BTR2SQL

Quick Start Guide

Overview

Thank you for downloading our free trial or purchasing Mertech's Btrieve to SQL database application drivers. This Quick Start Guide will help you perform your first migration.

BTR2SQL includes a Migration Utility and a dynamic link library (DLL). This guide will walk you through using the Migration Utility to migrate your existing Btrieve database to a Microsoft SQL Server, Oracle, MySQL or PostgreSQL database. The utility automatically creates new SQL tables and indexes from your existing Btrieve data. After the migration, BTR2SQL uses the DLL to allow your application to access these new files from your SQL backend.

If you need more information while performing your migration, reference the full BTR2SQL User's Guide included in your BTR2SQL installation.

Prerequisites

Important: The BTR2SQL migration requires data dictionary files (DDFs). BTR2SQL uses DDFs to determine field types, field names, and field size, as well as index structures. If you do not have DDFs, please contact us before performing a migration.

Before you start your migration, confirm you have all the following necessary components installed and configured. If you're unsure about how to enable any of these components, refer to your own documentation or contact us for assistance.

Component	Why You Need It
Btrieve 7 or above	The Btrieve engine reads your existing data during the migration. You can use a workgroup engine, a server engine, or a client with the server engine hosting the data on another computer.
Btrieve data files with schema defined in Btrieve 7+ DDFs	DDFs define the layout, or schema, of the tables in the Pervasive.SQL database. Without DDFs, BTR2SQL can't migrate data to SQL.

A target SQL backend	BTR2SQL supports migration to Microsoft SQL Server (using BTR2SQL Version 5.3 and below), MySQL, Oracle, and PostgreSQL backends (using BTR2SQL Version 5.2 and below). You must have one of these backends installed and running before attempting a migration. You must also have installed the related client software on the computer you're using to perform the migration. Additional database specific prerequisites follow: **Microsoft SQL Server** ● Your server must be Microsoft SQL Server 2005 or higher (including Azure). ● You must set the DB_Owner role to the User ID you plan to use during migration. ● We recommend you use SQL Server 2012 Native Client, as it provides the fullest data type support. Alternatively, you can use 2008 or 2005 Native Client. **MySQL** ● Your server must be version 5.1 or higher. ● If your MySQL Server is version 5.1.5 or below, you must grant Super rights to the User ID you plan to use during migration. **Oracle** ● Your server must be version 9.x or higher. ● Using Oracle's Security Manager, add the Select Any Table privilege to the User ID you plan to use during migration. **PostgreSQL** ● Your server must be version 9.1 or above. ● Because PostgreSQL does not support storing Zero (null) bytes in a string, you must include the Binary flag on DDF fields (bit 12/0x1000 on field flags) that must include a Zero byte.
.NET Framework 3.5	BTR2SQL will automatically install .NET 3.5 if is not installed on your machine, unless you are using Windows 8. Windows 8 uses .NET 4, but will prompt you to install .NET 3.5 during your migration (if it is

	not installed already).

We also recommend you pre-allocate database or table space on your new backend according to the size of your Pervasive.SQL database. You should leave room for growth if possible and defragment the drive. Defragmenting the drive ensures tables won't be fragmented across your hard disk.

Installation and Licensing

If you've purchased a driver, you received a license file and instructions inside the BTR2SQL ZIP package. Follow the instructions to register your driver. Then, make sure you've included the license file (sql_btr.cfg for Microsoft SQL Server, mys_btr.cfg for MySQL, ora_btr.cfg for Oracle, or pgs_btr.cfg for PostgreSQL) in the following places:

- Your Windows PATH
- Your installation folder (<programfiles>\Mertech Data Systems\DB Drivers\Btrieve\bin)
- The folder that includes your Pervasive access DLL and your application exe (see step 4 below for more details)

If you're evaluating the product, the BTR2SQL installer provides a full-use, 14 day trial license that allows you to test BTR2SQL alongside your application and an obfuscated version of your data. If you want to request more time with the trial license, or you have any other questions, contact us at sales@mertechdata.com or +1.954.585.9016. Be sure to provide your company name and information on how you intend to use our driver.

Migrating Your Data

This section will walk you through migrating your data, step-by-step.

