Migrating to MySQL

Ted Wennmark, consultant and cluster specialist

MySQL is Everywhere

MULTIPLE PLATFORMS

LAMP
Linux Apache MySQL PHP,Perl,Python

Mac

redhat

solaris

opensolaris

Microsoft Windows

suse

MULTIPLE LANGUAGES

php

perl

python

Java

Microsoft .NET

Ruby

C C++ C#

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MySQL – Cross-Platform Flexibility

- Support for 20+ Platforms
- No Lock-in
- Develop/Test on X, release on LAMP, SAMP, WAMP etc.
- OEM/ISVs Embedding MySQL Ship into More Markets and Provide more Flexibility to End Users

Broad Language Support

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MySQL Connectors

Developed by Oracle

- Connector/ODBC ODBC
- Connector/Net ADO.NET
- Connector/J JDBC
- Connector/C C API
- Connector/C++ C++ API

Community

- PHP
- Perl
- Python
- Ruby
- and more ...

Hardware: The Perfect MySQL Server

- CPU
  - ✓ MySQL 5.5 scales to 24 cores
  - ✓ MySQL 5.6 scales up to 48 (60) cores
- Memory
  - ✓ Normally more is better
  - ✓ InnoDB buffer pool need to hold “hot data”
- Network
  - ✓ At least 2 x NICs for redundancy
- For replication
  - ✓ Slaves should be as powerful as the Master

Hardware: The Perfect MySQL Server

- Disk subsystem (options next slide)
  - ✓ Fast HD (if possible 10-15k rpm)
  - ✓ More disks are often better! – 4x recommended, more spindles increase IO
  - ✓ RAID 10 best, RAID 5 ‘maybe OK’ if very read intensive
  - ✓ Separate random and sequential IO (logs and table spaces)
  - ✓ Top performance:
    - ✓ SAN + BBWC
    - ✓ Fusion-IO cards

Hardware: Disk system

- Hardware RAID battery backed up cache is critical!
- Use LVM on Linux (Snapshots)
- Own disk/partition for mysql data
  - ✓ Location of data- and logfiles on different spindles?
- EXT4 and XFS good choice for Linux
  - ✓ mounting “noatime” an option?
  - ✓ mounting “nobarrier” an option?
  - ✓ Blocksize?

- Check settings & partitions for Windows as well!
  - ✓ HKLM\System\CurrentControlSet\Control\FileSystem\ is NtfsDisableLastAccessUpdate

Migrating to MySQL

- Importing data to MySQL
  - mysqlimport
  - LOAD DATA INFILE
  - Read DML into mysql client using source command
- Complete tools for migrating data and objects
  - MySQL Workbench
  - SQLWays (from partner Ispirer)

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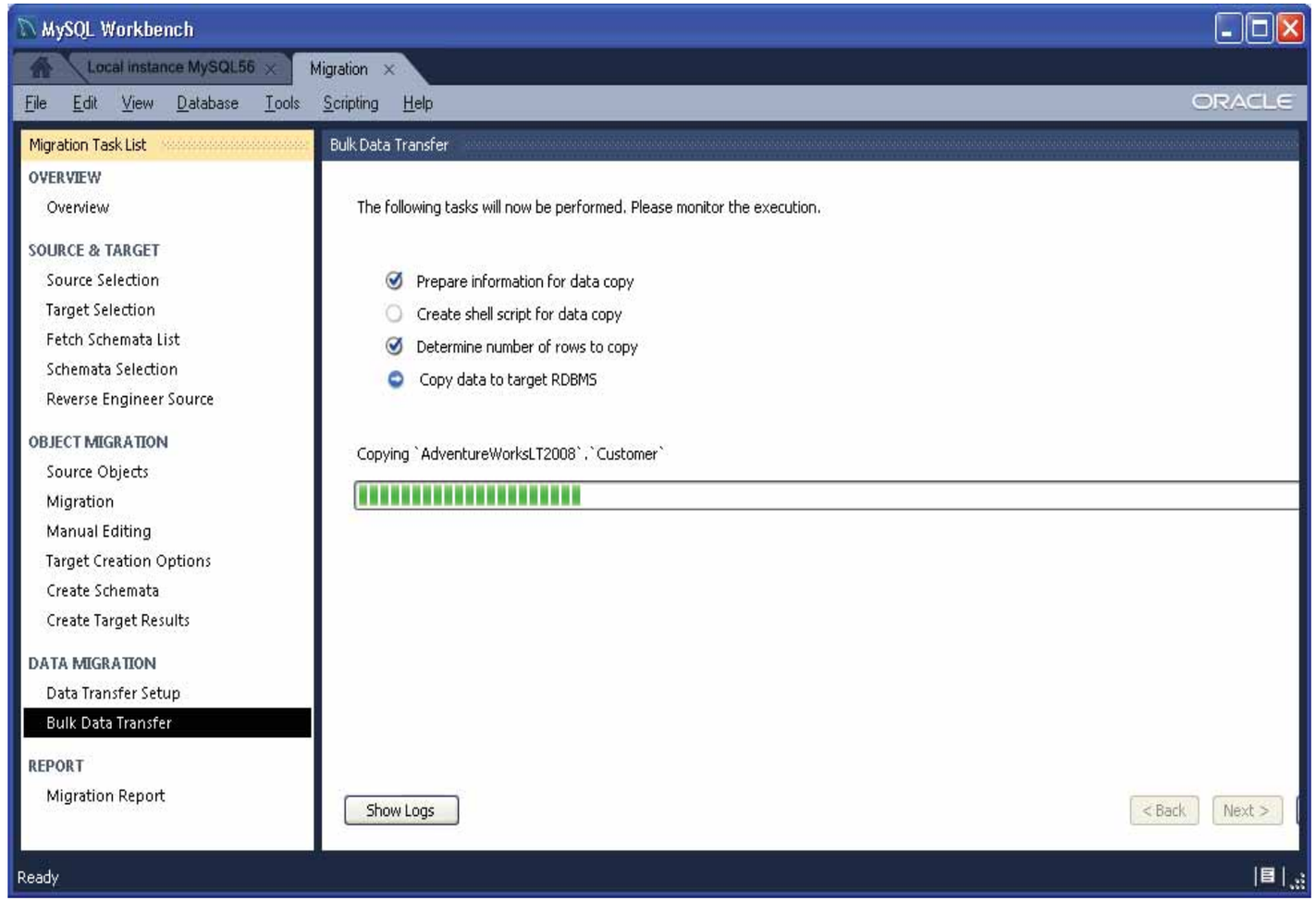
Workbench – Easy Data Migration

- Easy Migration
  - Microsoft SQL Server
  - PostgreSQL
  - Sybase ASE
  - Sybase SQL Anywhere
  - SQLite, MS Access u. a.
- Normally based on ODBC



Workbench – Easy Data Migration

Migration project management

allows migrations to be configured, copied, edited, executed and scheduled.

Source and Target selection

allows users to define specific data sources and to analyze source data in advance of the migration.

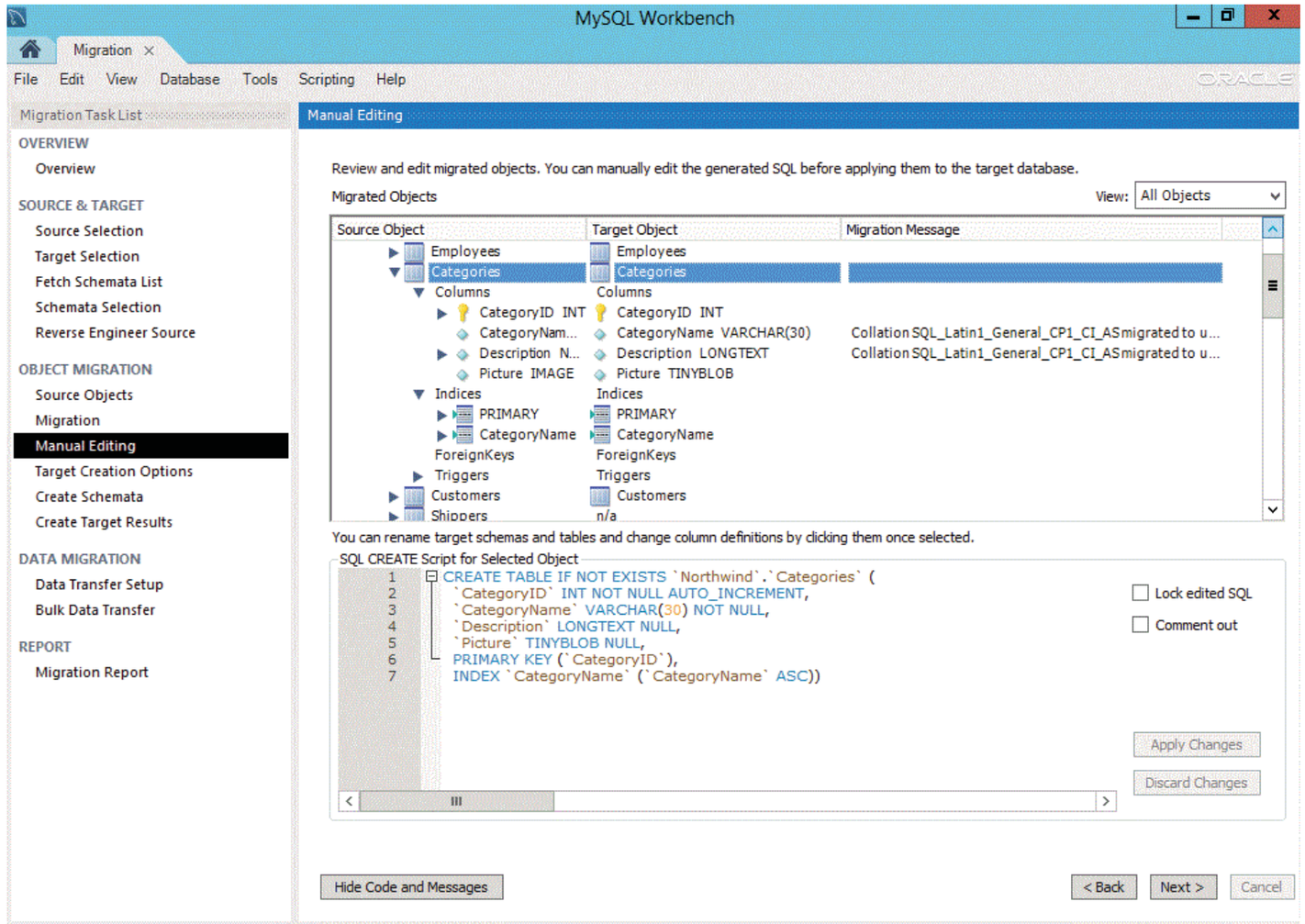
Object migration

allows users to select objects to migrate, assign source to target mappings where needed, edit migration scripts and create the target schema.

