MySQL Migration Toolkit

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Abstract

This is the MySQL Migration Toolkit Manual.

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Chapter 1. MySQL Enterprise

A MySQL Enterprise subscription is the most comprehensive offering of MySQL database software, services and support; it ensures that your business achieves the highest levels of reliability, security, and uptime.

An Enterprise Subscription includes:

1. The MySQL Enterprise Server – the most reliable, secure, and up-to-date version of the world's most popular open source database
2. The MySQL Enterprise Monitor – An automated virtual DBA assistant that monitors all your MySQL Servers around-the-clock, identifies exceptions to MySQL best practices, and provides expert advice on fixing any problems discovered
3. MySQL Production Support – Technical and consultative support when you need it, along with regularly scheduled service packs, hot-fixes, and more

For more information, visit http://www.mysql.com/enterprise.

Chapter 2. Introduction to the MySQL Migration Toolkit

The MySQL Migration Toolkit is a graphical tool provided by MySQL AB for migrating schema and data from various relational database systems to MySQL.

MySQL Migration Toolkit is designed to work with MySQL versions 5.0 and higher.

If you find that MySQL Migration Toolkit lacks some feature important to you, or if you discover a bug, please use our MySQL Bug System to request features or report problems.

At the moment, MySQL Migration Toolkit is only available for Windows.

Chapter 3. Installation

3.1. Introduction

MySQL GUI Tools run on Windows, Linux, and Mac OS X. You can find MySQL GUI Tools for the operating system of your choice on the MySQL GUI Tools Downloads page.

The MySQL Migration Toolkit requires the Java Runtime Environment (JRE). The minimum version supported is 5.0 update 8.

3.2. Installing Under Windows

MySQL GUI Tools run on recent 32-bit Windows NT based operating systems, including Windows 2000, XP, Vista, and 2003. They don't run on Windows NT 4 and below.

3.2.1. Using the Windows Installer

MySQL GUI Tools can be installed on all Windows operating systems using the Windows Installer (`.msi`) installation package. The MSI package is contained within a ZIP archive named `mysql-gui-tools-`*`version`*`-win32.msi`, where *`version`* indicates the MySQL GUI Tools version.

The Microsoft Windows Installer Engine was updated with the release of Windows XP; those using a previous version of Windows can reference this Microsoft Knowledge Base article for information on upgrading to the latest version of the Windows Installer Engine.

In addition, Microsoft has recently introduced the WiX (Windows Installer XML) toolkit. This is the first highly acknowledged Open Source project from Microsoft. We have switched to WiX because it is an Open Source project and it allows us to handle the complete Windows installation process in a flexible manner using scripts.

Improving the MySQL Installation Wizard depends on the support and feedback of users like you. If you find that the MySQL Installation Wizard is lacking some feature important to you, or if you discover a bug, please report it in our bugs database using the instructions given in How to Report Bugs or Problems.

To install MySQL GUI Tools, right click on the MSI file and select INSTALL.

> **Note**
>
> Installing MySQL GUI Tools on Windows Vista requires administrative privileges.

At the `Setup Type` window you may choose a `complete` or `custom` installation. If you do not wish to install all of the MySQL GUI Tools choose the custom option. Custom installation also gives you the option of installing support for languages other than English. MySQL GUI Tools supports, German, Greek, Japanese, Polish, and Brazilian Portuguese.

Unless you choose otherwise, MySQL GUI Tools are installed in `C:\`*`%PROGRAMFILES%`*`\MySQL\MySQL Tools for `*`version`*`\`, where *`%PROGRAMFILES%`* is the default directory for programs on your machine and `version` is the version number of MySQL GUI Tools. The `%PROGRAMFILES%`directory might be `C:\Program Files` or `C:\programme`.

> **Note**
>
> Installing MySQL GUI Tools using the Windows installer automatically creates entries in the `Start` menu.
>
> MySQL Workbench is not included in the bundled MySQL GUI Tools download so must be installed separately. To do this, find the link to MySQL Workbench on http://dev.mysql.com/downloads/. After downloading install this file as described in Section 3.2, “Installing Under Windows”.

3.2.2. Installing From the ZIP File

If you are having problems running the installer, as an alternative, you can download a ZIP file without an installer. That file is called `mysql-gui-tools-noinstall-`*`version`*`-win32.zip`. Using a ZIP program, unpack it to the directory of your choice. You may also want to create shortcuts to `MySQLAdministrator.exe`, `MySQLMigrationTool.exe`, and `MySQLQueryBrowser.exe` for your desktop or the quick launch bar.

3.3. Installing Under Linux

MySQL GUI Tools runs on Linux machines that have a graphical desktop installed. It is designed to run under the Gnome desktop with GTK2 and has been tested on Linux kernel versions 2.4 and 2.6. It should also run on other versions, and even on a number of Unix-like operating systems.

> **Note**
>
> Currently, the MySQL Migration Toolkit is not available for Linux.

3.3.1. Installing the Generic Tarball

The generic tar archive allows you to install MySQL GUI Tools on most Linux distributions. The tarball file is called `mysql-gui-tools-version.tar.gz`, where *`version`* indicates the MySQL GUI Tools version (for example, 5.0r3).

To see all files in the tarball, run this command:

```
shell> tar -tzf  mysql-gui-tools-version.tar.gz
```

To install MySQL GUI Tools, run this command:

```
shell> tar --directory=/opt -xzvf mysql-gui-tools-version.tar.gz
```

This installs the various application binaries in the directory, `/opt/mysql-gui-tools-version`.

If you install MySQL GUI Tools to the `opt` directory, icons for use with desktop shortcuts or for creating menu items are found under the `opt/mysql-gui-tools-version/share/mysql-gui` directory.

If you install MySQL GUI Tools to a directory other than the `/opt` directory, you will need to update the installation directory. This done by using the `--update-paths` option the first time that you run any one of the MySQL GUI Tools. For example, when running Query Browser for the first time, navigate to the installation directory and enter the following command:

```
shell> ./mysql-query-browser --update-paths
```

You need only run one MySQL GUI Tools application with the `--update-path` option. This updates the path for all MySQL GUI Tools.

If you do not use the default installation directory and create a Desktop shortcut using the `.desktop` files found under the `mysql-gui-tools-5.0` directory you must edit the properties of any shortcut you create. Enter the correct path for the application on your system.

3.3.2. RPM Installation

In addition to a generic tarball, some distribution-specific RPMs are available. Currently these include Red Hat Enterprise Linux (RHEL) 3 and 4, Fedora Core 5 (FC5), and SuSE Linux 10.x. For FC5 and SuSE the `gtkmm24` toolkit is a requirement for installing the RPM version of MySQL GUI Tools. You may also need to install the widget for displaying HTML pages. On FC5 you may install these RPMs from the command line in the following way:

```
shell> yum install gtkmm24 gtkhtml2
```

For installation on SuSE Linux:

```
shell> yast2 -i gtkmm24 gtkhtml2
```

> **Note**
>
> You may need root privileges to run the `yast2` command.

The Red Hat RPMs are self contained so no additional packages need to be installed.

The RPM downloads are made up of the individual GUI Tools components combined into a single TAR archive. Extract the individual RPMs in the following way:

```
shell> tar -zxf mysql-gui-tools-version.tar.gz
```

```
```

This will decompress the RPM files to the current directory.

Install all the RPM files by typing:

```
shell> rpm -ivh mysql-*.rpm
```

If you are upgrading to a newer version of MySQL GUI Tools see Section 5.2.2, “RPM Upgrade”.

If you install the RPM files individually, you must install the `mysql-gui-tools-version.rpm` file first in order to satisfy dependencies.

If you wish, you may install only one of the MySQL GUI Tools. For example, to install MySQL Administrator only, do the following:

```
shell> rpm -ivh mysql-gui-toolsversion.rpm mysql-administratorversion.rpm
```

If possible, the RPM installation process creates shortcuts in the start menu of your window manager. For example, SuSE Linux with the KDE window manager adds shortcuts to the MySQL GUI Tools under the DEVELOPMENT, OTHER TOOLS menu item. Likewise, with FC5, shortcuts are created under the DEVELOPMENT menu item.

Icons for use with desktop shortcuts or for creating menu items are found under the `/usr/share/mysql-gui` directory.

See the MySQL GUI Tools Downloads page for the most up-to-date listing of the various RPM packages available.

3.4. Installing Under Mac OS X

To install MySQL GUI Tools under Mac OS X, double-click the downloaded `.dmg` file and wait for it to be opened and attached. Once a window containing the MySQL GUI Tools icon pops up, drag it to your Applications folder — or any other location you prefer.

Once the copy is complete, you may eject the disk image.

The minimum supported version is Mac OS X 10.4.

> **Note**
>
> Currently, the MySQL Migration Toolkit is not available for Mac OS X.

Chapter 4. Removing MySQL GUI Tools

Under Linux and Mac OS X it is easy to remove all the MySQL GUI Tools or individual applications. Under Windows, removing individual applications is a bit more problematic.

4.1. Uninstall – Windows

To uninstall MySQL GUI Tools, open the `Control Panel` and Choose `Add or Remove Programs`. Find the `MySQL Tools` entry and choose the REMOVE button. Choosing this option will remove all of the GUI Tools.

> **Note**
>
> Currently, there is no command-line option for removing MySQL GUI Tools.

After you have removed MySQL GUI Tools you may remove the `MySQL Tools for version` directory. Unless you chose otherwise on installation, you should find this directory below the `C:\%PROGRAMFILES%\MySQL\` directory.

You may remove individual applications manually. Go to the `C:\%PROGRAMFILES%\MySQL\` directory and delete the `exe` and `chm` files associated with the application you wish to remove. Also remove the appropriate icon from the `Start` menu.

> **Note**
>
> Removing an application manually will not remove all the files belonging to that application.

4.2. Uninstall – Linux

Unless you chose otherwise, you should find MySQL GUI Tools in the `/opt/mysql-gui-tools-version` directory.

If you installed MySQL GUI Tools using the RPM files you can remove all the tools by typing at the command line:

```
shell> rpm -e mysql-*.rpm
```

You may remove individual tools by using the `e` option with the name of the specific tool you wish to remove. For instance, to remove only the Administrator tool type:

```
shell> rpm -e mysql-administrator-version.rpm
```

> **Note**
>
> Remember, if you plan to keep any one of the MySQL GUI Tools you must also keep the `mysql-gui-tools-version.rpm` file.

After removal of all the MySQL GUI Tools, remove the `/opt/mysql-gui-tools-version` directory. if you have removed only selected tools, remove only the associated directories.

If you installed MySQL GUI Tools using the generic tarball, you can remove the tools by deleting the `/opt/mysql-gui-tools-version` directory. If you wish to remove an individual tool, find the directory associated with that tool and delete it.

4.3. Uninstall – Mac OS X

Find the directory where you installed MySQL GUI Tools, and remove applications by moving their icons to the `Trash`.

Chapter 5. Upgrading MySQL GUI Tools

5.1. Upgrading – Windows

If you are upgrading using the installer file follow the instructions given in Section 3.2, “Installing Under Windows”. There are is no need to remove your current installation.

If you are not using the installer file remove the current MySQL GUI Tools directory, and extract and install the new version as described in Section 3.2, “Installing Under Windows”.

MySQL Workbench is not included in the bundled MySQL GUI Tools download so must be installed separately. To do this, find the link to MySQL Workbench at http://dev.mysql.com/downloads/. After downloading, install this file as described in Section 3.2, “Installing Under Windows”.

5.2. Upgrading – Linux

5.2.1. Tarball Upgrade

If you are upgrading using the generic tarball file, remove the current MySQL GUI Tools directory, and extract and install the new tarball as described in Section 3.3.1, “Installing the Generic Tarball”.

5.2.2. RPM Upgrade

If you installed the MySQL GUI Tools using RPM files you can upgrade by navigating to the directory that contains the RPM files and typing at the command line:

```
shell> rpm -Uvh mysql-*.rpm
```

You may upgrade individual tools by using the `U` with the name of the specific tool you wish to upgrade. You will also need to upgrade the `mysql-gui-tools-version.rpm` file. For instance, to upgrade only the Administrator tool type:

```
shell> rpm -Uvh mysql-administrator-version.rpm mysql-gui-tools-version.rpm
```

> **Note**
>
> The `mysql-gui-tools-version.rpm` file is used by all MySQL GUI Tools. You must always upgrade this file.

When upgrading, packages cannot be installed separately because version conflicts will arise.

If your previous installation of MySQL GUI Tools included Workbench, (this tool has been removed from the GUI Tools package) you may encounter the following error when upgrading:

```
error: Failed dependencies:
mysql-gui-tools = old-version is needed by (installed)
mysql-workbench-version
```

To continue with the upgrade you must remove the Workbench RPM file. To determine the name of the Workbench RPM file issue the following command:

```
shell> rpm -qa  | grep workbench
```

Remove Workbench by issuing the command:

```
shell> rpm -e mysql-workbench-version
```

You should now be able to upgrade MySQL GUI Tools as described above.

If you do not wish to remove Workbench, perform an RPM installation rather than an upgrade. For instructions on doing this see Section 3.3.2, “RPM Installation”.

5.3. Upgrading – Mac OS X

Find the directory where you installed MySQL GUI Tools, and remove the applications by moving their icons to the `Trash`.

Install the upgrade as described in Section 3.4, “Installing Under Mac OS X”.

Chapter 6. Running MySQL GUI Tools

How you start any one of the MySQL GUI Tools depends on the operating system you are using.

6.1. Running Under Windows

Under Windows, the names of the executable files in the MySQL GUI Tools suite are:

- `MySQLAdministrator.exe`
- `MySQLQueryBrowser.exe`
- `MySQLMigrationTool.exe`

Start any one of the MySQL GUI Tools by double clicking its desktop icon, or by selecting it from the `Start` menu. Alternatively, you can open a DOS window and start it from the command line. For example, you could run the MySQL Administrator in the following way:

```
C:\> "C:\%PROGRAMFILES%\MySQL\MySQL Tools for version\MySQLAdministrator.exe"
```

`%PROGRAMFILES%` is the default directory for programs on your machine, for example `C:\Program Files` or `C:\programme`. If your path contains spaces, you must enclose the command within quotation marks as shown above.

6.2. Running Under Linux

Under Linux, the names of the executable files in the MySQL GUI Tools suite are:

- `mysql-administrator`
- `mysql-query-browser`

> **Note**
>
> There is no Linux version of MySQL Migration Toolkit.

If you installed MySQL GUI Tools to the `/opt` directory using the tar archive file, change into the `/opt/mysql-gui-tools-`*`version`* directory to run any one of the MySQL GUI Tools.

To run MySQL Administrator you would type:

```
shell> ./mysql-administrator
```

However, adding `/opt/mysql-gui-tools-`*`version`* to the `PATH` variable makes it much simpler to run MySQL GUI Tools — you need not worry about your present working directory.

When installed from RPM files, the MySQL GUI Tools are found in the `/usr/bin` directory. This directory is usually included in the `PATH` variable, so running any one of the MySQL GUI Tools simply requires typing the executable file name, regardless of your current directory. For example:

```
shell> mysql-administrator
```

For those distributions that create menu items, you may also, of course, start any one of the tools by choosing the menu item.

6.3. Running On Mac OS X

On Mac OS X, navigate to the MySQL GUI Tools installation directory and double-click on the application you wish to start.

Note

There is no Mac OS X version of MySQL Migration Toolkit.

Chapter 7. Features of the MySQL Migration Toolkit

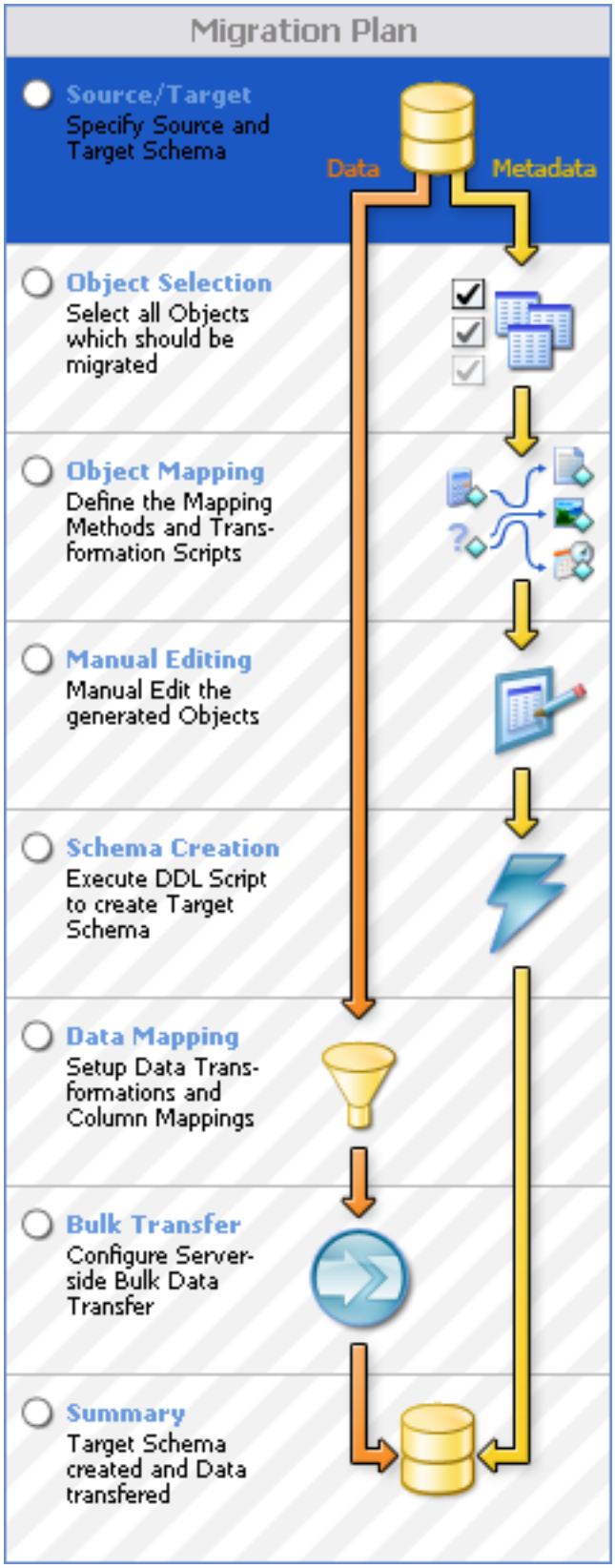
The following are some of the key features of the MySQL Migration Toolkit:

- The MySQL Migration Toolkit supports a variety of source database systems, including the following:
  - Oracle
  - Microsoft SQL Server
  - Microsoft Access
  - Sybase
  - MySQL
- The MySQL Migration Toolkit is fully customizable through its Java runtime interface. Advanced users can use Java to perform custom data and schema transformations.
- The MySQL Migration Toolkit supports agent-based data migrations, with the MySQL Migration Toolkit residing on a separate machine than the source and target database servers, through the use of a special migration agent. The agent-based data migration improves migration performance by allowing data to be transferred directly from the source machine to the target machine without being routed through the MySQL Migration Toolkit.

