search in Metadata** tool, select the **Tools | Search in Metadata** main menu 961 item, or use the *Ctrl+Alt+F* shortcut 1001.



- Using Navigation bar and Toolbar 715
- Setting search conditions 717
- Viewing search results 719

Availability:

Full version (for Windows) **Yes**

Lite version (for Windows) **No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Database Objects Management 155

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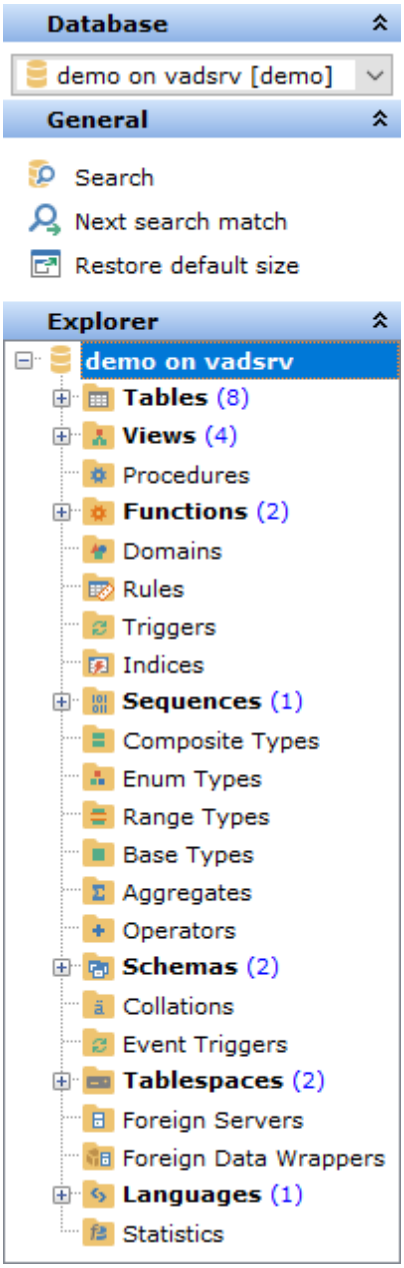
10.10.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Search in Metadata**.



The **Navigation bar** of the **Search in Metadata** tool allows you to:

Database
select a database for searching

General

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set search conditions 717
restore the default size and position of the window

Explorer
browse the tree of found database objects

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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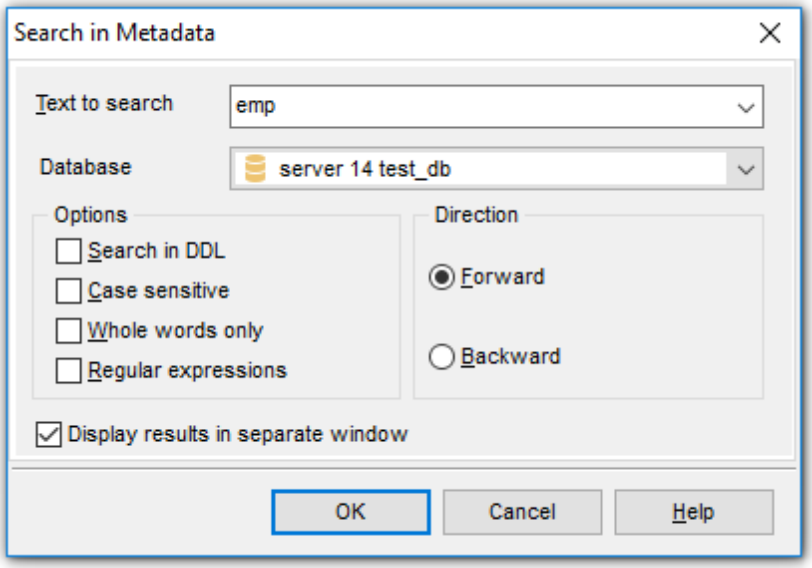
10.10.2 Setting search conditions

The **Find in metadata** dialog allows you to set search conditions. It opens each time the **Search in Metadata** tool is launched.



Text to search
Enter a search string in this box. The Arrow-Down button which can be found next to the input box allows you to select any of the previously entered search strings.

Database
Use the drop-down list to select a database for the search operation.

Options

Search in DDL
This option includes object definition in search scope.

Case sensitive
This option can be used to differentiate uppercase characters from lowercase ones during the search process.

Whole words only
Use this option to search for words only (with this option off, the search string might be found within longer words.

Regular expressions
Recognizes regular expressions in the **Text to find** field.
For example, you can type "empl*" to search for metadata containing the "empl" substring; enter "^emp" to search for words starting with "emp" or "^emp|emp$" to search for the string "emp" at the beginning or at the end of the string.
Note: The syntax of regular expressions that can be used in the **Text to find** field is similar to that used in Perl regular expressions. Comprehensive information about it can be found at http://perldoc.perl.org/perlre.html#Regular-Expressions.

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Direction

Forward
Searches from the current position to the end of the working area.

Backward
Searches from the current position to the beginning of the working area.

Display results in separate window
This option enables displaying results in a separate window. Otherwise search results replace the current search.

See also:

Find Text dialog 971

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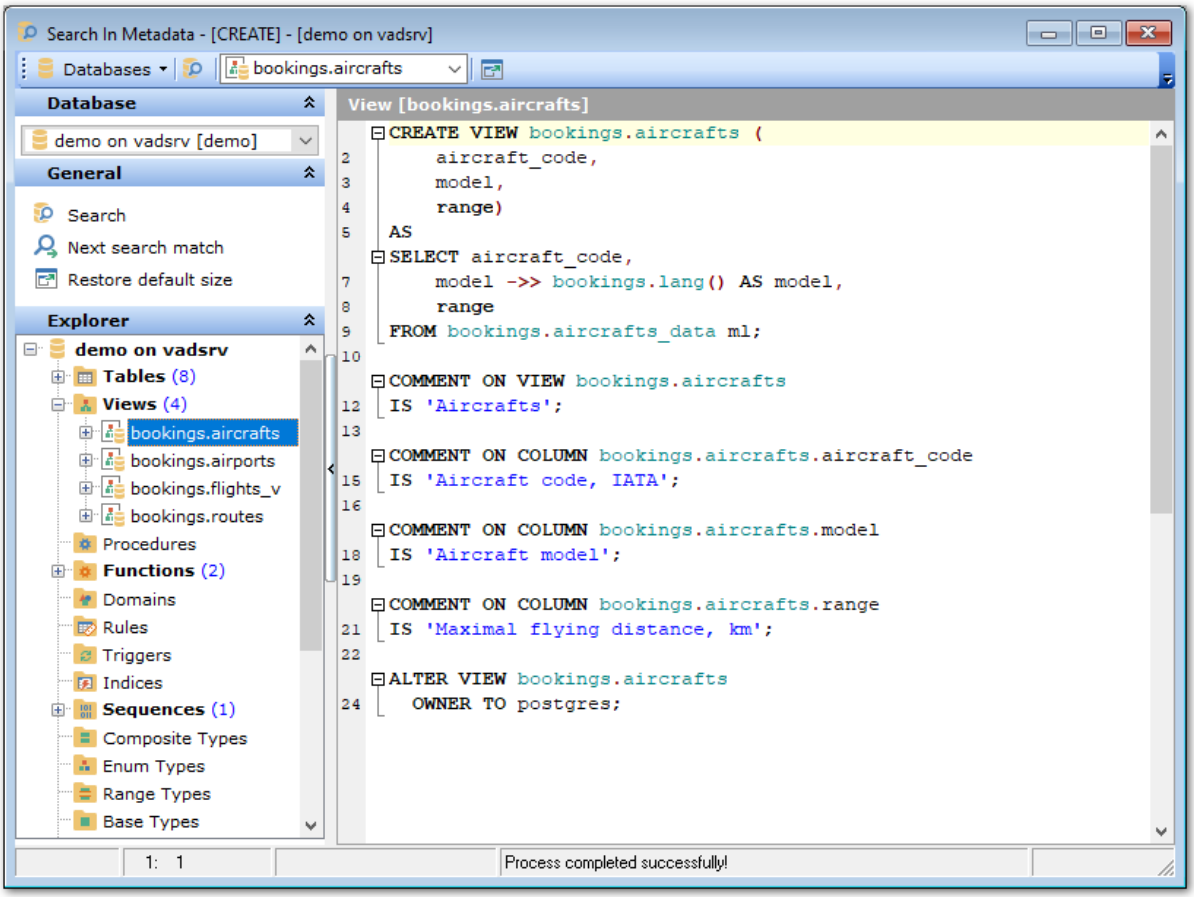
10.10.3 Viewing search results

The **Search in Metadata** window allows you to view the search progress and results fetched from the database.



After the search is complete, the **Explorer** group on the Navigation bar[715] displays the tree of database objects in which the search string is found, and allows you to view metadata of the required object or its fragment quickly by clicking enclosed object branches in the tree.

The **Object <object_name>** area is provided for viewing metadata of the objects, with the search string highlighted.
For your convenience the **syntax highlight**, **code completion** and a number of other features for efficient SQL editing are implemented. For details see Working with Query Data area[418] and Using the context menu[420].

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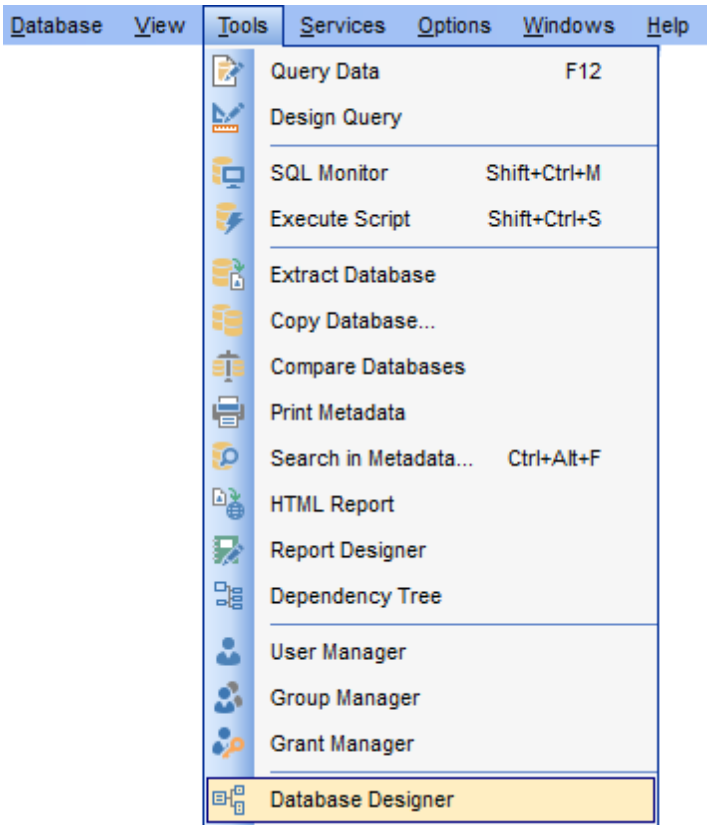
10.11 Database Designer

Database Designer is provided for visual presentation of databases, database objects and relations between objects. It also allows you to create, edit and drop tables and table columns, set relations between tables and perform other operations you may need to achieve your purpose.

To open the designer, select the **Tools | Database Designer** main menu 961 item, or use the **DBD** button on the main toolbar 963.



- Using Navigation bar and Toolbars 722
- Using Diagram Navigator and DB Objects pane 726
- Using context menus 728
- Adding/removing objects to/from diagram 730
- Incremental search 731
- Creating new objects 732
- Creating relations 733
- Working with diagram pages 735
- Reverse engineering 736
- Printing diagram 737
- Saving/loading diagram 741
- Setting diagram options 742

Availability:
Full version (for Windows) **Yes**

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Lite version (for Windows) **No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Database Objects Management 155

Database Designer options 900

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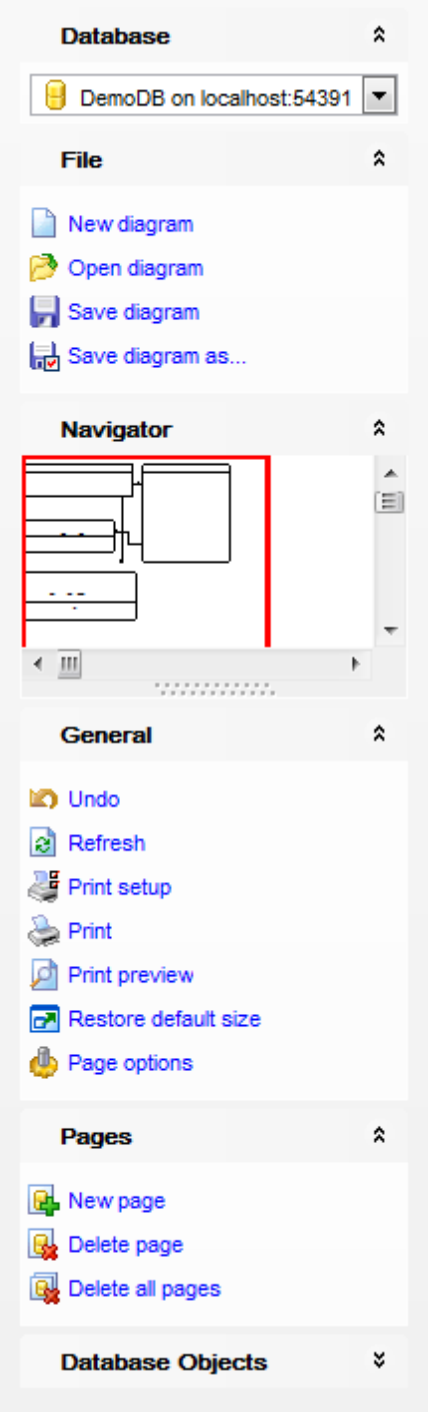
10.11.1 Using Navigation bar and Toolbars

The **Navigation bar** and **Toolbars** provide quick access to tools implemented in **Database Designer**.



Database
select a database for building the diagram

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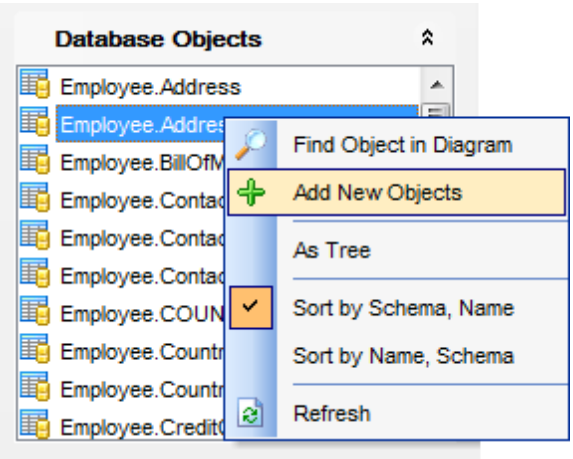
File group
create a new diagram;
open 741 an existing diagram;
save 741 the current diagram to a **.pgd* file;
save the current diagram as a custom file

Navigator
use Diagram Navigator 726

General group
cancel latest modification;
repeat canceled modification;
refresh objects in the diagram;
Print setup - define printing settings;
print 737 the diagram;
show Print Preview 738;
edit diagram options 742
restore the default size and position of the window
Pages group:
add a new page;
delete the current page;
delete all pages.

Database Objects



contains the list of objects (tables, views and functions) that can be placed to diagram.
Context menu of Database Objects group allows you to:
search 731 for objects in the diagram using the Database Objects 726 pane;
add 730 objects to the diagram using the Database Objects 726 pane;
switch objects view: **As tree**/**As list**;
enable/disable sorting by schema, object name or object name, schema;
refresh list of objects.

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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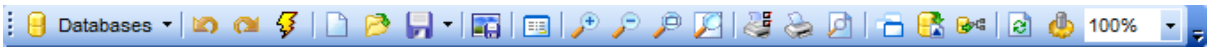
The **main toolbar** (by default, the toolbar is located at the top of the diagram area) contains a number of tools (including items of the **Navigation bar**, context menu[728], tools for printing diagram[737], etc.) allowing you to:

- select the database for building the diagram;
- create a new diagram;
- open[741] an existing diagram;
- save[741] the current diagram to a **.pgd* file;
- save[741] the current diagram as an image;
- activate the Incremental search[731] panel;
- adjust diagram zoom for optimal representation: *zoom in*, *zoom out*, *fit model*;
- switch cursor mode: *select* / *select rectangle to fit*;
- open the Print Setup[739] dialog;
- print[737] the diagram;
- show Print Preview[738];
- arrange objects in the diagram;
- extract metadata of all objects in the diagram and load the script to Execute Script Editor[646];
- perform Reverse Engineering[736];
- refresh objects in the diagram;
- view/edit diagram options[742];
- specify a predefined zoom value;
- restore the default size and position of the window[720].

Object Customization panel allows you to define *font*, *font size*, *font style*, *font color* and *brush color*.



The **Pages** toolbar (by default, the toolbar is located at the top of the diagram area) contains tools for working with diagram pages[735] allowing you to:

- *add* a new page;
- *delete* the current page;
- *delete all* pages.

Diagram toolbar located on the left allows you to:

- switch to object selection mode;
- switch to create table mode (enables creating tables[169] on clicking);
- switch to create relation mode;
- switch to create virtual relation mode;
- switch to create comment mode;
- align left edges;
- align right edges;
- align tops;
- align bottom;
- align horizontal centers;

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align vertical centers;
space equally, horizontal;
space equally, vertical.

The **New object** toolbar (by default, the toolbar is located on the left side of the diagram area) allows you to:

- set the cursor mode to *Select*;
- create a new object[732] (a *table* or a *comment*);
- create a new relation[733];

See also:

Using Diagram Navigator and DB Objects pane[726]
Using context menus[728]
Adding/removing objects to/from diagram[730]
Incremental search[731]
Creating new objects[732]
Creating relations[733]
Working with diagram pages[735]
Reverse engineering[736]
Printing diagram[737]
Saving/loading diagram[741]
Setting diagram options[742]

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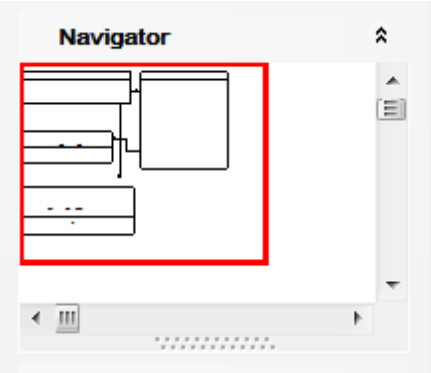
10.11.2 Using Diagram Navigator and DB Objects panel

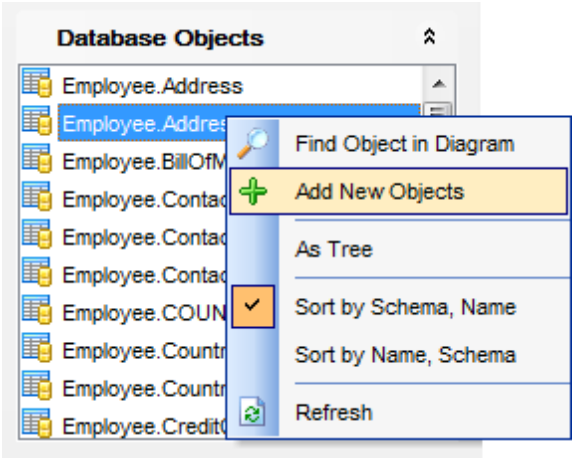
To navigate within the large diagram, use the **Navigator** tool available on the Navigation bar[722]. It allows you to see the whole diagram in a reduced scale and to perform a number of operations over the diagram objects.



A mouse click in the **Navigator** area sets the center of the visible diagram area. The area currently visible in the main diagram area is outlined in a red bounding rectangle.

Using the **Navigator** you can work with the diagram objects in the same way as in the main diagram area: add[730]/remove[730], create[732] new objects, move objects within the diagram and perform other operations.

The **Database Objects** pane available on the Navigation bar[722] allows you to browse the list of available database objects[155] that can be added to the diagram.



Select and drag an object to the diagram area or double-click it to add[730] the object to the diagram.

Right-click an item within the list to call the **context menu** allowing you to:
find the selected object in the diagram (if the object is found, it will be highlighted in the diagram area);
add new objects to the diagram by Reverse engineering[736];
toggle objects representation mode: *as a tree / as a list*;
select the sorting mode applied to the objects in the list: *by schema, name / by*

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name, *schema*;
refresh the list.

See also:

Using Navigation bar and Toolbars 722
Adding/removing objects to/from diagram 730
Creating new objects 732
Creating relations 733
Working with diagram pages 735

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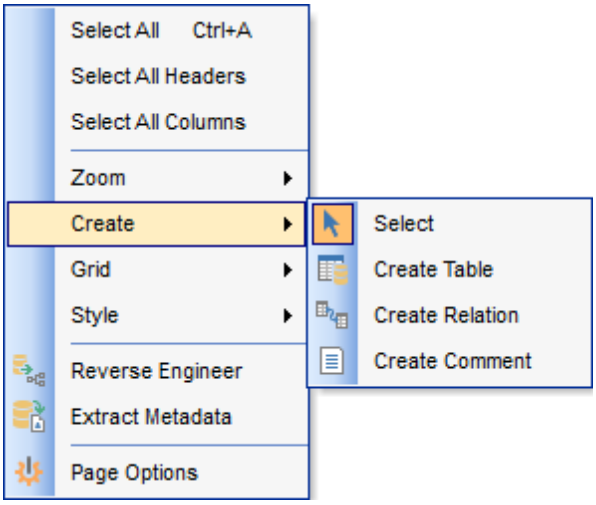
10.11.3 Using context menus

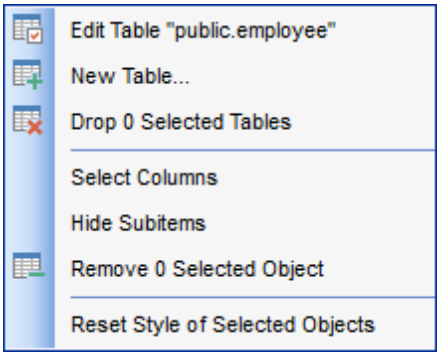
The **context menu** of the diagram area contains a number of items available in the Navigation bar[722] and toolbars[724] and allows you to:

- select all objects in the diagram area;
- Select All Headers;
- Select All Columns;
- adjust diagram zoom for optimal representation: *zoom in*, *zoom out*, *select rectangle to fit*, *fit model*, specify a predefined *zoom* value;
- set the cursor mode to *Select* or create a new table[732], relation[733], or comment[732];
- configure the grid[742]: *draw grid*, *snap to grid*;
- adjust the diagram style[742]: *draw primary key columns separately*, *draw entities icons*, *draw attributes icons*, *draw only names ofentities*, *draw foreign key names*;
- perform Reverse Engineering[736];
- extract metadata of the diagram objects to Execute Script Editor[646];
- view/edit diagram options[742].



The **context menu** of an entity contains items for working with the object and allows you to:

- edit[155] the object using its editor;
- create[732] a new object using its editor;
- drop[155] the object from the database;
- show/hide object subitems;
- remove[730] the object from the diagram.



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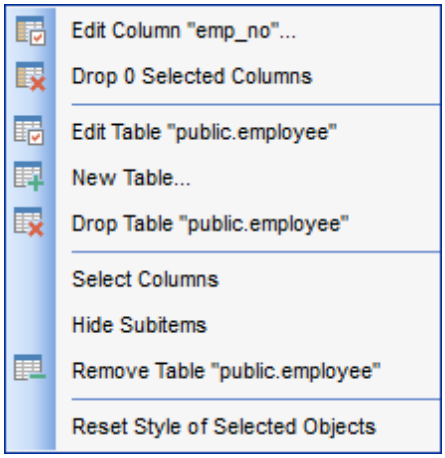
The **context menu** of a column contains items for working with the object and its columns and allows you to:

- edit 208 the selected column using its editor (Column Editor 209);
- create 208 a new column;
- drop 208 the selected column;
- edit 155 the object using its editor (Table Editor 177);
- create 732 a new object using its editor (New table 170);
- drop 155 the object from the database;
- show/hide object subitems;
- remove 730 the object from the diagram.



See also:

Using Navigation bar and Toolbars 722
Adding/removing objects to/from diagram 730
Incremental search 731
Creating new objects 732
Creating relations 733

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10.11.4 Working with diagram objects

10.11.4.1 Adding/removing objects to/from diagram

To *add* an object to the diagram:

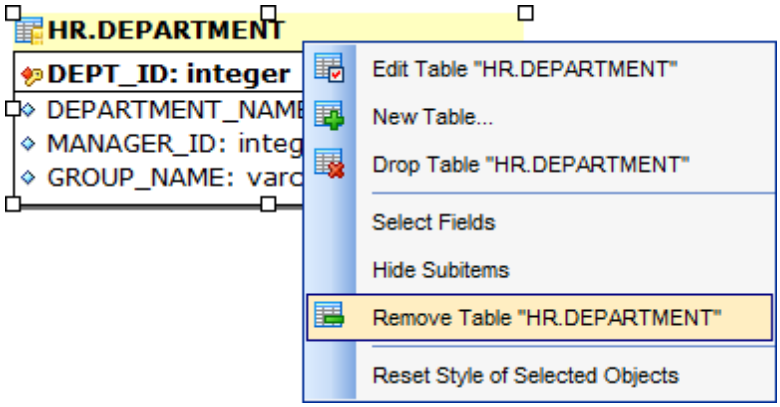
- drag it from the Database Explorer 65 tree to the diagram area

or

- drag it from the Database Objects 726 pane (available on the Navigation bar 722) to the diagram area or simply double-click this object in the list.

To add objects by Reverse engineering 736, you can right-click within the **Database Objects** list and select the **Add new objects...** context menu item.

To remove an object from the diagram, select it in the diagram area, then right-click its title and choose the **Remove <object_name>** item from the context menu 728, or just press the **Del** key.



See also:

Using Navigation bar and Toolbars 722
Using Diagram Navigator and DB Objects pane 726
Using context menus 728
Creating new objects 732
Creating relations 733
Reverse engineering 736
Database Objects Management 155

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10.11.4.2 Incremental search

To **search** for an object within the diagram:

- right-click the required object in the Database Objects pane and select the **Find Object in Diagram** item from the context menu

or

- click the **Incremental Search** button on the main toolbar or use the *Ctrl+F* shortcut to activate the Incremental Search panel in the status bar area of the designer window.

Type a string in the edit-box, and the object having the name with the closest match will be highlighted in the diagram area.

See also:

Using Diagram Navigator and DB Objects pane

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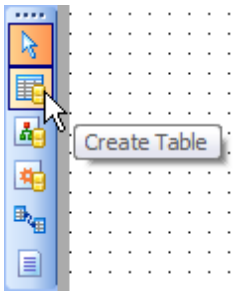
10.11.4.3 Creating objects

To create[155] a new object using Database Designer:

- press the **Create table/view/function** button on the New object toolbar[725];
- click the desired point on the diagram to place the new object at;
- specify object properties using its editor (New table[170]).



Hint: To create a new object, you can also select the corresponding item from the context menu[728]. The context menus also allow you to edit[155] and drop[155] database objects.

Note: Before you press the **Compile** button the object is created on the diagram area only but not in the database.

See also:

Using Diagram Navigator and DB Objects pane[726]
Adding/removing objects to/from diagram[730]
Incremental search[731]
Creating relations[733]

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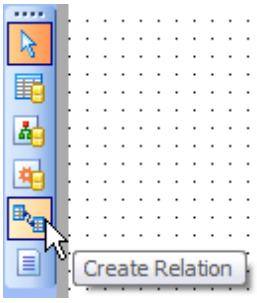
10.11.4.4 Creating relations

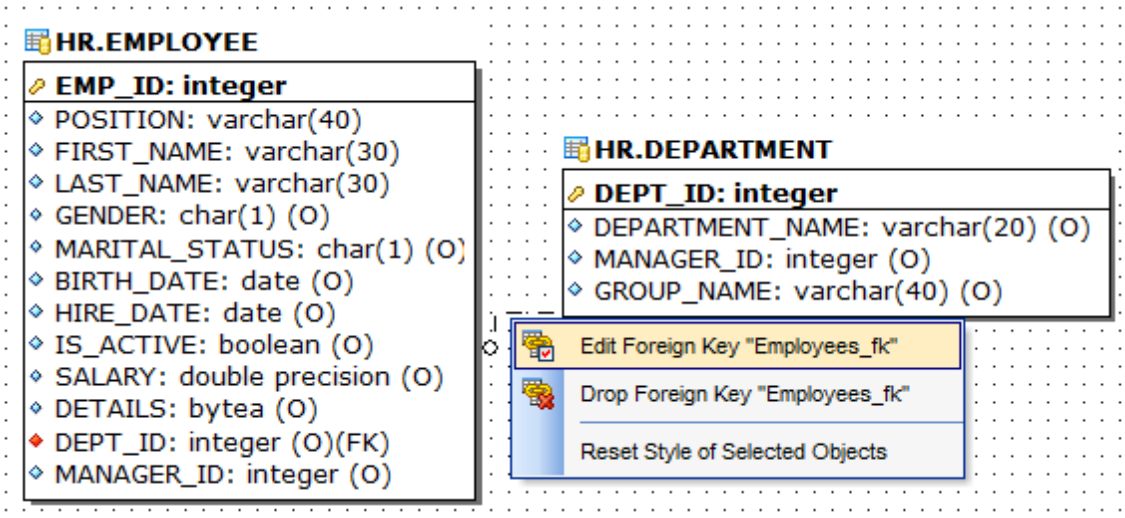
To establish a new relation (which is the foreign key 212 in terms of database management):

- press the **Create relation** button on the New object toolbar 725;
- click the entity where the referential constraint should be created;
- click the referred entity;
- specify new foreign key properties using Foreign key Editor 213.



Hint: To create a relation, you can also use the corresponding item of the context menu 728.

Once the relation is created, it is displayed as a line between two entities in the diagram area. The style the line is drawn is determined by the diagram *notation*.
The **context menu** of this line allows you to edit 212 the foreign key using Foreign key Editor 213 or drop 212 the foreign key from the database.



See also:

Using Diagram Navigator and DB Objects pane 726
Adding/removing objects to/from diagram 730
Incremental search 731

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Creating new objects 732

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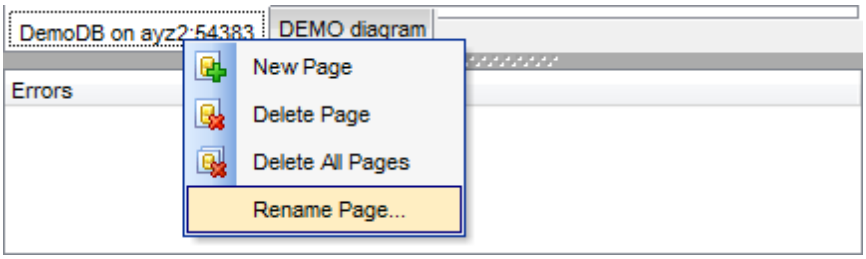
10.11.5 Working with diagram pages

You can create several **pages** in one diagram to split the model into several subject groups, e.g. for better comprehension.

To manage diagram pages, right-click on the tabs at the bottom of the diagram area and select the required popup menu items for *adding*, *deleting* and *renaming* pages.



Hint: Page management items are also available on the Pages toolbar[724] of Database Designer.

See also:

Using Diagram Navigator and DB Objects pane[726]

Adding/removing objects to/from diagram[730]

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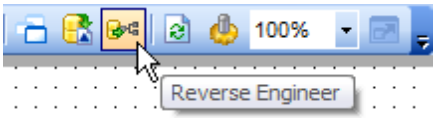
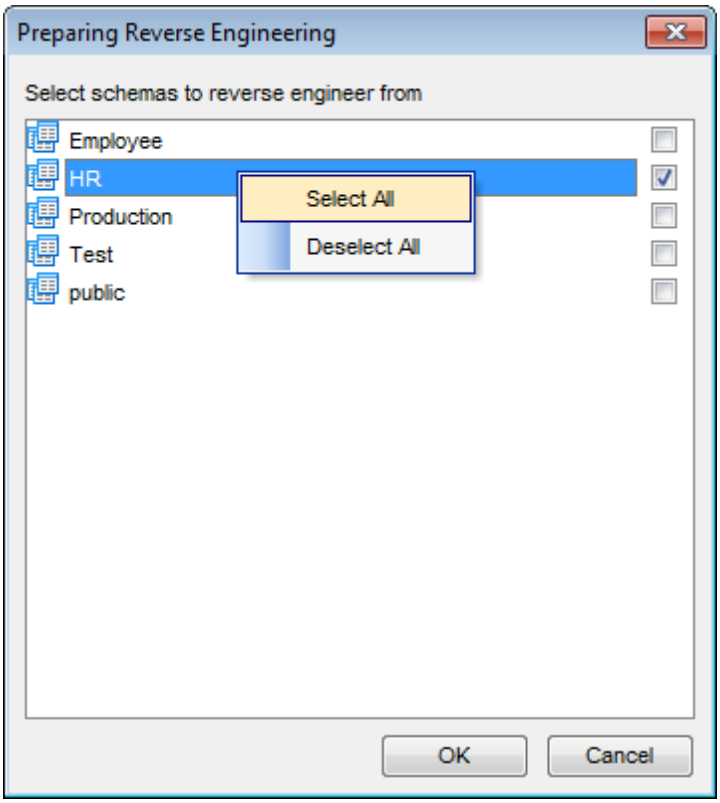
10.11.6 Reverse engineering

The **reverse engineering** operation builds relationship diagram on the basis of the current database's structure. The objects are arranged automatically within the diagram model.

To start the reverse engineering process, press the **Reverse Engineer** button on the main toolbar[724], or use the corresponding item of the context menu[728].



The **Preparing Reverse Engineering** dialog allows you to select schemas[164] containing objects to reverse engineer.



For your convenience the *Select All* and *Deselect All* items are available in the context menu of the schemas list.

See also:

Using Navigation bar and Toolbars[722]

Using Diagram Navigator and DB Objects pane[726]

Adding/removing objects to/from diagram[730]

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10.11.7 Printing diagram

Database Designer allows you to print and preview the diagram.

To preview the diagram:

- press the **Print Preview** button on the toolbar[724];
- preview the diagram using the Print Preview[738] window.

To setup print options:

- press the **Print Setup** button on the toolbar[724], or use the corresponding link on the Navigation bar[722];
- set printing options using the Print Setup[739] dialog and press **OK**.

To print the diagram:

- press the **Print** button on the toolbar[724];
- set printing options using the Print Setup[739] dialog and press the **Print** button.

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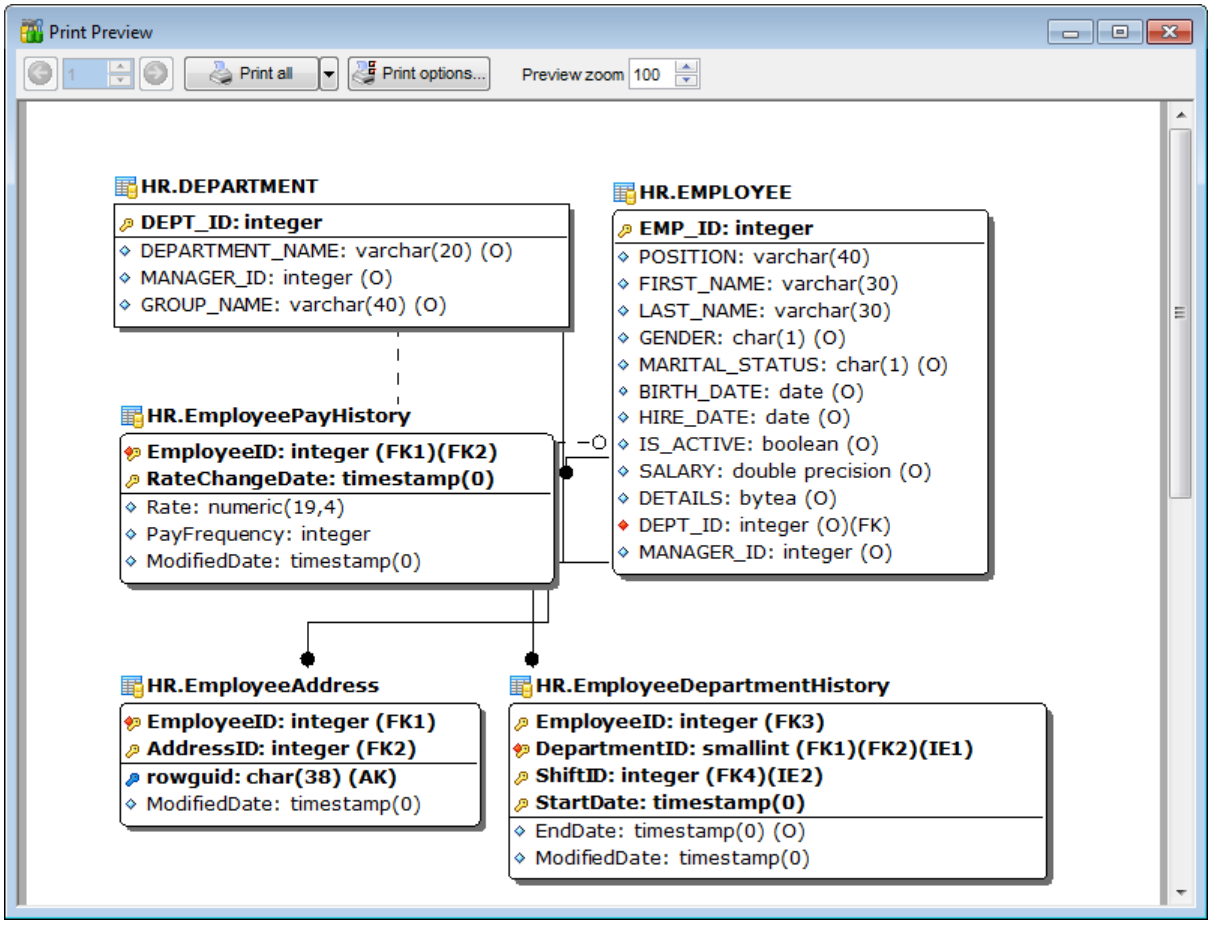
10.11.7.1 Print Preview

The **Print Preview** dialog allows you to see the diagram layout in WYSIWYG mode before it will be printed.

Use the navigation buttons or the spinner control to navigate within the preview pages.
Click the **Print options...** button to call the Print Setup 739 dialog.
If necessary, specify the **preview zoom** according to your preferences.
Click the **Print all** button to start printing.



See also:

Print Setup dialog 739

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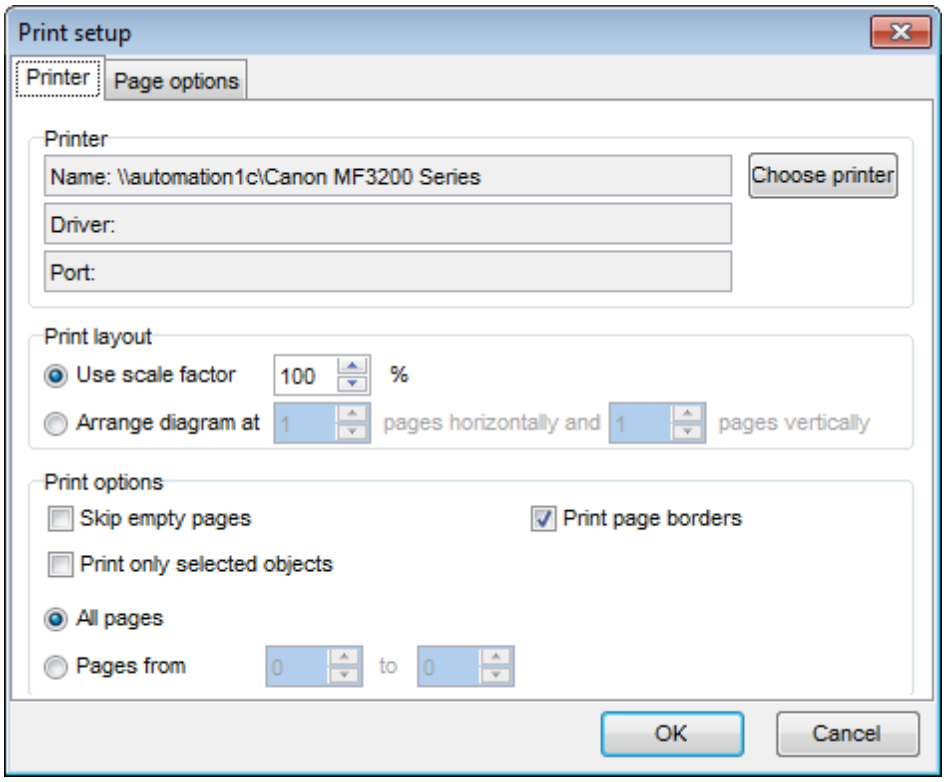
10.11.7.2 Print Setup dialog

The **Print Setup** dialog of **Database Designer** provides two tabs for setting printing options: **Printer** and **Page options**.

The **Printer** tab of the **Print Setup** dialog allows you to:

- specify the printer (use the **Choose printer** button to select a printer which is not set by default on your system; the *name*, *driver*, *port* fields display the selected printer details);
- specify print layout: print using a defined *scale factor* or arrange diagram at a defined number of pages horizontally and vertically;
- set other print options.



The **Page options** tab of the **Print Setup** dialog allows you to:

- specify page margins (in millimeters): *Top margin*, *Bottom margin*, *Left margin*, *Right margin*;
- specify **Page header** and **Page footer**: enter the header/footer running titles *text*, set left/center/right *align*.

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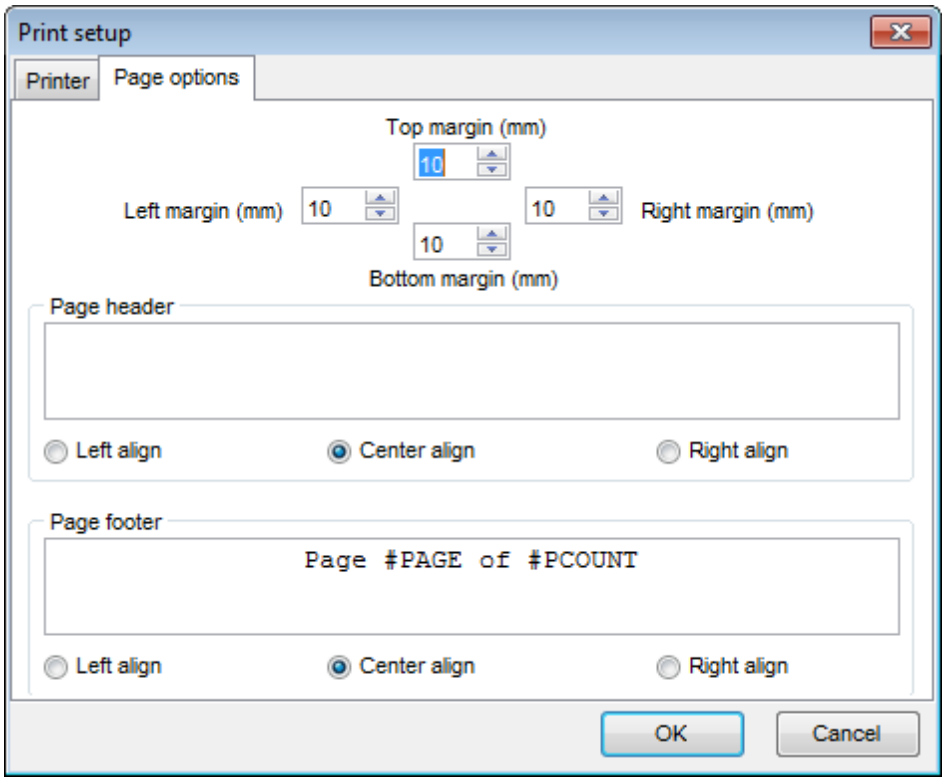

Hint: It is also possible to set macros in the **Page header** and **Page footer** fields:
#PCOUNT stands for the quantity of pages;
#PAGE - the number of the current page;
#DATE denotes the current date;
#TIME denotes the current time.

See also:

Print Preview 738

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10.11.8 Saving/loading diagram

Use the **Save Diagram** and the **Open Diagram** buttons on the main toolbar[724] to save the diagram as a **.pgd* file for future use or to load the previously saved diagram.

If necessary, you can save the diagram as an image: click the **Save as Picture** button on the on the main toolbar[724].

See also:

Using Navigation bar and Toolbars[722]
Using Diagram Navigator and DB Objects pane[726]
Using context menus[728]
Adding/removing objects to/from diagram[730]

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10.11.9 Setting diagram options

Using the **Diagram Options** dialog you can setup the behavior and look of each diagram page.

To open this dialog, use the **Diagram options** item of the Navigation bar[722] or on the main toolbar[724], or select the corresponding item from the context menu[728].

See detailed description of each option on the Database Designer[900] page of the Environment Options[871] dialog.

Apply changes to all new pages
If this option is selected, the current settings will be applied to all newly created pages of Database Designer.

See also:

Using Diagram Navigator and DB Objects pane[726]
Database Designer options[900]

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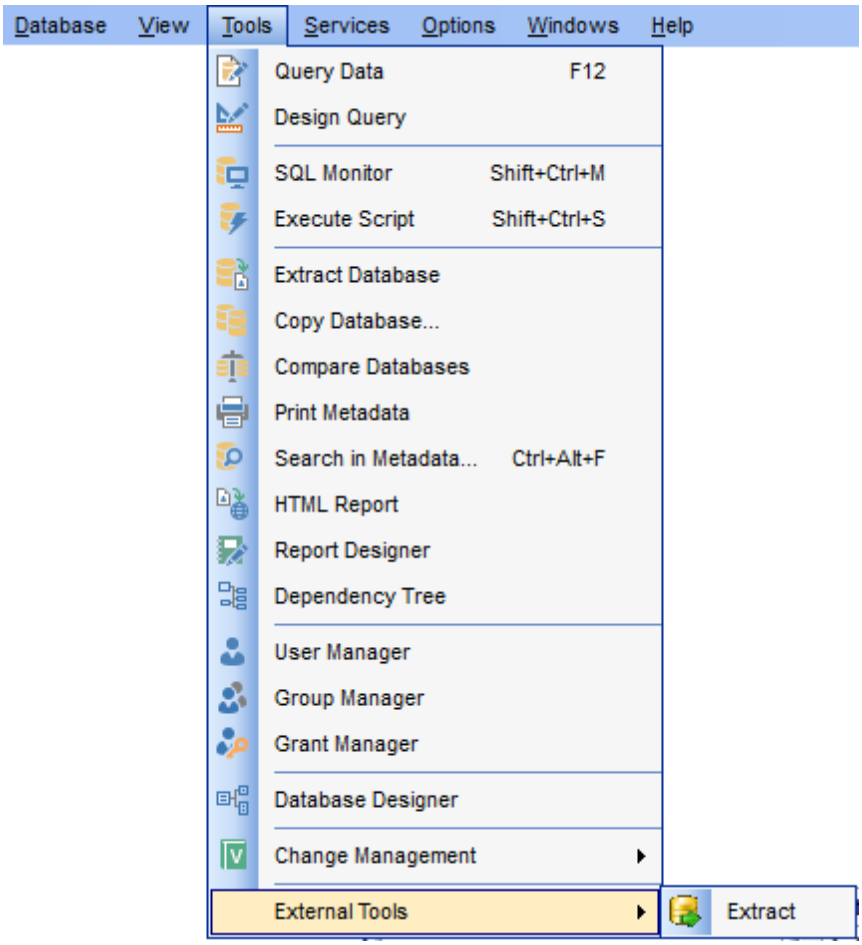
10.12 External Tools

When using SQL Manager for PostgreSQL, you can add **external Windows applications** to make your work more efficient.

- External Tools dialog 745
- External Tool Info editor 747



Adding External Tools

- select the **Options | External Tools...** main menu 961 item;
- click the **Add...** button in the External Tools 745 dialog;
- specify parameters of the new external tool within the External Tool Info 747 editor;
- confirm adding the new external tool by clicking **OK** in the External Tool Info 747 editor and the External Tools 745 dialog.

This adds the icon and the title of the application you have selected to the **Tools | External Tools** submenu. Now you can run this tool quickly without closing SQL Manager.

Removing External Tools

- select the **Options | External Tools...** main menu 961 item;
- select the tool to be removed in the **Tools** list of the External Tools 745 dialog;

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- press the **Del** key or click the **Delete** button within the dialog;
- click **OK** to confirm removing the tool and closing the dialog.

The selected tool has been removed and is no longer accessible from the **Tools | External Tools** submenu.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
Server Tools
Options 870
How To... 1006

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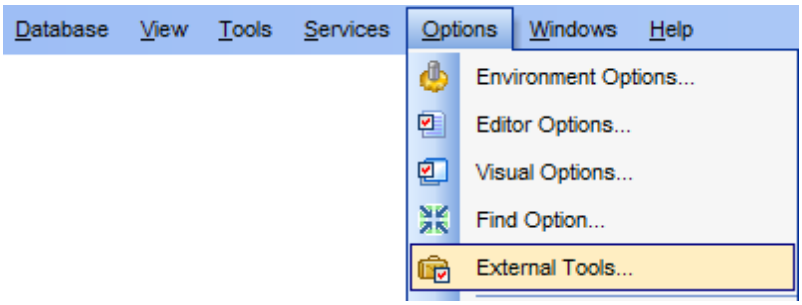
10.12.1 External Tools dialog

The **External Tools** dialog allows you to manage the list of external applications which can be easily run from within SQL Manager environment.

To open this dialog, select the **Options |** **External Tools...** main menu 961 item.



Tools
Lists all added external applications.

Add...
Opens the External Tool Info 747 editor for adding a new tool to the **Tools | External Tools** submenu.

Edit...
Opens the External Tool Info 747 editor for editing the title, the hot key, the path to the executable file, the working directory and execution parameters of the tool currently selected in the **Tools** list.

Delete
Removes the selected tool from the list of SQL Manager for PostgreSQL external tools.

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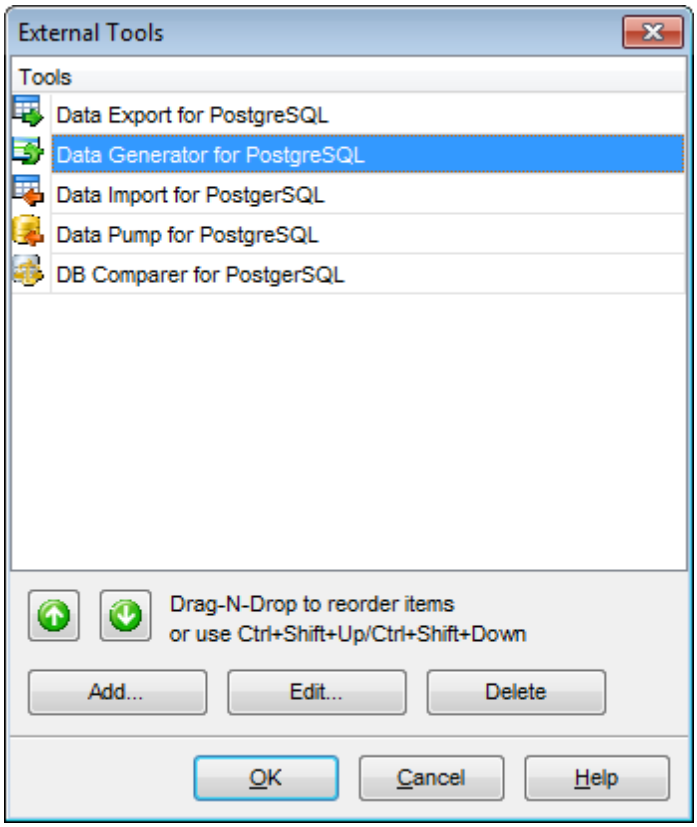

To change the order of tools in the list, use the arrow buttons at the bottom area of the dialog, or use the *Ctrl+Shift+Up / Ctrl+Shift+Down* shortcuts[1001]. You can also drag-and-drop items within the list box to change their positions.

See also:

External Tool Info editor[747]

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10.12.2 External Tool Info editor

The **External Tool Info** editor allows you to set common parameters of running added external programs from within SQL Manager environment. This dialog is used both when adding external tools and editing their parameters (see Add External Tool 743 and External Tools 745).

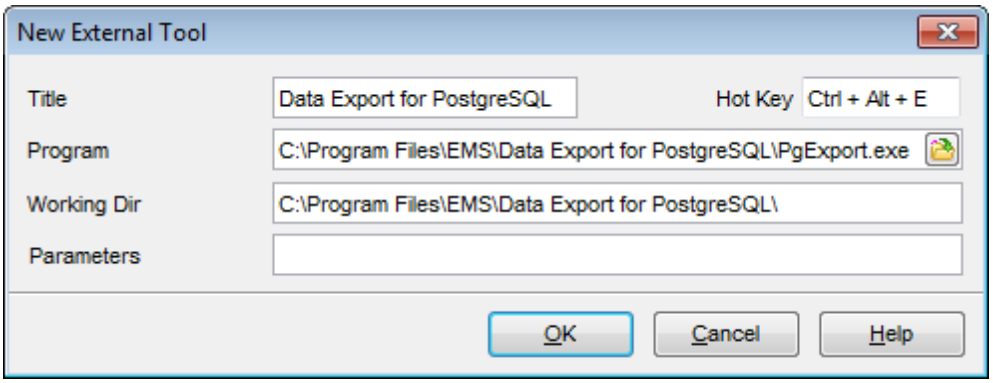
Title
Enter the title to be displayed in the **Tools | External Tools** submenu of SQL Manager.

Hot Key
Press a key or a key combination to set it as a hot key for running the tool.

Program
Use the **Explorer** button to specify the path to the **.exe* file of the external program.

Working Dir
Set the default working directory of the program.

Parameters
This box stores parameters for the program execution (if required).



See also:
External Tools dialog 745

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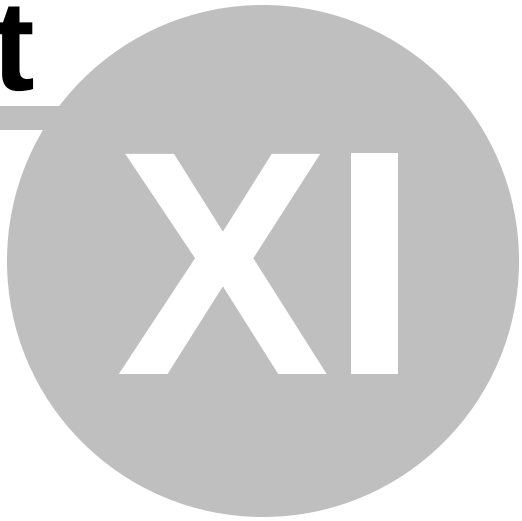
Part



11 Roles and Privileges

PostgreSQL manages database access permissions using the concept of **roles**. A **role** can be either a database user, or a group of database users.

Roles can own database objects and can assign privileges on those objects to other roles to control who has access to which objects. Furthermore, it is possible to grant membership in a role to another role, thus allowing the member role use of privileges assigned to the role it is a member of.

Note: In PostgreSQL versions before 8.1, users and groups were distinct kinds of entities, but now there are only **roles**. Any role can act as a *user*, a *group*, or both.

SQL Manager for PostgreSQL provides tools for efficient management of PostgreSQL database roles and privileges:
User Manager
Allows you to manage PostgreSQL users.
Group Manager
Allows you to manage PostgreSQL groups.
Role Editor
Allows you to create and edit PostgreSQL roles.
Grant Manager
Allows you to grant/revoke privileges on databases and database objects.

Adding Users

In order to add a new user/role:

- select the **Tools | User Manager** main menu item or use the corresponding toolbar button to open User Manager;
- select the **Add user...** item from the **context menu** or within the **Navigation bar**;
- define user/role properties and permissions using Role Editor.

Editing User Properties

In order to edit an existing user/role:

- select the **Tools | User Manager** main menu item or use the corresponding toolbar button to open User Manager;
- select the **Edit user...** item from the **context menu** or within the **Navigation bar**;
- edit the user/role properties and permissions using Role Editor.

Deleting Users

In order to delete an existing user/role:

- select the **Tools | User Manager** main menu item or use the corresponding toolbar button to open User Manager;
- right-click the user/role to delete and select the **Delete User** item from the **context menu** or within the **Navigation bar**;
- confirm deleting in the dialog window.

Adding Groups

In order to add a new group:

- select the **Tools | Group Manager** main menu item or use the corresponding toolbar button to open Group Manager;
- select the **Add group...** item from the **context menu** or within the **Navigation bar**;
- define group properties and permissions using Role Editor.

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Editing Group Properties

In order to edit an existing group:

- select the **Tools | Group Manager** main menu 961 item or use the corresponding toolbar 963 button to open Group Manager 754;
- select the **Edit group...** item from the **context menu** or within the **Navigation bar**;
- edit the group properties and permissions using Role Editor 757.

Deleting Groups

In order to delete an existing group:

- select the **Tools | Group Manager** main menu 961 item or use the corresponding toolbar 963 button to open Group Manager 754;
- right-click the group to delete and select the **Delete Group** item from the **context menu** or within the **Navigation bar**;
- confirm deleting in the dialog window.

Managing Privileges

To define grants on database objects:

- select the **Tools | Grant Manager** main menu 961 item, or use the corresponding toolbar 963 button to open Grant Manager 762;
- select the object type using the drop-down list on the toolbar 763;
- select a **user** or **group** from the **Privileges for** pane of the Navigation bar 763;
- edit user/group privileges using Grant Manager 766

or

- right-click an object in DB Explorer 65 and select the **Grants for <object_name>** item from the context menu 57;
- edit user/group privileges using Grant Manager 766.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Tools 636
Services 771
Options 870
How To... 1006

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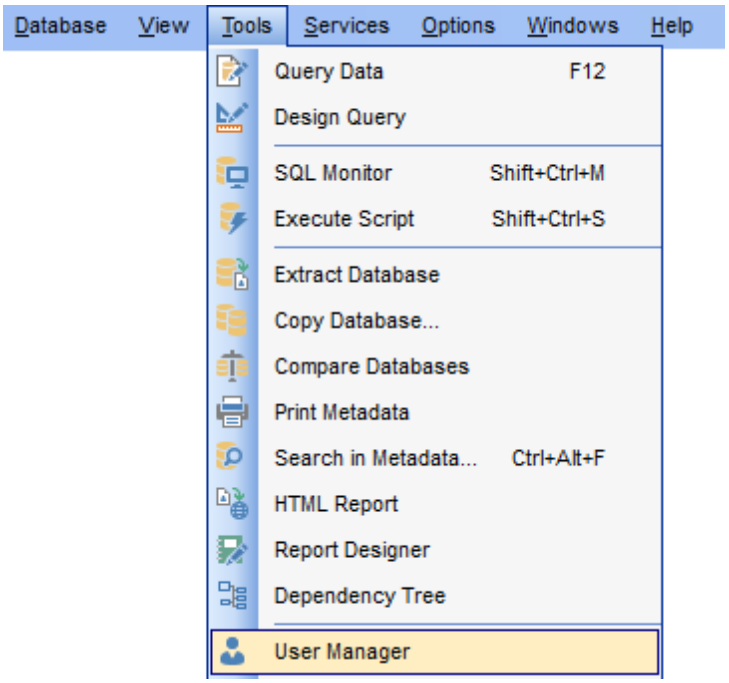
11.1 User Manager

The **User Manager** allows you to browse the list of existing PostgreSQL users and manage them efficiently.

To launch the tool, select the **Tools | User Manager** main menu 961 item, or right-click the host alias in the DB Explorer 65 tree and select the **Tasks | Manage Users** item from the context menu 52.



See also:

Group Manager 754
Role Editor 757
Grant Manager 762

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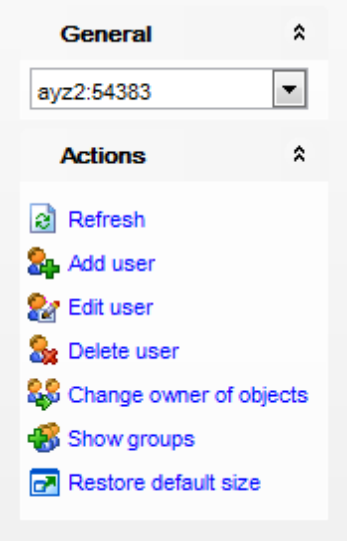
11.1.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **User Manager**.



The **Navigation bar** of the **User Manager** window allows you to:

General
select the host to retrieve the list of users

Actions
refresh the currently displayed list of users
call Role Editor 757 to add 749 a new user
call Role Editor 757 to edit 749 the selected user
delete 749 the selected user
change owner of objects (for PostgreSQL 8.2 and higher)
show/hide groups 754
restore the default size and position of the window

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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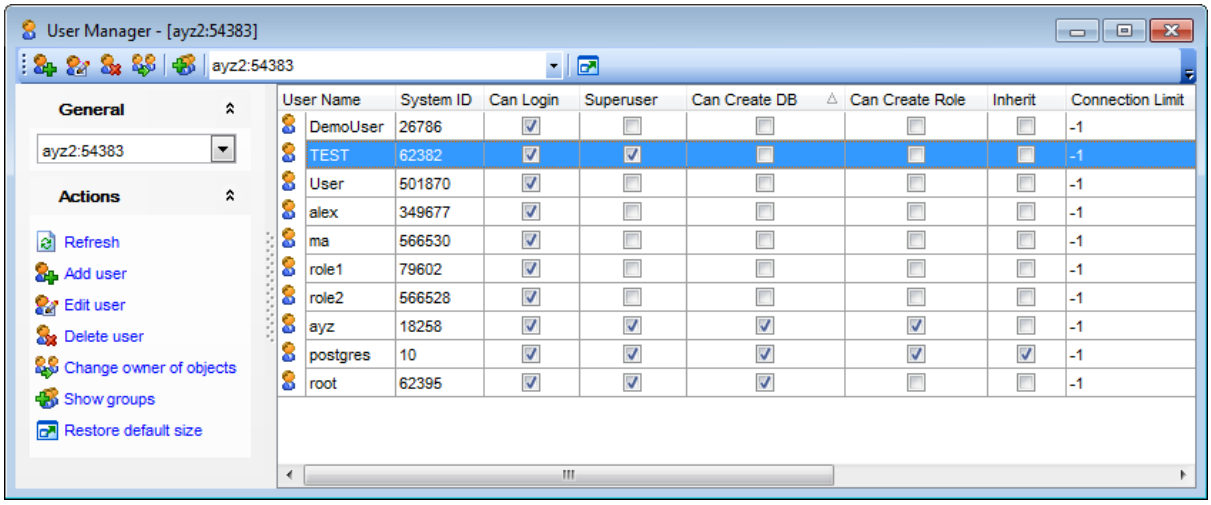
11.1.2 Managing users

If you are not connected to the database server yet, select the host from the drop-down list on the Navigation bar[752] to define connection settings[976].



The list displays the existing users as a grid with the following columns: *User Name*, *System ID*, *Can Login*, *Superuser*, *Can Create DB*, *Can Create Role*, *Inherit*, *Connection Limit*, *Valid Until*, *Modify Catalog*, *User Count*, *Group Count*.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Right-click an item within the list to call the **context menu** allowing you to *create* a new user and specify its properties using Role Editor[757], *edit*, *rename*, *delete* the selected user, *change (reassign) owner of objects* (for PostgreSQL 8.2 and higher), *show/hide* groups[754], or show/hide columns of the list.

Users management tools are also available through the Navigation bar[752] and toolbar[752] of the **User Manager**.

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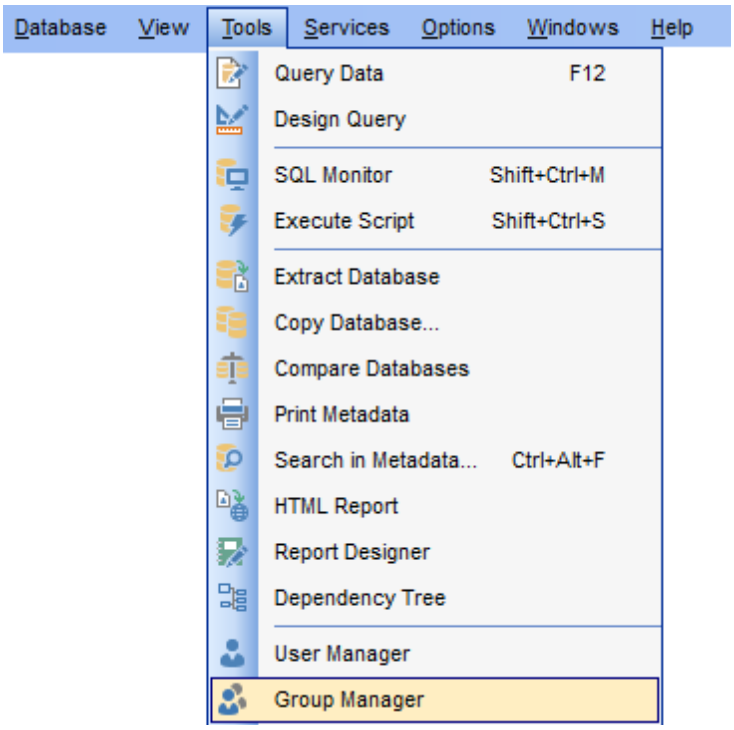
11.2 Group Manager

The **Group Manager** allows you to browse the list of existing PostgreSQL groups and manage them efficiently.

To launch the tool, select the **Tools | Group Manager** main menu 961 item, or right-click the host alias in the DB Explorer 65 tree and select the **Tasks | Manage Groups** item from the context menu 52.



See also:

User Manager 751
Role Editor 757
Grant Manager 762

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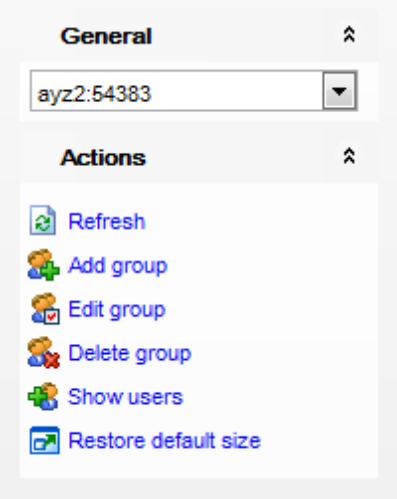
11.2.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Group Manager**.



General
select the host to retrieve the list of groups

Actions
refresh the currently displayed list of groups
call Role Editor 757 to add 749 a new group
call Role Editor 757 to edit 750 the selected group
delete 750 the selected group
change owner of objects (for PostgreSQL 8.2 and higher)
show/hide users 751
restore the default size and position of the window

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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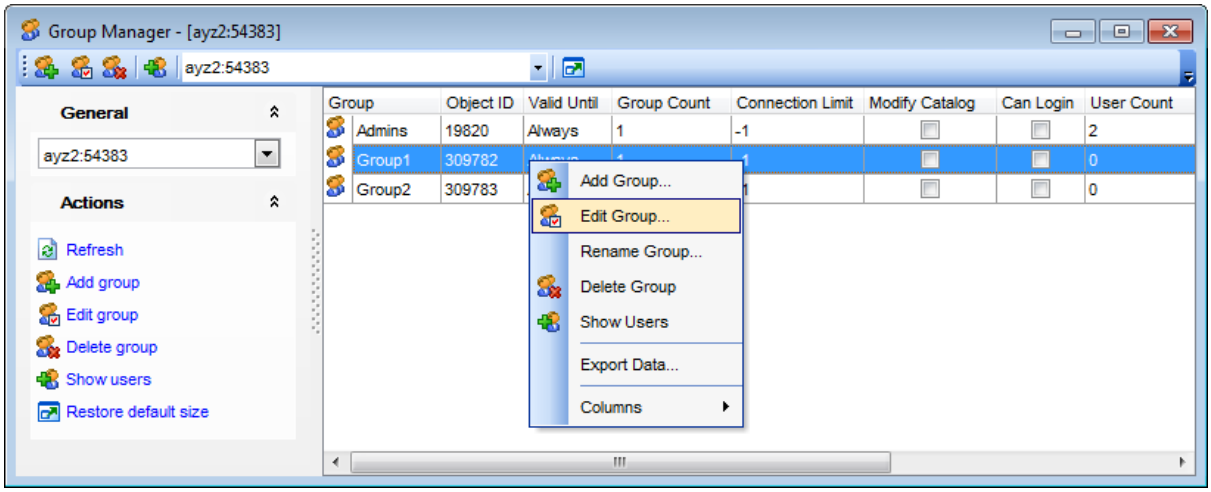
11.2.2 Managing groups

If you are not connected to the database server yet, select the host from the drop-down list on the Navigation bar[755] to define connection settings[976].



The list displays the existing groups as a grid with the following columns: *Group*, *Object ID*, *Can Login*, *Superuser*, *Can Create DB*, *Can Create Role*, *Inherit*, *Connection Limit*, *Valid Until*, *Modify Catalog*, *User Count*, *Group Count*.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Right-click an item within the list to call the **context menu** allowing you to *create* a new group and specify its properties using Role Editor[757], *edit*, *rename*, *delete* the selected group, *show/hide* users[751], or show/hide columns of the list.

Groups management tools are also available through the Navigation bar[755] and toolbar[755] of the **Group Manager**.

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11.3 Role Editor

Role Editor allows you to define user/group properties and membership. It opens automatically when you create a new user or group and is available on editing an existing one (see Create user 749, Edit user 749, Create Group 749, Edit Group 750 for details).

To open a user or group in **Role Editor**, right-click it in the User Manager 753 or Group Manager 756 and select the **Edit User.../Edit Group...** context menu item.

- Editing properties 758
- Selecting role members 760
- Defining user/group membership 761
- Viewing DDL definition 965

See also:

User Manager 751

Group Manager 754

Grant Manager 762

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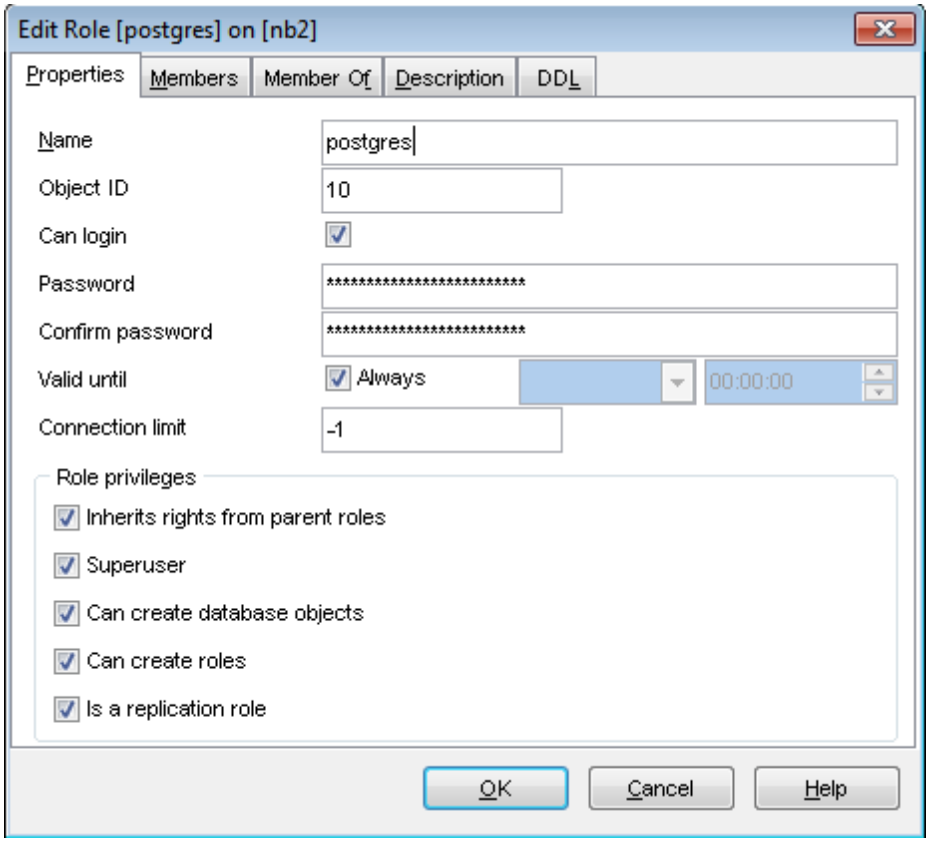
11.3.1 Editing properties

Use the **Properties** tab of **Role Editor** to specify properties of the user751/group754 being created/edited.

Name
Specifies the name by which the role is identified in the server.



Object ID
This field displays the OID of the role being created/edited. This value is read-only.

Can login
This option specifies whether the role can be used to login (user751) or not (role).

Password / **Confirm password**
Enter/confirm a password to identify the role.

Valid until
Check **Always** if you do not want to restrict the role validity term, or set the role expiration date/time (i.e. the date and time after which the role's password is no longer valid) using the corresponding controls. It is possible to set the date value **manually** by typing it in, or using the **date editor** which is activated when you click the value box.

Connection limit
Specify how many concurrent connections the role can make (the default is *-1* indicating

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that the number of connections is unlimited).

Role privileges

Inherits rights from parent roles
This option determines whether the role inherits the privileges of role(s) it is a member of 761.

Superuser
This option determines whether the role is a superuser, who can override all access restrictions within the database.

Can create database objects
This option defines the role's ability to create database objects 155.

Can create roles
This option determines whether the role will be permitted to create new roles (i.e. execute *CREATE ROLE*).

Is a replication role
This option determines whether a role is allowed to initiate streaming replication or put the system in and out of backup mode.

Can modify catalog directly
This option determines whether the role can modify system catalog directly or not.
Note: This option is only available if **Superuser** is specified for the role.

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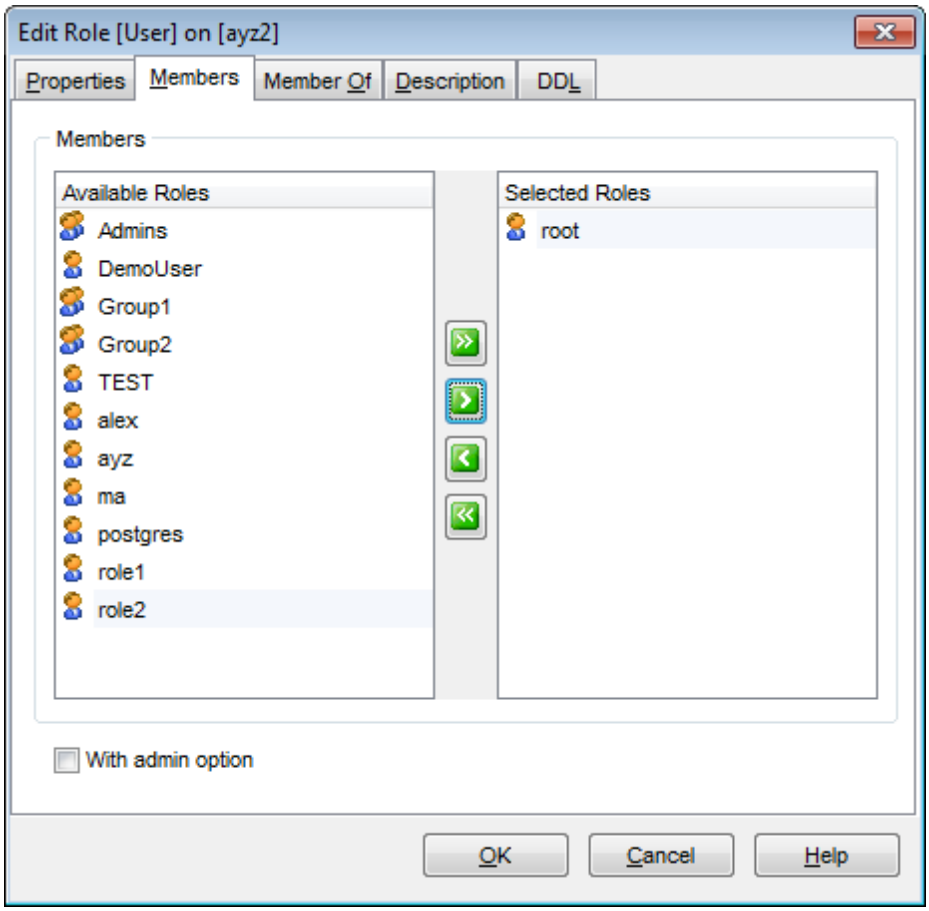
11.3.2 Selecting role members

The **Members** tab of **Role Editor** allows you to define which roles belong to the user751/ group754, i.e. the existing roles which are automatically added as members of the role being created/edited.



To select a role, you need to move it from the **Available roles** list to the **Selected roles** list. Use the buttons or drag-and-drop operations to move the roles from one list to another.

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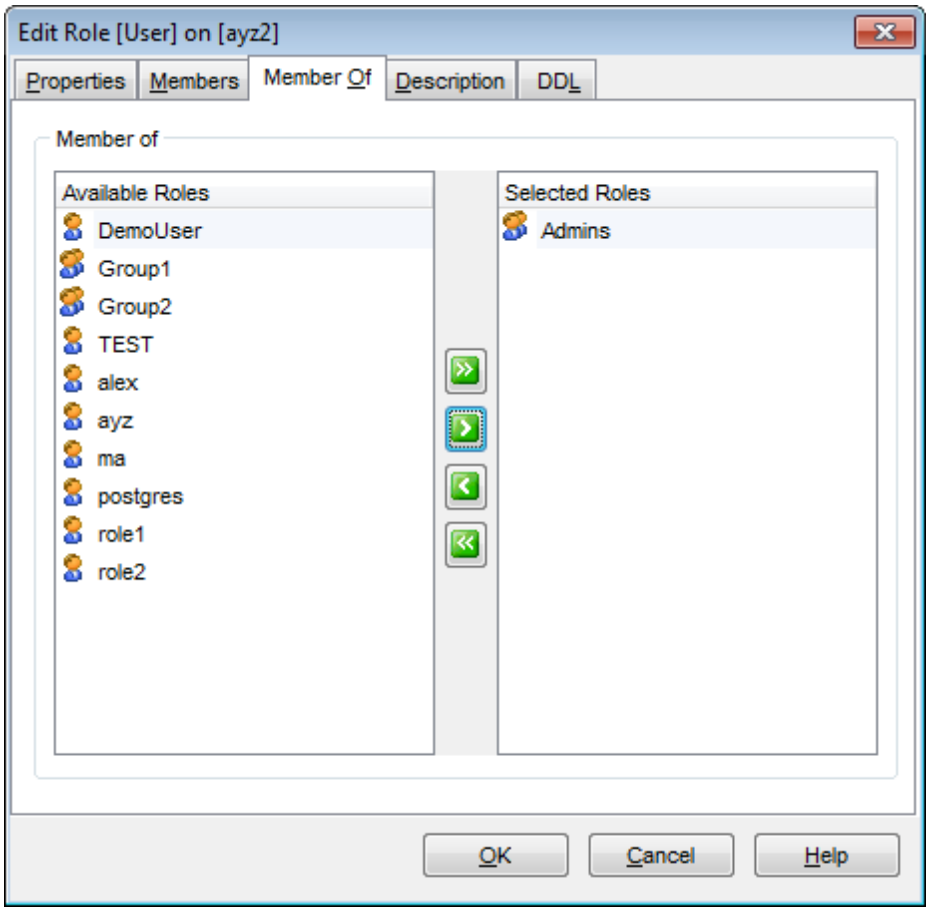
11.3.3 Defining user/group membership

The **Member of** tab of **Role Editor** allows you to define user751/group754 membership by selecting the role(s) the user/group will belong to (i.e. to which the user/group will be immediately added as a new member). The selected roles determine the tasks that can be performed through the user or group.



To select a role, you need to move it from the **Available roles** list to the **Selected roles** list. Use the buttons or drag-and-drop operations to move the roles from one list to another.

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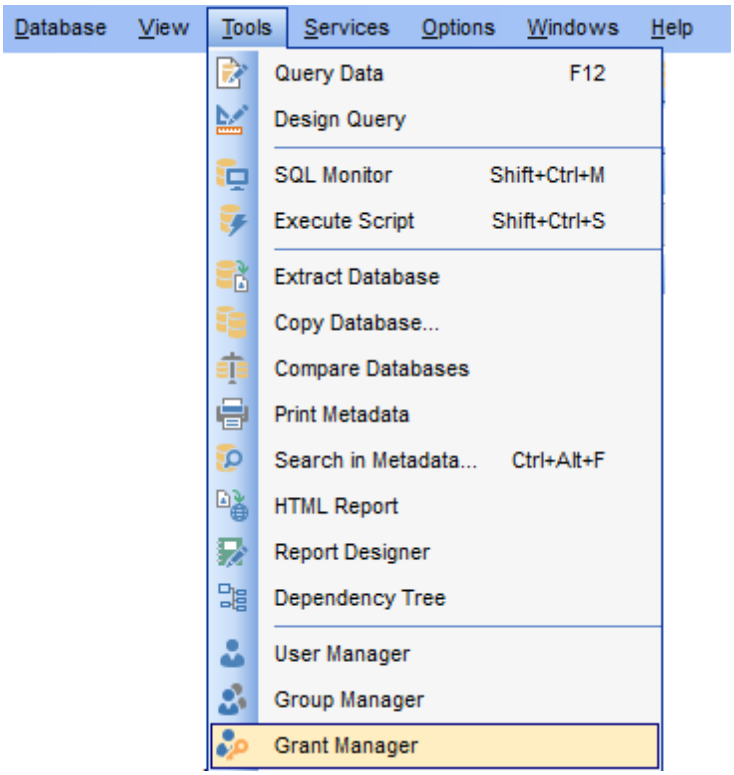
11.4 Grant Manager

Grant Manager allows you to set the user access grants on certain databases[87] and database objects[155]: schemas[164], tables[169], views[229], functions[239], sequences[274], languages[321], tablespaces[318], etc. Granting privileges on the selected database objects allows a user to perform the defined operation over the objects.

To open **Grant Manager**, select the **Tools | Grant Manager** main menu[961] item.