1. Validate Your DDFs

Any incongruities in your DDFs, even minor information mismatches, can cause trouble during your migration. This is why **you must run the DDF Validation Tool included in your install before performing a migration**, to ensure your DDFs are accurately defined. The validation tool searches for common DDF definition mistakes and anomalies, examining every table, field,

and row in your database. If the validation tool finds an error, it shows the corresponding error code and suggests how you should fix the error.

We recommend all customers validate their DDFs, even those who've had them for years. We also recommend you re-validate your DDFs any time you modify them.

For more information on the DDF Validation Tool, refer to the BTR2SQL User's Guide included in your install.

2. Migrate Your Data to Your SQL Backend

Open the BTR2SQL Migration Utility and use the following instructions to migrate your data to SQL:

1. From the menu, click *Select Files* and select the files and tables you want to migrate. We recommend choosing *Select All* to migrate all your data at once.
2. Choose *Convert Data Files*.
3. Click *OK* to migrate the selected tables using BTR2SQL's default settings.

At this point, BTR2SQL creates table definition files (.INT) that allow your application to access data in SQL. The application then creates SQL tables and copies your data from Btrieve to SQL.

Notes: If Pervasive.SQL and the data you need to migrate reside on a machine other than your new Microsoft SQL or Oracle server, run the migration on your Pervasive.SQL machine. This allows the machines to divide the migration's processing requirements.

Also, if you test your application against your SQL backend at this point, you might discover some table definitions are misaligned. If so, we recommend you correct your DDFs and then re-migrate the affected tables to SQL.

3. Verify the Migration

Run the Migration Validator included in your install to validate the migration process. The Migration Validator uses a standard Btrieve API to read rows from Btrieve and SQL simultaneously and compare the data buffer returned. The validator shows a message if it finds any mismatches.

If you need more information about the Migration Validator, refer to the BTR2SQL User's Guide.

4. Replace Your Btrieve Access DLLs

32-bit Windows applications accessing Btrieve data via DLLs use either wbtrv32.dll or w3btrv7.dll. You must replace these standard DLLs with the DLLs included in the BTR2SQL installation, so your application can send and retrieve data from SQL. You can find our DLLs by following the path %ProgramFiles(x86)%\Mertech Data Systems\DB Drivers\Btrieve\deploy\

If you're not sure which DLL you're using, we recommend you replace both. There are several places you can put the replacement DLLs, but your application must be able to find your new DLLs using Windows's standard DLL Search Order.

Typically, you should place our replacement DLLs in the directory that includes your application's executable (.EXE) file. Windows searches for dependencies here first, so this should guarantee that your application will use the new DLL.

However, in odd situations, you might want to place the replacement DLL in:

- The system directory (%windir%\system32, or %windir%\SysWOW64).
- The 16-bit system directory (%windir%).
- The current directory.
- The directories listed in the PATH environment variable. Note this does not include the per-application path specified by the App Paths registry key. The App Paths key is not used when computing the DLL search path.

Then, you must delete and replace the Pervasive DLLs in your PVSW\BIN folder. This ensures your application will use your new DLLs. However, many Pervasive tools will no longer work after you replace the DLLs in this folder. For example, if you need to correct your table definitions in the future, you'll have to restore your original Pervasive DLL. **Be sure to save a copy of your original Pervasive DLLs before you replace them.**

Important: The BTR2SQL license file must also be found in the system PATH. We recommend you place BTR2SQL's .CFG file in the same folder as the BTR2SQL DLL. For example, if your application executable file is located in c:\myapp\bin, and you will be accessing data in Oracle, you should copy C:\Program Files\Mertech Data Systems\DB Drivers\Btrieve\deploy\oracle\ w3btrv7.dll and ora_btr.cfg to C:\myapp\bin.

5. Run Your Application

After you've replaced your DLL, run your application to confirm it works as expected. A Server Login dialog box will appear, indicating the program is now

accessing your new backend. Enter the User ID and password for your SQL server. (If the dialog box does not appear, either the application did not find your Mertech DLL or you've previously saved your User ID and password.)

The application will now send and receive data from your new backend. Perform your normal testing routines to confirm your application functions correctly alongside your new backend.