Chapter 8. An Overview of the Migration Process

Migrating data from an external RDBMS to MySQL is an eight step process :

Figure 8.1. The MySQL Migration Toolkit Migration Plan


Migration Plan
Source/Target
Specify Source and Target Schema
Data
Metadata
Object Selection
Select all Objects which should be migrated
Object Mapping
Define the Mapping Methods and Trans-formation Scripts
Manual Editing
Manual Edit the generated Objects
Schema Creation
Execute DDL Script to create Target Schema
Data Mapping
Setup Data Trans-formations and Column Mappings
Bulk Transfer
Configure Server-side Bulk Data Transfer
Summary
Target Schema created and Data transfered

- `Source/Target Selection`: In the first step you specify the connection parameters for the source and target database servers.
- `Object Selection`: In the second step you select the objects (tables, views, stored procedures) that will be migrated.
- `Object Mapping`: In the third step you choose the method used for mapping and transforming the objects.
- `Manual Editing`: In the fourth step you can manually edit the new objects to ensure a proper transformation.
- `Schema Creation`: In the fifth step the MySQL Migration Toolkit creates the transformed object on the target MySQL server.
- `Data Mapping`: In the sixth step you specify any changes that need to be made to the data as it is migrated.
- `Bulk Transfer`: In the seventh step the MySQL Migration Toolkit transfers the data from the source server to the target server.
- `Summary`: In the eighth and final step the MySQL Migration Toolkit creates a summary report of the migration process for you to review.

Each of these sections will be covered in more detail in the coming chapters.

Chapter 9. The Migration Process In-Depth

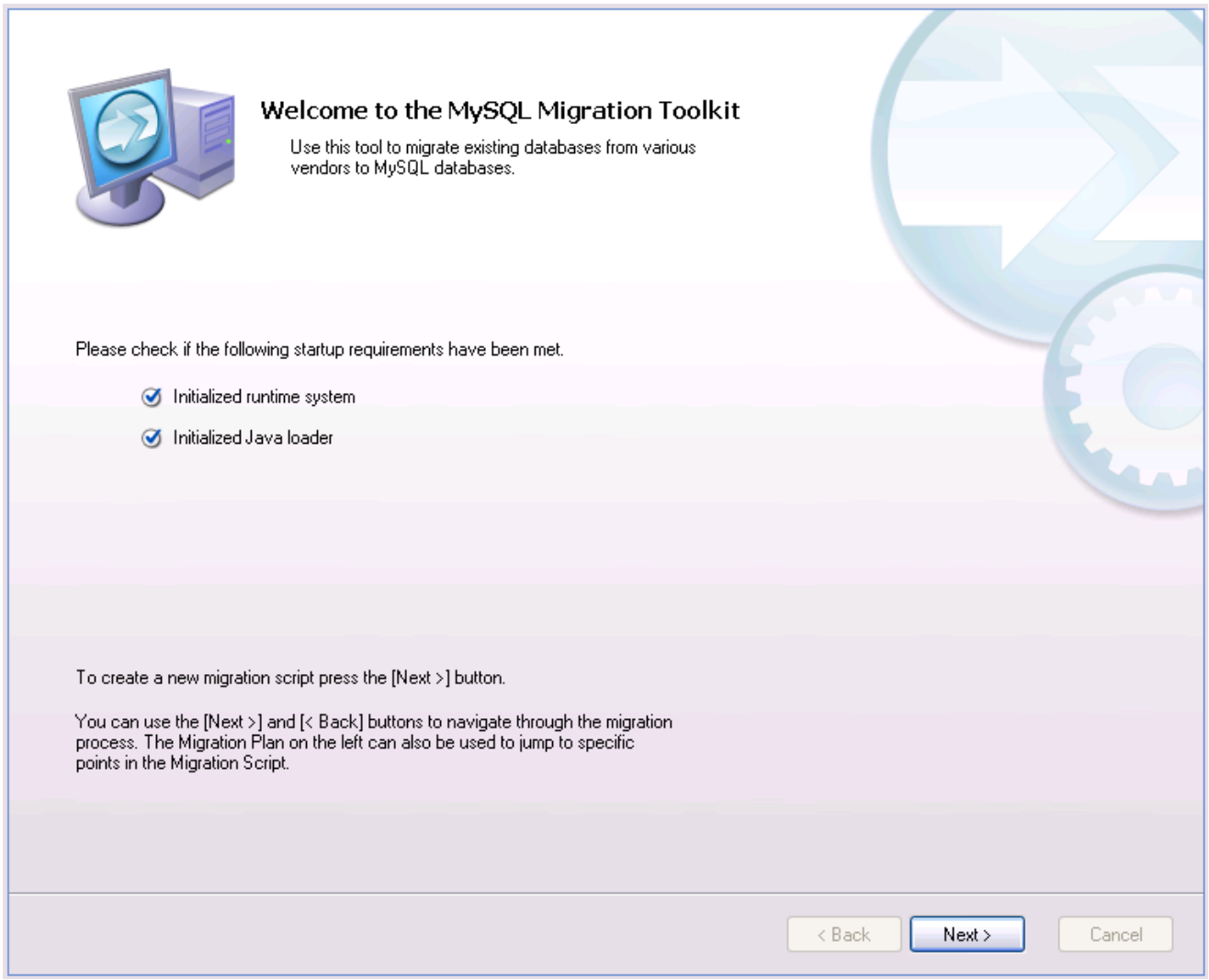
9.1. Introduction

In this chapter we will cover the different steps of the MySQL Migration Toolkit in depth. The different steps will be covered in the order that they appear in the MySQL Migration Toolkit.

9.2. The Welcome Screen

The first screen of the MySQL Migration Toolkit is the Welcome Screen:

Figure 9.1. The MySQL Migration Toolkit welcome screen

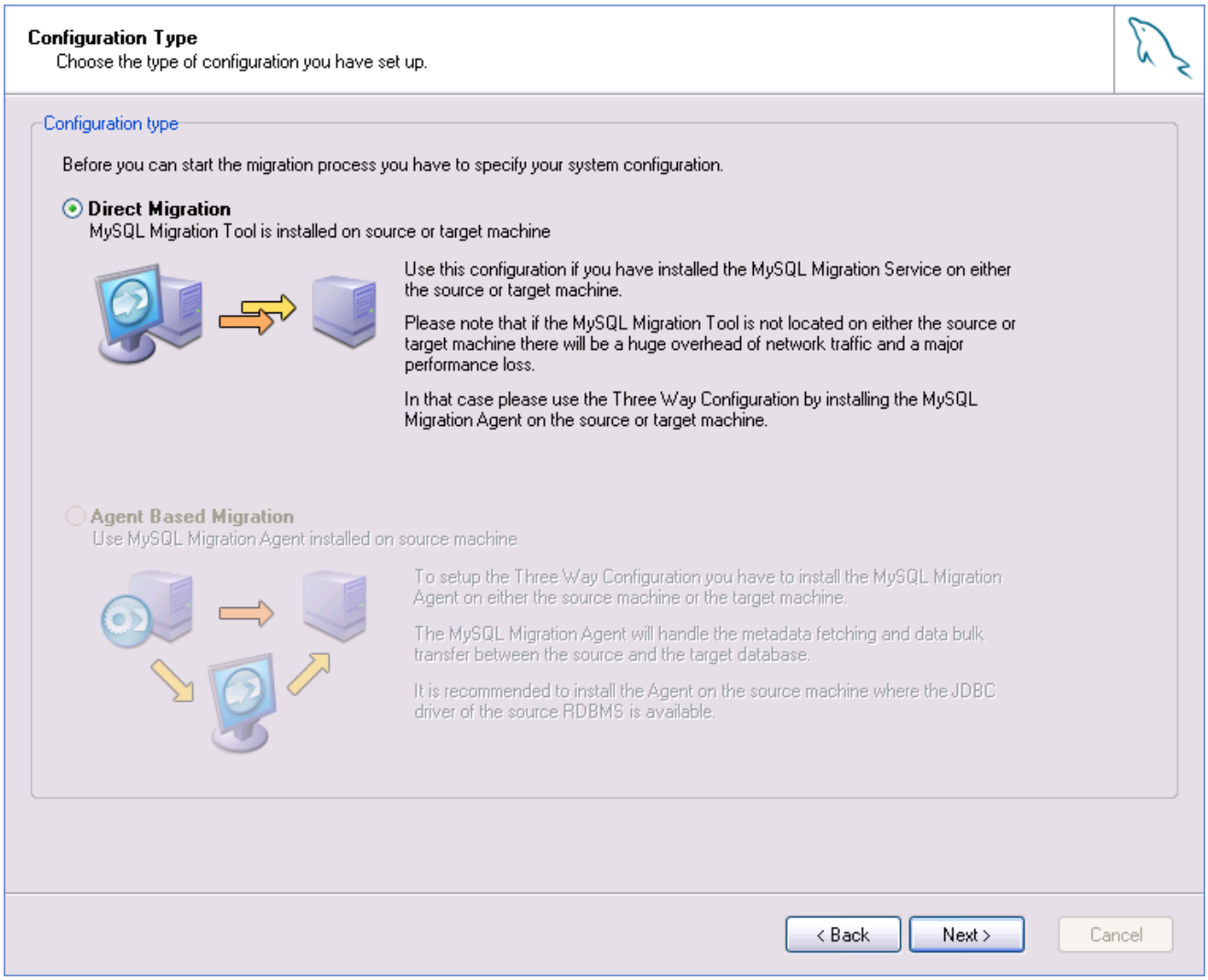


The welcome screen indicates the progress of loading the various components of the MySQL Migration Toolkit. If you encounter any errors on the welcome screen you should close the MySQL Migration Toolkit and confirm that you have properly installed the Java Runtime Environment. See Chapter 2, *Introduction to the MySQL Migration Toolkit* for information on downloading and installing the Java Runtime Environment.

9.3. The Configuration Type Screen

The Configuration Type screen allows you to choose between a Direct Migration and a Agent-Based Migration:

Figure 9.2. The Configuration Type screen



Use the `Direct Migration` if the MySQL Migration Toolkit is installed on either the source or target machine. The Direct Migration should not be used when the MySQL Migration Toolkit is not located on either the source or target machine, as it will create a large amount of network traffic and will result in decreased performance.

Use the `Agent-Based Migration` when migrating between two server machines that do not support the use of the MySQL Migration Toolkit. The MySQL Migration agent should be installed on the source machine before using the Agent-Based Migration.

9.4. The Source Database Screen

Use the Source Database screen to select the source RDBMS used in the migration and to specify the connection parameters.

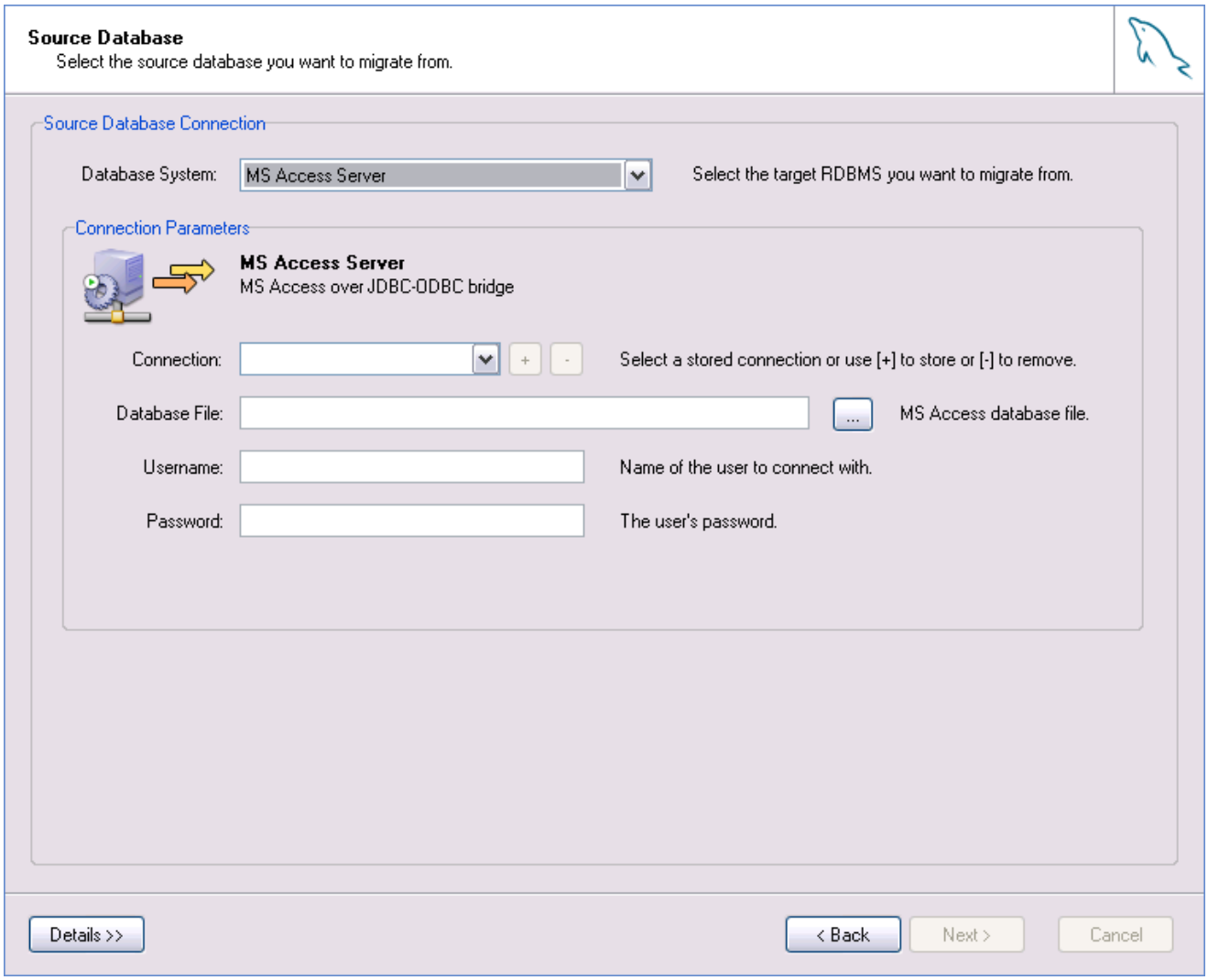
The Source Database screen's appearance will vary depending on the type of source database selected.

All Data Source screens will feature a DETAILS button that can be used to expose the **ADVANCED SETTINGS** panel. The Advanced Settings panel can be used to manually specify a JDBC driver and JDBC connection string for your migration session.

9.4.1. Microsoft Access

The Source Database screen appears as follows when you select Microsoft Access as the source database:

Figure 9.3. Source database – Microsoft Access



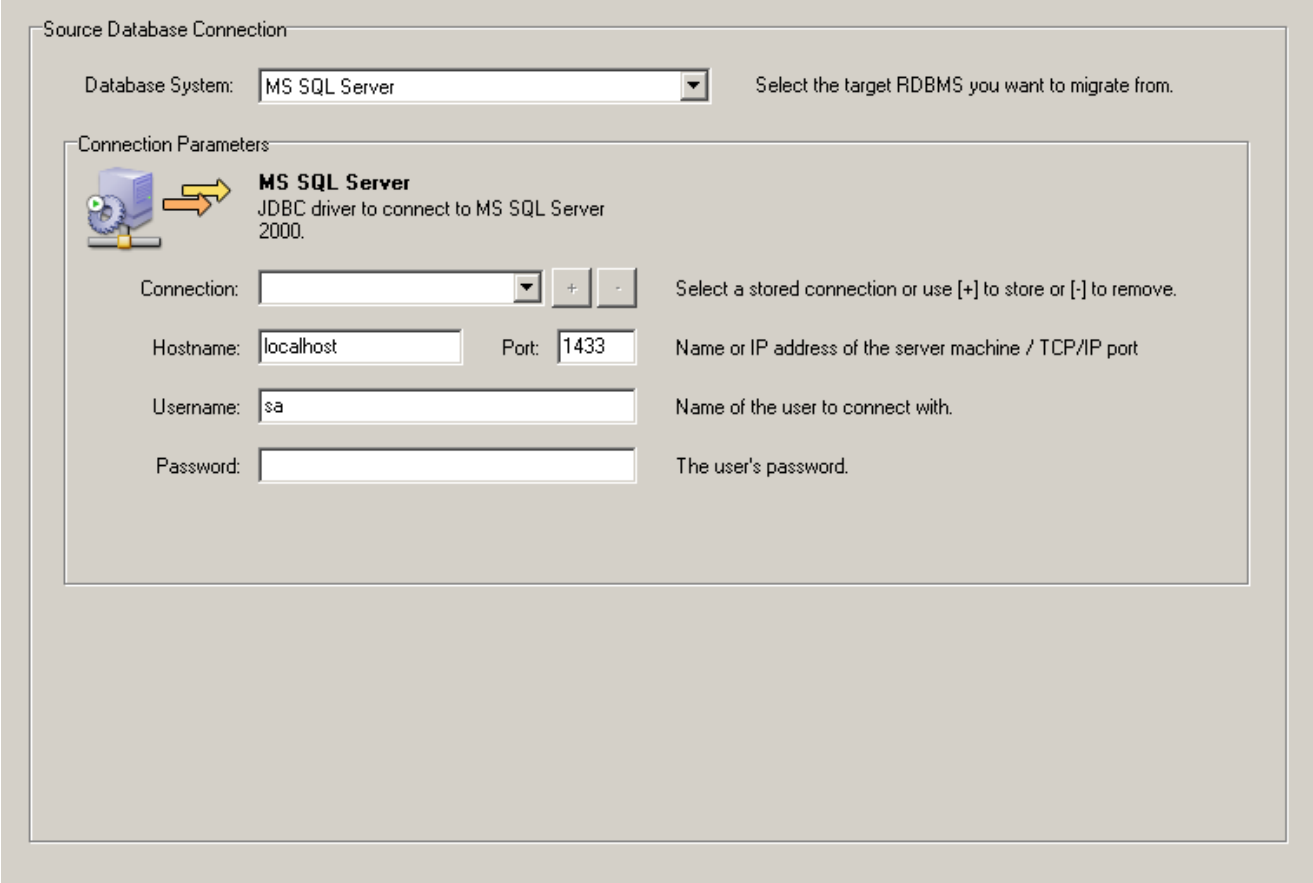
Specify the path to the `.mdb` database file in the `Database File` field and specify the database user name and password information if applicable.