- Using Navigation bar, Toolbar and context menu[763]
- Managing database-specific privileges[766]
- Filtering objects in list[769]

See also:

User Manager[751]

Group Manager[754]

Role Editor[757]

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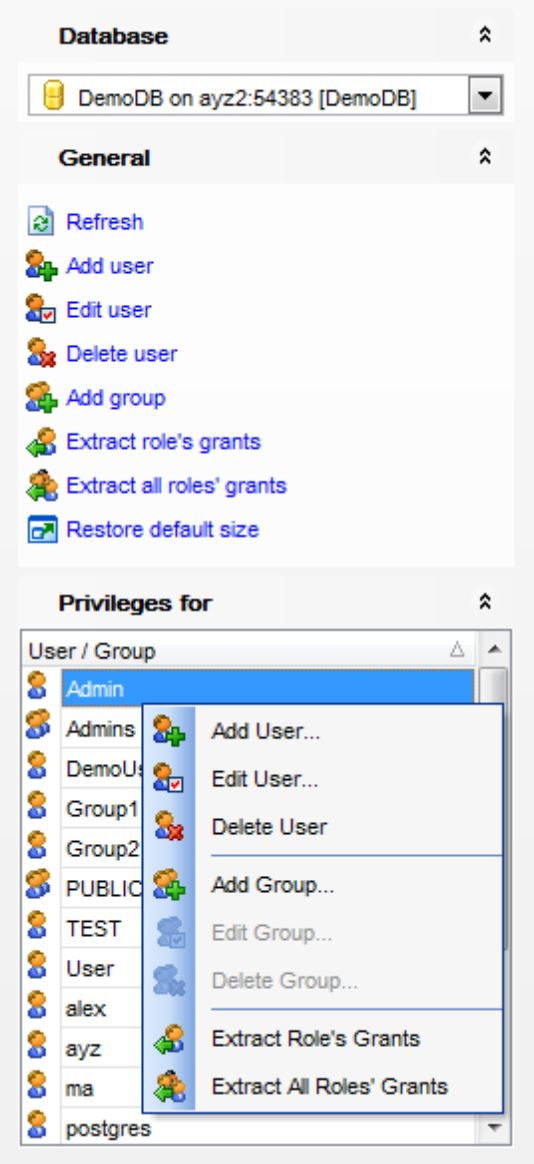
11.4.1 Using Navigation bar, Toolbar and context menu

The **Navigation bar**, **Toolbar** and **context menu** provide quick access to tools implemented in **Grant Manager**.



Database

select a database for grants management

General

refresh the content of the window

call Role Editor[757] to add[749] a new user

call Role Editor[757] to edit[749] an existing user

delete[749] a database user

call Role Editor[757] to add[749] a new group

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call Role Editor 757 to edit 750 a new group
delete 750 a group
extract selected role's grants
extract all roles' grants
/ show/hide groups in the list
restore the default size and position of the window

Privileges for

select an existing database user 751/group 754 to grant privileges to

Right-click an item within the **Privileges for** list to call the **context menu** allowing you to:

- call Role Editor 757 to add 749 a new user;
- call Role Editor 757 to edit 749 the selected user;
- delete 749 the selected user;
- call Role Editor 757 to add 749 a new group;
- call Role Editor 757 to edit 750 the selected group;
- delete 750 the selected group.

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

The **context menu** is aimed at facilitating your work: you can perform a variety of operations using context menu items.

The **context menu** of **Grant Manager** allows you to:

- grant a permission on an object to the selected role;
- grant a permission (with Grant Option) on an object to the selected role;
- revoke a previously granted permission;
- grant all permissions on an object to the selected role;
- grant all permissions (with Grant Option) on an object to the selected role;
- revoke all previously granted permissions on an object;
- grant a permission on all objects to the selected role;
- grant a permission (with Grant Option) on all objects to the selected role;
- revoke a previously granted permission on all objects;
- apply sorting of objects in grid (by type, name, schema);
- apply sorting of objects in grid (by name, schema);
- apply sorting of objects in grid (by type, schema, name);
- apply sorting of objects in grid (by schema, name).

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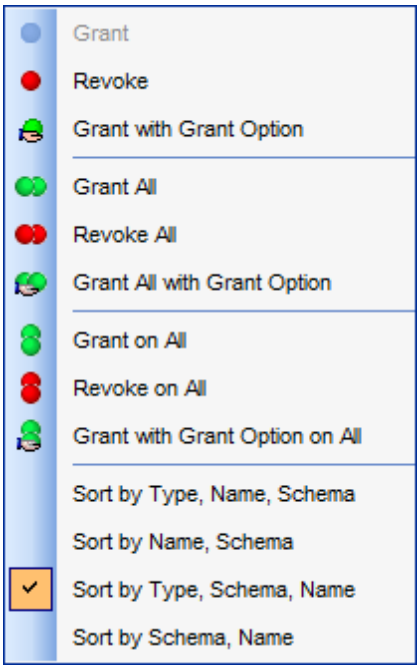

See also:

Managing database-specific privileges 766
Filtering objects in list 769

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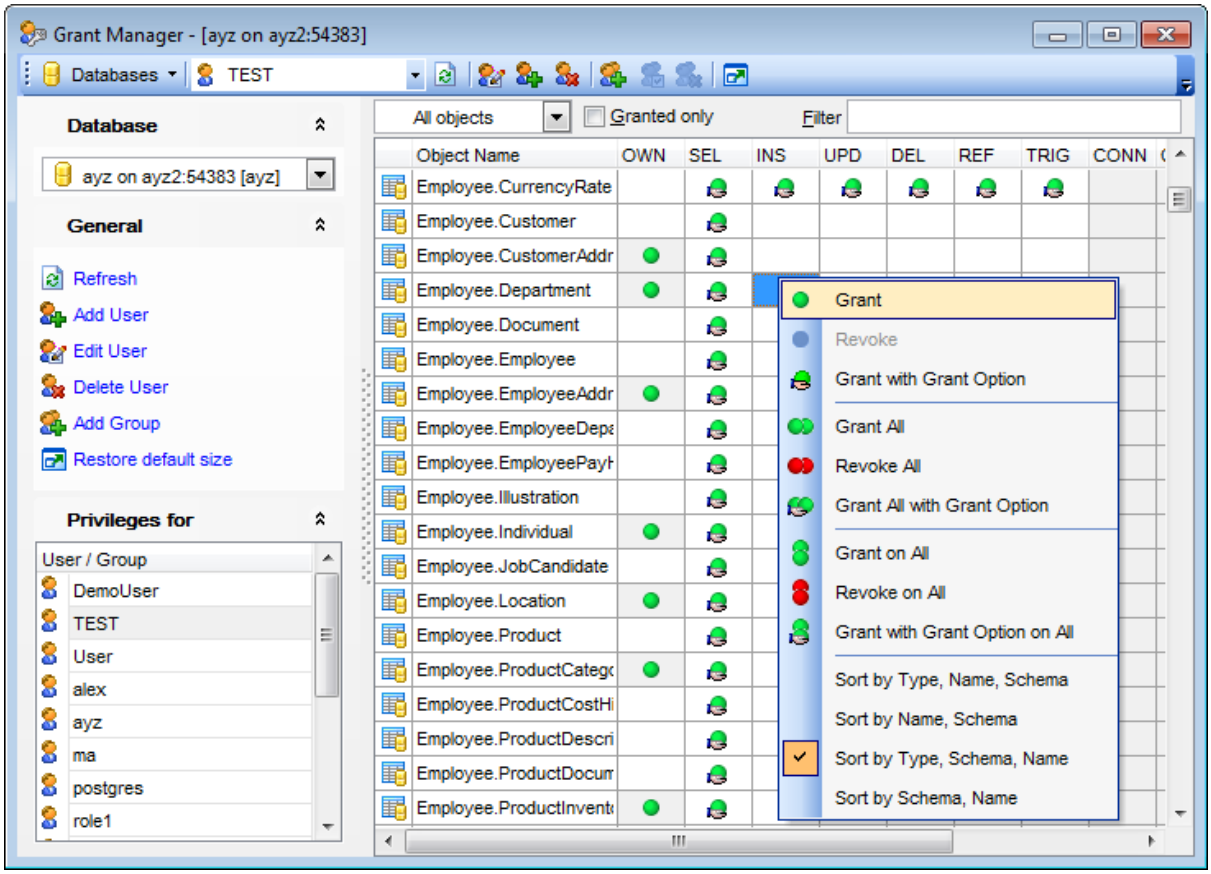
11.4.2 Managing database-specific privileges

This window allows you to define privileges on database objects and grant privileges to a user[751] or group[754].

To edit the privileges of a user[751]/group[754] on an object of a database, select the database using the **Database** pane of the Navigation bar[763], then select a *user* or *group* from the **Privileges for** list available within the Navigation bar[763] or toolbar[763]. Then select the type of objects[769] to be displayed in the main working window using the drop-down list at the top.

The **Object Name** column contains the list of objects of the selected type; each subsequent column corresponds to the permission which can be granted on the selected object:
OWN, *SEL*, *INS*, *UPD*, *DEL*, *RULE*, *REF*, *TRIG* (for tables[169], views[229]);
SEL, *UPD*, *USG* (for sequences[274]);
OWN, *EXEC* (for functions[239]);
OWN, *CRT*, *USG* (for schemas[164]);
USG (for languages[321]);
OWN, *CRT* (for tablespaces[318]);
OWN, *CONN*, *CRT*, *TMP*, *TRUN* (starting from server version 8.4) (for databases[87]).



The list of objects can be configured in several ways: you can specify that only granted objects[769] are displayed in the grid, or define an object name to filter[769] the objects by that name.

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Right-click a cell to grant a specific permission on a certain object. To grant a permission on an object, you should find the object in the **Object Name** list and the column with the corresponding permission. Note that the cells that are highlighted gray do not admit to setting grants for an obvious reason (e.g. you cannot execute a table). The context menu[764] of a cell contains possible permissions that can be granted:

- *Grant*
- *Grant with Grant Option*
- *Revoke* (removes a previously granted permission)
- *Grant All*
- *Grant All with Grant Option*
- *Revoke All*
- *Grant on All*
- *Grant on All with Grant Option*
- *Revoke on All*

Note: When the *Grant on all / Grant on All with Grant Option / Revoke on All* items are used, the *OWN* privilege can be granted/revoked on all objects except *databases*. *OWN* privileges on databases should be assigned separately.

Hint: You can also assign privileges by double-clicking the respective cell - in this case the grant status is changed in the following order: *Grant -> Grant with Grant Option -> Revoke*.

The **Column permissions of role** *<role_name>* **on table/view** *<table_name>* area displays the grid with table/view columns and the privileges that can be granted to the selected role[757].

Use items of the context menu[764] to grant/deny/revoke permissions on columns.

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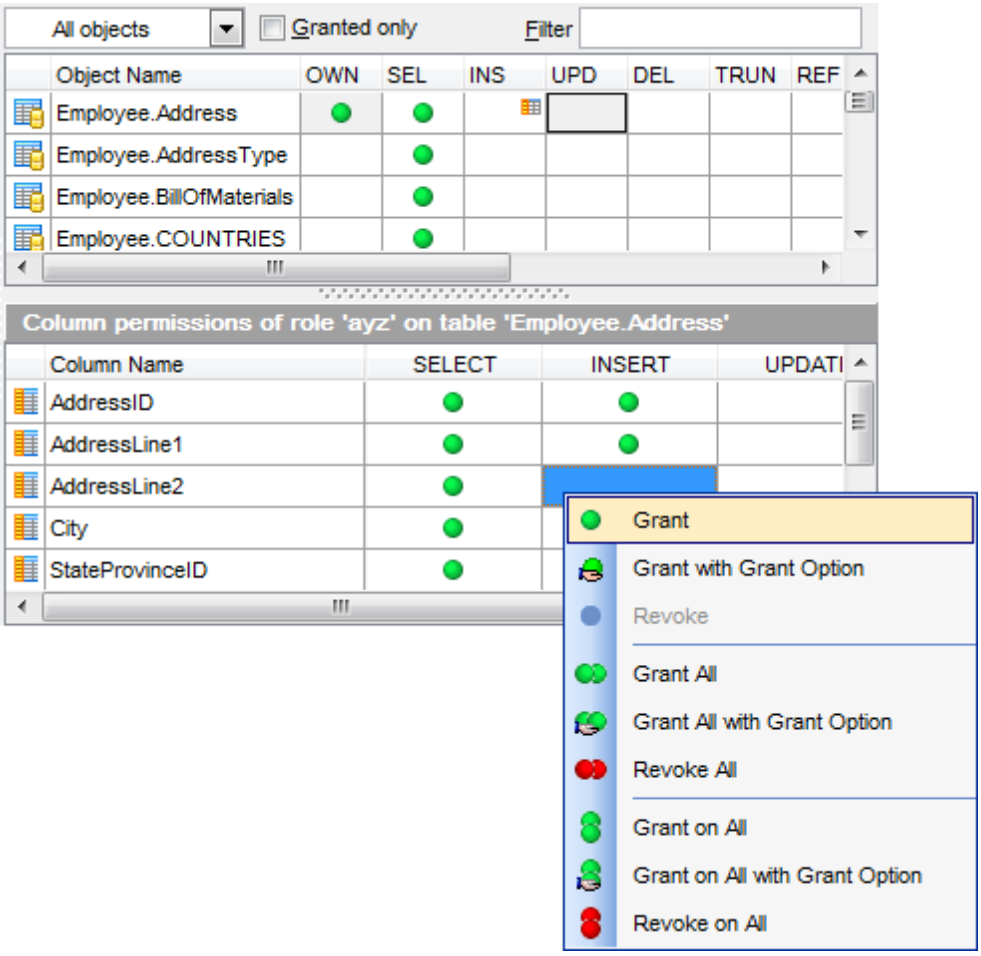

If permissions on a column have been defined (for a *table* or *view*), the corresponding permission cell of the table/view contains a specific icon .

See also:

Using Navigation bar, Toolbar and context menu 763
Filtering objects in list 769

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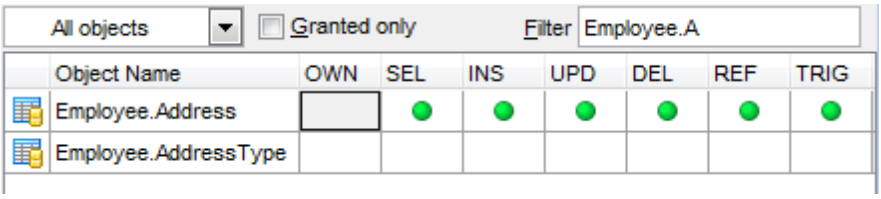
11.4.3 Filtering objects in list

In large databases with huge amount of objects it may be difficult to find the required object. For this purpose you are provided with several tools for *filtering objects in list*:

- the **Object type** control: select the required object type from the drop-down list (e. g. *Tables*);
- the **Filter** panel: enter a character string to filter the object names by that string (note that the filter is case-sensitive);
- the **Granted only** option: check this option to display objects with at least one granted operation.



See also:

Using Navigation bar, Toolbar and context menu 763
Managing database-specific privileges 766

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Part

12 Services

SQL Manager for PostgreSQL provides graphical interface for a number of database maintenance operations. The following *services* are available in SQL Manager:

Analyze Tables 773
Collects statistics about the contents of tables in the database.

Vacuum Tables 777
Reclaims storage occupied by deleted tuples.

Reindex 782
Allows you to rebuild corrupted indexes.

Download Files 788
Allows you to save and load files directly to/from the server machine.

Database Statistics 794
A tool for browsing and reporting information about database activity.

Backup Database Wizard 808
A tool for creating database backups.

Restore Database Wizard 821
A tool for restoring databases from previously created backups.

Compare Databases Wizard 674
Creates an SQL Script providing databases synchronization.

Instance Manager 837
A tool for checking PostgreSQL service status.

Server status 839
Provides a convenient Server Status viewer.

Server logs 848
Provides a convenient Server Log SQL Parser.

Server Configuration 852
Provides a convenient Server Configuration manager.

Extensions 864
A tool for managing extensions which are packages that contain multiple SQL objects.

Using templates 982
Facilitates using SQL Manager wizards.

To obtain detailed information concerning specific PostgreSQL database maintenance services, refer to the official PostgreSQL server documentation.

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See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Options 870
How To... 1006

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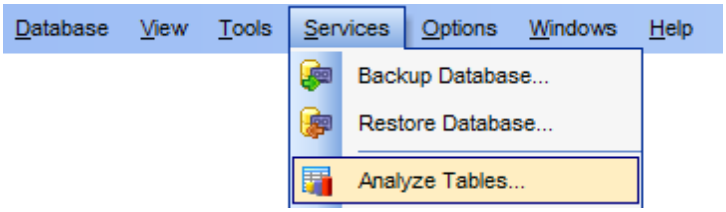
12.1 Analyze Tables

Analyze Tables Wizard collects statistics about the contents of tables in the database, and stores the results in the system table *pg_statistic* (with PostgreSQL routines used). Subsequently, the query planner uses these statistics to help determine the most efficient execution plans for queries.

Note that **Analyze Tables** service is only available for the versions of PostgreSQL server 7.2 and higher.

To run the wizard, select the **Services | Analyze Tables...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Analyze Tables...** item from the context menu 54.



- Selecting database 774
- Selecting tables for analysis 775
- Analyzing tables 776

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Vacuum Tables 777

Reindex 782

Database Statistics 794

Tables 169

Using templates 982

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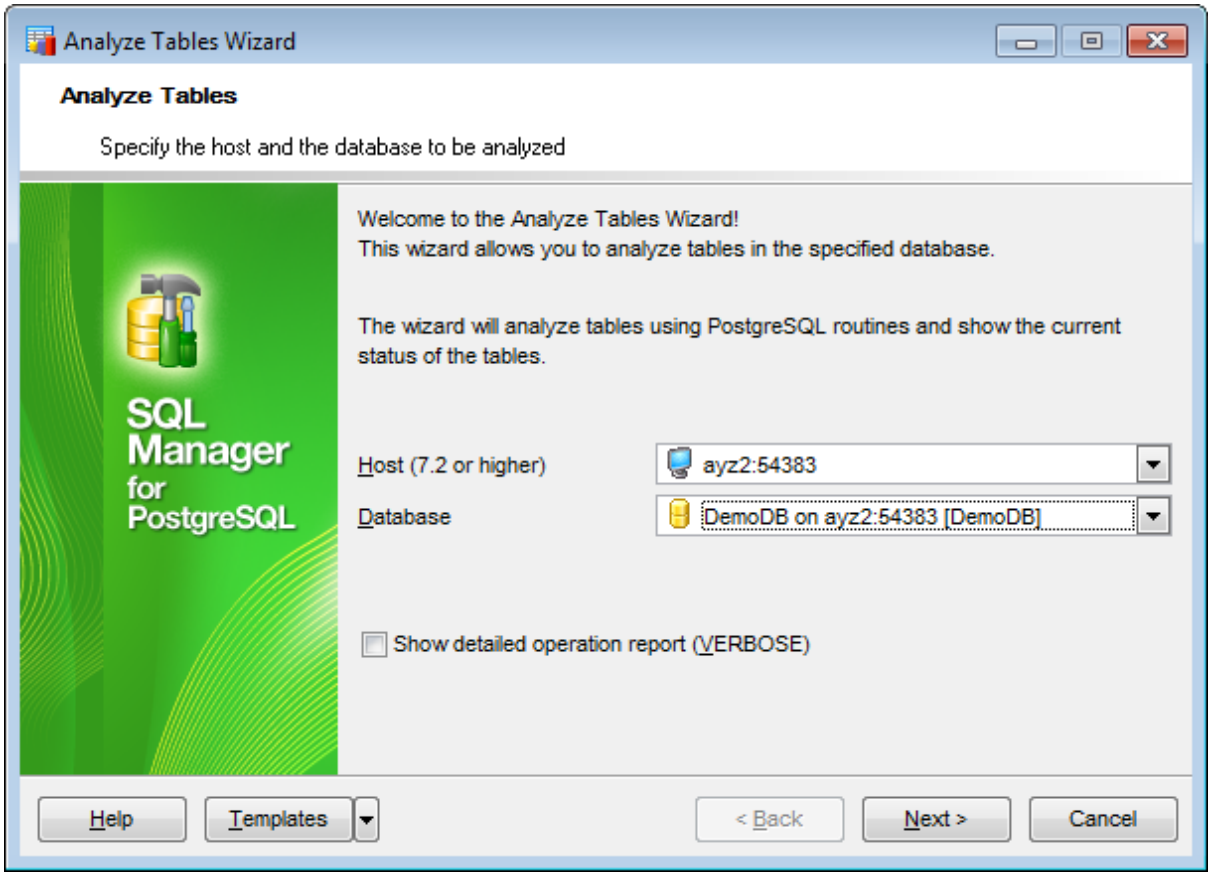
12.1.1 Selecting database

This step of the wizard allows you to specify the **host** and the **database** where tables for analysis are stored.



Host (7.2 or higher)
Use the drop-down list of registered hosts to select the host where the database resides.

Database
Use the drop-down list of registered databases to select the database where tables for analysis are stored.

☑ **Show detailed operation report**
Check this option to receive a detailed activity report for each analyzed table (*VERBOSE*).

Click the **Next** button to proceed to the Selecting tables to be analyzed 775 step of the wizard.

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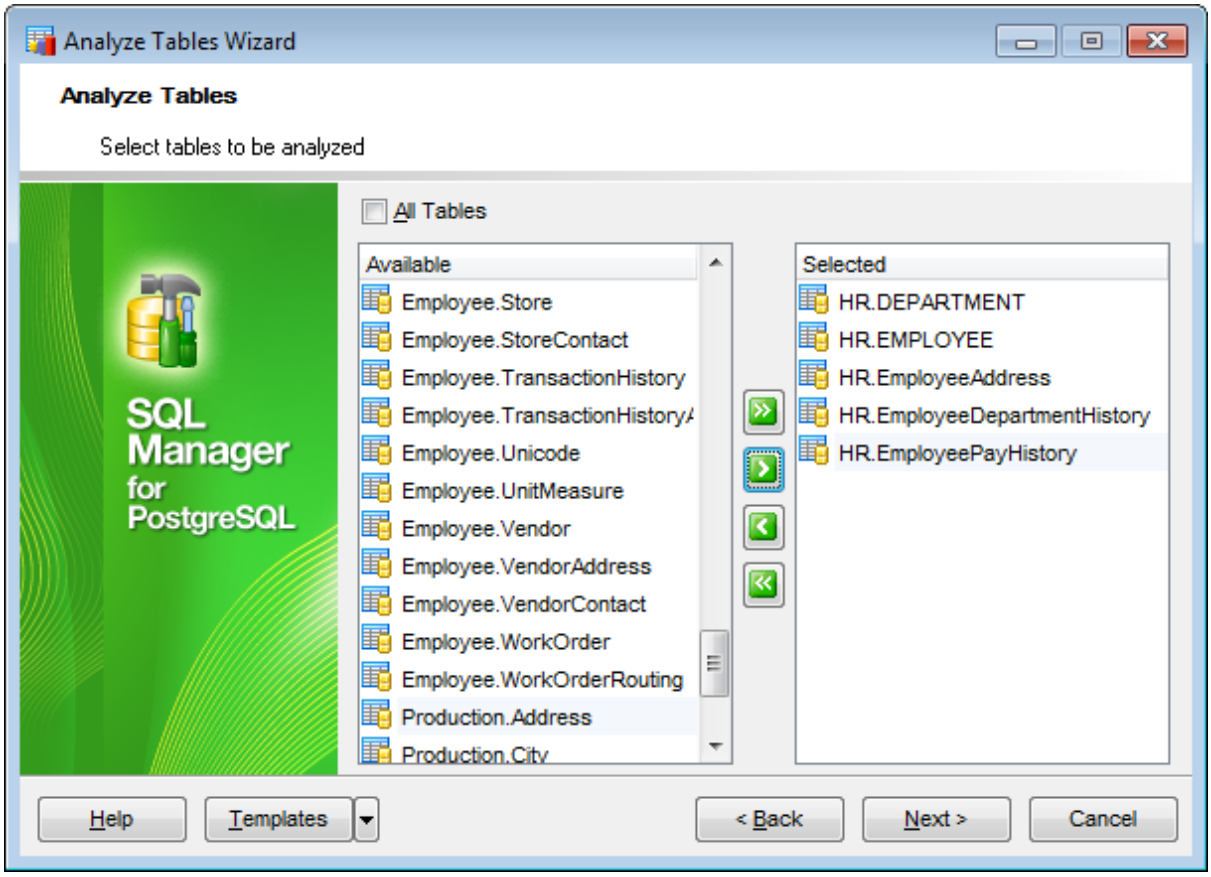
12.1.2 Selecting tables to be analyzed

Use this step of the wizard to **select the tables** to be analyzed using PostgreSQL routines.

To select a table, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.

You can also enable the **All Tables** option to select all available tables automatically.



When you are done, click the **Next** button to proceed to the Analyzing tables 776 step of the wizard.

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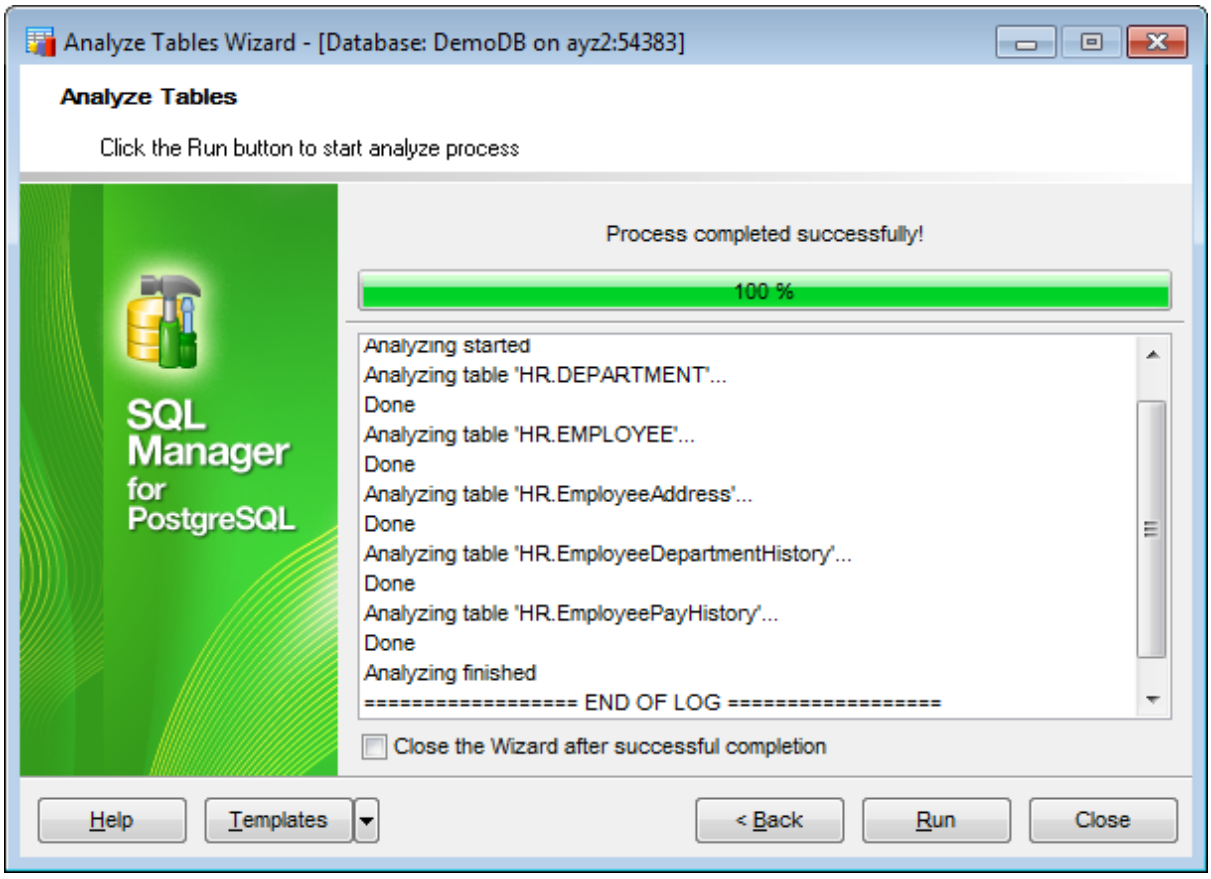
12.1.3 Analyzing tables

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the analyze tables process.

The **Operations** tab allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to complete the operation.

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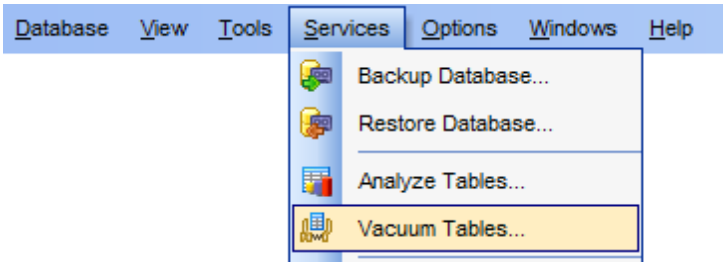
12.2 Vacuum Tables

Vacuum Tables Wizard reclaims storage occupied by deleted tuples (with PostgreSQL routines used).

In normal PostgreSQL operation, tuples that are deleted or obsolete due to an update are not physically removed from their table; they remain present until a *VACUUM* is done. Therefore it is necessary perform this operation periodically, especially on frequently updated tables.

To run the wizard, select the **Services | Vacuum Tables...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Vacuum Tables...** item from the context menu 54.



- Selecting database 778
- Setting vacuum parameters 779
- Selecting tables 780
- Vacuuming tables 781

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Analyze Tables 773

Reindex 782

Tables 169

Using templates 982

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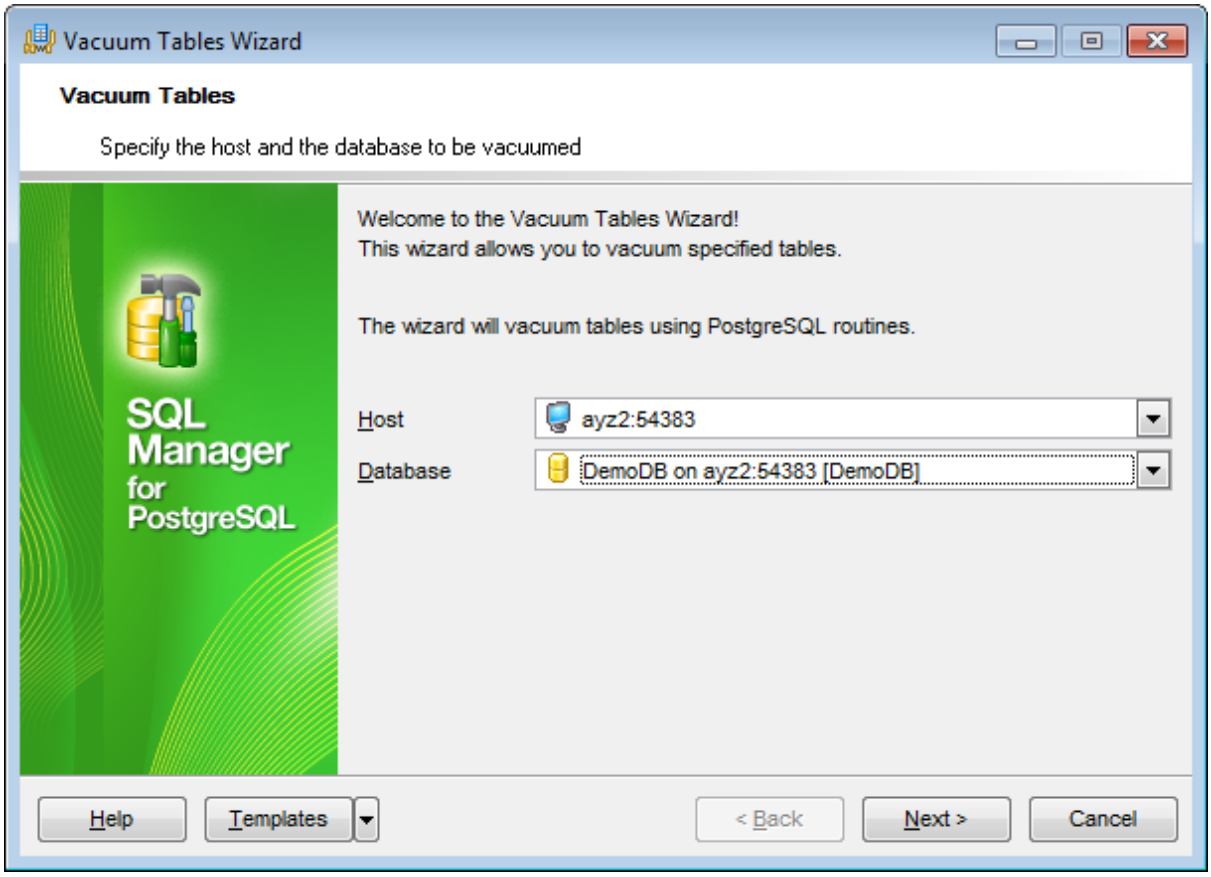
12.2.1 Selecting database

This step of the wizard allows you to specify the **host** and the **database** where tables for vacuuming are stored.



Host
Use the drop-down list of registered hosts to select the host where the database resides.

Database
Use the drop-down list of registered databases to select the database where tables for vacuuming are stored.

Click the **Next** button to proceed to the Setting vacuum parameters 779 step of the wizard.

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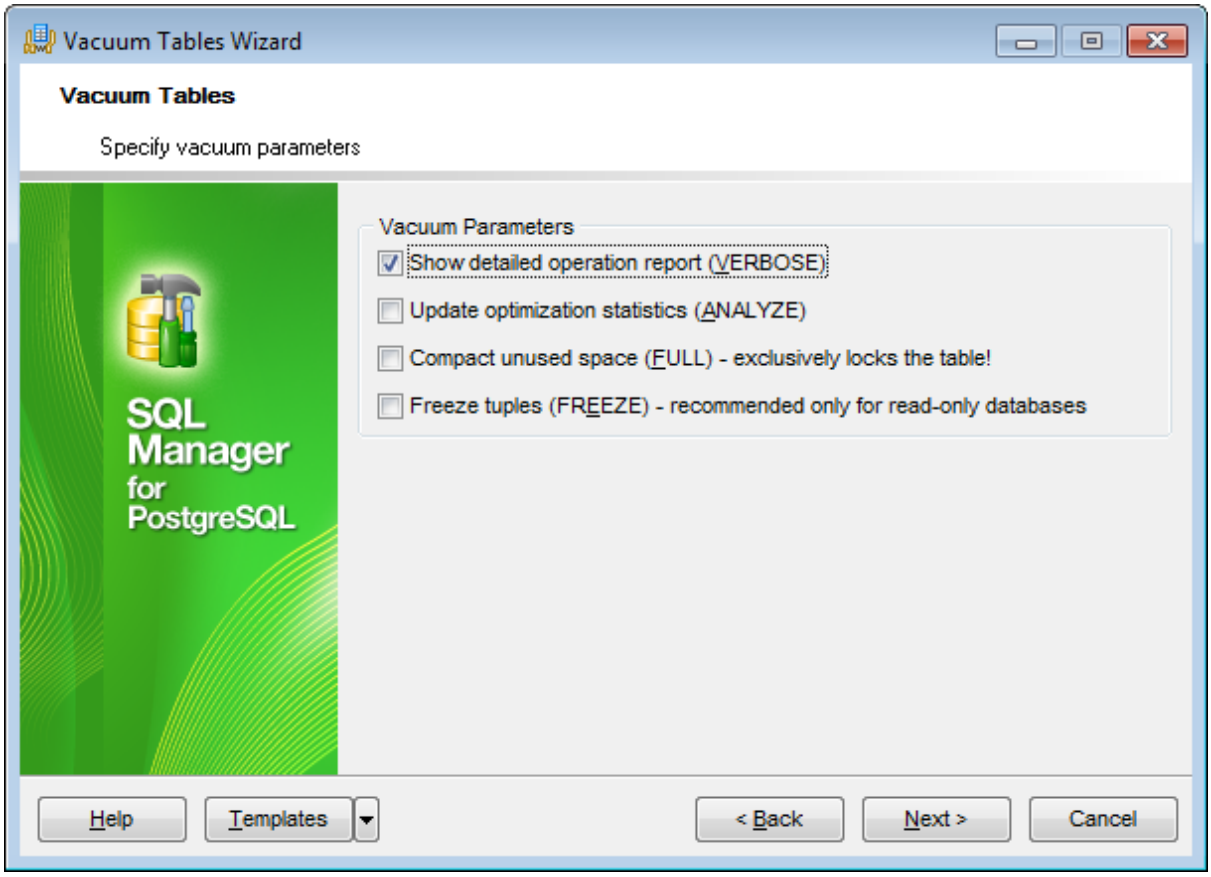
12.2.2 Setting vacuum parameters

This step of the wizard allows you to specify basic **vacuum parameters** to be applied to the VACUUM operation.



Show detailed operation report
Check this option to receive a detailed vacuum activity report for each table (*VERBOSE*).

Update optimization statistics
This option updates statistics used by the optimizer to determine the most efficient way to execute a query (*ANALYZE*).

Compact unused space
This option specifies "full" vacuum which may reclaim more space, but takes much longer and exclusively locks the table (*FULL*).

Freeze tuples
This option enforces "freezing" of tuples (*FREEZE*). This option is recommended for read-only databases.

Click the **Next** button to proceed to the Selecting tables 780 step of the wizard.

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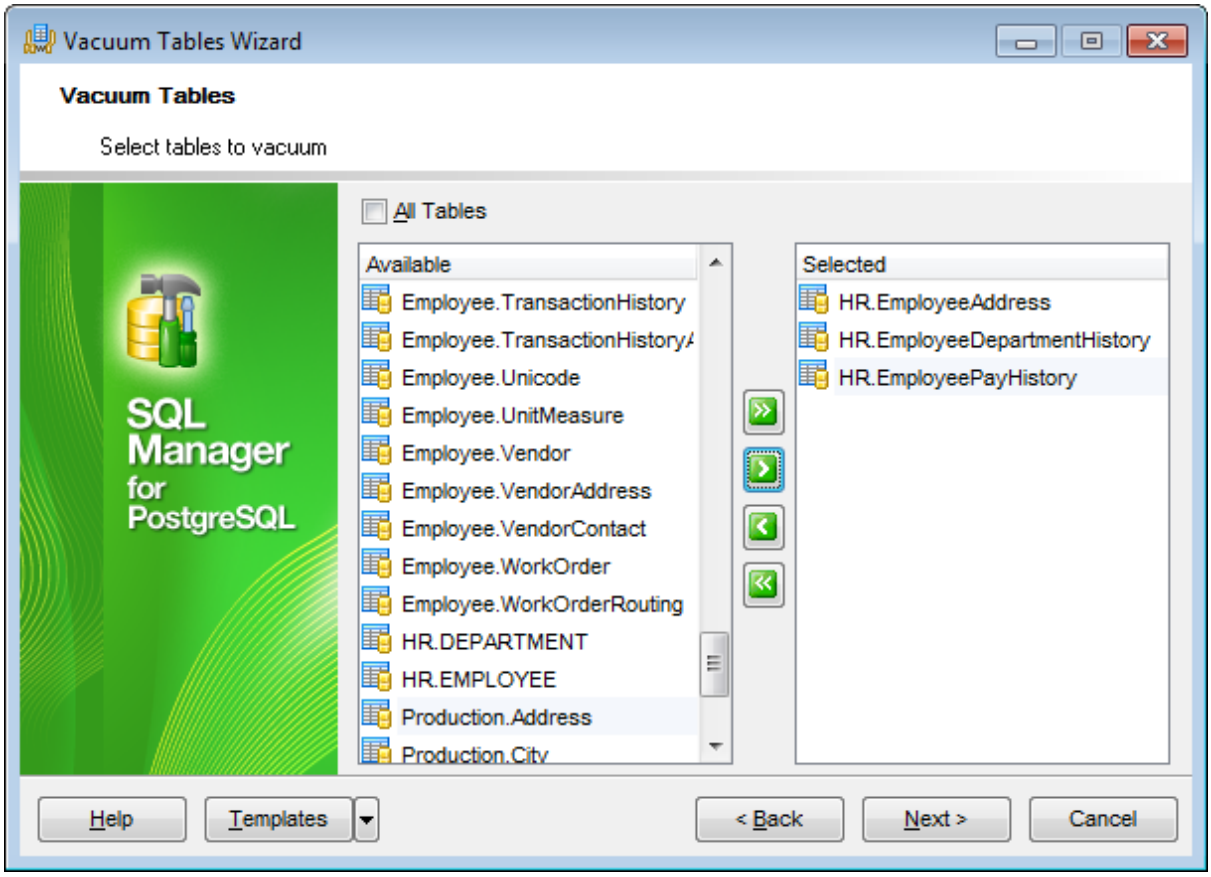
12.2.3 Selecting tables

Use this step of the wizard to **select the tables** to be vacuumed using PostgreSQL routines.

To select a table, you need to move it from the **Available** list to the **Selected** list. Use the buttons or drag-and-drop operations to move the tables from one list to another.

You can also enable the **All Tables** option to select all available tables automatically.



If necessary, you can save a template[982] for future use.

When you are done, click the **Next** button to proceed to the Vacuuming tables[781] step of the wizard.

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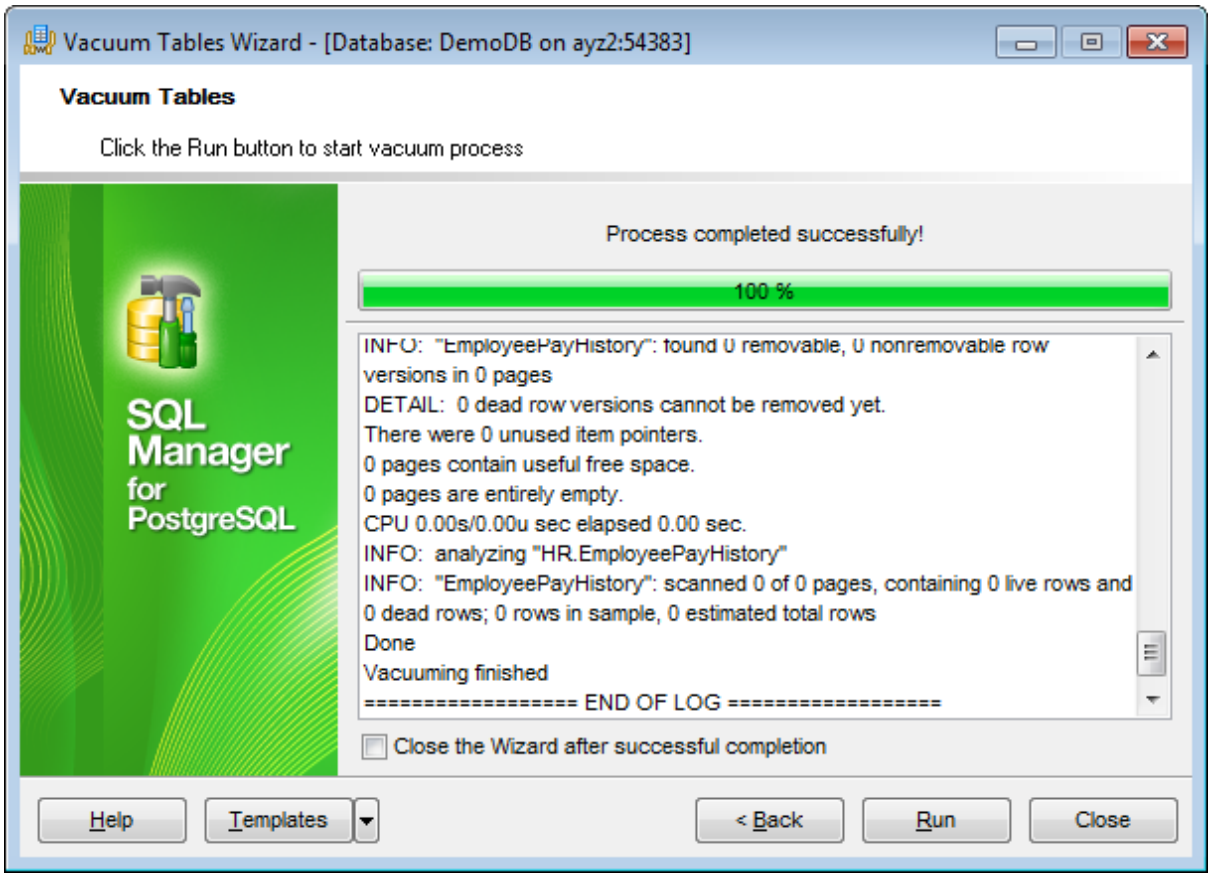
12.2.4 Vacuuming tables

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the vacuum tables process.

The **Operations** tab allows you to view the log of operations and errors (if any).



☑ **Close the Wizard after successful completion**
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to complete the operation.

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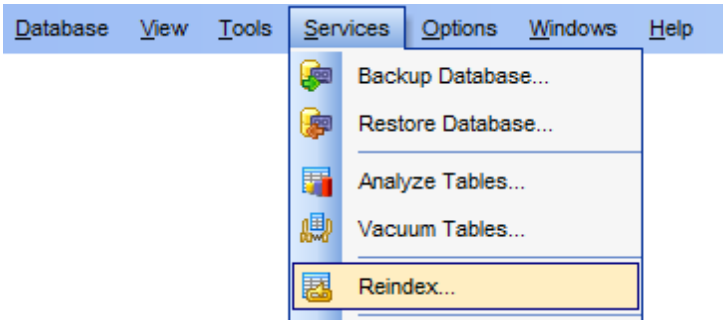
12.3 Reindex

Reindex wizard allows you to rebuild corrupted indexes (with PostgreSQL routines used).

In some cases it is worthwhile rebuilding indexes periodically. Also, the contrib/reindexdb routine which can reindex an entire database. However, PostgreSQL has substantially reduced the need for this activity as compared to earlier releases.

To run the wizard, select the **Services |** **Reindex...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks |** **Reindex ...** item from the context menu 54.



- Selecting database 783
- Setting reindex options 784
- Selecting objects to reindex 786
- Reindexing objects 787

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:
Analyze Tables 773
Using templates 982
Tables 169
Indexes 219

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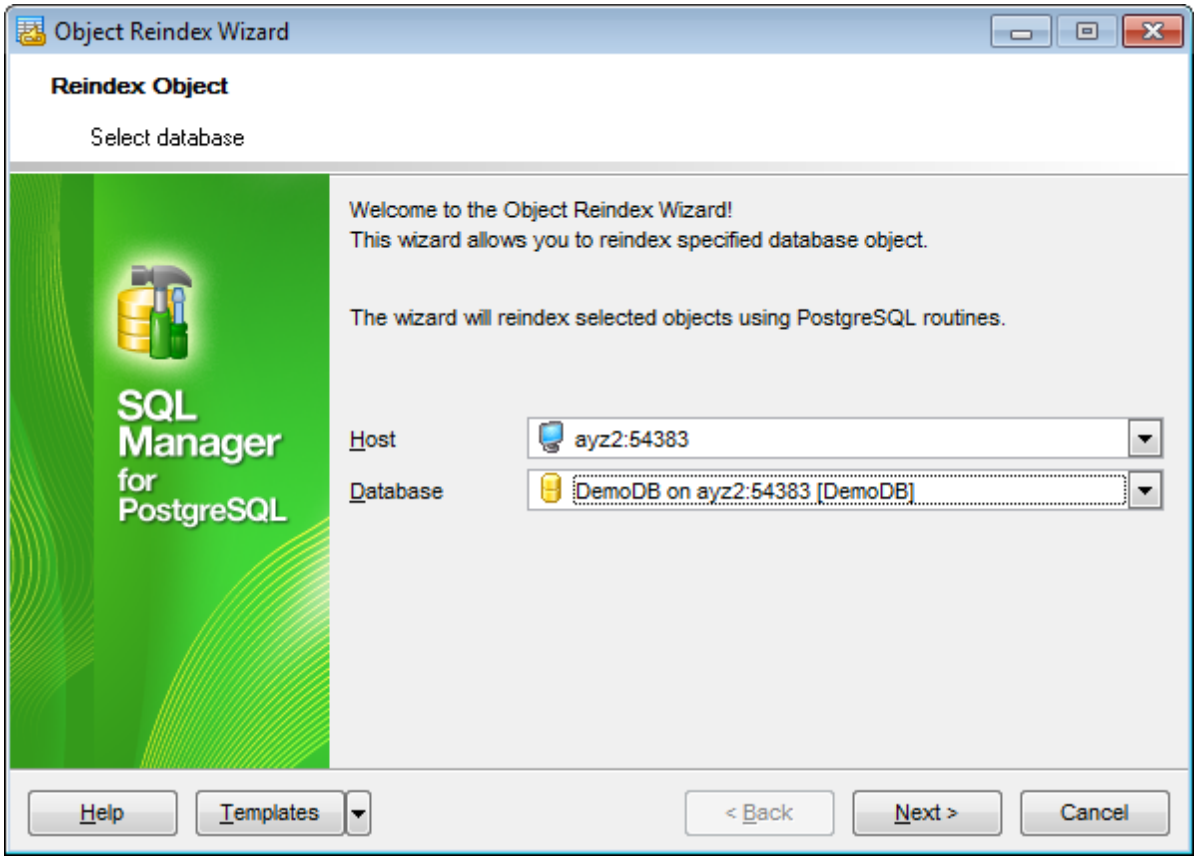
12.3.1 Selecting database

This step of the wizard allows you to specify the **host** and the **database** where objects for reindex are stored.



Host
Use the drop-down list of registered hosts to select the host where the database resides.

Database
Use the drop-down list of registered databases to select the database where objects for reindex are stored.

Click the **Next** button to proceed to the Setting reindex options 784 step of the wizard.

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12.3.2 Setting reindex options

This step of the wizard allows you to set up basic **options** pertaining to the reindex operation.

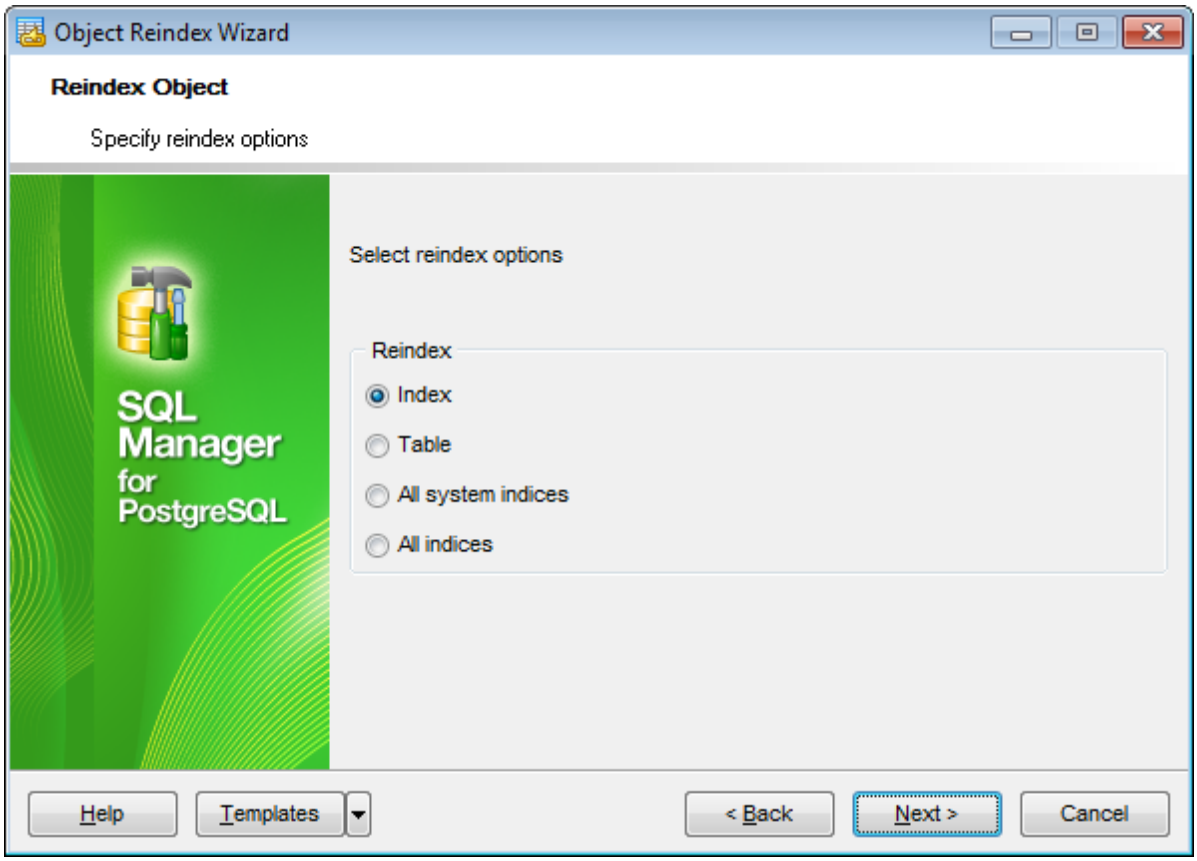
Select the reindex target:

Index
Specifies Index as the reindex target object. If selected, you will have to specify the index table using the **Table** box, and select index(-es) in the appropriate boxes at the next step[786] of the wizard.

Table
Specifies Table as the reindex target object. If selected, you will have to select the table (s) at the next step[786] of the wizard.

All system indices
Specifies that all system indexes of the selected database should be reindexed. If selected, you will be immediately forwarded to the Reindexing objects[787] step upon pressing the **Next** button.

All indices
Specifies that all indexes of the selected database should be reindexed. If selected, you will be immediately forwarded to the Reindexing objects[787] step upon pressing the **Next** button.



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Click the **Next** button to proceed to the Selecting objects to reindex 786 step, or to the Reindexing objects 787 step of the wizard if you have specified to reindex *All system indices* or *All indices*.

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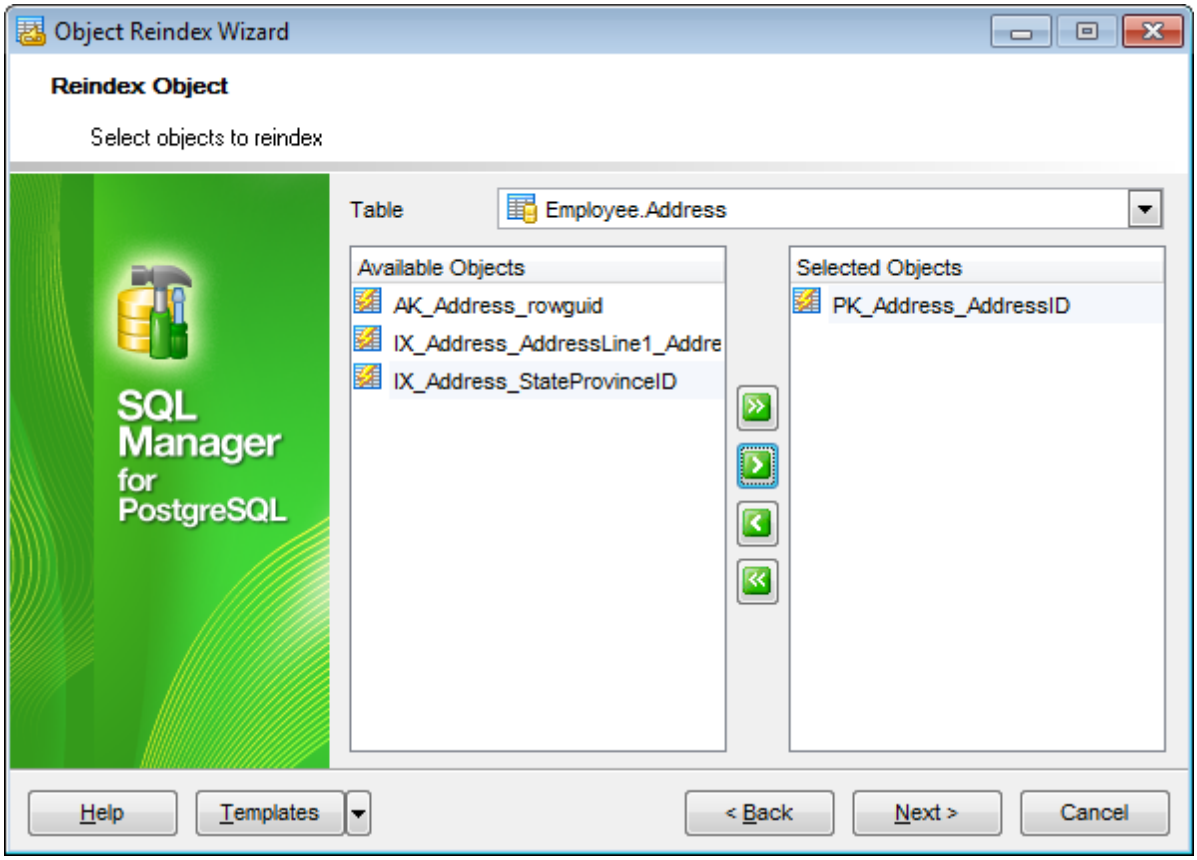
12.3.3 Selecting objects to reindex

Use this step of the wizard to **select the objects** to be reindexed using PostgreSQL routines.

Note that this step is only available if *Index* or *Table* was specified when setting reindex options 784.

To select an object, you need to move it from the **Available Objects** list to the **Selected Objects** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.



When you are done, click the **Next** button to proceed to the Reindexing objects 787 step of the wizard.

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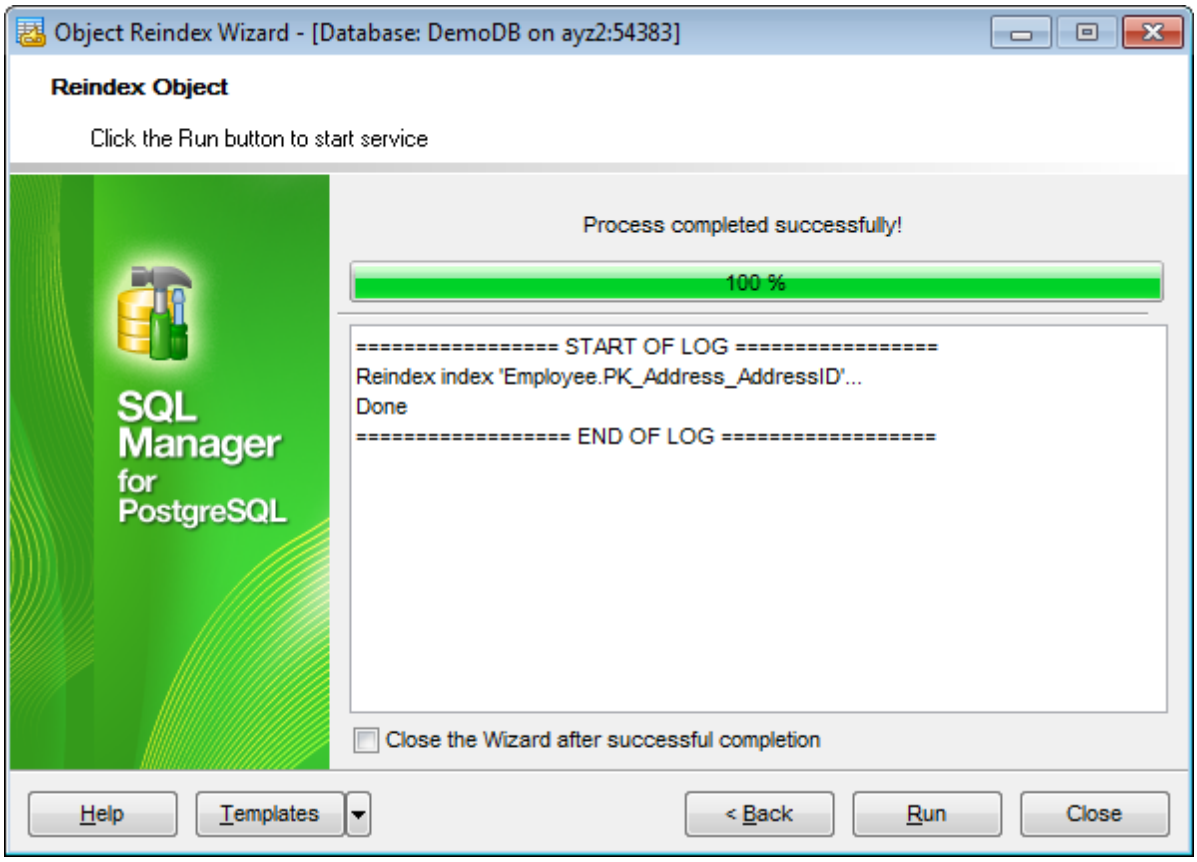
12.3.4 Reindexing objects

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the reindex process.

The **Operations** tab allows you to view the log of operations and errors (if any).



Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template[982] for future use.

Click the **Run** button to run the reindex object service.

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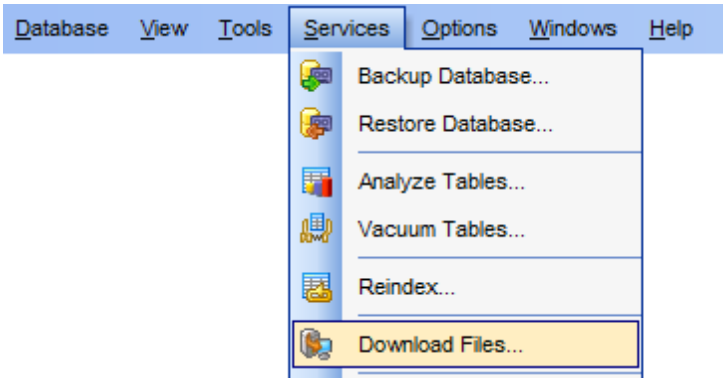
12.4 Download Files

Download File wizard allows you to save and load files directly to/from the server machine.

In most cases loading data is performed considerably faster with the help of this wizard, especially when dealing with large files, due to using native server file access functions.

To run the wizard, select the **Services | Download Files...** main menu 961 item.



- Selecting download method 789
- Selecting database 790
- FTP/SFTP connection setup 791
- Specifying operation and selecting files 792

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Extensions 864

Using templates 982

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12.4.1 Selecting download method

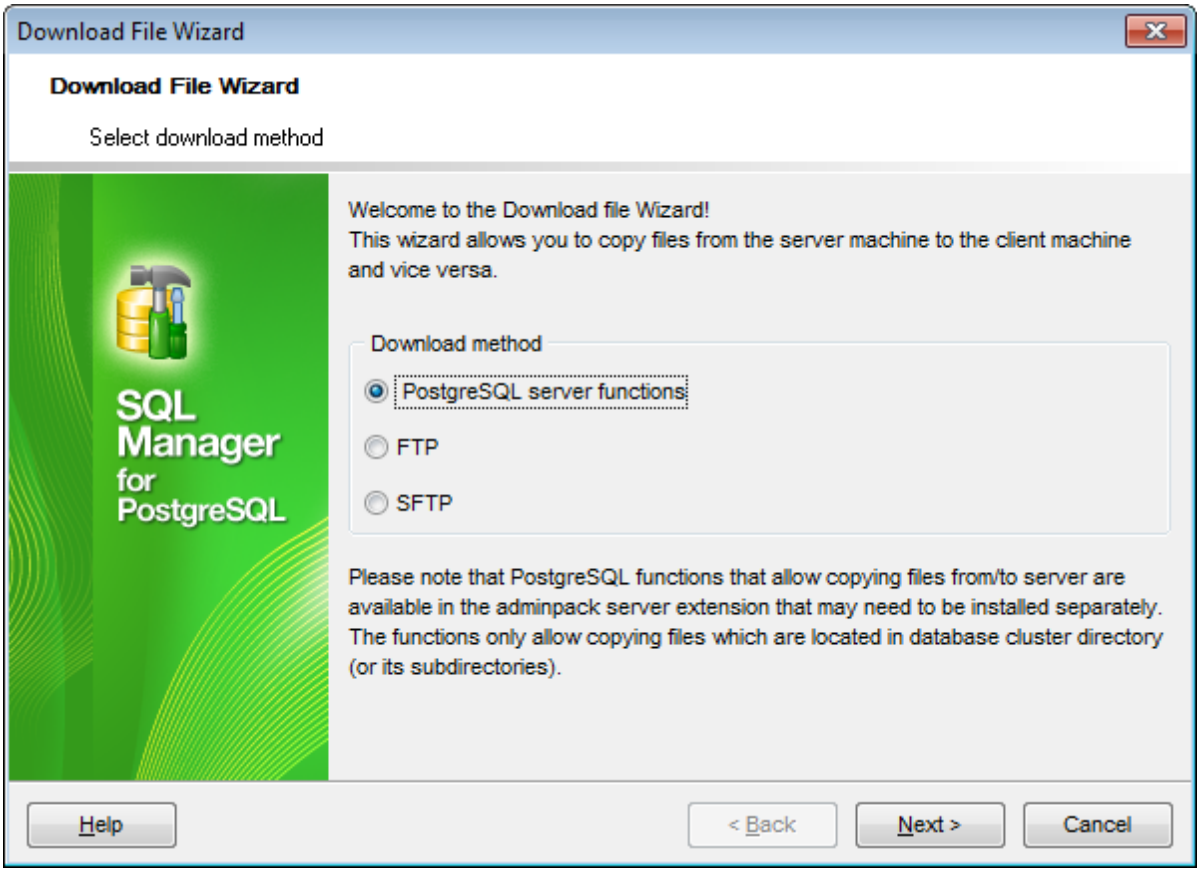
At this step you should select the download method which will be used for transferring files.

Select the preferable download method:

PostgreSQL server functions
With the native PostgreSQL server file access functions used, files transfer is performed considerably faster in most cases.

FTP
Specifies that the FTP method will be used for the file transfer operation.

SFTP
Specifies that the SecureFTP method will be used for the file transfer operation.



Depending on whether you have selected the *PostgreSQL server functions* or *FTP / SFTP* download methods, upon pressing the **Next** button you will either proceed to the Selecting database 790 step, or you will be immediately forwarded to the FTP/SFTP connection setup 791 step of the wizard.

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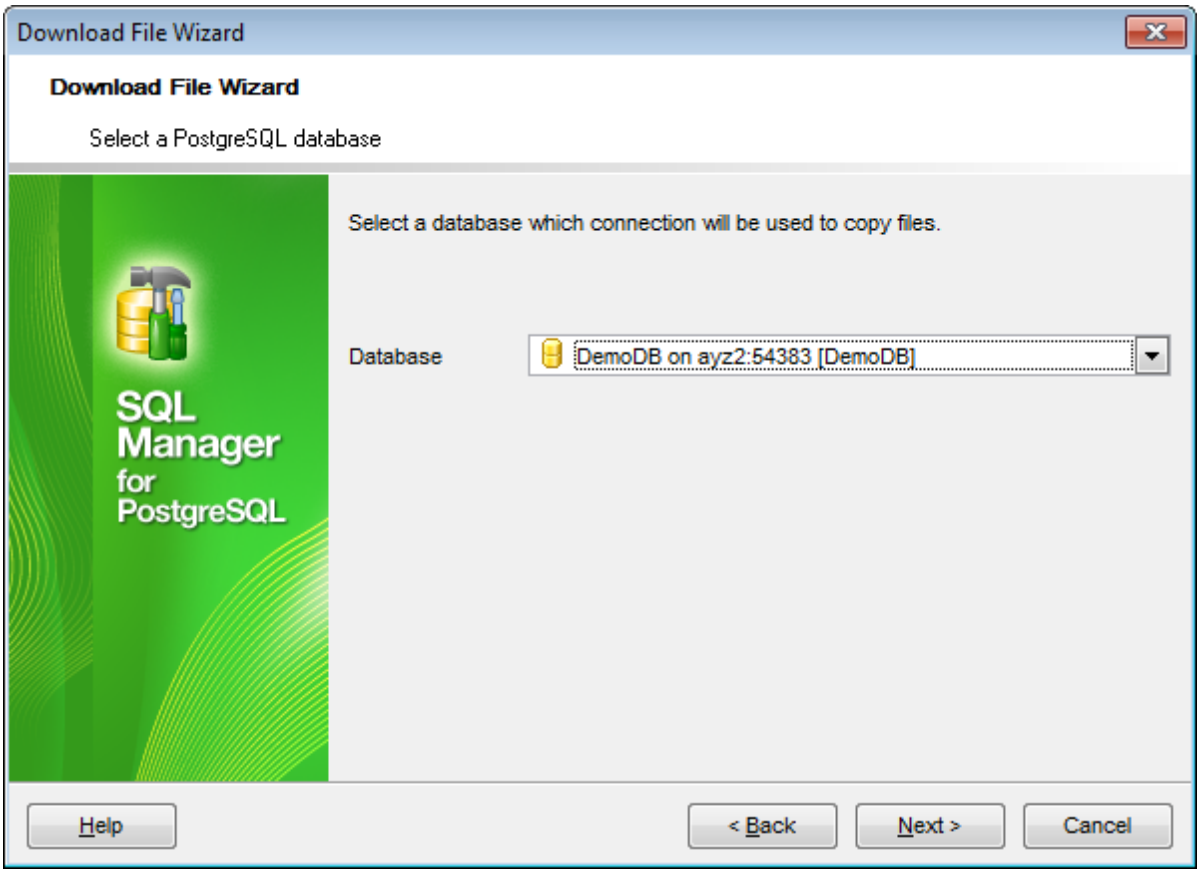
12.4.2 Selecting database

This step of the wizard allows you to specify the **database** to copy files.

Note that this step is only available if the *PostgreSQL server functions* method was specified when selecting download method[789].



Database
Use the drop-down list of registered databases to select the database for copying files.

Click the **Next** button to proceed to the Specifying operation and selecting files[792] step of the wizard.

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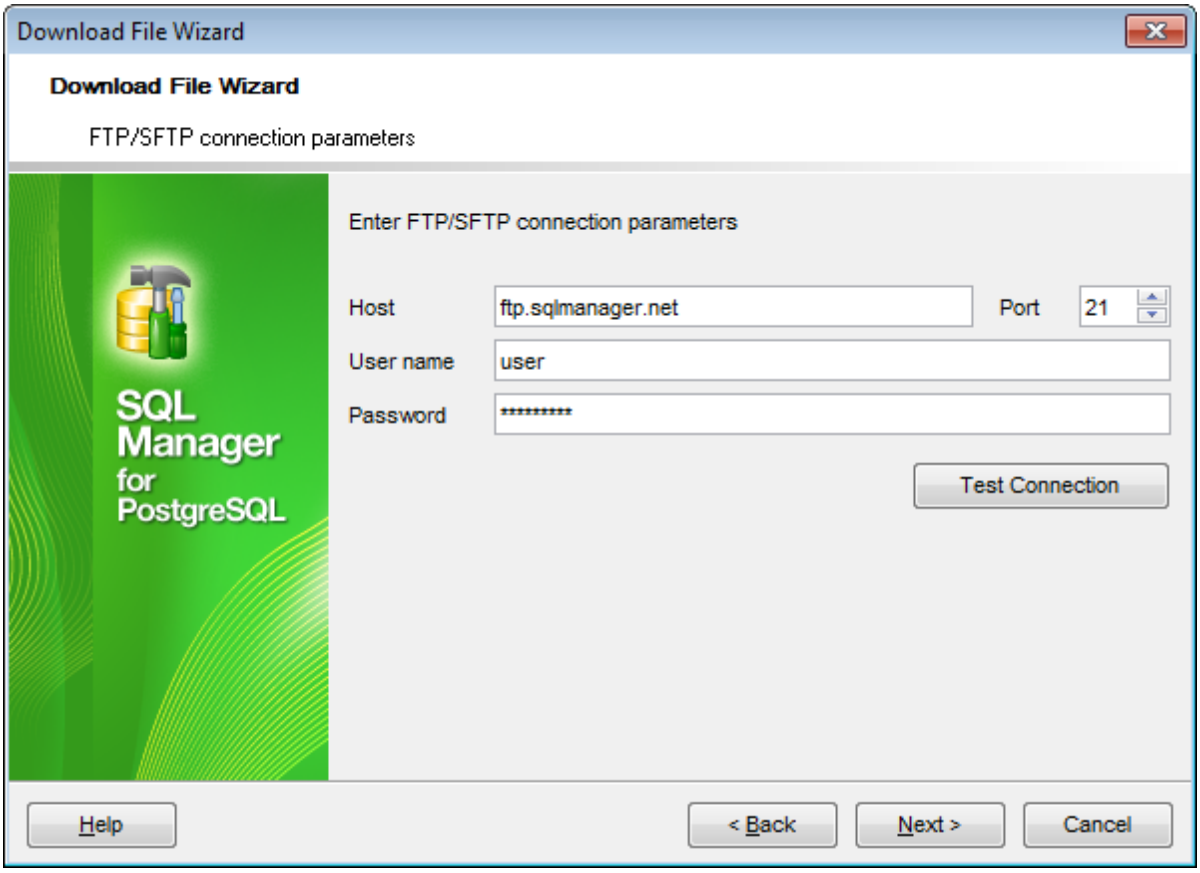
12.4.3 FTP/SFTP connection setup

Use this step of the wizard to specify FTP/SFTP connection parameters.

Note that this step is only available if the *FTP* or *SFTP* method was specified when selecting download method[789].

Enter valid connection settings in the corresponding fields: *Host*, *Port*, *User name*, *Password*.



Once you have specified the connection parameters, you can check whether it is possible to establish connection to the server: click the **Test Connection** button for this purpose. If connection is successful, you will get the *'Connected!'* message; otherwise an error message will be returned.

Click the **Next** button to proceed to the Specifying operation and selecting files[792] step of the wizard.

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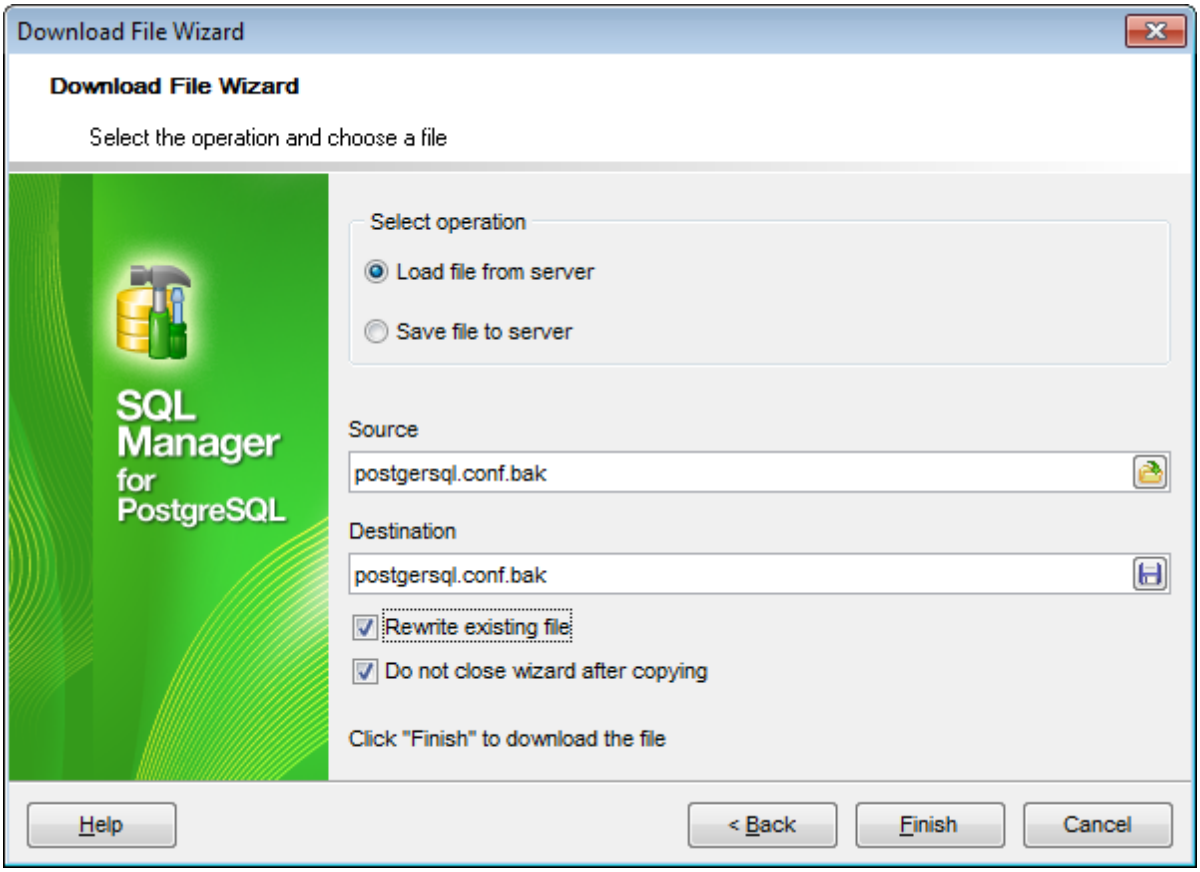
12.4.4 Specifying operation and selecting files

At this step you need to specify the desired operation and define the source and destination files.

Select the operation to be performed:
- *Load file from server*
- *Save file to server*



Source

Type in or use the button to specify the path and name of the source file.

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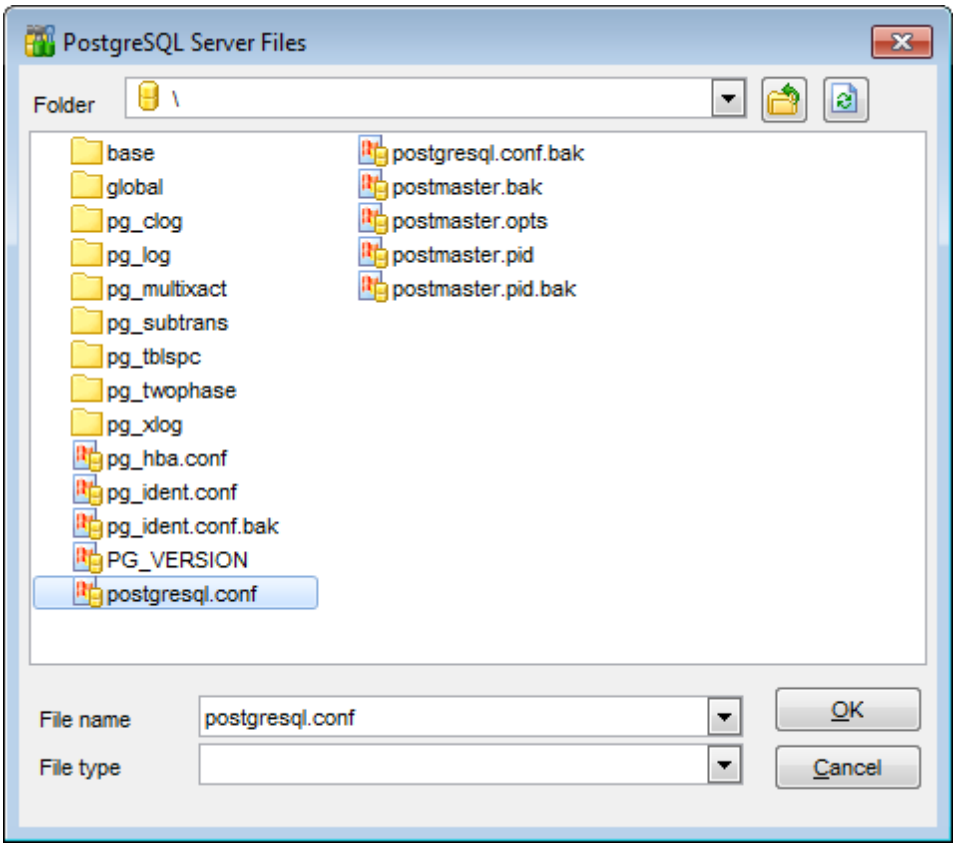

Destination
Type in or use the **Save as...** button to specify the path and name of the destination file.

Rewrite existing file
If this option is selected, existing destination files are replaced with the corresponding source files.

Do not close wizard after copying
If this option is deselected, the wizard will be closed automatically when the process is completed.

Click the **Finish** button to run the file transfer operation.

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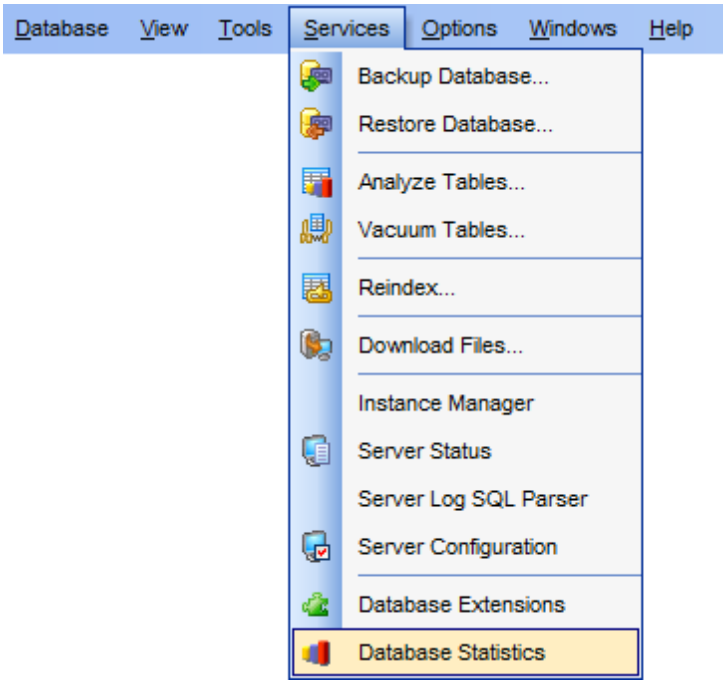
12.5 Database Statistics

The **Database Statistics** service is intended for browsing and reporting information about database activity.

Using the service, you can get count of accesses to tables and indexes. PostgreSQL also supports determining the exact command currently being executed by other server processes. Since collection of statistics adds some overhead to query execution, the system can be configured to collect or not collect information. This is controlled by configuration parameters that can easily can be set up with the help of the corresponding item of the Navigation bar 796.

To open the **Database Statistics** window, select the **Services | Database Statistics** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Database Statistics** item from the context menu 54.



- Using Navigation bar and Toolbar 796
- Diagram view 800
- Browsing Object Statistics 802
- Browsing Column Statistics 798
- Browsing Database Statistics 804
- Saving/loading statistics 806
- Statistics Collector options 807

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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See also:

Analyze Tables 773
Reindex 782

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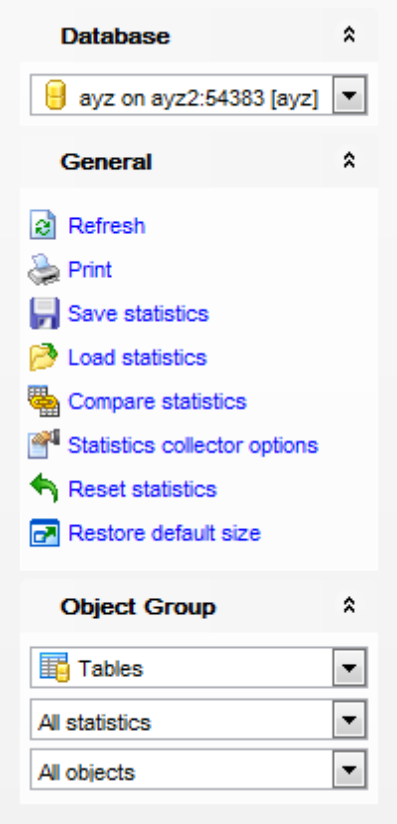
12.5.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Database Statistics**.