Data migration

allows users to map source and target data and data types, set up data transfer and assign post data transfer events where needed.

Workbench – Easy Data Migration



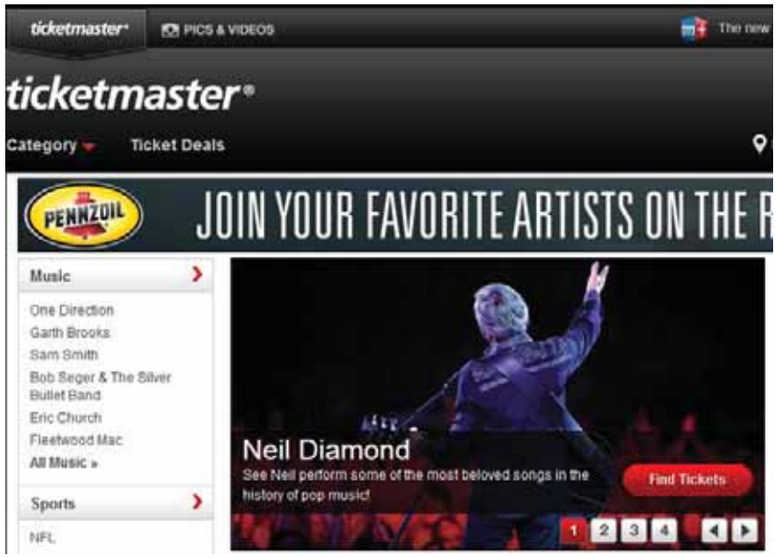
MySQL Architecture Comparison (Example)

Area	MySQL	Microsoft SQL Server
Memory Caches	• InnoDB data cache • InnoDB log cache • MyISAM key cache • Dictionary cache • Query Cache • User caches	• Buffer cache • SQL cache • Misc caches (lock, connection, workspace, etc.)
Redo/Undo Logs	• InnoDB Undo Space • InnoDB Logs • Binary Log	• TempDB (2005+) • Transaction Logs
Data Storage	• Tablespaces • Table/Index Files • Format files	• Filegroups • Files
Optimizer	• Cost-based	• Cost-based

MySQL Core Feature Set Comparison (Example)

Feature	MySQL	Microsoft
Standard Heap Tables and B-Tree Indexes	☑	☑
Partitioned Tables/Indexes	☑	☑
ACID Transaction Support	☑	☑
Row-Level Locking, MVCC (readers don't block writers)	☑	☑
Server-Enforced Referential Integrity	☑	☑
Advanced Indexing (Clustered, Full-Text)	☑	☑
Robust datatype support (BLOB's, varchar, datetime, numerics, etc.)	☑	☑
Replication	☑	☑
Stored Procedures, Triggers, Functions, Cursors, Updateable Views	☑	☑
Highly-Available Clustered Database	☑	☑
Cost-based Optimizer	☑	☑
Online Backup with Point-in-Time Recovery	☑	☑
Terabyte Database Size Capable	☑	☑
Open Source	☑	

Ticketmaster



Company Overview

Ticketmaster and Live Nation merged to create Live Nation Entertainment. the world's leading live entertainment company selling tickets to millions of fans.

Application

By migrating from Microsoft SQL Server to MySQL and Oracle, Ticketmaster.com improved scalability by 4X.

Why MySQL and Oracle?

"*At Ticketmaster, we use MySQL and Oracle to complement each other. The end result is a highly-distributed, optimal-performing database environment that powers one of the largest e-commerce and ticketing sites in the world.*" Ed Presz, Vice President, Database Services, Ticketmaster/Live Nation Entertainment, Inc.

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COMPANY OVERVIEW

- Leading telecoms provider across Europe and Asia. Largest Nordic provider
- 184m subscribers (Q2, 2010)

CHALLENGES / OPPORTUNITIES

- Extend OSS & BSS platforms for new mobile services and evolution to LTE
- OSS: IP Management & AAA
- BSS: Subscriber Data Management & Customer Support

SOLUTIONS

- MySQL Cluster
- MySQL Server
- MySQL Support Services

CUSTOMER PERSPECTIVE

"Telenor has been using MySQL for fixed IP management since 2003 and are extremely satisfied with its speed, availability and flexibility. Now we also support mobile and LTE IP management with our solution. Telenor has found MySQL Cluster to be the best performing database in the world for our applications."

- Peter Eriksson, Manager, Network Provisioning

RESULTS

- Launch new services with no downtime, due to on-line operations of MySQL Cluster
- Consolidated database supports Subscriber Data Management initiatives
- MySQL Cluster selected due to 99.999% availability, real time performance and linear scalability on commodity hardware

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Gina Tricot

Company Overview

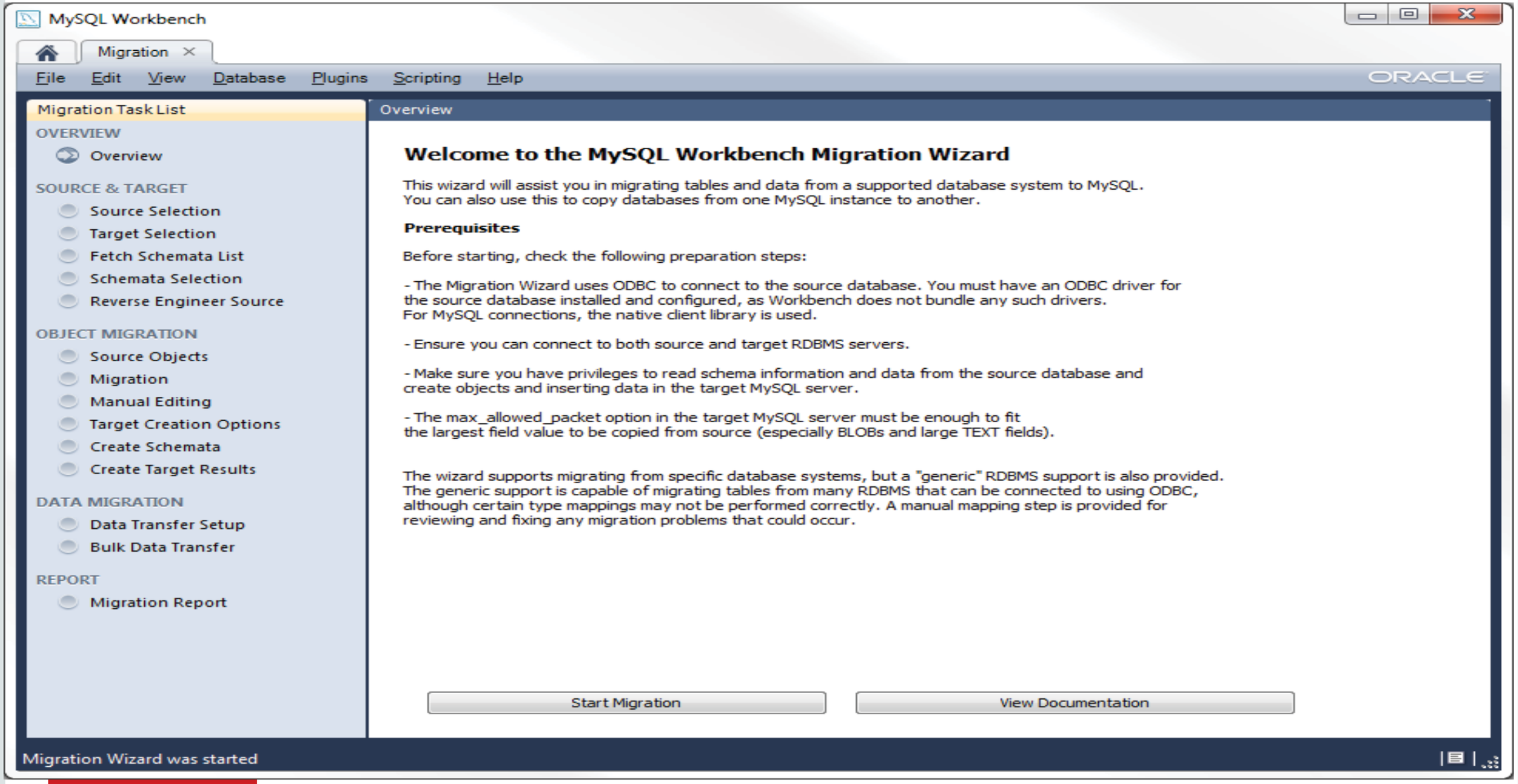
Swedish fashion chain with over 180 stores, and selling online in 28 countries.