You must make special modifications to your Access database file before it can be used with MySQL Migration Toolkit. Please see Chapter 13, *Preparing a Microsoft Access Database for Migration* for further information.

9.4.2. Microsoft SQL Server

The Source Database screen appears as follows when you select `MS SQL Server` as the source database:

Figure 9.4. Source database – Microsoft SQL Server

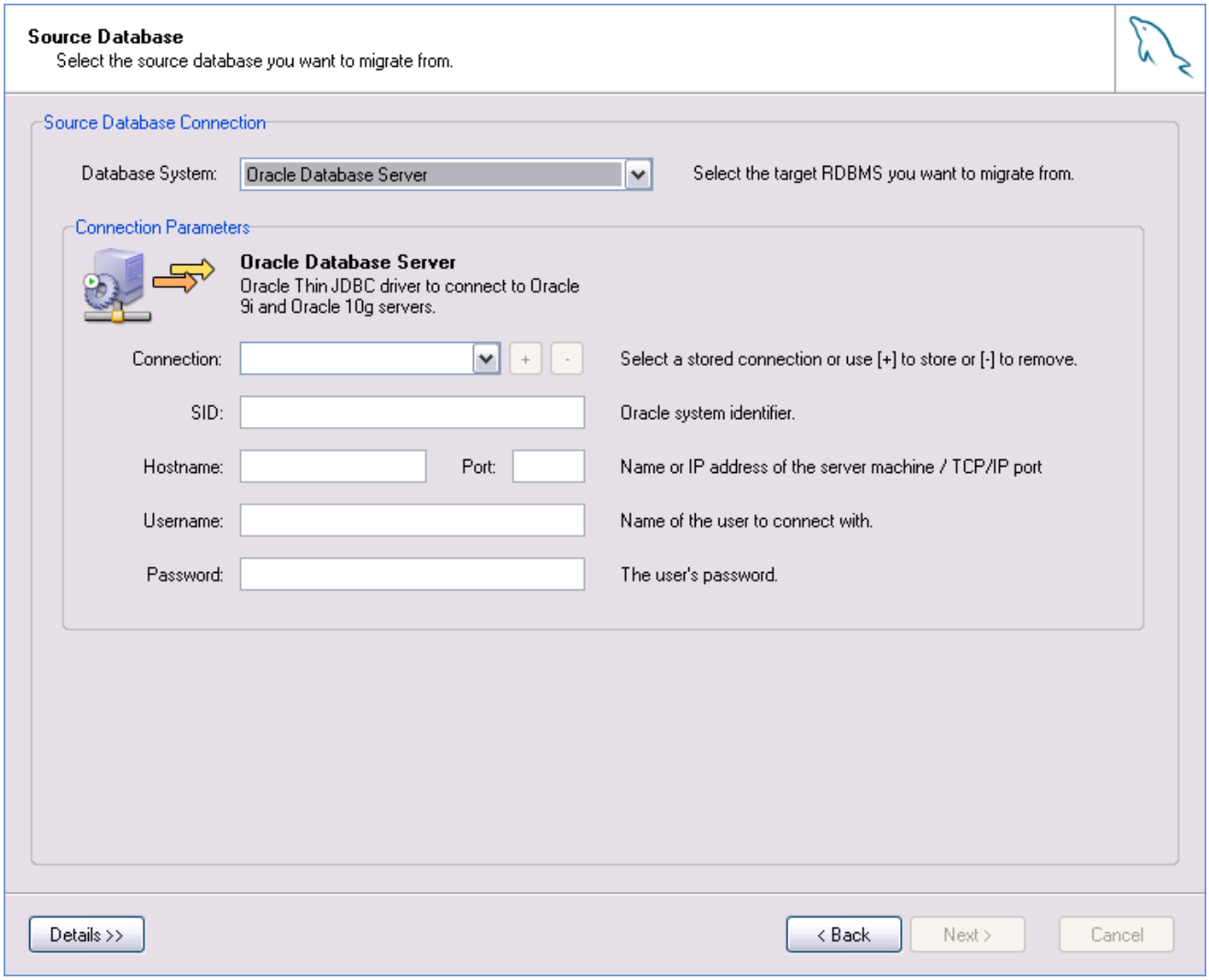


Specify the host name, user name, and password to connect to the source Microsoft SQL Server to connect and click NEXT.

9.4.3. Oracle

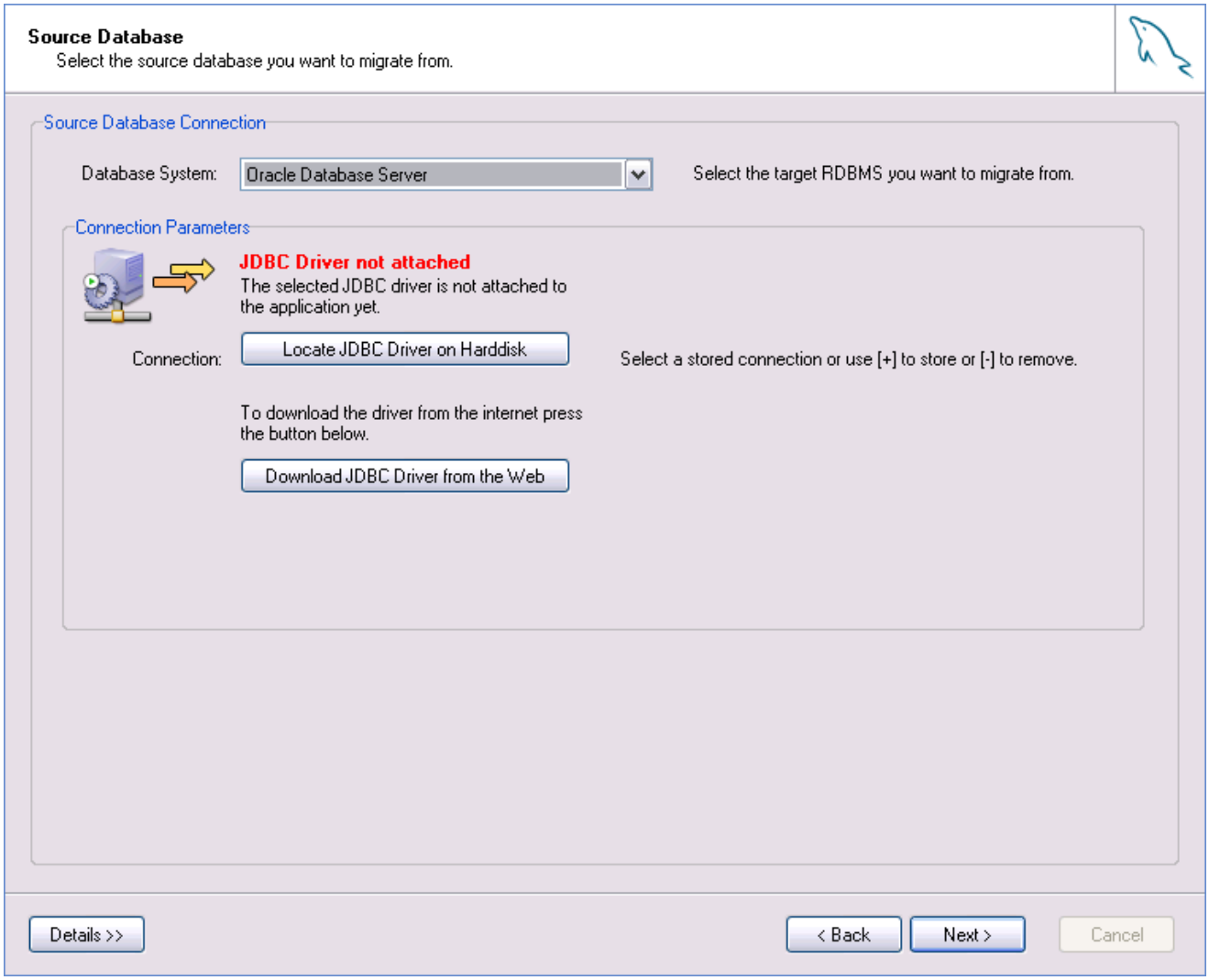
The Source Database screen appears as follows when you select Oracle as the source database:

Figure 9.5. Source database – Oracle



If you encounter the following database selection screen, it means that you do not have the appropriate JDBC driver for Oracle installed:

Figure 9.6. Oracle JDBC driver not attached



If the Oracle JDBC driver is present on your system, click the LOCATE JDBC DRIVER ON HARDDISK button to attach the driver.

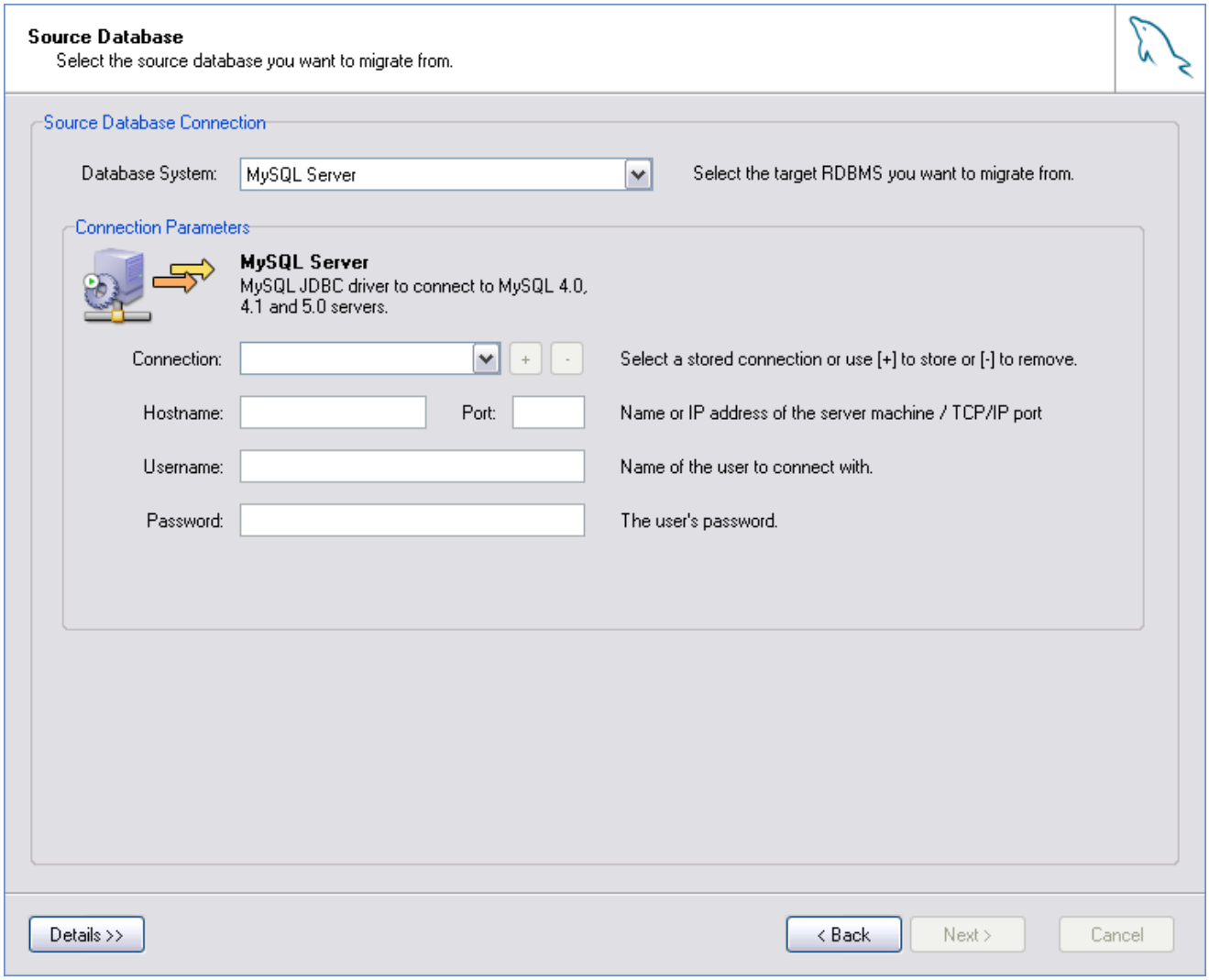
If the Oracle JDBC driver is not present on your system, click the DOWNLOAD JDBC DRIVER FROM THE WEB button to download it. Download the `ojdbc14.jar` file and then attach it by clicking on the LOCATE JDBC DRIVER ON HARDDISK button.

After attaching the Oracle JDBC driver you need to restart the MySQL Migration Toolkit.

9.4.4. MySQL

The Source Database screen appears as follows when you select MySQL as the source database:

Figure 9.7. Source database – MySQL



9.4.5. Saving Connection Information

After entering the connection information for the source database, click the + button to save the connection information.

When prompted, enter a name for the connection information and click the OK button to save the connection information for later re-use.

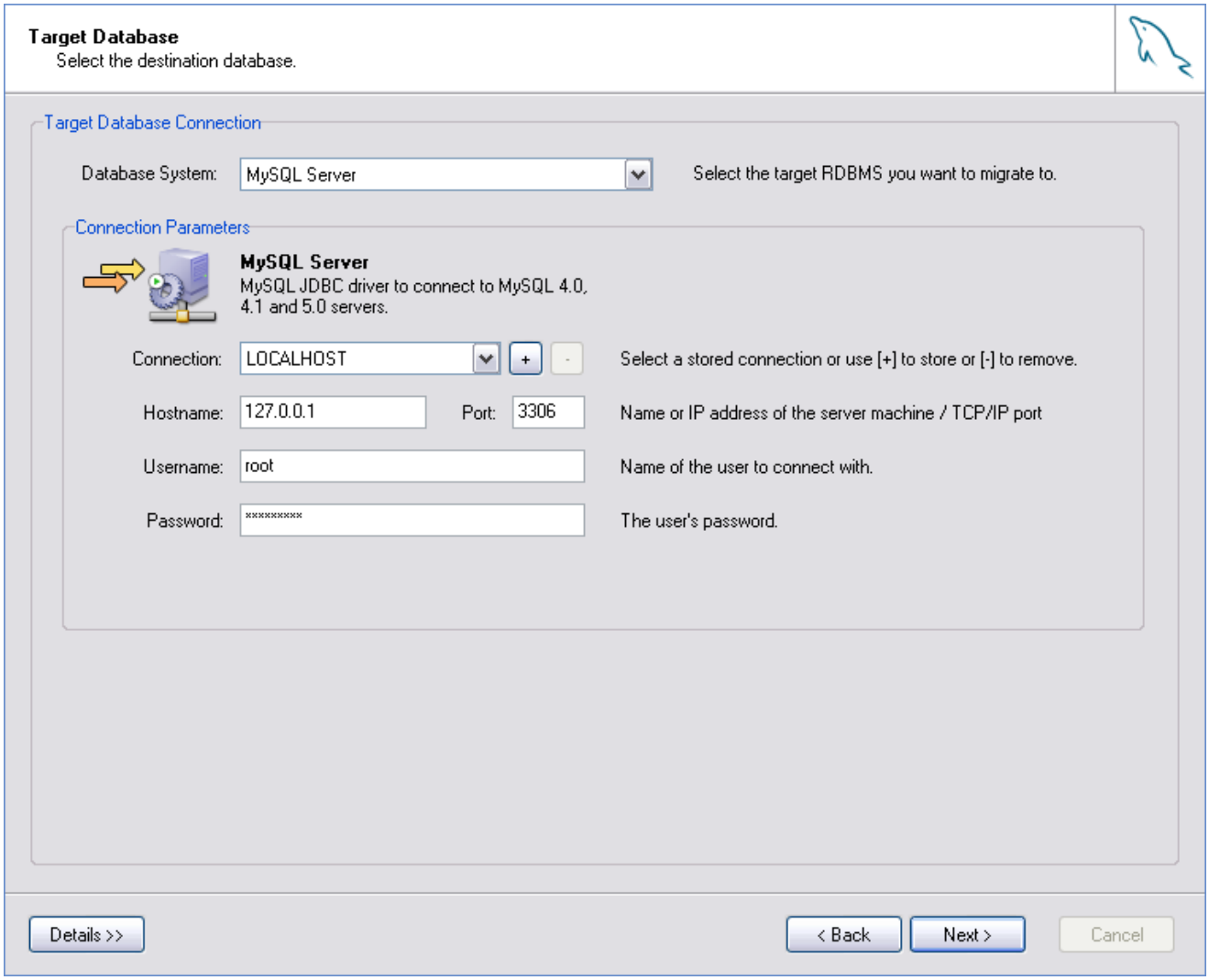
You can discard saved connection information by selecting the saved connection from the **CONNECTION** drop-down list and clicking the – button.

9.5. The Target Database Screen

Use the Target Database screen to select the target RDBMS used in the migration and to specify the connection parameters.