Database
select a database for collecting statistics

General
refresh the content of the active tab
print the content of the active tab
save 806 the statistics to an external file or memory
load 806 statistics from an external file or memory
compare current statistics data with data of an existing one
set Statistics Collector options 807
reset current statistics
restore the default size and position of the window

Depending on the current tab selection, the **Navigation bar** expands to one or more additional panes with tab-specific actions that can be useful for working with statistics data:

Object
select the type of objects to collect statistics for (*Tables*, *Indices*, *Sequences*)

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✓ select whether *all statistics*, *query statistics*, *data change statistics* or *cache statistics* should be collected
✓ select whether *All objects*, *User objects* only or *System objects* only should be displayed

Diagram Options

✓ specify the number of objects to be displayed in the diagram
✓ select the diagram **criterion**: *Most frequent table scans (sequential and index)*, *Number of scans*, *Updates*, *Inserts*, *Deletes*, *Most changed tables*, *Cache efficiency* (for **tables**); *Most frequently used indices*, *Most frequent scans*, *Cache efficiency* (for **indexes**); *Most frequent scans* (for **sequences**).

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

See also:

Diagram view 800
Browsing Object Statistics 802
Browsing Column Statistics 798
Browsing Database Statistics 804
Saving/loading statistics 806
Statistics Collector options 807

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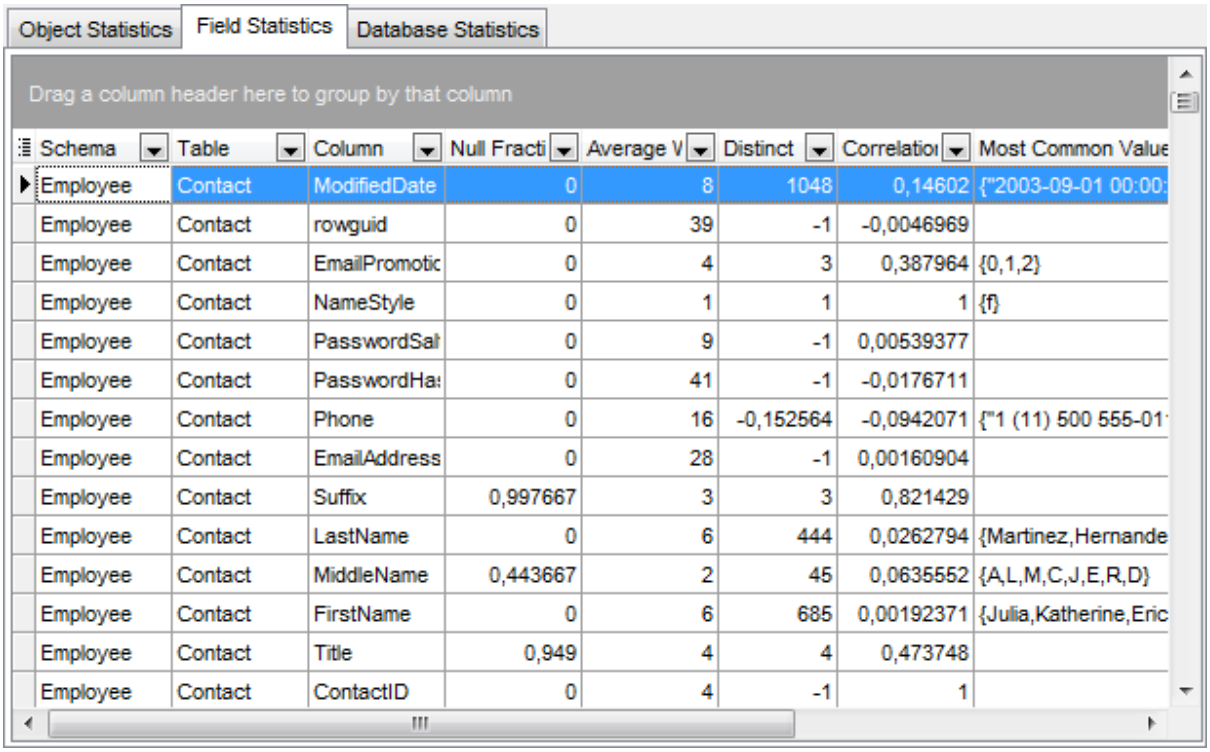
12.5.1.1 Browsing Column Statistics

The **Column Statistics** tab displays statistical data about the contents of the database, as well as statistical data about the values of index expressions. Note that all the statistical data is inherently approximate, even assuming that it is up-to-date.



Schema	Table	Column	Null Fracti	Average W	Distinct	Correlatio	Most Common Value
Employee	Contact	ModifiedDate	0	8	1048	0,14602	{"2003-09-01 00:00:
Employee	Contact	rowguid	0	39	-1	-0,0046969	
Employee	Contact	EmailPromotic	0	4	3	0,387964	{0,1,2}
Employee	Contact	NameStyle	0	1	1	1	{f}
Employee	Contact	PasswordSalt	0	9	-1	0,00539377	
Employee	Contact	PasswordHa:	0	41	-1	-0,0176711	
Employee	Contact	Phone	0	16	-0,152564	-0,0942071	{"1 (11) 500 555-01
Employee	Contact	EmailAddress	0	28	-1	0,00160904	
Employee	Contact	Suffix	0,997667	3	3	0,821429	
Employee	Contact	LastName	0	6	444	0,0262794	{Martinez,Hernande
Employee	Contact	MiddleName	0,443667	2	45	0,0635552	{A,L,M,C,J,E,R,D}
Employee	Contact	FirstName	0	6	685	0,00192371	{Julia,Katherine,Eric
Employee	Contact	Title	0,949	4	4	0,473748	
Employee	Contact	ContactID	0	4	-1	1	

The list displays fields as a grid with the following columns:
Schema, *Table*, *Column*, *NULL Fraction*, *Average Width*, *Distinct*, *Correlation*, *Most Common Values*, *Most Common Frequency*, *Histogram Bounds*.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

See also:

Using Navigation bar and Toolbar[796]
Diagram view[800]
Browsing Object Statistics[802]
Browsing Database Statistics[804]
Saving/loading statistics[806]
Statistics Collector options[807]

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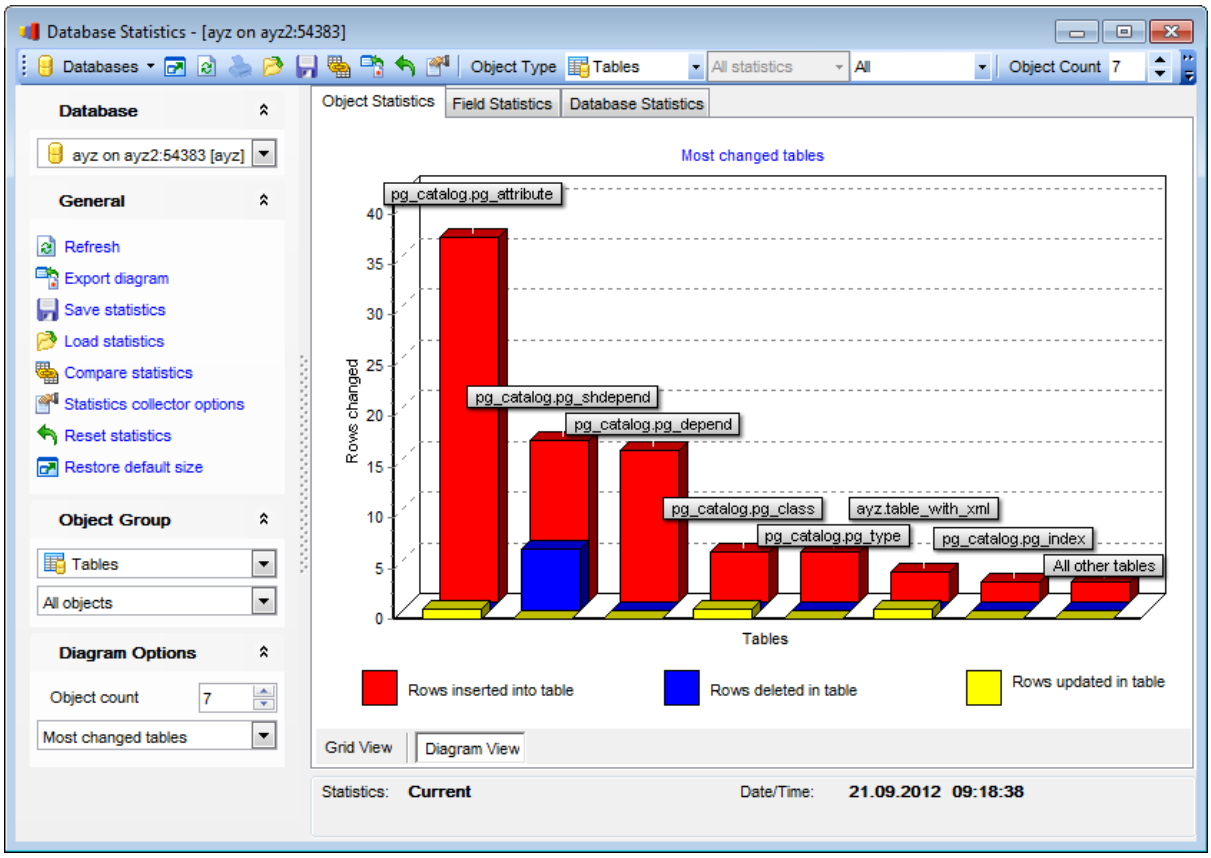
12.5.2 Diagram view

The **Diagram View** tab allows you to view object statistics[802] as a diagram. To activate this type of statistics data view, select the **Diagram View** tab on the View mode panel at the bottom of the working area of the window.



Use the **Object Group** pane of the Navigation bar[796] to select the type of objects to collect statistics for (*Tables*, *Indices*, *Sequences*), and whether *All objects*, *User objects* only or *System objects* only should be displayed.

Use the **Diagram Options** pane of the Navigation bar[796] to specify common diagram options:

Object count
Use the spinner control to specify the number of objects to be displayed in the diagram.

Use the drop-down list below to select the diagram **criterion**:
Most frequent table scans (sequential and index), *Number of scans*, *Updates*, *Inserts*, *Deletes*, *Most changed tables*, *Cache efficiency* (for **tables**);
Most frequently used indices, *Most frequent scans*, *Cache efficiency* (for **indexes**);
Most frequent scans (for **sequences**).

See also:
Using Navigation bar and Toolbar[796]

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Browsing Object Statistics 802
Browsing Column Statistics 798
Browsing Database Statistics 804
Saving/loading statistics 806
Statistics Collector options 807

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12.5.3 Browsing Object Statistics

The **Object Statistics** tab of the **Database Statistics** window displays statistics for each object of the specified type (*table*, *index*, *sequence*) in the current database.

The list displays the existing database objects as a grid with the following columns:
Schema, *Table*, *OID*, *Sequential Scans*, *Row Reads by Sequential Scans*, *Index Scans*, *Rows Fetched by Index Scans*, *Rows Inserted*, *Rows Updated*, *Rows Deleted*, *Block Reads from Disk*, *Block Reads from Cache*, *Index Block Reads from Disk*, *Index Block Reads from Cache*, *Toast Block Reads from Disk*, *Toast Block Reads from Cache*, *Toast Index Block Reads from Disk*, *Toast Index Block Reads from Cache*, *Live Rows Read*, *Dead Rows Read* (for **tables**);
Schema, *Table*, *Index*, *OID*, *Index Scans*, *Index Tuple Reads*, *Index Tuple Fetches*, *Index Block Reads from Disk*, *Index Block Reads from Cache* (for **indexes**);
Schema, *Sequence*, *OID*, *Block Reads from Disk*, *Block Reads from Cache* (for **sequences**).

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Statistics data can be also represented as a diagram. See Diagram view[800] for more information.

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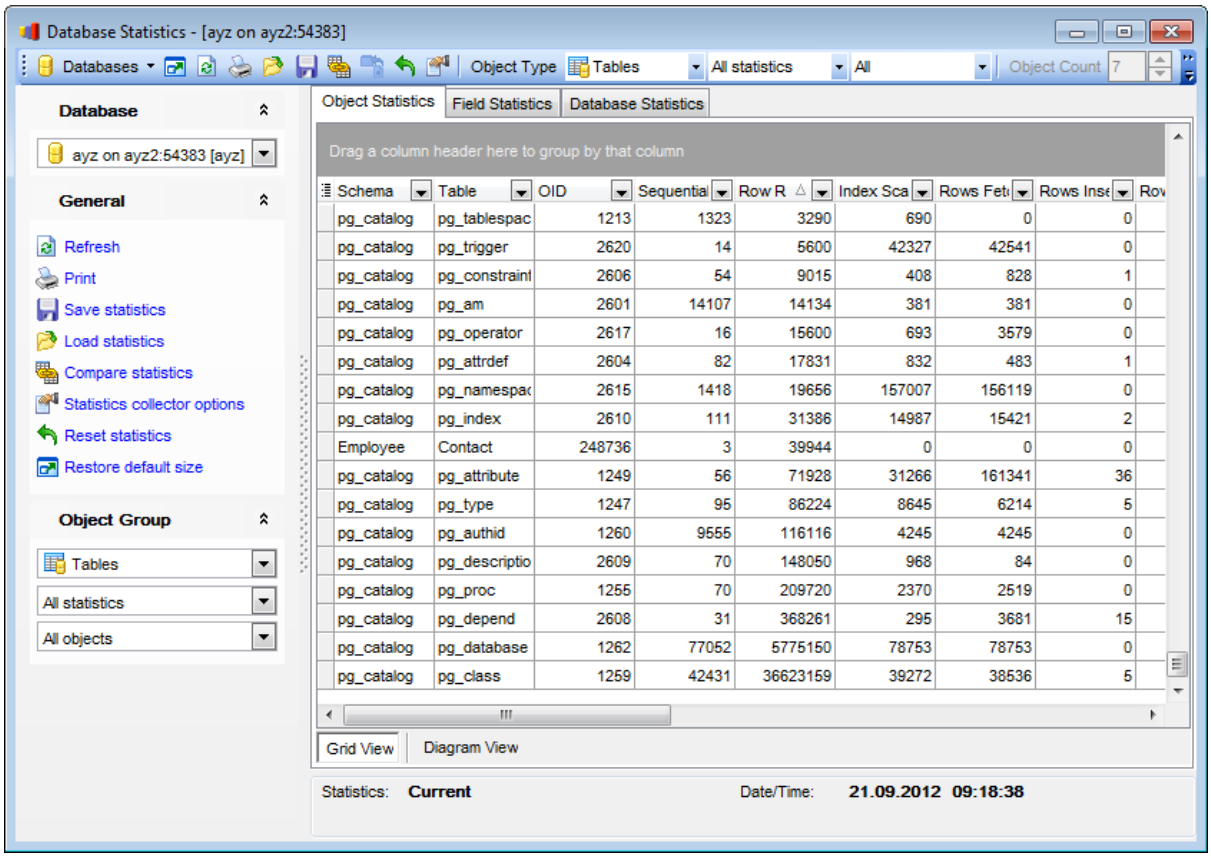

Use the **Object Group** pane of the Navigation bar[796] to select the type of objects to collect statistics for (*Tables*, *Indices*, *Sequences*), and whether *All objects*, *User objects* only or *System objects* only should be displayed.

The status bar at the bottom of the window displays type of **statistics** being currently displayed and the **date/time** they were collected.

See also:

Using Navigation bar and Toolbar[796]
Diagram view[800]
Browsing Column Statistics[798]
Browsing Database Statistics[804]
Saving/loading statistics[806]
Statistics Collector options[807]

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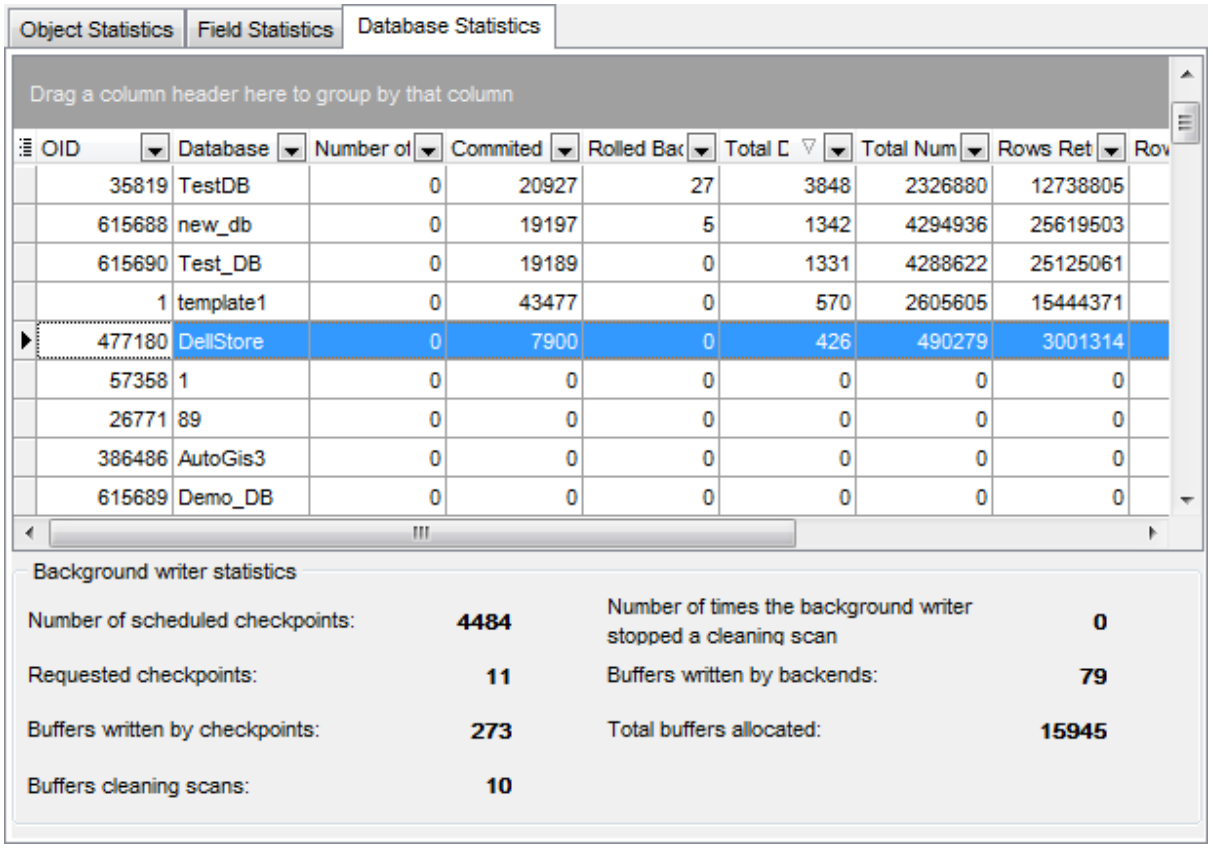
12.5.4 Browsing Database Statistics

The **Database Statistics** tab displays statistical data about the specified server databases.



The list displays databases as a grid with the following columns:
OID, *Database*, *Number of Active Server Processes*, *Committed Transactions*, *Rolled Back Transactions*, *Total Disk Block Reads*, *Total Number of Buffer Hits*, *Rows Returned*, *Rows Fetched*, *Rows Inserted*, *Rows Updated*, *Rows Deleted*.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Background writer statistics
This area is available for PostgreSQL 8.3. The following parameters pertaining to the selected database are available: *Number of scheduled checkpoints*, *Requested checkpoints*, *Buffers written by checkpoints*, *Buffers cleaning scans*, *Number of times the background writer stopped a cleaning scan*, *Buffers written by backends*, *Total buffers allocated*.

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See also:

Using Navigation bar and Toolbar 796
Diagram view 800
Browsing Object Statistics 802
Browsing Column Statistics 798
Saving/loading statistics 806
Statistics Collector options 807

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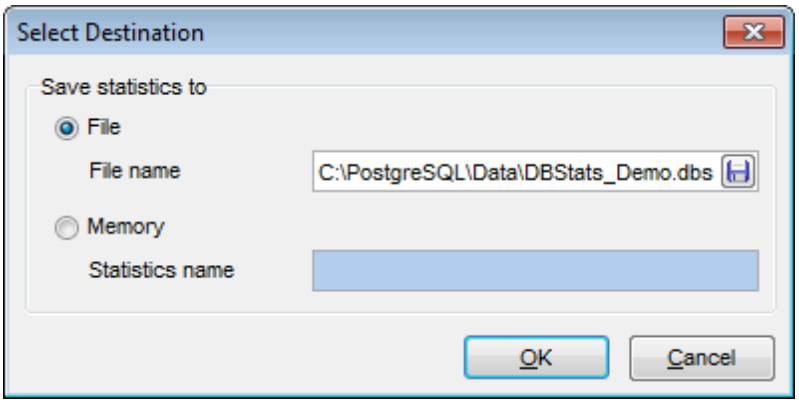
12.5.5 Saving/loading statistics

Use the **Save statistics** and the **Load statistics** items of the Navigation bar[796] to save the statistical data as an external file for future use or to memory, and to load the previously saved statistics data.

You are able to save the statistics to an external **.dbs* file for future use, or to memory. Loading the data is performed in the same way.



Moreover, you can compare the current statistics data with statistical data that were saved to a file or is stored in memory. In this case the differences will be displayed in the grid.

See also:

Using Navigation bar and Toolbar[796]
Diagram view[800]
Browsing Object Statistics[802]
Browsing Field Statistics[798]
Browsing Database Statistics[804]
Statistics Collector options[807]

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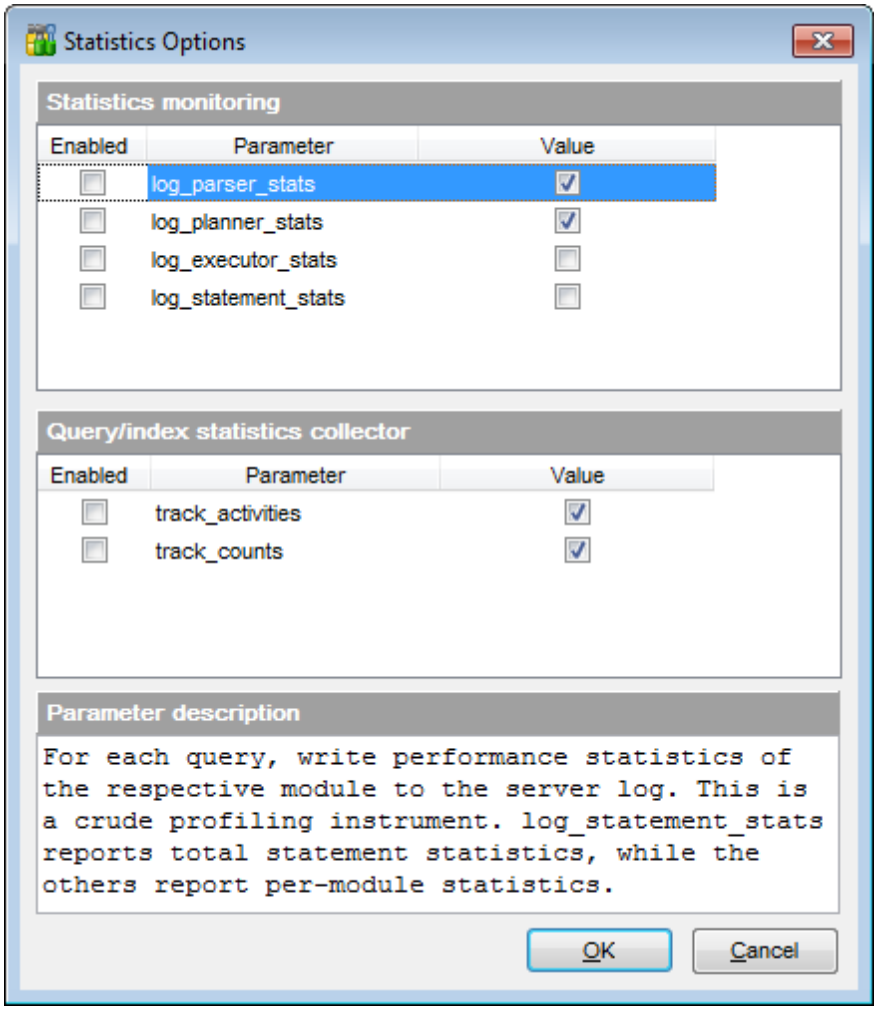
12.5.6 Statistics Collector options

In order to set the configuration parameters for collecting statistics, please select the **Statistics collector options** item of the Navigation bar[796].



See also:

Using Navigation bar and Toolbar[796]
Diagram view[800]
Browsing Object Statistics[802]
Browsing Field Statistics[798]
Browsing Database Statistics[804]
Saving/loading statistics[806]

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12.6 Backup Database

Backup Database Wizard allows you to perform the database backup operation on your PostgreSQL system (with the *pg_dump* utility of PostgreSQL server used).

This operation is used to create a backup copy of a *single database*, an entire *database cluster*, *roles* and/or *tablespaces*.

To run the wizard, select the **Services | Backup Database...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Backup Database...** item of the context menu 54. Alternatively, you can right-click the host alias and select the **Tasks | Backup Database...** context menu 52 item.

- Selecting host 809
- Specifying objects to backup 811
- Setting output format and file name 812
- Setting backup options for database objects 814
- Selecting objects to be included 815
- Selecting objects to be excluded 816
- Setting additional backup options 817
- Running database backup 820

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Copy Database Wizard 663

Restore Database 821

Using templates 982

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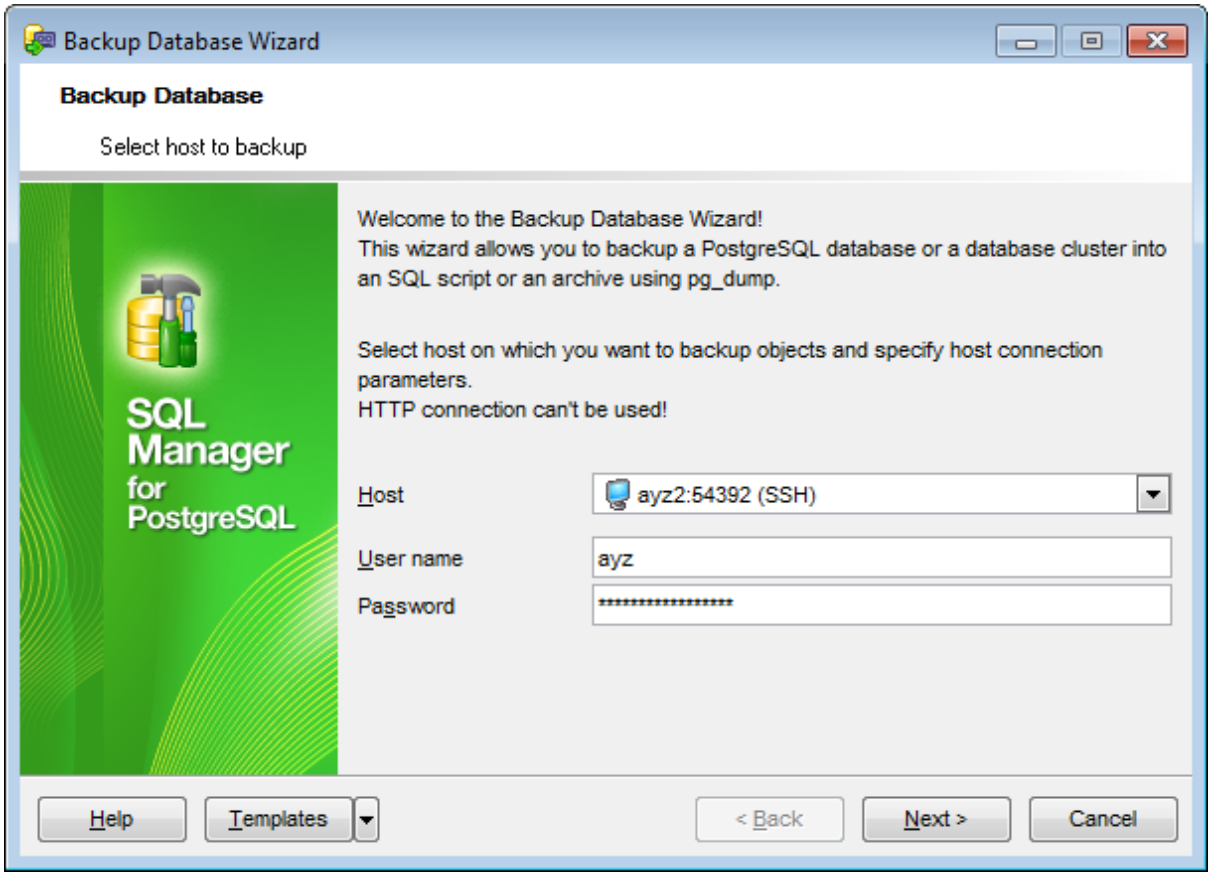
12.6.1 Selecting host

This step of the wizard allows you to specify the *host* where the database for backup resides, and to provide *authentication parameters*.



Host
Use the drop-down list to select the host where the database resides.

User name / **Password**
Specify valid user name and password to access the selected host.

Click the **Next** button to proceed to the Specifying objects to backup 811 step of the wizard.

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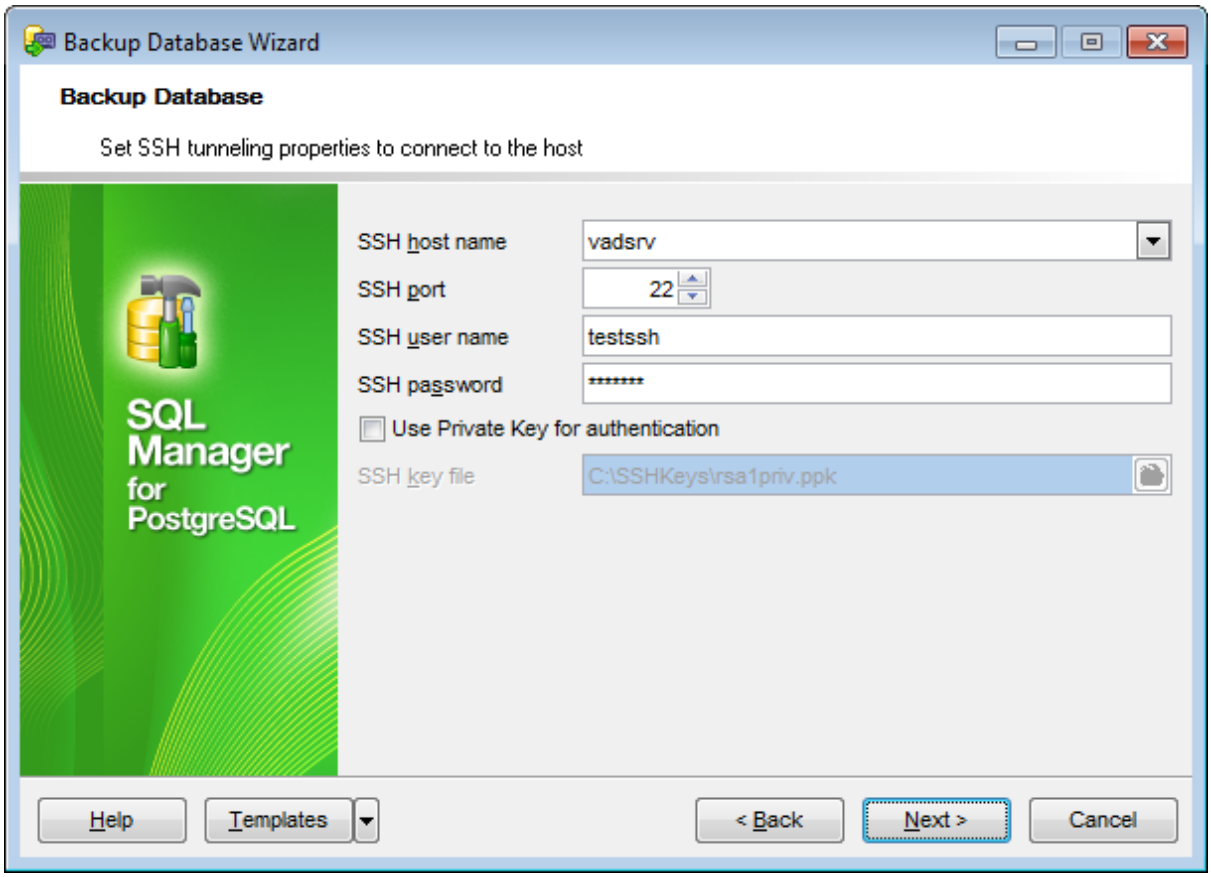
12.6.2 Specifying SSH tunneling parameters

This step appears only if you are performing backup operation of the database connected via SSH tunnel.
Here you are to specify the necessary parameters for connection with **SSH tunneling** used.

Specify **SSH host name**, **SSH port**, **SSH user name**, **SSH password**, the path to the **SSH key file** (if necessary) in the corresponding boxes.

See SSH connection properties 992 for details.



Click the **Next** button to proceed to the Specifying objects to backup 811 step of the wizard.

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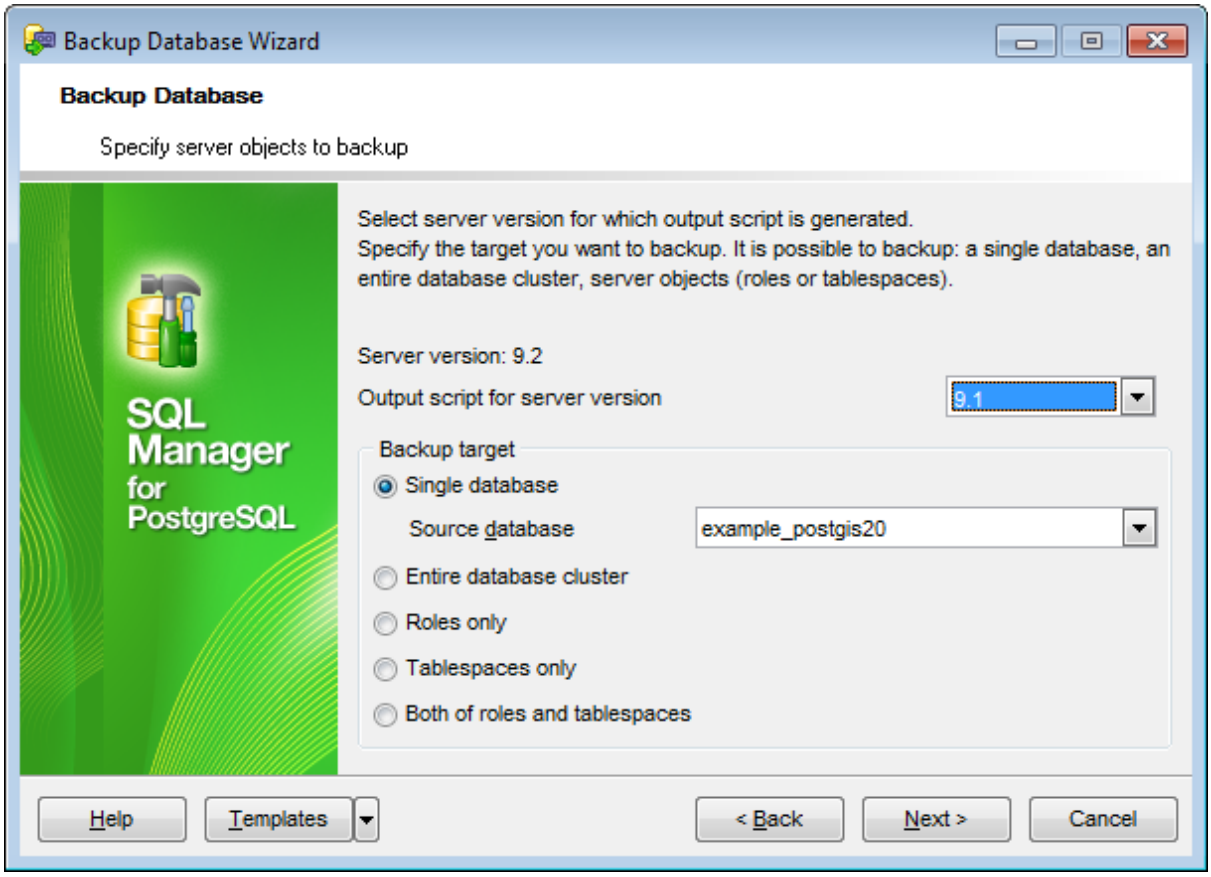
12.6.3 Specifying objects to backup

This step of the wizard allows you to specify *server objects* for the database backup operation.



Server version
This label displays the current PostgreSQL server version.

Output script for server version
Use the drop-down list to select the version of PostgreSQL server for the backup script. The output script will be generated in compliance with the specifications of the selected server version: *9.3, 9.2, 9.1, 9.0, 8.4, 8.3, 8.2, 8.1, 8.0 or 7.4.*

Backup target
Use this group to define the backup target:
- *Single database* (use the **Source database** drop-down list to select the database you need)
- *Entire database cluster*
- *Roles only*
- *Tablespaces only*
- *Both roles and tablespaces*

Click the **Next** button to proceed to the Setting output format and file name 812 step of the wizard.

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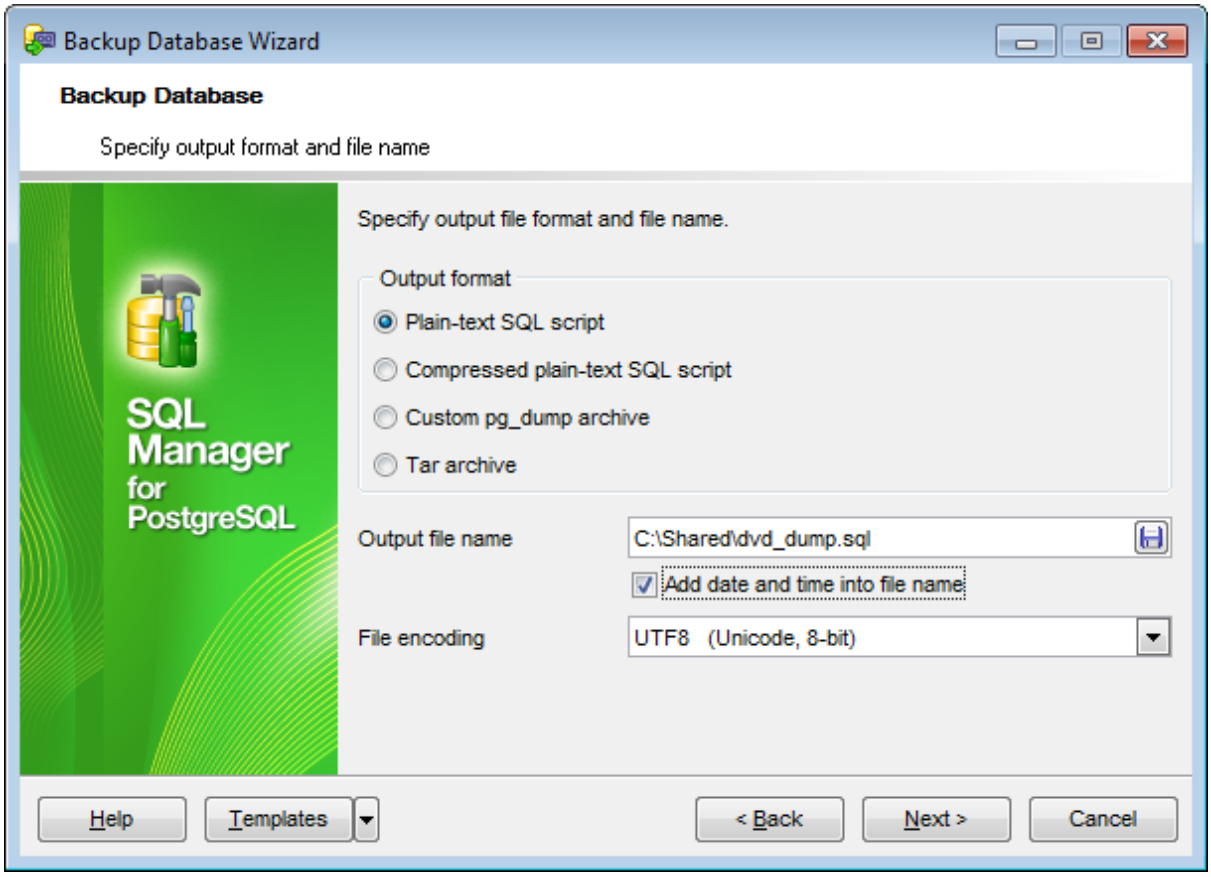
12.6.4 Setting output format and file name

This step allows you to specify the *output format* and *output file* properties.



Output format

Use this group to define the output format (**Note:** This group is only available if you selected **Single database** as the *backup target* at the previous step[811]):

- *Plain-text SQL script*
- *Compressed plain-text SQL script*
- *Custom pg_dump archive*
- *Tar archive*

Output file name

Set a name for the result file and type in or use the **Save as...** button to specify the path to this file on your local machine or on a machine in the LAN.

Add date and time into file name

Check this option to add the current timestamp to the generated backup file name.

File encoding

If necessary, use the drop-down list to select the encoding to be applied to the output file.

Click the **Next** button to proceed to the Setting backup options for database objects[814] step of the wizard.

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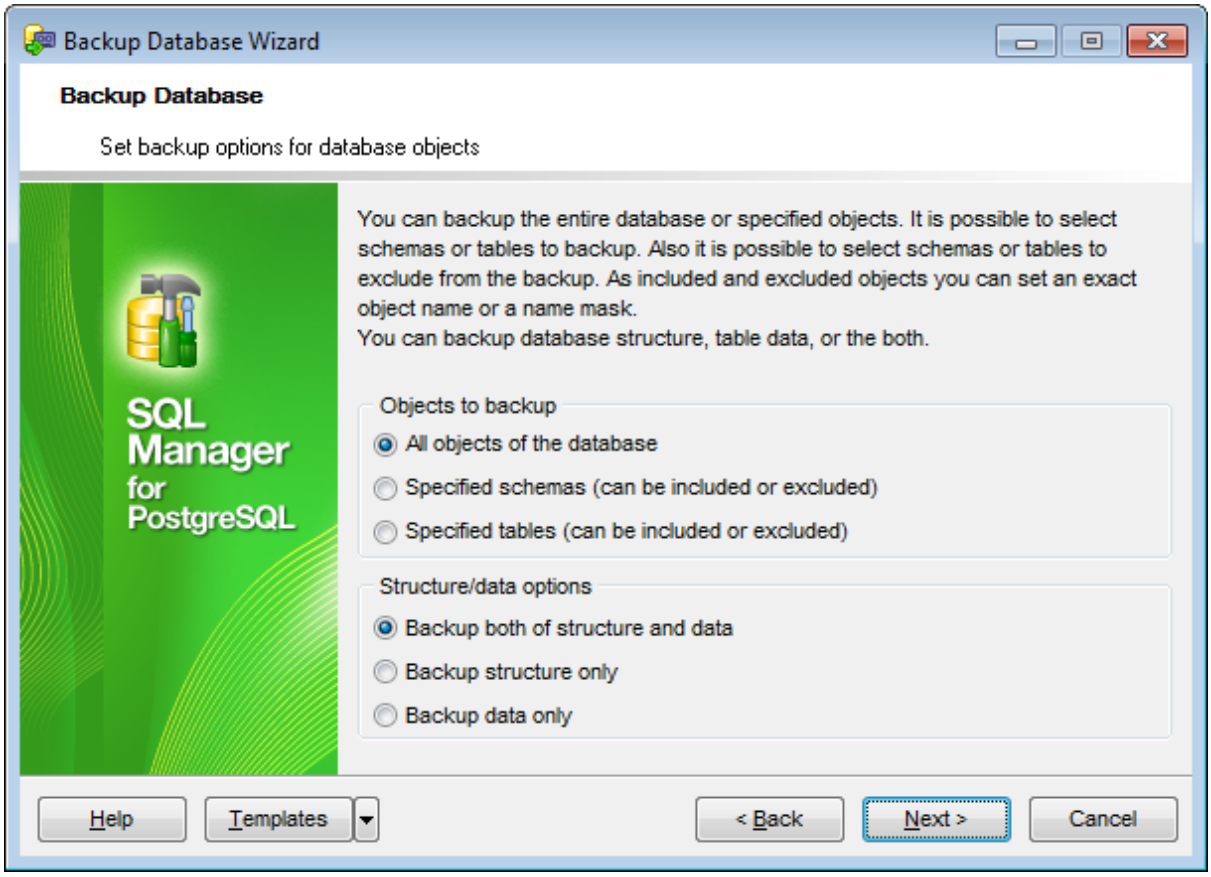
12.6.5 Setting backup options for database objects

Use this step of the wizard to specify *objects to backup* and *structure/data options* (if available).



Objects to backup

Use this group to specify whether all or specified objects are to be backed up:

- *All objects of the database*
- *Specified schemas*
- *Specified tables*

Structure/data options

Use this group to specify whether structure and/or data are to be backed up (**Note:** This group is only available if you selected **Plain-text SQL script** as the *output format* at the previous step[812]):

- *Backup both structure and data*
- *Backup structure only*
- *Backup data only*

Depending on whether you have selected to backup *Specified schemas / Specified tables* or *All objects of the database*, upon pressing the **Next** button you will either proceed to the next step of the wizard[815], or you will be immediately forwarded to the Setting additional backup options[817] step of the wizard.

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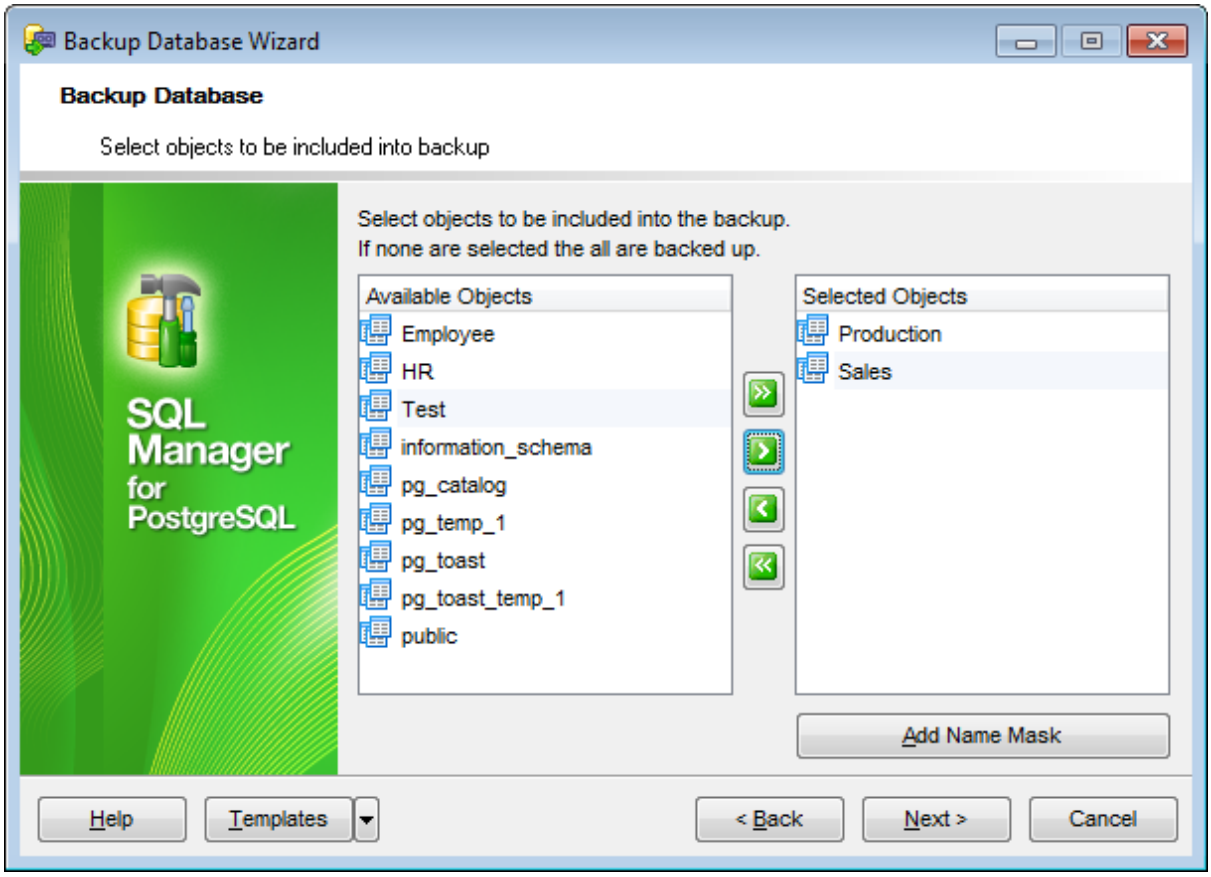
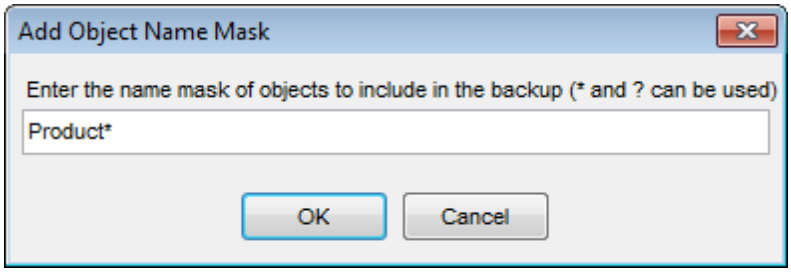
12.6.6 Selecting objects to be included

Use this step of the wizard to specify *objects to be included* into the backup operation.



To select an object, you need to move it from the **Available Objects** list to the **Selected Objects** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.

If necessary, you can select objects by mask: click the **Add Name Mask** button and specify a string in the **Add Object Name Mask** dialog.



Click the **Next** button to proceed to the Selecting objects to be excluded 816 step of the wizard.

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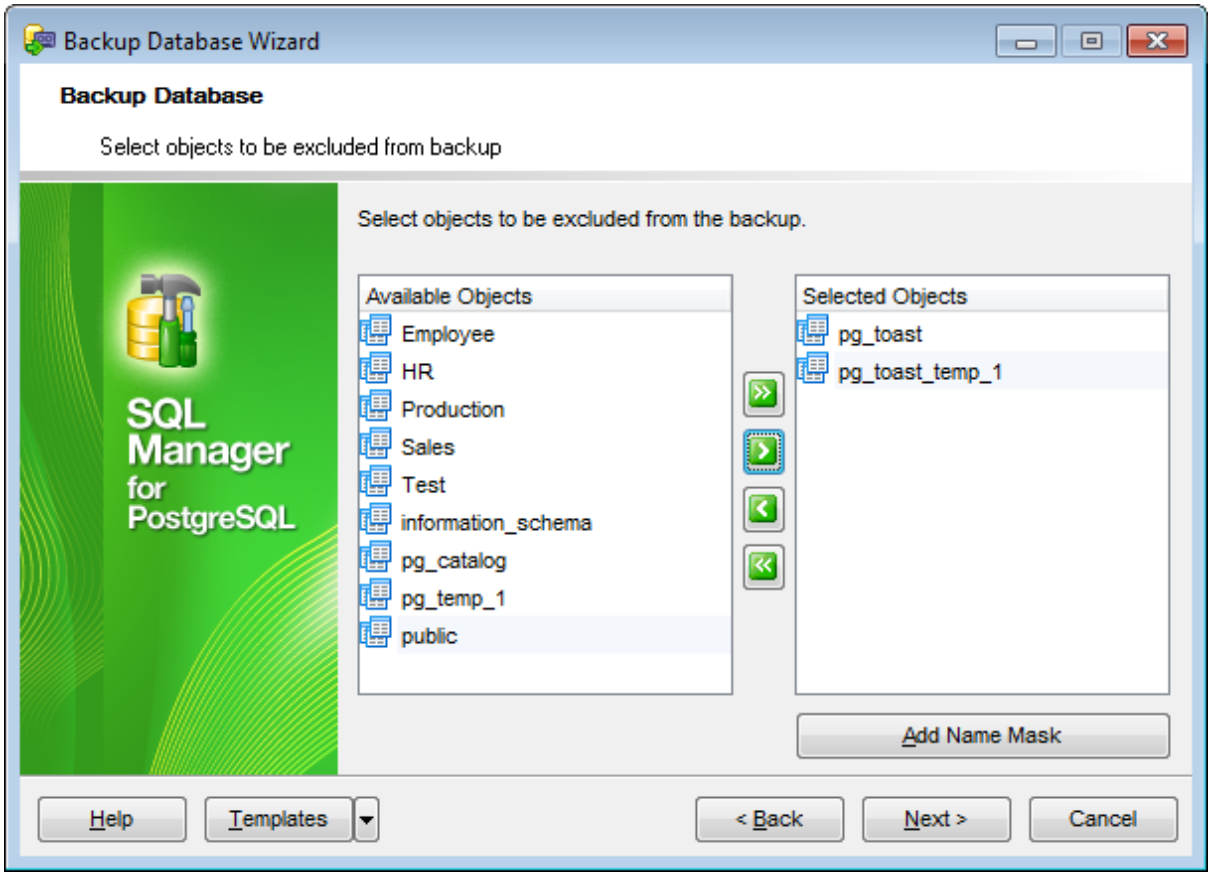
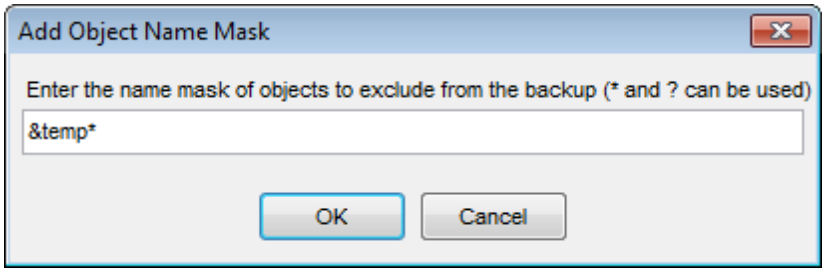
12.6.7 Selecting objects to be excluded

Use this step of the wizard to specify *objects to be excluded* from the backup operation.



To select an object, you need to move it from the **Available Objects** list to the **Selected Objects** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.

If necessary, you can select objects by mask: click the **Add Name Mask** button and specify a string in the **Add Object Name Mask** dialog.



Click the **Next** button to proceed to the Setting additional backup options 817 step of the wizard.

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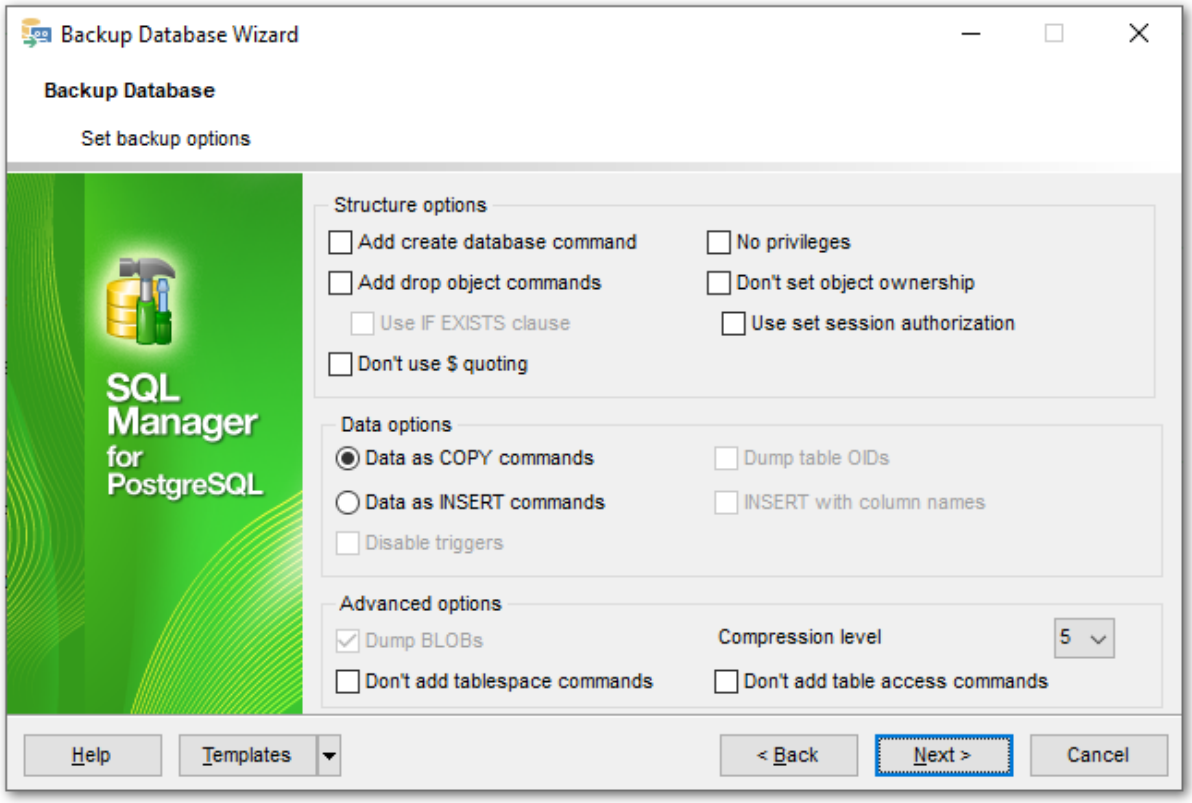
12.6.8 Setting additional backup options

This step offers some *additional options* that may be useful for the database backup operation.



Structure options

Add create database command
If this option is selected, the CREATE DATABASE statement will be included into the backup script.

Add drop object commands
If this option is selected, the DROP statements will be added for database objects.

Don't use $ quoting
This option disables dollar-quoting in the backup script.

No privileges
This option disables privilege allocation for database objects in the script.

Don't set object ownership
This option disables object ownership statements for database objects in the script.

Use set session authorization
If this option is selected, the currently set session authorization is used.

Data options

Specify the method that will be used to backup data.

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Data as COPY statements
Data as INSERT statements

Disable triggers
Select this option to disable triggers for the backup session.

Dump table OIDs
If this option is selected, table OIDs (object identifiers) will be dumped as well.

INSERT with column names
If this option is selected, column names will be included into the INSERT statements.

Advanced options

Compress file
If this option is selected, the backup file will be compressed to the extent specified using the **Compress level** control.

Dump BLOBs
If this option is selected, BLOBs (binary large objects) will be dumped as well.

No setting tablespace commands
With this option, all objects will be created in whichever tablespace is the default during restore.

Don't add table access commands
This option allows not to output commands to select table access methods. With this option enabled all objects will be created with the default table access method during restore.

Compress level
This control allows you to set the compression level for the backup file. Move the slider between the **0** and **9** threshold values to select the required compression level value within this scope.

When you are done, click the **Next** button to proceed to the next step 819 of the wizard.

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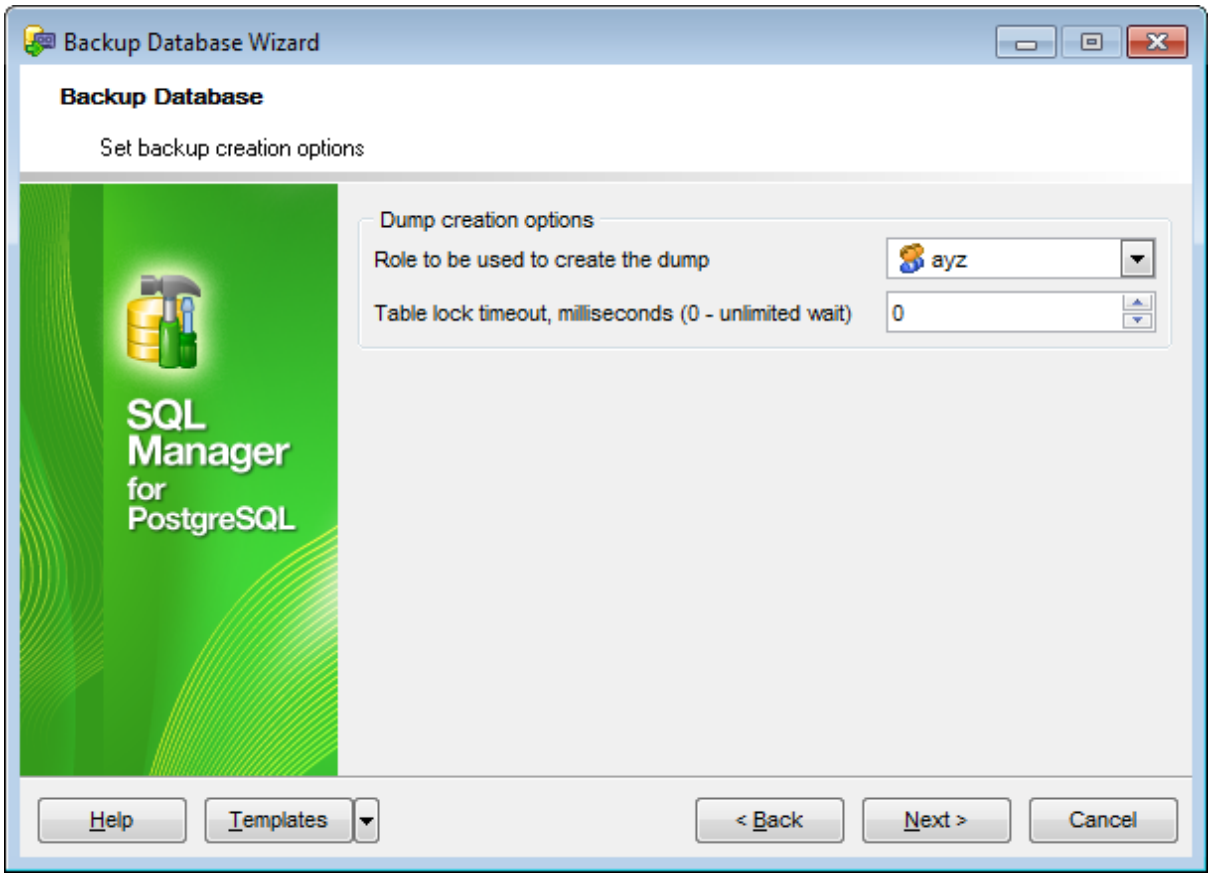
12.6.9 Setting backup creation options

This step of the wizard is available only when **Output script for server version** option value is set to 8.4 at the Specifying objects to backup 811 step.

Use this step to manage dump creation options:

Role to be used to create the dump
This drop-down list allows you to define role that will be used to dump the database.

Table lock timeout, milliseconds (0- unlimited wait)
Within this increment field you can restrict time to lock a table in milliseconds. By default it is set "0", that is used for to unlimited wait.



When you are done, click the **Next** button to proceed to the last step 820 of the wizard.

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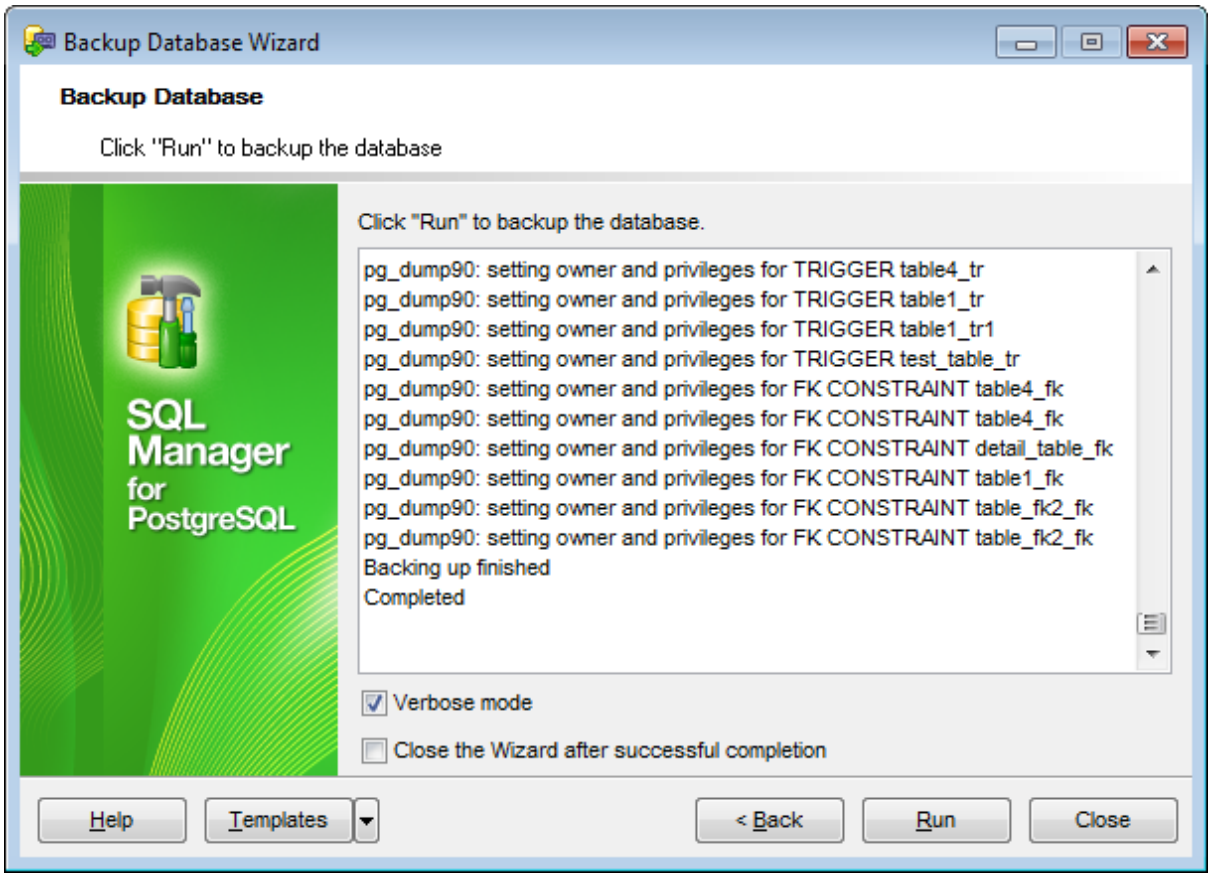
12.6.10 Running database backup

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the backup database process.

The log area allows you to view the log of operations and errors (if any).



Verbose mode
This option specifies verbose mode, i.e. detailed object comments, start/stop times and progress messages to standard error will be written to the dump file and displayed in the log area.

Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template 982 for future use.

Click the **Run** button to run the backup database operation.

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12.7 Restore Database

Restore Database Wizard allows you to perform the database restore operation on your PostgreSQL system (with the *pg_restore* utility of PostgreSQL server used).

This operation is used to rebuild a damaged or corrupted database that has been backed up using Backup Database Wizard 808. You can restore the backup copy to an existing database, or create a new database and restore the backup copy into the newly created database.

To run the wizard, select the **Services | Restore Database...** main menu 961 item, or right-click the database alias in the DB Explorer 65 tree and select the **Tasks | Restore Database...** item of the context menu 54. Alternatively, you can right-click the host alias and select the **Tasks | Restore Database...** context menu 52 item.

- Selecting host 822
- Selecting source file for restoring 824
- Selecting restore type 826
- Setting restore options for database objects 829
- Selecting objects to restore 831
- Setting additional restore options 833
- Running database restore 836

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

See also:

Backup Database 808

Using templates 982

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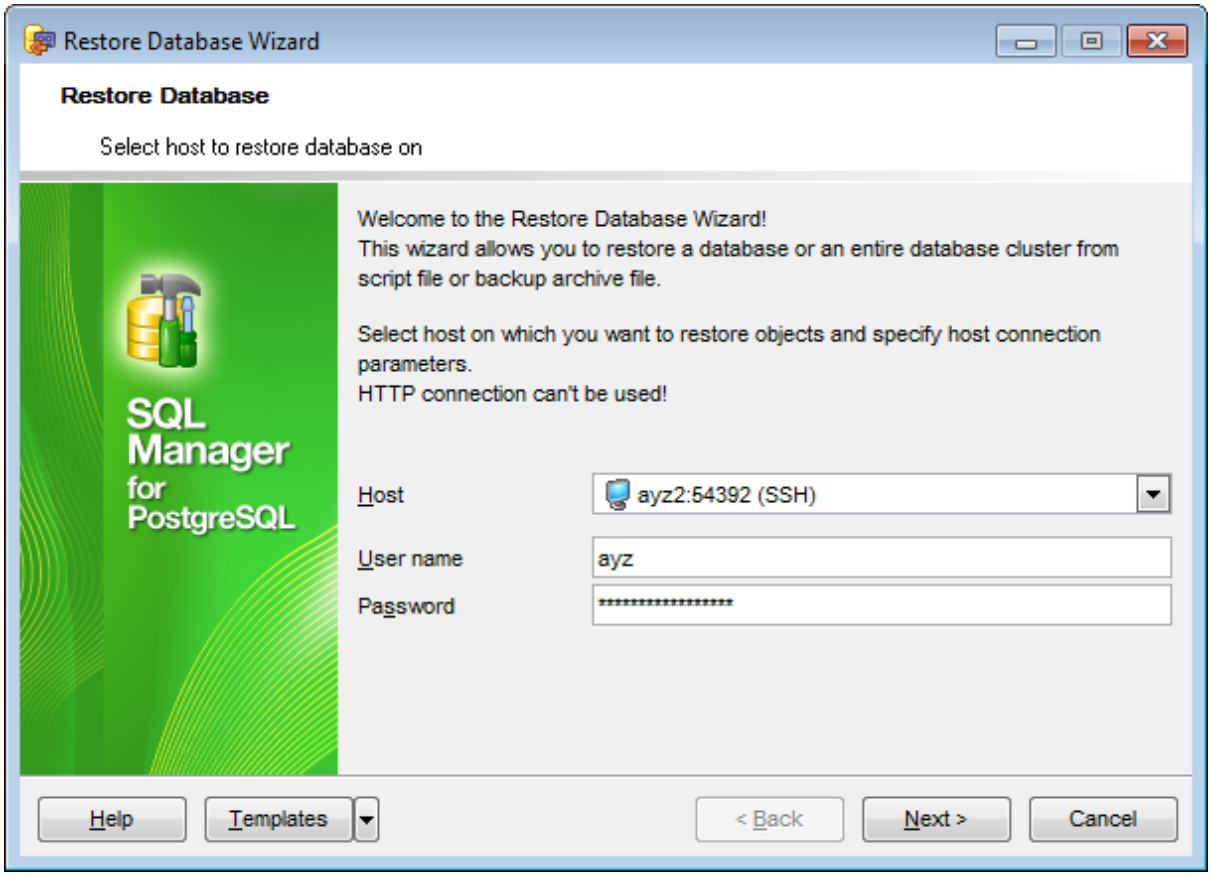
12.7.1 Selecting host

This step of the wizard allows you to specify the *host* to restore database onto, and to provide *authentication parameters*.



Host
Use the drop-down list to select the host to restore database onto.

User name / **Password**
Specify valid user name and password to access the selected host.

Click the **Next** button to proceed to the Selecting source file for restoring 824 step of the wizard.

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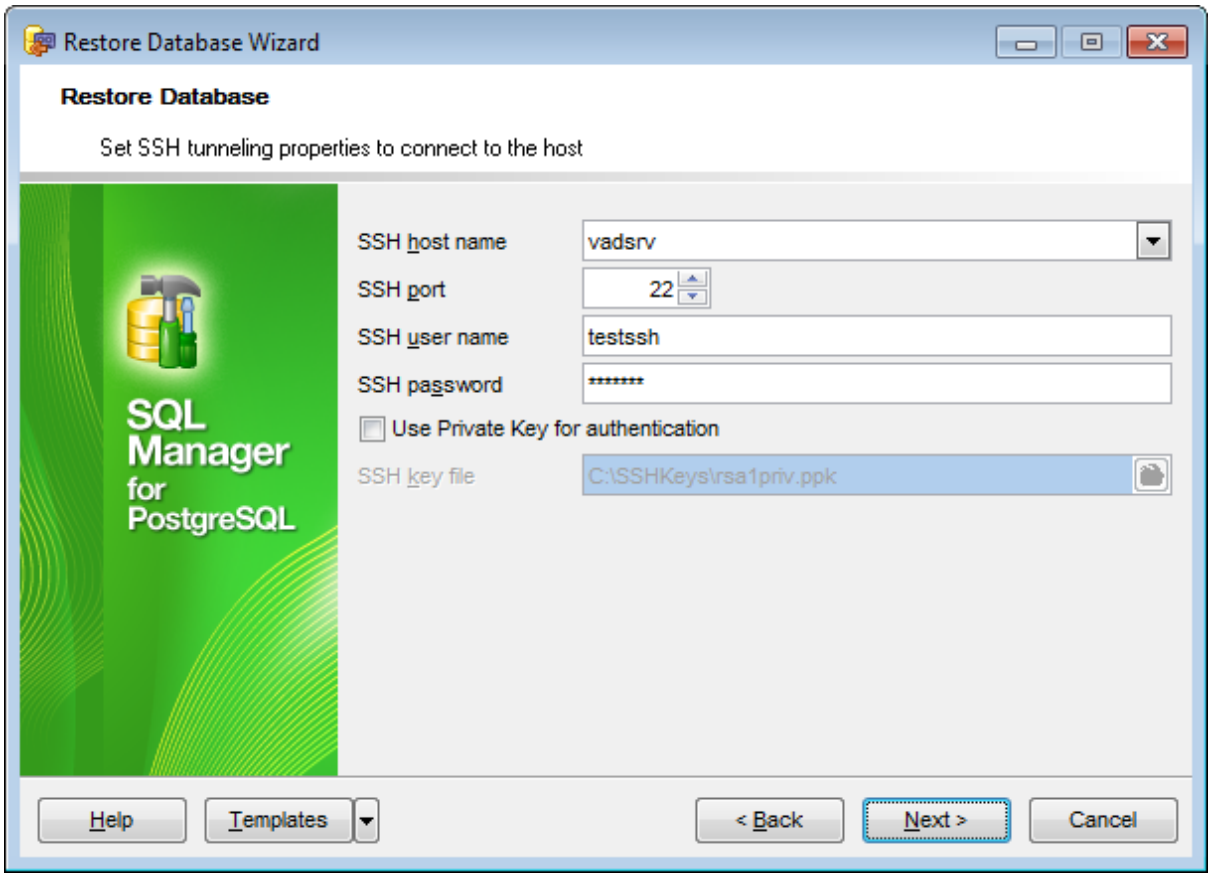
12.7.2 Specifying SSH tunneling parameters

This step appears only if you are performing restore operation of the database connected via SSH tunnel.
Here you are to specify the necessary parameters for connection with **SSH tunneling** used.

Specify **SSH host name**, **SSH port**, **SSH user name**, **SSH password**, the path to the **SSH key file** (if necessary) in the corresponding boxes.

See SSH connection properties 992 for details.



Click the **Next** button to proceed to the Selecting source file for restoring 824 step of the wizard.

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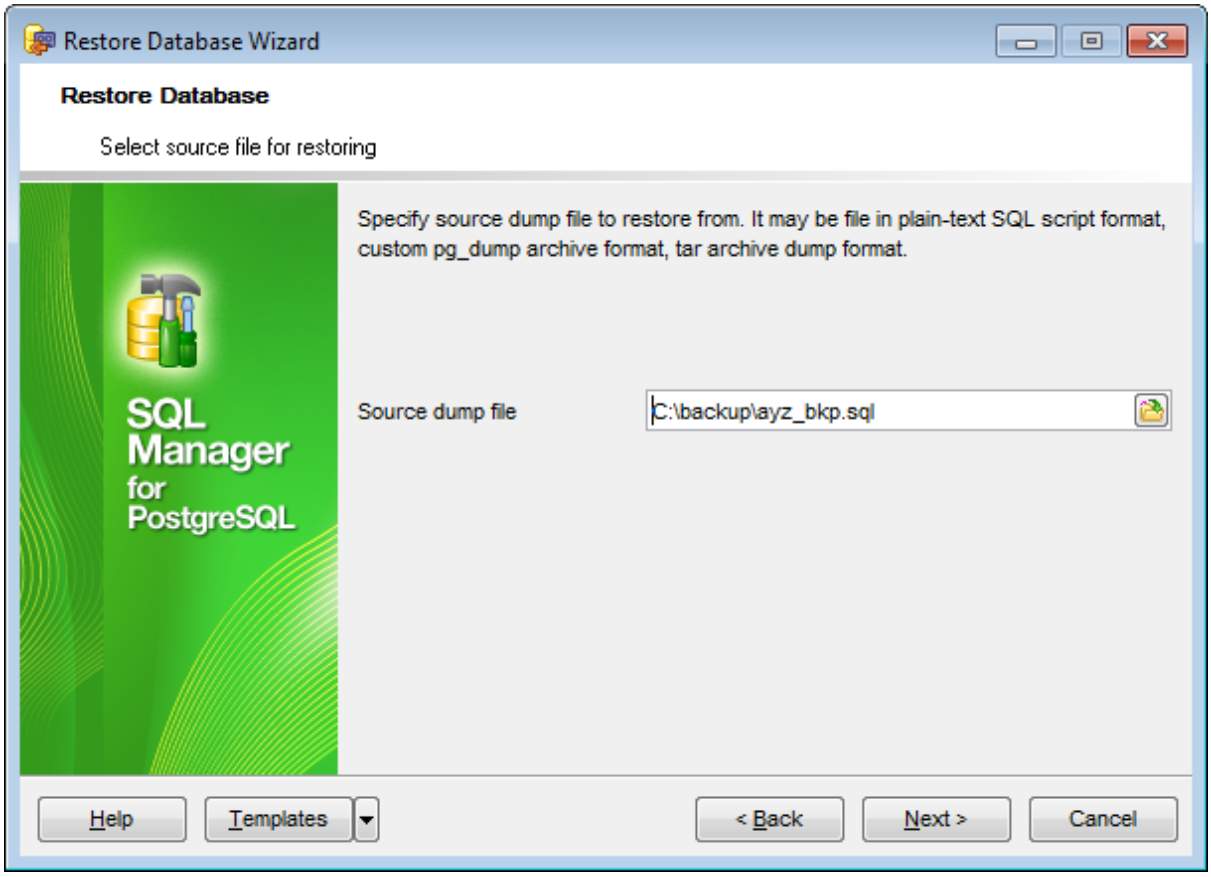
12.7.3 Selecting source file for restoring

This step of the wizard allows you to specify the *source dump file* for the database restore operation.



Source dump file
This control allows you to specify the source dump file for the restore operation. Depending on the specified backup file format[812], you should select a **sql*, **.dmp* or **.tar* file using the **Explorer** button.

Click the **Next** button to proceed to the Selecting restore type[826] step of the wizard.

Note: If you are restoring data from a plain-text SQL script, before you proceed to the next step, you will be offered to specify encoding[825] for the dump script.

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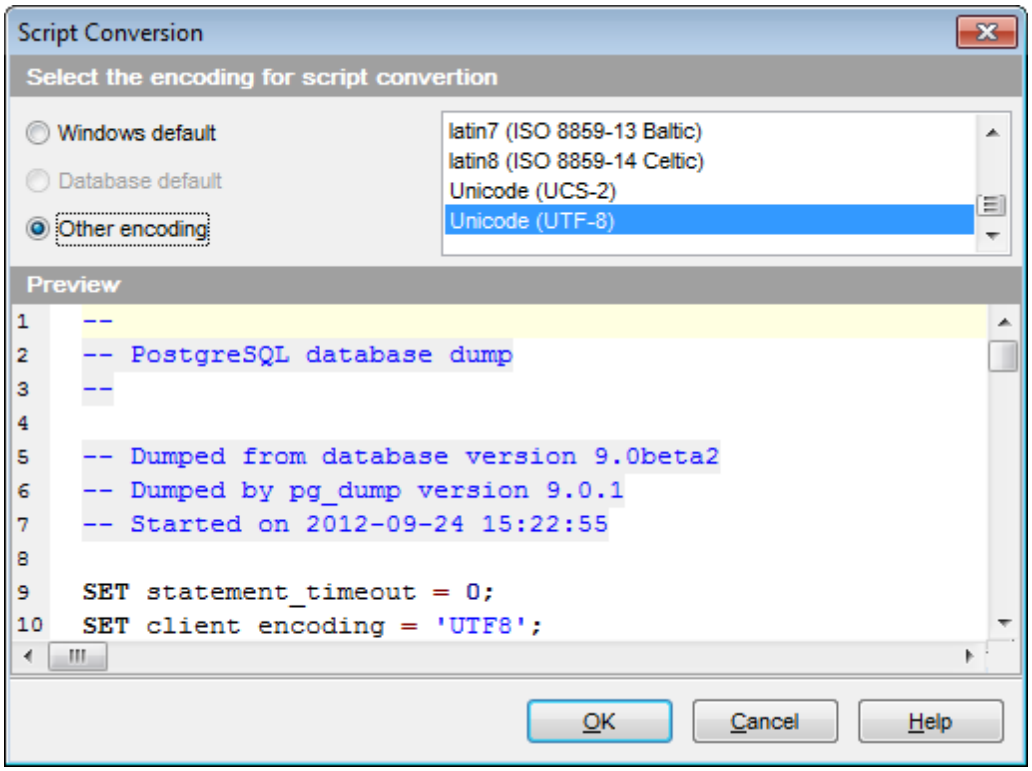
12.7.3.1 Script conversion

Before you proceed to the Selecting restore type 826 step, you can specify encoding for the dump script using the **Script Conversion** dialog.

Select the required encoding:
- *Windows default*
- *Database default* (disabled in this case)
- *Other encoding* (use the list on the right to select the encoding you need)

The **Preview** area allows you to browse the text of the dump script with the selected encoding applied, and edit the script text, if necessary.



Click **OK** to apply current settings and proceed to the Selecting restore type 826 step of the wizard.