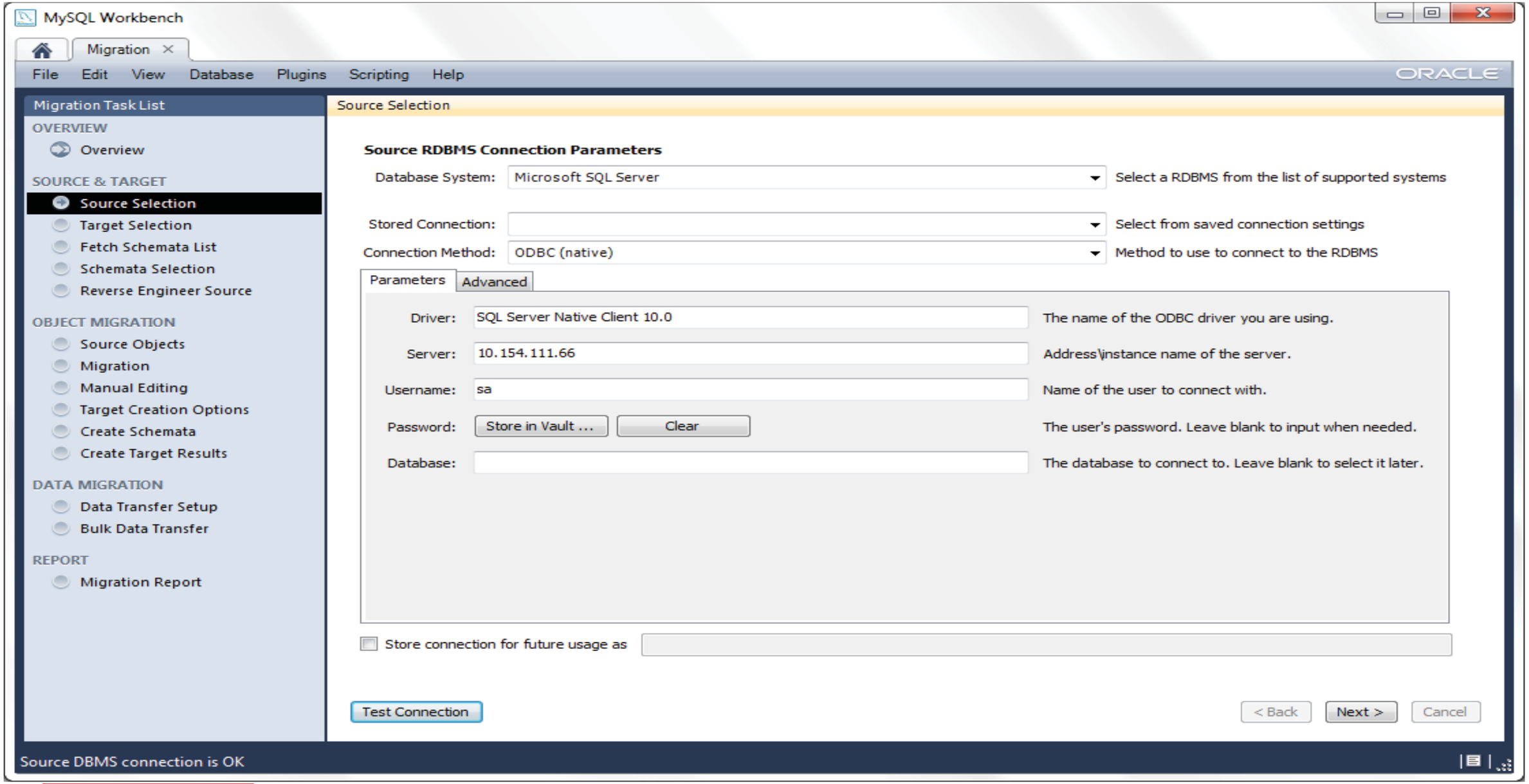
Application

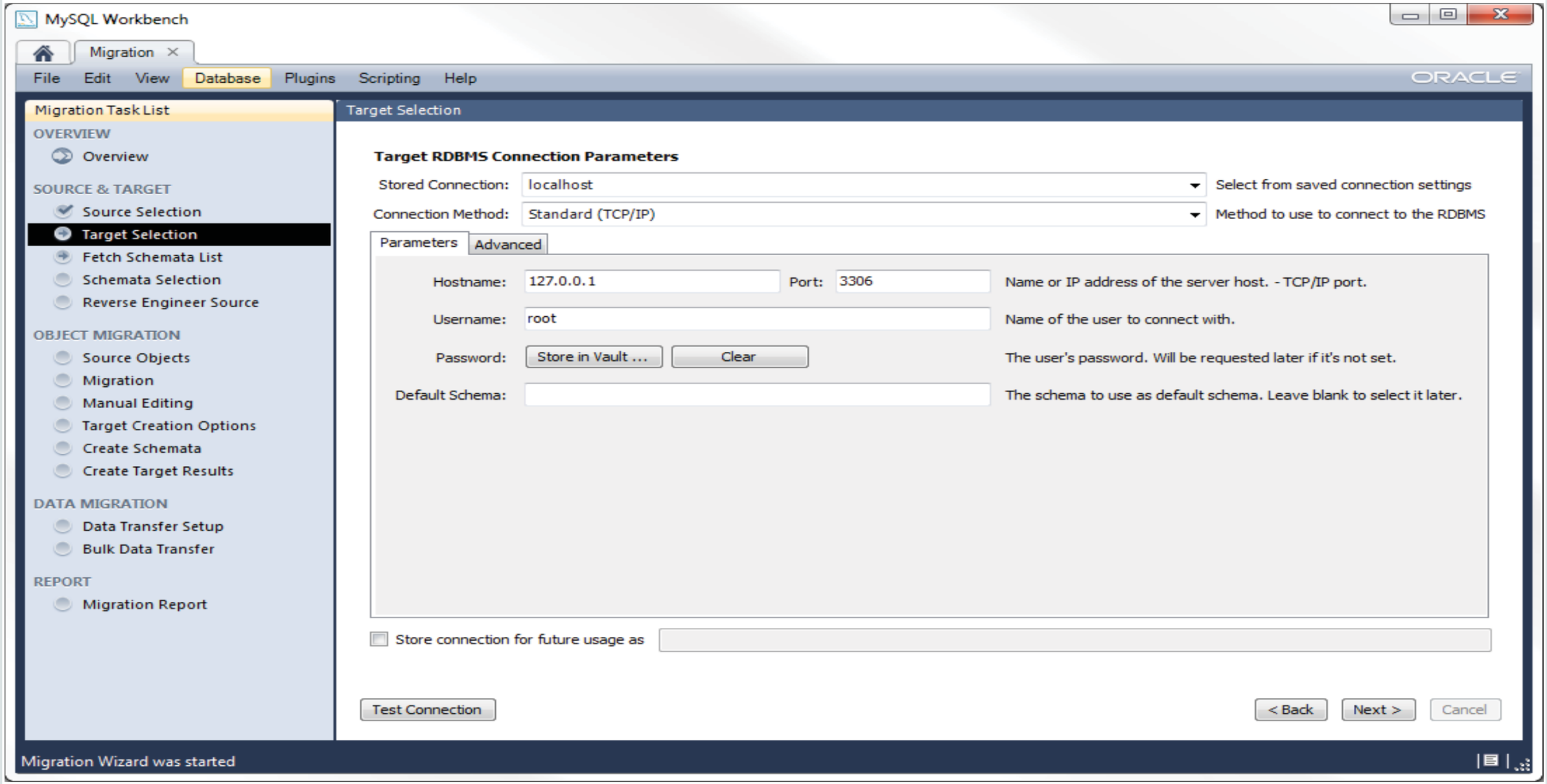
Cloud-based e-commerce application powered by MySQL Enterprise Edition (initially built on Community Edition).

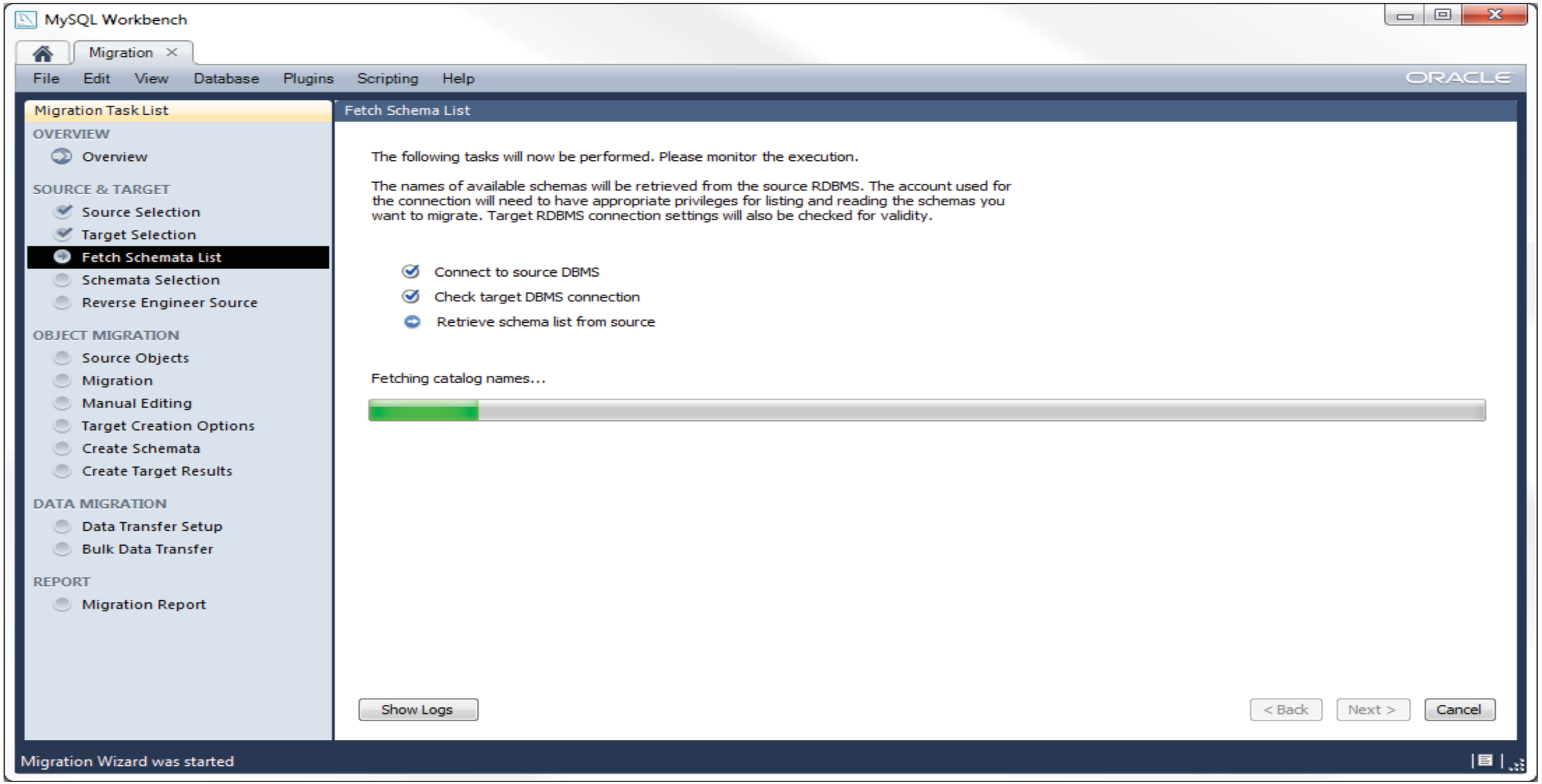
Why MySQL Enterprise Edition?