The target Database screen uses an interface that is identical to that of the Source Database screen:

Figure 9.8. Target Database – MySQL

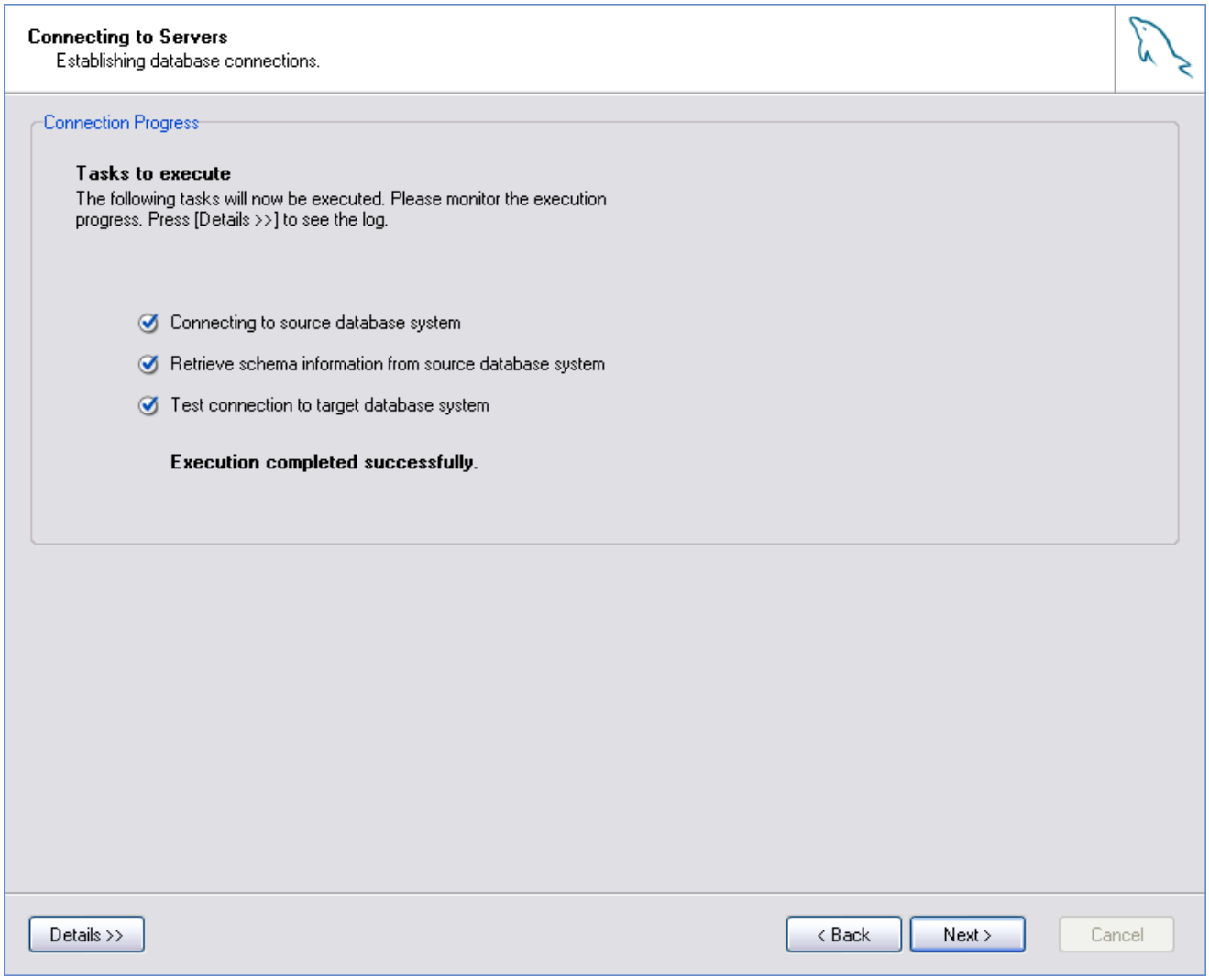


Target database support for the MySQL Migration Toolkit is currently limited to MySQL 4.1 and MySQL 5.0.

9.6. The Connect to Server Screen

After you specify your source and target database servers, the MySQL Migration Toolkit will connect to each server and retrieve the schema information from the source server:

Figure 9.9. The Connect to Servers screen



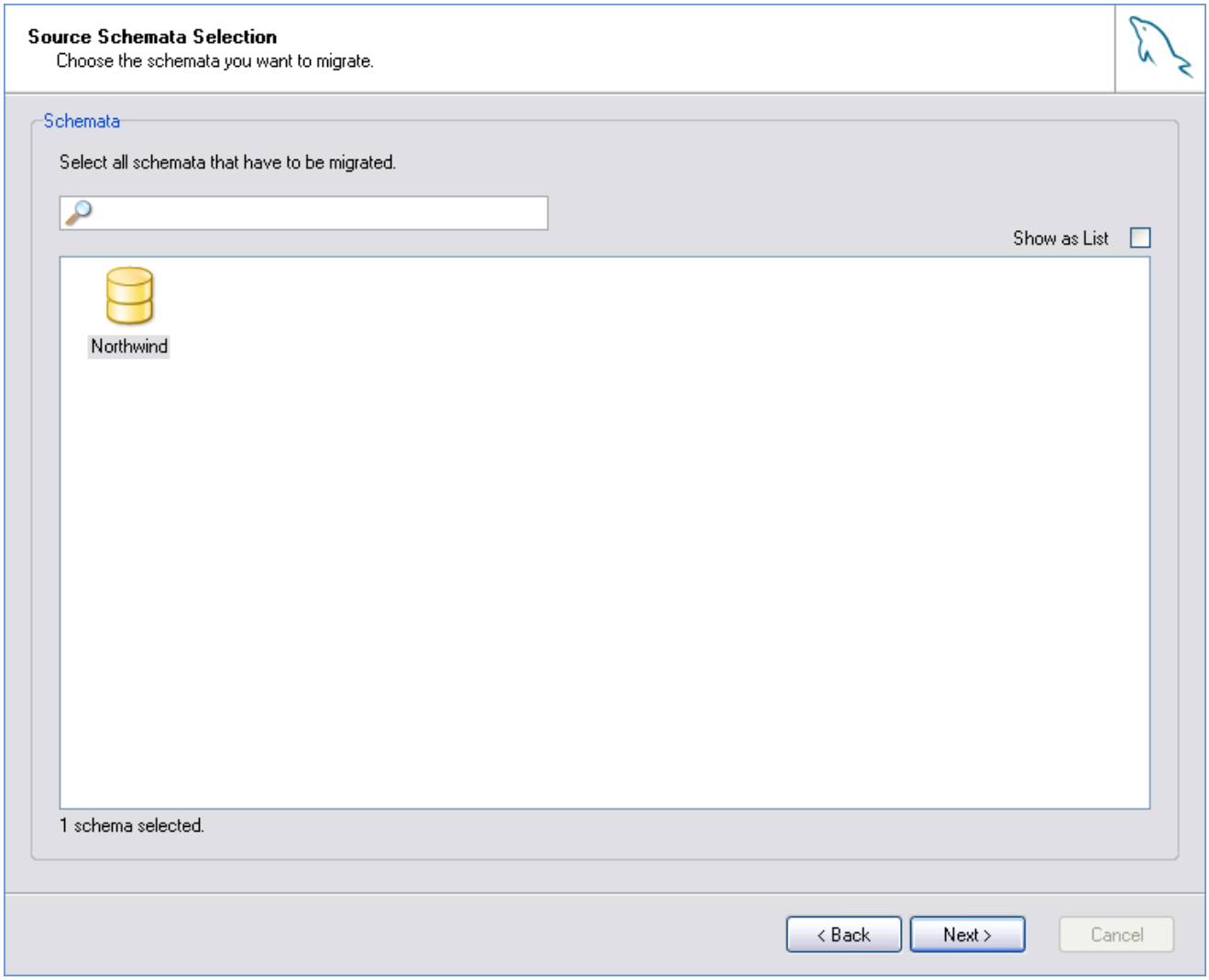
Click the DETAILS button to see a more detailed log of the connection process.

9.7. The Source Schema Selection Screen

Use the Source Schema Selection screen to choose which databases from the source server you would like to migrate.

If there are a large number of databases to choose from, you can search for a specific database by entering the database name in the `schemata` textbox as shown in the following image.

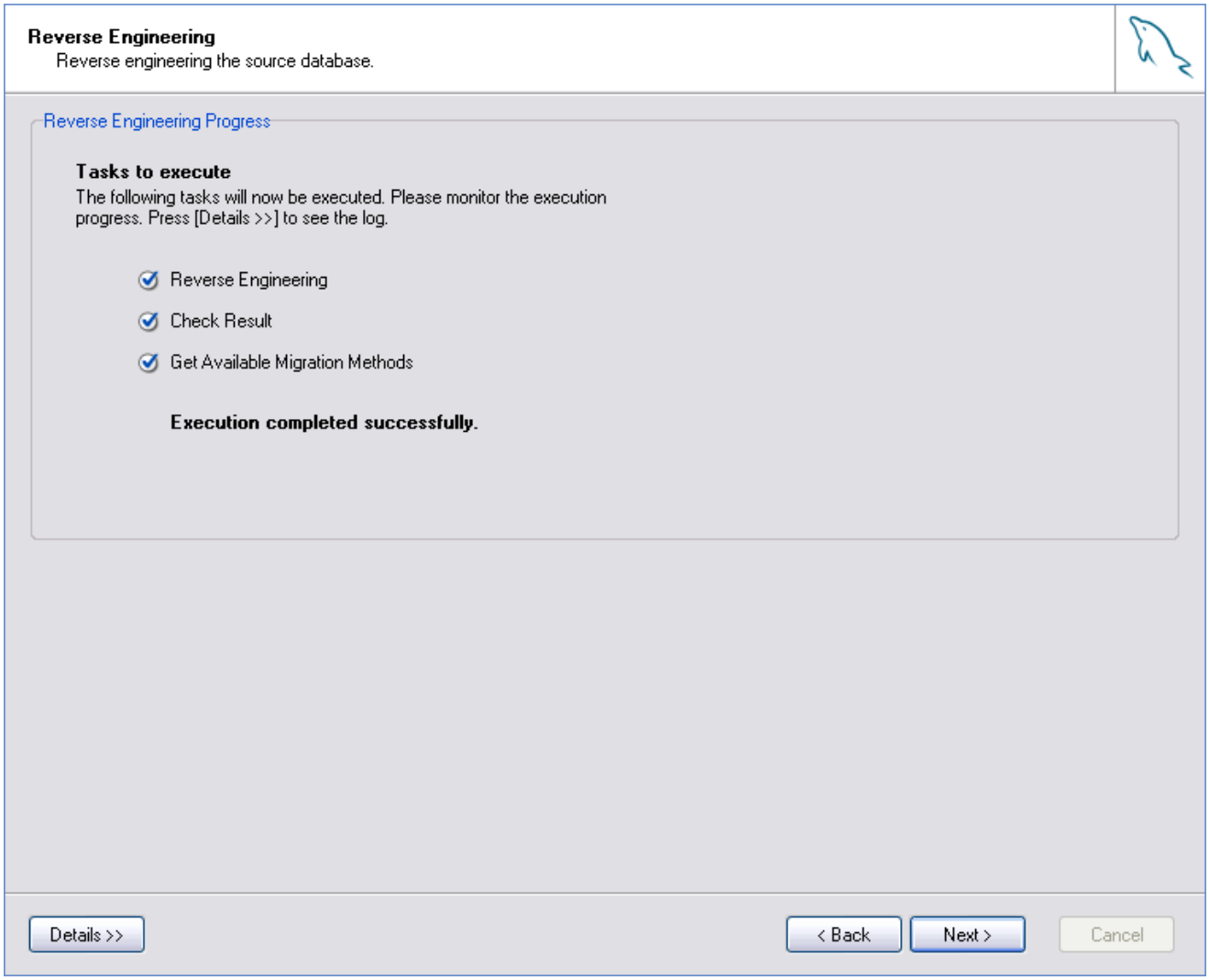
Figure 9.10. The Source Schema Selection screen



9.8. The Reverse Engineering Screen

Once you select the databases you wish to migrate, the MySQL Migration Toolkit begins the process of reverse engineering the source database:

Figure 9.11. The Reverse Engineering screen



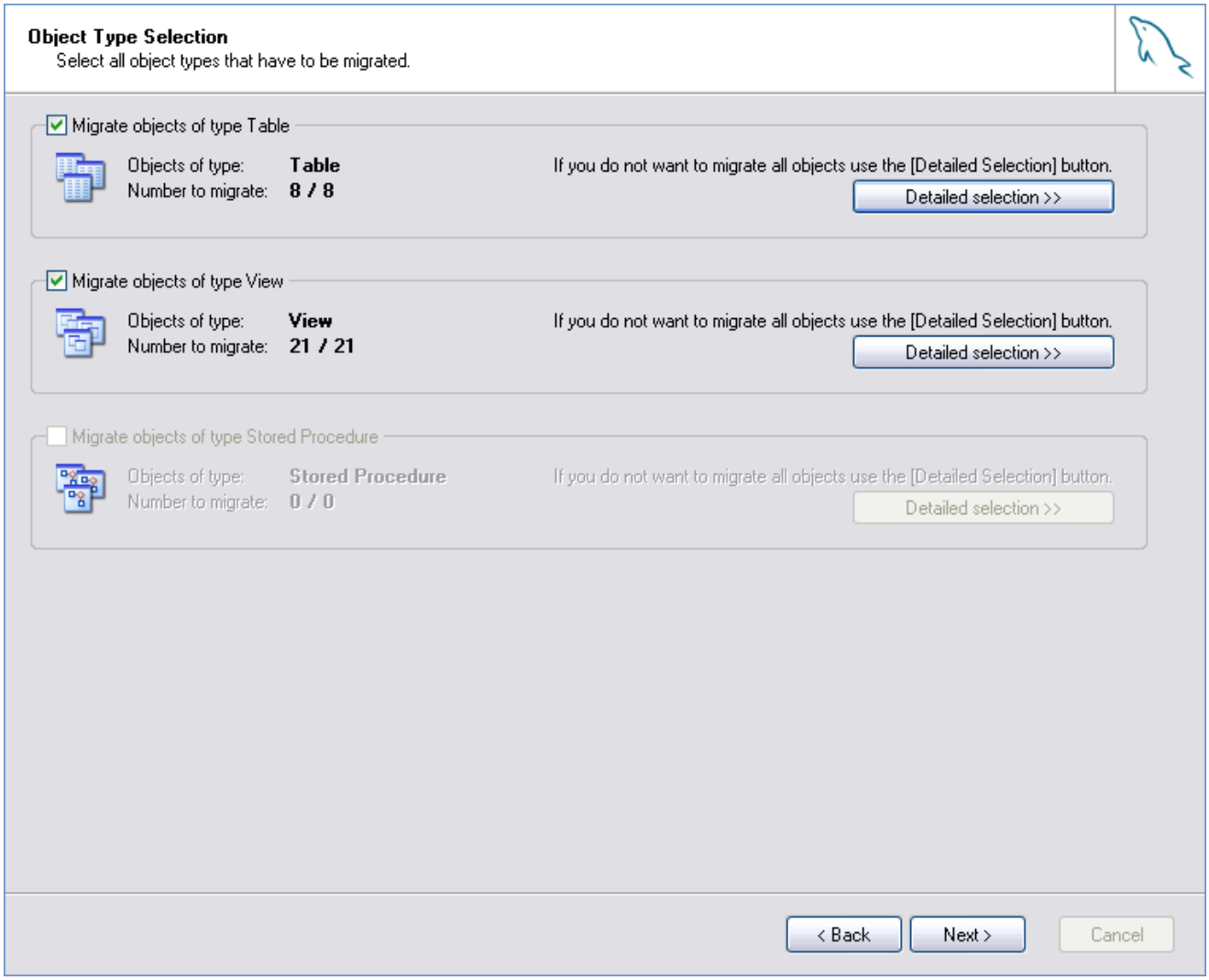
The MySQL Migration Toolkit collects column and index information for each table in the source database, along with information on stored procedures and views.

Click the DETAILS button to see a detailed log of the reverse engineering process.

9.9. The Object Type Selection Screen

Use the Object Type Selection screen to choose which objects you wish to migrate:

Figure 9.12. The Object Type Selection screen

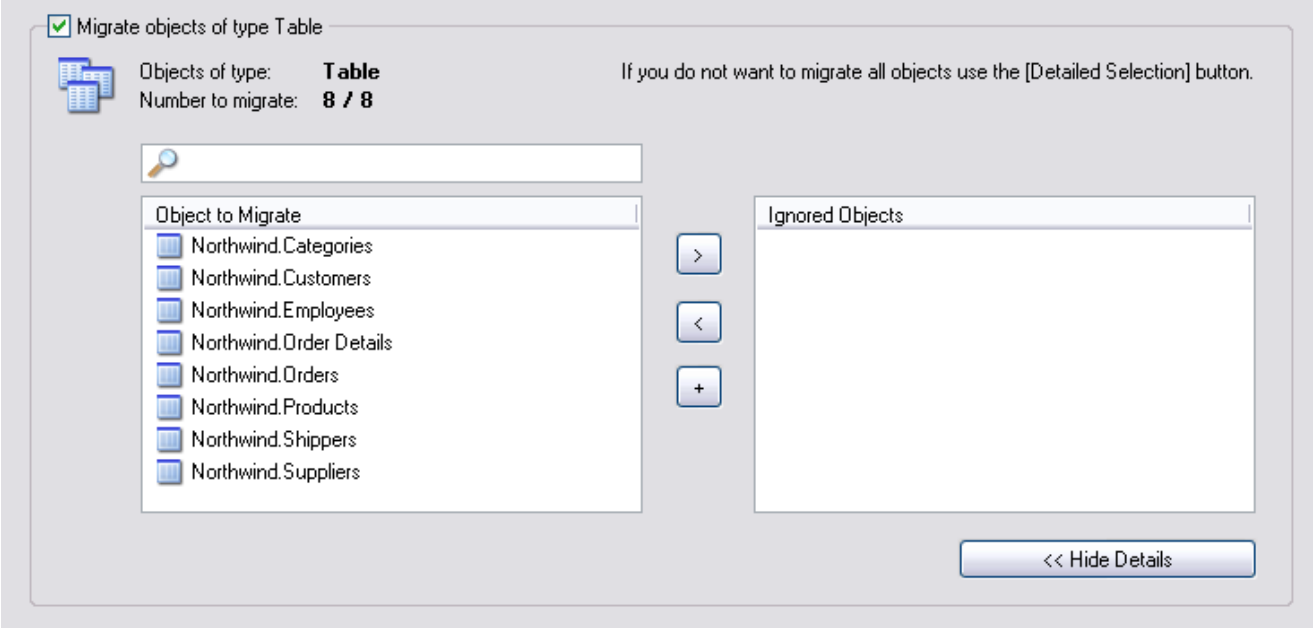


Check the box next to the objects types (Tables, Views, Stored Procedures) that you wish to migrate.

9.9.1. Migrating a Sub-Set of Object Types

If you only wish to migrate a sub-set of the available object types, click the DETAILED SELECTION button next to the object type:

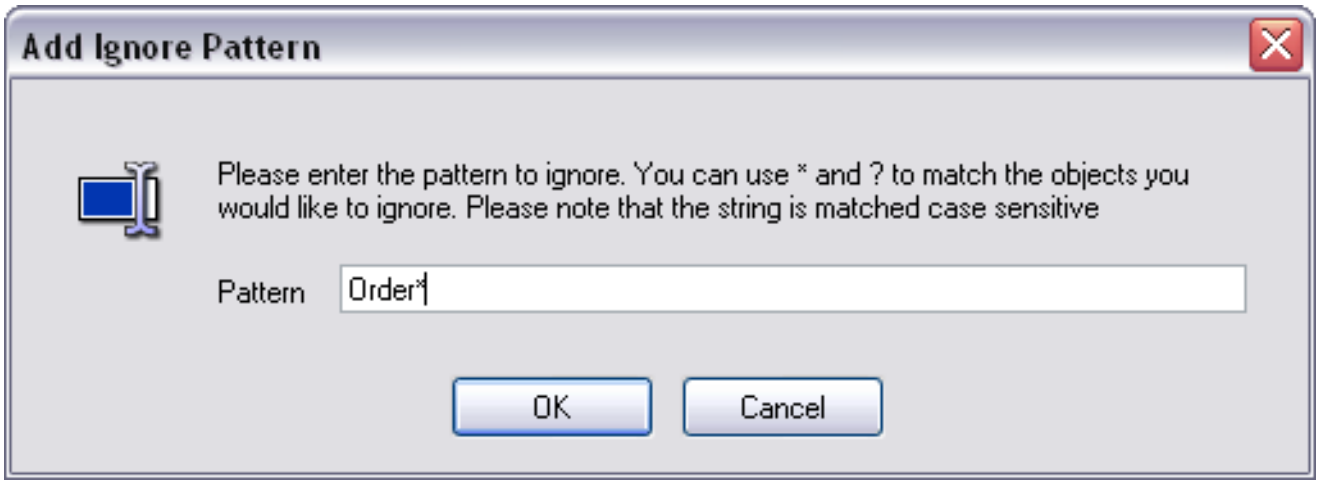
Figure 9.13. The detail view of the Object Type Selection screen



The objects in the left window will be migrated. To ignore an object, select it and click the > button. To move an object out of the ignore list, select it and click the < button.