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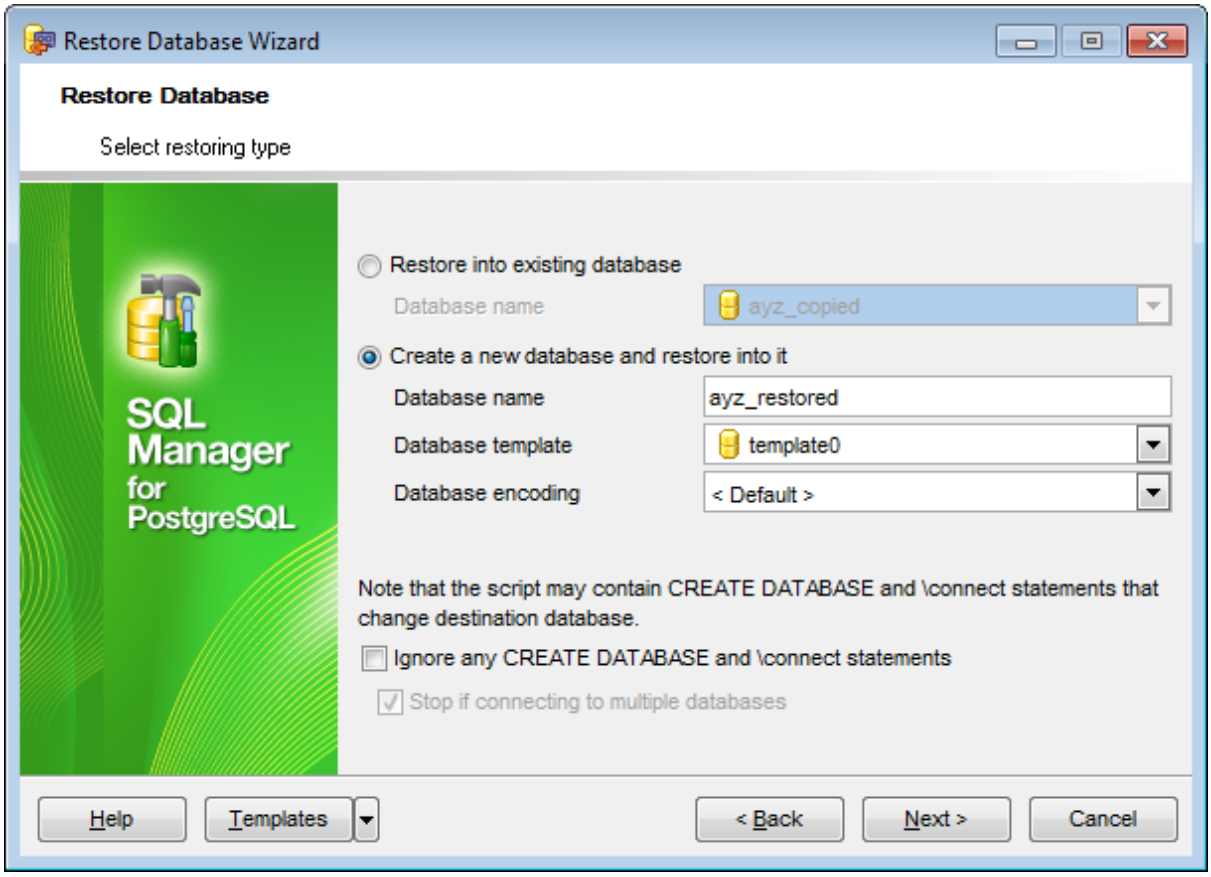
12.7.4 Selecting restore type

At this step of the wizard you need to select *restoring type*. Note that the set of available options depends on the source dump file[824] format and PostgreSQL version.



When restoring from a *plain-text SQL script*, set the following options:

Restore into existing database
Specifies that the backup copy will be restored into an existing database.

Database name
Use the drop-down list to select the database into which the backup script will be restored.

Create a new database and restore into it
Specifies that a new database will be created, and the backup copy will be restored into this database.

Database name
Enter a name for the new database to be created.

Database template
Use the drop-down list to select the database that will be used as a template for the new database.

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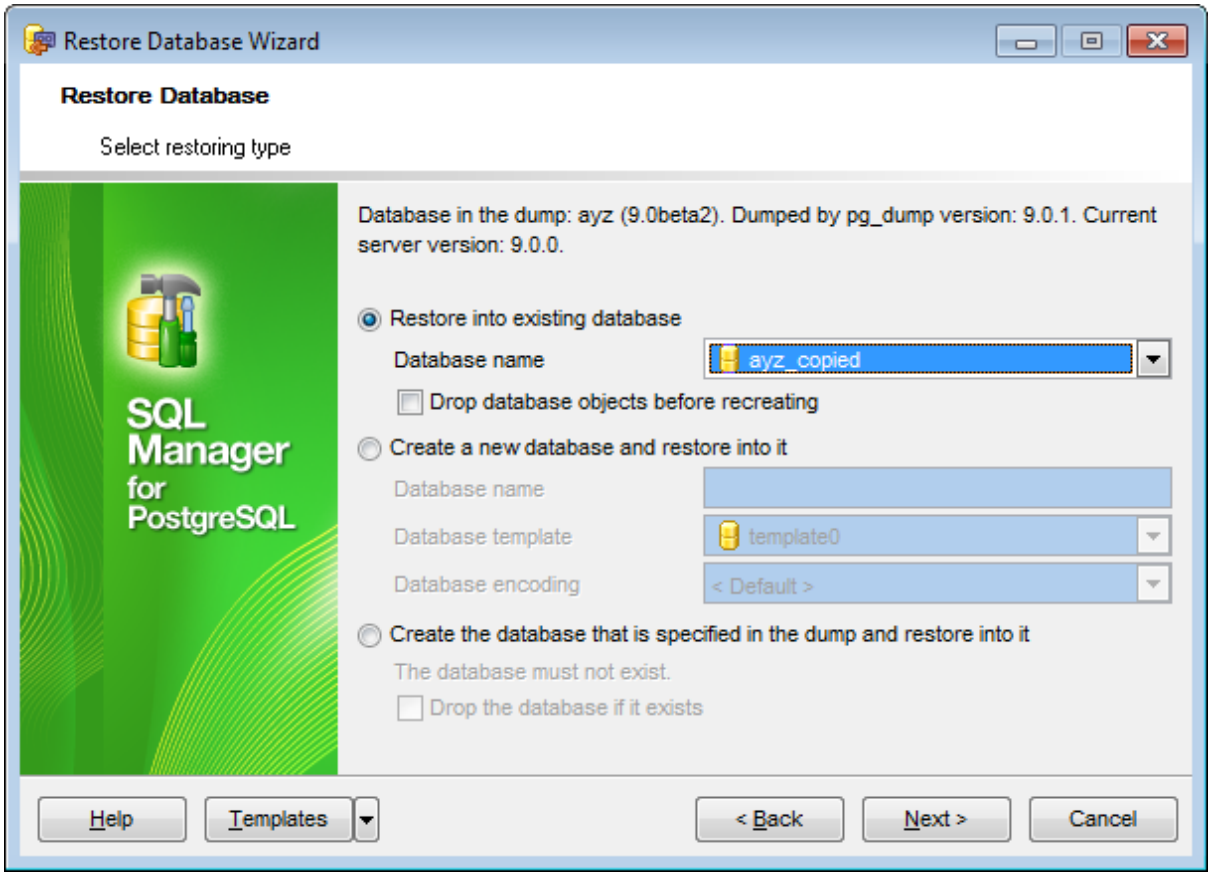
Database encoding
Use the drop-down list to select the encoding to be applied to the new database.

Ignore any CREATE DATABASE and \connect statements
If this option is selected, the *CREATE DATABASE* and *\connect* statements will be ignored while processing the backup archive.

Stop if connecting to multiple databases
If this option is selected, the restore operation will be stopped in case multiple database connections are detected.



When restoring from a *pg_dump archive* or a *Tar archive*, set the following options:

Restore into existing database
Specifies that the backup copy will be restored into an existing database.

Database name
Use the drop-down list to select the database into which the dump archive will be restored.

Drop database objects before recreating
Select this option to drop objects from the database before restoring.

Create a new database and restore into it

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Specifies that a new database will be created, and the backup copy will be restored into this database.

Database name
Enter a name for the new database to be created.

Database template
Use the drop-down list to select the database that will be used as a template for the new database.

Database encoding
Use the drop-down list to select the encoding to be applied to the new database.

Create the database that is specified in the dump and restore into it
The application will create the database that is specified in the dump archive, and the backup copy will be restored into this database.

Drop the database if it exists
Select this option to drop the existing database (if any).

Click the **Next** button to proceed to the Setting restore options for database objects 829 step of the wizard.

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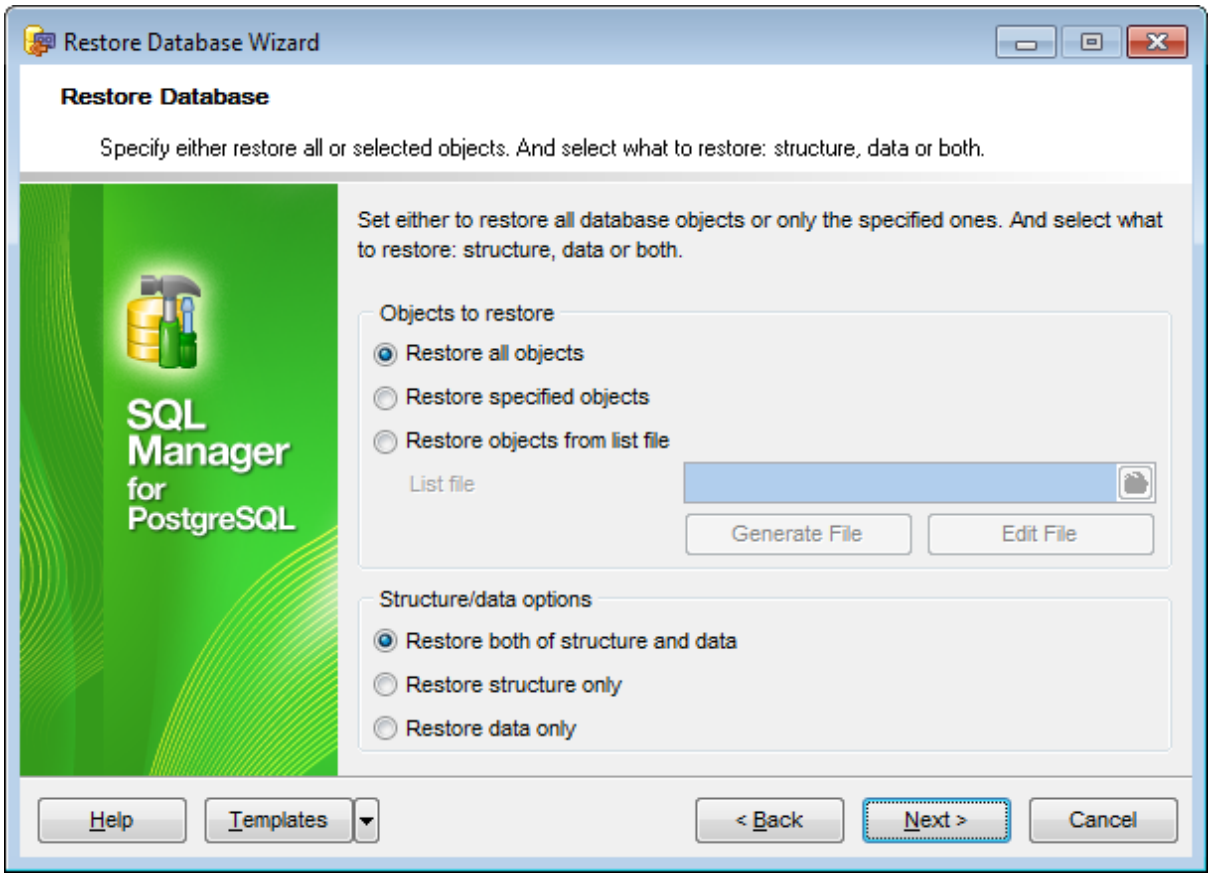
12.7.5 Setting restore options for database objects

Use this step of the wizard to specify *objects to restore* and *structure/data options*.

Note: This step is available if you restore database from a *pg_dump archive* or a *tar archive*.



Objects to restore

Use this group to specify whether all or specified objects are to be restored:
- *Restore all objects*
- *Restore specified objects*
- *Restore objects from list file*

List file

This box allows you to specify a file containing the list of objects to be restored. Type in or use the **Explorer** button to specify the path to this file on your local machine or on a machine in the LAN. If necessary, you can **Generate** and **Edit** this file using the corresponding buttons.

Structure/data options

Use this group to specify whether structure and/or data are to be restored:
- *Restore both structure and data*
- *Restore structure only*
- *Restore data only*

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Depending on whether you have selected to *Restore specified objects* or *Restore all objects / Restore objects from list file*, upon pressing the **Next** button you will either proceed to the next step of the wizard 831, or you will be immediately forwarded to the Setting additional restore options 833 step of the wizard.

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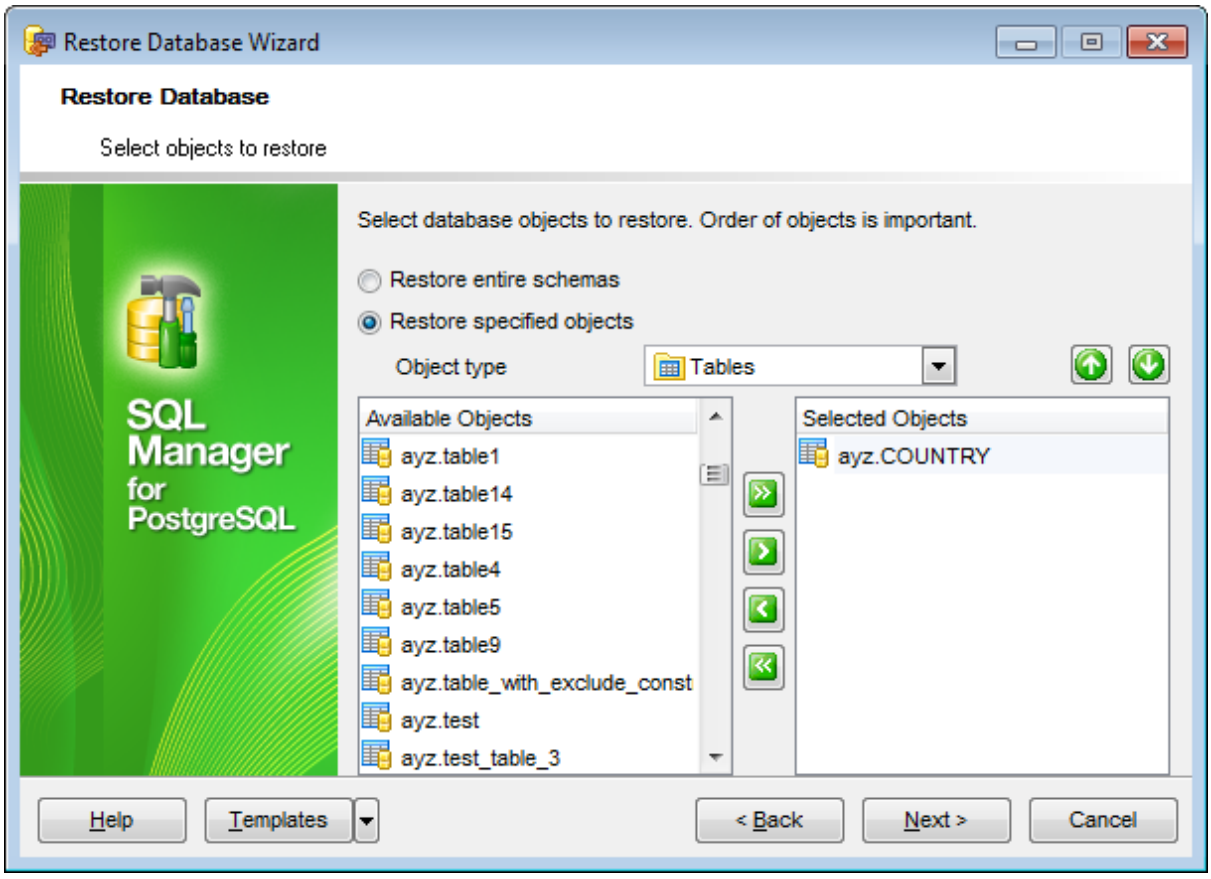
12.7.6 Selecting objects to restore

Use this step of the wizard to specify *objects to be restored*.

Note: This step is available if you restore database from a *pg_dump archive* or a *tar archive*.



Restore entire schemas
Adds all objects of a schema to the restore operation.

Restore specified objects
Adds only selected objects of specified type to the restore operation.

Object type
Use the drop-down list to select the type of objects to be restored.
To select an object, you need to move it from the **Available Objects** list to the **Selected Objects** list. Use the buttons or drag-and-drop operations to move the objects from one list to another.

If necessary, you can change the objects order: use the buttons or drag-and-drop operations within the **Selected Objects** list.

Click the **Next** button to proceed to the Setting additional restore options 833 step of the wizard.

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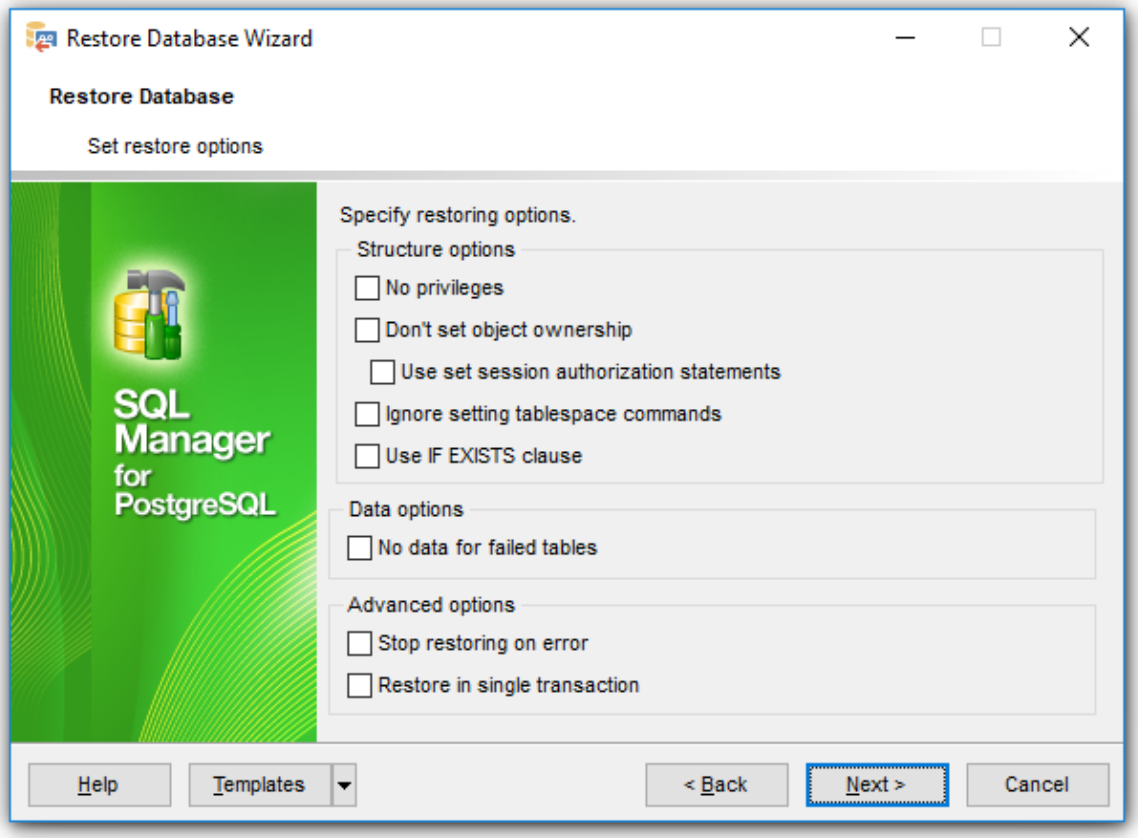
12.7.7 Setting additional restore options

This step allows you to set *additional options* that will be used to restore the database. Note that the set of available options depends on the source dump file[824] format and PostgreSQL version.



Structure options

No privileges
This option disables privilege allocation for database objects during the restore operation.

Don't set object ownership
This option disables object ownership statements for database objects during the restore operation.

Use set session authorization statements
If this option is selected, the currently set session authorization is used (available if the *Don't set object ownership* option is deselected).

Ignore settings tablespace commands
With this option, all objects will be created in whichever tablespace[318] is the default during restore.

Use IF EXISTS clause
Add IF EXISTS clause to metadata operations if applied.

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Data options

No data for failed tables
If this option is selected, table data will not be restored for the tables whose metadata failed to restore.

Don't add table access commands
Do not output commands to select table access methods. With this option, all objects will be created with whichever table access method is the default during restore.

Advanced options

Stop restoring on error
If this option is selected, the restore operation will be stopped when an error occurs.

Restore in single transaction
This option specifies restoring within a single transaction.

Don't add table access commands
This option disables table access method and all tables are created with the default access method.

Click the **Next** button to proceed to the next step 835 of the wizard.

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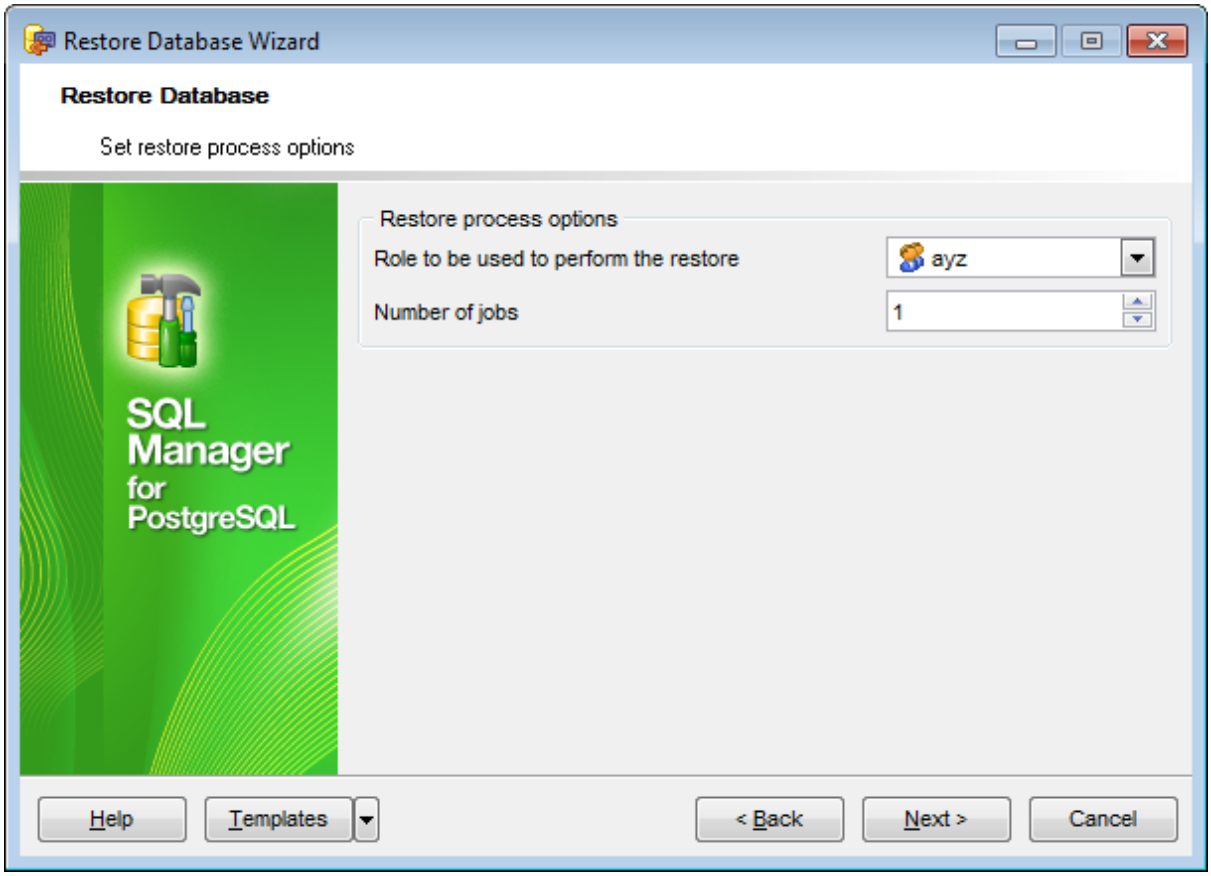
12.7.8 Setting restore process options

This step is available when you restore a PostgreSQL 8.4 database from a '*.tar*' or '*.dmp*' file.

Role to be used to perform the restore
Use this option to define the role that will be used to perform the restore operation.

Number of jobs
This option indicates the amount of threads used for the restore operation.



When you are done, click the **Next** button to proceed to the last step 836 of the wizard.

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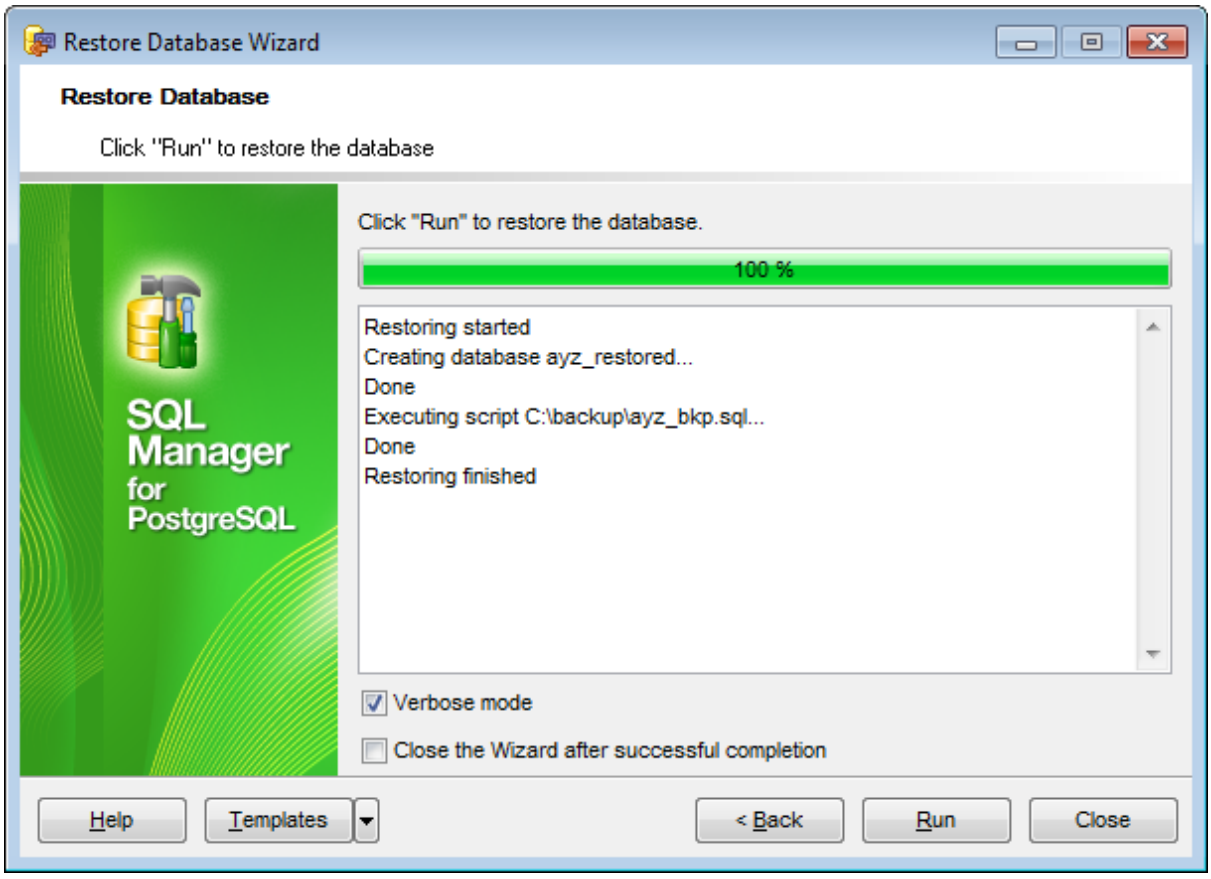
12.7.9 Running database restore

This step of the wizard is intended to inform you that all necessary options have been set, and you can start the restore database process.

The log area allows you to view the log of operations and errors (if any).



Verbose mode
This option specifies verbose mode, i.e. detailed object comments, start/stop times and progress messages to standard error will be displayed in the log area.

Close the Wizard after successful completion
If this option is selected, the wizard is closed automatically when the process is completed.

If necessary, you can save a template[982] for future use.

Click the **Run** button to run the restore database operation.

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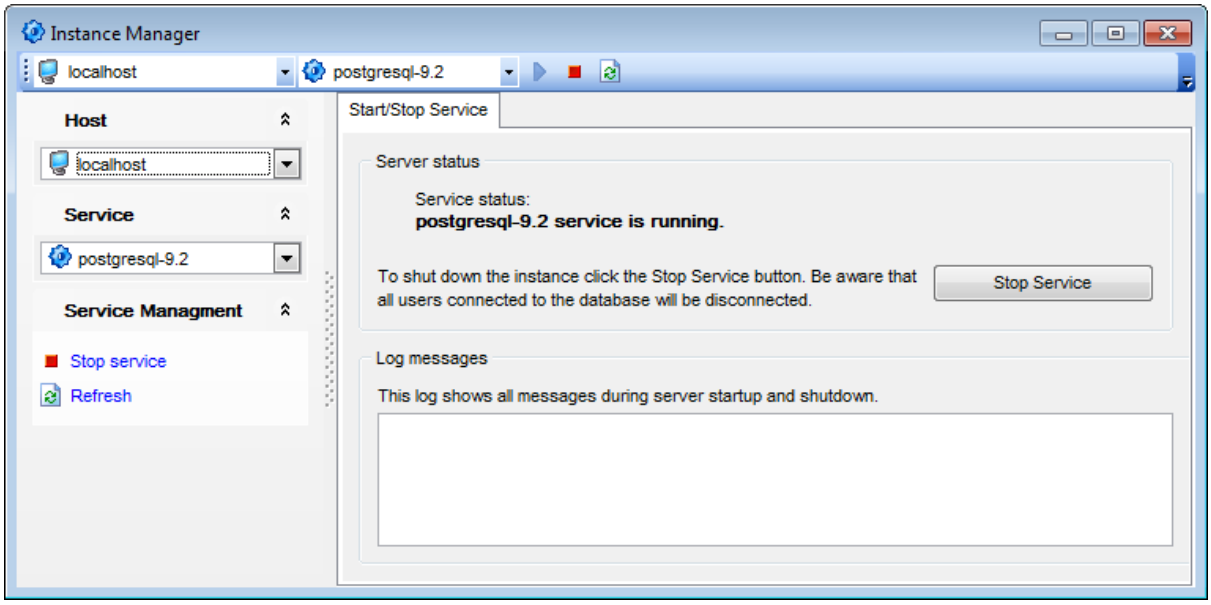
12.8 Instance Manager

This tool allows you to check PostgreSQL service status, to stop or start it. To launch this tool use the **Services | Instance Manager** item of main menu 961.



You can manage server instance by using navigation bar 838.
To shut down/startup the instance click the **Stop/Start Service** button. Be aware that all users connected to the databases will be disconnected.

Log messages
This log shows all messages during server startup and shutdown.

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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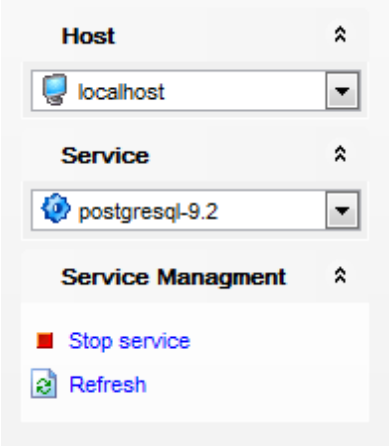
12.8.1 Using Navigation and Toolbar Bar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Instance Manager**.



The **Navigation bar** of the **Instance Manager** window allows you to:

Select server from the **Host** drop-down list;
Select **Service** from the corresponding drop-down list;

Start service;
Stop service;
Refresh - get actual statistics.

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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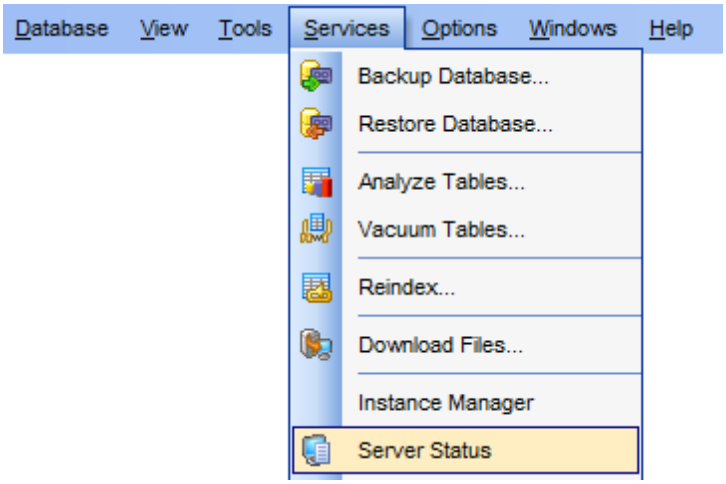
12.9 Server Status

The **Server Status** viewer allows you to get common information on current connections to the server, locks, prepared transactions, and to view server log files.

To open the **Server Status** viewer window, select the **Services | Server Status** main menu 961 item, or right-click the host alias in the DB Explorer 65 tree and select the **Tasks | Server Status** item from the context menu 52.

Note: Retrieving server status information is only available on PostgreSQL 7.4 and above.



- Using Navigation bar and Toolbar 840
- Viewing Connections 841
- Viewing Locks 843
- Managing Prepared Transactions 844
- Viewing Logfile 846

Availability:

Full version (for Windows)	**Yes**
Lite version (for Windows)	**No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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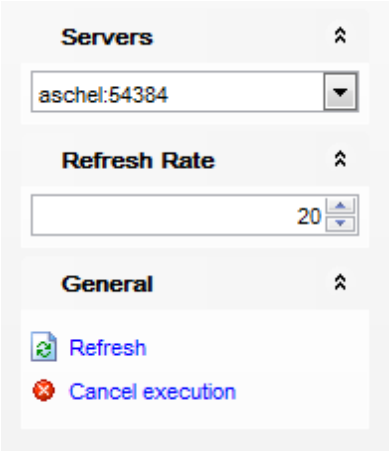
12.9.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Server Status**.



The **Navigation bar** of **Server Status** allows you to:

Servers
Select the registered server to view information about.

Refresh Rate
Type in or use the spinner controls to define the refresh periodicity (in seconds).

Log Date (on Logfile tab only)
Use the drop-down list to select the date for displaying logs.

General
- refresh the content of the active tab
- cancel execution
- rotate log (view the current log)
- view log options

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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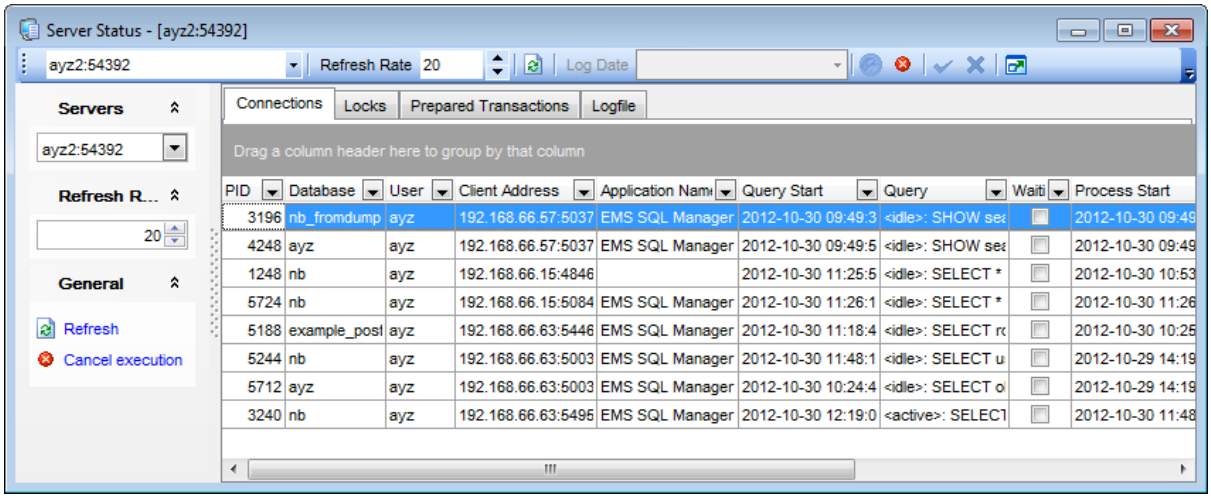
12.9.2 Viewing Connections

The **Connections** tab of the **Server Status** viewer is intended for viewing the current connections to each database on the specified host, the users, processes and other connection information.

Note: If you are not connected to the database server yet, select the host from the drop-down list on the Navigation bar 755 to define connection settings 976.



The list displays the connections as a grid with the following columns: *PID*, *Database*, *User*, *Client Address*, *Application Name*, *Query Start*, *Query*, *Process Start*. If more convenient, you can change the order 459 of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list or *cancel execution* of a query.

Connections view tools are also available through the **Navigation bar** and **Toolbar** of the **Server Status** viewer. Using the Navigation bar 961 and toolbar 963 you can also set the **Refresh Rate** for the connection list.

See also:

Locks 843

Prepared Transactions 844

Logfile 846

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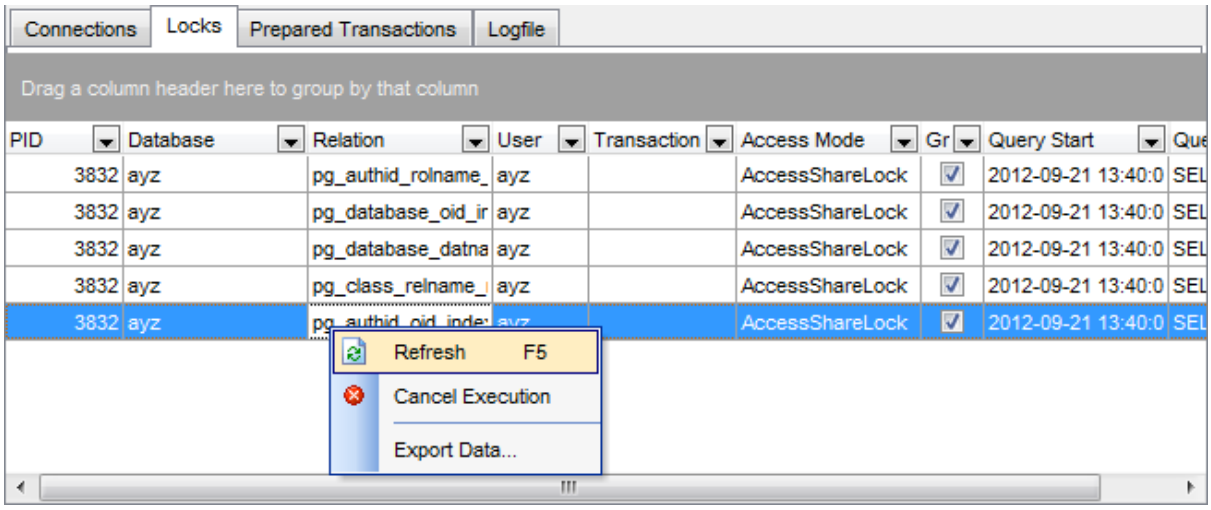
12.9.3 Viewing Locks

The **Locks** tab of the **Server Status** viewer displays the current locks outstanding in the PostgreSQL Lock Manager. This information can be useful when attempting to debug or track down deadlocks on your server.



The list displays the locks as a grid with the following columns: *PID*, *Database*, *Relation*, *User*, *Transaction*, *Access Mode*, *Granted*, *Query Start*, *Query*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list or *cancel execution* of a query.

Locks view tools are also available through the **Navigation bar** of the **Server Status** viewer. Using the Navigation bar you can also set the **Refresh Rate** for the lock list.

See also:

Connections[841]

Prepared Transactions[844]

Logfile[846]

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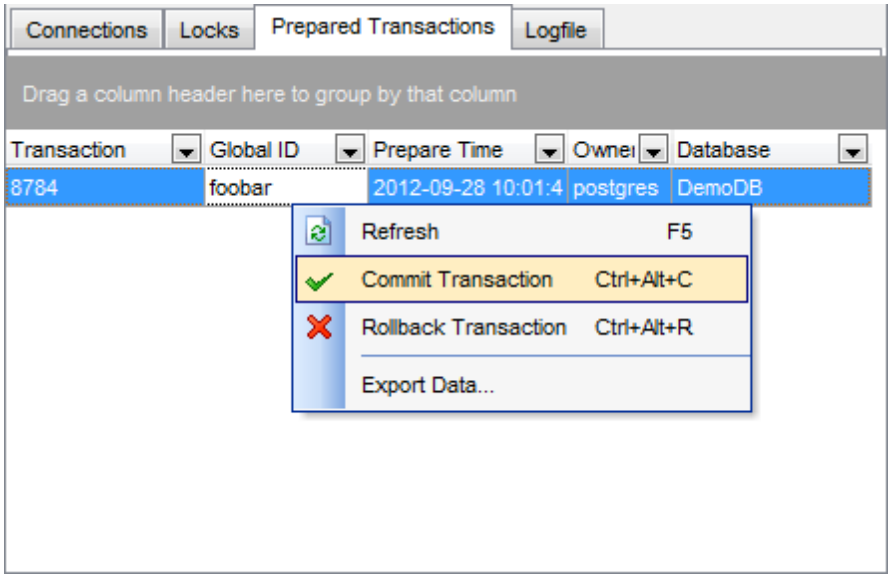
12.9.4 Managing Prepared Transactions

The **Prepared Transactions** tab of the **Server Status** viewer allows you to browse the list of outstanding prepared transactions. Prepared transactions are an aspect of Two Phase Commit (2PC), used in distributed transaction managers. Normally, prepared transactions are handled by the transaction manager. In case of a failure, it might be necessary to commit or rollback a transaction manually; use the **Commit transaction** or **Rollback transaction** items on the general bar to do that.

Note: This tab is only available for running PostgreSQL server version 8.1 or higher.



The list displays the prepared transactions as a grid with the following columns: *Transaction*, *Global ID*, *Prepare Time*, *Owner*, *Database*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list or *commit/rollback* a transaction.

Transaction management tools are also available through the **Navigation bar** of the **Server Status** viewer. Using the Navigation bar you can also set the **Refresh Rate** for the transactions list.

See also:

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Connections 841
Locks 843
Logfile 846

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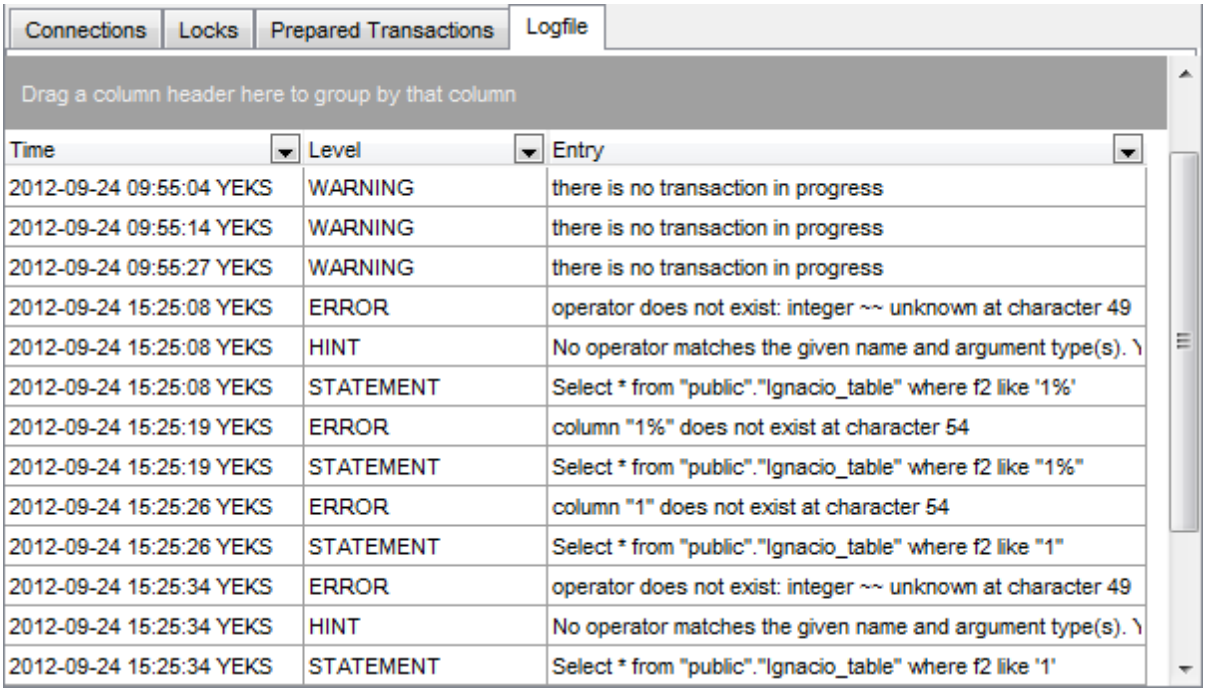
12.9.5 Viewing Logfile

The **Connections** tab of the **Server Status** viewer lists server log files, if configured in *postgresql.conf* (*redirect_stderr* = true, *log_destination*='stderr' and *log_filename* ='postgresql-%Y-%m-%d_%H%M%S.log'). SQL Manager will also extract a time stamp from the logfile in a separate column, if the *log_line_prefix* is configured accordingly.

Note: This tab is only available for running PostgreSQL server version 8.1 or higher.



Time	Level	Entry
2012-09-24 09:55:04 YEKS	WARNING	there is no transaction in progress
2012-09-24 09:55:14 YEKS	WARNING	there is no transaction in progress
2012-09-24 09:55:27 YEKS	WARNING	there is no transaction in progress
2012-09-24 15:25:08 YEKS	ERROR	operator does not exist: integer ~~ unknown at character 49
2012-09-24 15:25:08 YEKS	HINT	No operator matches the given name and argument type(s). Y
2012-09-24 15:25:08 YEKS	STATEMENT	Select * from "public"."Ignacio_table" where f2 like '1%'
2012-09-24 15:25:19 YEKS	ERROR	column "1%" does not exist at character 54
2012-09-24 15:25:19 YEKS	STATEMENT	Select * from "public"."Ignacio_table" where f2 like "1%"
2012-09-24 15:25:26 YEKS	ERROR	column "1" does not exist at character 54
2012-09-24 15:25:26 YEKS	STATEMENT	Select * from "public"."Ignacio_table" where f2 like "1"
2012-09-24 15:25:34 YEKS	ERROR	operator does not exist: integer ~~ unknown at character 49
2012-09-24 15:25:34 YEKS	HINT	No operator matches the given name and argument type(s). Y
2012-09-24 15:25:34 YEKS	STATEMENT	Select * from "public"."Ignacio_table" where f2 like '1'

The list displays the log entries as a grid with the following columns: *Time*, *Level*, *Entry*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list or *rotate* the selected log (i.e. start logging to a new log file).

Log management tools are also available through the **Navigation bar** of the **Server Status** viewer. Using the Navigation bar you can also set the **Refresh Rate** for the Logfile list, or filter the list by a time stamp using the **Log Date** drop-down list.

If necessary, you can configure **Log Options** using the corresponding item of the **Navigation bar**.

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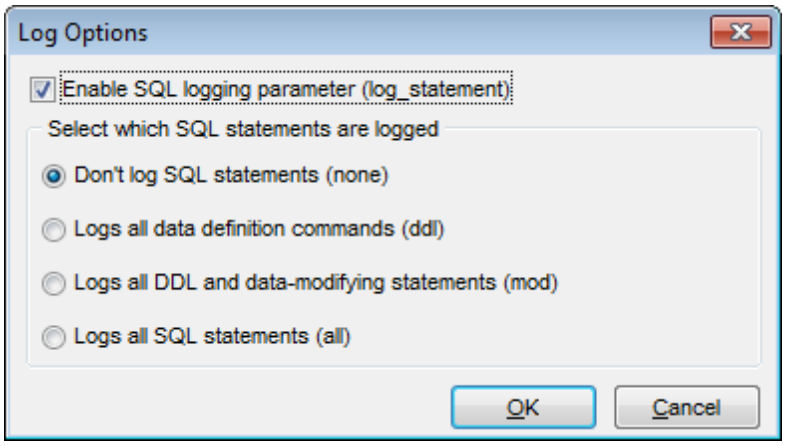

Select the **Enable SQL logging parameter (log_statement)** option and specify *which SQL statements will be logged*:

- *none (don't log SQL statements)*
- *DDL (logs all data definition commands)*
- *mod (logs all DDL and data-modifying statements: INSERT, UPDATE, DELETE, etc.)*
- *all (logs all SQL statements)*

See also:

Connections 841
Locks 843
Prepared Transactions 844

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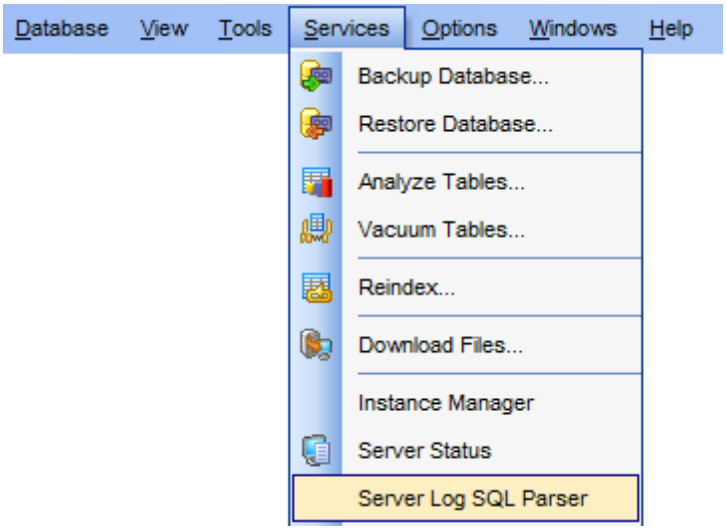
12.10 Server Log SQL Parser

Server Log SQL Parser allows you to analyze PostgreSQL server logs in a simple way providing the ability to sort, filter and group log statements.

To launch the tool, select the **Services | Server Log SQL Parser** main menu 961 item.



- Using Navigation bar and Toolbar 849
- Working with Server Log SQL Parser 850

Availability:
Full version (for Windows) **Yes**
Lite version (for Windows) **No**
Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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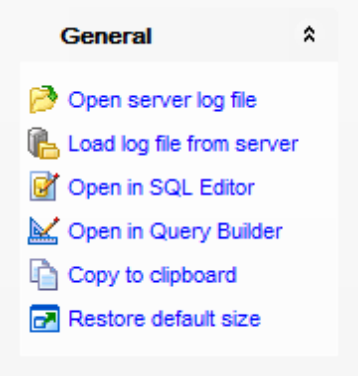
12.10.1 Using Navigation bar and Toolbar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Server Log SQL Parser**.



The **Navigation bar** of **Server Log SQL Parser** allows you to:

General

- open an external server log file
- load a log file from server using Download File Wizard 788
- open a log entry in Query Data 415
- open a log entry in Design Query 431
- copy the selected log entry to clipboard
- restore the default size and position of the window

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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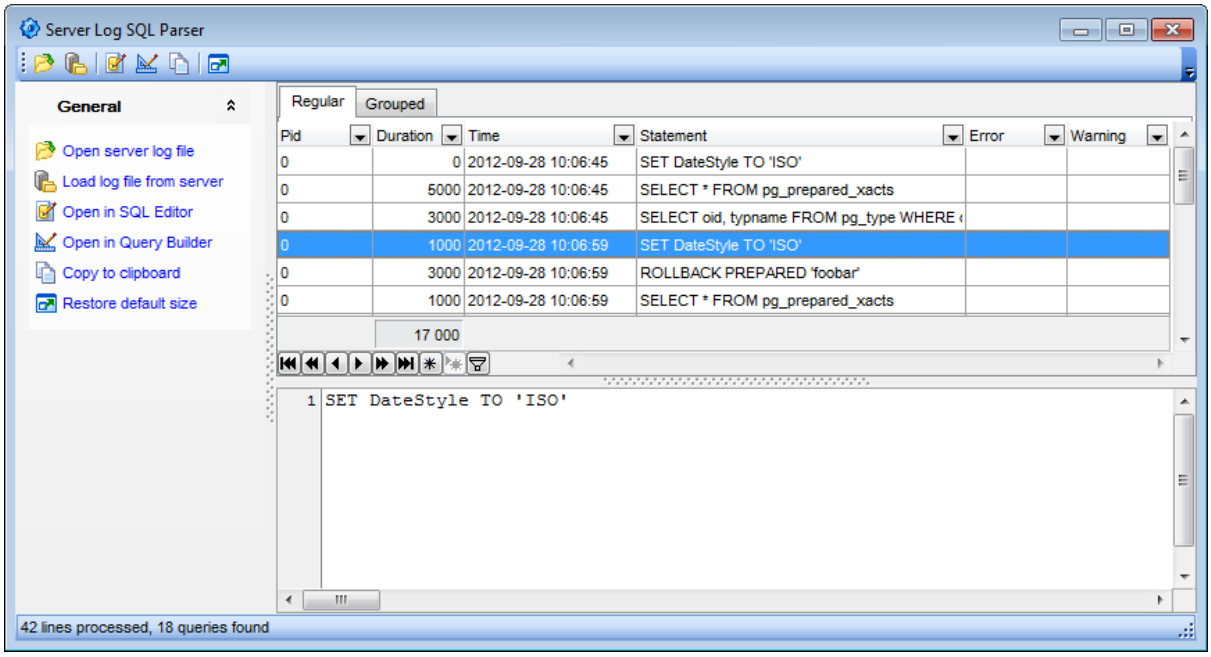
12.10.2 Working with Server Log SQL Parser

The **Server Log SQL Parser** window displays the list of server logs as a grid, and allows you to manage them efficiently.



Only logs containing SQL statements can be opened in **Server Log SQL Parser**. In order SQL statements to be logged to server logs you need to set the following parameters in PostgreSQL configuration file:

- log_statement = 'all'
- logging_collector = on
- log_min_duration_statement = 0

The list displays the server logs as a grid with the following columns: *Pid*, *Duration*, *Time*, *Statement*, *Error*, *Warning*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Right-click an item within the list to call the **context menu** allowing you to *open* a log in Query Data[415] and copy the selected log to Windows clipboard.

Server logs management tools are also available through the Navigation bar[849] of **Server Log SQL Parser**.

For your convenience several navigation and filtering facilities are implemented: you can navigate and filter log entries in grid using the corresponding buttons below. For details see Filtering records[463].

The lower area displays the full statement for the currently selected log entry.

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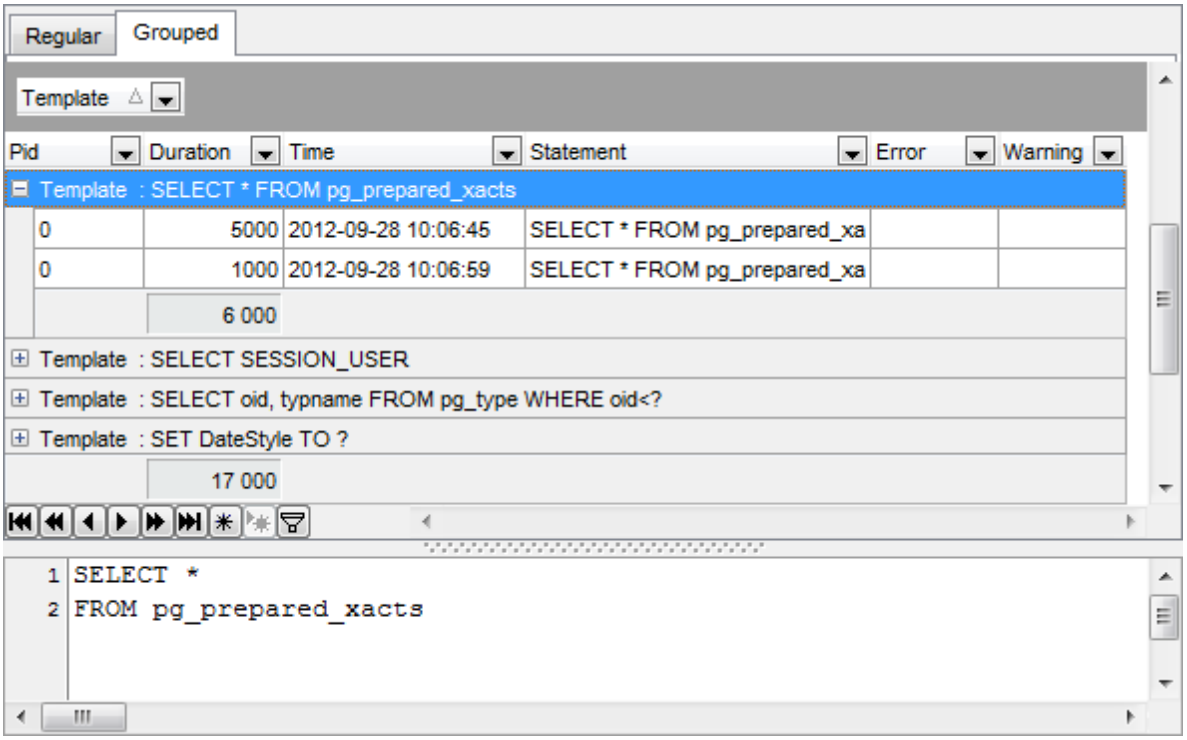
For your convenience the **Grouped** tab of the **Server Log SQL Parser** provides all statements grouped by the template. That is the default grouping and you can change it if you want.



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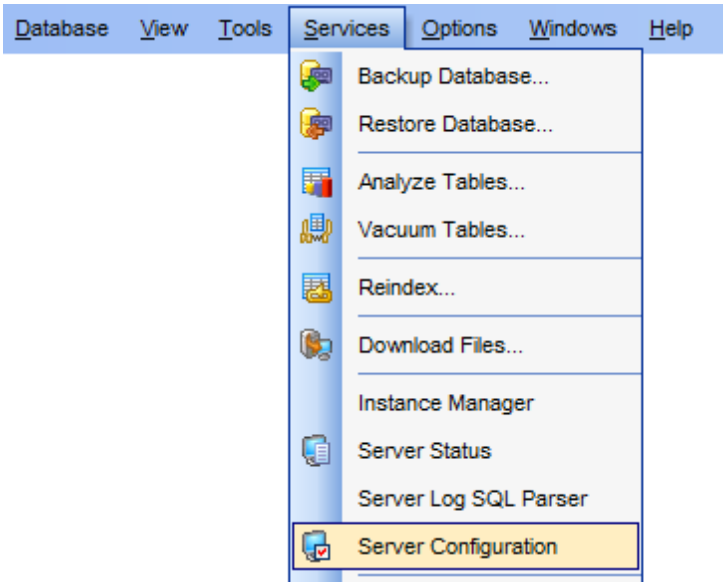
12.11 Server Configuration

SQL Manager for PostgreSQL provides a useful and effective service - the ability to view and change server configuration. There are many configuration parameters that affect the behavior of the database system which can be set up via **Server Configuration** manager.

Using the tabs of the **Server Configuration** manager you can view/edit a number of server parameters and options which can be changed to optimize PostgreSQL server performance.

To launch the tool, select the **Services | Server Configuration** main menu 961 item, or right-click the host alias in the DB Explorer 65 tree and select the **Server Configuration** item from the context menu 52.



- Viewing Parameters 853
- Modifying Role Settings 855
- Setting up Configuration Files 857
- Changing Host-Based Authentication File 859
- Changing Ident File 862

Availability:

Full version (for Windows) **Yes**

Lite version (for Windows) **No**

Note: To compare all features of the **Full** and the **Lite** versions of SQL Manager, refer to the Feature Matrix 22 page.

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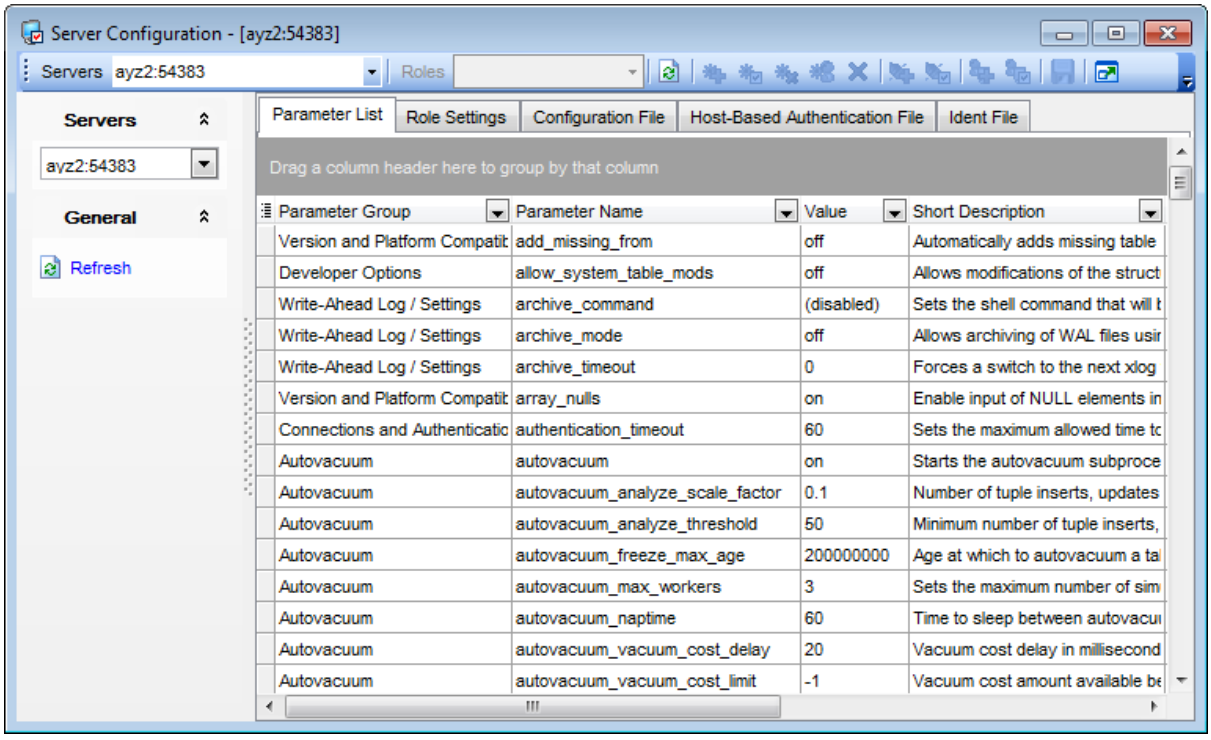
12.11.1 Viewing Parameters

The **Parameter List** tab of the **Server Configuration** manager allows you to view current parameters of your PostgreSQL. It displays a number of configuration parameters that affect the behavior of the database system. To obtain more information on specific parameters, refer to PostgreSQL documentation.

Note: If you are not connected to the database server yet, select the host from the drop-down list on the Navigation bar[755] to define connection settings[976].



The **Parameter List** displays the parameters as a grid with the following columns: *Parameter Name*, *Value*, *Short Description*, *Extra Description*, *Context*, *Type*, *Source*, *Minimum*, *Maximum*, *Parameter Group*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

Note: Only parameters with "user" or "superuser" values of the *Context* field can be redefined.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list.

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See also:

Modifying Role Settings 855
Setting up Configuration Files 857
Changing Host-Based Authentication File 859
Changing Ident File 862

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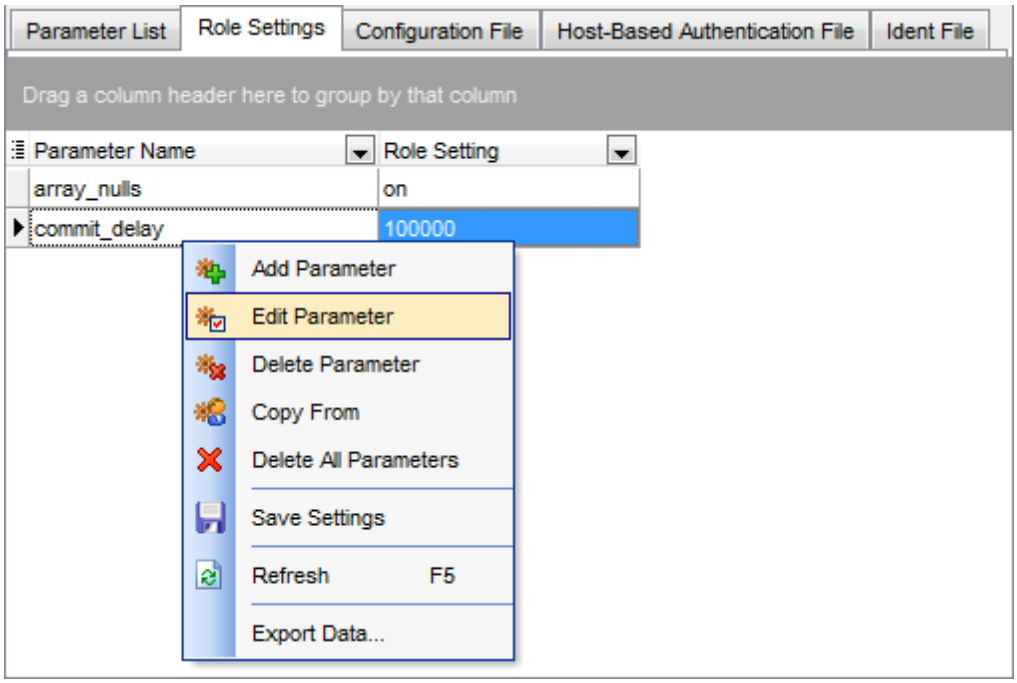
12.11.2 Modifying Role Settings

The **Role Settings** tab of the **Server Configuration** manager provides the ability to define specific server parameters for a role according to your needs. To obtain more information on specific parameters, refer to PostgreSQL documentation.

Use the **Roles** pane on the **Navigation bar** to select the PostgreSQL role[751].



The **Role Settings** list displays the parameters as a grid with the following columns: *Parameter Name*, *Role Setting*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list, *add/edit/remove* a parameter, *copy* parameters from one role to another, *delete all* parameters, *save* the settings.

Role tools are also available through the **Navigation bar** of the **Server Configuration** manager.

See also:

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Viewing Parameters 853
Setting up Configuration Files 857
Changing Host-Based Authentication File 859
Changing Ident File 862

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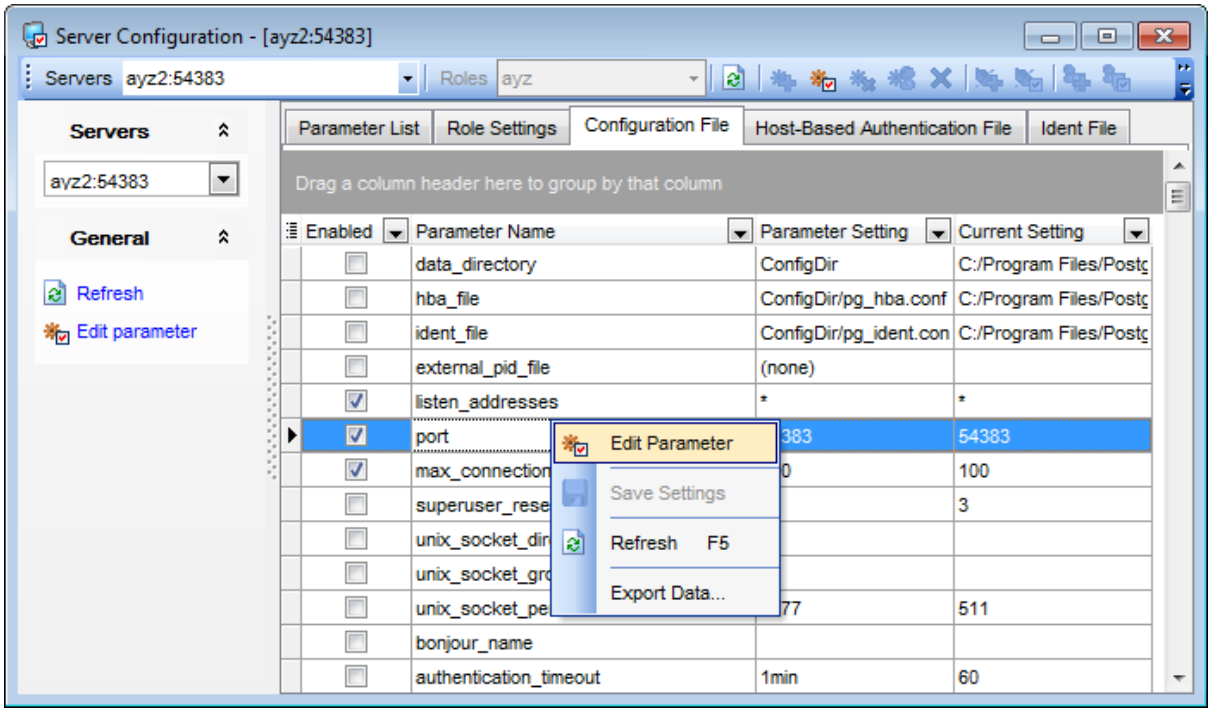
12.11.3 Setting up Configuration Files

The **Configuration File** tab of the **Server Configuration** manager allows you to edit parameters set starting and run-time parameters.

Common PostgreSQL configuration information is typically stored in *postgresql.conf* file. Each parameter can be edited and enabled for the database system to take effect. To obtain more information on specific parameters, refer to PostgreSQL documentation.



The **Configuration File** displays the configuration parameters as a grid with the following columns: *Enabled*, *Parameter Name*, *Parameter Setting*, *Current Setting*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list, *edit* a parameter, or *save* current settings.

Configuration file management tools are also available through the **Navigation bar** of the **Server Configuration** manager.

The **Edit Parameter** dialog allows you to change the *parameter name*, set its *value*,

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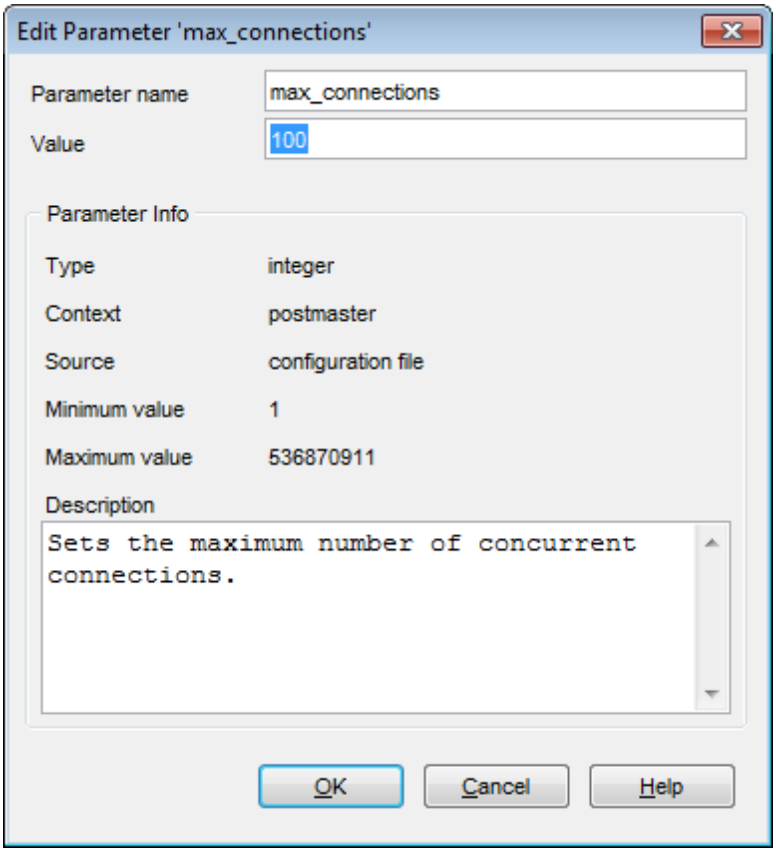
browse *parameter info* and supply a *description*, if necessary.



See also:

Viewing Parameters 853
Modifying Role Settings 855
Changing Host-Based Authentication File 859
Changing Ident File 862

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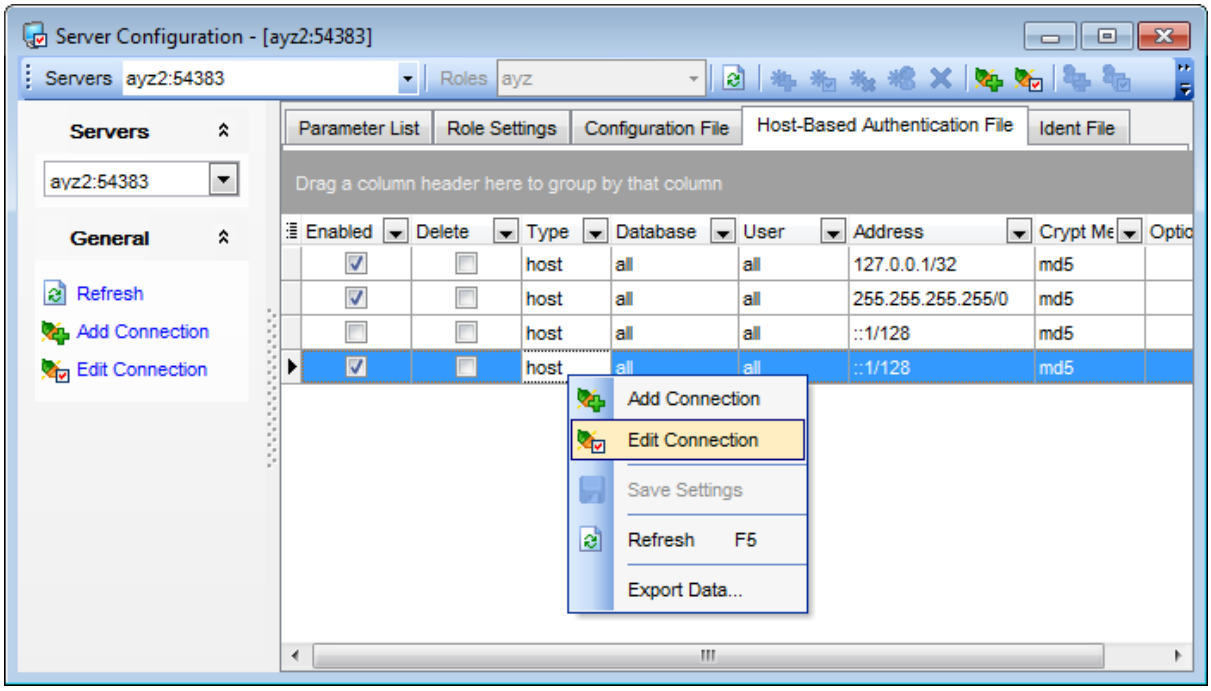
12.11.4 Changing HBA File

The **Host-Based Authentication File** tab of the **Server Configuration** manager allows you to set parameters for Host-Based authentication.

In addition to the *postgresql.conf* file already mentioned, PostgreSQL uses two other configuration files which control client authentication - *pg_hba.conf* and *pg_ident.conf*. Each parameter can be edited and enabled for the database system to take effect. To obtain more information on specific parameters, refer to PostgreSQL documentation.



The **Host-Based Authentication File** list displays the parameters as a grid with the following columns: *Enabled*, *Delete*, *Type*, *Database*, *User*, *Address*, *Crypt Method*, *Option* . If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list, *add/edit* a connection, or *save* current settings.

With the help of General bar you can **Add** or **Edit** selected connections; to edit an existing connection simply double-click it.

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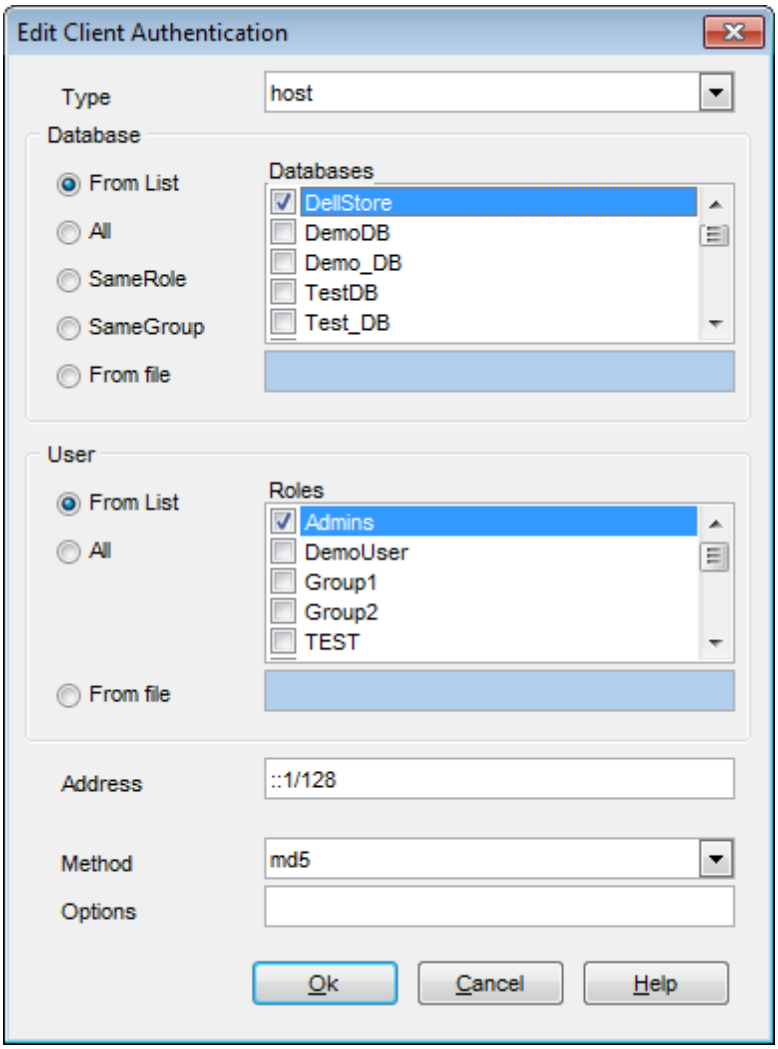

Type

local
This record matches connection attempts using Unix-domain sockets.
host
This record matches connection attempts made using TCP/IP. Host records match either SSL or non-SSL connection attempts.
hostssl
This record matches connection attempts made using TCP/IP, but only when the connection is made with SSL encryption.
hostnossl
This record type has the opposite logic to *hostssl*: it only matches connection attempts made over TCP/IP that do not use SSL.

Database
Specifies which database names this record matches.

User

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Specifies which database role[751] names this record matches.

Address
Specifies the client machine IP address range that this record matches.

Method
Specifies the authentication method to use when connecting via this record.

trust
Allow the connection unconditionally. This method allows anyone that can connect to the PostgreSQL database server to login as any PostgreSQL user they like, without the need for a password.

reject
Reject the connection unconditionally. This is useful for "filtering out" certain hosts from a group.

md5
Require the client to supply an MD5-encrypted password for authentication.

crypt
Require the client to supply a crypt()-encrypted password for authentication.
Note: this option is recommended only for communicating with pre-7.2 clients.

password
Require the client to supply an unencrypted password for authentication.

krb5
Use Kerberos V5 to authenticate the user. This is only available for TCP/IP connections.

ident
Obtain the operating system user name of the client and check if the user is allowed to connect as the requested database user by consulting the map specified after the ident key word.

pam
Authenticate using the Pluggable Authentication Modules (PAM) service provided by the operating system.

To obtain more information on specific parameters, refer to PostgreSQL documentation.

See also:
Viewing Parameters[853]
Modifying Role Settings[855]
Setting up Configuration Files[857]
Changing Ident File[862]

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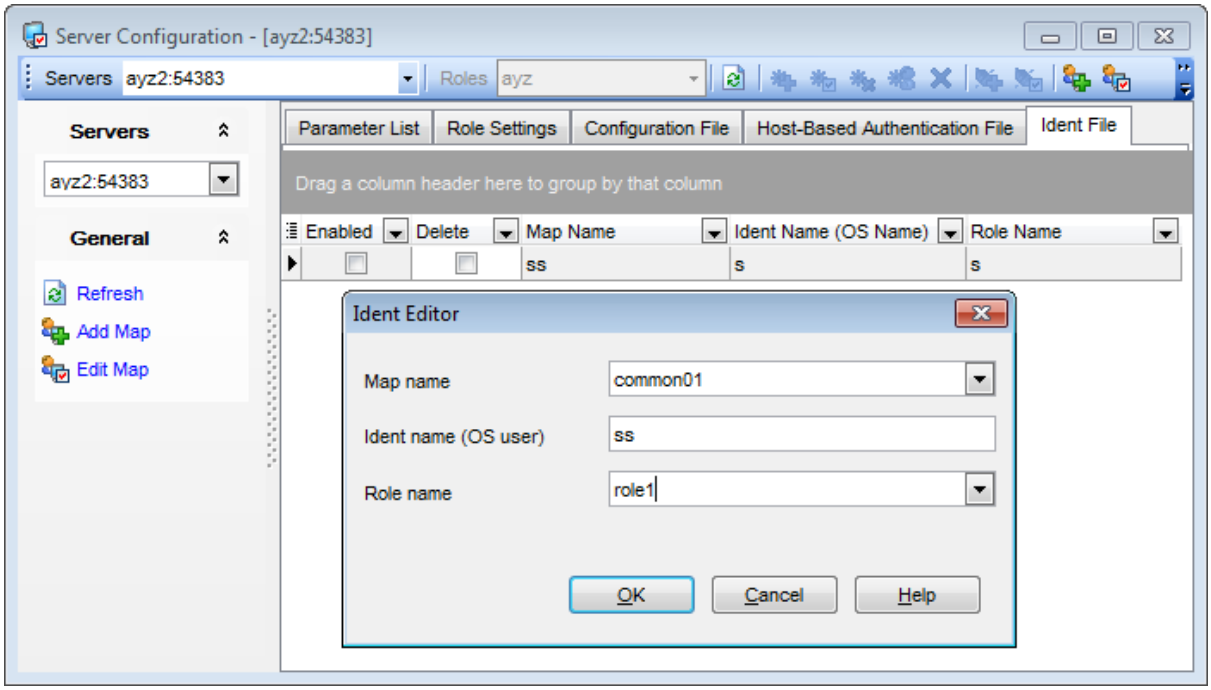
12.11.5 Changing Ident File

The **Ident File** tab of the **Server Configuration** manager allows you to configure ident-based authentication.

In addition to the *postgresql.conf* file already mentioned, PostgreSQL uses two other configuration files which control client authentication - *pg_hba.conf* and *pg_ident.conf*. Each parameter can be edited and enabled for the database system to take effect. To obtain more information on specific parameters, refer to PostgreSQL documentation.

Using of Ident method on editing client authentication means to obtain the operating system user name of the client (for TCP/IP connections by contacting the ident server on the client, for local connections by getting it from the operating system) and check if the user is allowed to connect as the requested database user[751] by consulting the map specified after the ident key word.

When using ident-based authentication, after having determined the name of the operating system user that initiated the connection, PostgreSQL checks whether that user is allowed to connect as the database user he is requesting to connect as. This is controlled by the ident map argument that follows the ident key word in the *pg_hba.conf* file.