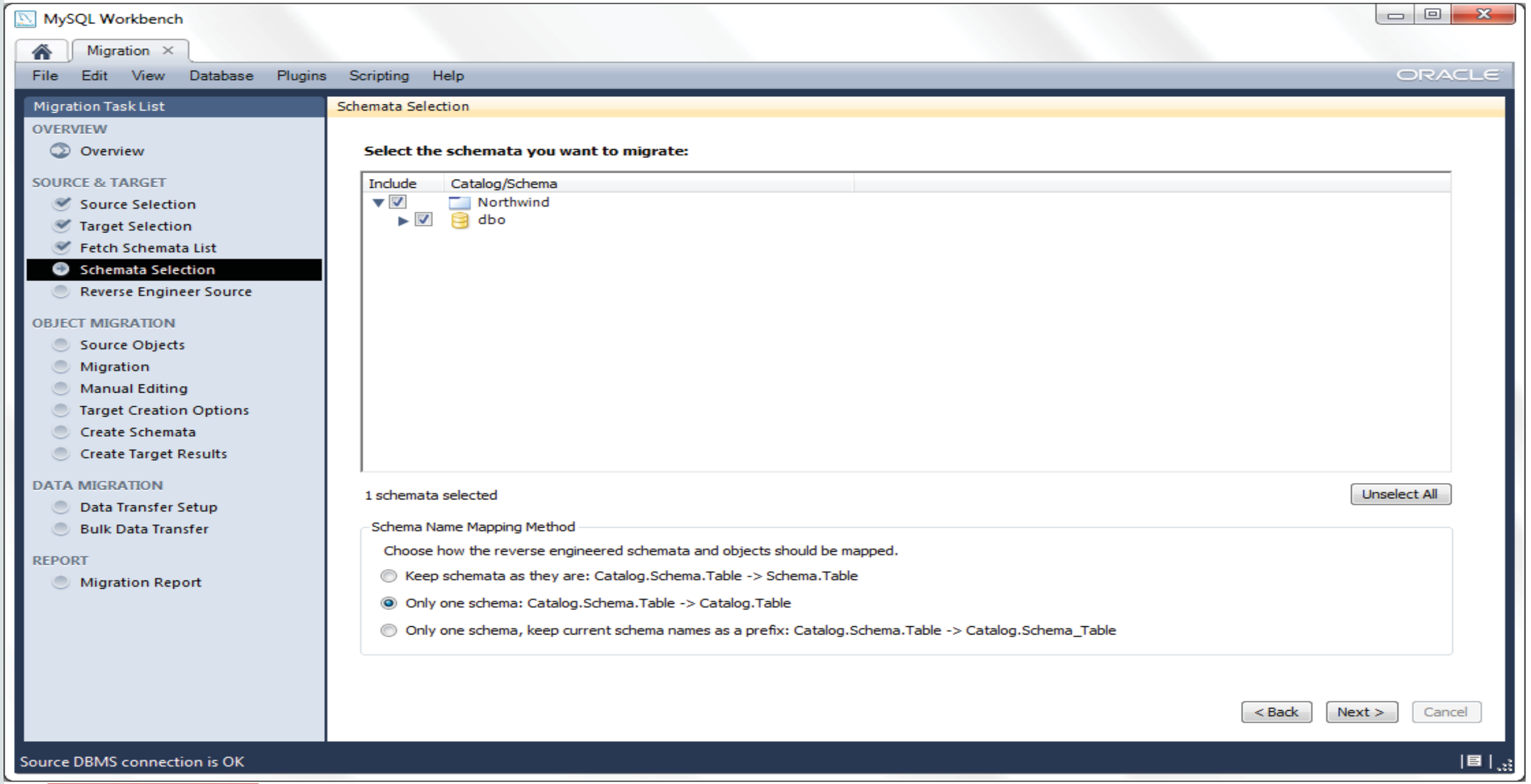
"MySQL Enterprise Edition enables us to expand and grow online sales in both existing and new countries while maintaining a low TCO. It is a high performance, scalable and easy to monitor database; we're extremely pleased with it." Nicklas Griphem, Manager Server & Infrastructure, Gina Tricot



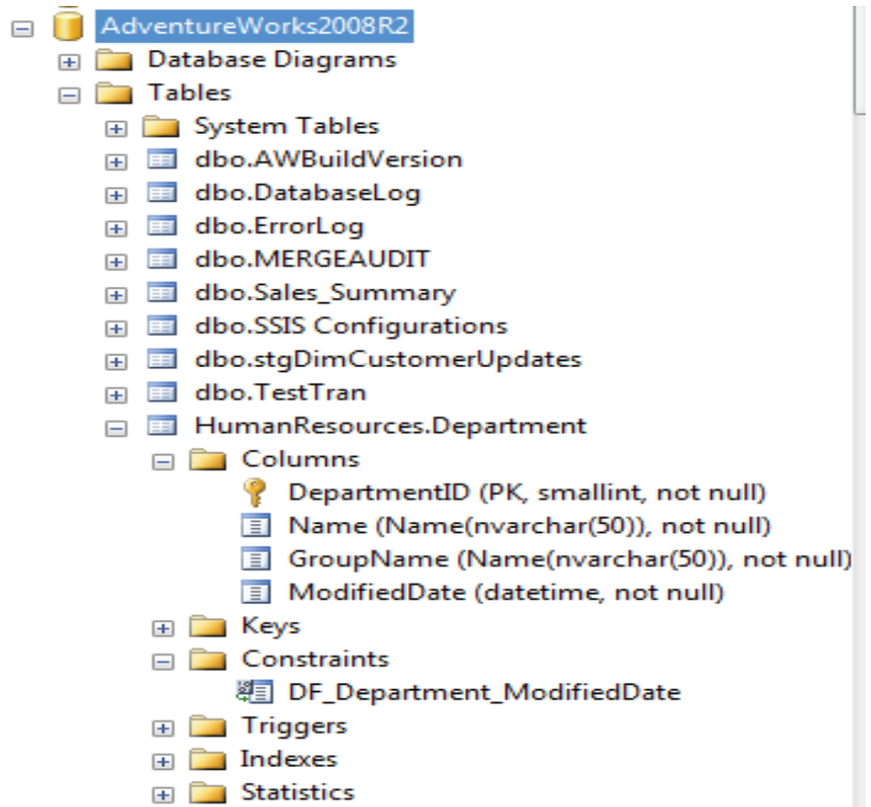








MS SQL Server Catalog/Schema mapping



- Catalog.Schema.<object>
- AdventureWorks2008R2
  - HumanResources
    - Department
- Mapped in MySQL as either

  AdventureWorks2008R2
  - HumanResource_De...
- or as

  AdventureWorks2008R2
  - Department

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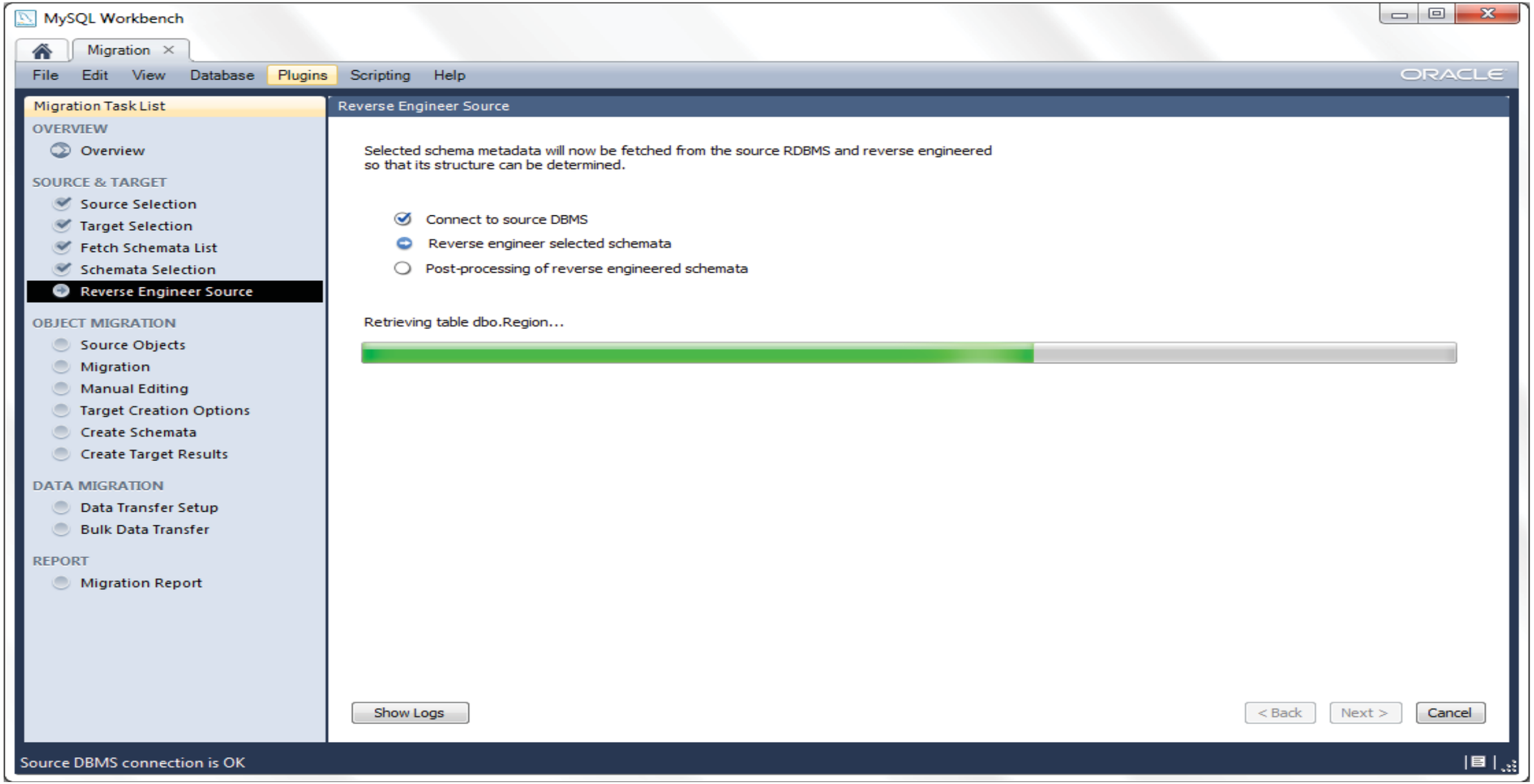