To exclude objects based on pattern matching, click the + button:

Figure 9.14. The Add Ignore Pattern dialog



Patterns can include the * and ? characters, with * representing multiple characters (including no characters at all) and ? representing a single character.

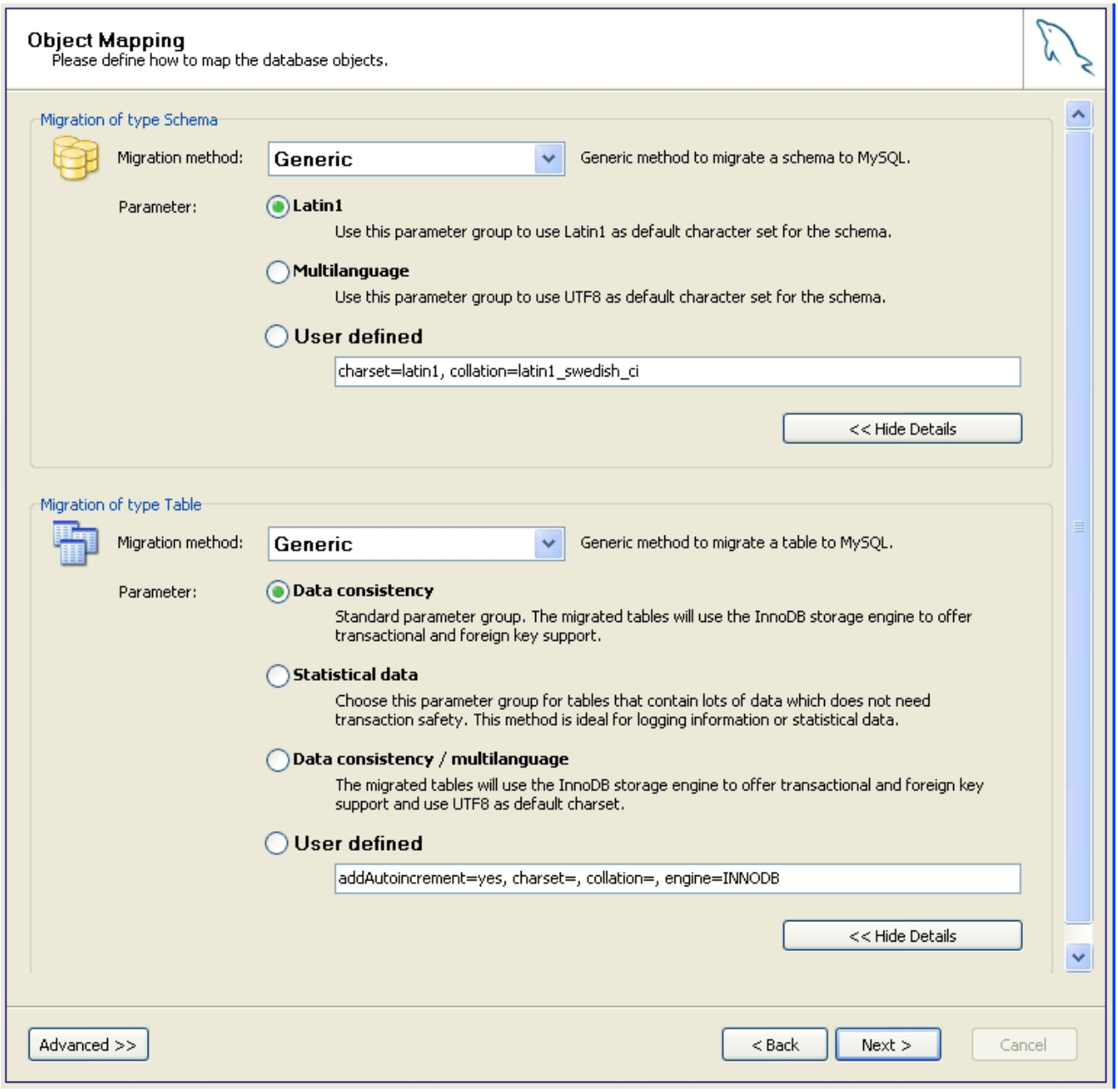
9.10. The Object Mapping Screen

Use the Object Mapping screen to configure the methods used to migrate the database objects to MySQL. The MySQL Migration Toolkit comes with multiple migration methods that can be used to convert the database objects of an external RDBMS to MySQL.

In most cases the default settings will be adequate.

There are four areas of migration to be addressed: Generic RunTime (GRT) Object, Table, View, and Stored Procedures:

Figure 9.15. The Object Mapping screen



9.10.1. GRT Object

The GRT Object section of the Object Mapping screen dictates the properties of the database itself. By default a generic profile is used, with a `Latin1` character set.

To modify the character set used on the database level, click the SET PARAMETER button. Choose from `Latin1`, `Multilanguage`, or `User defined`.

9.10.2. Table Objects

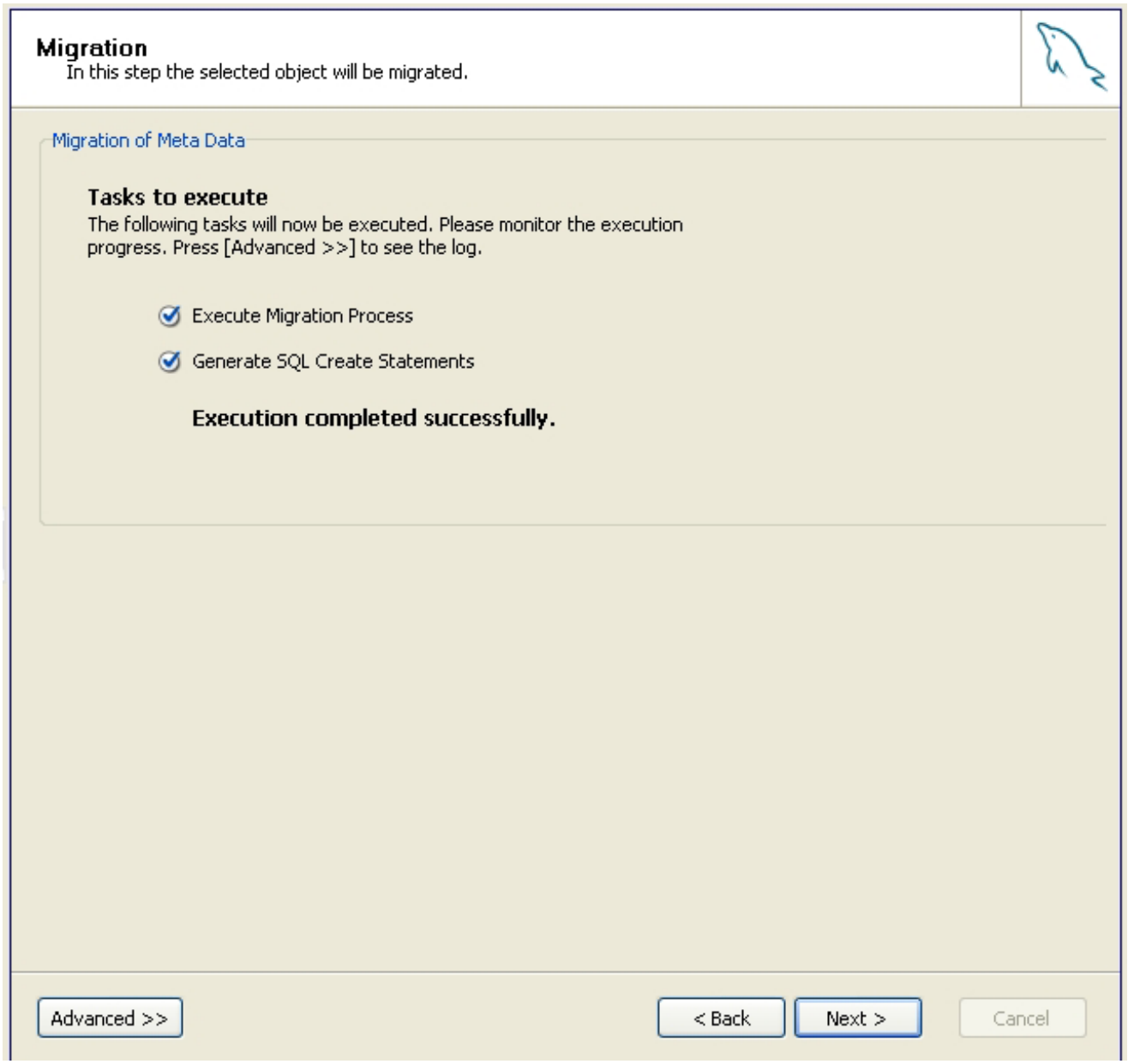
The Table section of the Object Mapping screen dictates the properties of the individual tables. By default a generic profile is used, with an `InnoDB` storage engine.

To modify the storage engine used with the migrated tables, click the SET PARAMETER button. Choose the `Data consistency` option to use the InnoDB storage engine for transactional and foreign key support. Choose the `Statistical data` option to use the MyISAM storage engine with increased performance but no transaction safety. Choose the `Data consistency / multilanguage` option to use the InnoDB storage engine with UTF8 as the default charset. If none of the provided options meet your needs, choose the `User defined option and provide your own settings.`

9.11. The Meta Migration Screen

After you configure data object mapping, the MySQL Migration Toolkit performs the conversion of the database objects and generates SQL `CREATE` statements.

Figure 9.16. The Meta Migration screen



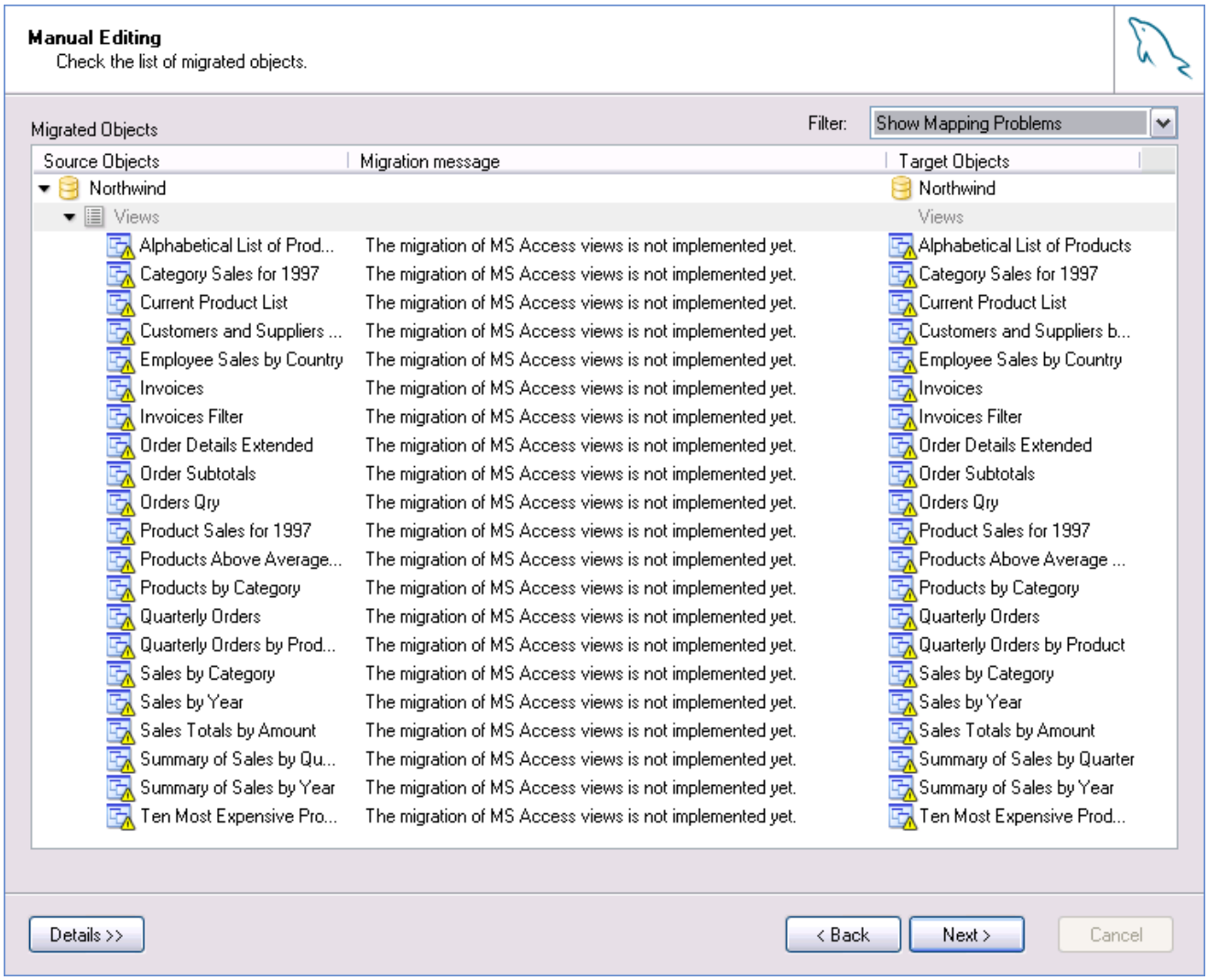
The SQL CREATE statements are not executed on the target server at this stage of the migration, but will be executed later.

Click the DETAILS button to view a detailed log of this stage of the migration process.

9.12. The Manual Editing Screen

Use the Manual Editing screen to review the SQL CREATE statements generated by the MySQL Migration Toolkit:

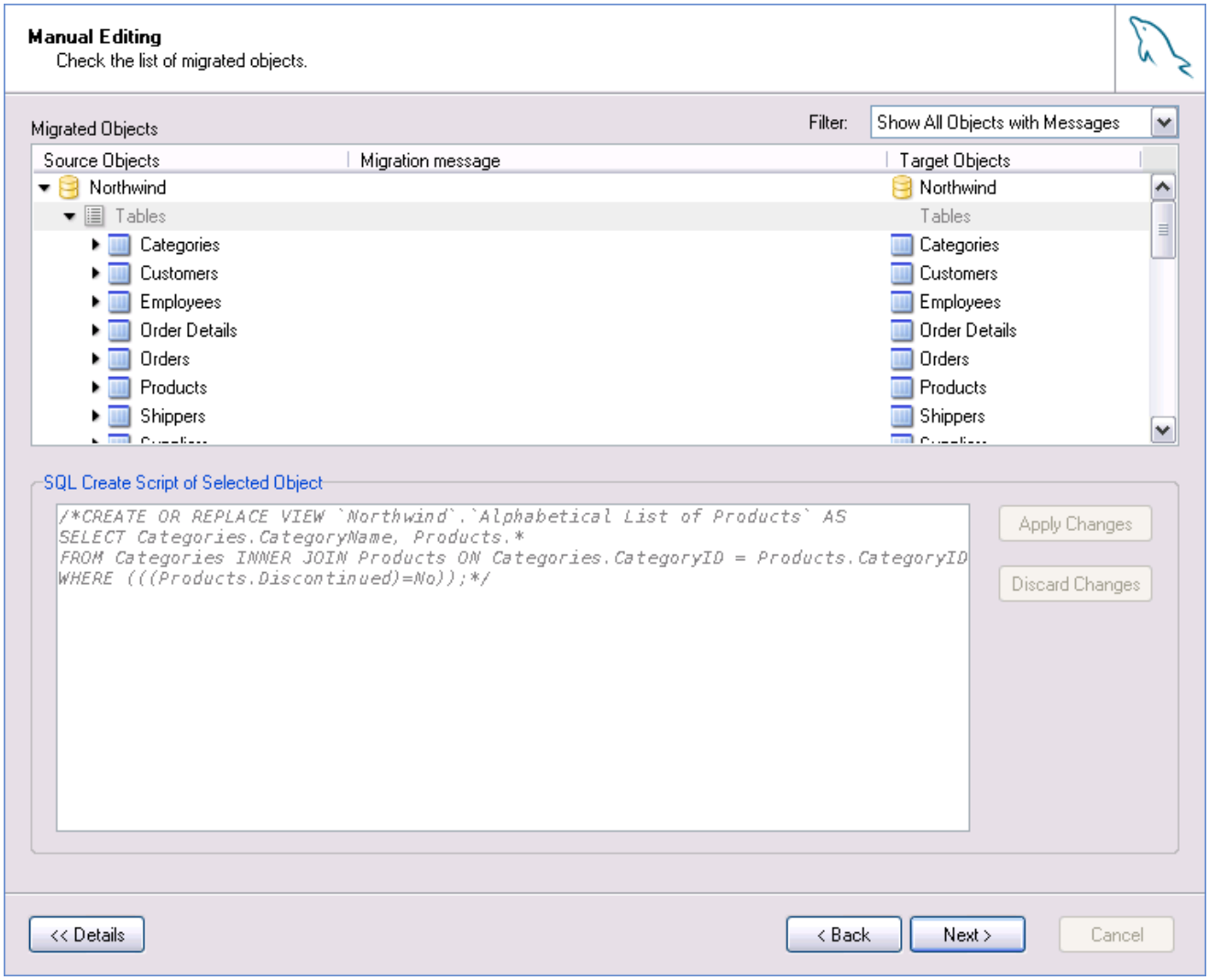
Figure 9.17. The Manual Editing screen



By default only objects that were not successfully converted are displayed in the Manual Editing screen. To view all objects select the SHOW ALL OBJECTS entry of the **FILTER** drop-down list. Choose the SHOW ALL OBJECTS WITH MESSAGES entry of the **FILTER** drop-down list to view all object with status messages.