The **Ident File** displays the parameters as a grid with the following columns: *Enabled*, *Delete*, *Map Name*, *Ident Name (OS Name)*, *Role Name*. If more convenient, you can change the order[459] of the columns by dragging their headers horizontally.

Click a column caption to **sort** items by values of this column in the ascending or the descending mode.

If necessary, you can **group the data in grid** by any of the columns. This operation is

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performed by dragging the column header to the gray **"Group by" box** area at the top. When grouping by a column is applied to the grid, all the rows are displayed as subnodes to the grouping row value. To reverse grouping, just drag the column header back.

Right-click an item within the list to call the **context menu** allowing you to *refresh* the list, *add/edit* map, or *save* current settings.

See also:

Viewing Parameters 853
Modifying Role Settings 855
Setting up Configuration Files 857
Changing Host-Based Authentication File 859

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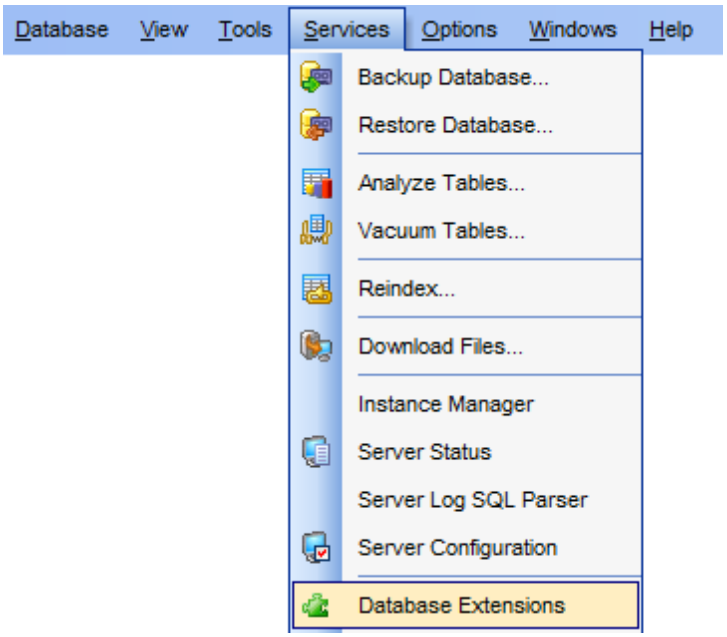
12.12 Extensions

Extensions are packages, which contain multiple SQL objects.
An extension to PostgreSQL typically includes multiple SQL objects: a new data type will require new functions, new operators, and probably new index operator classes. It is convenient to collect all these objects into a single package to simplify database management.

This tool is available only for Postgres SQL Server ver. 9.1 and above.
To open the **Extensions** window, select the **Services | Database Extensions** main menu[961] item, or right-click the database alias in the DB Explorer[65] tree and select the **Tasks | Database Extensions** item from the context menu[54].



All available extensions are displayed in this dialog.

You can manage server extensions by using navigation bar[866] or context menu.

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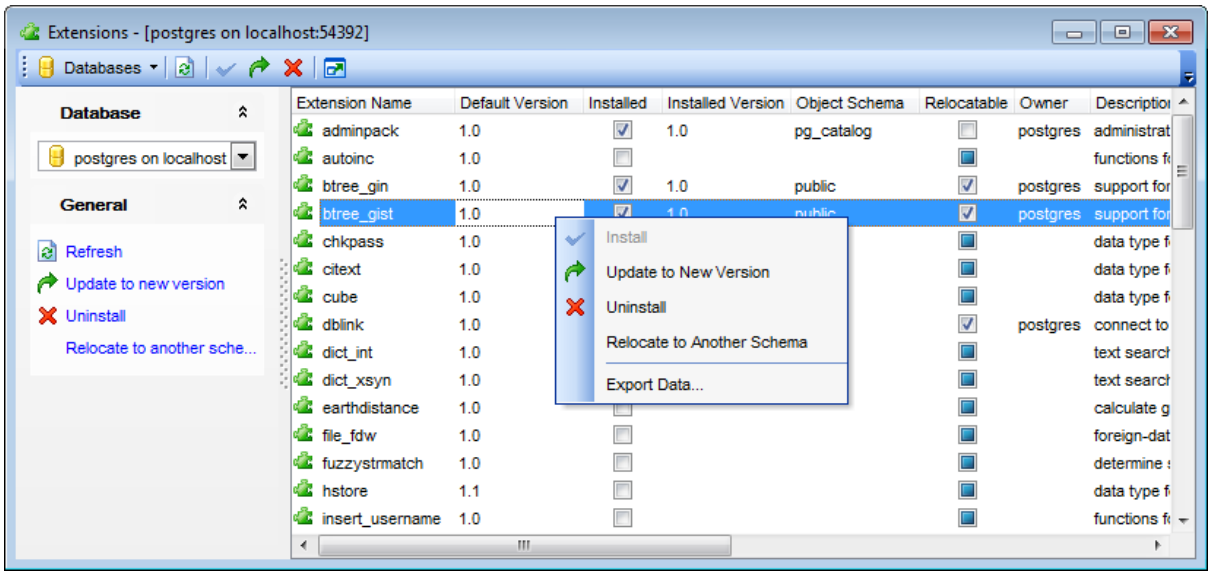

Extension properties:
Extension Name
Default version
Installed
Installed version
Object Schema
Relocatable
Owner
Description
Config Tables

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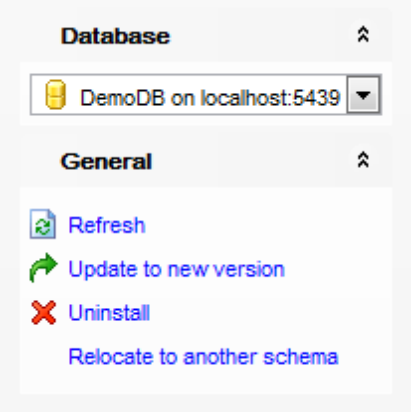
12.12.1 Using Navigation and Toolbar Bar

The **Navigation bar** and **Toolbar** provide quick access to tools implemented in **Extensions**.



Database
select a database for extension installing

General
Refresh the extensions list
Install 867 selected extension This item is only available for non-installed extensions.
Update 867 to new version
Uninstall selected extension
- Relocate to another schema

NB: You can enable\disable Toolbars and Navigation bars at Environment options 877.

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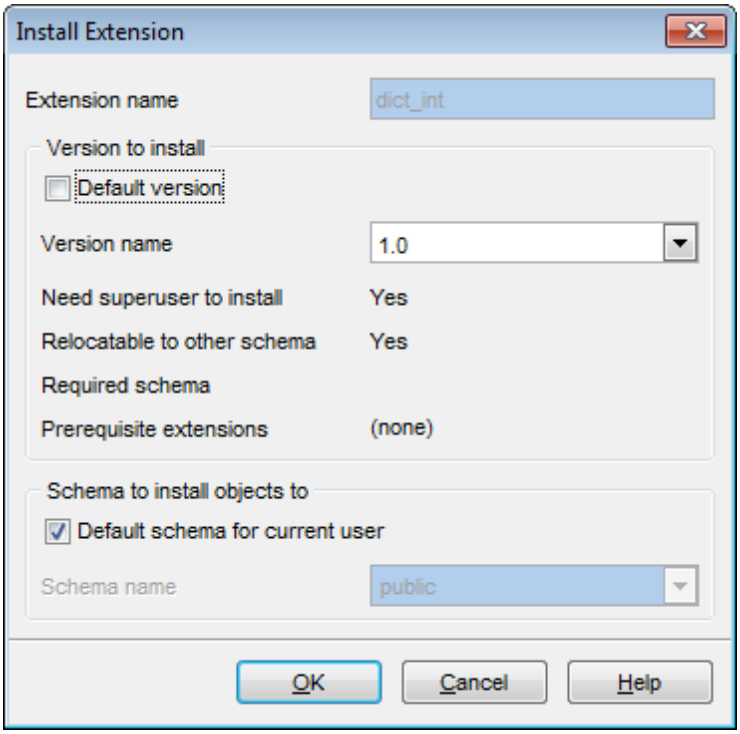
12.12.2 Install/Update Extensions

On **Install/Update** of the extension the following dialog is open.



Extension name is a name of the extension to install.

Version to install
☑ **Default version** - default version of the extension wil be installed

Version name - if you need another version of this extension select it from the drop down list. The **Default version** options is supposed to be unchecked.

Need superuser to install

Relocatable to other schema

Required schema - name of the schema that the extension must be installed into.

Prerequisite extensions - names of prerequisite extensions.

Schema to install objects to
☑ **Default schema for current user**. This option is available when you are installing the extension.
☑ **Move objects to another schema**. This option is available when you are updating the extension.

Schema name
To install the extension to schema different from the default user scheme select it from

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this drop down list.

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Part XII

13 Options

SQL Manager for PostgreSQL provides you with capabilities for flexible personalization of the application.

Please see the chapters below to learn how to use personalization tools effectively.

- Environment Options 871
- Editor Options 925
- Save Settings 945
- Localization 950
- Keyboard Templates 953
- Object Templates 956
- Find Option dialog 958

The **Options** menu allows you to export all program settings to a **.reg* file for future use, e.g. when you need to move the settings to another machine (see **Save Settings** 945 for details).

Hint: Each of the SQL Manager Options dialogs is provided with the **Reset to defaults button**. You can use it either to **Reset current category** or to **Reset all categories**.

See also:

Getting Started 39
Database Explorer 65
Database Management 87
Database Objects Management 155
Change Management 344
Query Management Tools 413
Data Management 452
Import/Export Tools 535
Database Tools 636
Services 771
How To... 1006

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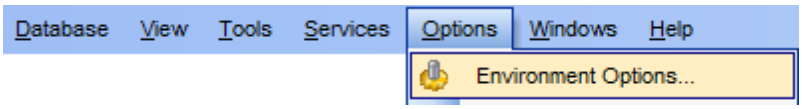
13.1 Environment Options

Environment Options allow you to customize general options of the SQL Manager application.

To open the **Environment Options** window, select the **Options | Environment Options...** main menu[961] item, or use the **Environment Options** button on the main toolbar[963].



Preferences[872]
Full mode activation[874]
Confirmations[875]
Appearance[877]
Tools[879]
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DB Explorer[882]
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Print Metadata[905]
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Data Options[912]
Print Data[914]
Color & Formats[915]
Advanced[917]
Column Options[919]
Localization[921]
Global Shortcuts[923]
Find Option[924]

See also:

Editor Options[925]
Save Settings[945]

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13.1.1 Preferences

Show splash screen at startup
Displays the splash screen of SQL Manager for PostgreSQL at the application startup.

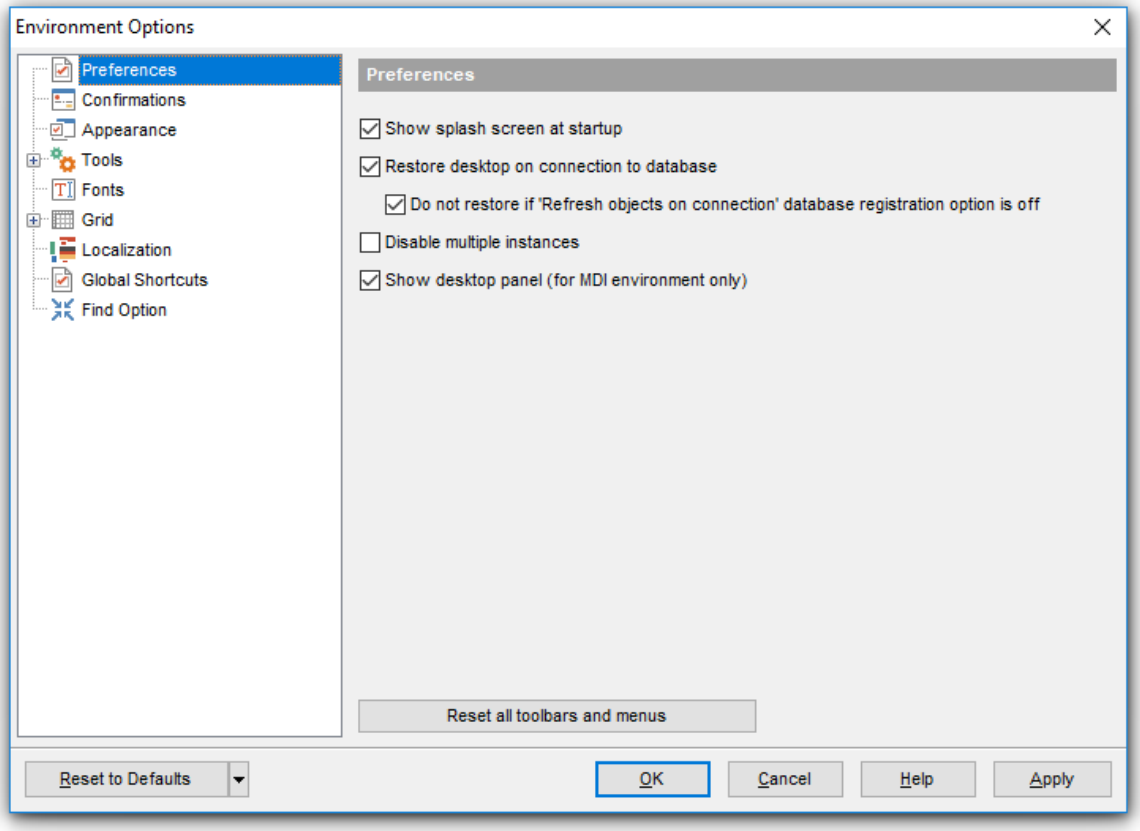
Restore desktop on connect
This option determines whether the previously opened windows and their positions should be restored upon connection to the database.

Do not restore if 'Refresh objects on connection' database registration option is off
Check this option to perform restoring desktop operation if the 'Refresh objects on connection' option of the Database registration info 111 is on.

Disable multiple instances
Checking this option prevents one from running multiple instances of SQL Manager for PostgreSQL.

Show desktop panel (for MDI Environment style only)
Displays Desktop Panel 45 when no child windows are open.

Show Full Version features
This option is available in the Lite version of SQL Manager. When selected, a 30-day period of fully-functional usage is activated 874.



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If necessary, you can **reset all toolbars and menus** of the application using the corresponding button.

Hint: The **Reset to Defaults** button which is common for all sections of the **Environment Options** dialog opens a menu with items allowing you to discard all changes and reset options of the *current category* or of *all categories* to their defaults.

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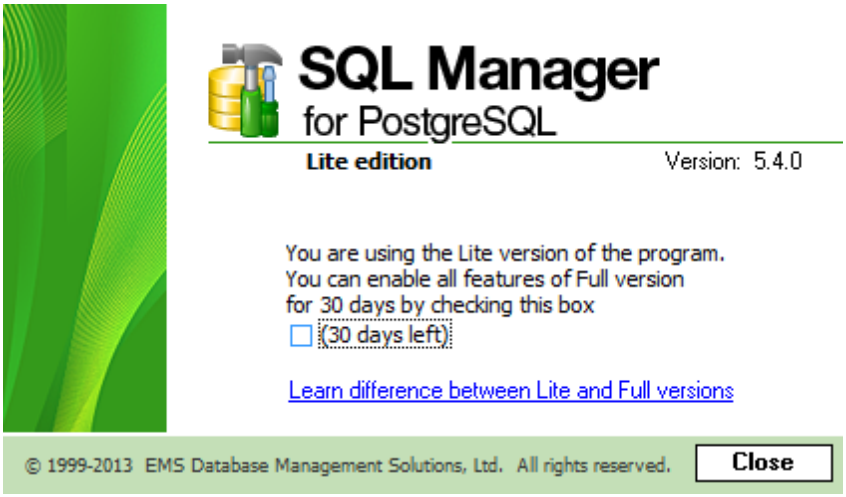
13.1.1.1 Full mode activation

Note that when using **the FREE Lite version of SQL Manager for PostgreSQL** (which contains functional limitations) you can activate a 30-day period of fully-functional usage. During this period you will get the splash screen displaying the number of days left every time you start the application. After the period expires, you will be able to continue using the Lite version.



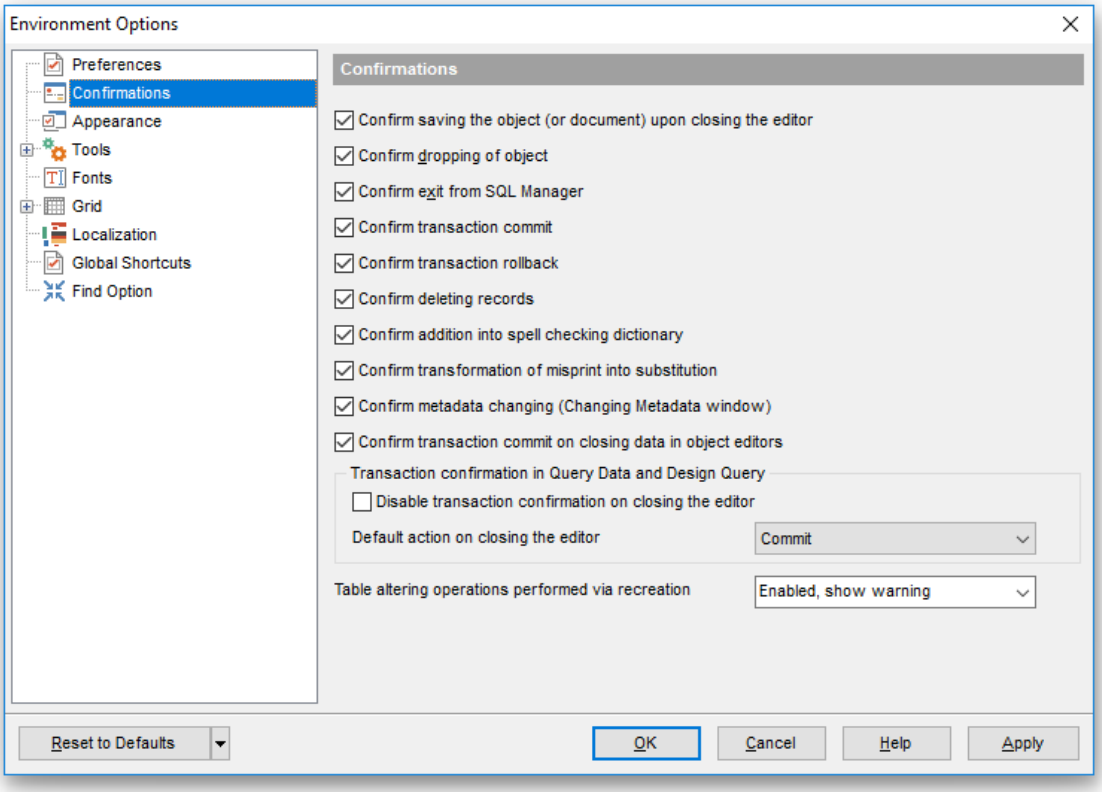
To activate *the 30-day Full version mode*, please enable the **Show Full Version features** option available on the Preferences 872 page of the **Environment Options** dialog (note that this option is only available in the Lite version of SQL Manager).

13.1.2 Confirmations

Confirm saving the object (or document) upon closing the editor
If this option is selected, the program requires confirmation each time you want to save changes in a database object or document.

Confirm dropping of object
If this option is selected, the program requires confirmation of dropping 155 a database object.

Confirm exit from SQL Manager
If this option is selected, you are prompted for confirmation each time when you exit the application.



Confirm deleting records
This option enables/disables a confirmation dialog for deleting records.

Confirm metadata changing (Changing Metadata Window)
This option enables/disables the Changing Metadata 969 window.

Confirm addition into spell checking dictionary
Enable this option if you wish to be prompted for adding a word to the dictionary which is used for checking words spelling (see Spell Checking 942).

Confirm transformation of misprint into substitution

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If this option is selected, you need to confirm replacing a misprinted word with a corresponding substitution word (see Spell Checking 942).

Confirm transaction commit
If this option is selected, the program requires confirmation on attempt to commit a transaction.

Confirm transaction rollback
If this option is selected, the program requires confirmation on attempt to rollback a transaction.

Confirm transaction commit on closing data in object editors
If this option is selected, the program prompts to commit the transaction upon closing the 'Data' tab in object editors.

Transaction confirmation in Query Data and Design Query

Disable transaction confirmation on closing the editor
If this option is checked, no transaction confirmation will be required on closing Query Data 415 and Design Query 431.

Default action on closing the editor
Specify the default action (*Commit* or *Rollback*) and this action will be performed automatically each time when you exit Design Query or Query Data.

Table altering operations performed via recreation
This option defines SQL Manager for PostgreSQL behavior when it is necessary to recreate a table to perform requested changes over it:
Enabled - such operations will be performed without warnings;
Enabled, show warning - the warning window will appear if an operation requires table recreation;
Disabled - denies operations of this type.

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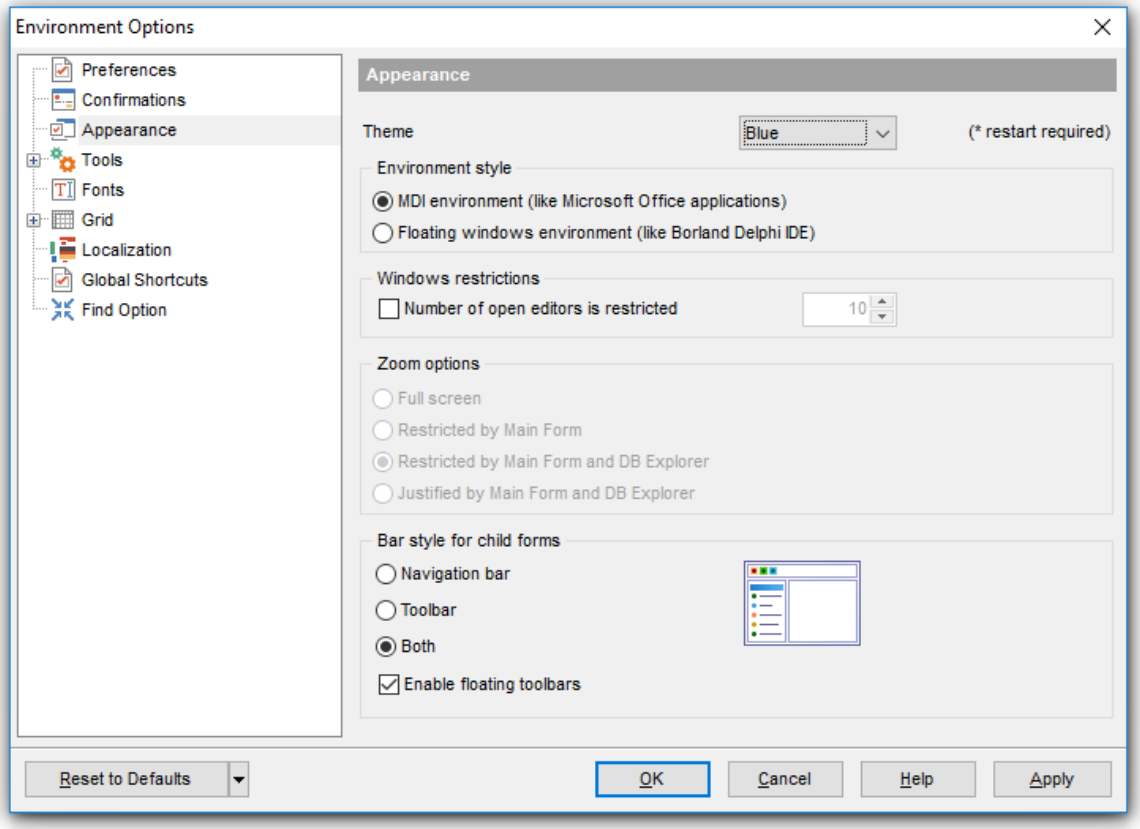
13.1.3 Appearance

Theme
Select the main color theme for the application: Light, Blue or Dark.

Environment style
This group allows you to define the basic window environment - *MDI* (like Microsoft® Office) or *Floating windows* (like Borland® Delphi IDE).

Windows restrictions
This option allows you to set the number of editors (Table Editor 177, SQL Query 415 etc.) that can be opened simultaneously.

Zoom options
This group of options is only available if **Environment Style** is set to *Floating windows environment*. It allows you to set maximization size for child windows:
- *Full screen*
- *Restricted by Main Form*
- *Restricted by Main Form and DB Explorer*
- *Justified my Main Form and DB Explorer*



Bar style for child forms
Here you can define the location of action buttons: within the *Navigation bar* (on the left) and/or on the *Toolbar*.

If necessary, you can also **Enable floating toolbars** for your application.

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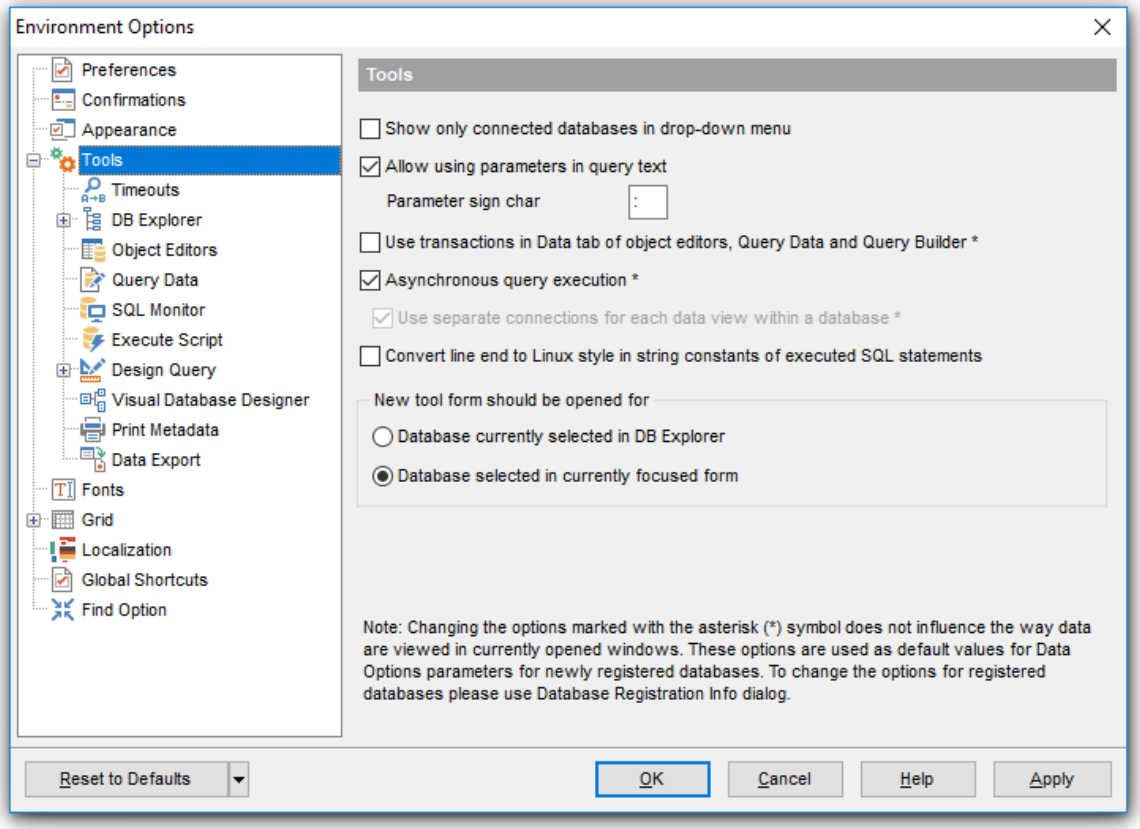
13.1.4 Tools

Show only connected databases in drop-down menu
If this option is checked, only connected 68 databases are displayed in drop-down menus of such tools as Design Query 431, Execute Script 646, etc.

Allow using parameters in query text
This feature allows you to specify different values within a query in a popup dialog 450 just before the query execution.
You can set the character to specify a parameter within the query in the **Parameter sign char** field.

Use transactions in Data tab of object editors, Query Data and Design Query*
If this option is enabled, a transaction is active until the 'Data' tab is closed or the 'Commit' button is pressed; all edited records are blocked until the transaction is committed. If this option is disabled, the transaction starts and is immediately committed (autocommit) on saving each record which is blocked only for a short period of time.



Asynchronous query execution*
Check this option to allow executing queries in background mode (asynchronously).

Use separate connection for each data view within a database*
Uncheck this option to use separate connection for each data view within a database. Note that this option is only available when the *Use transactions in Data tab of object editors, Query Data and Design Query* option is enabled.

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Convert line end to Linux style in string constants of executed SQL statements
Check this option to transform all the multi-line literals to Linux-like form, using one-byte line breaking term.

New tool form should be opened for

This option defines which database should be selected in the launched tool.

Database currently selected in DB Explorer
Tool will be opened with the database focused in the DB Explorer selected.

Database selected in currently focused form
Tool will be opened with the database which is selected in the current form.

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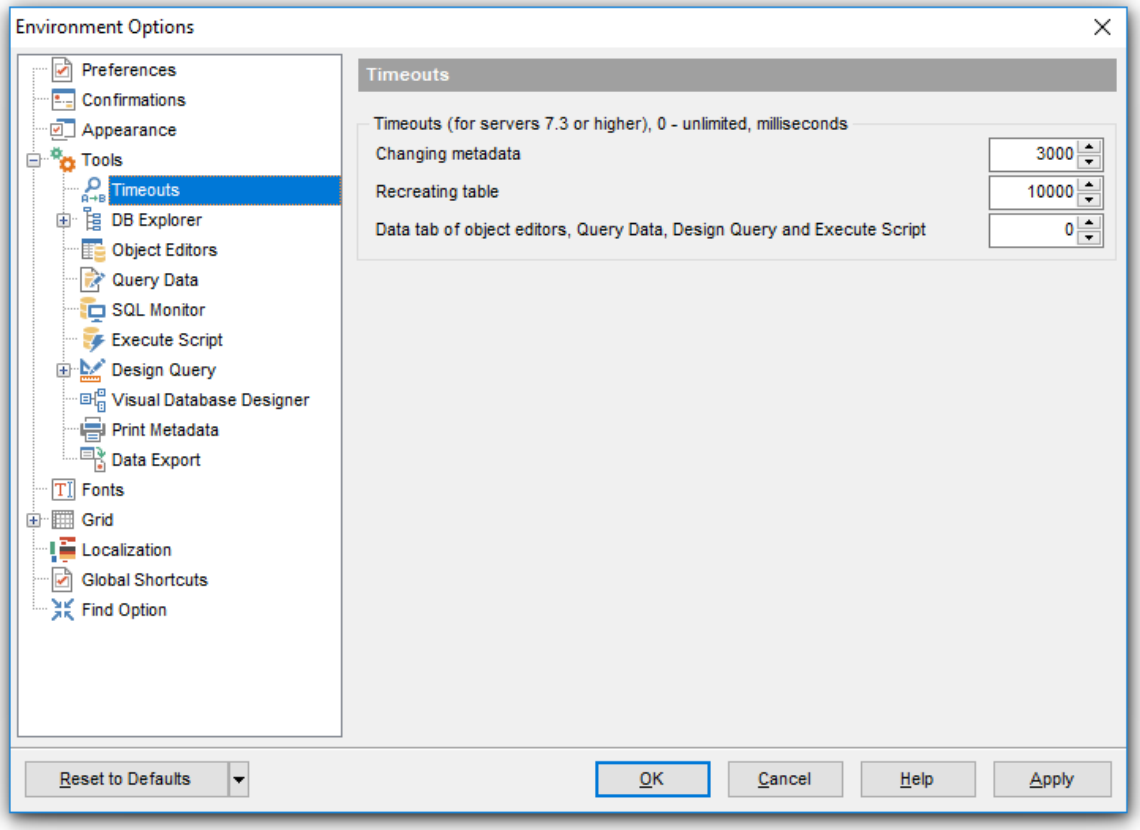
13.1.4.1 Timeouts

This page allows you to set timeouts for some operations performed in SQL Manager. Timeouts are necessary for preventing program hang-up upon execution of a SQL statement due to transaction interlocking. You can set timeouts for *changing metadata*, *recreating tables* and *data tabs*.



Refresh of objects can also be terminated after *timeout expiration* if there is an active transaction that has made any changes to metadata.

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13.1.4.2 DB Explorer

General options

Show hosts in DB Explorer
Shows/hides database hosts in the DB Explorer 65 tree.

Show table subobjects
Shows/hides table 169 subobjects (columns, indexes, etc.) in the DB Explorer 65 tree.

Sort by aliases
Use this option to apply sorting registered hosts and databases by their aliases in the DB Explorer 65 tree.

Rename objects by editing in place
Allows you to edit object names in DB Explorer 65 by selecting any object and clicking its alias one more time.

Refresh objects on showing in SQL Assistant
This option enables/disables refreshing objects each time they are displayed in SQL Assistant 81.

Auto expand navigation pane
If this option is checked, the list of navigation tabs in DB Explorer 75 is expanded automatically on program launch.

Show hint
The option enables/disables hints for objects in the DB Explorer 65 tree.

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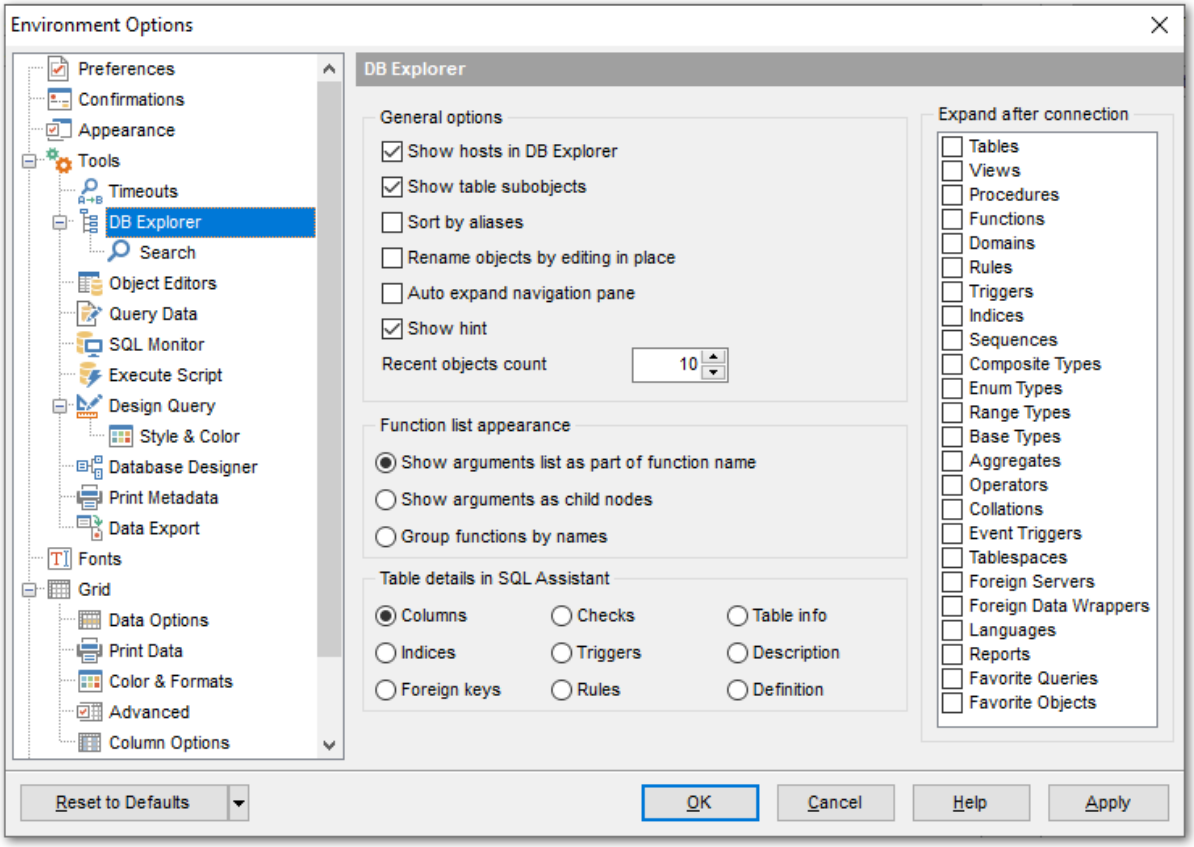

Recent objects count
Defines the number of objects displayed within the Recent 77 menu of the DB Explorer 65.

Function list appearance

This option defines appearance of functions in the DB Explorer 65 tree.

- *Show arguments list as part of function name*

If selected, function 239 nodes do not contain any child nodes and look like "function_name (argument_list)"

- *Show arguments as child nodes*

If selected, function 239 nodes contain "Arguments" node, which contains argument nodes.

- *Group functions by names*

If selected, overloaded functions 239 are grouped, having lists of arguments as child nodes.

Table details in SQL Assistant

These options switch the SQL Assistant 81 mode for displaying table 169 details (columns, *indexes*, *Foreign keys*, *checks*, *triggers*, *rules*, *table info*, *description* or *definition*).

Expand after connection

This group of options allows you to specify the node(s) indicating type(s) of objects that will be expanded within DB Explorer 65 upon successful connection to the database.

See also:

Database Explorer 65

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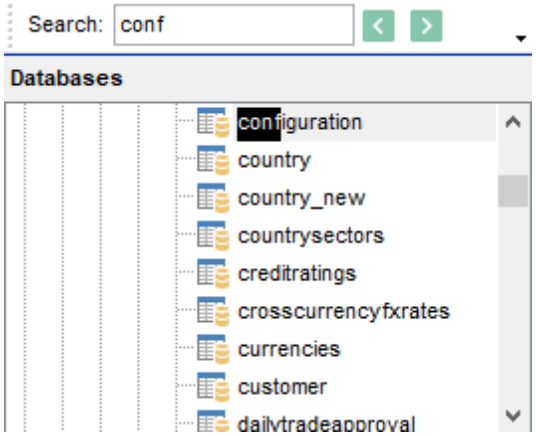
13.1.4.2.1 Search

Here you can set search options for DB Explorer search string:



Search options

Search by categories

This option determines the search scope when the Find Item 78 feature is used: if this option is selected, the search is performed within the currently selected category (node in the tree) only.

Use case sensitive search

If this option is selected, the search string case is considered when using the Search Panel 78.

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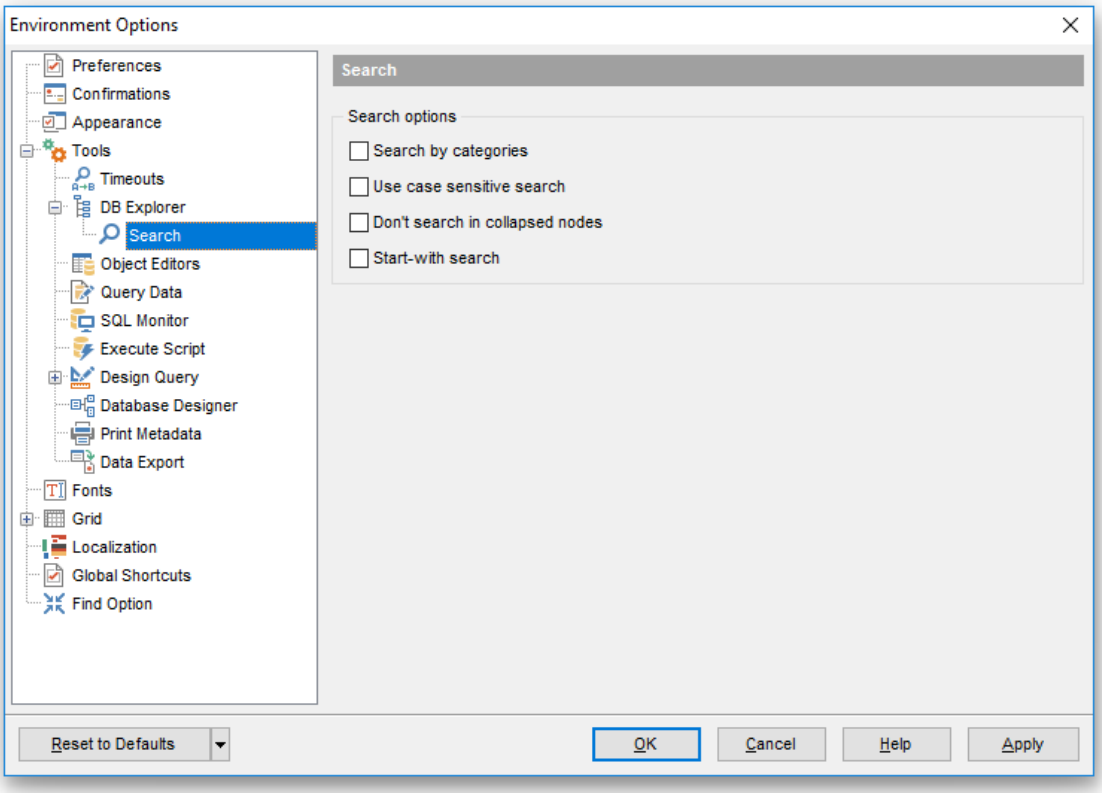

Use Case Sensitive search
If this option is selected, the search string case is considered when using the Search Panel 78.

Don't search in collapsed nodes
Enable the option to search within the expanded nodes only.

Start-with search
Check this option to search for objects those names begin with the defined searched string.

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13.1.4.3 Object Editors

All

Convert created objects' names to lower case
Enable this option if you need to convert the names of all newly created objects to the lower case automatically.

Show OWNER on DDL tab
With this option enabled OWNER statement is generated for the objects on the DDL tab, otherwise it's removed from the object definition.

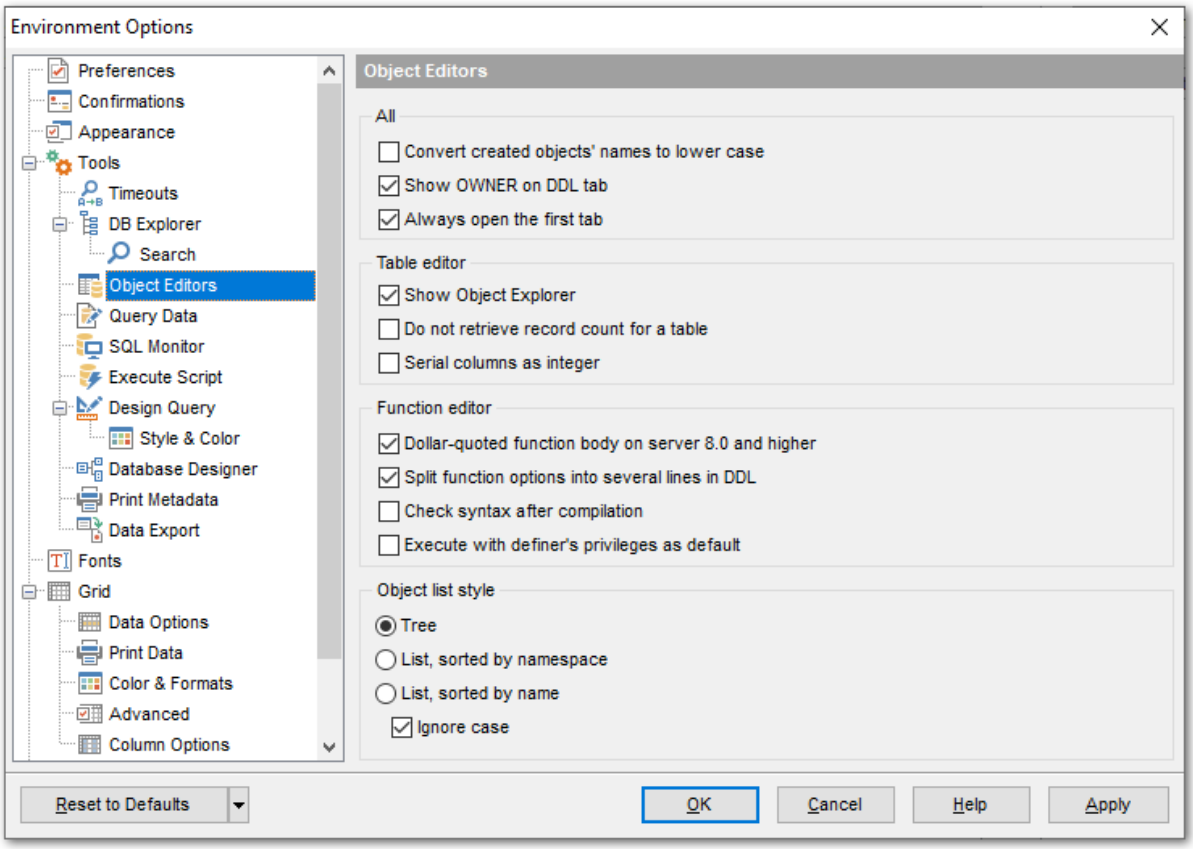
Always open the first tab
If this option is checked, the first tab is activated by default on opening an object in its editor.

Table editor

Show Object Explorer
Enables/disables the Object Explorer panel within the Navigation bar[178] of Table Editor[177].

Do not retrieve record count for a table
Check this option to disable retrieving record count for tables (with this feature enabled, opening large tables may take much time).

Serial columns as integer
With this option enabled, 'serial' type columns will be displayed as 'integer'.



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Function editor

Dollar-quoted function body on server 8.0 and higher
This option allows dollar-quoted function body definition.

Split function options into several lines in DDL
Use this option to define whether to split function options into several lines in DDL 965 or to display all options in one line.

Execute with definer's privileges as default
This option specifies that the function is to be executed with the privileges of the user 751 that created it. Otherwise, the function is to be executed with the privileges of the user that calls it. If this option is enabled then the **Execute with definer's privileges** option in the Function Editor 239 when creating a new function will be checked automatically.

Object list style

These options allow you to define the style of the combo-boxes used to select database objects (e.g. *Table or view* in Trigger Editor 268). Objects can be represented as a *tree*, a *list sorted by namespace* or a *list sorted by name*. Use the **Ignore case** option to enable/disable case sensitive sorting.

See also:

Database Objects Management 155

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13.1.4.4 Query Data

Query results

Fetch all data
If this option is checked, all the records according to the *SELECT* query are extracted from the tables, otherwise - only those displayed within the **Results** tab of Query Data 415 .

Show result for each query
With this option checked, when you execute 426 two or more queries, the result of each query will be displayed one by one. Otherwise, only the result of the last query will be displayed.

Show results on Edit tab
If this option is checked, the **Results** tab is displayed as a separate tab.

Advanced

Execute selected text separately
Check this option to allow execution 426 of the selected statement separately.

Write only successfully executed queries to database SQL log file
If this option is checked, unsuccessful queries will not be saved to the Query Data log file (see Setting log options 117 in the Database Registration Info 108 dialog).

Don't save queries automatically for the next session
If this option is checked, the SQL query text will not be saved. Otherwise, it will be saved in Windows registry and will be therefore available in the next application sessions.

Same queries for all databases
With this option enabled, Query Data 415 stores all queries in a shared repository, so that switching to another database does not cause loading queries of that database (applying this option does not affect currently opened copies of Query Data). The value of the option can be changed freely without any risk to lose the query repository content.

Refresh DB Explorer upon successful DDL statement execution
If this option is selected, the content of DB Explorer 65 is refreshed each time a DDL statement is executed 426 successfully in Query Data 415.

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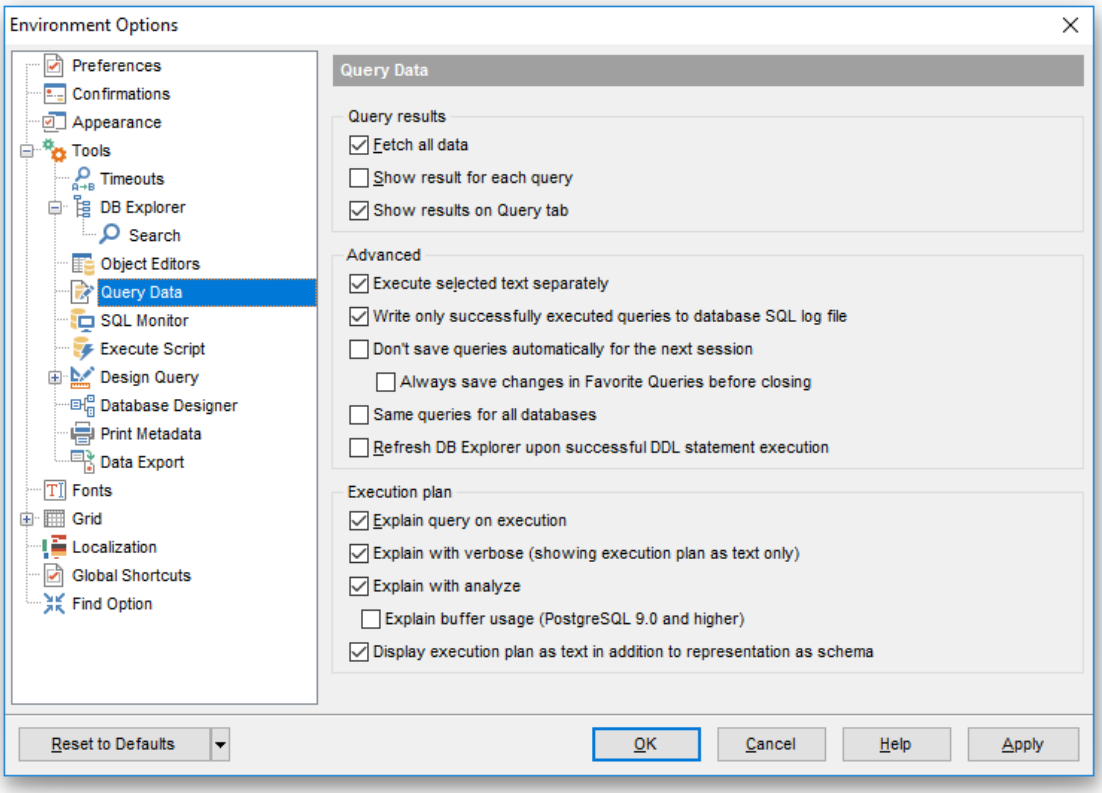

Execution plan

Explain query on execution

If this option is checked, the query plan[422] is displayed automatically upon query execution in Query Data[415].

Explain with verbose (showing execution plan as text only)

Check this option to display additional information regarding the plan. Specifically, include the output column list for each node in the plan tree, schema-qualify table and function names, always label variables in expressions with their range table alias, and always print the name of each trigger for which statistics are displayed.

Explain with analyze

Check this option to show the full internal representation of the plan[422] tree, rather than just a summary while displaying query plan.

Explain buffer usage (PostgreSQL 9.0 and higher)

Check this option to include information on buffer usage. Specifically, include the number of shared blocks hits, reads, and writes, the number of local blocks hits, reads, and writes, and the number of temp blocks reads and writes.

Display execution plan as text in addition to representation as schema

If this option is checked, the execution plan is represented both as a tree and text.

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See also:

Query Data 415

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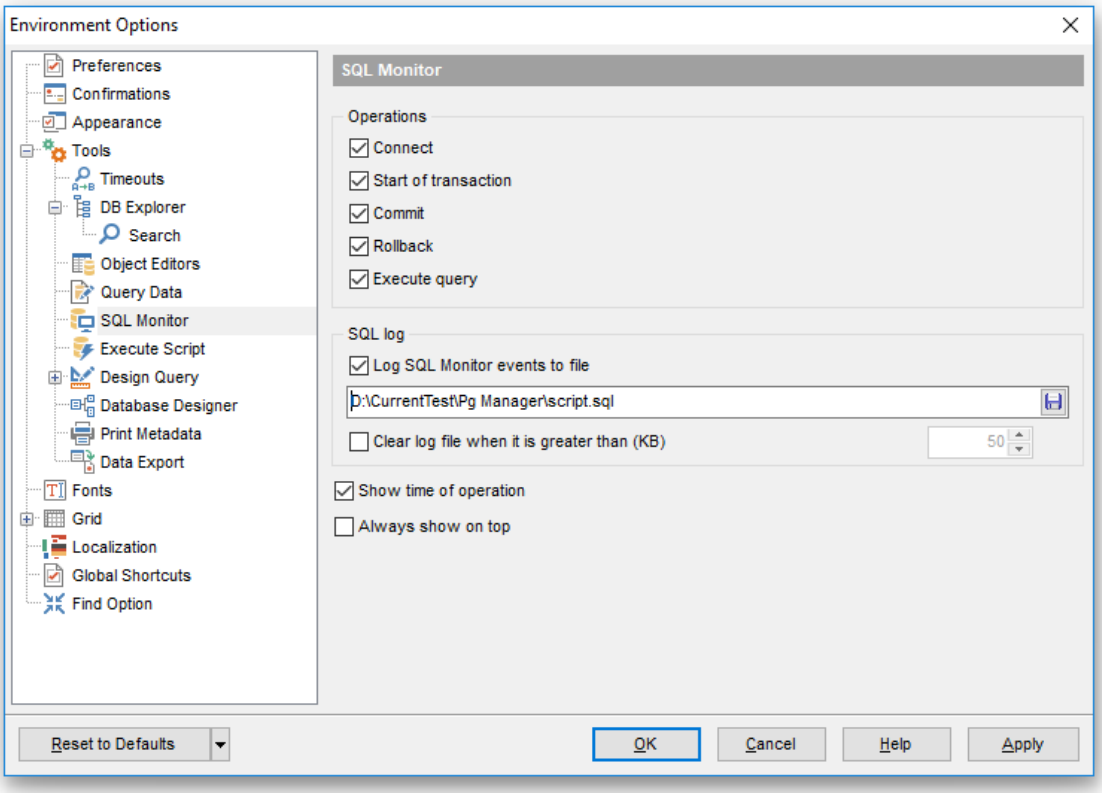
13.1.4.5 SQL Monitor

Operations

Specify the operations to be logged in SQL Monitor[643]: *Connect*, *Start of transaction*, *Commit*, *Rollback*, *Execute query*.

SQL log

This group of options allows you to enable logging of all SQL Monitor[643] events to a file. Check the **Log SQL Monitor events to file** option, specify the path to the log file using the button, and enter a name for the **.sql* file. To clear the log file after it reaches some definite size, check the **Clear log file when it is greater than...** option and set the maximum file size (in Kilobytes).



Show time of operation

If this option is checked, the execution time of logged operations is added.

Always show on top

Select this option if you want to display the SQL Monitor[643] window in the foreground permanently.

See also:

SQL Monitor[643]

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13.1.4.6 Execute Script

Abort script execution on error
If this option is checked, script execution is aborted if an error occurs.

Execute in transaction, rollback on error
This option is only available if the **Abort script on error** option is checked. This option evokes automatic rollback when script execution is aborted.

Enable parsing
With this option checked, Execute Script Editor 646 parses the loaded script to enable fast navigation in the Script Explorer 651 tool.

Show message when done
Displays a message box on finishing script execution.

Execute selected text separately
Check this option to allow execution 652 of the selected statement separately.

Don't clear error list on selected text execution
If this option is checked, the error list is not cleared upon execution of the selected statement.

Show notices in error list
Select this option to enable information messages when working with scripts.

Register newly created databases
If the option is enabled, the Register Database 103 dialog will appear when a database is created using Execute Script 646.

Disable all code features in Execute Script
This option disables code completion, code folding, highlight and all options that are set on the Code completion 935 page. For options that are set on the Color Scheme 933 page, the defaults will be applied.

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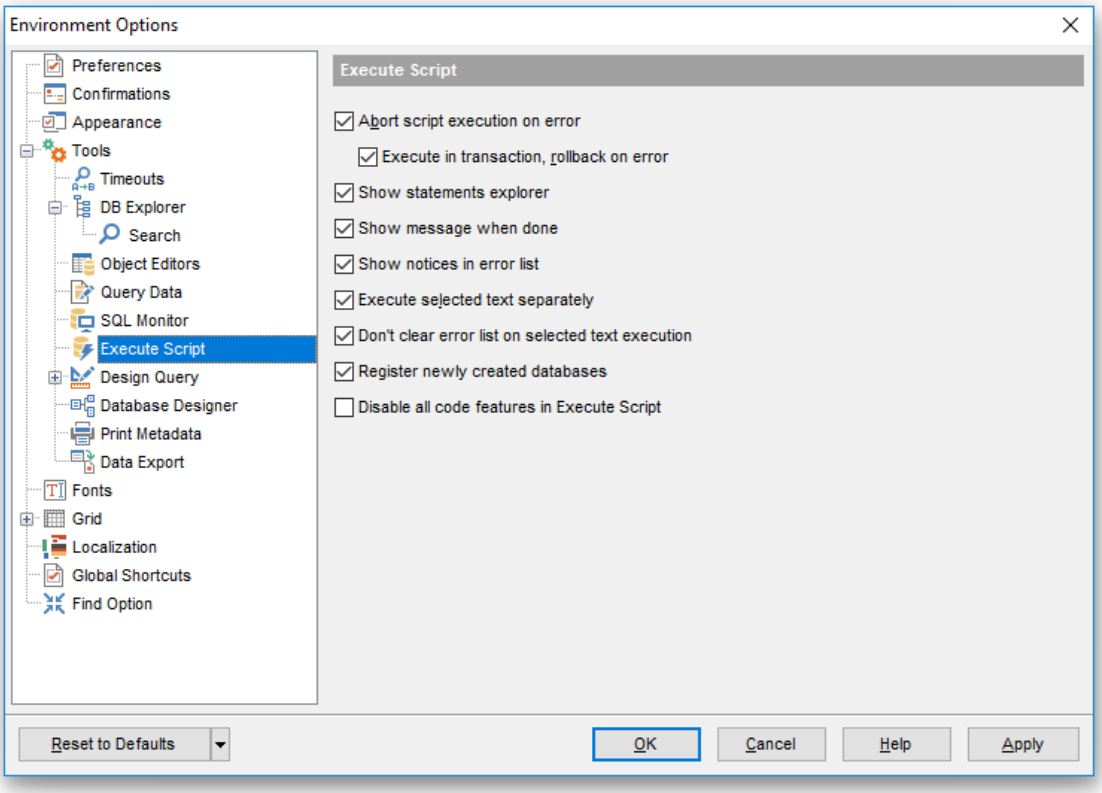

See also:

Execute Script Editor 646

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13.1.4.7 Design Query

General options

Allow SELECT queries only
When this option is checked, the *INSERT*, *UPDATE* and *DELETE* statements are not allowed in Design Query 431.

Select condition row
Displays the selected condition in different rows on the **Criteria** and **Grouping Criteria** tabs of Design Query 431.

Drag column name
Displays the dragged column name in the **Builder** area.

Hide selection when inactive
Hides the selection when the Design Query 431 window is inactive.

Show columns types
Displays columns types additionally to their names.

Union all by default
Check this option to use the *UNION ALL* expression in Design Query 431 by default.
The *UNION* keyword allows you to include the results of two *SELECT* statements in one resulting table.
The *ALL* parameter incorporates all rows into the results, including duplicates. If not specified, duplicate rows are removed.

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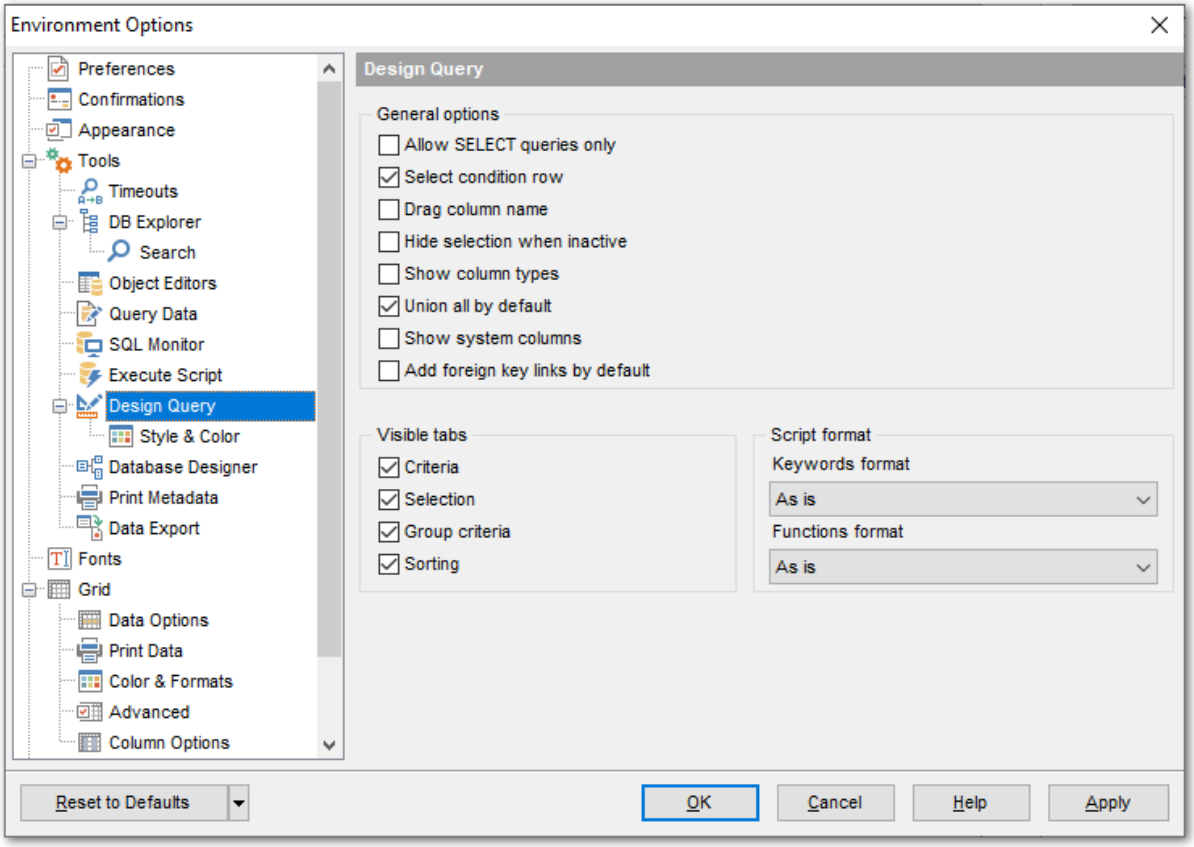

Visible tabs

These options specify which Design Query 431 tabs are available and which are not. Use the check boxes to make the corresponding tabs visible/invisible.

Script format

These options specify case formatting of keywords and functions in query text within the Edit 444 tab: *As is* keeps the original case, *Uppercase* sets all the keywords/functions to the upper case, *Lowercase* sets all the keywords/functions to the lower case, and *First upper* sets the first letters of all keywords/functions to the upper case.

Additionally, you can set styles and color for all **Design Query** objects by using Style & Color Palette 896.

See also:

Design Query 431

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13.1.4.7.1 Style & Color

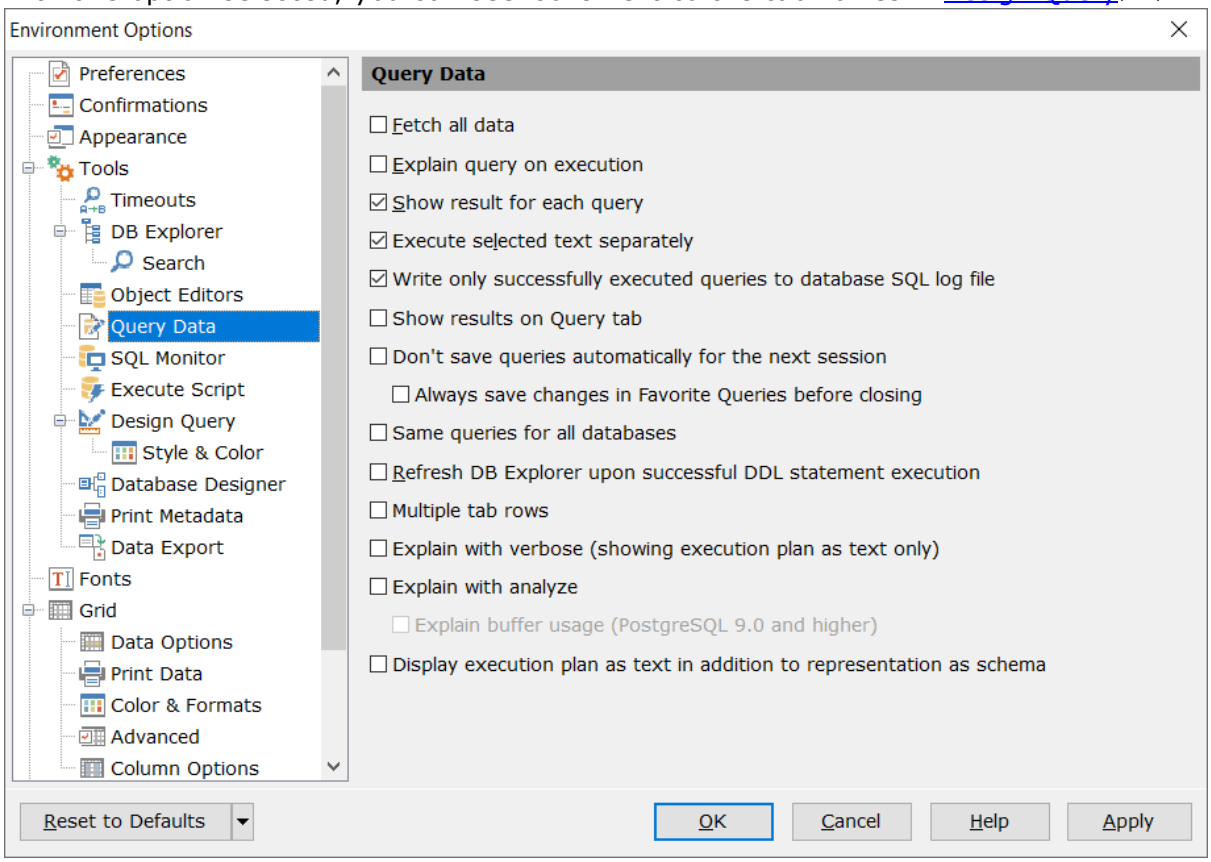
Style

These options specify the way various Design Query 431 elements look: the **Condition button**: *Flat*, *3DLook*, *Raised*; **object borders**: *Bump*, *Etched*, *Raised*, *Sunken*. If necessary, you can also specify **flatness** for objects and buttons using the corresponding options.

Flat objects
This option sets the flat appearance of objects in Design Query 431.

Windows style of tables
This option determines the appearance of tables in the Builder tab.

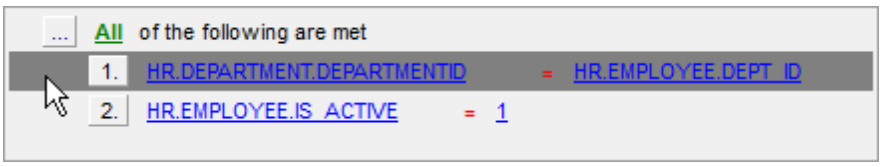
Show icons on tabs
With this option selected, you can see icons next to the tab names in Design Query 431.



Color palette

These options define the colors of various Design Query 431 elements.

Active condition row (at the Criteria 438 and Grouping criteria 442 tabs):



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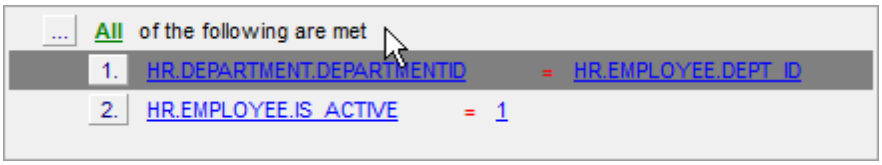
Condition text (at the Criteria 438 and Grouping criteria 442 tabs):



Condition item text (at the Criteria 438 and Grouping criteria 442 tabs):

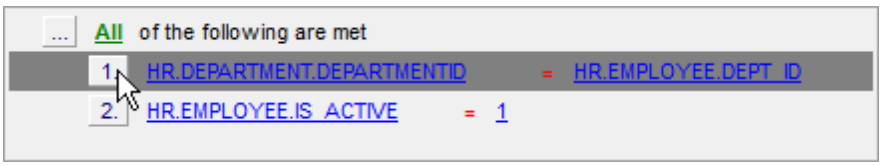
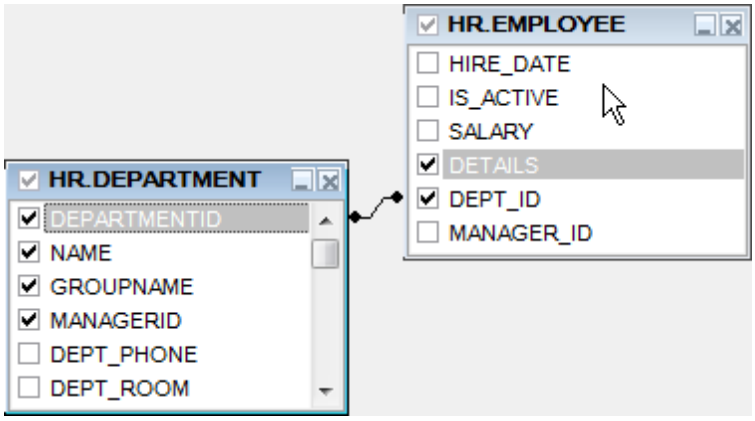
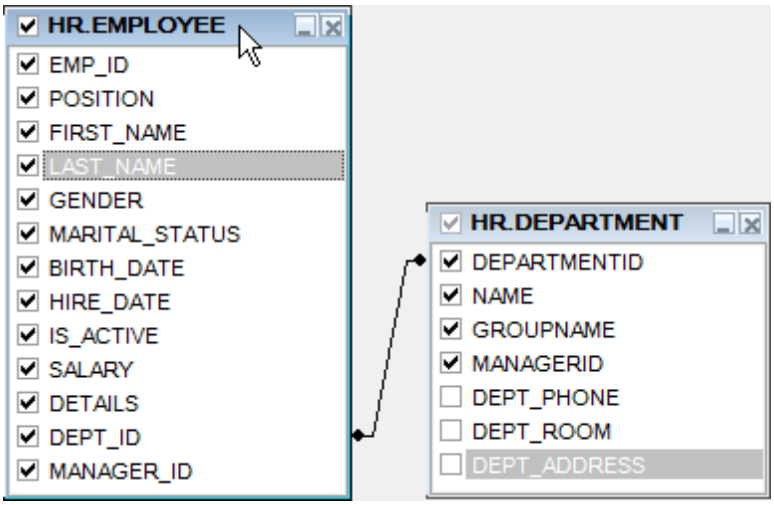


Table client area (in the diagram area 434):



Active table caption (in the diagram area 434):



Inactive table caption (in the diagram area 434):

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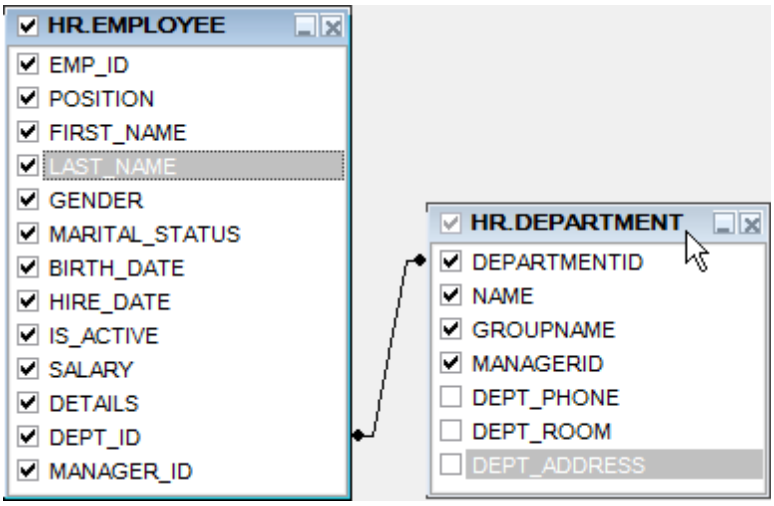
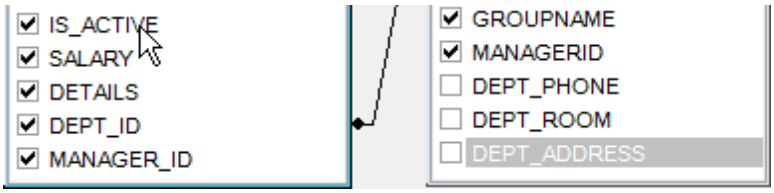
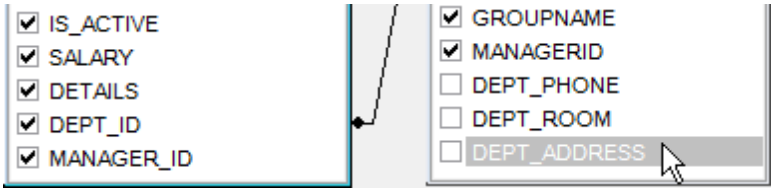


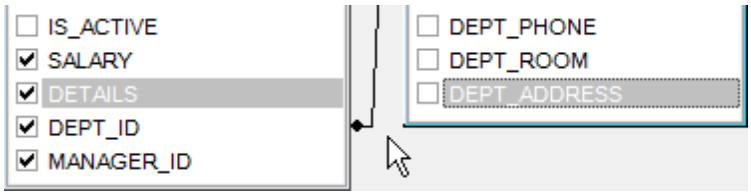
Column text (in the diagram area[434]):



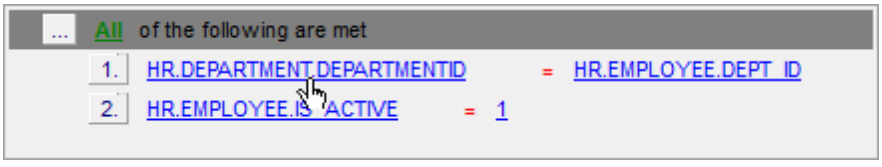
Selected column text (in the diagram area[434]):



Work space (in the diagram area[434]):



Column (at the Criteria[438] and Grouping criteria[442] tabs):



Operation (at the Criteria[438] and Grouping criteria[442] tabs):

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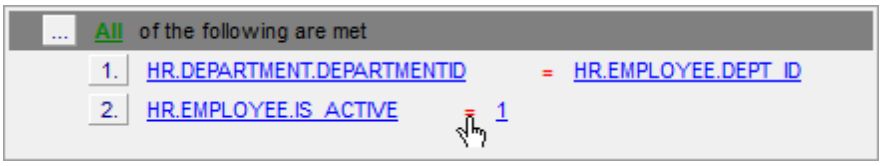
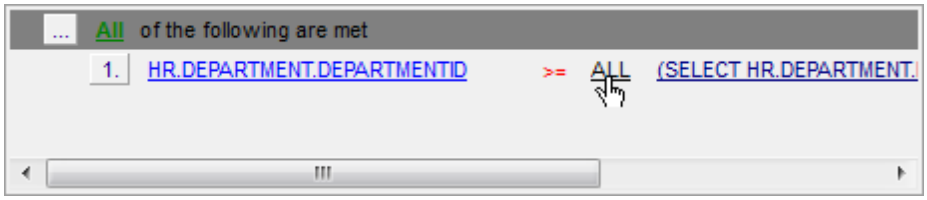
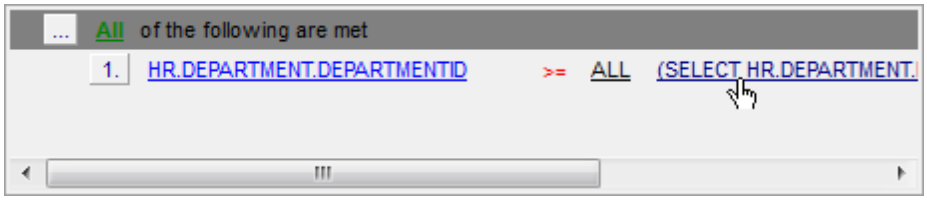


Group (at the Grouping criteria 442 tab):

Predicate (at the Criteria 438 and Grouping criteria 442 tabs when a subquery 435 is used):



Subquery (at the Criteria 438 and Grouping criteria 442 tabs when a subquery 435 is used):



Click an item to select a color for the corresponding element using the **Color** dialog where you can specify the required color from the palette.

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13.1.4.8 Database Designer

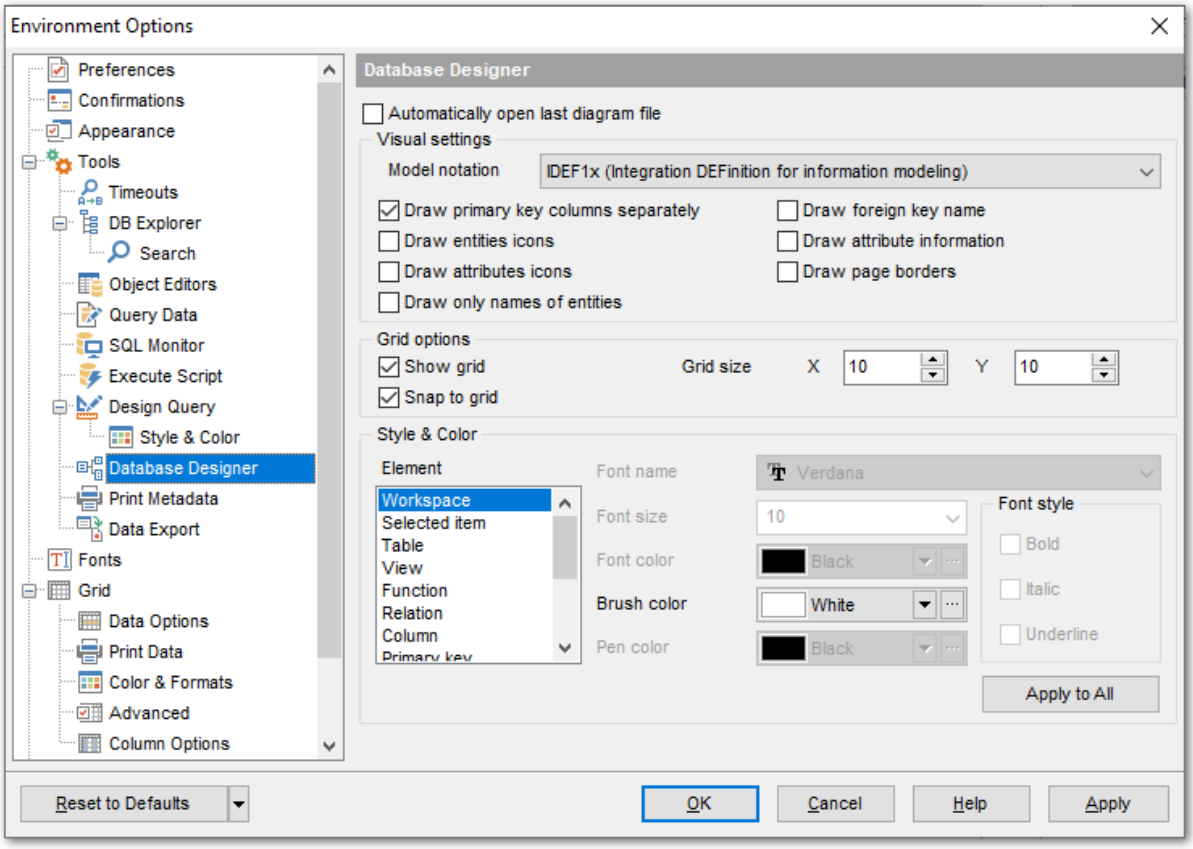
Automatically open last diagram file
With this option enabled the designer is opened with the last diagram edited.

Visual settings

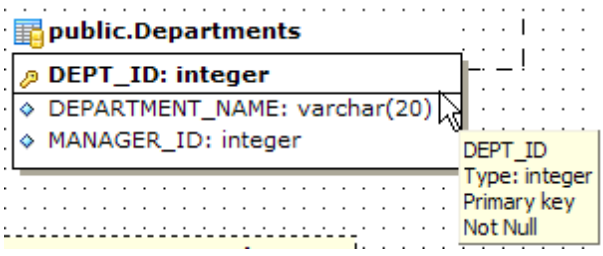
Model notation
When you work in Database Designer[720], you can choose one of the following modeling notations:

- Integration DEFinition for Information Modeling (IDEF1X);
- Information Engineering (IE).

The *IDEF1X* and *IE* notations use different symbols to represent relationships between entities (and tables).



Draw PRIMARY KEY columns separately
Separates Primary key columns from other columns with a horizontal line.



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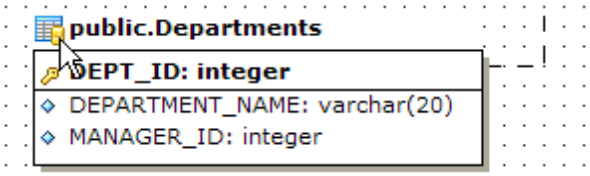
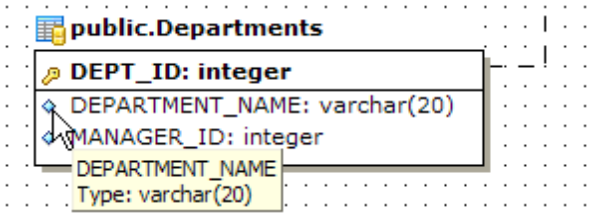
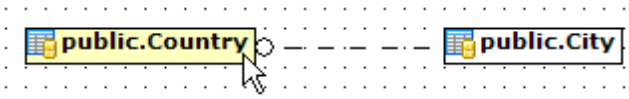
Draw entities icons
Displays icons at the left of each entity header according to its type.



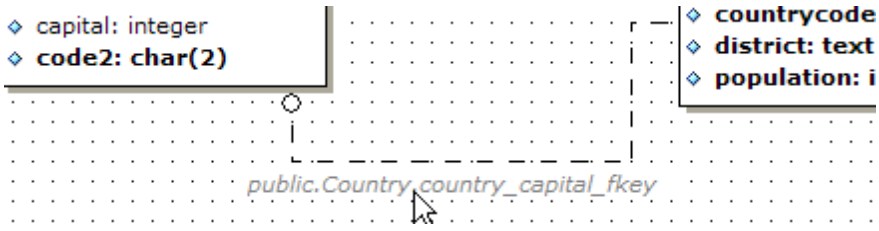
Draw attributes icons
Displays icons at the left of each attribute according to its type (Primary key, Foreign key, ordinary column).



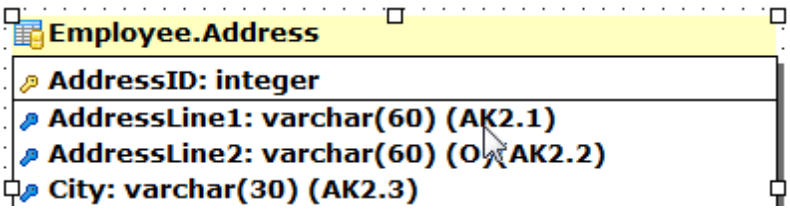
Draw only names of entities
Displays only entity headers, columns are hidden.



Draw FOREIGN KEY name
Displays foreign key names for the corresponding relations.