At this point, you can shut down your Pervasive services and stop your workgroup engine (provided you don't want to access Btrieve and SQL data simultaneously). Your application will continue running as expected using your new SQL server.

6. Deploy Your Application

When you deploy your application on other machines, take the following considerations into account:

- If your application does not need to access Btrieve and SQL data simultaneously, you don't need to include the Pervasive components located in the pvsw directory in your deployment. The Mertech DLL is installed in the application directory instead. You also do not need to include BTR2SQL registry keys, COM registration, Btrieve data files, or your DDFs.
- You must install your SQL server client on the system running the application.
- The application will install .INT files. For example, the application will continue doing a B_OPEN on billing.mkd, even though billing.mkd does not exist. In this example, your new DLL would redirect the action to Billing_mkd.int instead.

To see an example deployment directory structure, refer to the Data Directory Configuration File section in the BTR2SQL User's Guide.

Post-Migration Hardware Considerations

After you complete your migration, we recommend you perform the following steps to maximize your database performance:

1. **Utilize Raid 1+0.** 1+0 provides the best performance and data integrity balance.
2. **Defragment Your Server Drives.** Defragmenting your drives greatly

increases access speed.

3. **Operate with at Least 4G of Client RAM.** More memory provides better performance. Your server's cache should at least include enough memory to allow typical data access, ideally with memory to spare for optimal performance.
4. **Turn Off the Mertech Driver Trace.** During your post-migration testing, you might turn on the Mertech Driver Trace. Remember to turn the driver trace off after testing, to preserve performance.
5. **Place Data Index and Transaction Logs on Different Physical Hard Drives.** This balances your drive access.
6. **For Microsoft SQL Server, Set the Recovery Method to BULK LOGGED.**
7. **For MySQL, Configure the Database to Utilize as Much Server Memory as Possible.** This should boost performance. If you need assistance with this task, refer to your own documentation or contact us. Also, you should set innodb_flush_log_at_trx_commit = 0.

Troubleshooting with Function Executor

Pervasive provides a low-level Btrieve command execution tool called Function Executor. Because this tool runs directly off the BTRCALL function included in the Btrieve access DLL, it allows you to troubleshoot any differences you notice between your application's Btrieve and SQL behavior.

One way to examine the difference between Btrieve and SQL behavior is to create two disk folders. In the first, place the wbexec32.exe file found in the pvsw\bin directory and your original Btrieve DLL (w3btrv7.dll). In the second, place another copy of wbexec32.exe, the replacement Mertech DLL, and your .CFG file (sql_btr.cfg for Microsoft SQL Server, mys_btr.cfg for MySQL, ora_btr.cfg for Oracle, or pgs_btr.cfg for PostgreSQL).

Then, create shortcuts to each of the .EXE files in each folder. Using these shortcuts, you can selectively execute Btrieve API calls against either your Btrieve or SQL database. (Note that you must install the SQL client on your machine to to use Function Executor with SQL.)

Using the Executor's History window, you can save a sequence of API calls and play them back later or repeat them any number of times. As you do this, you can use the small arrow in the lower right corner of the dialog box to record the time needed to execute calls. Comparing these times allows you to gauge the difference in performance between your Btrieve and SQL backends.

Additional BTR2SQL Documentation

For more information on BTR2SQL, refer to the following additional resources:

Document	Includes	Where to Find It
BTR2SQL Help	Detailed info on the Migration Utility, including how to: • Customize your settings. • Create and restructure tables. • Perform index maintenance. • Synchronize relationships. • Perform high-speed script-based migration.	In the Migration Utility, select *Help* from the menu. Or, select Mertech's SQL Drivers for Btrieve App from the Windows Start menu, then select BTR2SQL Utility Help.
BTR2SQL Programmer's Guide	Examples of how to: • Consolidate directories during migration. • Work with multiple databases and servers. • Use stored procedures and result sets. • Propagate changes to customer sites. • Optimize database design. • Improve performance.	Select Mertech's SQL Drivers for Btrieve App from the Windows Start menu, then select Programmer's Guide.
Other	Our website includes a variety of BTR2SQL related documents, such as: • Whitepapers • Case studies • Webinars • Blog posts	Mertechdata.com

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