To edit the SQL CREATE statements created by the MySQL Migration Toolkit, select the object and click the DETAILS button:

Figure 9.18. The Manual Editing screen – detailed view

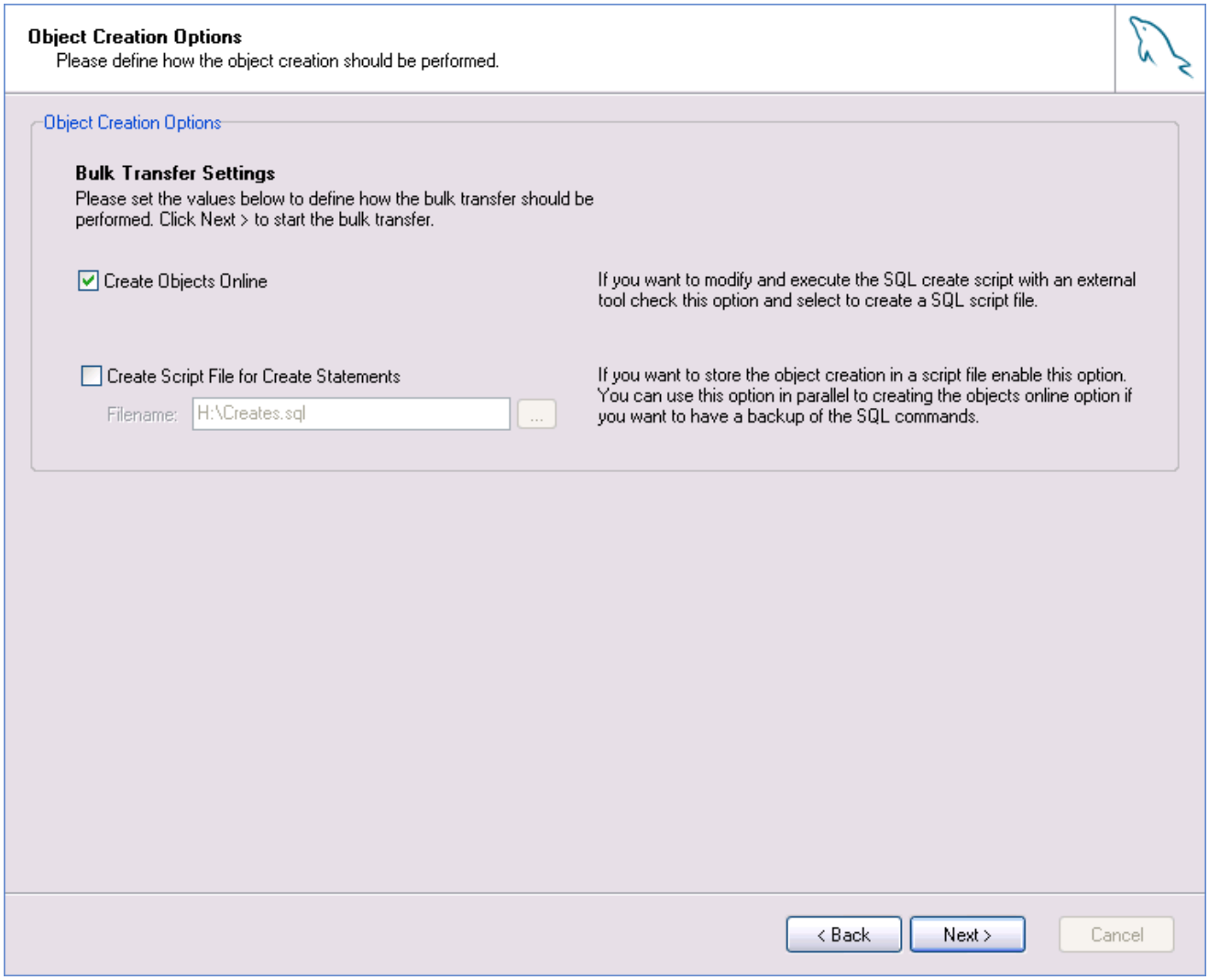


Make changes to the CREATE statement and click the APPLY CHANGES button. If you make a mistake while editing, click the DISCARD CHANGES button to undo the CREATE statement.

9.13. The Object Creation Options Screen

After performing manual object editing the MySQL Migration Toolkit is ready to create the database objects on the target server. You have the option of either creating the database objects directly on the target server or to create a script file of the CREATE statements for later execution:

Figure 9.19. The Object Creation Options screen

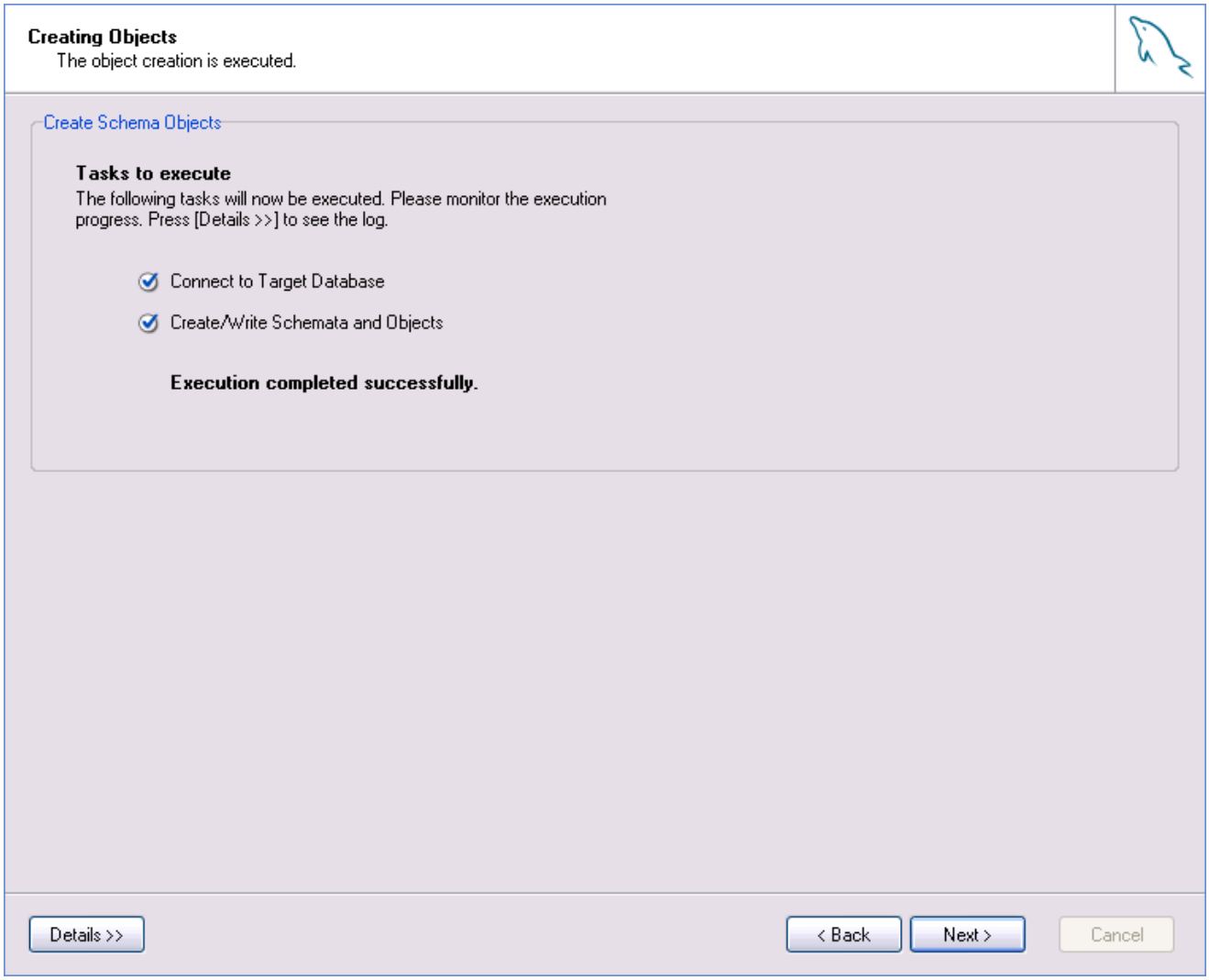


Select both options to create the target database objects and preserve a backup copy of the `CREATE` statements for later use.

9.14. The Creating Objects Screen

Once you choose object creation objects, the MySQL Migration Toolkit connects to the target server and creates the database objects (assuming you chose to have the MySQL Migration Toolkit connect to the target server to create the database objects).

Figure 9.20. The Creating Objects screen



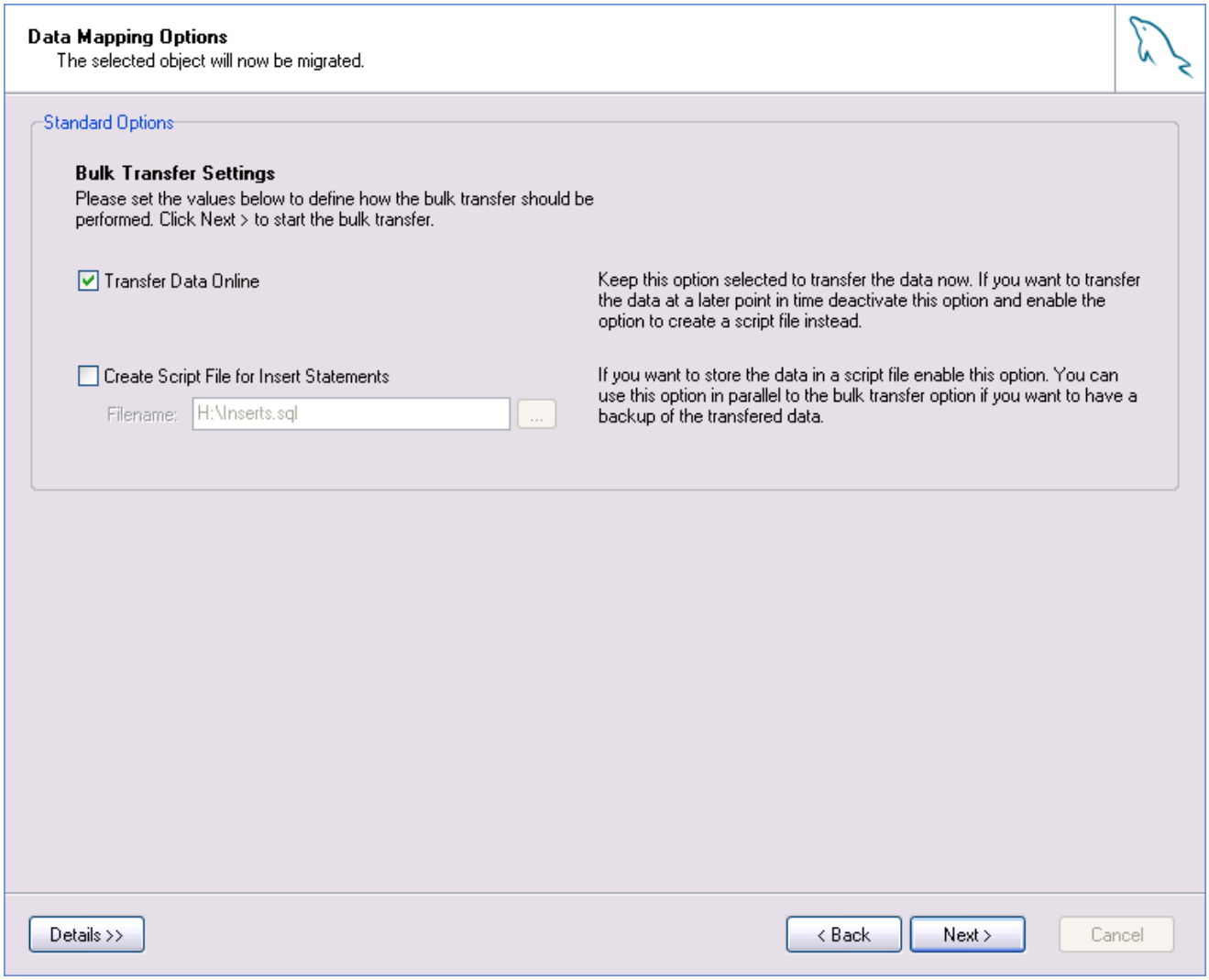
Click the DETAILS button to view a detailed log of this stage of the migration process.

Choose the `Create Script File for Create Statements` check box to save a copy of the `CREATE` statements to disk.

9.15. The Data Mapping Options Screen

After the database objects are created on the target database server the MySQL Migration Toolkit is ready to move the server data to the target server. You have the option of either inserting the data directly on the target server or to create a script file of the `INSERT` statements for later execution:

Figure 9.21. The Data Mapping Options screen



Select both options to move the data and preserve a backup copy of the `INSERT` statements for later use.

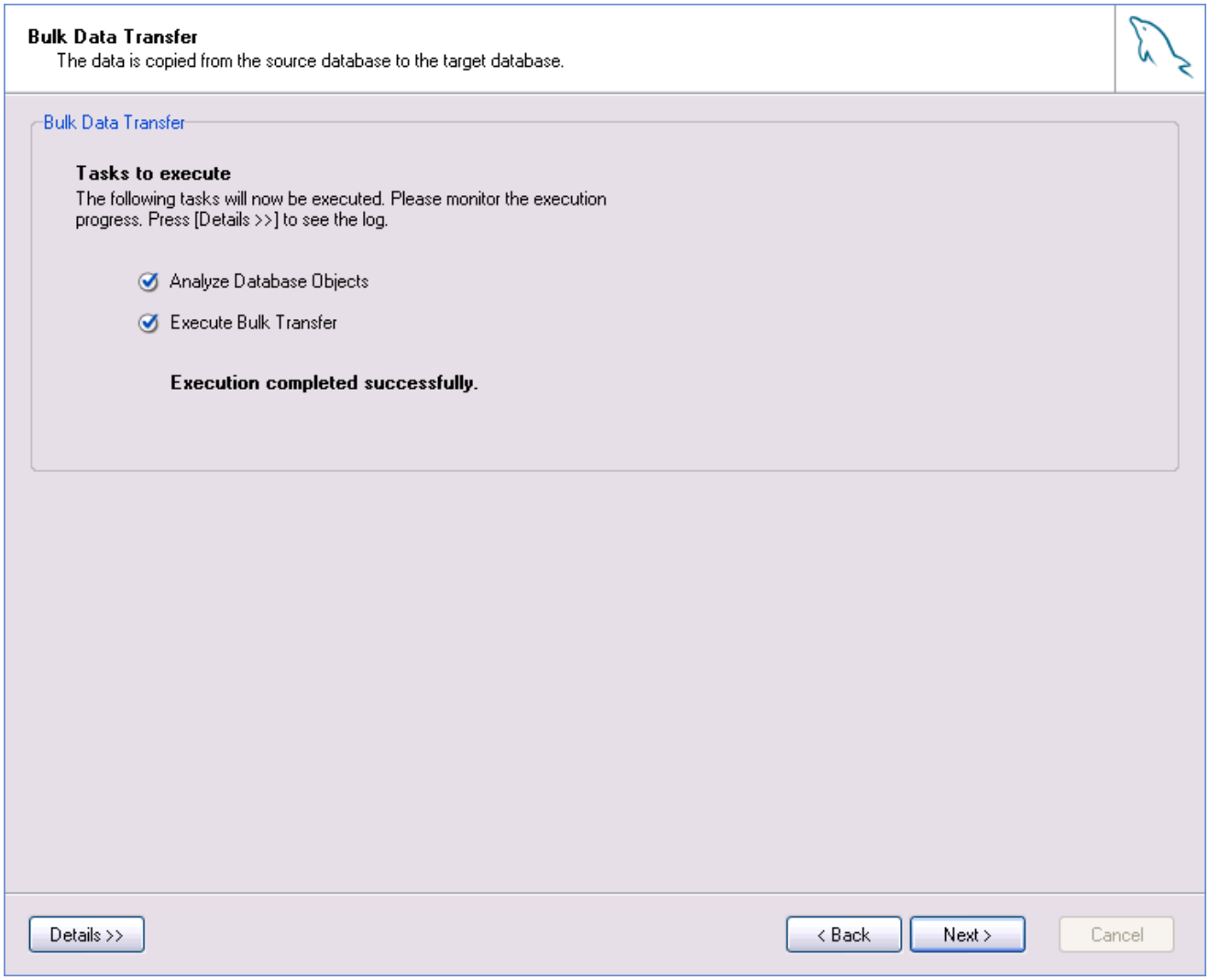
You can access additional options by clicking the DETAILS button. If you do not wish to move BLOB data to the target server, check the box next to the **EXCLUDE BLOB VALUES** option. The BLOB data will not be moved to the target server and will not be written to the script file. If you do not wish to move BLOB data to the target server, but wish to have the BLOB data written to the script file, also check the box next to the **WRITE BLOBS TO INSERT SCRIPT** option.

If you wish to limit the number of rows transferred to the target server, check the box next to the **MAXIMUM NUMBERS OF ROWS TO TRANSFER FOR A TABLE** option and enter the desired number of rows. This option can be useful when generating test data.

9.16. The Bulk Data Transfer Screen

Once the data mapping options are set, the MySQL Migration Toolkit will begin the bulk data transfer process. Data will be converted to a MySQL compatible format and inserted into the target database server using bulk `INSERT` statements. Data is typically inserted in batches of 15,000 rows at a time to maximize insertion speed.