Draw attribute information
Display attribute properties (optionality, keys, etc.) in parentheses after the attribute name and type.



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Draw page borders
Displays borders on the diagram page which are the borders used when printing pages with the diagram.

Grid options

Show grid
Displays dots in the diagram area to make the grid visible.

Snap to grid
Automatically aligns entities on the form with the nearest grid line. You cannot place an entity in between grid lines.

Grid size
Sets grid spacing in pixels along the *x*- and *y*-axes. Specify a higher number to increase grid spacing.

Entity header font
Select a font type and size to display entity headers.

Attributes font
Select a font type and size to display attributes.

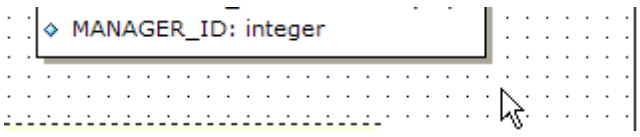
Additionally, you can set color for all VDBD diagram objects using the **Style and Color** section.

This section allows you to customize the default appearance of the diagram.

Select a diagram element from the list:

Workspace
Selected item
Table
Relation
Column
Primary key
Unique column
Foreign key
Autoincrement column
Not null column
Comment

Work area



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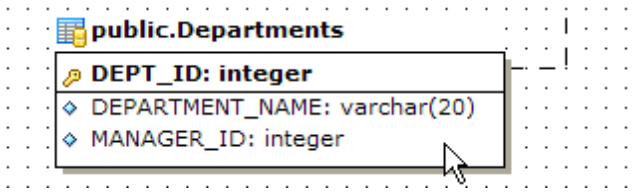
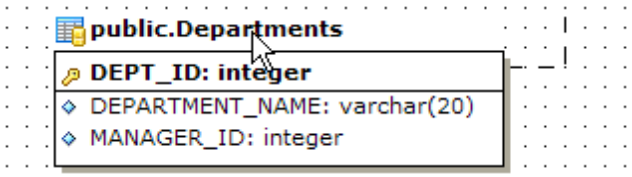
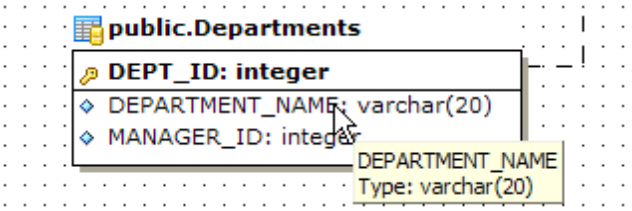
Entity



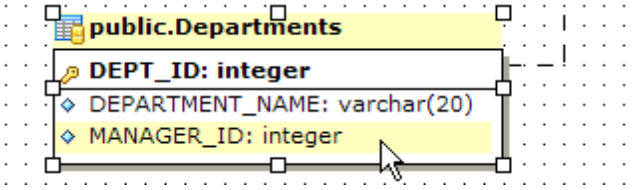
Entity caption text



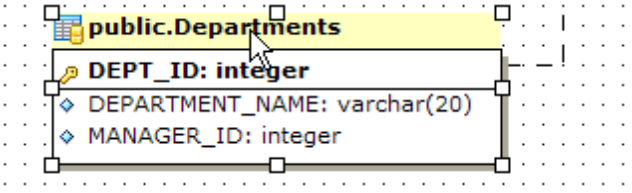
Attribute text



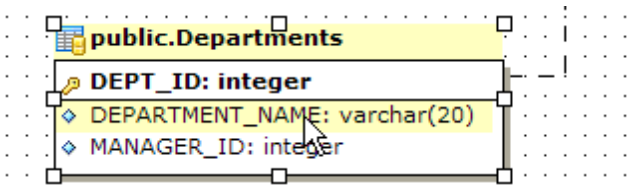
Selection



Selected entity caption text



Selected attribute text



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Click an item to select a color for the corresponding element using the **Color** dialog where you can specify the required color from the palette.

See also:

Database Designer 720

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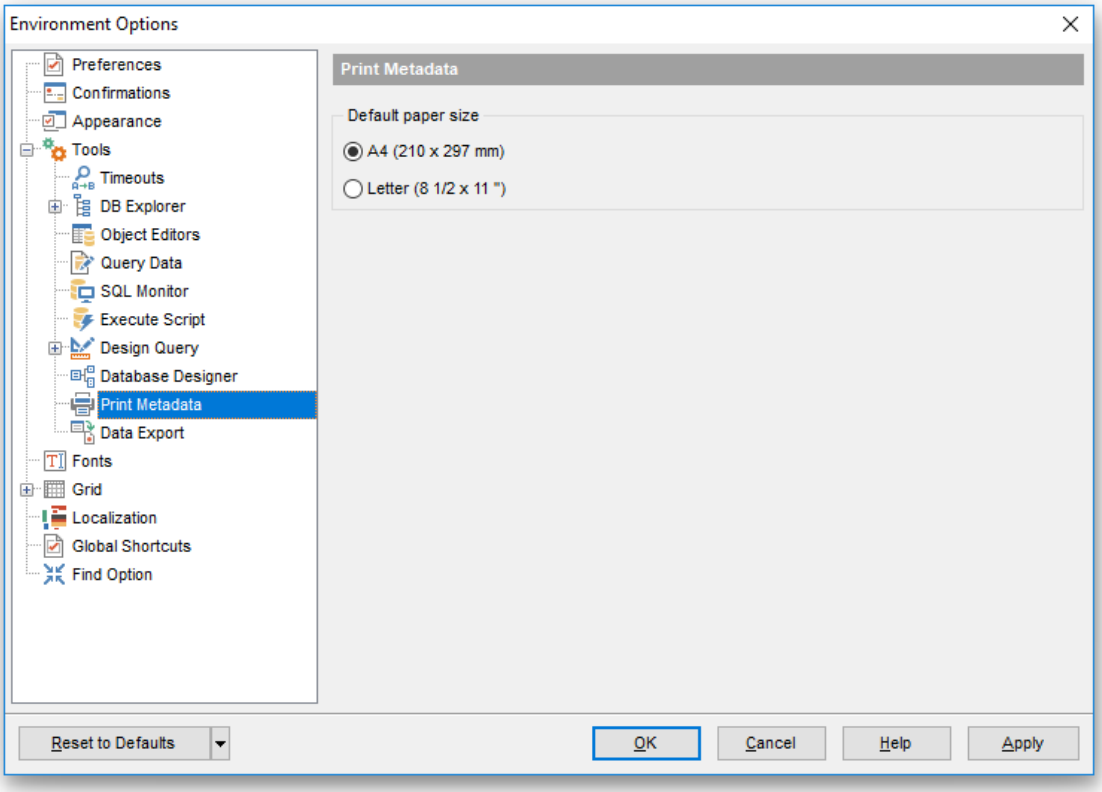
13.1.4.9 Print Metadata

Default paper size

Define the default paper size for reports created with the Print Metadata 680 tool used:

- *A4* (210 x 297 mm)
- *Letter* (8 1/2 x 11 ")



See also:

Print Metadata 680

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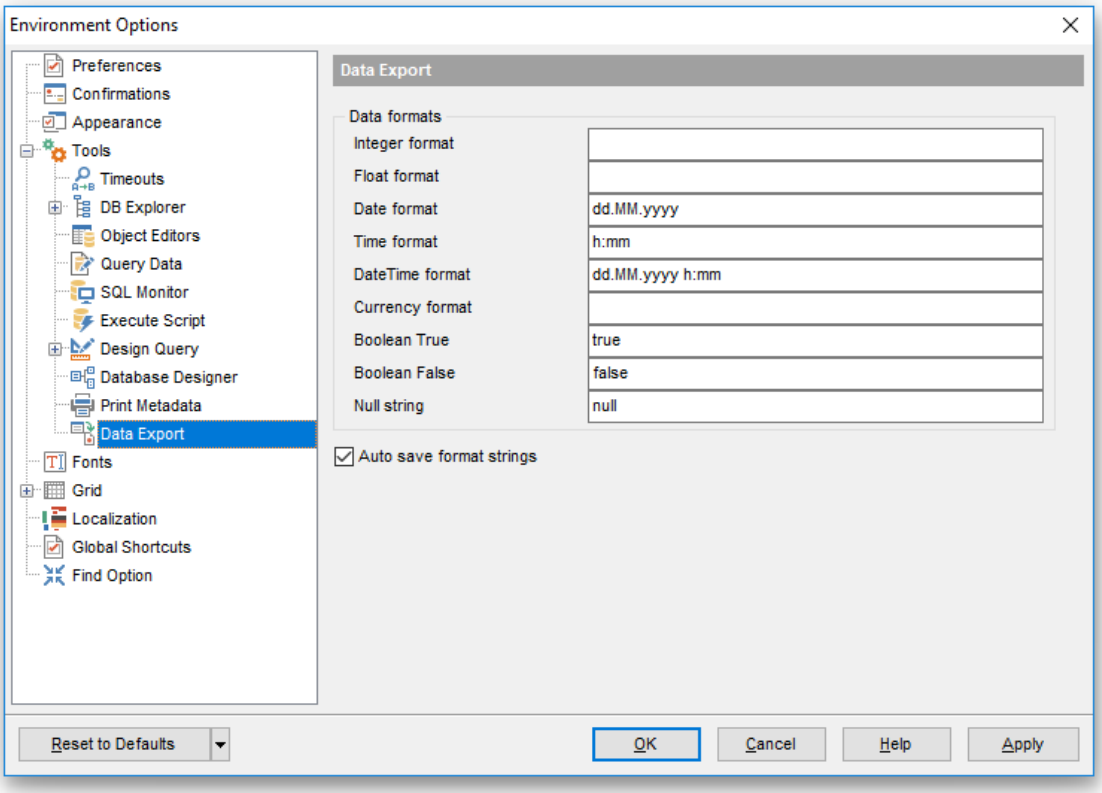
13.1.4.10 Data Export

This page allows you to customize formats applied to exported[536] data.



Data formats
Edit the format masks to adjust the result format in the way you need: *Integer format*, *Float format*, *Date format*, *Time format*, *DateTime format*, *Currency format*, *Boolean True*, *Boolean False*, *Null string*.

Auto save format strings
Select this option to save specified format strings automatically.

These settings can also be specified at the Adjusting data formats[540] step of Export Data Wizard[536].
Fore more details see Format specifiers[978].

See also:

Export Data Wizard[536]

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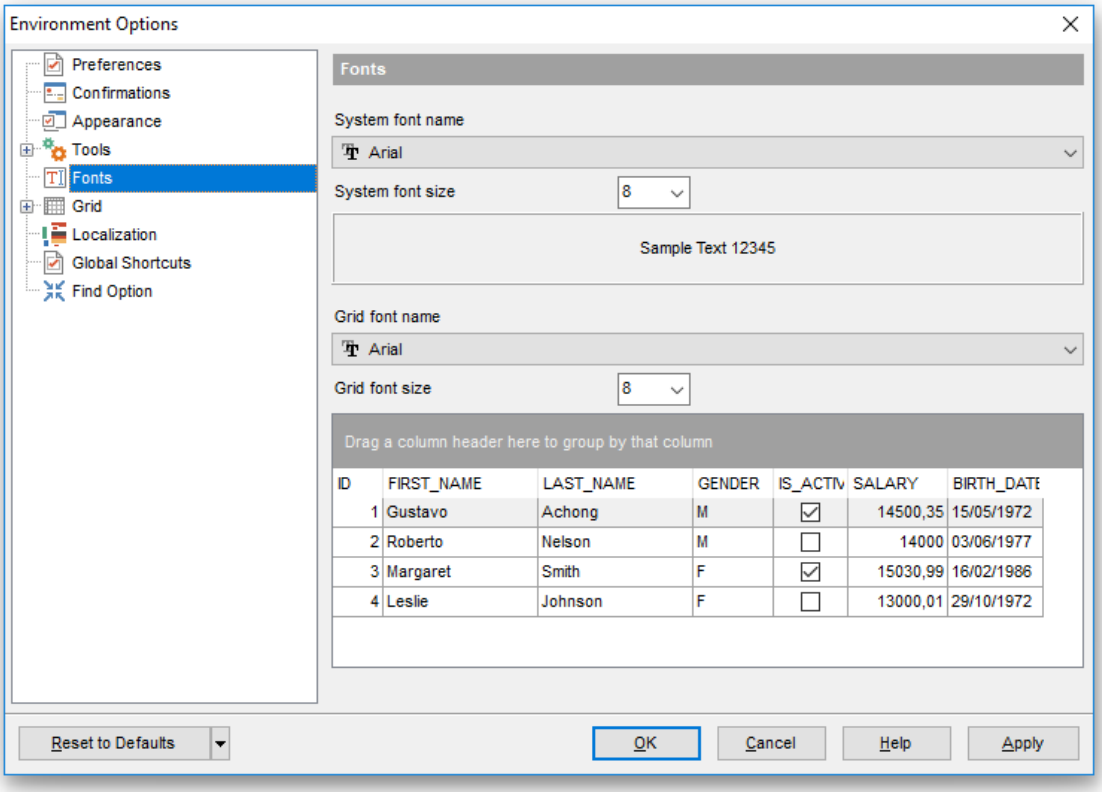
13.1.5 Fonts

This section of the **Environment Options** dialog allows you to specify fonts used in the application.
The box below displays the *sample text* with the selected font applied.



System font name
Defines the font used by SQL Manager for PostgreSQL. Select the font name from the drop-down list of available system fonts.

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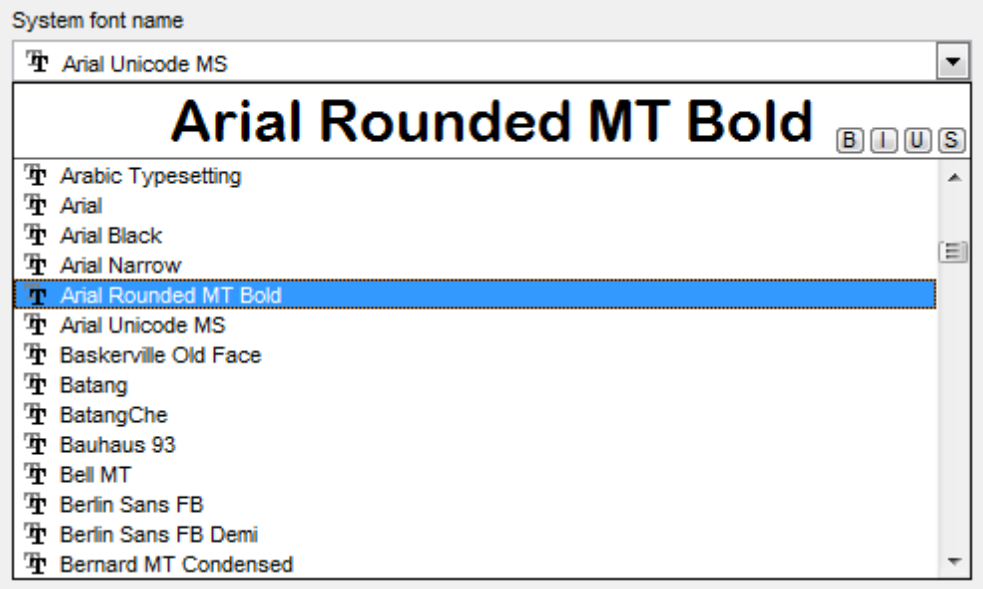

System font size
Defines the font size used by SQL Manager for PostgreSQL. Type in or use the drop-down list to select the required value.

Grid font name
Defines the font used for displaying data in the Data Grid 457. Select the font name from the drop-down list of available system fonts.

Grid font size
Defines the font size used for displaying data in the Data Grid 457. Type in or use the drop-down list to select the required value.

In the sample grid you can view how the data grid will look like with the configured font.

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13.1.6 Grid

General options

Striped grids
Displays the odd grid rows in a different color defined by the **Strip** option available on the Color & Formats 915 page.

Show editor immediately
Allows editing the cell value right after the cell is clicked.

Always show editor
Set this option to make the cell editors always active.

Enable auto-search in grid
If this option is checked, the cursor is automatically forwarded to the closest match when you start typing.

Row multi-selection
With this option set, multiple rows can be selected in grid 457.

Invert selection
Determines whether a single cell within the focused row or the entire row is highlighted when focused.

Column auto-width
With this option set, column widths are changed in order to display all columns without using the horizontal scroll bar. If the content a column is still too large to display without a need to resize the grid, then the column values are truncated and the hidden characters are replaced with an ellipsis at the end.

Cell auto-height
If the widths of the columns are insufficient to display the full content, then text clipping occurs. Set this option to prevent this. If this option is set, the cell content is displayed in multiple lines where necessary. You can set the number of lines to display using the **Cell max line count** option.

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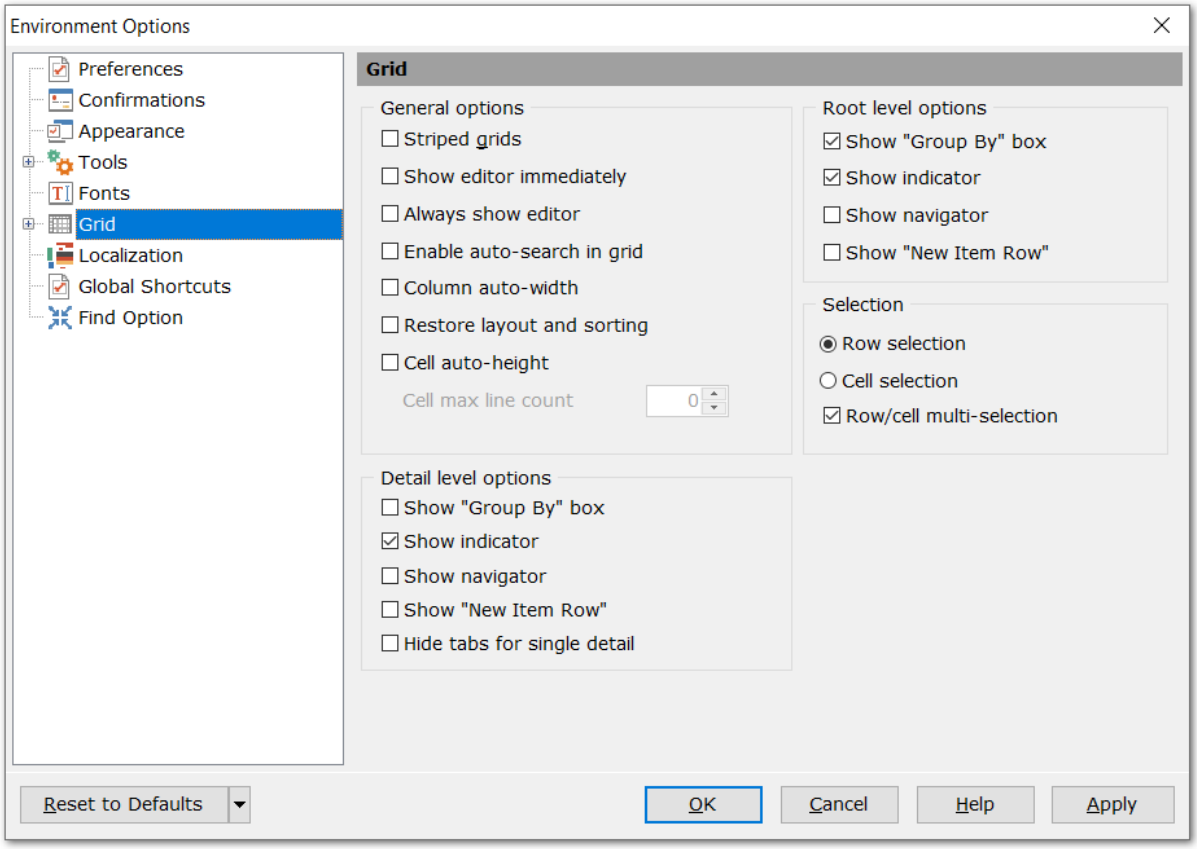

Grid layout preference

Autofit column widths
Use this option to shrink the grid columns so that the longest visible column value fits.

Save and restore layout
Use this option to keep the original grid width. Check the **Restore sorting** option to apply defaults to sorting (except for SQL sorting) as well.

Root level options

These options are applied to the main view[468] of the grid. See Grid View[457] for details.

Detail level options

These options are applied to the detail view[468] of the grid. See Grid View[457] for details.

Show "Group by" box
Displays the gray area above the column caption allowing one to group[460] data in the grid.

Show indicator
Activates/deactivates the row indicator pane at the left.

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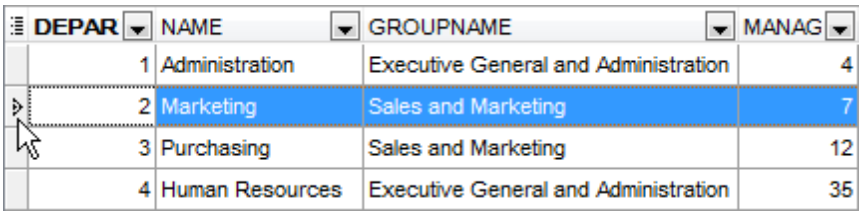
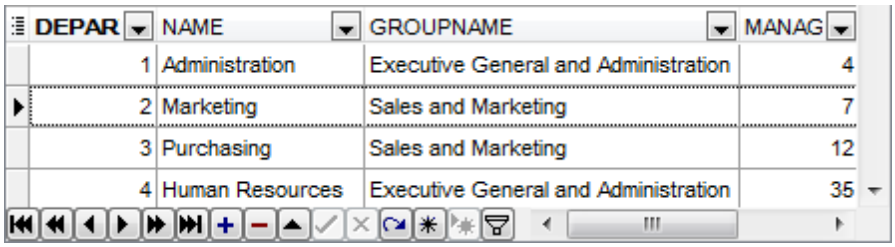


DEPAR	NAME	GROUPNAME	MANAG
1	Administration	Executive General and Administration	4
2	Marketing	Sales and Marketing	7
3	Purchasing	Sales and Marketing	12
4	Human Resources	Executive General and Administration	35

☑ **Show navigator**
Activates/deactivates the data navigator similar to the navigation pane[454] at the top of the grid. The navigator is available at the bottom of detail level view.



DEPAR	NAME	GROUPNAME	MANAG
1	Administration	Executive General and Administration	4
2	Marketing	Sales and Marketing	7
3	Purchasing	Sales and Marketing	12
4	Human Resources	Executive General and Administration	35

☑ **Show "New item row"**
Displays an empty row at the bottom of a view which is a convenient way for adding data to the grid.

☑ **Hide tabs for single detail**
This option is useful when only one view is present on the detail level. When the option is enabled, the view tab is hidden.

Selection

If the ◉ **Row selection** is selected then the whole record in the table is selected in the table on clicking the cell. Otherwise, only the clicked cell is selected (◉ **Cell selection** option).

Check the ☑ **Row/cell multi-selection** option to enable the selection of multiple cells or rows in the grid with the *Shift* button.

See also:
Grid View[457]

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13.1.6.1 Data Options

Limit options in table and view editors

Define the number of records to be selected on opening the **Data** tab of Table Editor[177] and View Editor[229]:

- *Select all records from a table**
- *Select only ... records** (you should set the number of records using the corresponding spinner control)

Advanced

OID columns as BLOB*

Enable this option if you want the OID column to be displayed as a BLOB (OID - object ID - the object identifier of a row).

TIMESTAMP columns as string

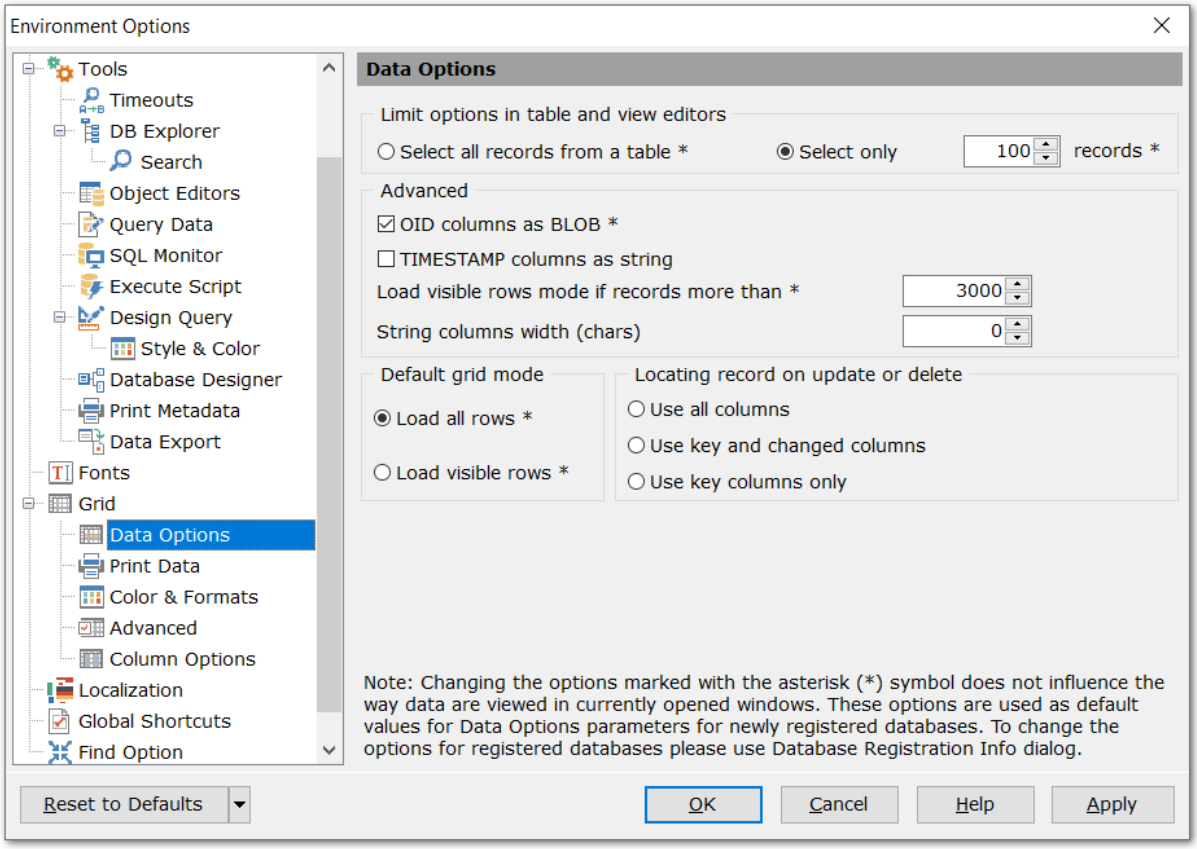
Use this option to select display of TIMESTAMP and TIMESTAMPTZ data.

Load visible rows mode if records more than...*

Set this option to switch to the **Load visible rows** mode when the number of records in the dataset exceeds the specified value.

String columns width (chars)

Using this option you can limit string columns width that may improve performance on large datasets.



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Locating record on update or delete

Specify the method of the *WHERE* clause generation for *UPDATE* and *DELETE* SQL statements:

- *Use all columns*
- *Use key and changed columns*
- *Use key columns only*

Default grid mode

- **Load all rows***

The grid loads all records from a dataset. This option increases the grid performance by reloading only changed dataset records when updating. In this mode all features (automatic sorting, filtering and summary calculations) are available.

- **Load visible rows***

The grid loads only a fixed number of dataset records into memory. This option minimizes dataset loading time. Automatic sorting, filtering, summary calculations are not available in this mode.

The **Default grid mode** options allow you to define the grid mode which will be used by default.
With the **Load all rows** option enabled, when loading data, all the records are loaded into grid buffers. In this mode opening the tables with many records may take a considerable amount of time. But in this case you can make use of some advantages: in the filter drop-down list the column headers are displayed with the values for quick filtering; it is possible to open several sub-levels at the same time when viewing data in master-detail view, etc. In case opening and other operations with an object consisting of many records takes sufficient time, the **Load visible rows** mode should be used instead. It can be set individually for each table and saved between sessions (can be set through the context menu 466 of the grid).

Note: Changing the options marked with the asterisk (*) sign does not affect the way data are viewed in currently opened windows. These options are used as default values for Data Options parameters for newly registered databases. To change the options for registered databases, please use the Database Registration Info 124 dialog.

See also:

EMS SQL Manager FAQ 30

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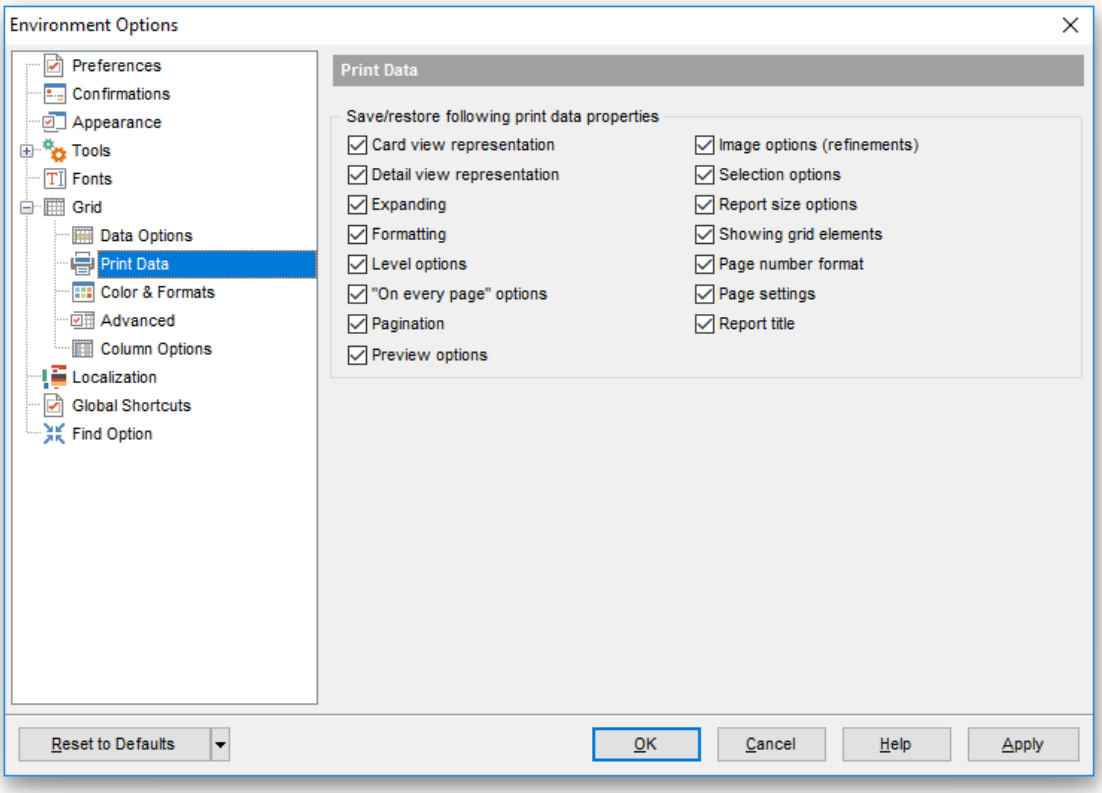
13.1.6.2 Print Data

Save/restore following print data properties

These options specify which Print Data 481 properties will be saved between work sessions (e.g. if you tick off the *Page settings* item, those settings will be saved and stored between the sessions).

You can save/restore the following **Print Data properties**: *Card view representation*, *Detail view representation*, *Expanding*, *Formatting*, *Level options*, *"On every page" options*, *Pagination*, *Preview options*, *Image options*, *Selection options*, *Report size options*, *Showing grid elements*, *Page number format*, *Page settings*, *Report title*.



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13.1.6.3 Color & Formats

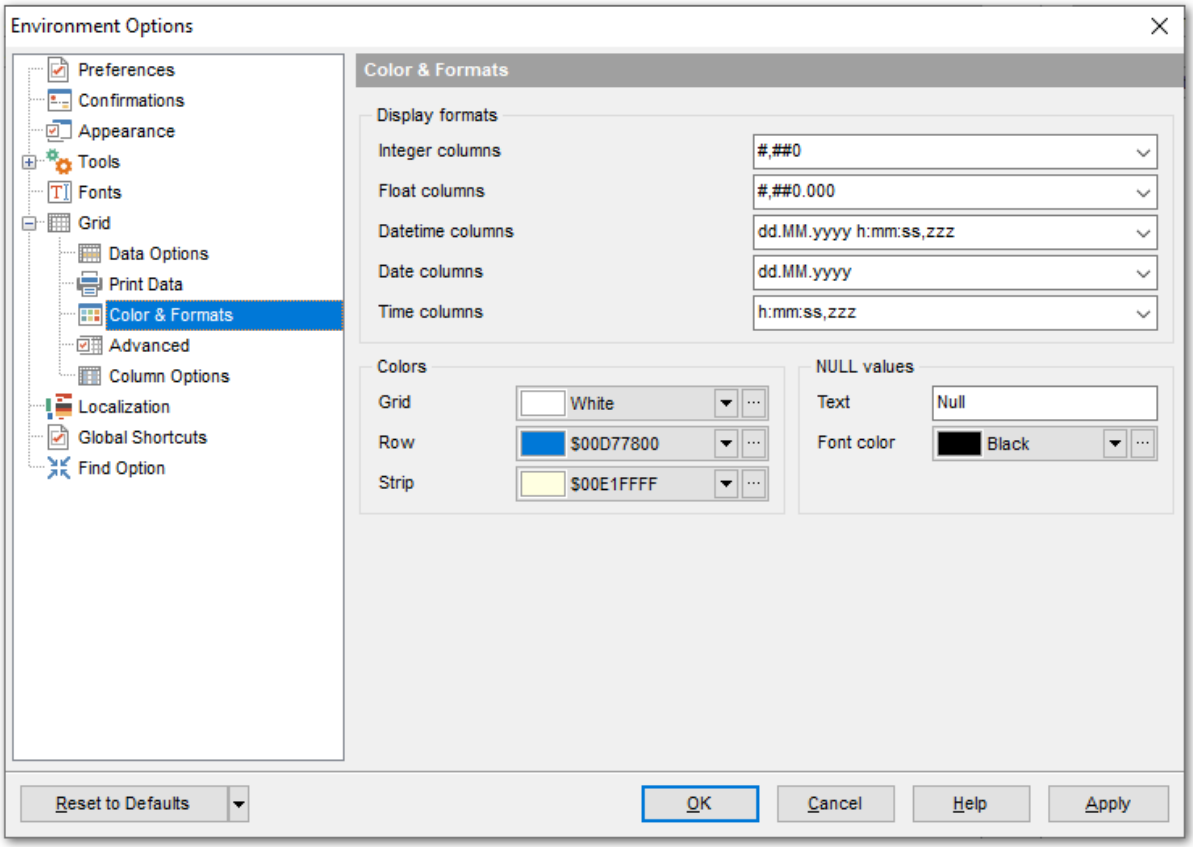
Display formats

Integer columns
Defines the format for displaying *INTEGER* columns.

Float columns
Defines the format for displaying *NUMERIC* and *DOUBLE PRECISION* columns.

Date / Time columns
Defines the format for displaying *DATE* / *TIME* columns.

For more information refer to the Format specifiers 978 page.



Colors

Options of this group allow you to set colors for basic grid 457 elements. Use the ellipsis button to open the **Color** dialog allowing you to select the required color from the palette.

Grid
Defines the background color of the data grid.

Row
Defines the color of the selected row in the data grid.

Strip

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Defines the color of the odd rows (applied if the **Striped grids** option is set on the Grid 909 page).

NULL values

Text

Defines the text that stands for NULL values in grid 457.

Font color

Defines the font color for displaying NULL values in the grid 457. Use the ellipsis button to open the **Color** dialog allowing you to select the required color from the palette.

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13.1.6.4 Advanced

Advanced options

Cell hints for clipped text
Indicates whether a hint box is displayed when hovering over a cell containing clipped text.

Focus cell on cycle
Determines whether the focus moves to the next row after it reaches the right-most cell within the current row.

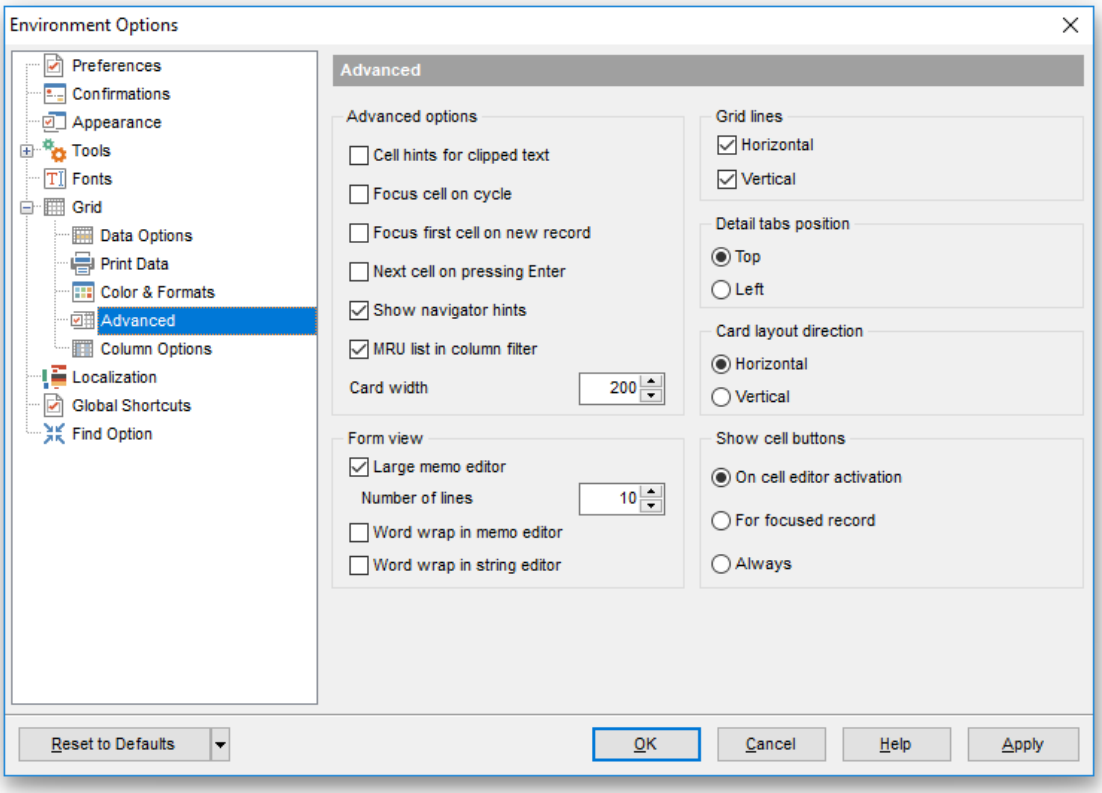
Focus first cell on new record
Determines whether the focus moves to the first cell of a newly created row.

Next cell on pressing Enter
Determines whether the current view columns can be navigated by using the **Enter** key.

Show navigator hints
Indicates whether a hint box is displayed when hovering over navigation buttons.

MRU list in column filter
Enables showing of *Most Recently Used* items when filtering columns

Card width
Defines the width of the card used in Card View 476 mode.



Form view

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Large memo editor
Sets the number of lines for text-typed columns when viewing data in Form view 479.

Word wrap in memo editor
Determines whether long strings are wrapped within the memo editor area.

Word wrap in string editor
Determines whether long strings are wrapped within the string editor area.

Grid lines
Determines whether to display *vertical* and *horizontal* lines between cells.

Detail tabs position
Specifies the position of the tabs in detail level views: *top* or *left*.

Card layout direction
Specifies the direction of cards in Card View mode: *horizontal* or *vertical*.

Show edit buttons
Indicates when the edit buttons are displayed: *never*, *for focused record* or *always*.

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13.1.6.5 Column Options

Common options

Auto-select text
Determines whether all text within an editor is automatically selected when the editor gets focus.

Hide selection on losing focus
Determines whether the visual indication of the selected text remains when the editor loses focus.

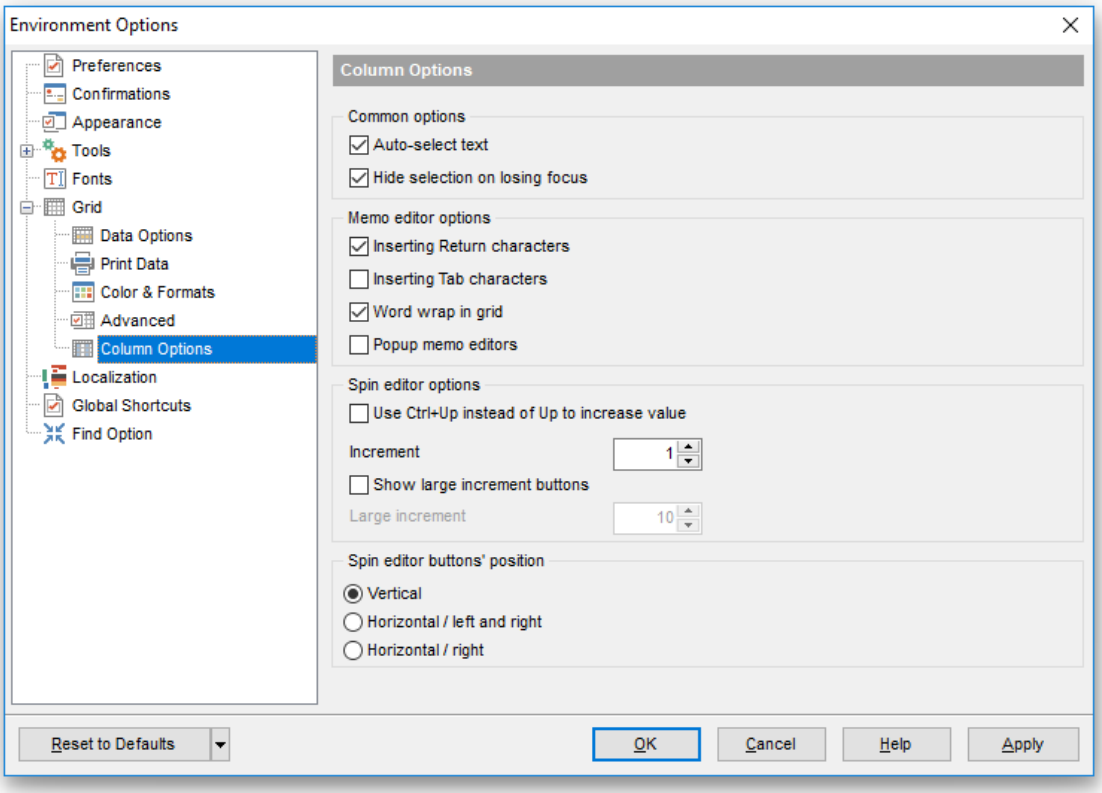
Memo editor options

Inserting Return characters
Specifies whether a user can insert return characters into text.

Inserting Tab characters
Specifies whether a user can insert tab characters into text.

Word wrap in grid
Determines whether long strings are wrapped in grid.

Popup memo editors
Turns on popup memo editors for text BLOB type columns.



Spin editor options

Use Ctrl+Up instead of Up to increase value
Allows you to use *Ctrl+Up* and *Ctrl+Down* key combinations for editing spinner values (for

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INTEGER column values).

Show large increment buttons
Determines whether fast buttons (for large increment) are visible within the editor.

Increment
Specifies the increment value for the spin editor (spinner control).

Large increment
Specifies the large increment value for the spin editor (spinner control).

Spin editor buttons' position
Specifies the position of spin editor (spinner control) buttons: *vertical*, *horizontal / left and right* or *horizontal / right*.

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13.1.7 Localization

The **Localization** section of the **Environment Options** dialog is provided for managing the localization files of SQL Manager for PostgreSQL.

You can create your own **.lng* files similar to those available in the *%program_directory %\Languages* folder, add them to the list of available languages and set the new language as the program interface language.

Default directory
Use the **Explorer** button to specify the directory where the **.lng* files are to be stored by default.

Choose program language
Use the drop-down list of available languages to select the interface language to be applied to the application.

Auto scan languages on startup
When checked, the directory with localization files will be scanned automatically at the application startup; all the languages found will be added to the list of available languages.

Available Languages
Lists all the languages available for localization and the corresponding **.lng* files. Double-click a language in the list to edit its name or the **.lng* file.

Add Defaults
This button is used to search for **.lng* files in the **Default directory** and add all of them to the **Available Languages** list.

Add
Opens the Add language 981 dialog where you can specify your own localization file and set the language name.

Edit
Opens the Edit language 981 dialog where you can change the language name or select another localization file for the specified language.

Delete
Removes the selected language from the **Available languages** list (without confirmation).

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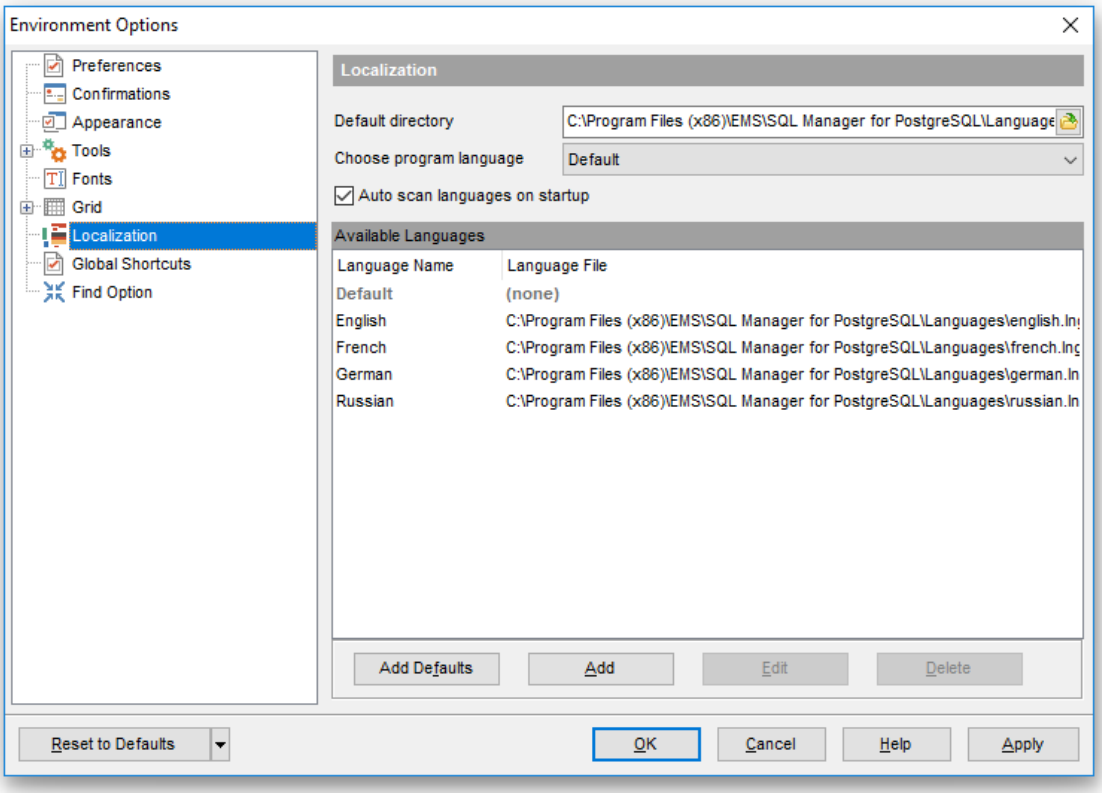

See also:

Localization 950

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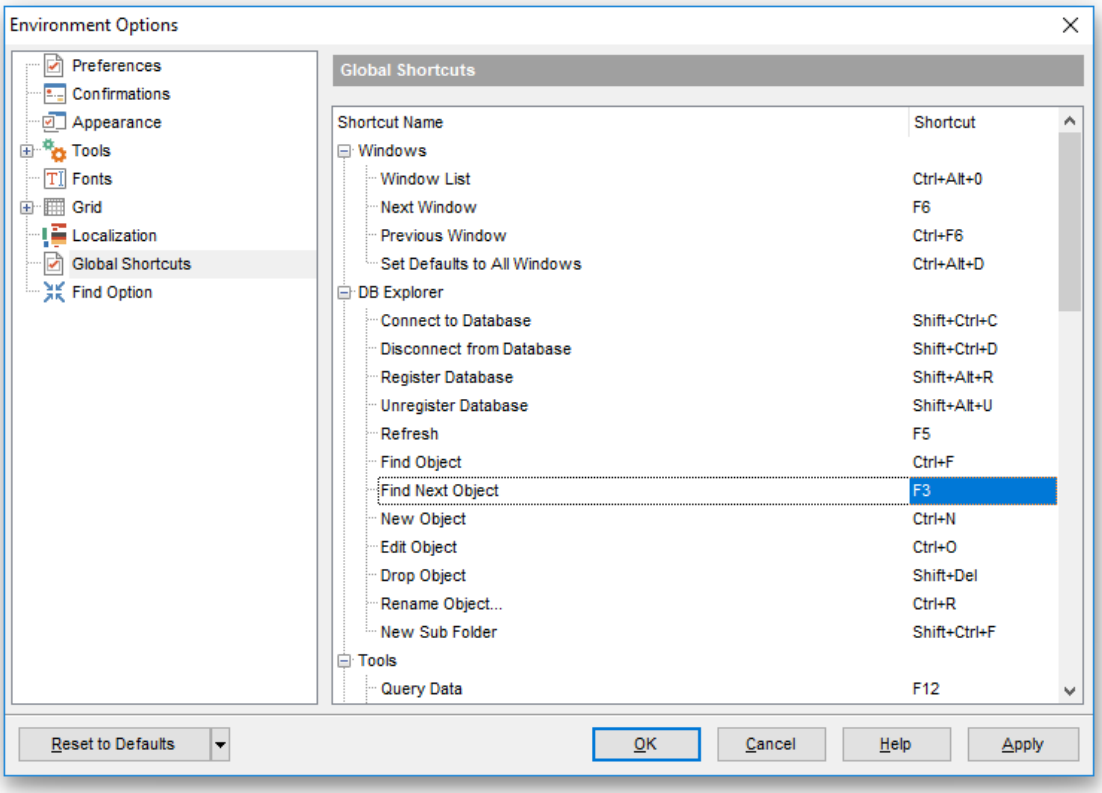
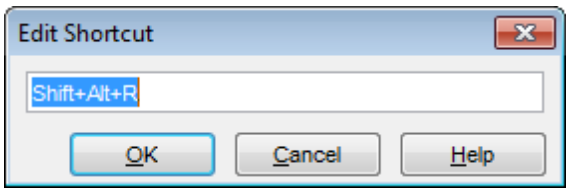
13.1.8 Global Shortcuts

This section allows you to view/edit shortcuts most needed actions when working with SQL Manager for PostgreSQL.



To edit shortcut, select the required action click the ellipsis button and press the preferred key combination to assign it with the action.



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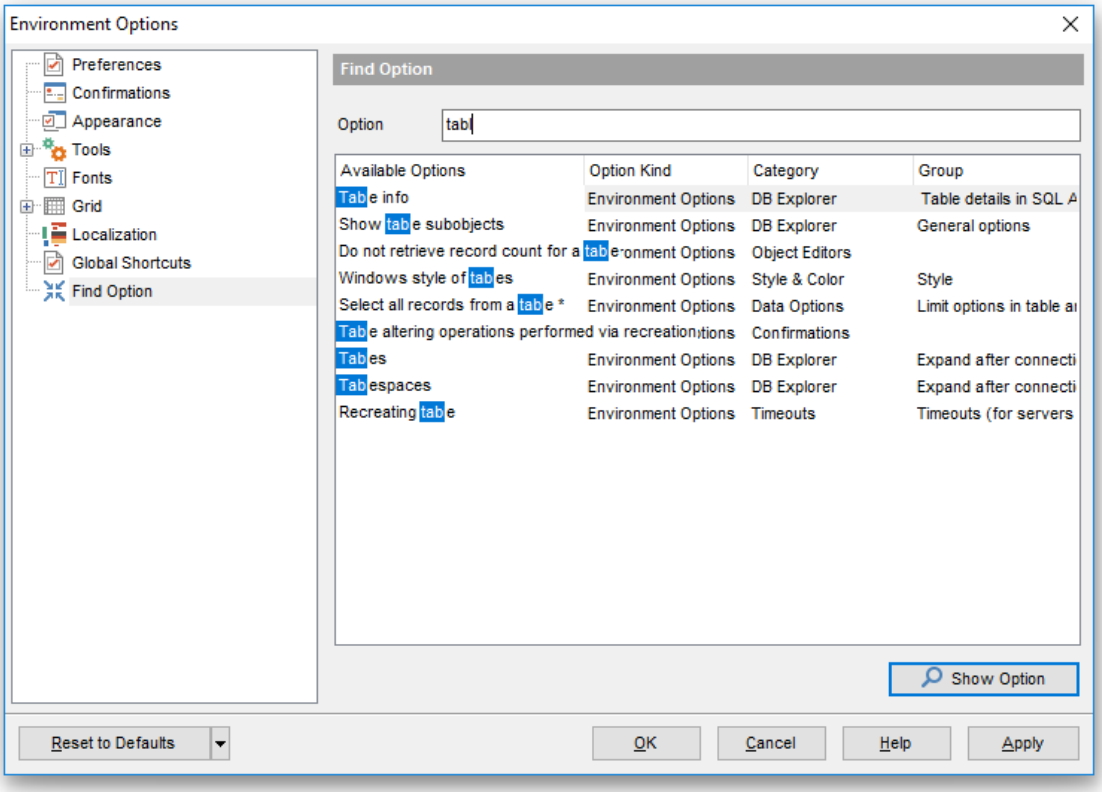
13.1.9 Find Option

The **Find Option** section allows you to search for options available within the **Environment Options** dialog easily and quickly.

Option
In this field you can enter the name of the option to search for within SQL Manager *Environment Options*.



The **Available options** area lists all options of the *Environment Options* category according to the specified name. The **Option Kind**, **Category** and **Group** columns specify option type and location.
Select the required option in the list and click **Show Option** to open the corresponding section where you can view/edit the value of this option. For your convenience the required option is marked with an animated icon.

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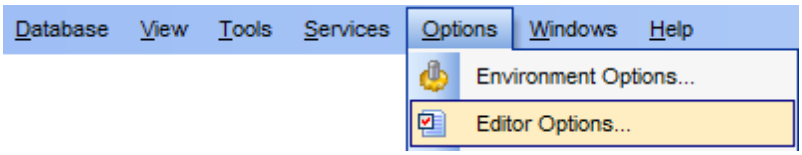
13.2 Editor Options

Editor Options allow you to set the parameters of viewing and editing SQL statements within Query Data 415 and other SQL editing tools of the SQL Manager application.

To open the **Editor Options** window, select the **Options | Editor Options...** main menu 961 item, or use the **Editor Options** button on the main toolbar 963.



General 926
Display 930
SQL Formatter 937
Key Mapping 940
Spell Checking 942
Find Option 944

See also:

Environment Options 871
Save Settings 945

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13.2.1 General

Editor options

Auto indent
If this option is checked, each new indention is the same as the previous one when editing SQL text.
Indents and outdents are used in the process of text editing to make the source code easier to read.

Insert mode
If this option is checked, the insert symbols mode is on by default.

Find text from cursor
If this option is checked, the From Cursor mode will be set in the Find Text 971 and Replace Text 973 dialog.

Always show hyperlinks
If this option is checked, hyperlinks are displayed in the editor window. To open a link, click it with the *Ctrl* key pressed.

Double click line
If this option is checked, double-clicking the line on which the cursor is set selects the whole line.

Trim trailing spaces
If this option is checked, all spaces after the last symbol in line will be trimmed.

Fixed line height
Prevents line height calculation. If this option is checked, the default line height is taken.

Persistent blocks
Keeps marked blocks selected even when the cursor is moved with the arrow keys used, unless a new block is selected.

Fixed column move
If this option is checked, the caret keeps its horizontal position when moved between lines.

Optimal fill
Check this option to enable optimal algorithm of filling text content in the working area of the editor.

Unindent keep align
Keeps align for the lines that are not indented.

Smart caret
This option determines the caret movement (up, down, line start, line end). The caret is moved to the nearest position on the screen.

Resolve aliases
Enables/disables the syntax highlight and code completion features for aliases.

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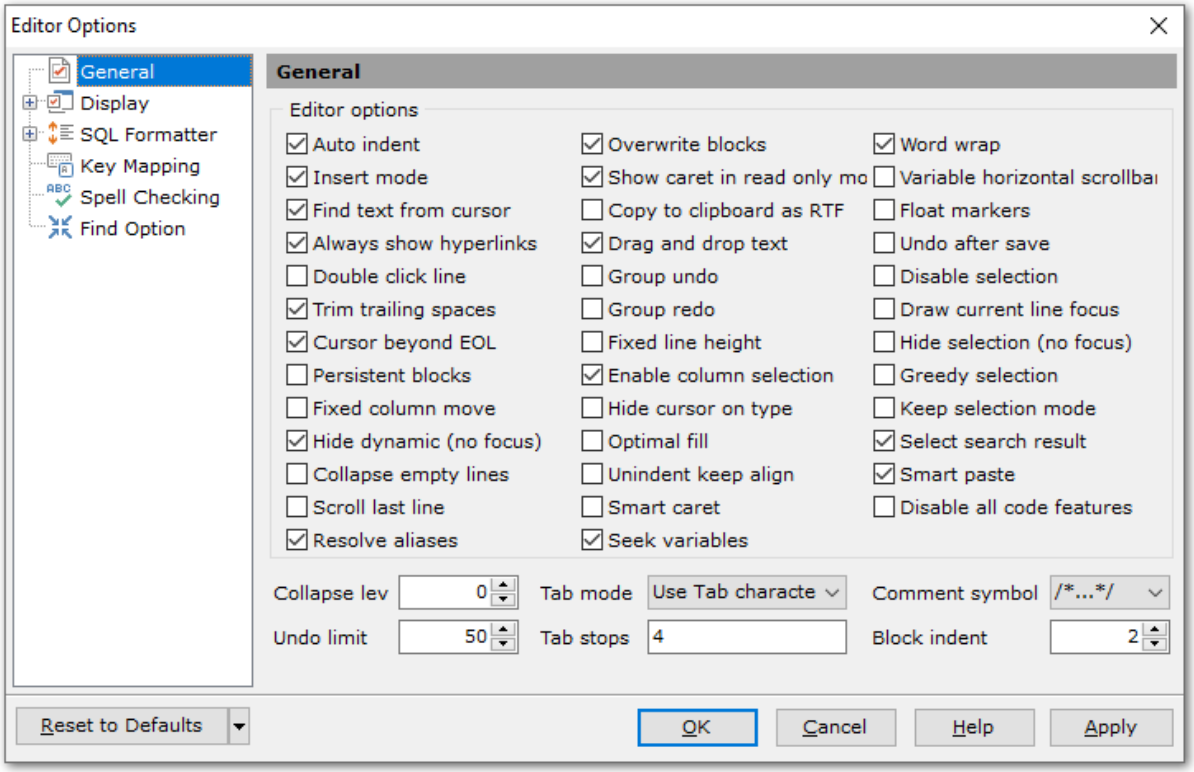

Overwrite blocks
Replaces a marked block of text with whatever is typed next. If **Persistent Blocks** is also selected, the text you enter is appended to the currently selected block.

Show caret in read only mode
Displays/hides the caret in read-only mode.

Copy to clipboard as RTF
If this option is checked, the selected text is copied in RTF format.

Drag and drop text
This option allows to drag and drop selected text.

Group undo
This option allows you to undo multiple actions of the same kind.

Group redo
This option allows you to redo multiple actions of the same kind.

Cursor beyond EOL
If this option is checked, the horizontal position of a cursor is kept. If you move the cursor (using the *Up* and *Down* arrow keys) onto a line having length less than the current cursor horizontal position, it will be positioned after the last symbol of the line.

Enable column selection
Enables/disables column selection mode.

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Hide cursor on type
Hides/displays mouse cursor within the working area while a user is typing some text.

Hide dynamic (no focus)
Hides dynamic highlights when an editor is not focused.

Collapse empty lines
Collapses empty lines after a text range when this range has been collapsed.

Scroll last line
When the option is enabled, you can scroll to the last line of the text only, otherwise you can scroll to the end of the page.

Seek variables
Disables code completion feature for variables.

Word wrap
When on, text is wrapped at the right margin of the editor area to fit in the visible area.

Variable horizontal scrollbar
If this option is checked, the horizontal scrollbar varies according to the current content of the editor.

Float markers
When enabled, markers are linked to the text, and they will move with the text while the text is being edited; otherwise the markers are linked to the caret position, and stay unchanged while the text is being edited.

Undo after save
Keeps undo buffer unchanged after saving.

Disable selection
Disables any selection when editing.

Draw current line focus
Draws the focus rectangle around the current line when the editor has focus.

Hide selection (no focus)
Hides the selection when the editor loses focus.

Greedy selection
Selects an extra column/line in column/line selection modes.

Keep selection mode
Enables selection for caret movement commands (like in BRIEF).

Select search result
Determines whether the search result should be selected.

Smart paste
When this option is enabled, the editor gets both Unicode and ANSI content from the clipboard, converts them using the selected character set and selects the best text to be

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pasted. This allows getting correct text copied from both ANSI and Unicode applications disregarding the currently selected keyboard language.

Disable all code features
This option disables code completion, code folding, highlight and all options that are set on the Quick Code 935 page. For options that are set on the Highlight 933 page, the defaults will be applied.

Collapse level
Specifies the level of text ranges that will be affected by the "Collapse all" command.

Undo limit
Defines the maximum number of changes possible to be undone.

Tab mode
Specifies the way the TAB key is processed. Possible values are: *Use tab character* (inserts a tab character); *Insert spaces* (inserts space characters); *Dialog behaviour* (when the edit control is in a dialog, the focus is switched to the next control); *Smart tab* (tabs to the first non-white space character in the preceding line).

Tab stops
Defines the tab length used when editing a text.

Comment symbols
Defines the symbols which will be used to comment code fragments.

Block indent
Specify the number of spaces to indent a marked block.

Hint: The **Reset to Defaults** button which is common for all sections of the **Editor Options** dialog opens a menu with items allowing you to discard all changes and reset options of the *current category* or of *all categories* to their defaults.

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13.2.2 Display

Default editor fonts

Use these options to set the *font* and *size* used in the editor.

☑ **Show only fixed-width fonts**
Use this option to display only fonts with fixed width in the **Font** dialog.

Gutter

☑ **Show line numbers**
If this option is checked, line numbers are displayed in the SQL text editor window.

☑ **Gutter auto width**
Enable this option to specify that the gutter width will be adjusted automatically.

☑ **Display line state**
If this option is checked, a colored line indicating the state of all altered lines in the text is displayed at the gutter of the editor window.

☑ **Use code folding**
Check this option to enable to code folding feature of Query data.

Width
Defines the gutter width in the editor window.

Use these options to set the *Font*, *Size* and *Numbering style* used in the gutter.

☑ **Show only fixed-width fonts**
Use this option to display only fonts with fixed width in the **Font** dialog.

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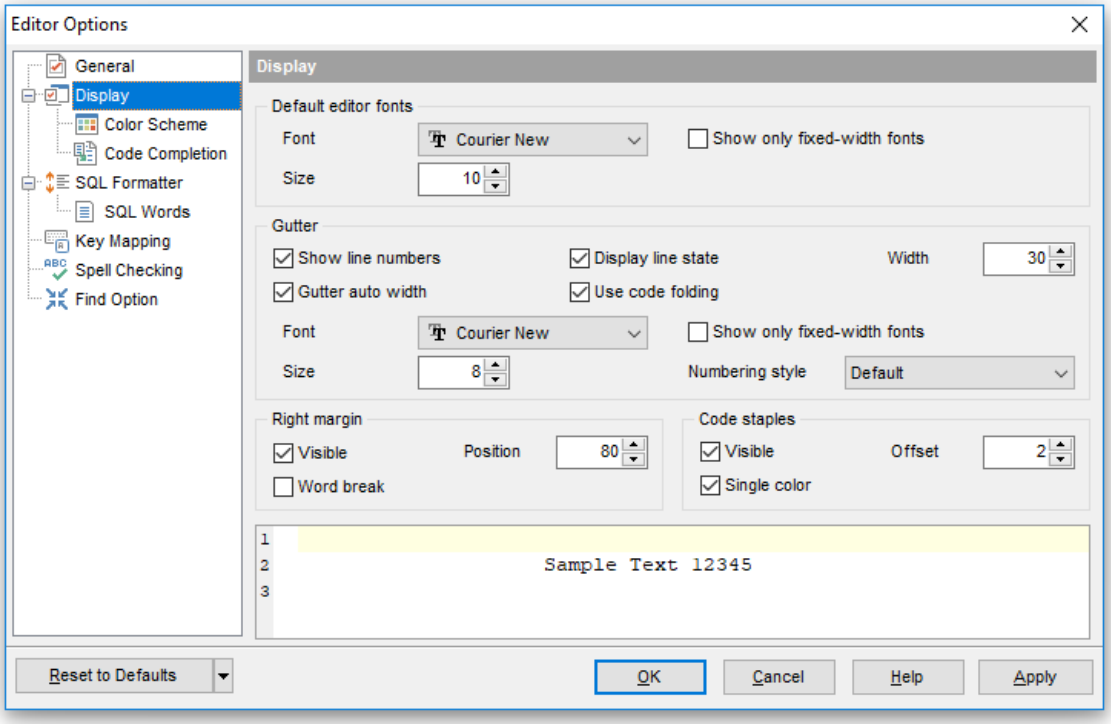

Right margin

Visible
Makes the right text margin visible.

Word break
Allows breaking the words at the right margin.

Position
Defines the position of the right text margin in the editor window.

Color
Defines the color of the right margin in the editor window. Select an item from the drop-down list or click the ellipsis button to select a color using the **Color** dialog where you can specify the required color from the palette.

Code staples

Visible
Makes the code staples visible in the editor window.

Single color
Check the option to apply a single color for code staples.

Offset
Specify the offset value for code staples.

Color

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Defines the code staples color in the editor window (if the **Single color** option is deselected). Select an item from the drop-down list or click the ellipsis button to select a color using the **Color** dialog where you can specify the required color from the palette.

Fonts
Use these options to set the *fonts*, *style*, *size* and *color* used in the editor. If the **Show only fixed-width fonts** option is checked, only fonts with fixed width are displayed in the **Font** dialog.

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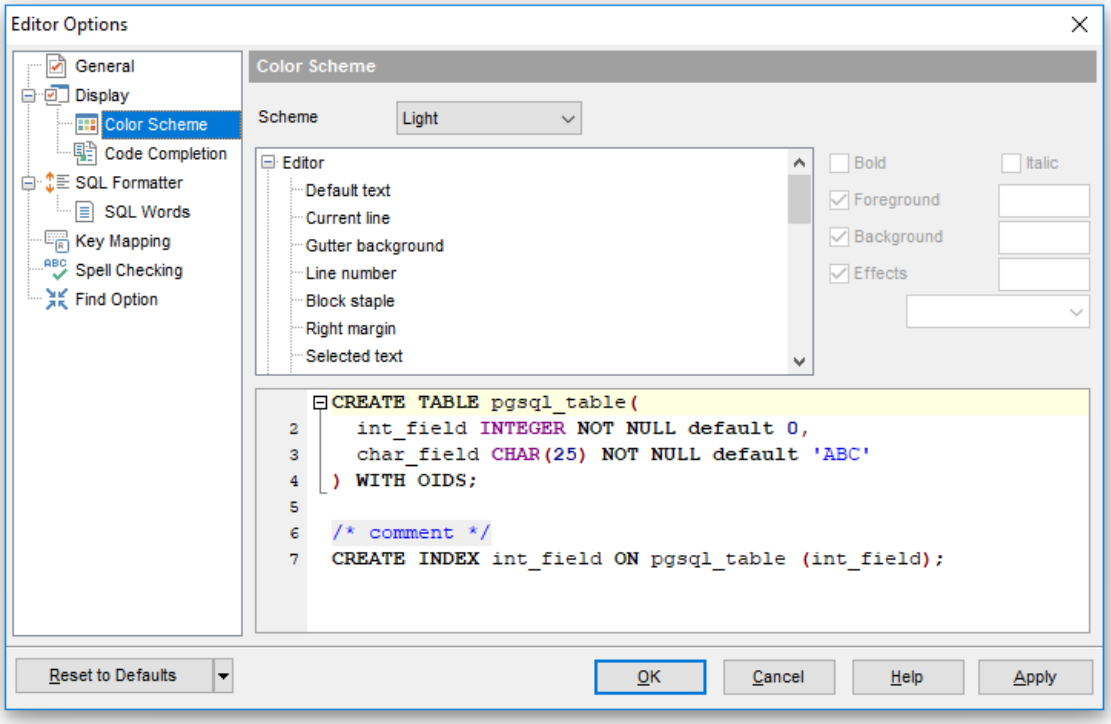
13.2.2.1 Color Scheme

Scheme
Select the default color scheme for all editors: *Default* (Light) or *Dark*.



The **Element** list contains all elements available in SQL editors of the program. For your convenience the preview area (located below the **Element** list) illustrates the changes being made to each of the elements
Controls for changing the properties of the item selected in the **Element** list are located on the right. Use the following instructions for each of the elements.

Bold
Highlights the element with bold.

Italic
Makes the element text cursive.

Foreground
Select the foreground color for the element.

Background
Select the background color for the element.

Effects
Enables additional effects for the element text.

See also:
Code Completion 935

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13.2.2.2 Code Completion

The **Code Completion** section of the **Editor Options** dialog allows you to specify the **automatic features**, **fonts**, **styles**, **foreground** and **background colors**, **borders** and other attributes of the text used by the editor to display objects for 'quick code': *tables*, *UDFs*, *indices*, *columns*, *foreign keys*, *procedures*, *functions*, *views*, *triggers*, *scheduled events*, *SQL keywords*, *SQL functions*.

Automatic features

☑ **Code completion**
If this option is checked, then on typing the first word characters in the SQL text editor you will be offered some variants for the word completion in a popup list (an analogue of the **Code Insight** feature in **Delphi IDE**). The popup list will appear after a period of time defined by the **Delay** option.

Delay
Using this option you can change the time after which completion variants popup.

Sensitivity
This option allows you to set the number of characters to be typed before code completion is activated.

☑ **Parameters completion**
If this option is checked, the Delphi-like hint for key words is enabled.

☑ **Group by type**
If enabled, the items in the code completion list are sorted by type, otherwise they are sorted by name.

☑ **Sort column names**
Enable this option to force sorting for column names.

☑ **Show information hints**
This option enables/disables information hints for variants offered by *code completion* feature.

☑ **Auto launch keyboard templates**
Allows you to use keyboard templates for faster typing frequently used expressions (see Keyboard Templates 953).

☑ **Accept by Space key too**
Enables selecting the completion item with Space key.

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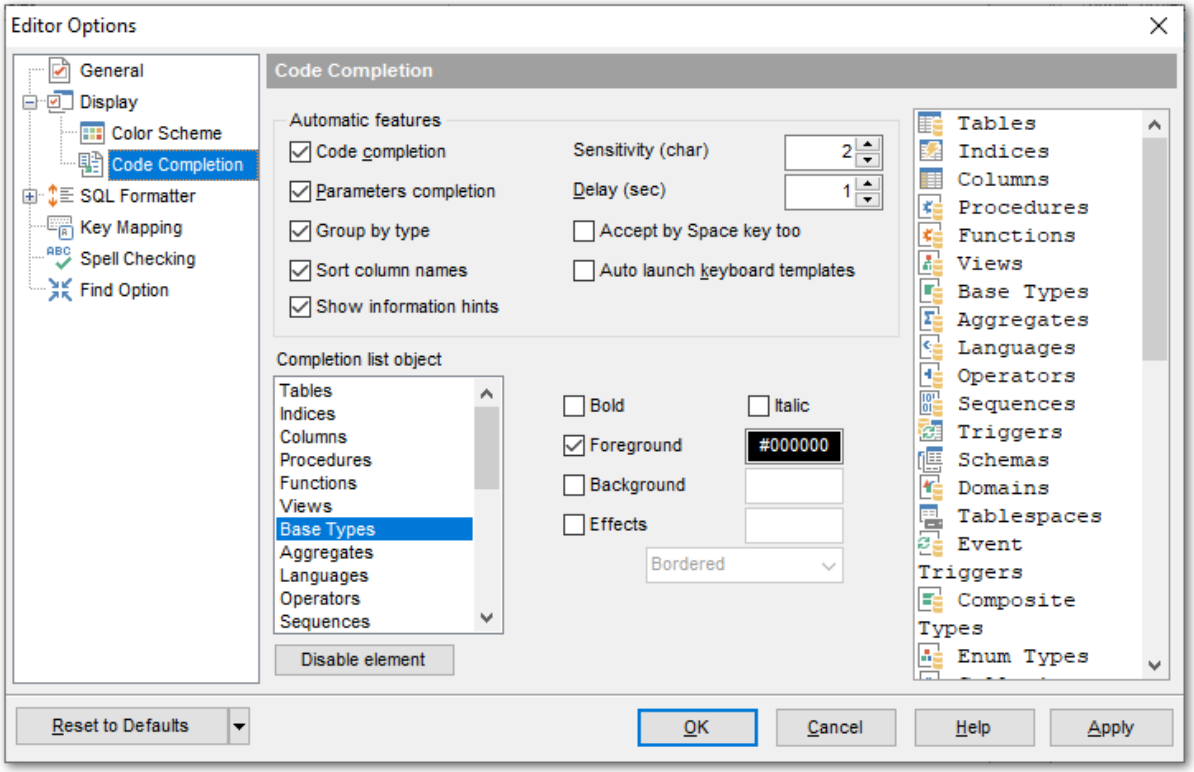

Completion list object

The list contains all objects for which you can set quick code parameters. For your convenience the preview area (located to the right of the **Completion list object** list) illustrates the changes being made to each of the objects.
If you press the **Disable element** button, the standard settings will be applied to this object; the button text will change to **Enable element**. If you press this button, you will be able to change font and color attributes for this object.

Controls for changing the properties of the item selected in the **Completion list object** list are located on the right.

See also:

Highlight 933

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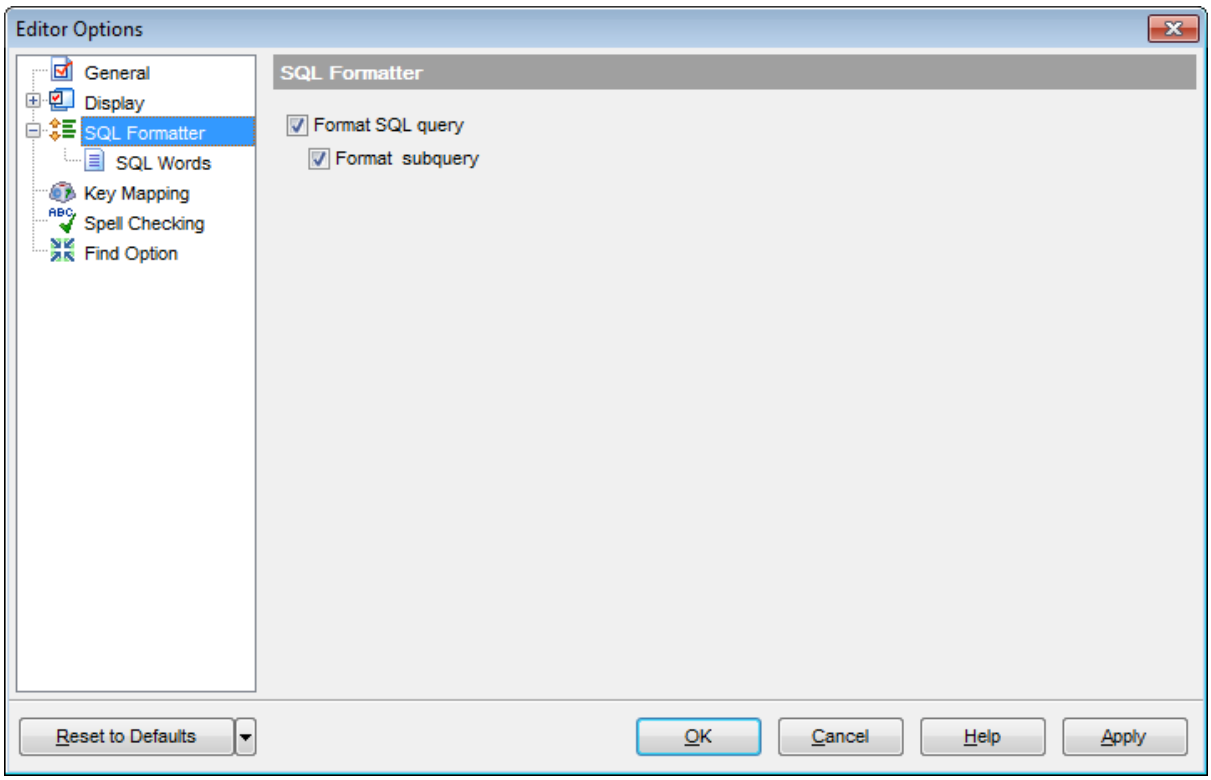
13.2.3 SQL Formatter

SQL Formatter is a feature implemented in SQL Manager for PostgreSQL and is a useful tool for formatting SQL queries and scripts, making SQL statements easy to read. SQL Formatter is introduced in Query Data 415, Execute Script 646 and some object editors.

The **Settings** tab of the **SQL Formatter** section allows you to enable this feature and apply SQL formatting to subqueries, if necessary.

☑ **Format SQL query**
Check this option to enable SQL formatting.

☑ **Format subquery**
Enables SQL formatting for subqueries.



See also:
Query Data 415

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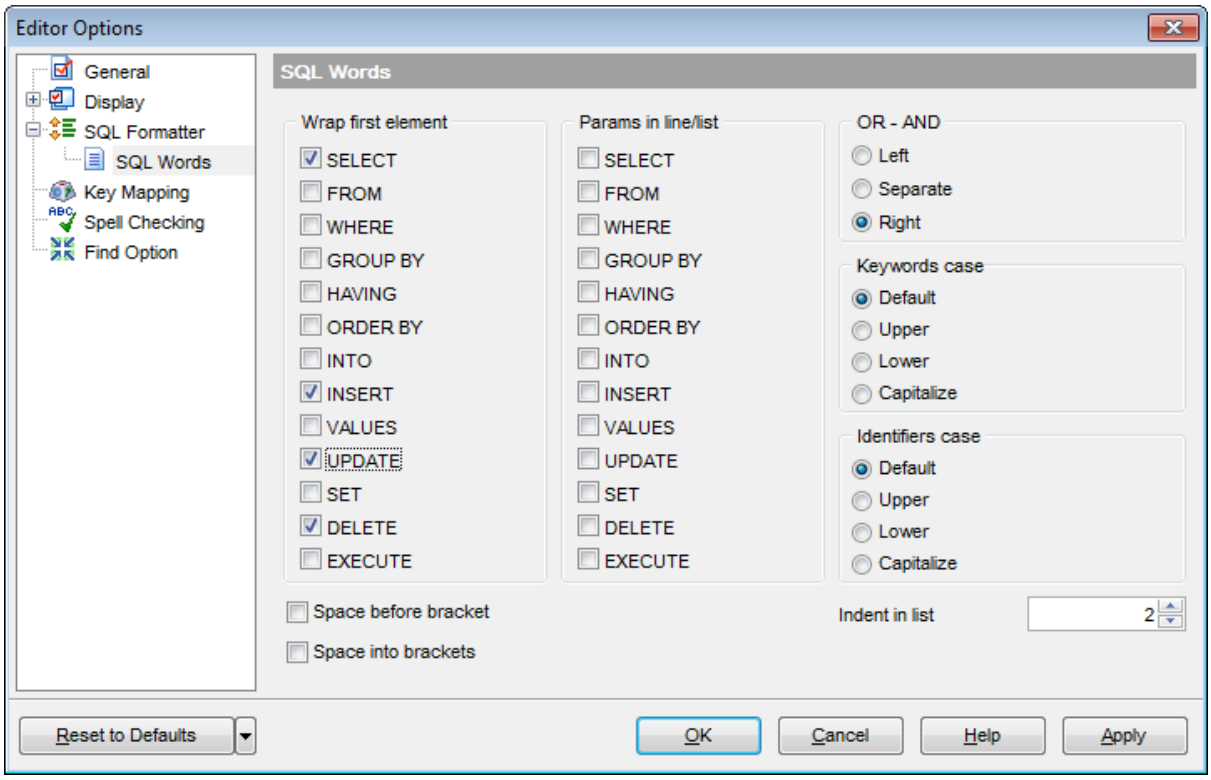
13.2.3.1 SQL Words

The **SQL words** page of the **SQL Formatter** section allows you to select the key words for each action of SQL formatter and to set formatting parameters.

Wrap first element
Wraps the selected text at a specific column. Select the SQL key words after which formatting should be applied.

Params in line/list
Allows you to display the parameters followed by the defined key words in list or in line.



OR - AND
Set the placement of the AND an OR operators according to the operands followed by them. See the example below.