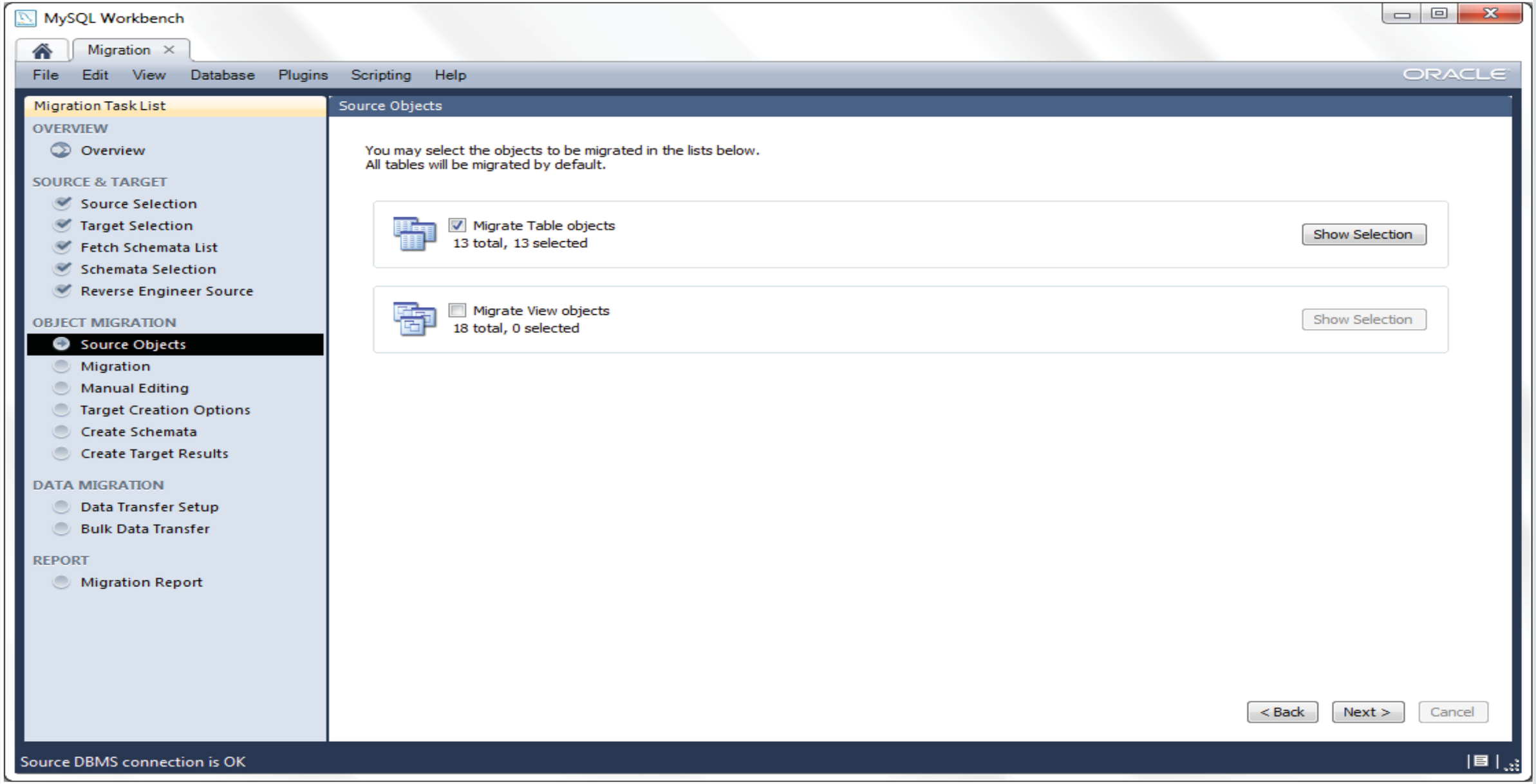

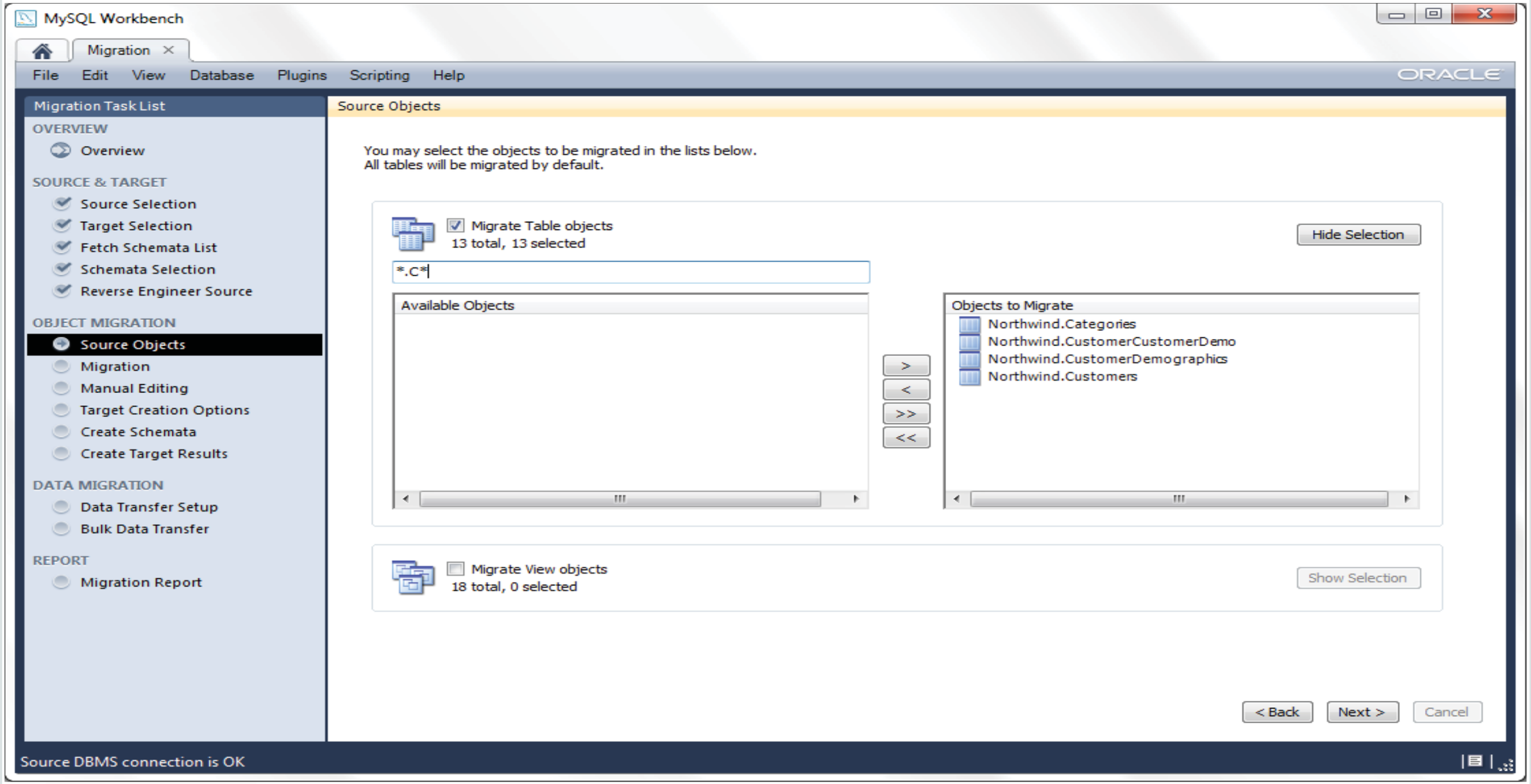

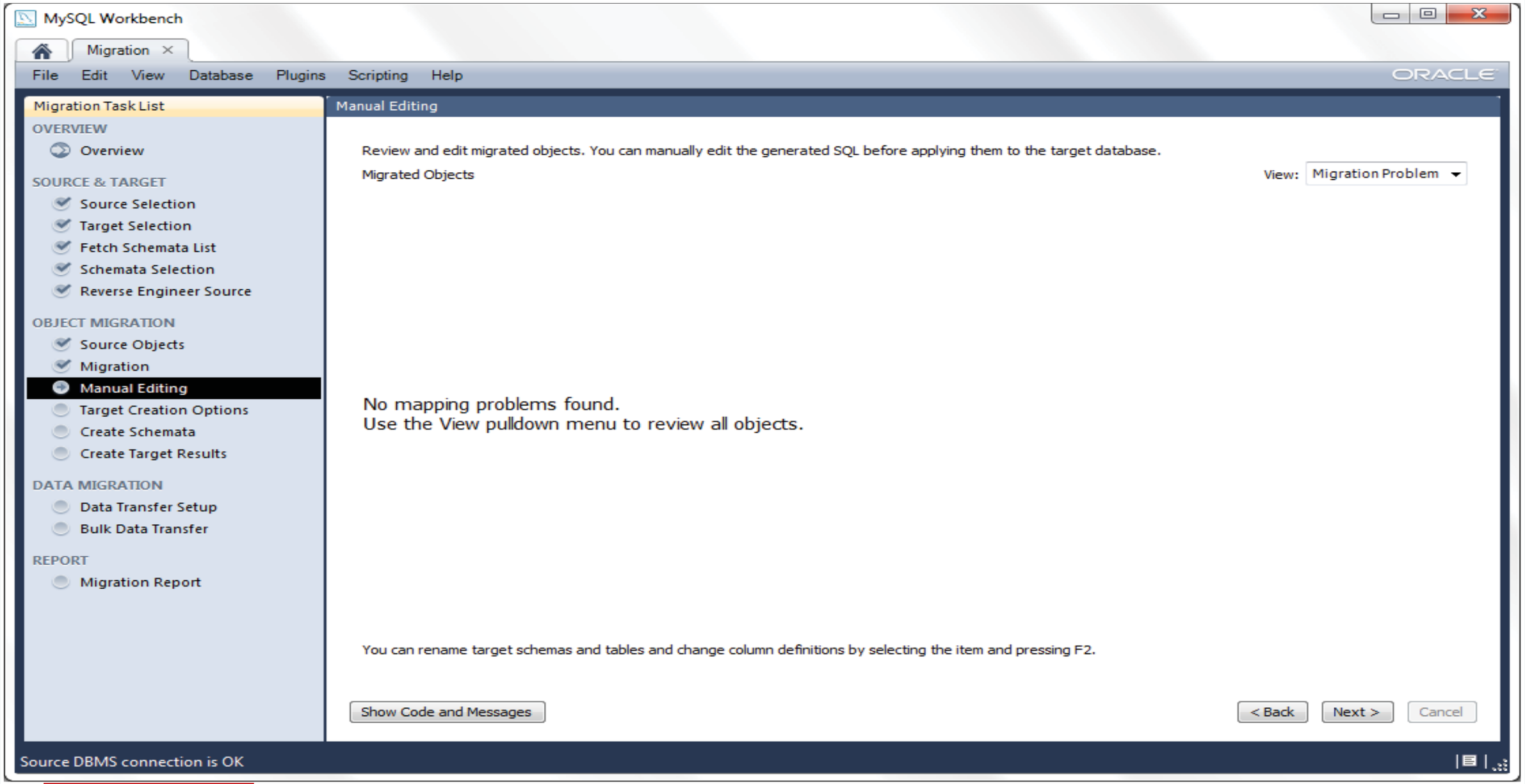

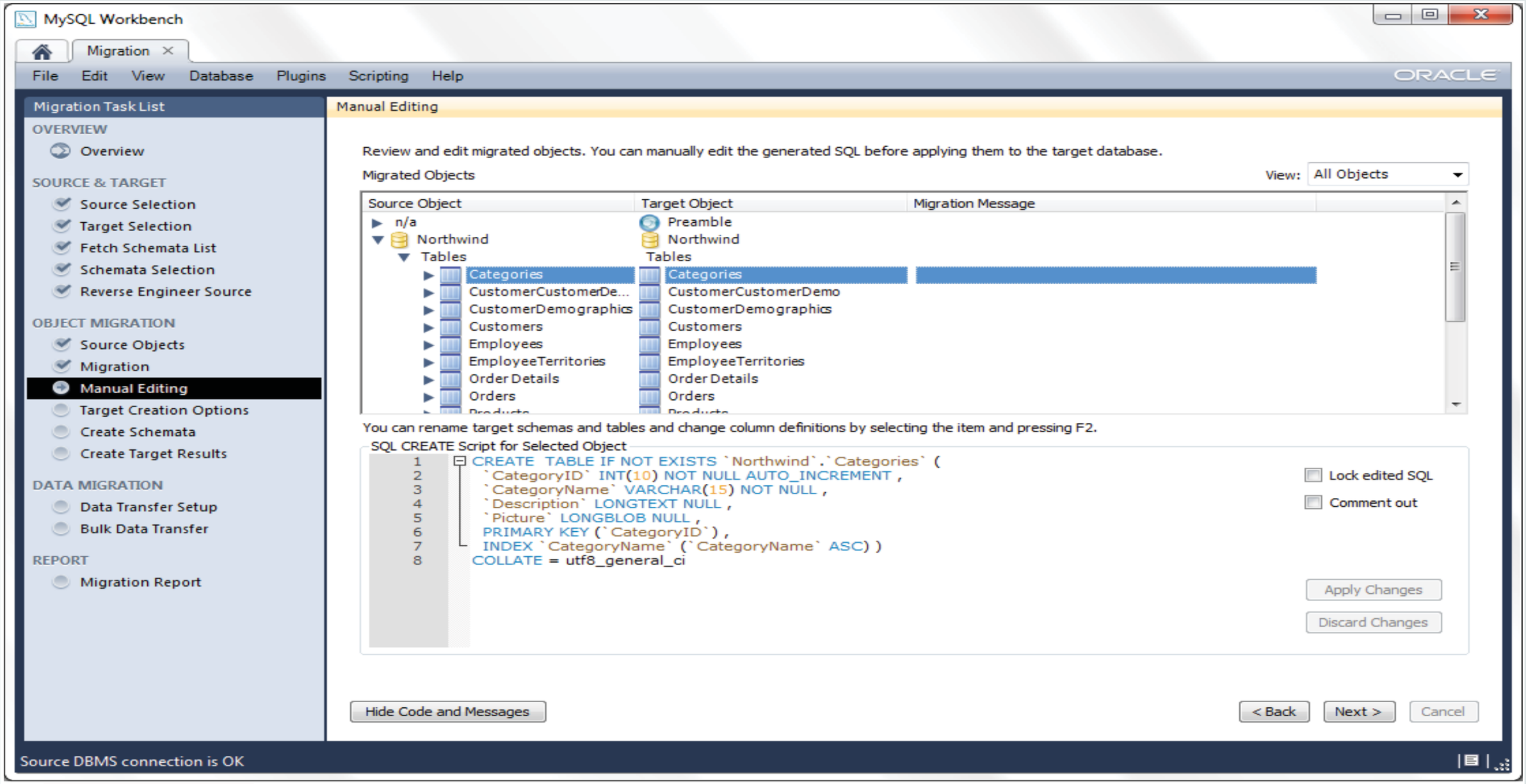

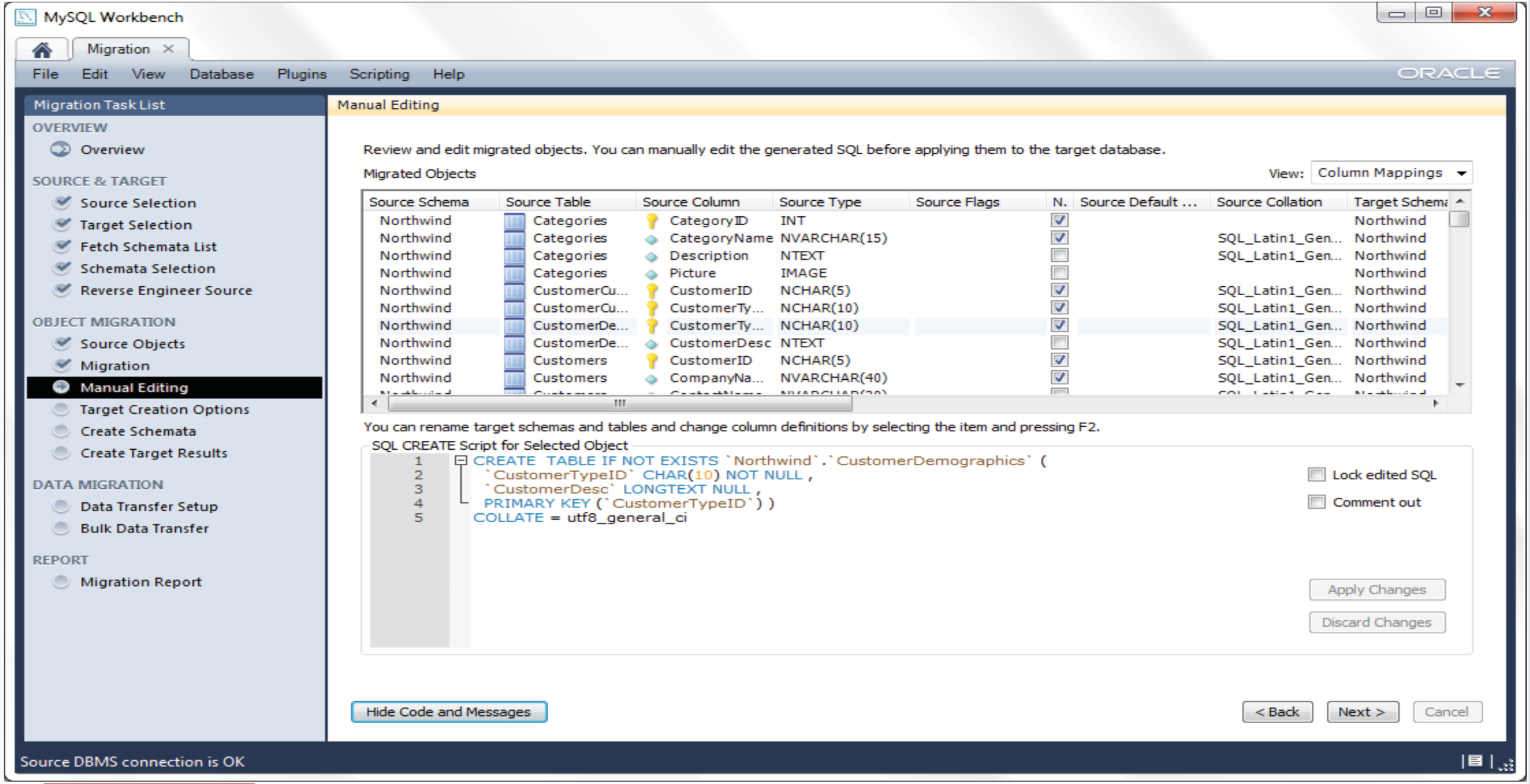

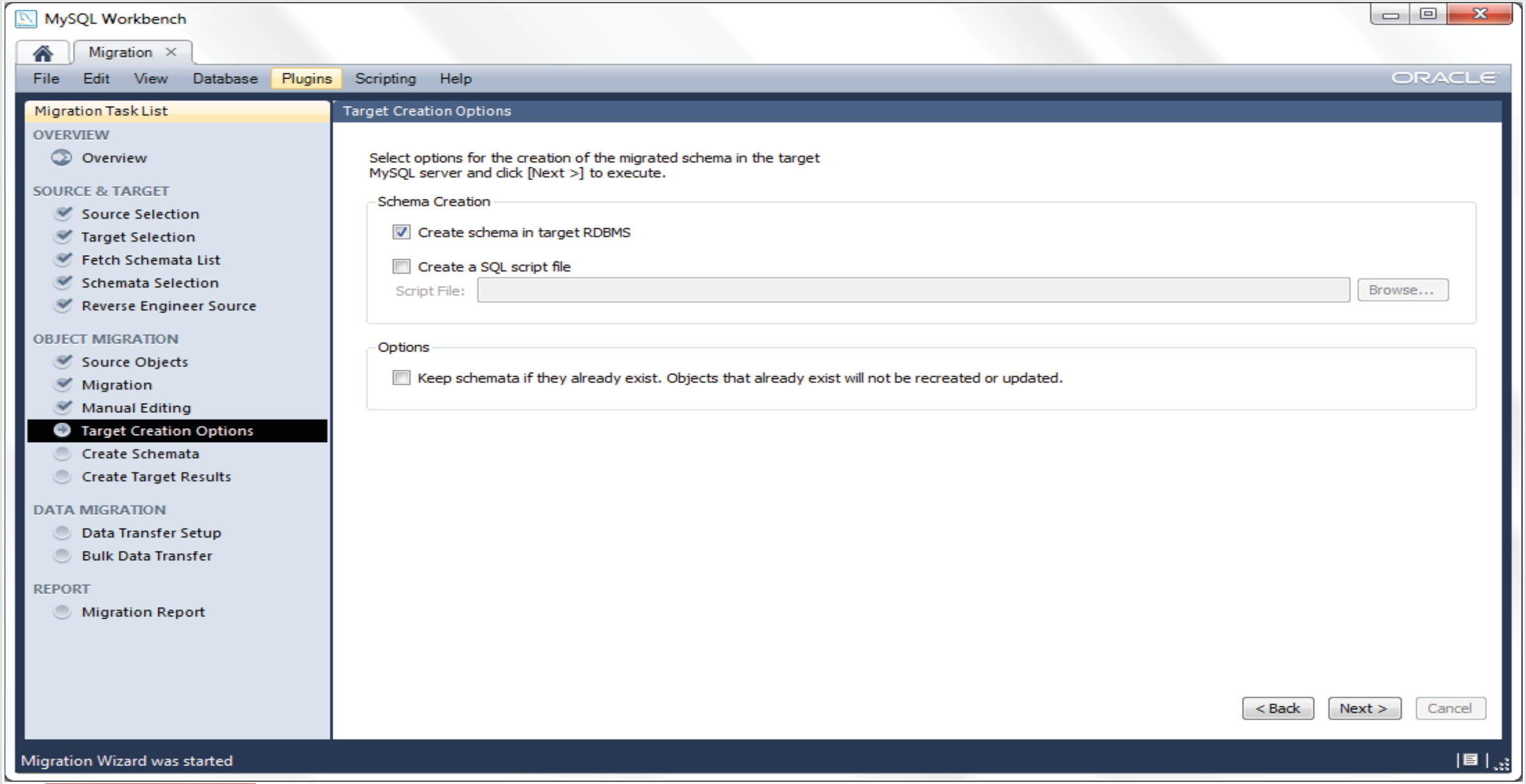