Figure 9.22. The Bulk Data Transfer screen

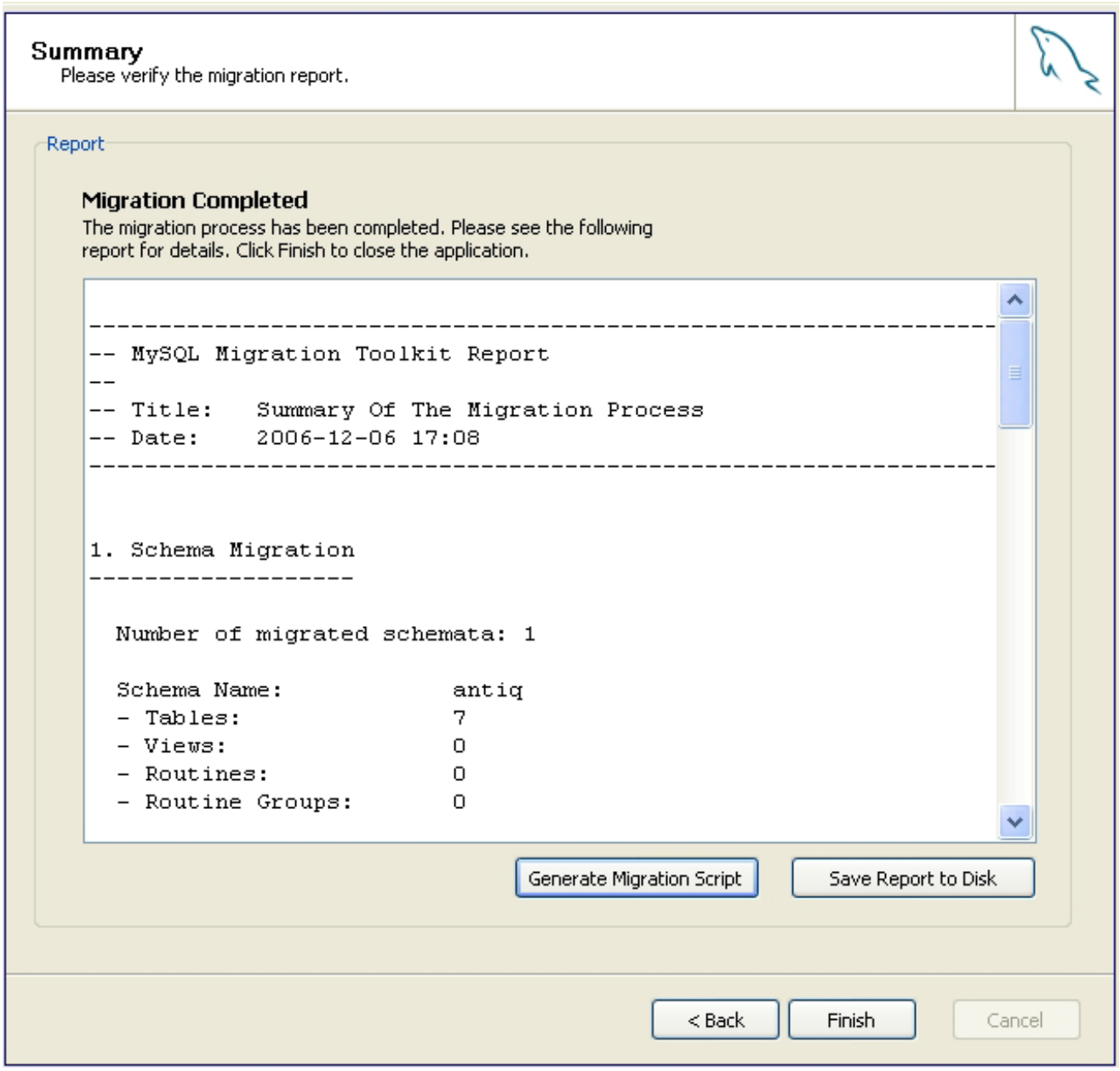


Click the DETAILS button to view a detailed log of this stage of the migration process.

9.17. The Summary Screen

Once the bulk data transfer is complete, a summary report of the migration will be displayed:

Figure 9.23. The Summary screen



Click the GENERATE MIGRATION SCRIPT to create a `Lua` script file of the migration process. With this file you can script the migration of a database or customize it. For more information about this topic, see Chapter 11, *Scripted Migration*.

Click the FINISH button to exit the MySQL Migration Toolkit.

9.18. Saving the Current Application State

If you need to close the MySQL Migration Toolkit part way through the migration process, you can save the state of the MySQL Migration Toolkit to disk and continue later.

To save the current state of the MySQL Migration Toolkit, choose the STORE CURRENT APPLICATION STATE option of the FILE menu.

To later retrieve the application state and resume configuring the migration, choose the RELOAD STORED APPLICATION STATE option of the FILE menu.

Saving the application state will prove useful when examining scripted migration in Chapter 11, *Scripted Migration*.

Chapter 10. The Generic Runtime Environment (GRT) Shell

10.1. Introduction

The GRT is a thin C layer, inspired by Objective C, which allows for dynamic typing and dynamic data objects. The GRT is used by the MySQL Migration Toolkit and provides a means for expanding these tools. Through the use of the GRT, these tools can support new behavior and data sources using code written in languages such as C, C++, Java, Python, and Lua with support for Mono forthcoming.

The GRT is not only useful for expanding MySQL GUI Tools. By using a script file from within the GRT shell you can perform repetitive tasks programmatically from the command line. Suppose, for example, that you have multiple schemata that you wish to migrate to MySQL. You can do this once using the graphical interface, in the process saving the procedure as a script file. You can then adapt this script file and run it unattended from the GRT shell.

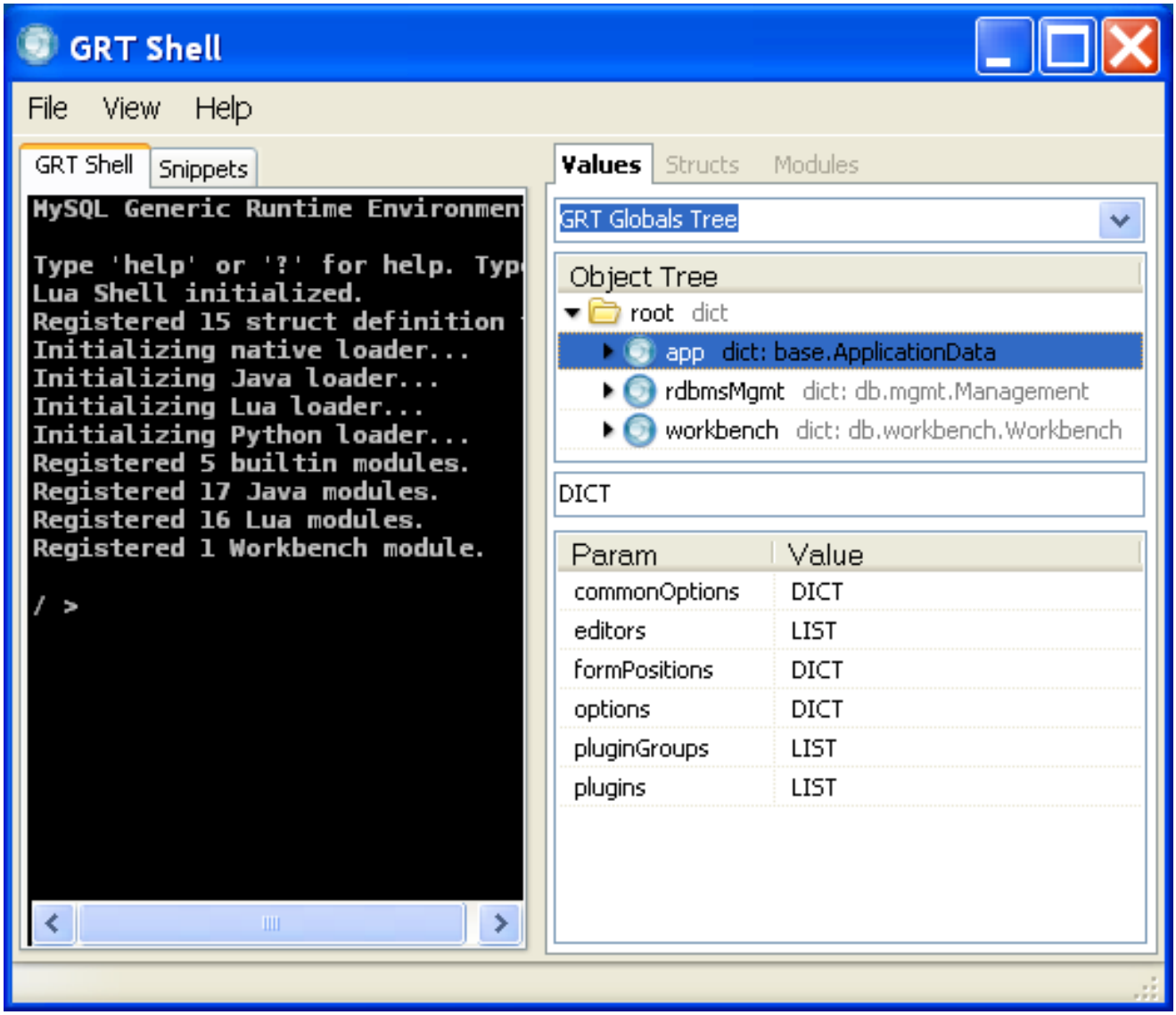
The preferred development language is Lua, a lightweight scripting language expressly designed for extending applications. For more information about this language see lua.org.

> **Note**
>
> The GRT supports Lua version 5.0. Version 5.1 is not supported.

10.2. Exploring the GRT Shell

To open the GRT shell from within the MySQL Migration Toolkit choose the GRT ENVIRONMENT SHELL option under the TOOLS menu. I

Figure 10.1. The GRT shell (Windows)



The GRT shell itself is the default tab on the left of the screen. Beside it is the `Snippets` tab, used for saving code snippets.

On the right, is the `GRT Globals Tree`—showing the various objects, variables, structures, and code modules used by the application. These objects are all directly accessible from the shell.

10.2.1. Menu Items

The menu runs across the top of the screen and varies significantly depending upon which OS you are using. Since the MySQL Migration Toolkit is currently only implemented on Windows, all references to invoking the GRT shell from this application apply only to the Windows OS.

10.2.1.1. The File or Shell Menu

10.2.1.1.1. Windows File Menu

Currently only two of the submenus under the FILE menu are implemented; EXIT, which simply exits the GRT shell, and OPEN SCRIPT. The OPEN SCRIPT option is for opening existing `Lua` scripts and is only implemented under Windows.

Sample scripts are found in the `Scripts` directory which is immediately below the installation directory. Opening a script from this menu option will create an additional tab labeled with the name of the script. Click on this tab to see the file contents. You may paste

text between the GRT Shell tab and any script tab.

10.2.1.1.2. Linux Shell Menu

Under Linux the SHELL menu shows menu items for closing the shell, refreshing the objects listed in the Global tree or saving the object tree.

The SAVE TREE ... menu option saves an XML file of all the data types and classes shown in the three tabs of the Objects Tree.

Under Linux there is no menu option to open a script.

10.2.1.2. The View Menu

10.2.1.2.1. The View Menu: Windows

The REFRESH option of the VIEW menu refreshes the view of the objects shown in the object tree tabs on the right.

The DISPLAY TYPE INFO and DISPLAY OBJECT VALUES menu items toggle the view of the objects in the Values tab on the right. When checked, DISPLAY TYPE INFO shows the data type of objects and DISPLAY OBJECT VALUES shows their value.

The DISPLAY OBJECT REFCOUNT shows the current number of references to specific objects.

10.2.1.2.2. The View Menu: Linux

The VIEW menu has only one element, STRUCTURE ONLY and it is not yet activated.

10.2.1.3. Mac OS X Menu

Under Mac OS X there are only two menu options, RELOAD and RELOAD SELECTED. RELOAD reloads all the objects in the Object Tree panel and is equivalent to the Windows VIEW, REFRESH option. The RELOAD SELECTED option only reloads the selected object.

10.2.2. The Shell

The GRT shell is principally used for running Lua scripts or typing Lua commands directly. However, you can also access the GRT Scripting Library functions and global functions and objects. To see the available commands type "?".

Some OS-specific commands are also available. For instance, under Windows you can clear the screen by typing cls. Unlike most shells, you can cut and paste text to and from the shell window.

Working from the command line is described in detail in Section 10.3, "Using the GRT Shell".

The Snippets tab functions as a scratch pad for saving code snippets. This makes it easy to reuse code and does away with the need to retype it at the command line.

If you have opened script files as described in Section 10.2.1.1.1, "Windows File Menu" [39], there may be any number of tabs to the right of the Snippets tab. These tabs will be labeled with the names of the script files. As with the Snippets tab you can cut and paste to or from any of the tabs. This gives you the opportunity to test code from the command line.

10.2.3. The Globals Tree Panel

The Globals Tree is found on the right side of the screen and is made up of three tabs, Values, Structs, and Modules.

10.2.3.1. The Values Tab

If you are running MySQL Migration Toolkit, find a migration object beneath the root object. Both applications show the rdbmsMgmt object.

When the Values tab is selected right clicking an object in the Globals Tree panel opens a pop-up menu with the options:

- Refresh
- Remove Object

- Display Type Info
- Display Object Values
- Display Object RefCount

With the exception of REMOVE OBJECT, these options are the same as those shown in Section 10.2.1.2, "The View Menu". You may remove any object except the `root` object.

> **Note**
>
> Note this pop-up menu only shows under Windows.

10.2.3.2. The `Struct` Tab

A `struct` is a user-defined data type formed by combining primitive data types. This tab shows the definitions of the structs used by the objects in the `Values` tab and the modules in the `Modules` tab.

When the `Structs` tab is selected right clicking a structure in the list opens a pop-up menu with the options:

- Order by Name
- Order by Hierarchy
- Order by Package

> **Note**
>
> Note this pop-up menu only shows under Windows.

The default view for this tab is by package, a grouping of elements by functionality. Double-click a package to show related structures. Under `db.mgmt`, for example, you should see elements you are already familiar with from the user interface, `Connection`, `Driver`, and so forth. If an element can be further decomposed, an arrow will show on it's left. Double-click the item to reveal its constituent elements.

If you switch to the hierarchical view you'll find the `db.mgmt.driver` object under the `GRT Object` since this is the parent object from which it is derived.

Ordering by name simply shows all the different objects arranged alphabetically.

10.2.3.3. The `Modules` Tab

A module can be either a Python or Lua script or a Java class file. Information about modules appears in the window below the module tree. For example, go to the `Modules` tab and click on the `ReverseEngineeringGeneric` module. Double click a module and you will see its methods.

Double clicking a method name will copy it into the GRT shell window. You will see how useful this can be in Section 10.3, "Using the GRT Shell".

10.3. Using the GRT Shell

There are three built-in Lua modules that assist working from the GRT shell:

- `grtV` – for accessing any object/variable in the `Values` tab
- `grtS` – for viewing the structs defined in the `Structures` tab
- `grtM` – for accessing any object in the `Modules` tab

All items in all the tabs are accessible from the GRT shell.

The script example below uses the `getGlobal` method of the `grtV` object to return a list of databases and then iterates through this list.

```
dbs = grtV.getGlobal("/rdbmsMgmt/rdbms")
for i = 1, grtV.getn(dbs) do
   print(dbs[i].name)
end
```

The `getGlobal` method returns the object found at the path parameter passed to it. In this case, the object is a list that is traversed using a `for` loop controlled by the `getn` method which returns the number of elements in the database list.

Running this `for` loop outputs the names of the database formats supported by the MySQL Migration Toolkit:

```
"Oracle"
"Mysql"
"MaxDB"
"GenericJdbc"
"Mssql"
"Access"
```

To discover all the methods available for a specific object, type the object name preceded by a "`?`". For example typing `?grtV` shows:

```
GRT Value Management Library - grtV
-----------------------------------
A library that contains functions to work with GRT values.

clearList               child                  diffMake
diffApply               duplicate              fromXml
getContentType          getKey                 getListItemByObjName
getListRefValueByObjName getn                  getGlobal
insert                  load                   lookupAdd
lookupId                newDict                newList
newObj                  remove                 save
setContentType          setGlobal              toLua
toXml                   typeOf

Type 'help grtV.<command>' to get help on a specific command.
```

10.4. Invoking the GRT Shell From the Command Line

> **Note**
>
> This capability is currently only available under Windows.

In addition to using the GRT shell from within the MySQL Migration Toolkit, you can invoke it directly from the command line. If the location of the MySQL GUI Tools is not included in the `PATH` variable, navigate to the installation directory and find the `grtsh.exe` file.

Execute this file by typing:

```
C:\> grtsh -?
```

Do this and you should see the following listing:

```
Usage: C:\Program Files\MySQL\MySQL Tools for 5.0\grtsh.exe [-classpath path] »
       [-modulepath path] [-jvm library] [-d path] [-listen port] [-verbose] [-x] [luafile]
       C:\Program Files\MySQL\MySQL Tools for 5.0\grtsh.exe -j structsfile outputdir
       C:\Program Files\MySQL\MySQL Tools for 5.0\grtsh.exe -p structsfile outputdir

  -lua ......... Use the Lua shell (default).
  -py .......... Use the Python shell.
  -classpath ... Sets the java classpath to the given value.
  -modulepath .. Sets the location of the GRT module directory.
  -jvm ......... The java virtual machine library to use (with absolute path).
  -basedir ..... Path to the data files location.
  -d path ...... Modules directory
  -x ........... Exits the shell after running the specified file
  luafile ...... File that is run at startup.

  -listen port . Runs in 'remote agent' mode on the given port number.
  -verbose ..... Prints detailed startup information.
  -j ........... Generates Java classes from the given structs file.
  -p ........... Generates PHP classes from the given structs file.
  -D var=value . Sets a global shell variable to the given value.
```

```
Environment variables:
GRT_MODULE_PATH  Equivalent to -modulepath, must point to the directory
                 where the grtsh binary resides
```

The default shell is the `Lua` shell and is indicated by the `/ >` prompt. Using the `-py` option opens a Python shell, indicated by the `/ >>>` prompt.

If you wish to set the classpath for Java classes use the `classpath` option. You may also change the Java Virtual Machine (JVM) by using the `jvm` option with the absolute path to the JVM you wish to use.

The `modulepath` option sets the location of the `dll` files used with the GRT shell. These files are located in the same directory as the `grtsh.exe` file. You can also set this directory by defining the environment variable, `GRT_MODULE_PATH`.

The location of any data files you wish to use may be set using the `basedir` option.

To see the various modules that are loaded at startup use the `verbose` option. The java modules are stored in the `java\com\mysql\grt\modules` directory immediately below the installation directory and the `Lua` modules in the `lua` directory. Currently, importing Python modules is not supported.

To include modules other than the default modules, use the `d` option with a path.

It is also possible to use the GRT shell to convert XML files to Java or PHP class files, by opening the shell using the `j` or the `p` option and specifying the XML source file and the destination directory.

Use the `listen` option with a port number to run the GRT shell as a service that can be accessed from a remote location.

Perhaps most importantly, you can pass a `Lua` script to the shell on startup. This allows you to perform tasks using a script file without even opening the MySQL Migration Toolkit. This is an especially useful feature if you need to migrate the same database a number of times or you want to customize a migration. You can easily create a `Lua` script by clicking the GENERATE MIGRATION SCRIPT when migrating using the graphical interface. For information on creating a Lua script, see Section 9.17, “The Summary Screen”. A Lua migration script is examined in detail in Chapter 11, *Scripted Migration*.

Passing a `Lua` file to the shell is usually invoked using the `x` option so that the shell closes after the script has executed.

The appearance of the GRT shell run from the command line is identical to its appearance when run from within the MySQL Migration Toolkit. All the commands and options described in Section 10.3, “Using the GRT Shell” are available when the GRT shell is invoked from the command line.

Chapter 11. Scripted Migration

This section reviews a simple migration script and assumes some familiarity with the GRT shell. If you haven't yet done so, read Chapter 10, *The Generic Runtime Environment (GRT) Shell*.