Left

```
WHERE
        AND ...
        AND ...
        AND ...
```

Separate

```
WHERE
        ...
         AND
```

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```
    ...
     AND
```

Right

```
WHERE
    ... AND
    ... AND
    ... AND
```

The **Keywords case** / **Identifiers case** options allow you to define the case of the corresponding items.
You can choose *UPPER*, *lower*, *Capitalize*.
Default case means that the name of the identifier/keyword remains "AS IS".

Space before bracket
Adds a "space" character before the opening bracket and after the closing one.

Space into brackets
Adds a "space" character after the opening bracket and before the closing one.

Indent in list
Sets the size of indent relatively to the previous string.

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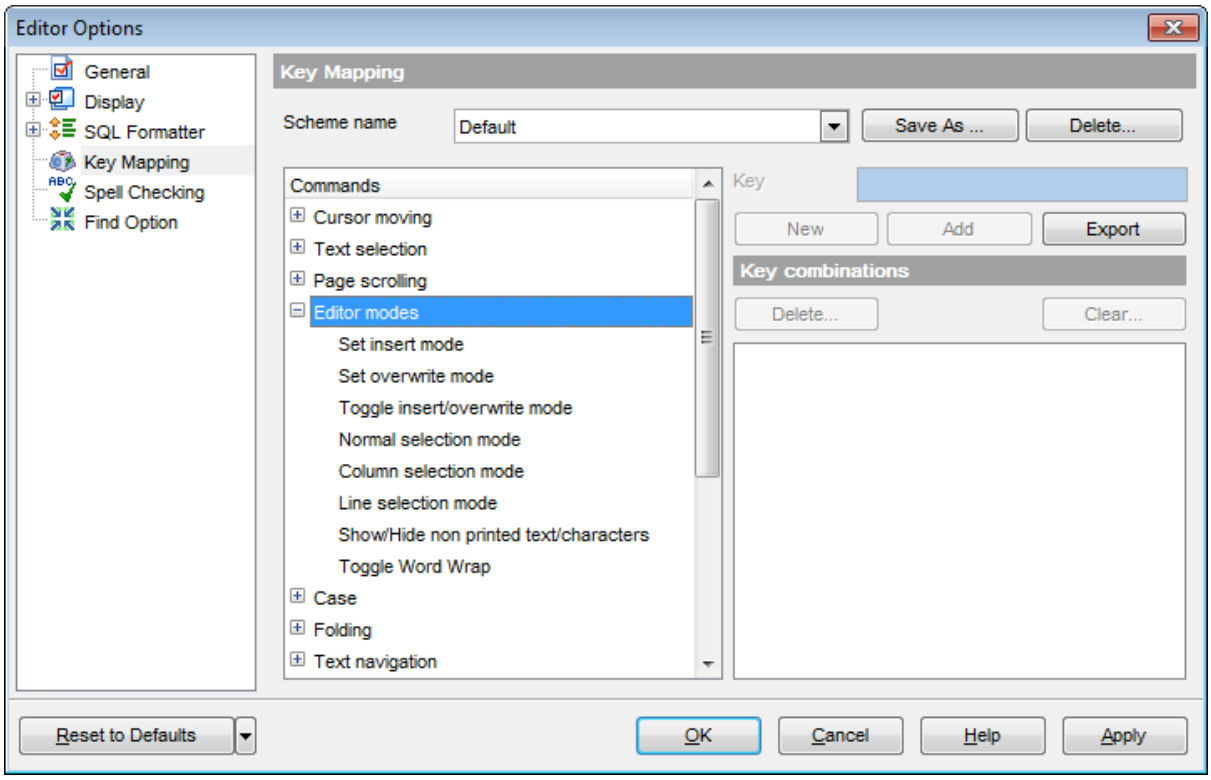
13.2.4 Key Mapping

For your convenience **key mapping** is provided in SQL Manager for PostgreSQL. On this page you can set the shortcuts[1001] for various commands/operations according to your needs.

Use the **Commands** list on the right to select the command for which you need to make a shortcut, then place cursor into the **Key** editor and press the key combination you find useful (use *Ctrl Alt Shift* buttons). After setting the shortcut, press the **New** button to add it to the list of existing **Key combinations**. If the specified shortcut is already assigned to another command/operation, an error message with the command/operation will be returned.



Note: It is possible to set more than one key combination for the same command/operation (e.g. *Ctrl+K, Ctrl+H*) using the **Add** button.

If necessary, you can export the current Key mapping list to an external file by pressing the **Export** button.

Manage the shortcuts within the Key combinations list using the **Delete** (to remove the selected item) and the **Clear** (to remove all shortcuts for this command/operation) buttons.

It is also possible to save a custom key mapping scheme, if necessary:

- set the shortcuts for the appropriate commands/operations;
- click the **Save As...** button;
- input the new scheme name in the corresponding dialog.

To delete a scheme, select it in the **Scheme name** drop-down list and press the **Delete**

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button.

See also:

Query Data 415

SQL Manager shortcuts 1001

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13.2.5 Spell Checking

Spell checking is a new feature implemented in SQL Manager for PostgreSQL for your convenience.

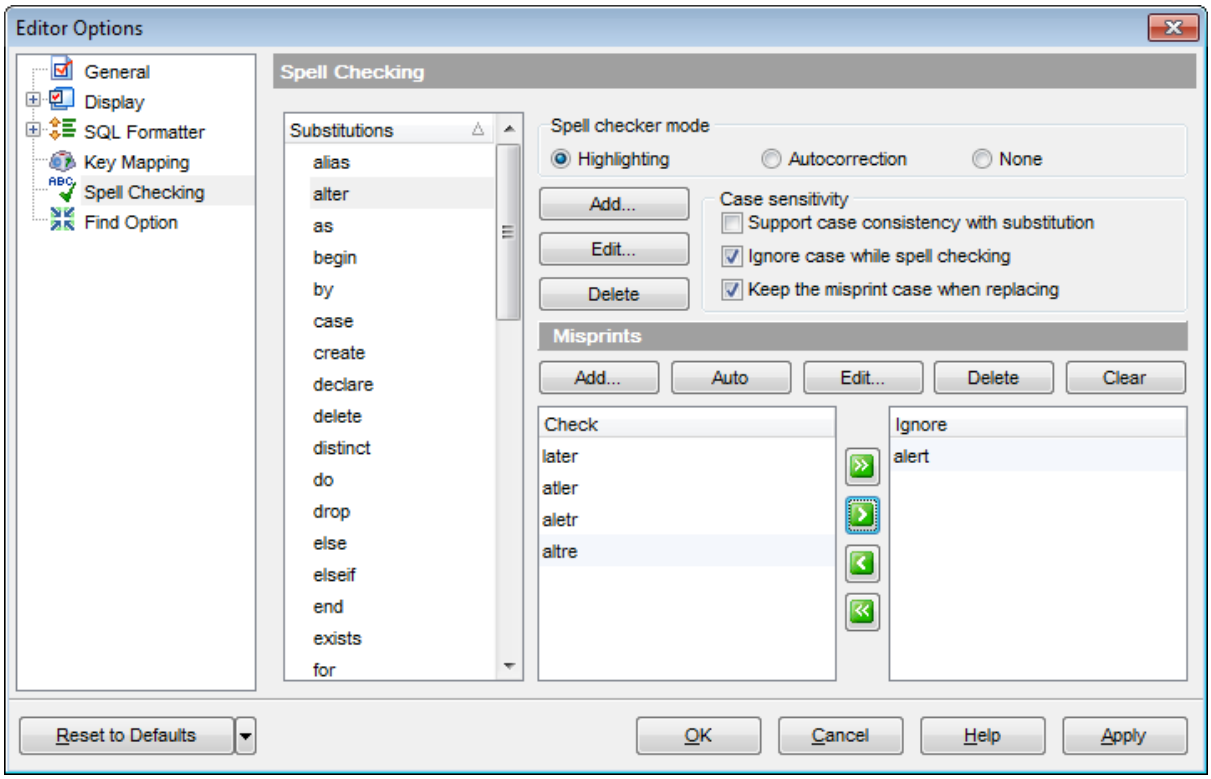
Set the necessary **Spell checker mode**:

Highlighting
In this mode incorrectly spelled and misprinted words are highlighted in the editor.

Autocorrection
In this mode incorrectly spelled and misprinted words are replaced with the corresponding words from the **Substitutions** list automatically.

None
In this mode the spelling checker is disabled.

Use the **Add...** button to add a new item to the **Substitutions** list, the **Edit...** button to alter the selected substitution, and the **Delete** button to remove the selected substitution from the spelling checker vocabulary.



Case sensitivity

Support case consistency with substitution
If this option is selected, the spelling checker uses the case of words-substitutions when performing a replacement.

Ignore case while spell checking
Check this option to disable case checking.

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Keep the misprint case when replacing
Check this option if you do not wish to change the case of the replaced word.

Misprints
Controls of this group allow you to manage the spelling checker vocabulary: use the **Add...** button to add a new misprint to the vocabulary, the **Auto** button to use the default list of misprints, the **Edit...** button to change the selected misprint, the **Delete** button to remove the selected misprint from the vocabulary, and the **Clear** button to empty the list of misprints for the currently selected substitution.

It is also possible to exclude a misprint from spell checking without deleting the misprint. This misprint will therefore remain in the vocabulary, but it will be ignored by the spelling checker.
To mark a misprint as excluded, you need to move it from the **Check** list to the **Ignore** list. Use the buttons or drag-and-drop operations to move the misprints from one list to another.

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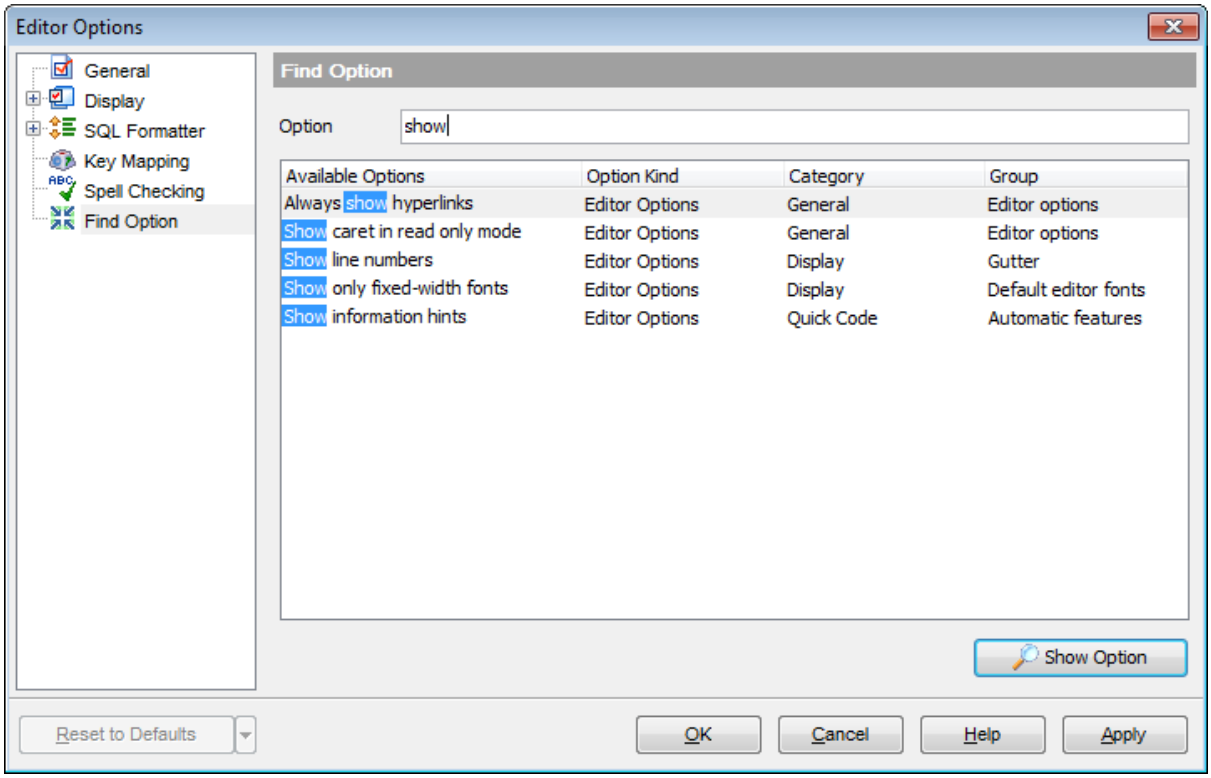
13.2.6 Find Option

The **Find Option** section allows you to search for options available within the **Editor Options** dialog easily and quickly.

Option
In this field you can enter the name of the option to search for within SQL Manager *Editor Options*.



The **Available options** area lists all options of the *Editor Options* category according to the specified name. The **Option Kind**, **Category** and **Group** columns specify option type and location.
Select the required option in the list and click **Show Option** to open the corresponding section where you can view/edit the value of this option. For your convenience the required option is marked with an animated icon.

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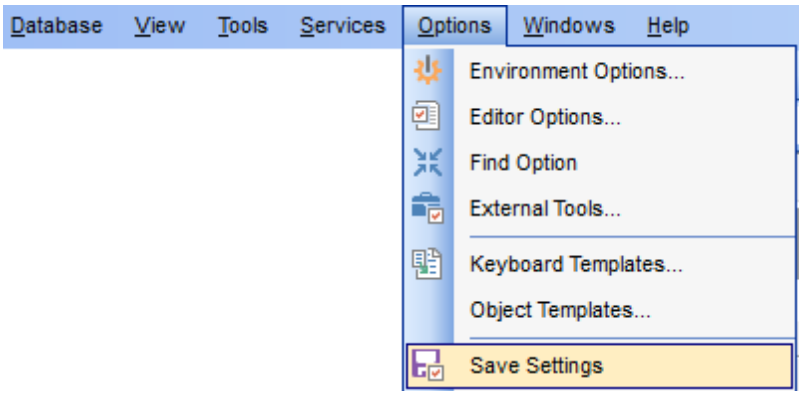
13.3 Save Settings

Save Settings Wizard allows you to export the settings of SQL Manager for PostgreSQL - wholly or partially - to a single **.reg* file which can be applied afterwards to SQL Manager for PostgreSQL installed on another machine, or it can be used to backup previous settings.

To start the wizard, select the **Options | Save Settings** main menu 961 item.



- Specifying destination file 946
- Selecting settings 947
- Selecting databases 948
- Saving settings 949

To apply saved settings you need to open the created **.reg* file, then press the OK button in the window appeared. All settings will be applied automatically (they will be added in the Windows Registry).

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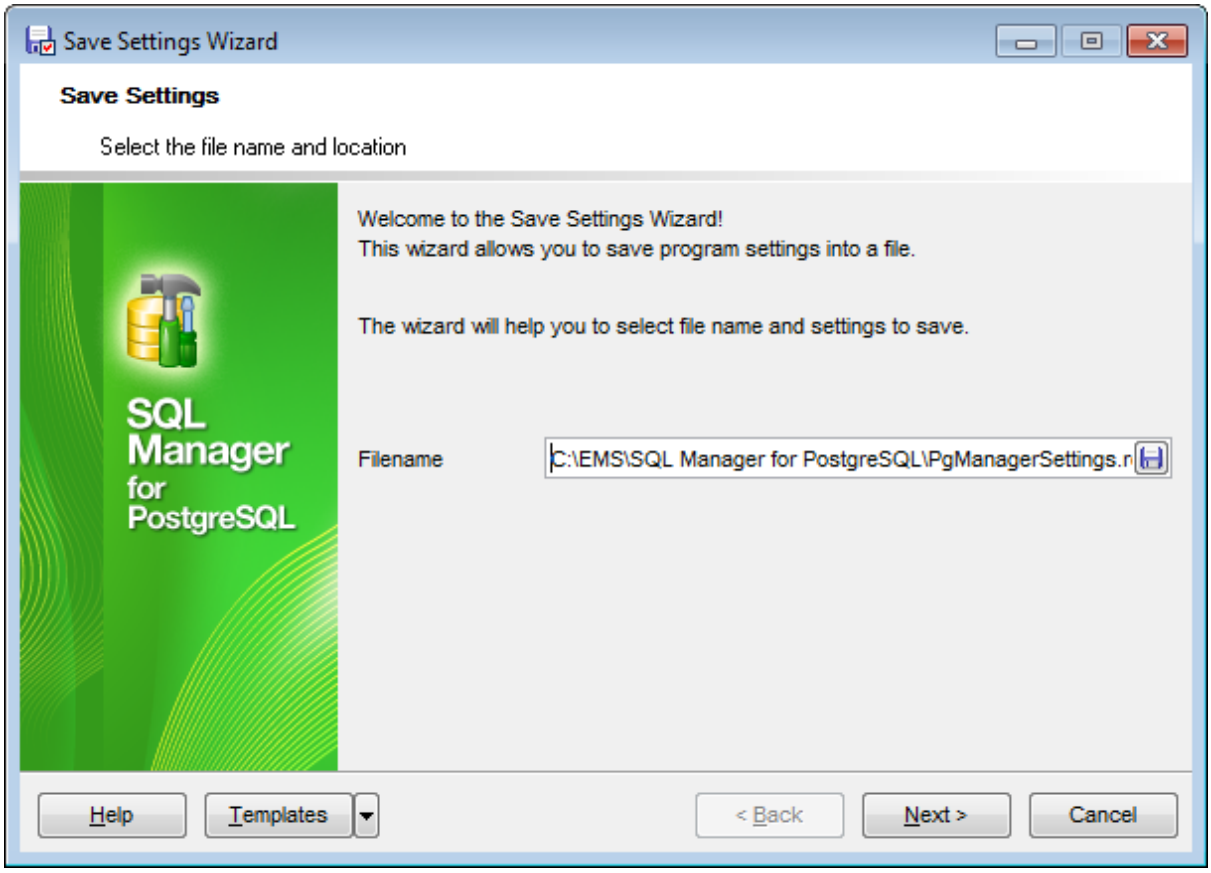
13.3.1 Specifying destination file

This step of the wizard allows you to specify the location of the destination file.

Filename
Use the button to set the path to the **.reg* file where the application settings are to be saved.

Note: If the target file already exists, the application will show a warning 998 dialog where you can choose the action you need.



Press the **Next** button to proceed to the next step 947 of the wizard.

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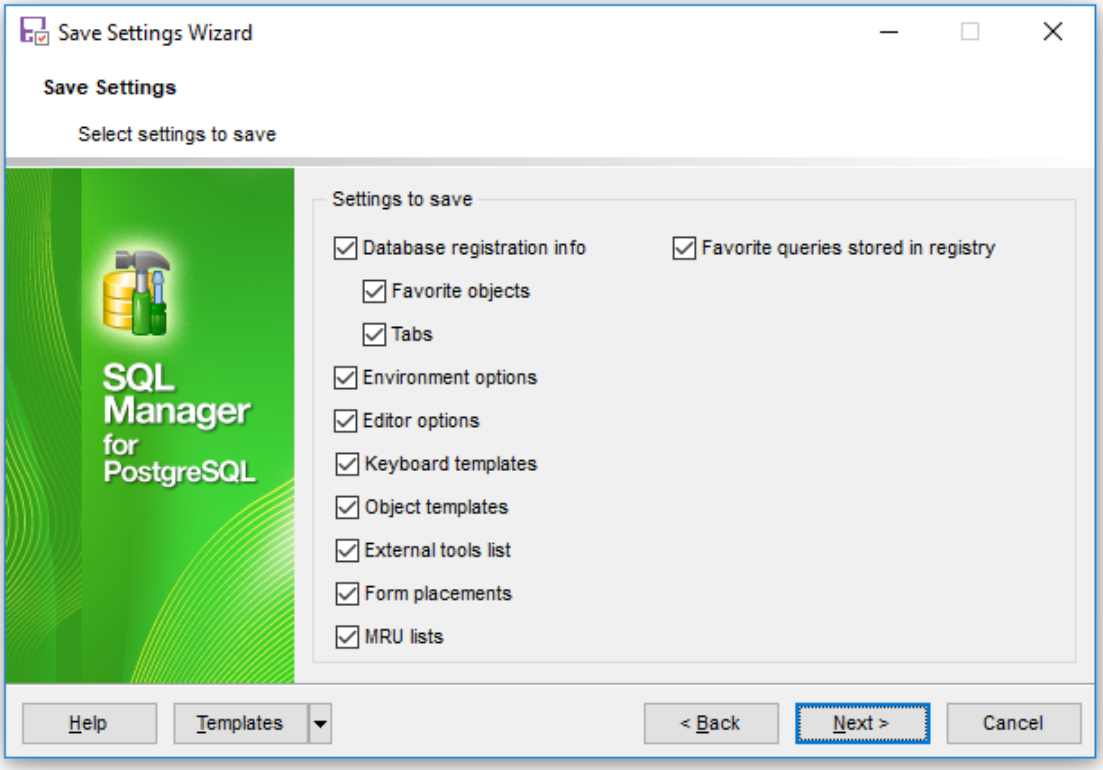
13.3.2 Selecting settings

This step of the wizard allows you to specify the information you need to be saved to the result file: *Database registration* info, *Database projects*, *Tabs*, *Environment options*, *Editor options*, *Visual options*, *Keyboard templates*, *External tools list*, *Form placements*, *MRU lists*.



Press the **Next** button to proceed to the next step 948 of the wizard.

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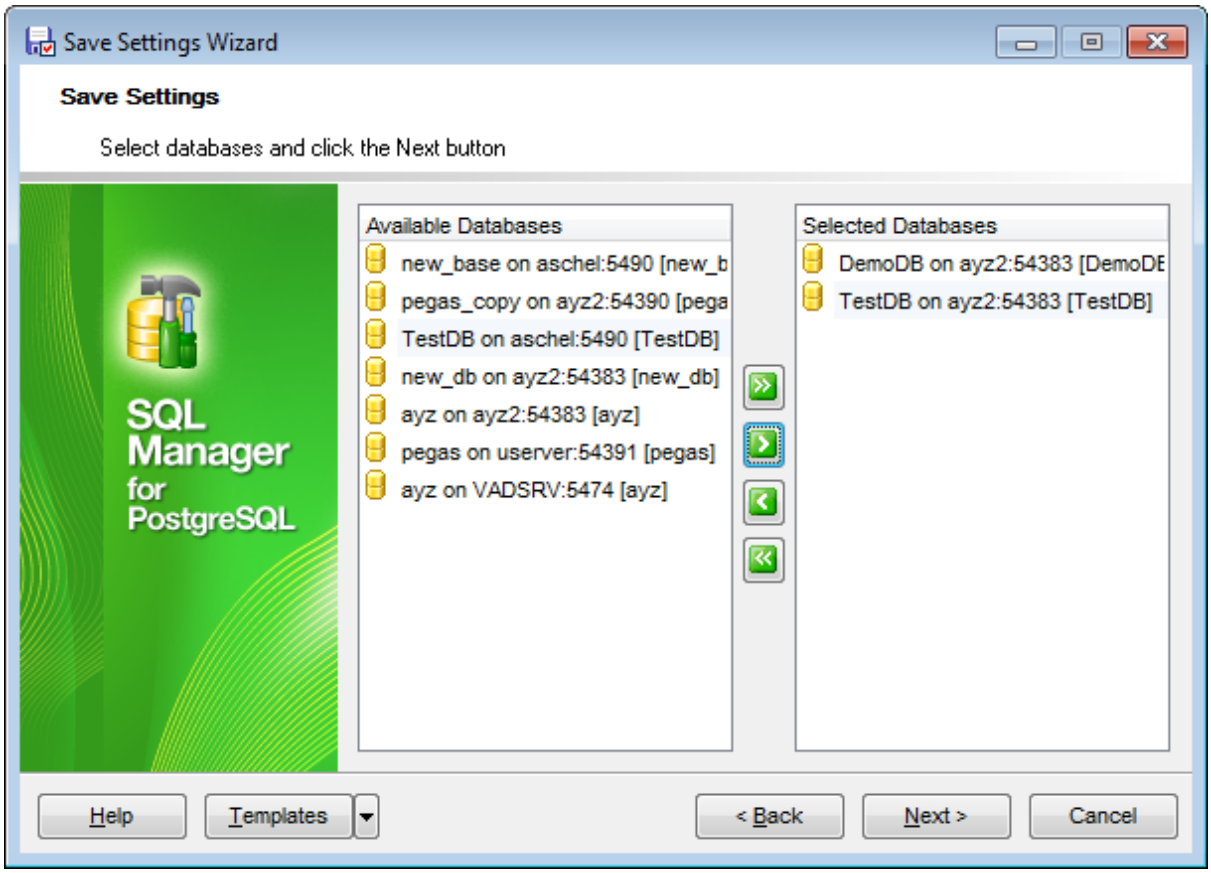
13.3.3 Selecting databases

This step of the wizard allows you to select the database(s) to save the registration settings.

To select a database, you need to move its alias from the **Available Databases** list to the **Selected Databases** list. Use the buttons or drag-and-drop operations to move the databases from one list to another.



Press the **Next** button to proceed to the next step[949] of the wizard.

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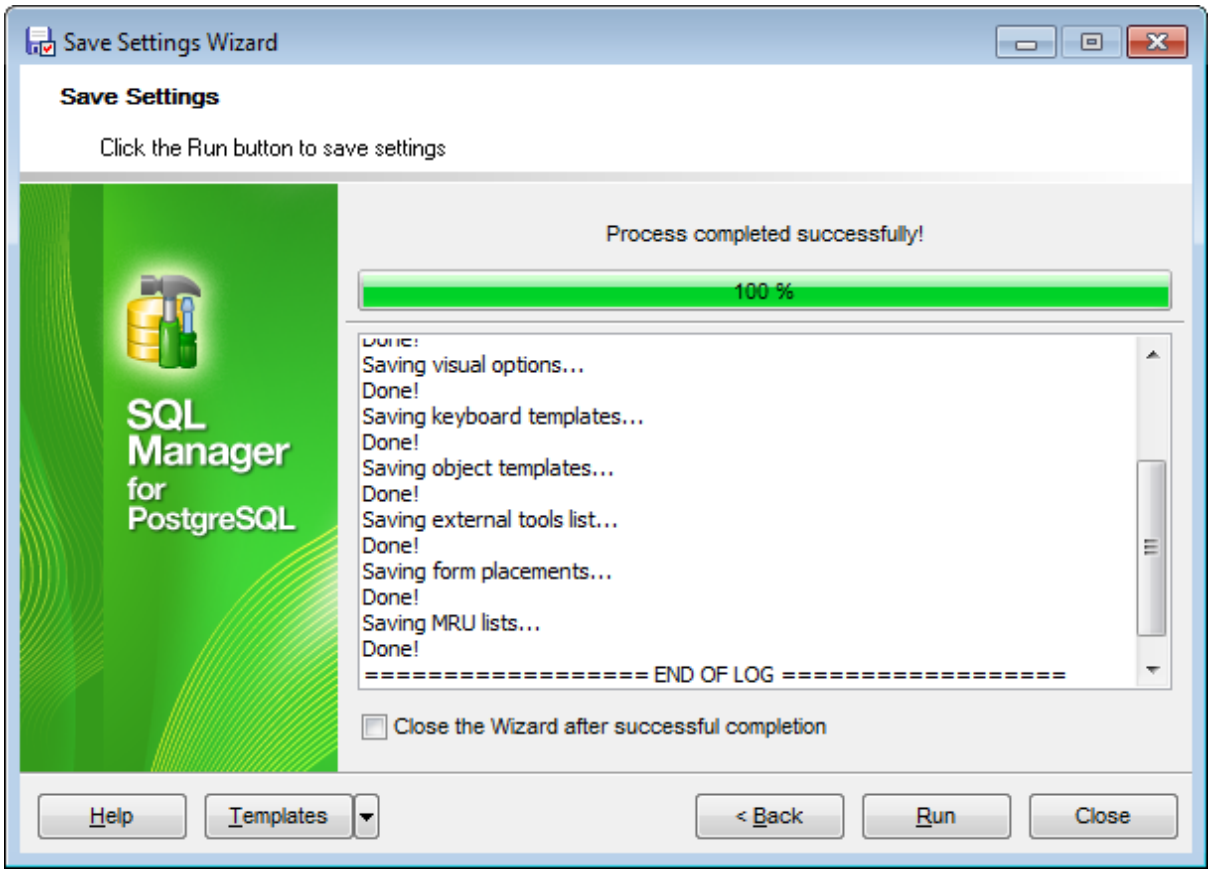
13.3.4 Saving settings

After the saving settings operation has been configured, you can immediately start the process.

If all the settings are saved correctly, you will get the following message:



Click the **Run** button to run the restore database operation.

If necessary, you can click **Details** to display/hide extended information about the operation.

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13.4 Localization

When using SQL Manager for PostgreSQL, your are provided with multi-language interface support. You can change the program language, specify the directories for your localization files easily, edit existing localizations and create your own localization files.

Changing Program Language

- select the **Options | Select Program Language...** main menu 961 item;
- select the interface language in the Select Language 952 dialog;
- click **OK** to apply the language and close the dialog.

Editing Program Localization

- open one of the program windows (e.g. Table Editor 177, Query Data 415) where you wish to edit the localization of captions and hints;
- use the *Shift+Ctrl+L* keyboard shortcut 1001 to open the Localization Editor 951 window;
- edit window captions and hints as necessary;
- click the **Save** button on the toolbar 963.

Note: The Localization Editor 951 window is only available if the currently selected language is different from the default.

Creating New Localization Files

- create a new localization file similar to those located in the *%program_directory%\Languages* folder;
- select the **Options | Environment Options** main menu 961 item;
- proceed to the Localization 921 section of the **Environment Options** dialog;
- click the **Add** button;
- set the language name and the path to the new **.lng* file within the Language Info Editor 981 dialog.

The new language is added to the list of available languages. Now you can set it as the interface language using the Select Program Language 952 dialog or the Localization 921 section of the Environment Options 871 dialog.

See also:

Localization 921

Language Info Editor 981

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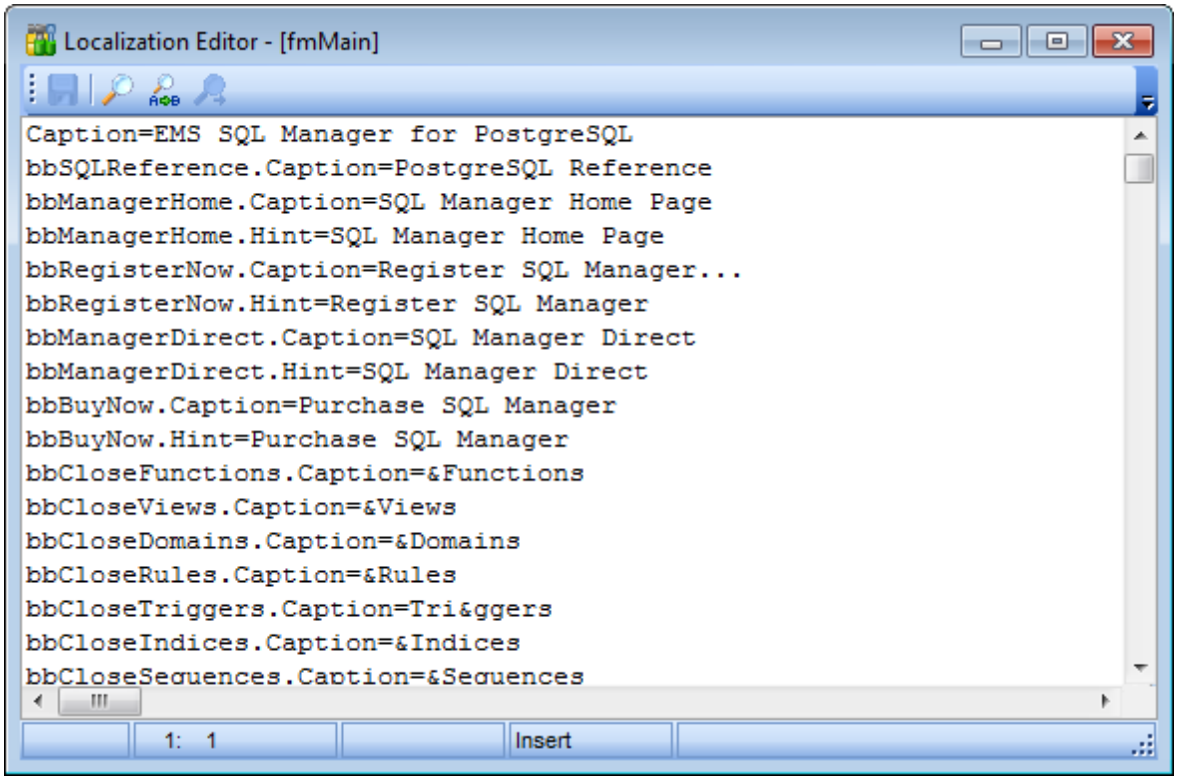
13.4.1 Localization Editor

The **Localization Editor** window allows you to edit the captions and hints of any SQL Manager window, if the selected program language is different from the default one.

To call this window, use the *Shift+Ctrl+L* shortcut[1001] in any child window of SQL Manager for PostgreSQL.

The working area of the window contains the element names and the corresponding strings divided by the "**=**" character. These strings are what you see in the program as menu items, window captions, button hints, etc. Edit them to change the program appearance. Be careful and do not edit the identifiers that stand before the "**=**" character - this will not produce any effect.

For your convenience the **Find** and **Replace** features are provided - the corresponding and toolbar[963] buttons are used to call the Find Text[971] dialog or the Replace Text[973] dialog respectively. The **Search Again** button enables the repeated search for the text that was last searched.



When you are done with editing, click the **Save** button on the toolbar[963] to apply the changes you have made.

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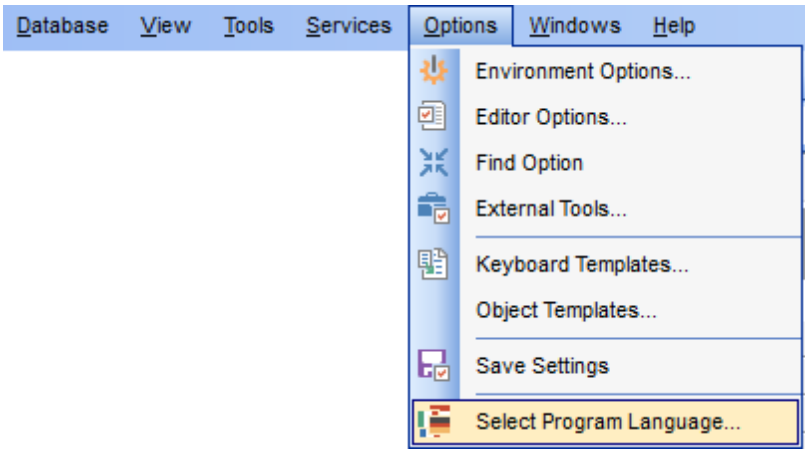
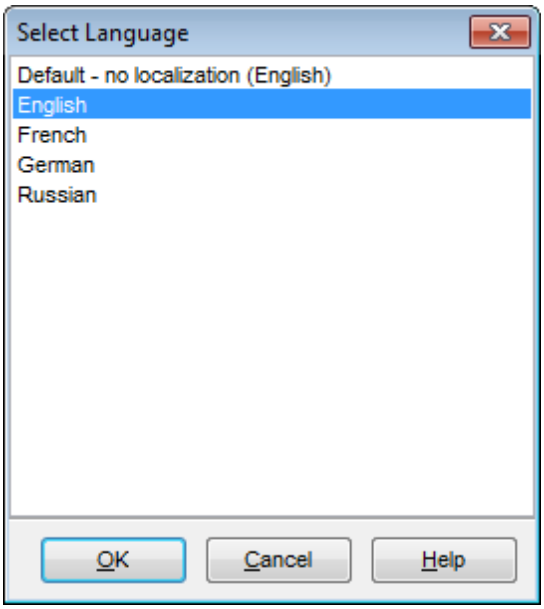
13.4.2 Select Program Language

The **Select Language** dialog allows you to select a language for SQL Manager for PostgreSQL localization.

To open this dialog, select the **Options | Select Program Language...** main menu 961 item.



The dialog displays the list of available languages configured on the Environment Options | Localization 921 page. Select a language from the list and click **OK** to confirm your choice and close the dialog.



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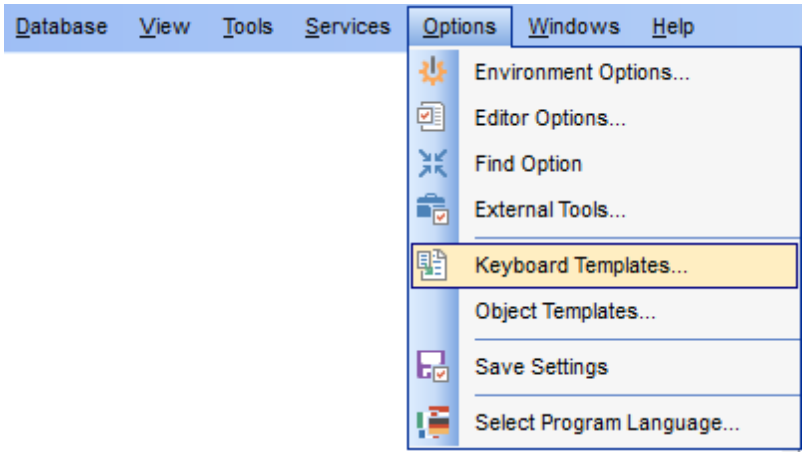
13.5 Keyboard Templates

The **Keyboard Templates** window allows you to create new keyboard templates for quicker typing regularly used expressions and to edit the existing ones.

To open this window, select the **Options |** **Keyboard Templates...** main menu 961 item.



To add a new keyboard template, click the **Add Template...** button, set the template name and define the template expression. In the upper right area of the window you can change the **case** of the template expression (*As is*, *Uppercase*, *Lowercase*, *First upper*).

You can deactivate an existing template by selecting it from the list on the left and removing the **Active** flag of the template.

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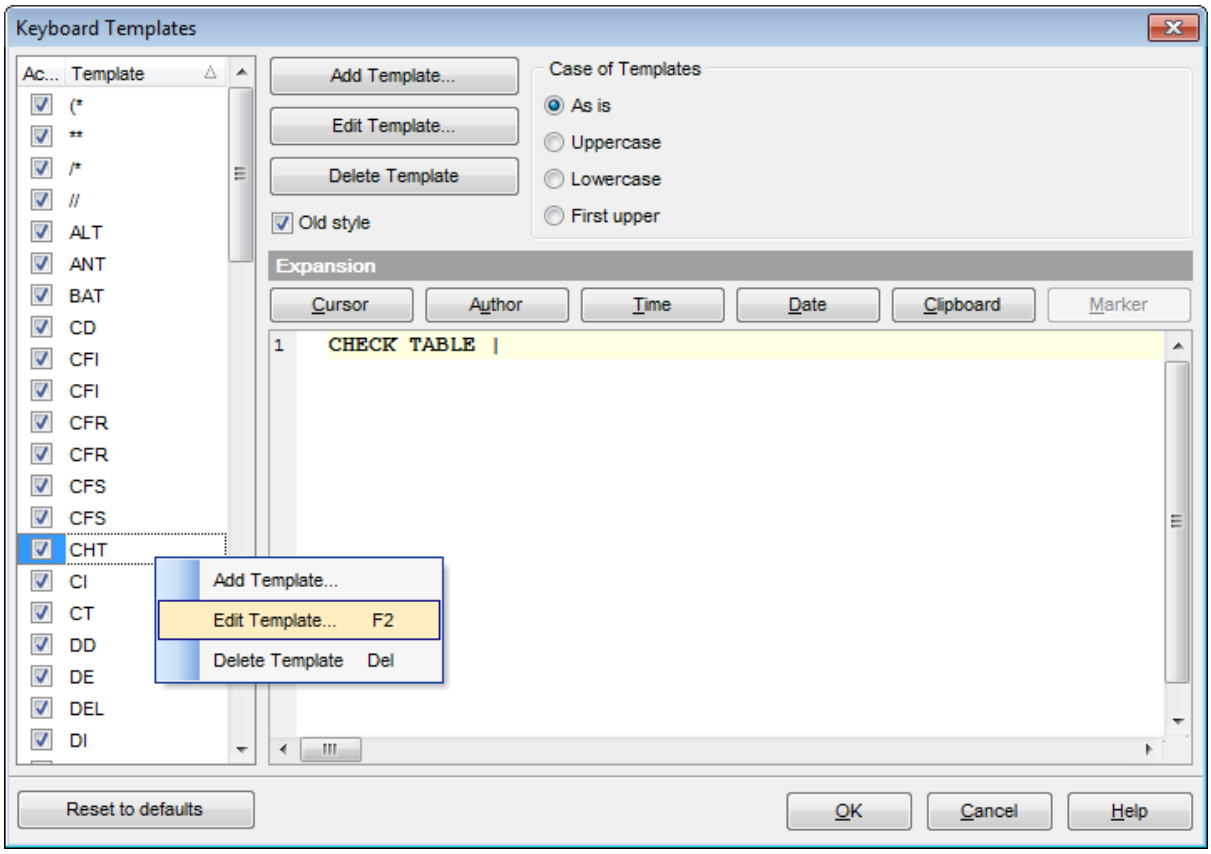

If necessary, you can also edit the template name using the **Edit Template...** button, delete the template using the **Delete Template** button or edit the template expression within the **Expansion** area of the window. For faster editing you can use the *Cursor*, *Author*, *Time*, *Date*, *Clipboard*, *Marker* buttons.

Hint: Add/edit/delete template items are also available in the *context menu* of the template list on the right.

☑ **Old style**
This option specifies whether the selected keyboard template expansion should conform to the template specifications used in the earlier versions of SQL Manager for PostgreSQL.

Once you have defined the templates, you can use them in Query Data 415. First of all, make sure that the ☑ **Auto launch keyboard templates** option is selected on the Quick Code 935 page of the Editor Options 925 dialog. When editing SQL text 418 in Query Data, type a template name and use the *Ctrl+J* shortcut 1001: the text associated with the template (**Expansion**) will be inserted automatically.

Hint: The **Reset to defaults** button which is available at the bottom of the **Keyboard Templates** dialog allows you to discard all changes and restore the settings to their defaults.

See also:
Code Completion 935

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SQL Manager shortcuts 1001

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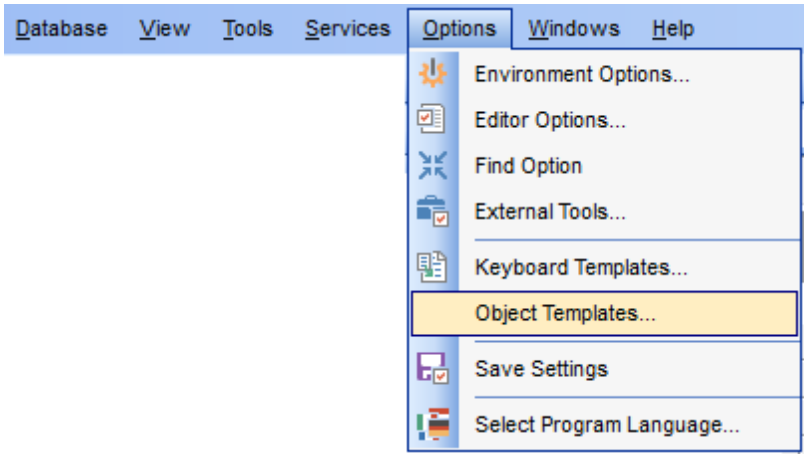
13.6 Object Templates

The **Object Templates** window allows you to preset the definition template for the name and/or body of an object to be created.

To open this window, select the **Options | Object Templates...** main menu 961 item.



Select an object in the tree (*View*, *Function*: *SQL*, *C*, *PL/pgSQL*, *PL/Tcl*, *PL/Perl*, *PL/Python*) and set its template using the editor area.

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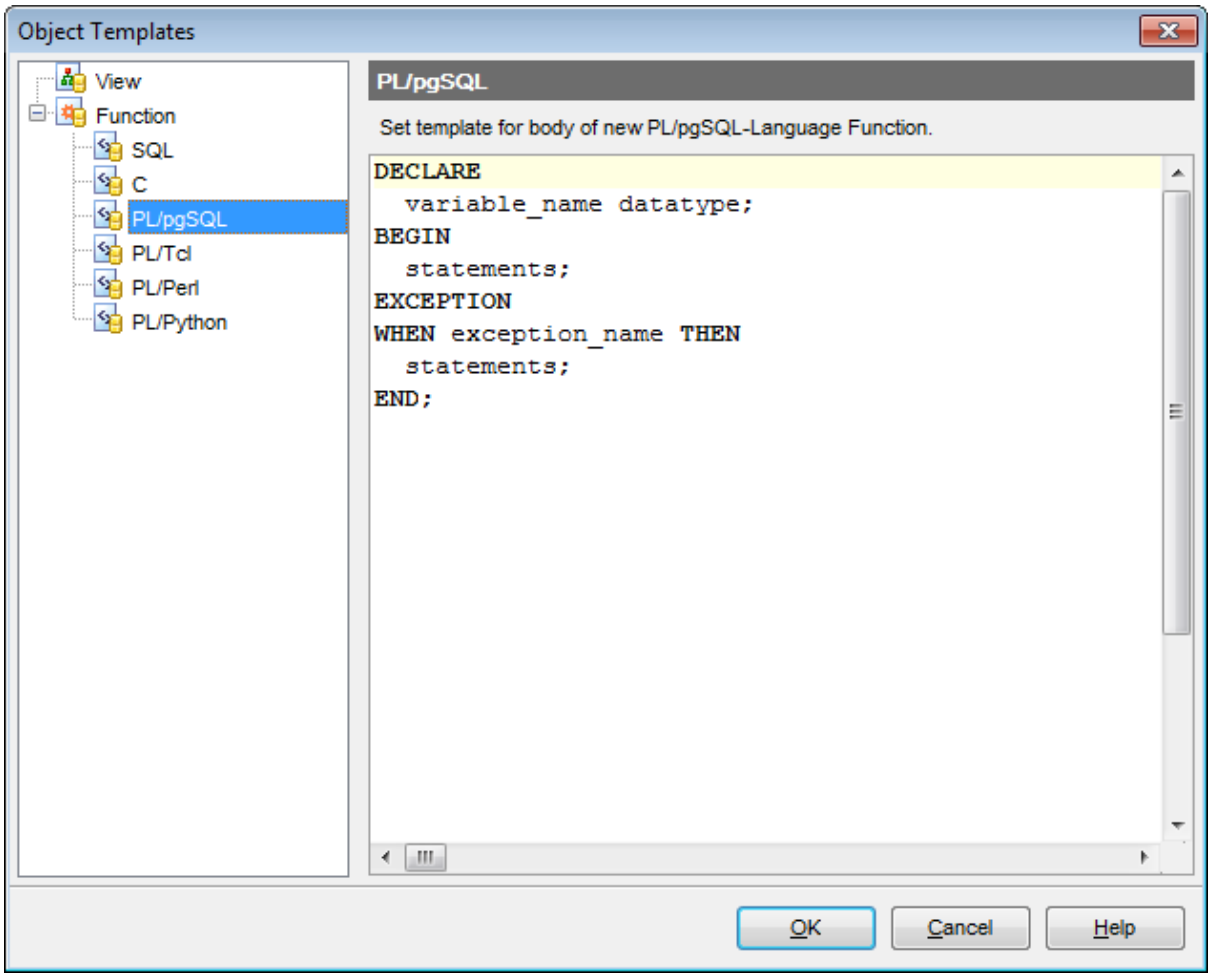

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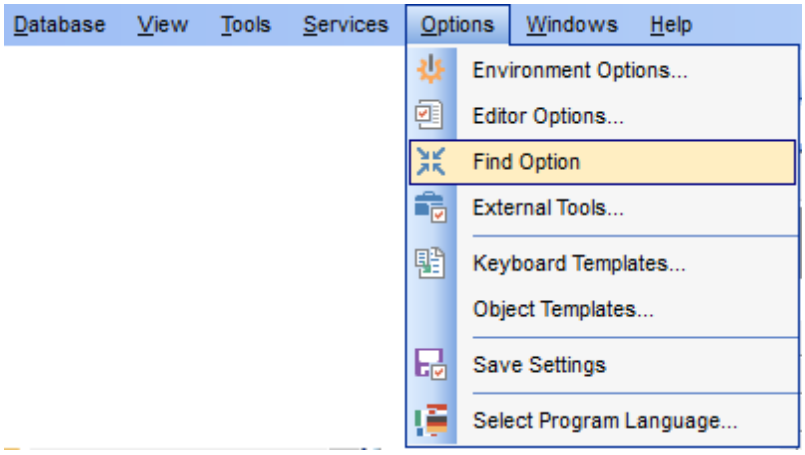
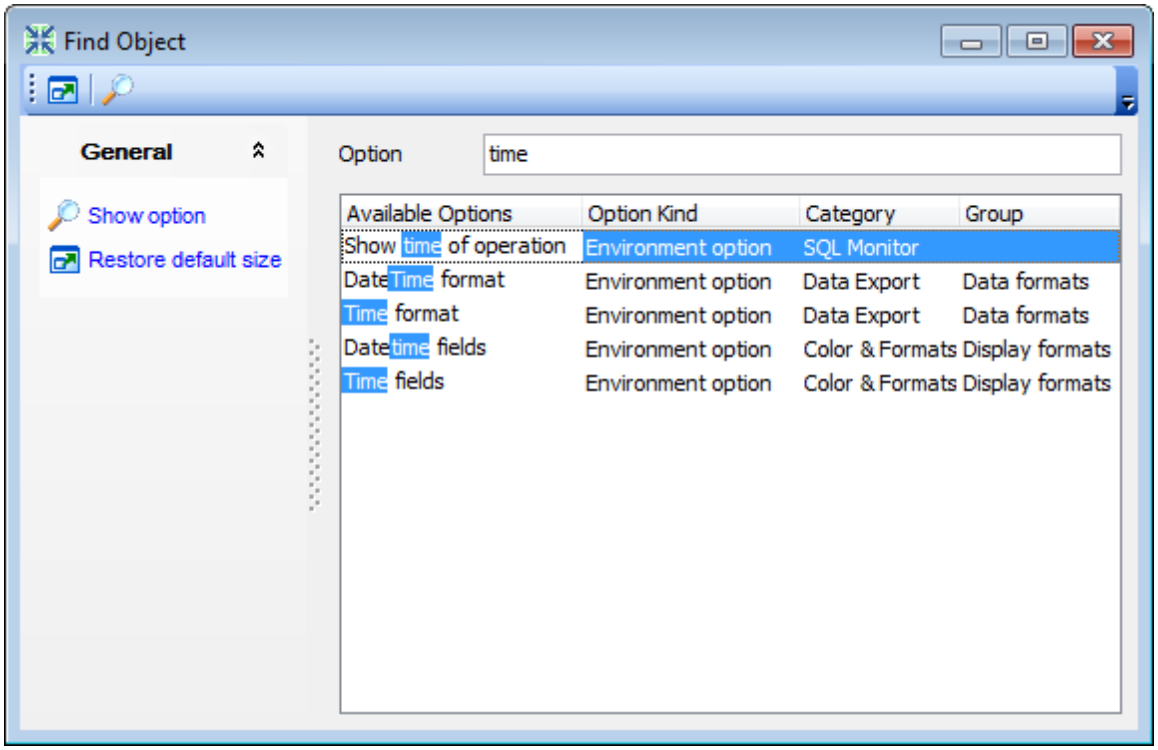
13.7 Find Option dialog

The **Find Option** dialog allows you to search for SQL Manager options easily.

To open this dialog, select the **Options | Find Option** main menu 961 item.



Option
In this field you can enter the name of the option to search for within the entire set of SQL Manager options.



The **Available options** area lists all options by categories according to the specified name. The **Option Kind**, **Category** and **Group** columns specify option type and location. Select the required option in the list and click **Show Option** to open the corresponding

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dialog where you can view/edit the value of this option. For your convenience the required option is marked with an animated icon.

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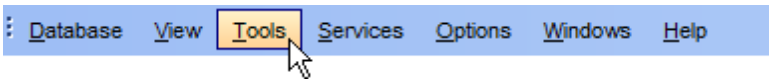
Part

14 Appendix

14.1 Program interface

Main menu

The main menu allows you to perform various **Database** operations, open To-Do List 985 and activate/deactivate Database Explorer 65, SQL Assistant 81 and various toolbars 963 within the **View** menu, manage your databases using items of the **Tools** and **Services** menus, customize 870 the application using the **Options** menu, manage SQL Manager **Windows** using Window List 987 and other tools and access Registration 24 information and product documentation, update 995 the product to the latest version using the corresponding items available within the **Help** menu.



Note: To learn how to configure SQL Manager menus, refer to the Customize toolbars and menus 988 page.

Navigation bars in object editors and program tools

Navigation bars are interface elements that enable users to quickly locate tools they need. Navigation bar items are displayed within a group with the help of links. A typical Navigation bar of SQL Manager contains links to commonly accessed tools (*refresh*, *print*, *restore default size* of the window), *options* pertaining to the editor or tool, and specific tools.

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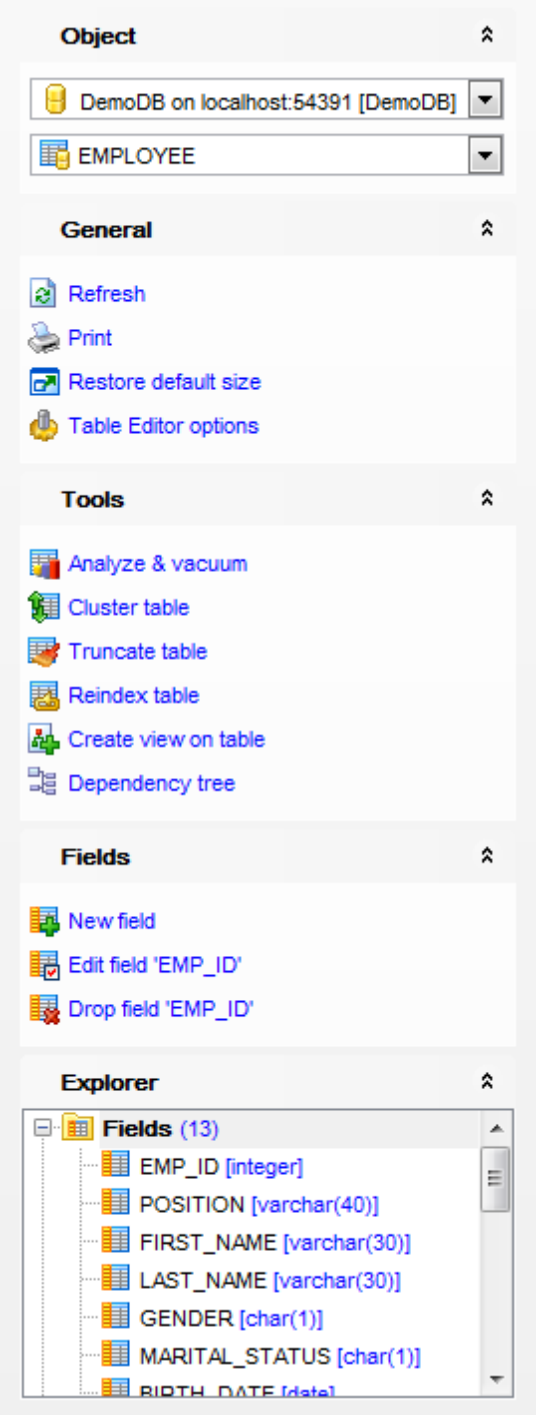

Navigation bar panes (groups) can be **expanded**/**collapsed**. When expanded, a pane provides access to its links; when collapsed, panes are displayed as headers only.

To expand/collapse a pane, click the pane header. The icons indicate the current pane state (collapsed/expanded respectively).

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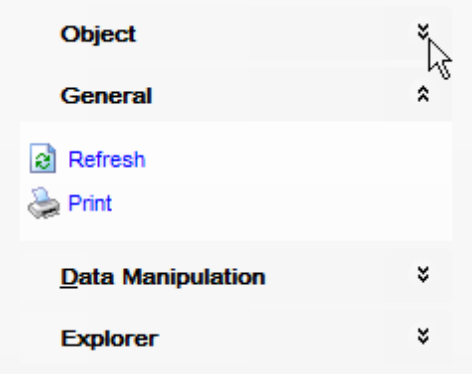


Note: Depending on the current tab selection, Navigation bars in most of the program tools expand to one or more additional panes with tab-specific actions that can be useful for working with the object or service.

Hint: Most items of the Navigation bars are also available on the Toolbars 963.

Toolbars in the main program window, object editors and program tools

A **toolbar** is a horizontal row or vertical column of selectable image buttons that give the user a constantly visible reminder of and an easy way to select certain application functions. Most SQL Manager editors and tools are supplemented with toolbars.

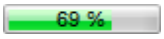
To enable the **toolbars** in SQL Manager for PostgreSQL, open the Environment Options 871 dialog, proceed to the Windows 877 section there and select *Toolbar* (if you need the toolbar only) or *Both* (if you need both the toolbar and the Navigation bar 961) in the **Bar style for child forms** group.

Hint: Most SQL Manager toolbars are dockable, i.e. you can place a toolbar to any available location within the parent window.

To learn how to configure toolbar items, refer to the Customize toolbars and menus 988 page.

Progress bars

A **progress bar** is an interface element that conveys the progress of a task or service. Several SQL Manager editors (e.g. Execute Script 646),tools (e.g. Dependency Tree 638) and wizards (e.g. Import Data Wizard 582) are supplemented with progress bars indicating the progress of lengthy operations.



The graphic of SQL Manager progress bars is accompanied by a textual representation of the progress in the percent format.

Splitters

Splitter controls are used to resize docked controls at run time. In SQL Manager for PostgreSQL the splitter controls are used on the main form, DB Explorer 65, and in program

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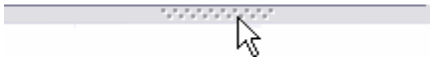
tools and editors as a separator between the working area and Navigation bars 961, status bars, etc.



Incremental Search bar

Incremental search bar is the tool which is available in the status bar area of some SQL Manager tools. The bar is normally called through the *Ctrl+I* shortcut 1001. Type in the first letters of the search string, and the corresponding string will be highlighted in the search scope.

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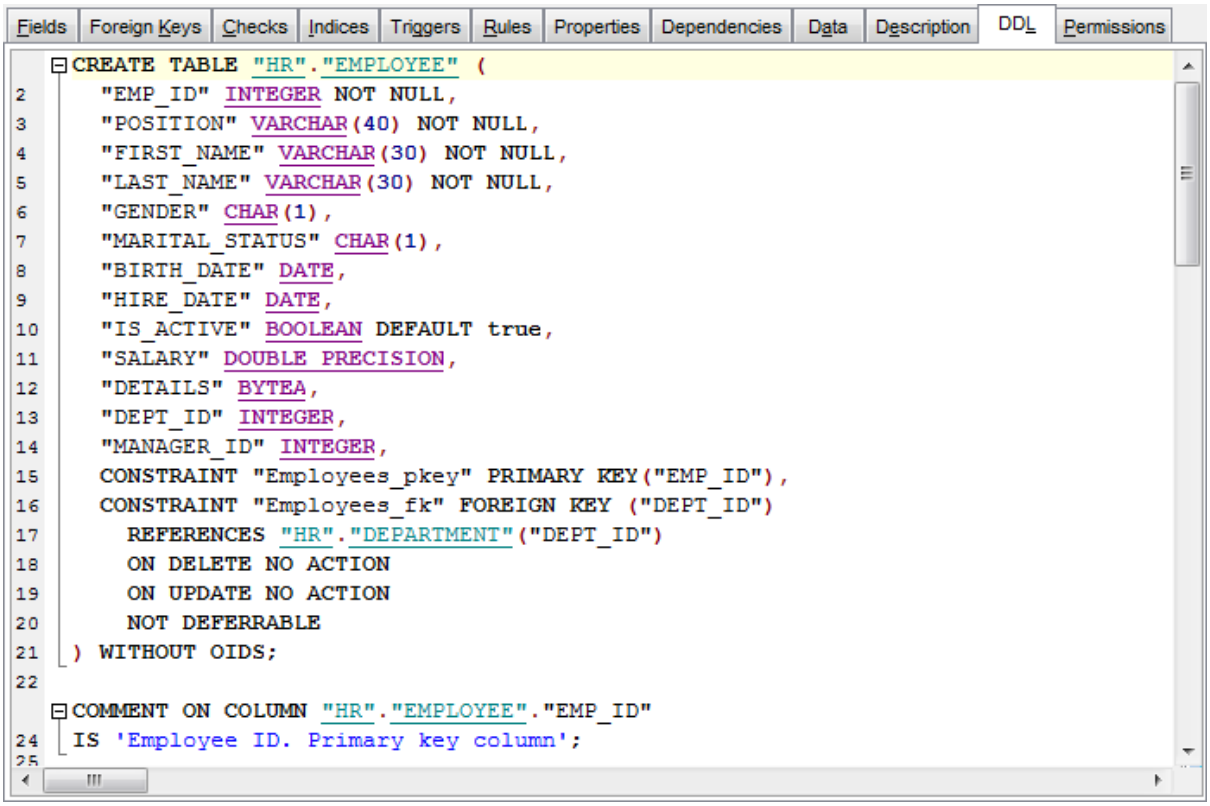
14.2 Viewing object DDL structure

The **DDL** (Data Definition Language) tab displays the SQL statement for creating the object with all its subobjects, if any. This text is read-only. If you want to change the object definition, use the appropriate editor tabs instead, or copy the text to the Windows Clipboard to paste it in the Query Data 415 or Execute Script Editor 646.



Hint: If more convenient, you can use the **Save DDL to file** and **Open DDL in Query Data** items available on the DDL pane within the Navigation bar 961 of object editors.

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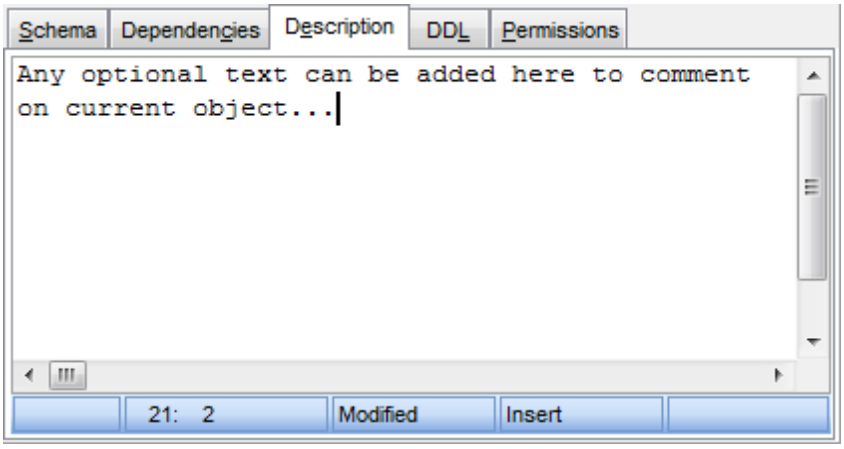
14.3 Editing object description

The **Description** tab allows you to view and edit the comment for the object (optional).



You can save changes made in this area by clicking the **Save Description** item on the Navigation bar[961].

If the changes have not been saved, on attempt to select another tab of the editor you will be prompted for an action whether changes in the object description should be saved or discarded.

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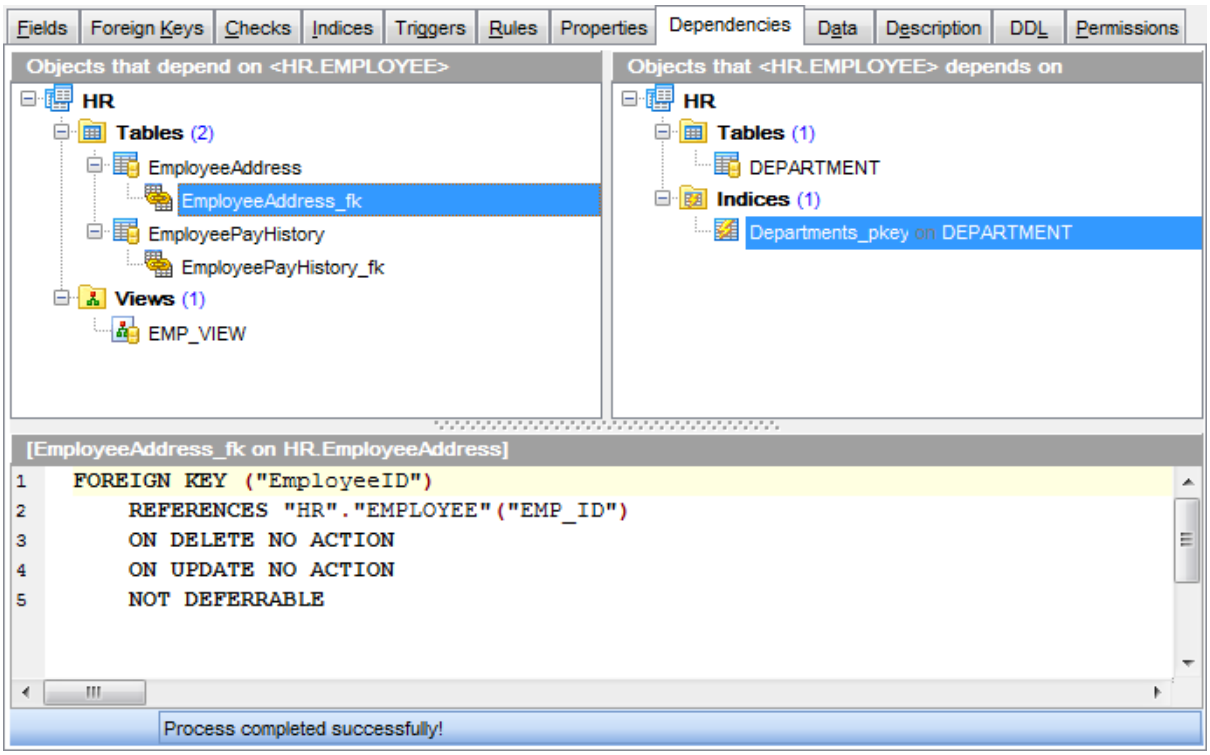
14.4 Browsing object dependencies

The **Dependencies** tab allows you to view objects that depend on the object being edited, and the objects that the edited object depends on.

While the tree of dependencies is built, the progress bar963 is displayed in the status area of the editor window.



Hint: To open a dependent object or a depending object in its editor, you can simply double-click the object alias in the **Objects that <object_name> depends on** and **Objects that depend on <object_name>** lists.

See also:

Dependency Tree638

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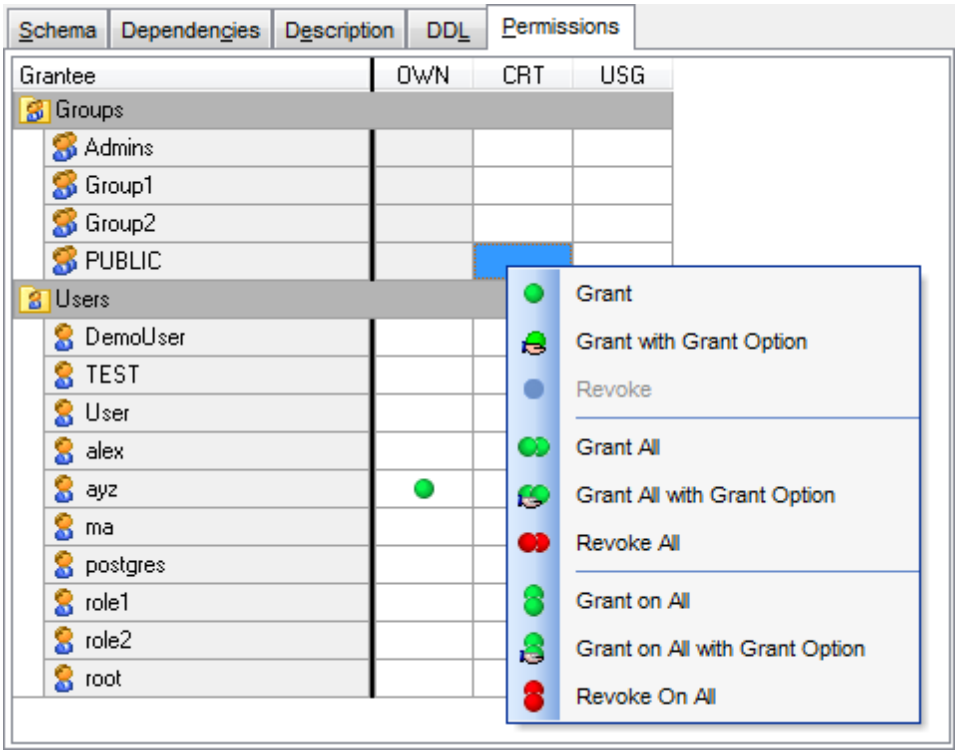
14.5 Setting object permissions

The **Permissions** tab allows you to view the permissions currently allocated for this object, and to grant permissions[766] on the object to any of the existing principals.



For details see Grant Manager[762].

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14.6 Changing Metadata window

The **Changing Metadata** window is used to trace the errors and edit SQL statements during their compilation. The compilation window appears each time metadata is changed, both when the compilation is successful and when there are compilation errors. To hide this window for successful metadata changes, select the ☑ **Don't show this window on success** option.
Note: This option is unavailable for changing metadata of database with Change Management 126 enabled.

If Change Management 126 is enabled for database whose metadata is being changed, the following features become available:

Comment for Change Management
Use this field to comment transaction to ease finding it when browsing history.

Log to VC
Use the drop-down list to define whether to add this transaction to version control log *always*, only *if script changes objects* or to *log only statements that change objects*.

Compile SQL
This area displays the SQL statement pending to be executed to perform metadata changing. In this area you can view and edit the SQL statement.
In case of a compilation error the **Error** tab also becomes visible - here you can view the error description returned by the server.

Commit
This button starts execution of the statement(s). Click it to commit the current transaction. This button is available only if there were no errors in compilation.

Rollback
This button cancels the script execution and allows you to return to the previous stage (editor window or DB Explorer 65).

Rollback and Recompile
This button calls for recompilation with the changes you made in the **Compile SQL** area. Use this button after correcting the SQL statement.

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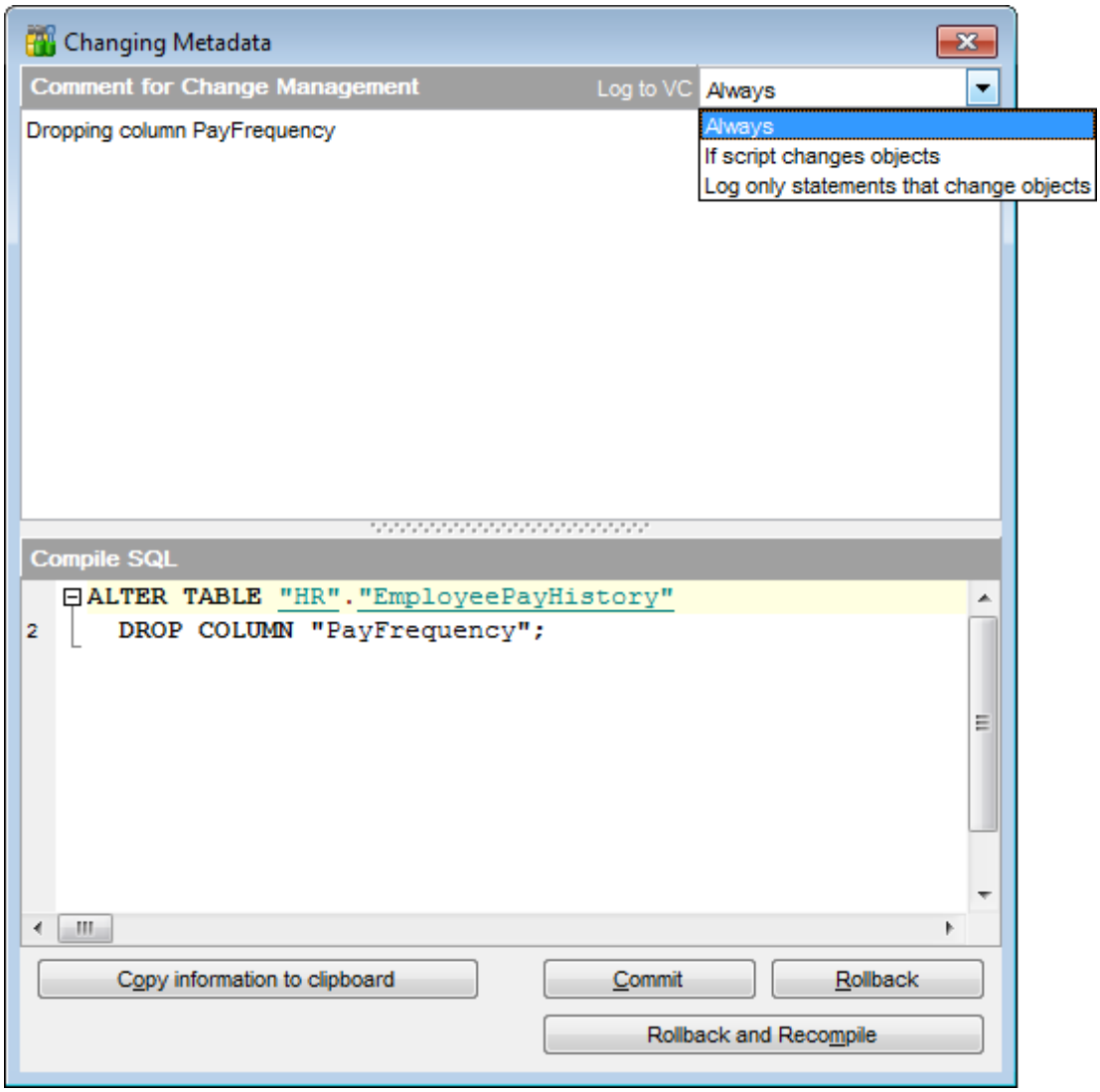

If script execution was stopped due to timeout limit exceeding, you can **recompile it with double** or **unlimited timeout** using corresponding buttons.

If necessary, you can **copy information to clipboard** and save it in a text editor afterwards (the button is only enabled when a compilation error occurs).

If you want this window to appear only in case of an error, uncheck the **Confirm metadata changing (Changing Metadata Window)** option (checked by default) available within the **Confirmations** section of the Environment Options 871 dialog.

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14.7 Find Text dialog

The **Find Text** dialog is provided for quick and flexible searching for specified text within the working area of SQL Manager editors.

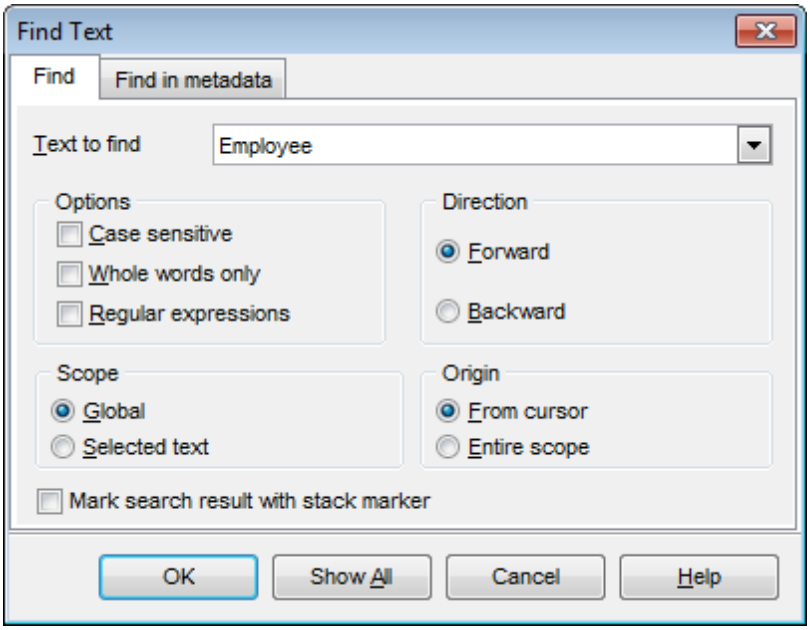
Text to find
Enter a search string in this box. The Arrow-Down button which can be found next to the input box allows you to select any of the previously entered search strings.

Options

Case sensitive
This option can be used to differentiate uppercase characters from lowercase ones during the search process.

Whole words only
Use this option to search for words only (with this option off, the search string might be found within longer words.)

Regular expressions
Recognizes regular expressions in the **Text to find** field.
For example, you can type "empl*" to search for metadata containing the "empl" substring; enter "^emp" to search for words starting with "emp" or "^emp|emp$" to search for the string "emp" at the beginning or at the end of the string.
Note: The syntax of regular expressions that can be used in the **Text to find** field is similar to that used in Perl regular expressions. Comprehensive information about it can be found at http://perldoc.perl.org/perlre.html#Regular-Expressions.



Direction

Forward
Searches from the current position to the end of the working area.

Backward

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Searches from the current position to the beginning of the working area.

Scope

Global
Searches within the entire working area, in the direction specified by the *Direction* setting.

Selected text
Searches only within the currently selected text, in the direction specified by the *Direction* setting. You can use the mouse or block commands to select a block of text.

Origin

From cursor
The search starts at the cursor's current position, and then proceeds either forward to the end of the scope, or backward to the beginning of the scope depending on the *Direction* setting.

Entire scope
The search covers either the entire block of selected text or the entire script (no matter where the cursor is in the Editor area) depending upon the *Scope* options.

Mark search result with stack marker
The option toggles marking search results. If this option is selected, stack markers are set at all search positions - this makes it possible to jump from one marker (search result) to another within the text.

Click the **Show All** button to highlight every occurrence of the search string.

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14.8 Replace Text dialog

The **Replace Text** dialog is provided for searching and replacing text within the working area of SQL Manager editors.

Text to find
Enter a search string in this box. The Arrow-Down button which can be found next to the input box allows you to select any of the previously entered search strings.

Text to replace
This box allows you to enter a string to replace the search string. The Arrow-Down button which can be found next to the input box allows you to select any of the previously entered strings. To replace the search string with an empty string, leave this input box blank.

Options

☑ **Case sensitive**
This option can be used to differentiate uppercase characters from lowercase ones during the search process.

☑ **Whole words only**
Use this option to search for words only (with this option off, the search string might be found within longer words.)

☑ **Regular expressions**
Recognizes regular expressions in the **Text to find** field.

☑ **Replace with template**
This option requires the **Regular expressions** option selection.
Enable this option to use regular expressions in the **Text to replace** field. Expression used in this field will be applied to each string that matches the **Text to find** expression.

Note: The syntax of regular expressions that can be used in the **Text to find** and the **Text to replace** fields is similar to that used in Perl regular expressions. Comprehensive information about it can be found at http://perldoc.perl.org/perlre.html#Regular-Expressions.

☑ **Prompt on replace**
Check this option if you wish to be prompted before replacing upon each occurrence of the search string. When this option is off, the search string is replaced automatically.

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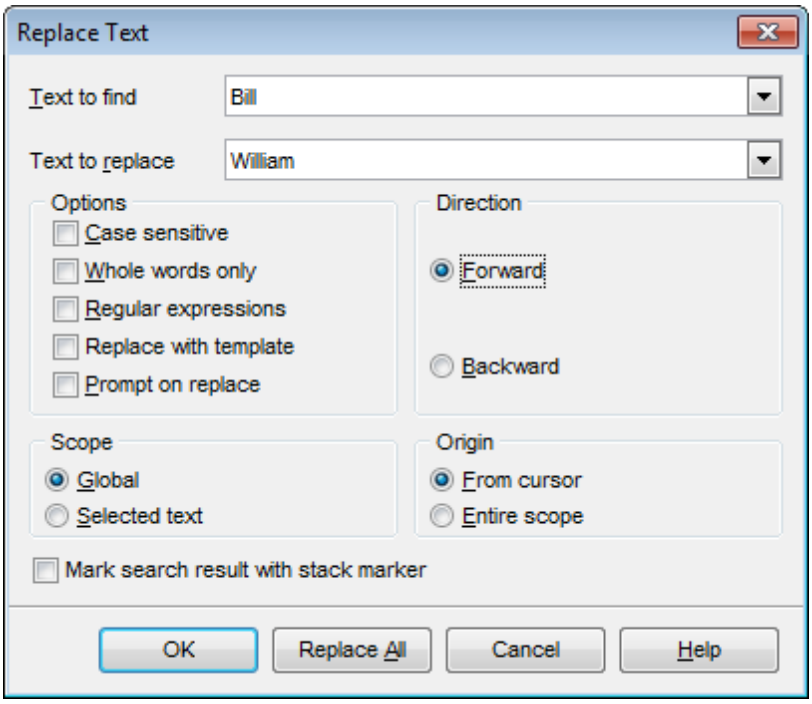

Direction

Forward
Searches and replaces from the current position to the end of the working area.

Backward
Searches and replaces from the current position to the beginning of the working area.

Scope

Global
Searches and replaces within the entire working area, in the direction specified by the *Direction* setting.

Selected text
Searches and replaces only within the currently selected text, in the direction specified by the *Direction* setting. You can use the mouse or block commands to select a block of text.

Origin

From cursor
The search and replace process starts at the cursor's current position, and then proceeds either forward to the end of the scope, or backward to the beginning of the scope depending on the *Direction* setting.

Entire scope
The search and replace process covers either the entire block of selected text or the entire script (no matter where the cursor is in the Editor area) depending upon the *Scope* options.

Mark search result with stack marker

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The option toggles marking search results. If this option is selected, stack markers are set at all search positions - this makes it possible to jump from one marker (search result) to another within the text.

Click the **Replace All** button to replace every occurrence of the search string. If you have checked the **Prompt on replace** option, the confirmation dialog box appears upon each occurrence of the search string.

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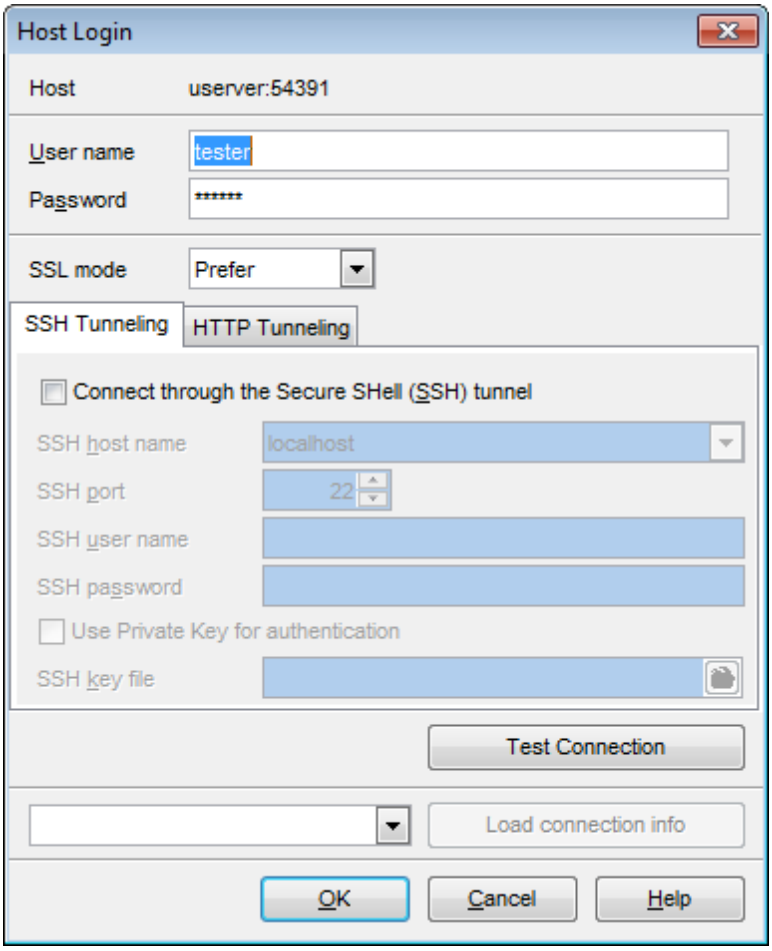
14.9 Host Login dialog

This form appears when selecting a host without active database connections in the navigation bar. Services where this dialog can be called from are: User Manager 751, Group Manager 754, Server Status 839 and Server Configuration 852.



This form contains all necessary options to define settings for connecting to host.

Provide *authorization* settings: **User name** and **Password**.

If tunneling required proceed to the respective tab to define tunneling parameters. You can get sufficient information about tunneling here: SSH tunneling options 992, HTTP tunneling options 994.

Click the **Test Connection** button to check whether define settings are valid.

You can also get the connection information from database registration info 108. For this pick a database from the drop-down list in the bottom area of the window and click the **Load connection info** button.

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14.10 Add parameter

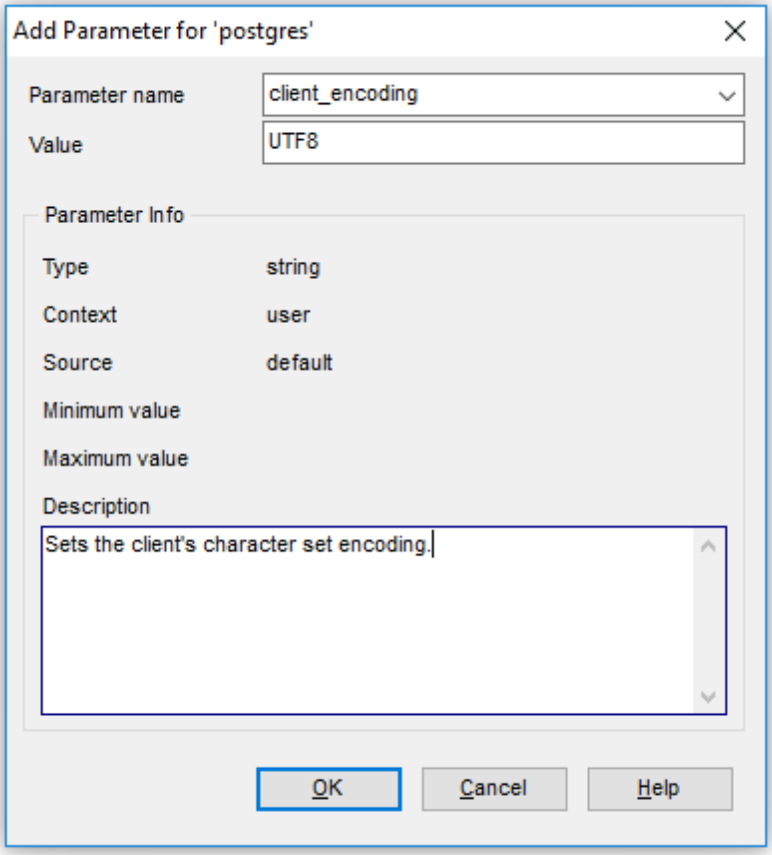
The following dialog appears on adding or editing parameters.

Parameter name
Select the parameter from the dropdown list.

Value
View the current value and edit if necessary.

Parameter info
Here you can see the additional info about the parameter.

Description
Input the comments on the selected parameter.



To obtain more information on specific parameters, refer to PostgreSQL documentation.

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14.11 Format specifiers

The following format specifiers are supported in the format string:

Float/Integer format

0
Digit place holder. If the value being formatted has a digit in the position where the '0' appears in the format string, then that digit is copied to the output string. Otherwise, a '0' is stored in that position in the output string.

#
Digit placeholder. If the value being formatted has a digit in the position where the '#' appears in the format string, then that digit is copied to the output string. Otherwise, nothing is stored in that position in the output string.

.
Decimal point. The first '.' character in the format string determines the location of the decimal separator in the formatted value; any additional '.' characters are ignored.

,
Thousand separator. If the format string contains one or more ',' characters, the output will have thousand separators inserted between each group of three digits to the left of the decimal point. The placement and number of ',' characters in the format string does not affect the output, except to indicate that thousand separators are wanted.

E+
Scientific notation. If any of the strings 'E+', 'E-', 'e+', or 'e-' are contained in the format string, the number is formatted using scientific notation. A group of up to four '0' characters can immediately follow the 'E+', 'E-', 'e+', or 'e-' to determine the minimum number of digits in the exponent. The 'E+' and 'e+' formats cause a plus sign to be output for positive exponents and a minus sign to be output for negative exponents. The 'E-' and 'e-' formats output a sign character only for negative exponents.

Date/Time format

c
Displays the date using the format using the Short Date Format, followed by the time using the Long Time Format. The time is not displayed if the date-time value indicates midnight precisely.

d
Displays the day as a number without a leading zero (1-31).

dd
Displays the day as a number with a leading zero (01-31).

ddd
Displays the day as an abbreviation (Sun-Sat) using the strings of the Short Day Names.

dddd
Displays the day as a full name (Sunday-Saturday) using the strings of the Long Day

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Names.

ddddd
Displays the date using the Short Date Format.

dddddd
Displays the date using the Long Date Format.

e
Displays the year in the current period/era as a number without a leading zero (Japanese, Korean and Taiwanese locales only).

ee
Displays the year in the current period/era as a number with a leading zero (Japanese, Korean and Taiwanese locales only).

g
Displays the period/era as an abbreviation (Japanese and Taiwanese locales only).

gg
Displays the period/era as a full name. (Japanese and Taiwanese locales only).

m
Displays the month as a number without a leading zero (1-12). If the m specifier immediately follows an h or hh specifier, the minute rather than the month is displayed.

mm
Displays the month as a number with a leading zero (01-12). If the mm specifier immediately follows an h or hh specifier, the minute rather than the month is displayed.

mmm
Displays the month as an abbreviation (Jan-Dec) using the strings given of the Short Month Names.

mmmm
Displays the month as a full name (January-December) using the strings of the Long Month Names.

yy
Displays the year as a two-digit number (00-99).

yyyy
Displays the year as a four-digit number (0000-9999).

h
Displays the hour without a leading zero (0-23).

hh
Displays the hour with a leading zero (00-23).

n
Displays the minute without a leading zero (0-59).

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nn
Displays the minute with a leading zero (00-59).

s
Displays the second without a leading zero (0-59).

ss
Displays the second with a leading zero (00-59).

z
Displays the millisecond without a leading zero (0-999).

zzz
Displays the millisecond with a leading zero (000-999).

t
Displays the time using the Short Time Format.

tt
Displays the time using the Long Time Format.

am/pm
Uses the 12-hour clock for the preceding h or hh specifier, and displays 'am' for any hour before noon, and 'pm' for any hour after noon. The am/pm specifier can use lower, upper, or mixed case, and the result is displayed accordingly.

a/p
Uses the 12-hour clock for the preceding h or hh specifier, and displays 'a' for any hour before noon, and 'p' for any hour after noon. The a/p specifier can use lower, upper, or mixed case, and the result is displayed accordingly.

ampm
Uses the 12-hour clock for the preceding h or hh specifier, and displays the contents of the TimeAMString global variable for any hour before noon, and the contents of the TimePMString global variable for any hour after noon.

/
Displays the date separator character using the Date Separator.

:
Displays the time separator character using the Time Separator.

'xx'/"xx"
Characters enclosed in single or double quotes are displayed as-is, and do not affect formatting.

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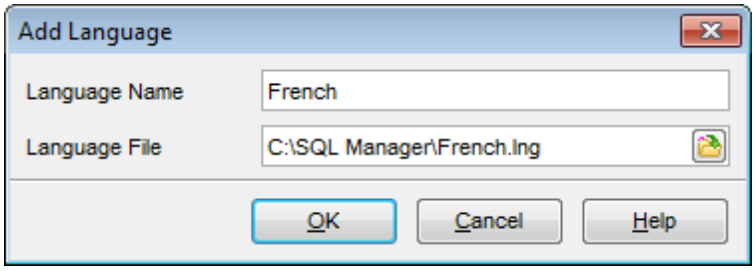
14.12 Language Info Editor

The **Language Info Editor** dialog allows you to set the language name and specify the corresponding **.lng* localization file. This dialog is opened when you add or edit a language (see Environment Options | Localization 921).

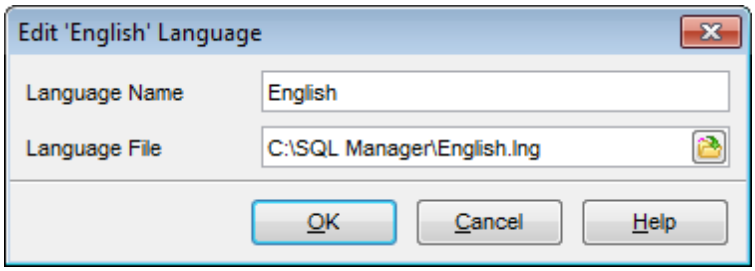
Language Name
The name of the language that is displayed in the Select Program Language 952 dialog and within the **Available Languages** list of the Environment Options | Localization 921 section.

Language File
The **.lng* file containing the translated string resources. See the *%program_directory%\Languages* folder to find already existing localization files.

Adding a language
The *Add language* dialog allows you to specify your own localization file and set the language name.



Editing a language
The *Edit language* dialog allows you to change the language name or select another localization file for the specified language.



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14.13 Using templates

For your convenience the ability to use templates is provided by SQL Manager for PostgreSQL. A template is a named collection of wizard options stored in a file.

Instead of performing a long chain of routine steps all the time you can save all the options of the wizard for future use as a template file. Select the **Templates | Save Template** drop-down menu item, specify the template file name and set an optional comment for the template file.
When starting the wizard next time, you can load the template by selecting the **Templates | Load Template** drop-down menu item.

Note that saving/loading of templates is possible at any step of the wizard.

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14.14 Supported file formats

MS Excel 97-2003
The most popular e-table format used by Microsoft® Excel (*.xls). The result files are fully compatible with Microsoft® Excel versions 97-2000, 2003 and XP.

MS Access
File of Microsoft® Access format (*.mdb, *.accdb) with an ADO connection used.

MS Word 97-2003
One of the most popular text processing formats used by Microsoft® Word (*.doc). The result files are fully compatible with Microsoft® Word versions 97-2000, 2003 and XP.

RTF
Rich Text Format (*.rtf) supported by many text processing programs (e.g. WordPad).

HTML
Hyper Text Markup Language file format (*.html, *.htm), complete compatibility with HTML 4.0 specification.

PDF
A standard format in electronic publishing (*.pdf).

Text file
Plain text file format (*.txt).

CSV file
Comma-Separated Value file format (*.csv).

DIF file
Data Interchange File (*.dif) format.

SYLK
Symbolic Links (*.slk) file format.

Note: all the text formats including *Text file*, *CSV*, *DIF*, *SYLK* are usually used as working or interchange formats.

LaTeX
A specific file format (*.tex) which is a popular (especially among mathematicians and physicists) macroextension of *TeX* pack developed by D.Knut.

XML
A markup language for documents containing structured information (*.xml).

DBF
Database file format (*.dbf) used by dBASE and a number of xBASE applications.

MS Excel
The contemporary e-table format used by Microsoft® Excel (*.xlsx). The result files are fully compatible with Microsoft® Excel 2007.

MS Word

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The contemporary text processing format used by Microsoft® Word (*.docx). The result files are fully compatible with Microsoft® Word 2007.

ODF Spreadsheets
OASIS Open Document Format for Office Applications - open document file format for spreadsheets (*.ods) used by a number of applications including OpenOffice.org and KOffice.

ODF text
OASIS Open Document Format for Office Applications - open document file format for word processing (*.odt) documents used by a number of applications including OpenOffice.org and KOffice.

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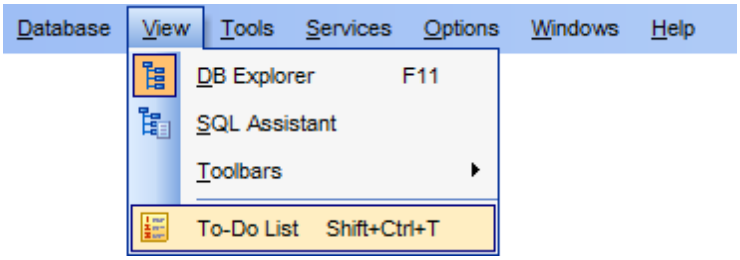
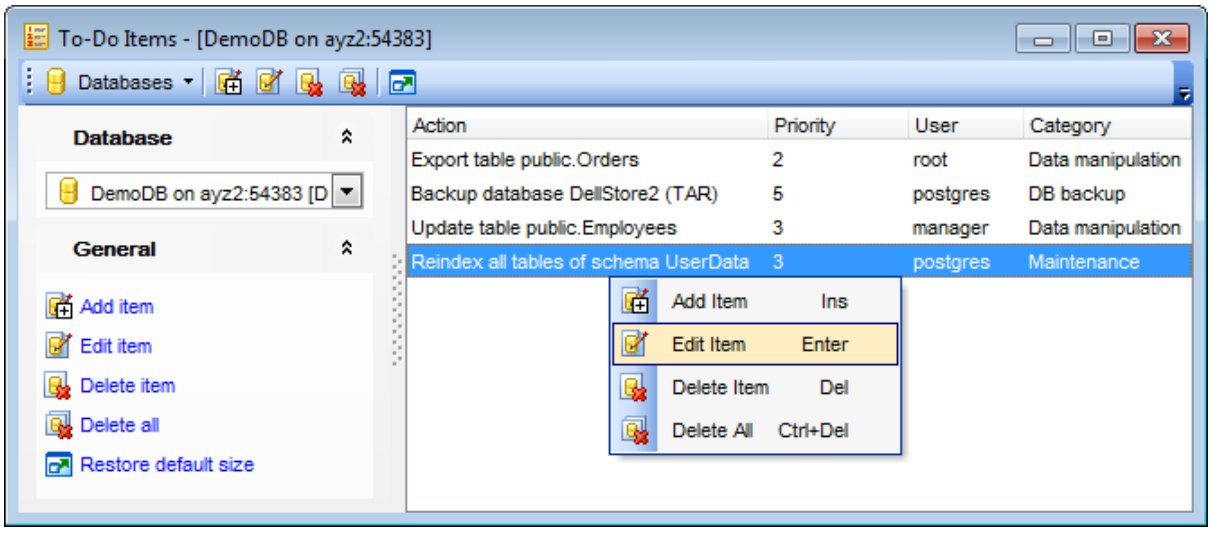
14.15 To-Do List

The **To-Do List** window allows you to make up a list of tasks for the database.

To call this window, select the **View | To-Do List** main menu 961 item, or use the *Shift+Ctrl+T* shortcut 1001.



The task list is displayed in a form of a grid. Its columns (*Action*, *Priority*, *User*, *Category*) correspond to the task parameters. Click the column caption to sort the task list by the current parameter or change the sorting direction. Use the Navigation bar and context menu to *add*, *edit*, and *delete* to-do items.



Database
Select the database to apply the task list to. When switching between the databases you can view different task lists.

To add a task to this list, click the **Add Item** link on the Navigation bar, or select **Add Item** from the context menu. You can also use the *Ins* key for the same purpose. Define the task parameters and click **OK** to add the new task to the list.

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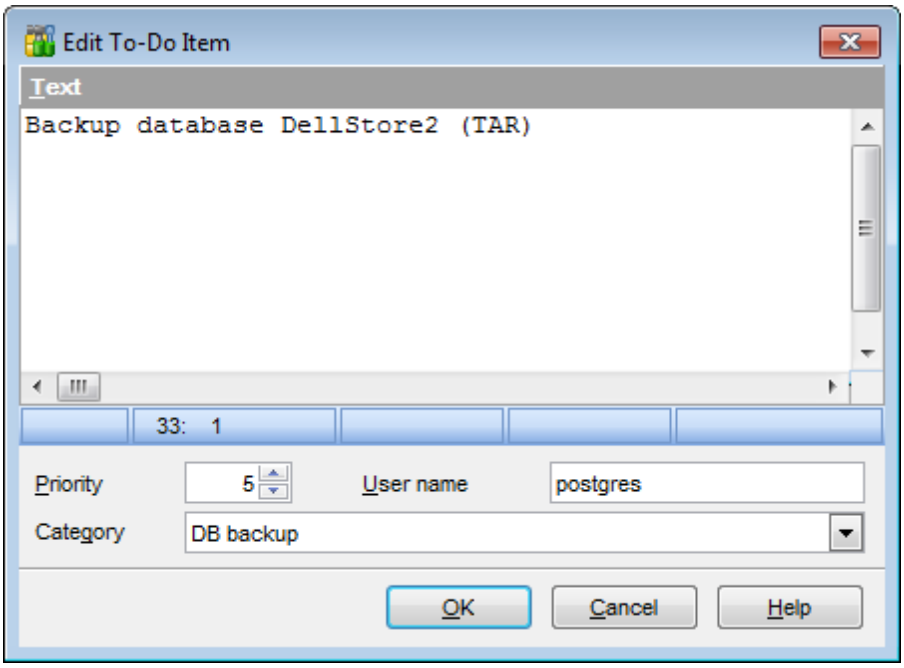

Text
Optional text to describe the task.

Priority
Set a numeric value to indicate the priority of the task.

User Name
The database User name this task is applied to.

Category
Set a category for the task. Using categories may be useful for grouping tasks.

To modify a task, select the task in the list and click the **Edit Item** link of the Navigation bar, or select **Edit Item** in the context menu. You can also use the *Enter* key for the same purpose.

To remove a task, select the task in the list and click the **Delete Item** link of the Navigation bar, or select **Delete Item** in the context menu. You can also use the *Del* key for the same purpose.

To remove all tasks from To-Do List, click the **Delete all** link of the Navigation bar, or select **Delete all** in the context menu. You can also use the *Ctrl+Del* shortcut 1001 for the same purpose.

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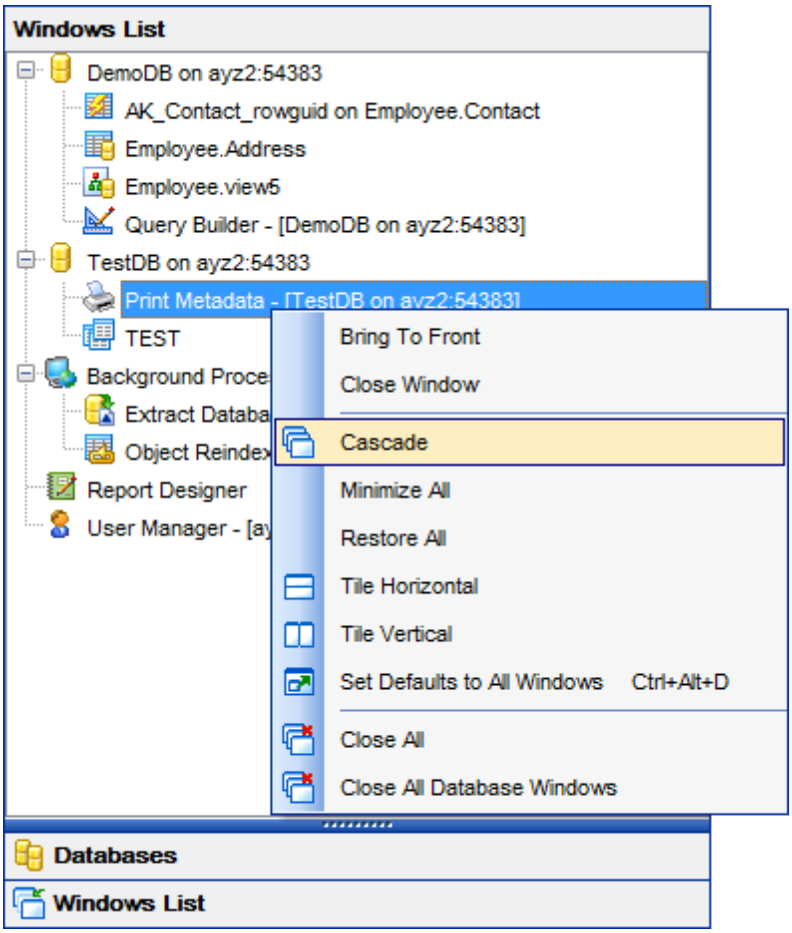
14.16 Windows List

The **Windows List** panel allows you to browse the list of windows that are currently opened within SQL Manager for PostgreSQL IDE.

To activate this panel as a DB Explorer tab[75], select the **Windows | Window List** main menu[961] item, or use the *Ctrl+Alt+0* shortcut[1004].



If necessary, you can right-click within the list area to call the **popup menu** which allows you to bring a window to foreground, close windows one by one or in groups, and to arrange the windows according to your preferences.

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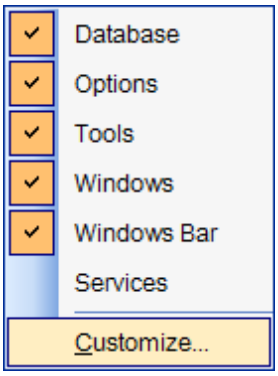
14.17 Customize toolbars and menus

For your convenience SQL Manager for PostgreSQL provides **toolbars** and **menus** that you can customize, so the commands you use frequently are readily available and easily identifiable.

The **Customize** dialog allows you to create and personalize SQL Manager menus and toolbars.

To call this dialog, click **More buttons...** on the right side of any toolbar, then click **Add or Remove Buttons** and select **Customize...** from the drop-down menu. Alternatively, you can right-click any toolbar and select the **Customize...** popup menu item.



Toolbars

Toolbars
This list displays all currently existing toolbars of SQL Manager (both *default* and *user-defined* toolbars). Check/uncheck the box at a toolbar name to show/hide the toolbar.

New...
Use this button to add a new user-defined toolbar to the **Toolbars** list. Set a name for the newly created toolbar and dock it by dragging it to any permitted location within the application window.

Rename...
Use this button to rename the selected user-defined toolbar.

Delete
Use this button to delete the selected user-defined toolbar.

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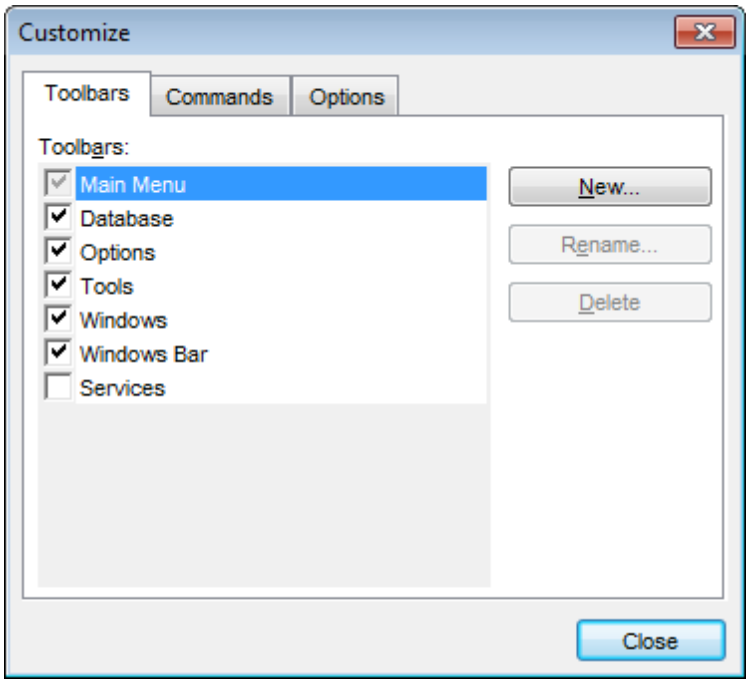
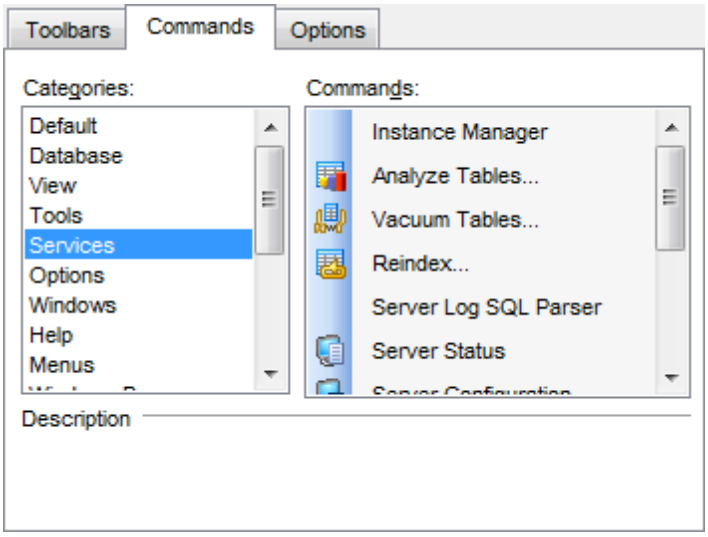


Commands

This tab allows you to browse the list of all commands available within the menus and toolbars of the application window. Selecting categories in the **Categories** list displays commands of the selected category (e.g. 'Database' or 'Tools') in the **Commands** list.

If necessary, you can pick a command and drag it to any toolbar[963] to create a button for this command.



Options

Personalized Menus and Toolbars

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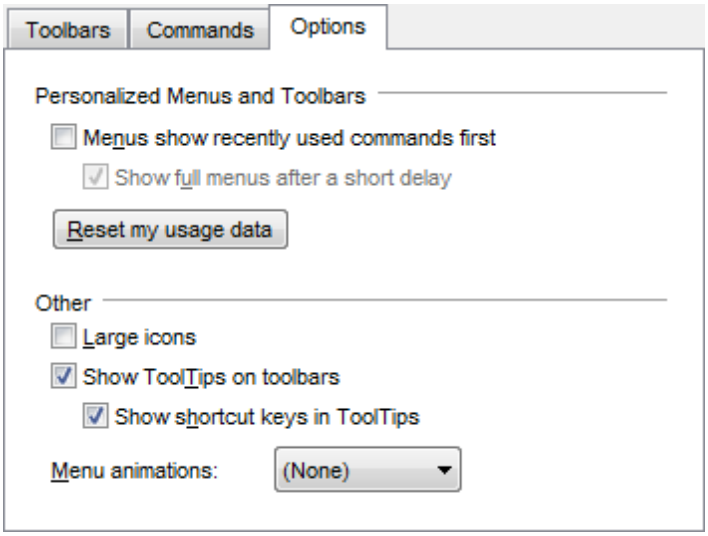
Menus show recently used commands first
This option determines whether the most frequently used items will be placed in menus at first position.
If this option is enabled, frequently used menu items are "promoted" and displayed higher on the list. Unused and infrequently used menu items are visually suppressed and appear "collapsed".

Show full menus after a short delay
This option is available only if the **Menus show recently used commands first** option is selected.
If this option is enabled, infrequently used menu items (if they appear "collapsed") will be automatically expanded after a delay upon setting mouse cursor (or upon selection with the *Up/Down* keys) on the bottom of the menu. Otherwise, the menu expands only after clicking its bottom-most button (or using the *Ctrl+Down* shortcut[1004]).

Reset my usage data
Resets the lists of recently used commands in the toolbars and menus.



Other

Large icons
This option displays larger icons on the parent window toolbars[963].

Show ToolTips on toolbars
If this option is selected, ToolTips (hints) popup when the mouse cursor is positioned over a toolbar[963] button.

Show shortcut keys in ToolTips
If this option is selected, the corresponding shortcuts[1001] are displayed in ToolTips (hints) for toolbar buttons.

Menu animations
Use the drop-down list to specify the menu animation effects:
None (no animation)
Random (random choice: *Unfold*, *Slide*, *Fade*)

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Unfold (unfolding menus)
Slide (sliding menus)
Fade (menus fade in when appearing)

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14.18 SSH tunneling options

SSH (Secure Shell Host) protocol is used to heighten computer security when working with Unix systems on the Internet. SSH uses several encryption algorithms of different reliability. The spread of SSH is also related to the fact that a number of *nix operating systems (e.g. FreeBSD) include SSH server in their standard distributions. To learn more about SSH, please visit http://openssh.org.

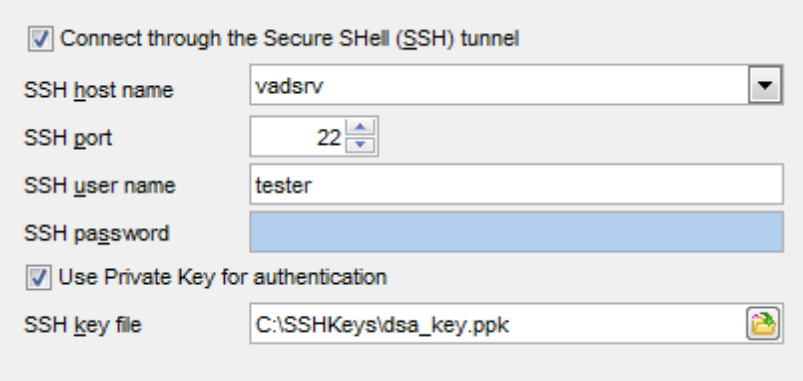
The SSH tunneling feature of SQL Manager is a means of ensuring secure connection to PostgreSQL servers when working over insecure connection channels. You can also use SSH tunnel to get access to the remote PostgreSQL servers when port 3306 is closed for external connections for some reasons.

The connection via SSH tunnel works in the following way.
First, a connection is established and the process of authentication between SSH client built in SQL Manager and remote PostgreSQL server is performed. Then all incoming and outgoing information between the application and PostgreSQL is transmitted through SSH server with the help of a communication port (regularly port 22), and SSH server transfers this information directly to PostgreSQL server.

To setup the connection via **SSH tunnel**, input the following values in the corresponding fields:

- **SSH host name** is the name of the host where SSH server is running
- **SSH port** indicates the port where SSH server is activated
- **SSH user name** stands for the user on the machine where SSH server is running (**Note:** it is a Linux/Windows user, not a user of PostgreSQL server)
- **SSH password** is the Linux/Windows user password

Please note that PostgreSQL **host name** should be set relatively to the SSH server in this case. For example, if both PostgreSQL and SSH servers are located on the same computer, you should specify *localhost* as **host name** instead of the server external host name or IP address.



Use Private Key for authentication
If the SSH encryption is enabled on the SSH server, a user can generate a pair of cryptographic keys (the **Private key** and the **Public key**). The **Public key** is placed on the SSH server, and the **Private key** is the part you keep secret inside a secure box that can only be opened with the correct passphrase (or an empty string as the passphrase). When you wish to access the remote system, you open the secure box with your

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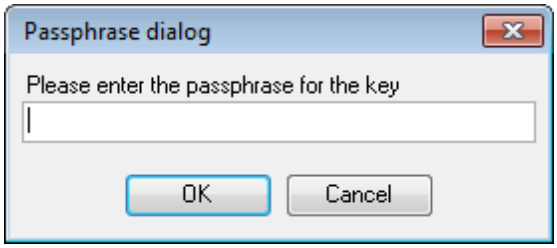
passphrase (if any), and use the private key to authenticate yourself with the Public key on the remote Linux computer.

SSH Key file
Specify the location (the secure box) of the **Private key** file on your local machine.
Supported Private Key file formats are:
OpenSSH
Putty
SSH.com
Note that you need to trust your local machine not to scrape your passphrase or a copy of your Private key file while it is out of its secure box.