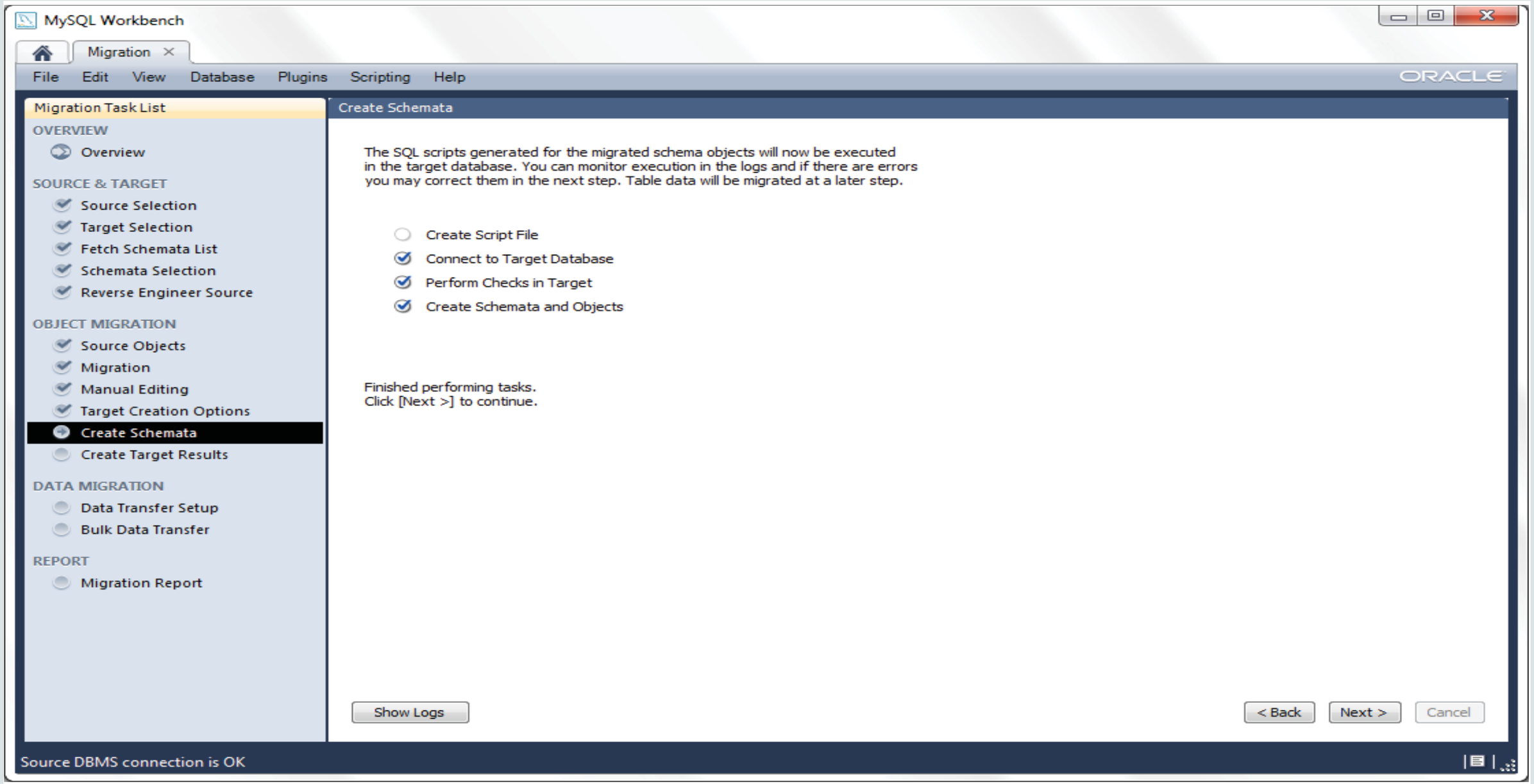

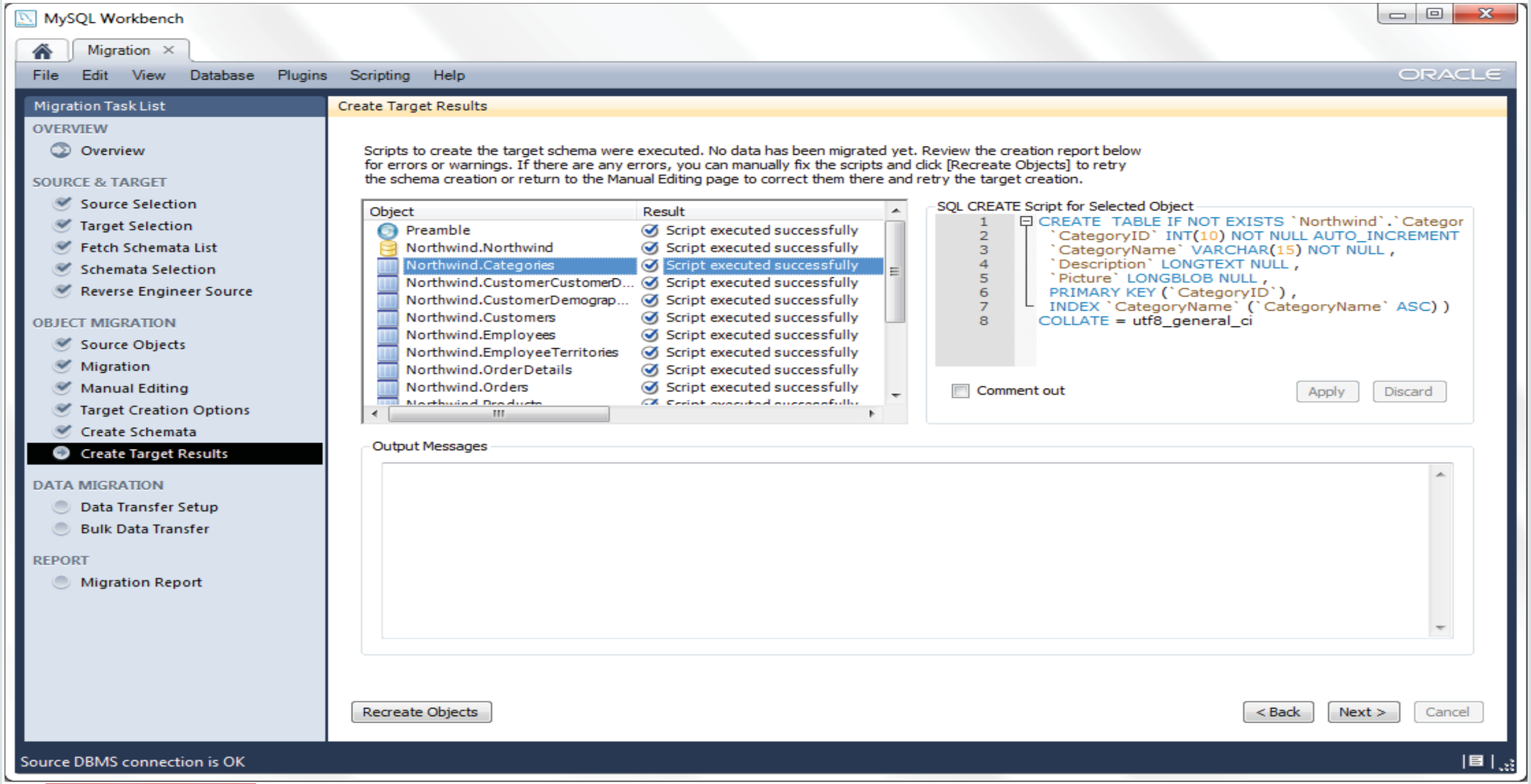

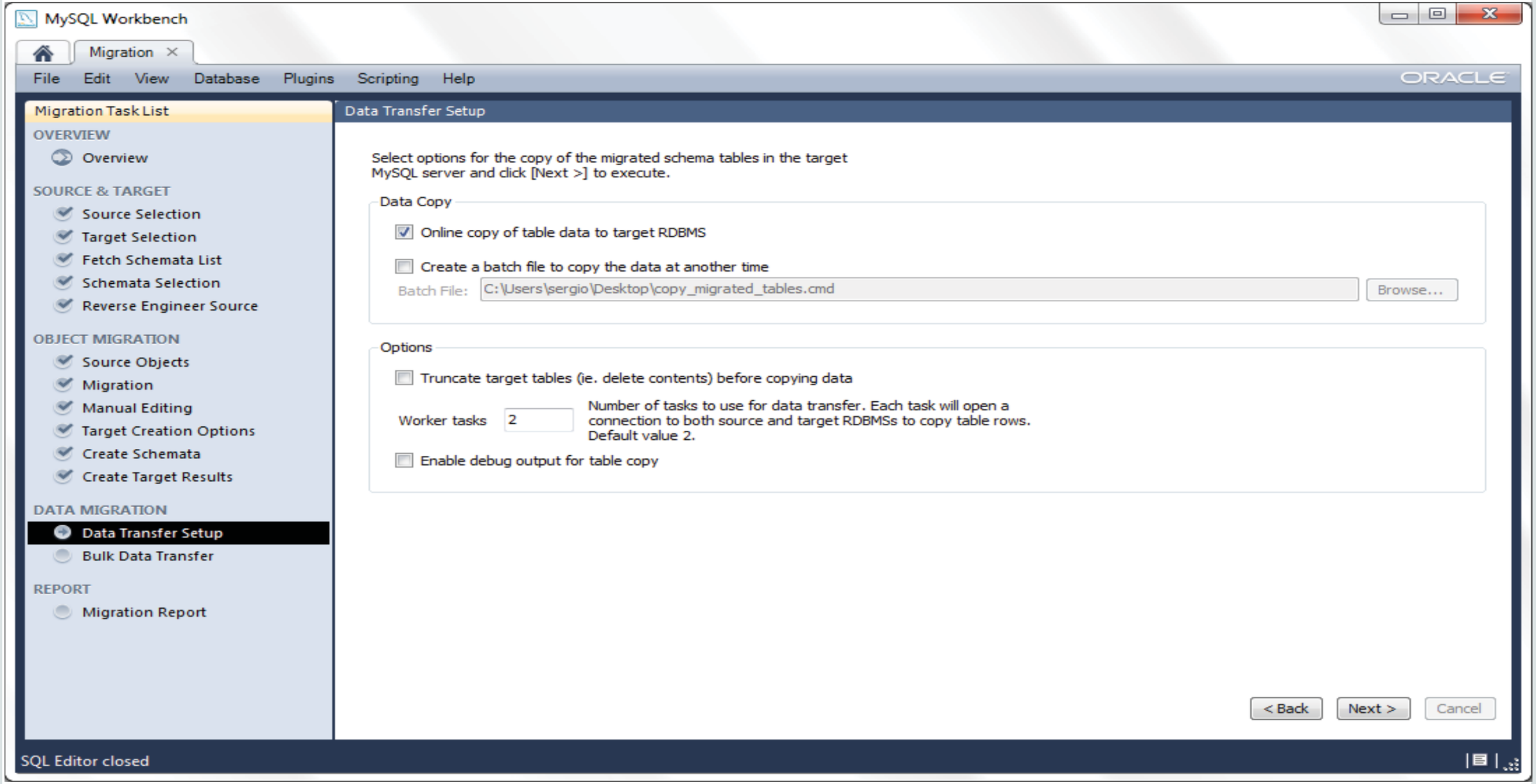

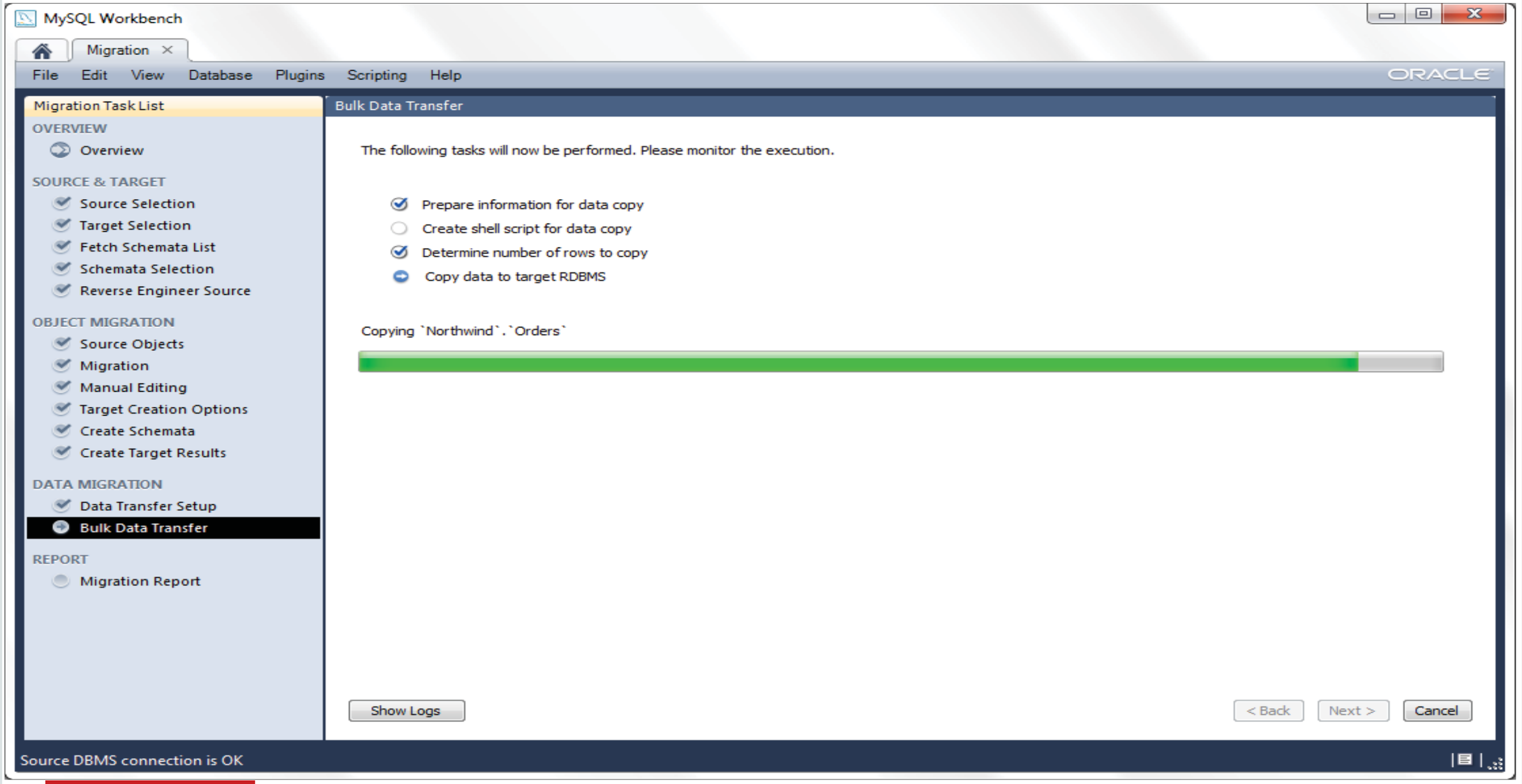

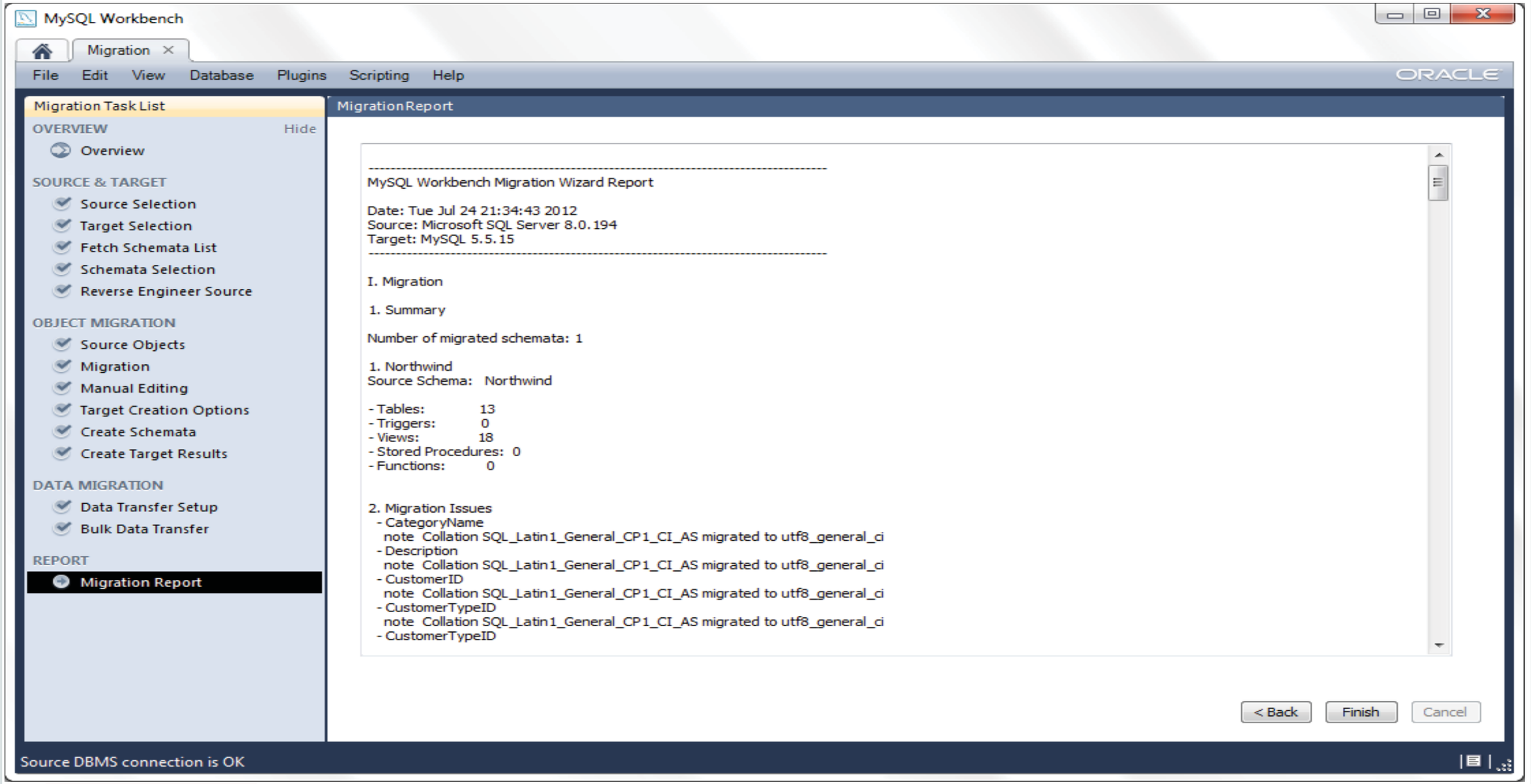

Getting Started

MySQL Workbench

- http://www.mysql.com/products/workbench/migrate/
- http://www.mysql.com/why-mysql/white-papers/guide-to-migrating-from-sql-server-to-mysql/

MySQL Migrations

- http://www.mysql.com/news-and-events/web-seminars/mysql-on-windows-new-migration-wizard/
- http://www.ispirer.com/products/mysql-migration

MySQL Case Studies

- http://www.mysql.com/customers/view/?id=684
- http://www.mysql.com/customers/view/?id=1143

Thank You!

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