As noted earlier in Section 9.17, "The Summary Screen", if you choose, you can generate a migration script when migrating a database. Doing this creates a Lua script of the entire migration process. You can find out more about Lua by going to lua.org. However, if you have some familiarity with programming you should be able to make sense of this script without too much effort.

> **Note**
>
> The MySQL Migration Toolkit supports Lua version 5.0. Version 5.1 is not supported.

For a better understanding of the migration script, it is useful to have the GRT shell open within the MySQL Migration Toolkit. In this way you can examine the various objects created during migration by clicking on them in the Globals Tree panel. To save the application state and have access to these objects, migrate a database as described in Chapter 9, *The Migration Process In-Depth*, and when you reach the `Summary` step, choose the menu options FILE, STORE CURRENT APPLICATION STATE ... . This will save an XML file of the entire migration process. You can now reload the migration state whenever you wish.

11.1. The Steps for Scripted Migration

The migration script is conveniently divided up into six sections or checkpoints:

1. Set Source and Target Connection
2. Do the Reverse Engineering
3. Migration Methods and Ignore List
4. Set Object Mappings and Do Migration
5. Generate and Execute SQL Create Statements
6. Bulk Data Transfer

Each checkpoint will be examined in turn. To reload the application state and have access to the objects created during migration, choose the menu options FILE, RELOAD STORED APPLICATION STATE ... . Find the XML file that you previously saved. Open this file and you will see how the various objects in the GRT Globals Tree are referenced from the shell. Press **F4** to open the GRT shell.

11.2. Setting the Source and Target Connection

With the GRT shell open and the **VALUES** tab selected, double click the `migration` object and find the `sourceConnection` object. Click this item and its parameters and the values of those parameters will be exposed in the frame beneath the Globals tree. The parameters are as follows:

- _id
- driver
- modules
- name
- parameter values

> **Note**
>
> If you cannot find a `sourceConnection` object then the application state has not been reloaded.

Open the Lua script that you generated during migration and find the `-- Set source connection` line. Immediately below this

line is the code that defines the source connection of the schema that is being migrated.

The names of the parameters of the source connection in the Lua script should match the parameters shown in the frame below the Globals tree (though they do not appear in the same order). The value shown for the `_id` parameter is the value created by the `newGuid` method of the `grt` object. The Universally Unique Identifier (UUID) of the driver show in this frame should match the value shown in your script.

The `name` is the name of the variable being created by the Lua script.

In the `Values` tab both the `modules` and `parameterValues` items show as objects of the `dict` type.

Click on `modules` to see the modules used during migration. The `MigrationModule` has a name specific to the migration source schema. If you are migrating from Access, for example, it is called `MigrationAccess`. Click on `parameterValues` and see the parameters you supplied for connecting to the source schema.

Below the `-- set struct and types` line find the definition of the data types used so far. A `sourceConnection` is a struct derived from the `db.mgmt.Connection` structure. `modules` and `parameterValues` are both strings.

The parameters and the modules used for a `targetConnection` are shown beneath the `--Set target connection` line. After examining a `sourceConnection` you should quickly be able to understand a `targetConnection`. The same applies to the structs and data types used by the `targetConnection`.

11.3. Reverse Engineering

The conversion of the source schema to a MySQL schema occurs in the lines immediately following the comment `-- Do the reverse engineering`. This calls the GRT reverse engineering module to convert from the current schema type to the target type.

> **Note**
>
> To convert GRT objects to Lua values requires using the `toLua` method. Future versions of the GRT may overload the assignment operator.

The reverse engineering modules used by the MySQL Migration Toolkit are also used by the MySQL Workbench.

11.4. Migration Methods

The code following the comment `-- Migration methods and ignore list` invokes the migration module appropriate to the source database.

If you are migrating from Access, for instance, the `MigrationAccess` module will be invoked. Find this module in the modules tab to examine its three methods:

- `migrationMethods`
- `migrate`
- `dataBulkTransfer`

Any schema objects that you chose not to migrate, show up in the `ignoreList` object. This object is found beneath the `migration` object in the Globals tree panel.

11.5. Map Objects and Migrate

Instead of finding an object in the `Values` tab of the Objects tree, you may query an object from the command line in the GRT shell. For example, in the code following the comment `-- Set object mappings and do migration` a `mappingDefaults` object is created by the `grtV.setGlobal` method.

To see that this method has executed successfully enter the following command in the GRT shell:

```
/ > print(grtV.getGlobal("/migration/mappingDefaults"))
```

This should output a listing of the mapping defaults as shown in your script file. The results will vary depending upon the objects you

have chosen to migrate. However, in all cases you should see a schema mapping.

Beneath the `-- update _ids` comment the migration methods are copied to a local variable and then executed.

11.6. The SQL Create Statements

The code to create the target schema follows the `-- Generate and execute sql create statements` comment. If you chose the `Create Script File for Create Statements` option on the **OBJECT CREATION OPTIONS** screen then a text file of the data definition statements required to create the migrated schema is written to a file. For information on setting this option see. Section 9.13, “The Object Creation Options Screen”.

The actual creation of the schema on the database server is done by the `transformationModule` module.

11.7. Bulk Data Transfer

The code to populated the target schema follows the `-- Bulk data transfer` comment. If you chose the `Create Script File for Insert Statements` option on the **DATA MAPPING OPTIONS** screen then a text file of the insert statements required to populate the migrated schema is written to a file. For more information on setting this option, see Section 9.15, “The Data Mapping Options Screen”.

The actual creation of the data in the new schema is done by the `migrationModule` module.

Chapter 12. Extending The MySQL Migration Toolkit

12.1. Introduction

One of the key features of the MySQL Migration Toolkit is that it can be easily extended and customized to support new data sources. This is done through the use of its Generic RunTime (`GRT`) Environment.

Extending the MySQL Migration Toolkit to support a new RDBMS requires the creation of two new modules: one module that reverse engineers (ie., retrieves schema information) the source database objects and converts them into GRT objects, and one module that migrates the source GRT objects into MySQL GRT objects. The MySQL Migration Toolkit then converts the GRT MySQL objects into SQL statements that create the target MySQL server objects.

Existing modules can be easily expanded and customized to achieve the perfect migration for individual requirements. New migration "methods" that define how the migration is performed can be added easily. The new methods are listed and can be selected from the Wizard interface or used in migration scripts.

12.2. Architecture of the MySQL Migration Toolkit

The MySQL Migration Toolkit is built on three primary modules: reverse engineer modules, migration modules, and transformation modules.

Reverse engineering modules retrieve the schema information from the source database and return GRT objects that describe the schema. Reverse engineering modules will have a name similar to `ReverseEngineeringAccess`.

Migration modules convert the source database GRT objects to MySQL GRT objects and then handle the bulk data transfer between the source and MySQL databases. Migration modules will have a name similar to `MigrationAccess`.

Transformation modules convert the MySQL GRT objects into the actual SQL statements used to create objects such as tables and views on the target MySQL server. Transformation modules will have a name similar to `TransformationMySQL`. Transformation modules are supplied by the MySQL GUI team and need not be created to add support for a new source database.

All modules are derived from base classes whose methods can be rewritten to match the new source database.

12.3. The Modular Migration Process

From the point of view of modular development, the migration process is as follows:

1. The MySQL Migration Toolkit prompts the user for a source database and connection parameters. The user selection determines which modules will be used for the source database.
2. The MySQL Migration Toolkit calls the `testConnection` method of the reverse engineering module. The `testConnection` method returns success or failure to the MySQL Migration Toolkit.
3. The MySQL Migration Toolkit calls the `getSchemata` method of the reverse engineering module. The `getSchemata` method returns a list of the schemata available on the source RDBMS.
4. Once the user has selected one or more schemata to migrate, the MySQL Migration Toolkit calls the `reverseEngineer` method of the reverse engineering module. The `reverseEngineer` method converts all objects in the source RDBMS (tables, views, procedures) into a collection of GRT objects.
5. After the source database has been reverse engineered, the MySQL Migration Toolkit calls the `migrationMethods` method of the migration module. The `migrationMethods` method generates a list of available methods than can be selected by the user in the Object Mapping Screen.
6. Once the user has selected the migration methods, the MySQL Migration Toolkit calls the `migrate` method of the migration module. The `migrate` method converts the source RDBMS GRT objects into MySQL GRT objects by calling the selected migration method for each source schema object. If no explicit method is assigned, the default migration method for the object type will be used.
7. After the MySQL GRT objects have been created, the MySQL Migration Toolkit calls the transformation module to convert the MySQL GRT objects into SQL statements that will create the objects on the target MySQL server. The MySQL Migration Toolkit

then either executes the SQL statements on the target MySQL server or writes them to a script file.

8. In the final step, the MySQL Migration Toolkit calls the `dataBulkTransfer` method of the migration module. The `dataBulkTransfer` method loops through the selected tables in the selected schema and migrates the rows of the tables to the target MySQL database or loads them into a script file, depending on the user preference.

12.4. Tools Required to Extend the MySQL Migration Toolkit

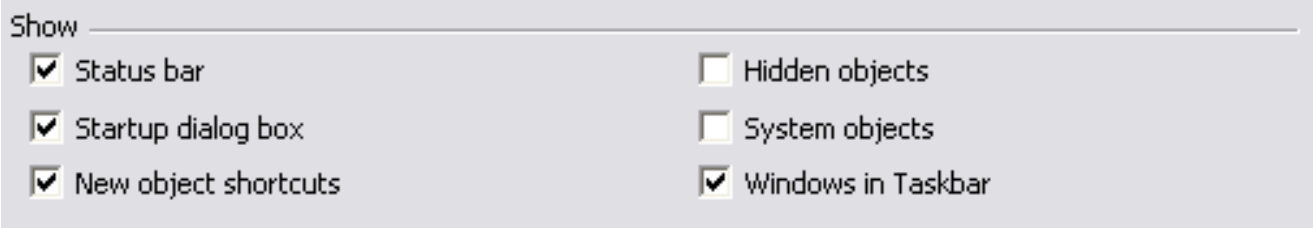
The MySQL AB GUI Team uses Eclipse for development of the MySQL Migration Toolkit modules and recommends Eclipse for use when developing modules for the MySQL Migration Toolkit. See http://www.eclipse.org/ for more information.

Chapter 13. Preparing a Microsoft Access Database for Migration

The MySQL Migration Toolkit requires access to the system tables of a Microsoft Access database for the purpose of reverse-engineering. By default, read access to the system tables of an Access database is restricted for external applications.

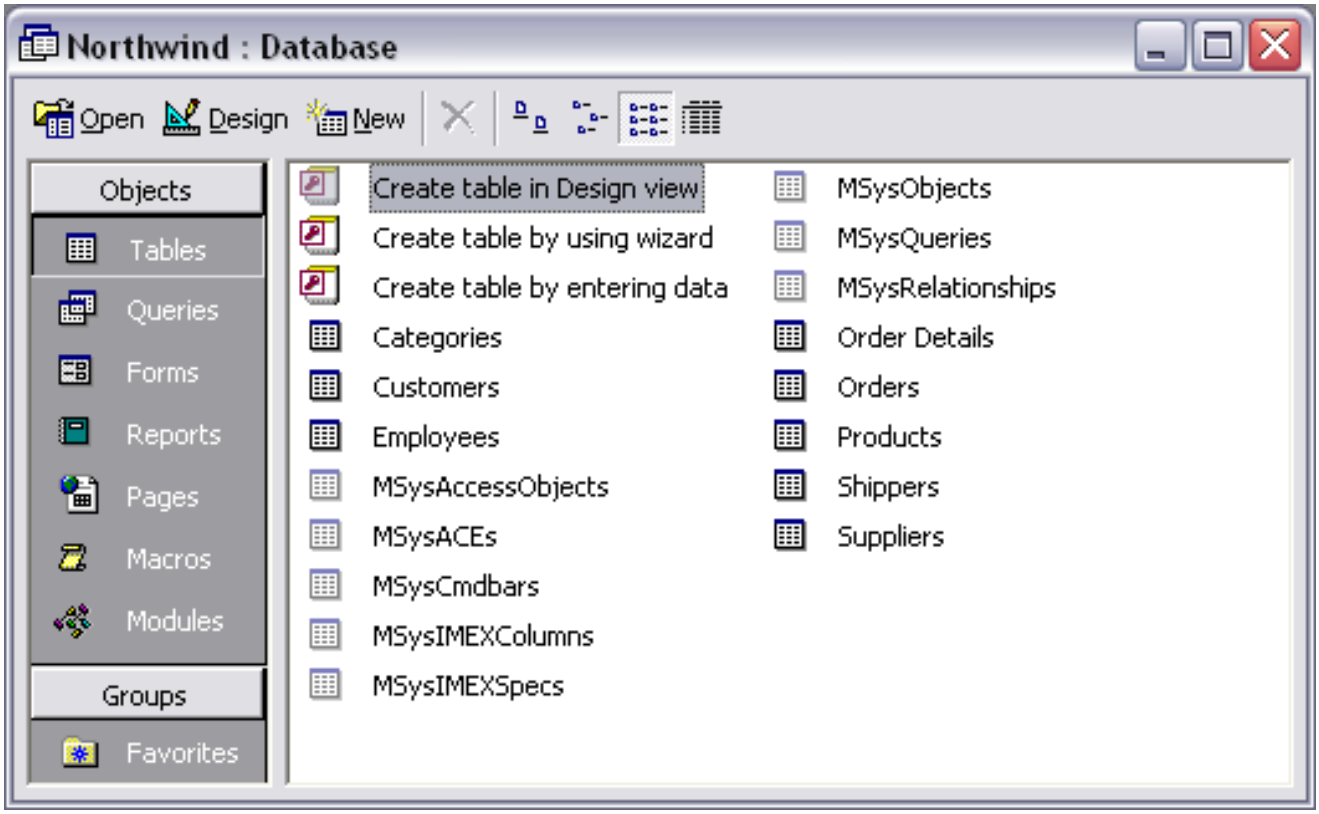
To enable access to the system tables by the MySQL Migration Toolkit, open the database in Microsoft Access and choose the OPTIONS entry of the TOOLS menu. Within the `Options` dialog, select the **VIEW** tab and look for the `Show` section:

Figure 13.1. The show section



Check the box next to the **SYSTEM OBJECTS** option and close the options dialog. System tables for the database should now be present:

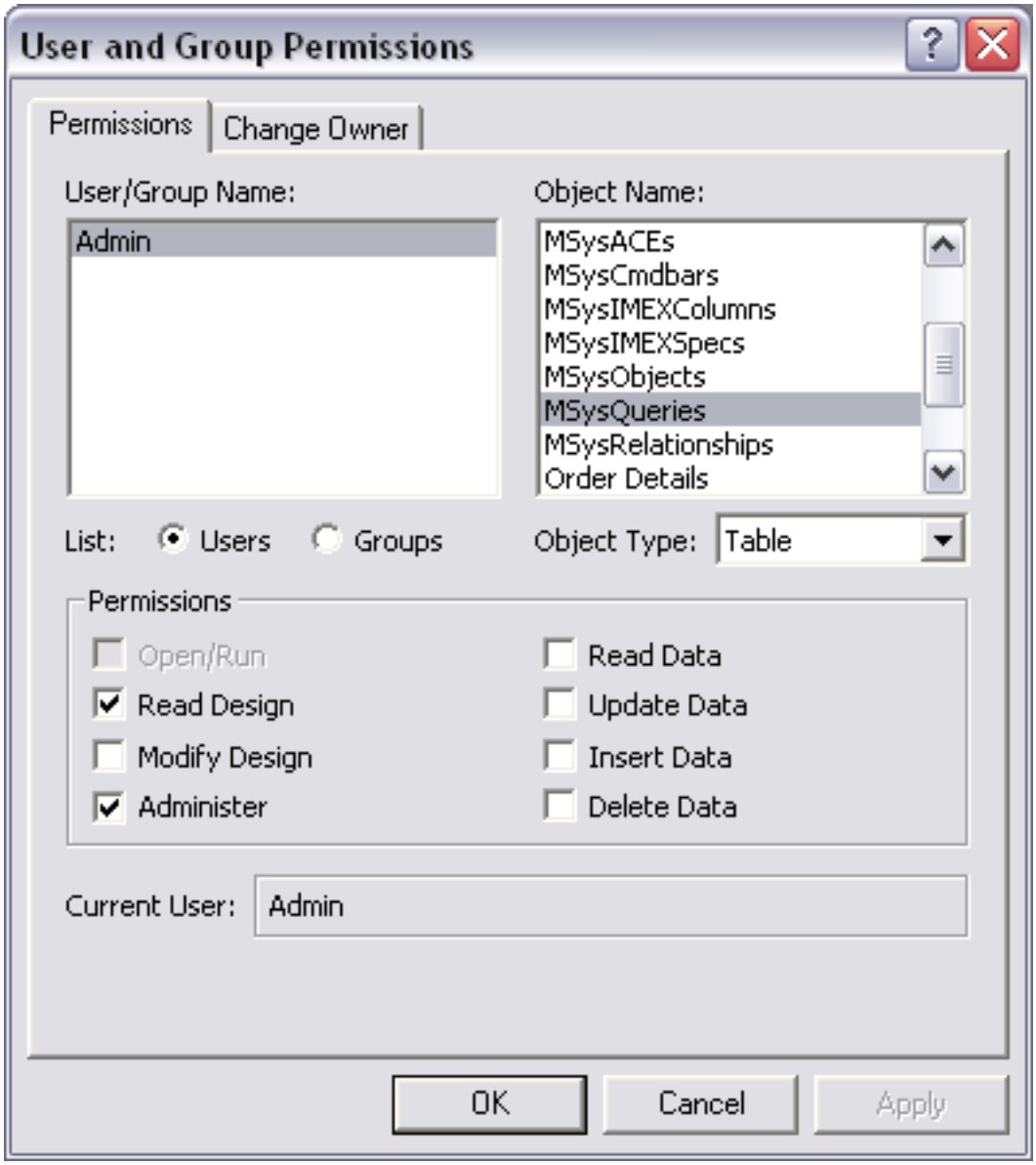
Figure 13.2. The system objects



Note the presence of the various `MSys` tables.

After you expose the system objects to the MySQL Migration Toolkit, you must also grant permission to access the objects. Choose the USER AND GROUP PERMISSIONS entry from the SECURITY section of the TOOLS menu:

Figure 13.3. Granting access to the system objects



Enable the `Administer` permission for both the `MSysObjects`, `MSysQueries`, and `MSysRelationships` tables. You will need to click the APPLY button after enabling each table and before moving to the next table.

After completing these steps, you can reverse engineer the schema in your Access database using the MySQL Migration Toolkit.