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14.19 HTTP tunneling options

HTTP tunneling is a method that allows one to connect to a database and transmit data between the program and a PostgreSQL server through the HTTP/HTTPS protocols using port 80 which is used by a regular Internet browser. This method is used to connect to the remote PostgreSQL server of a hosting company when direct connection is not available (e.g. for security reasons).

The HTTP tunnel works in the following way.
All outgoing queries and commands sent by the client's software are encoded and transmitted through the HTTP/HTTPS protocol using port 80 to the special script that decodes the received data, sends it to PostgreSQL server for processing and then sends the result back. This method requires the HTTP server (Apache) and PHP with PostgreSQL to be installed on the remote server. Normally this software is provided by a hosting company that offers Linux hosting solutions.

To use **HTTP tunneling**, just upload the tunneling script to the webserver where PostgreSQL server is located (e.g. to the location where other PHP scripts are stored), or to any other webserver from which direct connections to your PostgreSQL server are allowed. This script exposes the PostgreSQL API as a set of web-services used by SQL Manager for PostgreSQL.

If your webserver complies with the requirements and the script is installed correctly, you will see the message "EmsProxy v 1.31" (version can be different) in your browser when opening the http://<your_webserver>/emsproxy.php page.

In case of using this connection method the response will be slower as compared to the direct connection or the SSH Tunneling method, since the data are XML encoded and HTTP is stateless by nature. However, all the features of SQL Manager for PostgreSQL are available.

Note that the *emsproxy.php* script file is included into the distribution package and can be found in SQL Manager installation directory.

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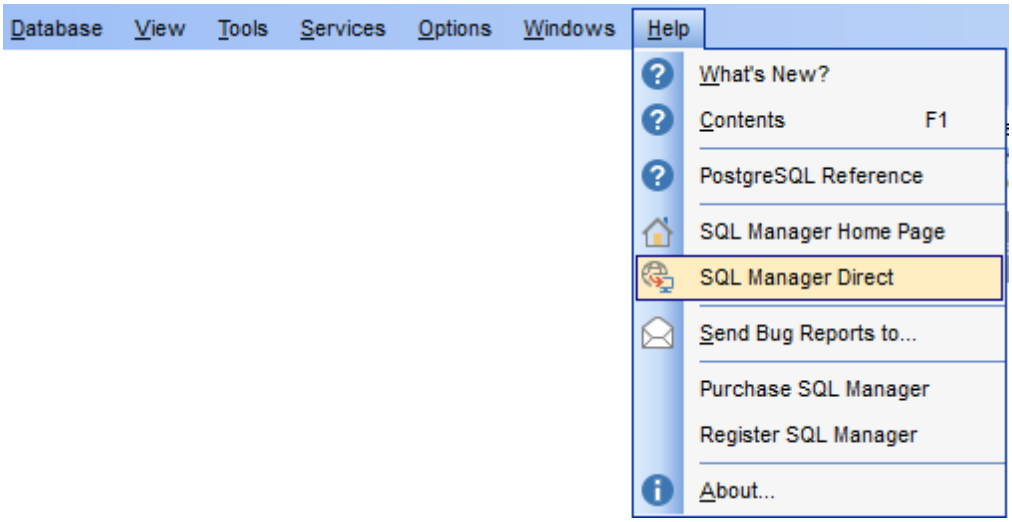
14.20 SQL Manager Direct

SQL Manager Direct is a feature of SQL Manager for PostgreSQL which provides you with quick access to the related Internet resources and allows you to keep your SQL Manager version up-to-date.

To open the **SQL Manager Direct** window, select the **Help | SQL Manager Direct** item from the main menu 961.



Links to sqlmanager.net resources provided by the **SQL Manager Direct** window are grouped into several sections:

- *SQL Manager for PostgreSQL News*
- *General Information*
- *Downloads*
- *Related Products*

Upon a link selection you will be immediately forwarded to the corresponding resource.

SQL Manager for PostgreSQL News
This section takes you directly to the latest EMS news column. Using the links you can get up-to-date news, product information and downloads from sqlmanager.net.

General Information
This section offers a number of links to product news, features, Feature Matrix 22, system requirements 21, testimonials and much more.

Downloads
Using links of this section you can download other product versions from the download page.

Related Products
This section allows you to browse the list of related products developed by EMS Database Management Solutions, Inc.

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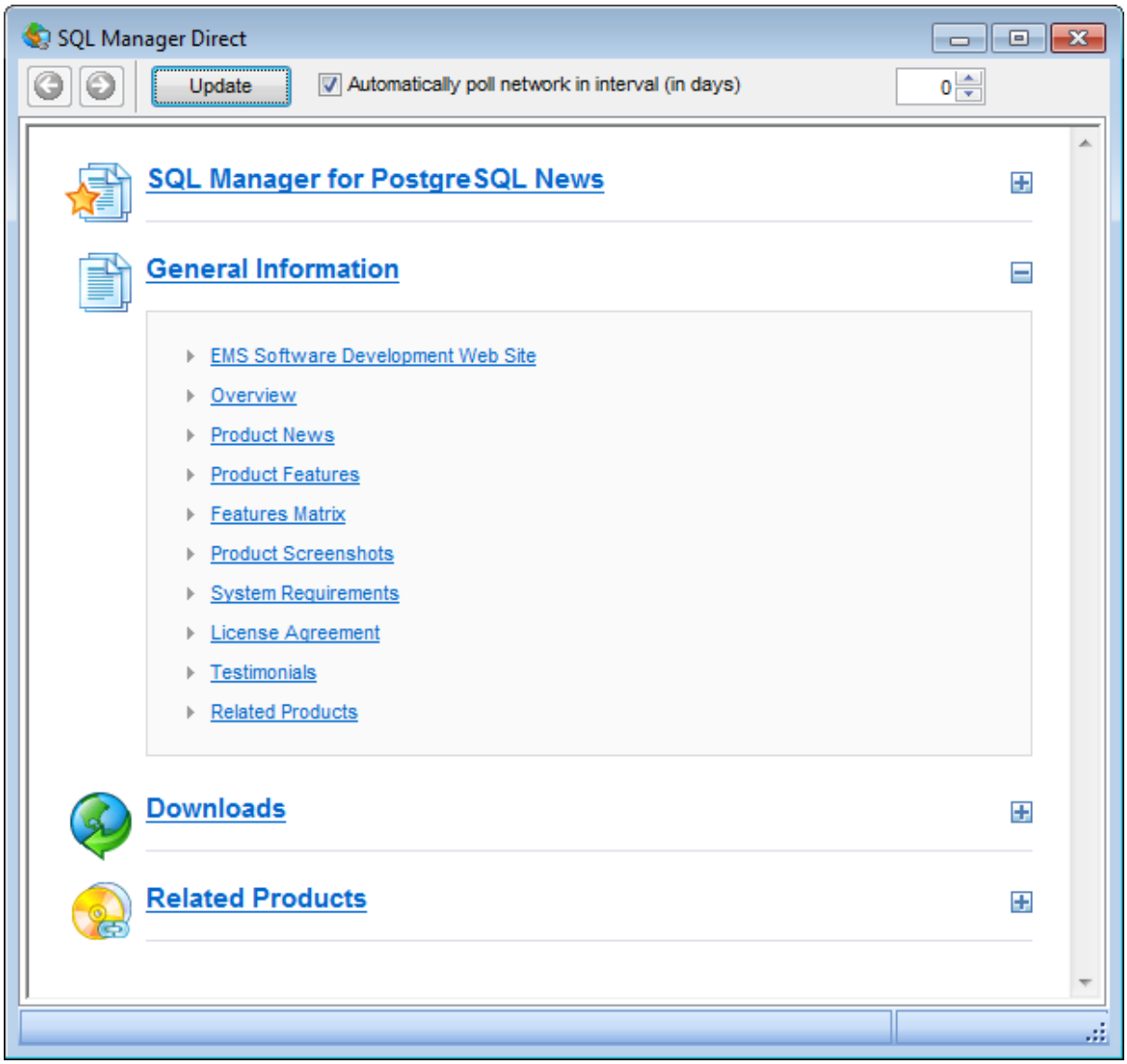

Use the buttons to navigate in the same way as you normally do it using a web browser.

Click the **Update** button to refresh the page.

☑ **Automatically poll network in interval (in days)**
If this option is selected, the page is refreshed automatically after the specified time interval. Use the spinner control to set the interval (in days).

In the **Status** area at the bottom of the **SQL Manager Direct** window you can find the status of your request to the sqlmanager.net website.

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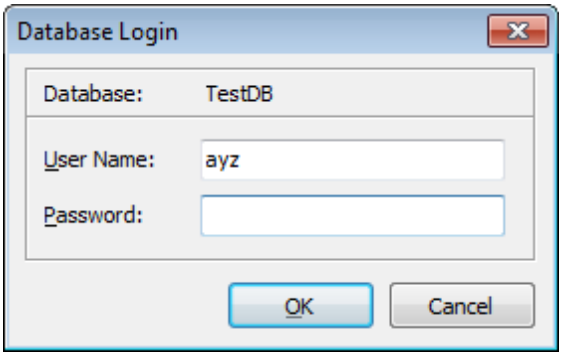
14.21 Database Login dialog

The **Database Login** dialog appears on attempt to connect 87 to a database if the **Login prompt before connection** option is enabled on the Options 111 page of the Database Registration Info 108 dialog.



Note: If SSH tunneling 992 is used for the database connection, the **SSH Login** dialog with the **SSH user name** and **SSH password** boxes appears first.

Specify *SSH user name / password* (if necessary), *user name / password* and click **OK** to start working with the database.

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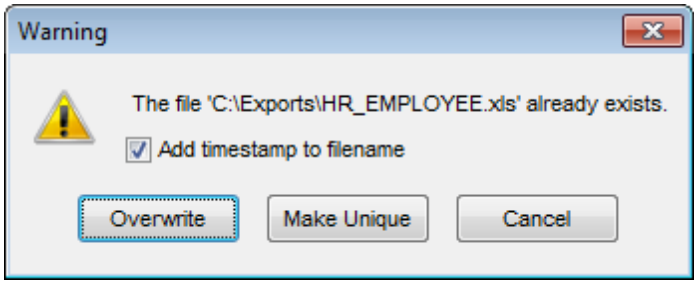
14.22 Overwriting existing output file

If a file having the same name as specified for an output file generated by SQL Manager already exists, a warning dialog is displayed.



You can **Overwrite** the file, **Make** it **Unique**, or **Cancel** both and change the path or file name manually.

The application makes the file unique by adding the current timestamp to the specified file name if the ☑ **Add Timestamp to filename** option is enabled, or by adding a simple numeric postfix to the file name if this option is disabled.

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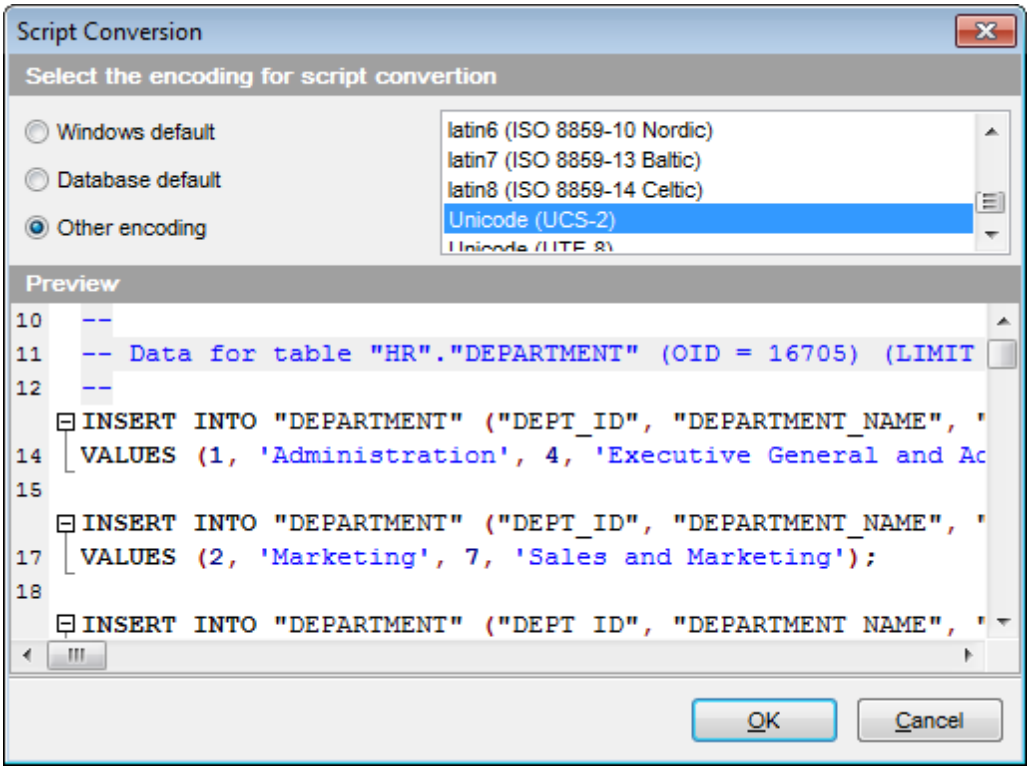
14.23 Script conversion

The **Script conversion** dialog allows you to select encoding to be used for script conversion upon loading script to one of SQL Manager editors (Query Data 415, Execute Script Editor 646) from an external file.



Windows default
Specifies that the standard Windows encoding will be used for the script conversion.

Database default
Specifies that the default encoding of the database will be used for the script conversion.

Other encoding
Allows you to select the encoding that will be used for the script conversion.

Preview
This area displays the script with the current encoding parameters applied.

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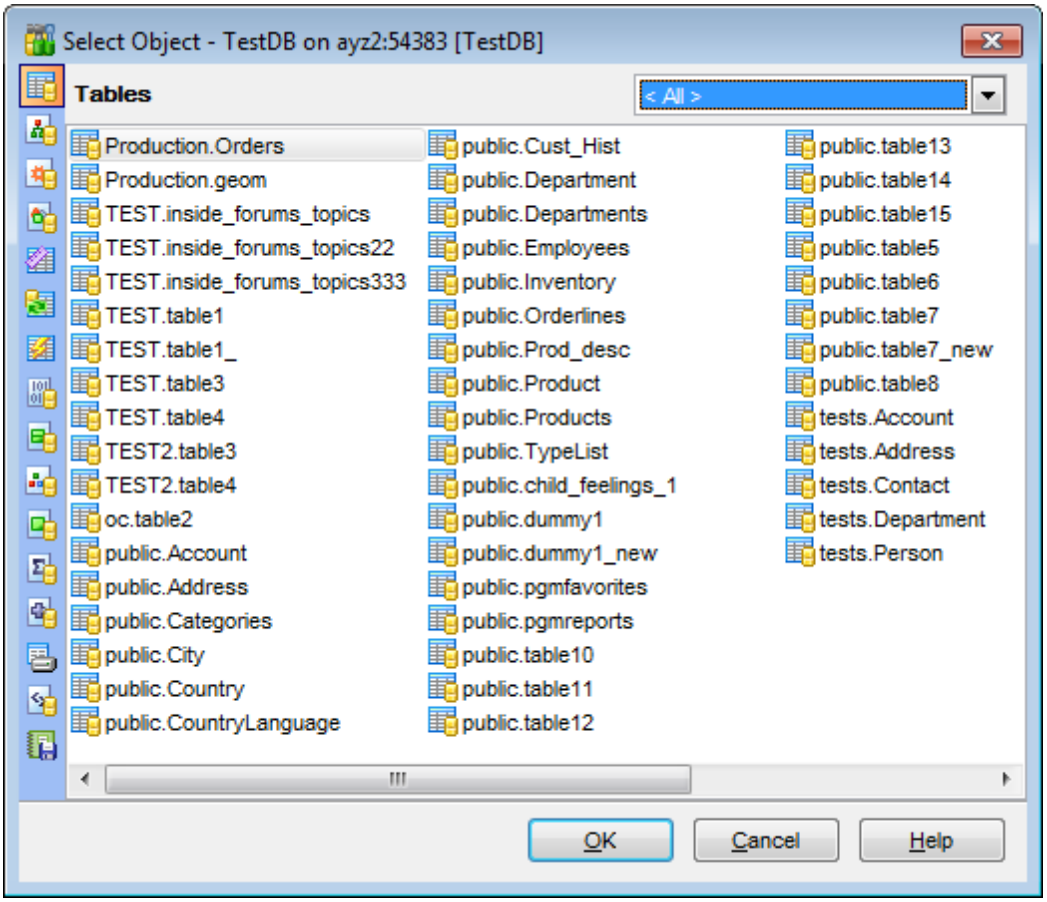
14.24 Select Object dialog

The **Select Object** dialog appears each time the application requests a database object selection, e.g. upon a root object selection for the Dependency Tree 638 tool, or when choosing an object to be added to a project.



First select the object type in the list on the left-hand side of the window. Use the drop-down list at the top to select the schema, pick the object you need and click **OK** the apply your selection.

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14.25 SQL Manager shortcuts

Database management

Shift+Alt+R	Register a database using Register Database Wizard 98
Shift+Alt+U	Unregister the selected database
Shift+Ctrl+C	Connect 68 to a database
Shift+Ctrl+D	Disconnect from a database

Database objects management

Ctrl+N	Create a new object (the object type depends on the current selection)
Ctrl+O	Edit the selected object in its editor
Ctrl+R	Rename the selected object
Shift+Del	Drop the selected object
Ctrl+Shift+C	Collapse the current DB Explorer 65 tree branch and switch selection to the parent tree node

SQL Manager tools

F11	View/hide Database Explorer 65
Ctrl+F	Search for an item in the DB Explorer 65 tree
Shift+Ctrl+T	Open the To-Do List 985 window
F12	Show Query Data 415
Shift+F12	Open a new instance of Query Data 415
Shift+Ctrl+M	Open SQL Monitor 643
Shift+Ctrl+S	Open Execute Script Editor 646
Shift+Ctrl+L	Open Localization Editor 951
Ins	Add a new table subobject (the subobject type depends on the current tab selection)
Ctrl+Ins	Add a parameter in Function Editor 239
Ctrl+Del	Remove a parameter in Function Editor 239
Ctrl+Up	Move an argument up in Function Editor 239
Ctrl+Down	Move an argument down in Function Editor 239
Ctrl+I	Start incremental search 964

Query Data and Execute Script (fixed and default)

F9	Execute query/script
Alt+F9	Execute selected only
Ctrl+Alt+F9	Execute under cursor
Ctrl+Alt+F2	Reset execution point (Query Data only)
Shift+Ctrl+<digit>	Toggle bookmark #*<digit>*
Ctrl+<digit>	Go to bookmark #*<digit>*
Ctrl+Q,N	Go to next bookmark
Ctrl+Q,P	Go to previous bookmark
F2	Drop marker to current position
Esc	Collect marker (jump back)

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Shift+Esc	Swap marker to current position
Ctrl+Z; *Alt+BkSp*	Undo
Shift+Ctrl+Z; *Shift+Alt+BkSp*	Redo
Ctrl+F	Search for text using the Find Text 971 dialog
Ctrl+R	Replace text using the Replace Text 973 dialog
F3	Search next
Ctrl+I	Start incremental search
Alt+G	Go to line number (an input number dialog prompts for the number)
Ctrl+L	Load a script from an external file
Ctrl+S	Load the script to an external file
Shift+Ctrl+F	Format the SQL text using SQL Formatter
Alt+<symbol>	Switch to the query with *<&symbol>* in its name (Query Data only)
Ctrl+J	Insert a keyboard template 953
Ctrl+D	Toggle query results display mode (at the Edit tab or at a separate one)
Ctrl+Alt+Left	Switch to the next tab of Query Data 415
Ctrl+Alt+Right	Switch to the previous tab of Query Data 415
Ctrl+Alt+PgUp	Switch to the last tab of Query Data 415
Ctrl+Alt+PgDown	Switch to the first tab of Query Data 415
Ctrl+Q,S	Move cursor to beginning of line
Ctrl+Q,D	Move cursor to end of line
Ctrl+Q,R	Move cursor to absolute beginning
Ctrl+Q,C	Move cursor to absolute end
Ctrl+O,N	Normal selection mode
Ctrl+O,L	Line selection mode
Ctrl+O,C	Column selection mode
Shift+Ctrl+Left	Select the previous word
Shift+Ctrl+Right	Select the next word
Shift+Home	Select text to the beginning of the line
Shift+End	Select text to the end of the line
Shift+PageUp	Select one page up
Shift+PageDown	Select one page down
Shift+Ctrl+PageUp	Select text to the first line on the page
Shift+Ctrl+PageDown	Select text to the last line on the page
Shift+Ctrl+Home	Select text to the absolute beginning
Shift+Ctrl+End	Select text to the absolute end
Shift+Alt+Left	Select column symbol-by-symbol to the left
Shift+Alt+Right	Select column symbol-by-symbol to the right
Shift+Alt+Up	Select column upwards
Shift+Alt+Down	Select column downwards
Shift+Ctrl+Alt+Left	Select column word-by-word to the left
Shift+Ctrl+Alt+Right	Select column word-by-word to the right
Shift+Alt+Home	Select column to the beginning of line
Shift+Alt+End	Select column to the end of line
Shift+Alt+PageUp	Select column to the beginning of the page

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Up	
Shift+Alt+Page Down	Select column to the end of the page
Shift+Ctrl+Alt+Home	Select column from the current cursor position to the beginning of the first line
Shift+Ctrl+Alt+End	Select column from the current cursor position to the beginning of the last line
Ctrl+Up	Scroll up one line with cursor position unchanged
Ctrl+Down	Scroll down one line with cursor position unchanged
Alt+Down, Alt+Up	Toggle case of a current word
Ctrl+Alt+Up	Toggle case to upper of a current selection or char
Ctrl+Alt+Down	Toggle case to lower of a current selection or char
Ctrl+G+T	Toggle folding
Ctrl+G,Ctrl+F	Collapse block at current line
Ctrl+G,Ctrl+E	Expand block at current line
Ctrl+G,Ctrl+C	Collapse/Expand block at current line
Ctrl+G,Ctrl+M	Collapse all blocks in the text
Ctrl+G,Ctrl+P	Expand all blocks in the text
Ctrl+=	Collapse/expand the nearest block
Shift+Ctrl+B	Jump to matching bracket (change range side)
Shift+Ctrl+I	Indent selected block
Shift+Ctrl+U; Shift+Tab	Unindent selected block
Ctrl+/	Comment/uncomment selected block
Ctrl+Space	Show code completion
Ctrl+Alt+Space	Show character map
Ctrl+Shift+Space	Show code parameters
Ctrl+Alt+Q	Show columns
Ctrl+Alt+T	Show tables
Ctrl+Alt+V	Show views
Ctrl+Alt+U	Show functions
Ctrl+Alt+J	Show domains
Ctrl+Alt+G	Show triggers
Ctrl+Alt+X	Show indices
Ctrl+Alt+S	Show sequences
Ctrl+Alt+M	Show composite types
Ctrl+Alt+E	Show enum types
Ctrl+Alt+Y	Show base types
Ctrl+Alt+A	Show aggregates
Ctrl+Alt+O	Show operators
Ctrl+Alt+N	Show collations
Ctrl+Alt+L	Show languages 321
Ctrl+Alt+P	Show tablespaces 318
Ctrl+C; Ctrl+Ins	Copy selection to Clipboard
Ctrl+X; Shift+Del	Cut selection to Clipboard
Ctrl+V; Shift+Ins	Paste Clipboard to current position
Ctrl+Del	Delete from cursor to the next word
Ctrl+BkSp	Delete from cursor to the end of the previous word
Ctrl+B	Delete from cursor to the beginning of the line
Shift+Ctrl+Y	Delete from cursor to the end of the line

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Ctrl+Y	Delete the current line
Ctrl+M; *Enter;* *Shift+Enter*	Break line at current position, move caret to a new line
Ctrl+Alt+I	Insert Tab char
Shift+Ctrl+R	Start macro recording
Shift+Ctrl+P	Play macro
Alt+End	Skip misprint
Ctrl+Alt+End	Skip all misprints
Alt+Home	Correct all misprints
F5	Toggle breakpoint
Shift+F5	Enable breakpoint

Print Data View

Ctrl+O	Load a printing report from a file
Ctrl+S	Save the report to file
Ctrl+P	Open the Print 506 dialog
Ctrl+Home	Go to the first page
Ctrl+Up	Go to the previous page
Ctrl+Down	Go to the next page
Ctrl+End	Go to the last page
Ctrl+D	Open Report Formatter 490
Ctrl+	Zoom 100%
Ctrl+0	Zoom page width
Ctrl+1	Whole page
Ctrl+2	Two pages
Ctrl+4	Four pages
Ctrl+W	Widen to source width
Ctrl+M	Show/hide margins
Ctrl+K	Set background color for the report

Working with windows, menus and tabs

Ctrl+Tab	Switch to the next tab 59
Ctrl+Alt-0	Open Windows List 987
Ctrl+Alt+D	Set defaults to all windows
Ctrl+F6	Switch to the previous window
F6	Switch to the next window
Ctrl+W	Close the active window
Ctrl+Down	Expand a collapsed menu
Ctrl+Shift+N	Move to the next tab 75 in DB Explorer
Ctrl+Shift+P	Move to the previous tab 75 in DB Explorer

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Part

15 How to...

The succeeding pages of this chapter are intended to provide you with brief instructions on how to perform this or that operation correctly using SQL Manager for PostgreSQL.

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15.1 Work with Databases

15.1.1 Connect to a database

If you want to connect to a database that has not been registered yet then perform the following operations:

1. Launch the Register Database wizard 98 by selecting the **Database | Register Database...** main menu item.
2. If a host where the database is located has not been registered yet then type in its name in the **Host name** field on the first step 99 of the wizard. Otherwise, select the necessary host from the drop-down list. If needed you can set Tunneling parameters 93 as well.

Note: To register several databases at once uncheck the **Register a single database** option. In this case you will proceed to the Selecting databases 103 step of the wizard where you are to define databases you want to be registered.

3. On the last step 105 of the wizard set database name and specify specific options.
4. The registered database(s) is/are now displayed in the DB Explorer 65. To connect to the database double-click its alias or select the **Connect to Database** item of the database context menu 54.

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15.1.2 Create a database

To create a database on the registered server perform the following operations:

1. Launch the Create Database wizard 89 by selecting **Database | Create Database** main menu item.
2. On the first step 90 specify a name for a newly created database.
3. On the second step 91 set the necessary **connection properties** for the database being created. Use the corresponding boxes and options: *Host name*, *Port*, *User name* and *Password*. If needed you can set Tunneling parameters 93 as well.
4. If you want your newly created database to contain data of another database then select it from the *Template* drop-down list situated on the Setting advanced database properties 95 step. There you can also specify such properties as *Encoding*, *Owner*, *Default tablespace* and *Connection limit*.
5. On the last step 97 view the result SQL statement. If you have checked the **Register After Creating** box on the first step of the wizard 90 then the Database Registration Info 109 dialog will appear after creating a new database.

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15.1.3 Edit database connection parameters

If you have made a mistake when creating 89 or registering 98 a database or the information provided is incomplete then it can be edited using the Database Registration Info 109 dialog. You can view this information both for connected or disconnected database.

To open the dialog, select the database or any of its objects in the DB Explorer 65 tree, then select the **Database | Database Registration Info...** main menu item, or right-click the database alias in DB Explorer 65 and use the **Database Registration Info...** context menu item.

The connection parameters can be changed on the **Connections** tab of the dialog. Here you can define or redefine the following properties in the corresponding boxes: *Server name*, *User name*, *Password*, *Database name*, *Database alias* and *Font charset*.

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15.1.4 Make work with a database faster

If your database contains too many objects or if connection to the database is slow you can increase work speed by uncheking the ☑ **Refresh objects on connection** option when registering database or editing the Database Registration Info 111.

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15.1.5 Design a visual database structure

To design your database visually you may use the Database Designer[720]. It allows you to create, edit and drop tables and table columns, set relations between tables and perform other operations you may need to achieve your purpose. All new objects are displayed on a diagram.

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15.1.6 View an ER diagram

The relationship diagram is built using the reverse engineering 736 operation.
To view an ER diagram of a scheme you should follow the steps:

1. Run Database Designer 720;
2. Click the **Reverse Engineer** button on the main toolbar 724 or use the corresponding item of the context menu 728.
3. Choose schemas to reverse engineer from.

The created diagram can be saved as a **.pgd* file (**Save Diagram** button) or as an image (**Save as Picture** button).

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15.1.7 Create a database copy

In order to create a copy of the whole database or of separate objects you can:

1. Extract DB objects structure and data into SQL script using the Extract Database Wizard 653. The result script can be used to copy or restore your database.
2. Create database backups with the help of the Backup Database Wizard 808.
3. Create copies of separate database objects by using the Duplicate Object Wizard 159.
4. Copy 663 the selected database wholly or partially to a new database or to one of the existing databases using the Copy Database Wizard 663.

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15.1.8 Document a database

There are several ways to document a database:

1. You can generate a detailed HTML report of the selected database objects using HTML Report Wizard 686.
2. You can generate and print metadata 680 reports of any database object(s). Generated reports can be exported to any of the available formats: *HTML file*, *Excel file*, *Text file*, *RTF file*, *CSV file*, *HTML file*, *BMP image*, *Excel table (OLE)*, *JPEG image*, *TIFF image.*
3. You can save the Database Designer 720 diagram as a **.pgd* file for future use. If necessary, you can also save the diagram as an image.

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15.1.9 Save metadata reports to file

To save a metadata report in a file of any supported format (**.txt*, **.csv*, **.pdf*, **.html*) you should do the following:

1. Open the Print Metadata 680 window by selecting the **Tools |** **Print Metadata** item of the main menu.
2. Mark the needed objects and define printing settings and click the **Preview** button on the navigation bar or toolbar 681.
3. In the opened Preview window click **Export** and select from the drop-down list the needed file format for report saving. When done, specify file name and location.

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15.1.10 Log database changes

If you want to perform metadata changes logging and SQL query logging you need to:

1. Check the **Enable log of metadata changes** and specify the path to the **.sql* file to store the metadata logs.
2. Check the **Enable log of Query Data queries** and specify the path to the **.sql* file to store the logs of SQL queries: date/time of query execution, SQL text, execution result or errors (if any).

This can be done in the Database Registration Info | Logs 117 window.

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15.1.11 Get an SQL dump

To get an SQL dump (an **.sql* file) of your database use the Extract Database Wizard[653] that will extract database objects and/or data to an SQL script, e.g. for backup purposes.

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15.1.12 Synchronize two databases

The synchronization between two databases can be done with a help of the Compare Databases Wizard[674]. This wizard allows you to compare databases and create a script to deploy changes from one database into another one.

To run the wizard use the **Tools |** **Compare Databases...** item of the main menu.

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15.2 Work with Database Objects

15.2.1 Group objects

If you want to group objects you can do it in one of the following ways:

- Using projects (situated in the DB Explorer 65 tree):
  1. Click create **New Sub Folder** in the **Projects** folder using the corresponding item of the context menu
  2. Define its name and drag-and-drop necessary objects there or use the **Add Object** item of the created folder context menu. Pick the objects to add to folder from the appeared dialog.
- Using DB Explorer 65 tabs:
  1. Right-click the necessary object in the DB Explorer 65.
  2. Choose the **New Tab from Here** item of the object context menu 57 and define the name of the tab.
  3. Now your objects are stored on the separate tab of a DB Explorer 65.
     Note: If an object is not a tree node, it cannot be placed on a separate tab.

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15.2.2 Find objects

In order to search for objects you need you can:

1. Call the **Find Object** dialog by right-clicking the **Database** alias, any database object group nodes or objects in the **DB Explorer** tree and select the **Find Object...** context menu 51 item.
2. Call the **Find Object** dialog by using the *Ctrl+F* shortcut 1001.
3. Type in the first letters in the edit-box of the Search Panel 78, and the corresponding object will be highlighted in the tree.
   Note: Objects among which the search is performed should be updated and the object node should be expanded.
4. Launch the Search in Metadata 714 tool by selecting the **Tools | Search in Metadata** main menu 961 item, or using the *Ctrl+Alt+F* shortcut 1001. After the search is complete, the **Explorer** group on the Navigation bar 715 displays the tree of database objects in which the search string is found, and allows you to view metadata of the required object or its fragment.

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15.2.3 View dependecies

If you want to view all the object dependencies then:
1. Use a dependencies tab[967] in the Table Editor[177].
2. Use the Dependency Tree[638] tool.

These tools may be useful when you can't find an object that prevents your from dropping a table.

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15.2.4 Get an object DDL

In order to get an object DDL you can:

1. Right-click the object in the DB explorer 65 tree and select the **Script to New Query Data | Create** context menu item.
2. Right-click the object and select the **Edit Table <table_name>...** context menu item or double-click the table and then proceed to the DDL tab in the opened table editor window.
3. Right-click the object in the DB explorer 65 tree and select the **Data Manipulation | Export Data as SQL Script** context menu item.

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15.3 Work with Data

15.3.1 View tables with many records

If your table contains a lot of records you can minimize dataset loading time by:
1. Setting the number of records to be selected;
2. Enabling **Load visible records** in order to load only a fixed number of dataset records into memory

These options can be set only for the selected database on the Data Options 124 page of the Database Registration Info 108.
Default settings for newly registered databases can be defined on the Grid | Data Options 912 page of the Environment Options 871 dialog.

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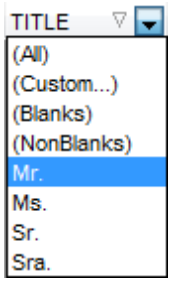
15.3.2 Set data filter

Quick Filtering (by the current value in a cell)

Open the context menu of the needed column and choose the **Quick Filter** item. Then choose a filter condition 463 in the opened submenu.

Filtering by Column

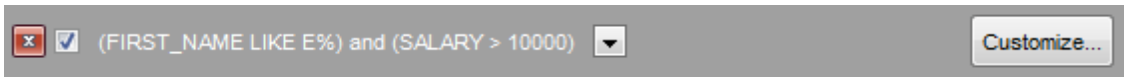


Open the drop-down list on the column title and choose a filter condition from the list.
You can set advanced conditions by using the **Custom...** menu item.
When choosing this item, the special window for setting filter conditions 522 opens.

Advanced Filtering

You can set advanced filter options by pressing the button on the toolbar 454 of the Data View and set filter parameters in the Filter Builder 524. Apply the set conditions by pressing the **Apply** button.

If a filter is set for a table, the special bar appears in the lower part of the table where you can see filter conditions and the history of filter changes opened by pressing the drop-down list.



Disable Filtering

To cancel filtering, open the context menu of the column and choose the **Disable filter** item.
Or press the button on the filter toolbar.

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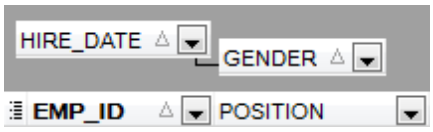
15.3.3 Sort and group data

In order to *sort* data, do the following:
1. Open data at the **Data** or **Results** tab.
2. Choose the column by which you need to sort data and click the column title.
3. If the column was not sorted, the first click will sort it in the ascending order and the second one - in the descending order.

Note: To cancel the sorting, open the context menu by right-clicking the necessary column and choose the **Clear Sorting** item, or press the *Ctrl* button and click the column title.

To enable *grouping*, drag the column title to the special grouping car above the table.



Note: To disable grouping, drag the column title from the group bar back to the table.

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15.3.4 Export/import data

You can *export* data from a database table into an external file of any supported format 983 by means of the Export Data Wizard 536. There are several ways to launch it:

1. Open the **Data** or **Results** tab, press **Export Data** on one of the Data View toolbars 454.
2. Open the **Data** or **Results** tab, choose **Data Manipulation | Export Data** in the Data Grid context menu 466.
3. Open the table context menu 57 in the DB Explorer 65, choose the **Data Manipulation | Export Data** item.
4. Open the **Data** or **Results** tab and use the shortcut **Shift+Ctrl+E**.

You can *import* data from external sources into a table or view using the Import Data Wizard 582:

1. Open the **Data** tab, press the **Import Data** button on one of the Data View toolbar 454.
2. Open the **Data** tab, choose **Data Manipulation | Import Data** in the Data Grid context menu 466.
3. Open the table context menu 57 in the DB Explorer 65, choose the **Import Data** item.
4. Open the **Data** tab and use the shortcut **Ctrl+I**.

Note: Export and import data tools are available in full version of SQL Manager for PostgreSQL only.

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15.3.5 Export data as SQL script

You can export data from a database table into SQL script with INSERT INTO statements in one of the following ways:

1. Open the **Data** or **Results** tab, press the **Export Data as SQL Script** on one of the **Data View** toolbars454 and set export parameters in the opened Export as SQL Script Wizard608.
2. Open the **Data** or **Results** tab, choose **Data Manipulation | Export Data as SQL Script** in the Data Grid context menu466 and set export parameters in the opened Export as SQL Script Wizard608.
3. Open the table context menu57 in the DB Explorer65, choose the **Data Manipulation | Export Data as SQL Script** item and set export parameters in the opened Export as SQL Script Wizard608.

Note: In order to extract table DDL (CREATE TABLE statement), check the **Add CREATE TABLE statement** box at the Step 1610.

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15.3.6 Edit data of master-detail tables

You can work with data in multi-level mode, that is you can view and modify it in several related tables simultaneously.
To manage grid levels, right-click the grid and select the **Grid Levels** context menu 466 group. Click **Add Grid Level** in the menu to run the Create Grid Level wizard 469. After the level is added you can edit data of the related tables.

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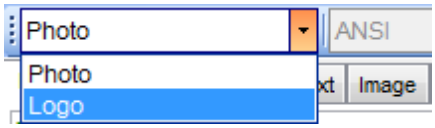
15.3.7 Add image to table

If you want to add an image to a table then do the following:

1. Open the table on the Data tab.
2. Go to the BLOB View section (the navigation buttons are located in the bottom part of the window) and then proceed to the Image tab.
3. If there are several BLOB columns, choose the required column from the Select BLOB Column drop-down list on the toolbar of the Blob View tab 455 and press the **Load from File** button on the same toolbar.
4. Choose the needed image file in the appeared dialog.



Note: Adding images to table is possible only if table contains at least one BLOB column 507.

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15.3.8 Set data display format

To set the format for displaying data open the **Options |** **Environment Options** dialog from the main program menu 961, proceed to the Color & Formats 915 tab and define or choose the display format for some data types 983 in the **Display formats** section.

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15.4 Work with Queries and Scripts

15.4.1 Create SQL statements rapidly

There are two options for creating SQL queries rapidly:

In the DB Explorer

1. Right-click a table in the DB Explorer 65
2. Choose **Script to New Query Data** context menu item.
3. Select the necessary query type.

In the Visual Design Query

1. Open Design Query 431.
2. On the **Builder** tab drag an object from the DB Explorer 70 tree to the diagram area.
3. Choose necessary columns to include in the query by checking the corresponding box located to the left from the column name in the list, or just by double-clicking it. To include all columns of the table/view, check the box located to the left of the table/view caption.
4. Associate two objects 436 by their columns. Drag a column from one object list to another. This will set a link between these objects by the selected columns. It is indicated by a bidirectional arrow between the linked columns.
5. Edit link properties 436. Double-click the linking arrow or right-click it and select the **Property** popup menu item. The **Link properties** dialog allows you to change the association condition by choosing it from the drop-down list.
6. You can view and edit your SQL statement on the **Edit** tab of the Design Query 431.

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15.4.2 Control a query productivity

You can view a query productivity on the query plan[422]. It allows you to view the sequence of actions performed by the database server in the process of the query execution, and the amount of system resources used for the query execution.
To view the **Plan** of a query, open the query in **Query Data** and use the **Show estimated execution plan** item of the Navigation bar[416] or toolbar[416].
If necessary, you can specify that the **Plan** tab appears automatically upon query execution in Query Data[415]: select the **Show actual execution plan on query execution** option available within the Tools | Query Data[888] section of the Environment Options[871] dialog.

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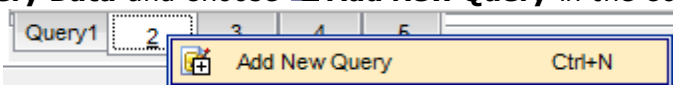
15.4.3 Work with several queries at once

Query Data[415] provides a possibility to open and edit several queries. You can create tabs in the lower part of the **Query Data**, each tab may contain a separate query. There are several ways for creating tabs:

1. Open **Query Data** and choose **Add New Query** on one of the toolbars[416].
2. Open **Query Data** and choose **Add New Query** in the context menu[420] of the existing tab.



3. Use the shortcut **Ctrl + N**.

Note: Each tab can be renamed and any query can be added to Favorite Queries[85].

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15.4.4 Save most frequently used queries

Use the Favorite Queries 85 feature to store your most frequently used SQL queries. To access the list of your favorite queries you can use the **Favorite Queries** node of DB Explorer or create a separate tab for your Favorite queries.

Using the context menu you can create a new Favorite query or edit an existing one using Favorites editor 429, open any of the existing queries in Query Data 415 or remove a query if you don't need it any longer.

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15.4.5 Execute queries with parameters

If you want to use queries with parameters then you should check **Allow using parameters in query text** option in the Environment Options | Tools 879.
This feature allows you to specify different values within a query in a popup dialog 450 just before the query execution. Use the colon (':') character before an identifier (e.g. :P1) to specify a parameter within the query.

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15.4.6 Export query results into file

When executing queries, their results can be displayed on the **Edit** or **Results** tab in the Data View 453.
You can copy data from database tables into an external file of any supported format 983 in one of the following ways:

1. Open the **Data** or **Results** tab, press **Export Data** on one of the Data View toolbars and define export parameters in the opened Data Export Wizard 536.
2. Open the **Data** or **Results** tab, choose **Data Manipulation | Export Data** in the Data Grid context menu 466 and define export parameters in the opened Data Export Wizard 536.
3. Open the table context menu 57 in the DB Explorer 65, choose the **Export Data** item and define export parameters in the opened Data Export Wizard 536.
4. Open the **Data** or **Results** tab and use the shortcut Ctrl+E.

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15.4.7 Execute scripts

Execute Script 646 allows you to create, view, edit and execute SQL scripts. To open Execute Script Editor select the **Tools |** **Execute Script...** main menu 961 item. This tool is intended for work with a great number of SQL statements and with scripts that are stored in files. For instance, you can execute a script directly from a file without loading it to the Editor window. This reduces memory usage. However Execute Script allows just to estimate whether the execution of script statements will be successful, but it does not return query result.

Note: To execute SQL scripts you should use Execute Script 646, not Query Data 415. The latter is intended for creating, editing and executing SQL statements. It also provides a possibility to view query result, perform various operations with it (data import, data export, etc.) and manage transactions.

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15.4.8 Execute a large SQL script

If you need to execute a large SQL script it's not necessary to load it from file to the Execute Script Editor[646] window as it can take a lot of time. Instead you can execute script directly from **.sql*, **.zsql* or **.txt* file. In order to do this click the **Execute script from file** button of the Navigation bar and Toolbar[647] in Execute Script editor[646].

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15.4.9 Make SQL script work faster

In order to make the SQL script work faster, you can disable some functions.

Parsing

Choose and disable the **Disable Parsing** item on one of Execute Script Editor toolbars 647.

Automatic Creation of Hierarchical Text Structure

Uncheck the **Use code folding** box on the Display 930 tab of the Editor options 925.

Syntax Highlight and Quick Code for Aliases

Choose **Options** | **Editor options** in the main menu, proceed to the General 926 tab and uncheck the **Resolve aliases** box - the syntax highlight 933 and quick code 935 for aliases will be disabled.

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15.4.10 Customize work with query/script text

Using Internal Link
The name of the object existing on a database is highlighted in a query/script text. You can open such an object by holding the *Ctrl* key and clicking the object with a mouse.

Adding Text Template
To add a keyboard template 953, use *Ctrl+J* shortcut.

Automatic Completion (Object List)
You can call the autocompletion list by starting to enter the first characters of the text and using the shortcut *Ctrl + Space*.

Customize Autocompletion List
Choose **Options** | **Editor options** in the main program menu 961, proceed to the Code Completion 935 tab and define the list and quick code parameters.

Automatic Formatting of Query/Script
Choose **Quick Code** | **Format** in the Query Data/Execute Script context menu 420 or the *Shift+Ctrl+F* shortcut to apply automatic formatting.

Setting Font and Query/Script Format at the Display tab
Choose **Options** | **Editor options** in the main program menu 961, proceed to the Display 930 tab and define common font and format parameters for Query Data/Execute Script.

Setting Font and Query/Script Format at the Highlight tab
Choose **Options** | **Editor options** in the main program menu 961, proceed to the Color Scheme 933 tab and define font options for each element.
Note: If some font parameters are defined on the **Highlight** tab, they will be applied to the query/script text and not the ones defined on the **Display** tab.

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15.4.11 View executed queries and scripts

To view all queries and scripts sent to the server you need to launch SQL Monitor643. It will show you the log of database operations and SQL queries as items, each consisting of 3 parts: *Executed* (the date and time of the operation), *Operation* (SQL statement sent to the server), *Result* (the result of the operation).

Note: SQL Monitor only displays scripts and queries executed in SQL Manager for PostgreSQL during the current session.

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15.5 Work with Version Control

Change management system allows you to:

- Systematization of release database new versions process: storing different database versions; tracking of database changes; Getting (storing, testing) change scripts which reveal differences between two database states.
- Possibility to rollback database to definite state.
- Control of database changes.

When a user of the system makes typical actions, such as getting previous version of a document or creating new version etc., he works with a local copy of repository. As the amount of applied changes grows, repositories of various developers become more different. This results in necessity of synchronization of repositories. Synchronization can be performed by interchange of patches or change sets among developers.

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15.5.1 Enable version control

To start working with Version Control System (VCS) you need to:

1. Install change management system.
   The following systems are supported:
   - **CVS**
   - **Subversion**
   - **Microsoft Visual SourceSafe**
   - **Team Foundation Server**
2. Create the directory for **CVS** and **Subversion**, which is a working copy of VCS (version control system) directory.
3. Open the Change Management 126 tab of the Database Registration Info 108 dialog to check the **Enabled** flag.
4. Create local repository 129 for each database under version control. Press the **Repository Management Wizard** button to open the corresponding wizard 129. Use this wizard to define settings for linking database to VCS repository. Repository is a directory, where VCS stores all documents with history of its changes and other service information.
5. Specify the parameters of the created repository at the Change Management 126 tab of the database registration info 108 dialog, or confirm autocomplete on closing the Repository management wizard 129.
6. Confirm the changes and reconnect to the database.

You can view/edit repository connection settings within the **Provider settings** dialog which can be called by pressing the **Properties** button.

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15.5.2 Create the repository for a database from scratch

If you have just installed Subversion (please note that SQL Manager supports CollabNet Subversion and Slik Subversion only), and you need to create the repository for your database from scratch, please perform the following.

1. You need to initialize the SVN server repository. To do this, use native Subversion 'svnadmin' tool which is included into subversion server installation. Please execute the following command: <msg:code>svnadmin create c:\svnstorage\</msg:code> specifying the valid path to the existing empty directory.
2. Launch SQL Manager and open the Database Registration Info 108 dialog for the database which you need to add to the SVN. Switch to the Change Management 126 tab and press the Repository Management Wizard 129 button.
3. Choose the **Create new repository** item and press 'Next'.
4. Choose the **Subversion** item and press 'Next'.
5. Specify the path to your Subversion server libraries in the **Subversion client libraries path** field (for example: "C:\Program Files\CollabNet Subversion Server\"). If you use the client part only (in case of using a remote SVN server) you need to specify the path to your installed client part (for example: "C:\Program Files\CollabNet Subversion Client\"). Check the ability to load the libraries by clicking the 'Test' button and press 'Next'.
6. Specify the path to your server repository in the **Server path** field as 'file:///c:/svnrepository/'; specify your working copy directory or any other empty directory where the working copy will be created automatically in the **Local path** field as 'c:\project\'; specify a name for your database repository in the **Repository name** field (for example: "mydb"); press 'Next' two times.
7. Press the 'Run' button to start the process.
8. After the process has finished, press the 'Close' button and then press the 'Yes' button in the popup dialog asking your to apply the settings.
9. Press 'OK' to apply the Version Control settings and close the Database Registration Info 108 dialog.

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15.5.3 Rollback to previous revision state

If you want to rollback a database to the state of a previous revision then you need to perform the following actions:

1. Right-click database in the DB Explorer 65 and select **Change management | Get Change Script** item from the popup menu or select the **Tools | Change Management | Get Change Script** in the main program menu 961. Get change script wizard 366 will appear.
2. On the second step 369 check **Generate differential script** in order to generate a script reflecting difference between two database states.
3. On the third step 370 specify a date or tag as a script end point so as to define a state to which you want to rollback your database and create a reverse script.
4. Execution of this script will rollback your database to the necessary point.

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15.5.4 View database changes

If you want to view committed database changes you can do it in one of the following ways:

- Using database history 407:
  1. Right-click database alias in the DB Explorer 65 and select **Change management | History** item from the popup menu or select the **Tools | Change Management | History** in the main program menu 961.
  2. Define the **Period** within the corresponding section. Changes made in this period will be displayed in the working area.
  3. At the top of the window you can find a table that displays information about changes made in the specified period. It displays transaction *ID*, *Date* when transaction was made, name of the *User* who made changes and *Comment* to a transaction if any. In the bottom part of the window you can view SQL statement of the selected action.
- Using tags and change script:
  1. Right-click database alias in the DB Explorer 65 and select **Change management | Get Change Script** item from the popup menu or select the **Tools | Change Management | Get Change Script** in the main program menu 961. The Get change script wizard 366 will appear.
  2. On the second step 369 check **Generate differential script** in order to generate a script reflecting difference between two database states.
  3. On the third step 370 you may either select tags 348 from the drop-down list to specify two database states to view changes between or pick up dates to define a period of changes.
  4. After that a generated change script will show you the differences between two database states.

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15.5.5 View procedure changes

If you have modified a procedure and want to view committed changes then you need to do the following:

1. Right-click this procedure in the DB Explorer 65.
2. Select **Change management | History** item from the popup menu. You will see a table of object changes history.
3. Select two procedure revisions you need to compare.
4. Right-click any of the objects to call the context menu and select the Compare Properties 410 or Compare DDL 411 item to view differences as table of properties or as object script respectively.
5. If you are comparing properties then in the window appeared you will see a table containing all procedure properties and its value in compared revisions. Properties with different values are highlighted with grey.
6. If you are comparing DDL then in the window appeared you will see DDL of procedures revisions. Extra lines in an early revision script are red, in latter revision - grey. Lines for pasting missing lines are yellow and different lines are blue.

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15.6 Create a simple report in report designer

To create a report using Report Designer[701]:

1. Select the **Tools |** **Report Designer** main menu item.
2. In the opened **Report Designer** select the **File |** **New Report** main menu item, or click the **New Report** item of the navigation bar. The following objects will be added to the newly created report: **ReportTitle**, **MasterData** and **PageFooter**.
3. Connect to data source[704].
4. Add ADOTable[704] or ADOQuery[704] object.
5. Link ADOTable[704] or ADOQuery[704] with ADODatabase[704].
6. Place database fields Page1. Move the required fields from Data Tree to **Band MasterData**.

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15.7 Transfer program settings

If you want to apply current program settings (wholly or partially) to SQL Manager for PostgreSQL installed on another machine you can save them into a single **.reg* file. This can be done by means of the Save Settings Wizard 945.

Note that 85 Favorite Queries 85 are not saved in this case. To get access to your queries from another machine please store 429 them in the database.

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15.8 Update SQL Manager

SQL Manager for PostgreSQL can be updated in the following ways:

1. Download the SQL Manager for PostgreSQL distribution package from the download page, then extract archive to the preferable directory (e.g. c:\unzipped). Close SQL Manager for PostgreSQL if it's opened and run *PgManagerFull.msi* or *PgManagerLite.msi*.
2. Select the **Help |** SQL Manager Direct 995, then press the **Update** button. If new SQL Manager for PostgreSQL version is released it will be offered for downloading. Click Yes in the dialog window to update SQL Manager for PostgreSQL automatically.

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15.9 Report bugs and suggestions

Before reporting bugs and suggestions make sure you are using the latest version of the SQL Manager for PostgreSQL. If so then you may contact us via Members Area on https://www.sqlmanager.net/, via **Help** main menu or by sending an email to support@sqlmanager.net. Please, don't forget to mention your OS version, PostgreSQL server version and program version. Describe the steps to reproduce the bug in detail and illustrate them with screenshots.

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