



TIBCO® Data Virtualization

File Datasources Adapter Guide

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TDV File Data Sources

This topic describes the configuration of file-based data sources. For the purposes of TDV, the file data sources grouped in this topic are those that are file based and require similar configuration options.

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Supported Character Encoding Types

There are over 110 supported character-encoding types, they include:

• Cp1250	• utf-16be
• Cp1257	• utf-16le
• iso-8859-1	• windows-1250
• us-ascii	• windows-1251
• utf-8	• windows-1256
• utf-16	• windows-1257

Supported URL Protocols

Data sources that reference a file, can do so through a URL. TDV supports several URL protocols, including file, http:, https:, ldap, smb, and ftp. For example, your file data source could be located at one of the following URL locations:

- file:///C:/projectstuff/build/trialrun/teststuff/flatfile/USPSaddresses.csv
- file:///\\megawat/engineering/bees/swarmhive/xml_files/royaljelly_xml_1000.xml
- http://rss.news.queenbee.com/rss/topstories
- https://dvirtual-weakhive1/beepackage1/shadyhive10.csv
- ftp://ftp.varoa.fi/pests/standards/RFC/treatment_options.txt
- ldap://dvirtual-waxmoth:389/dc=small,dc=net
- http://dvirtual-waggle/cgi-bin/dance_GetVoters.cgi

- jdbc:PostgreSQL://queenhost:3406/cs030101?continueBatchOnError=false&useUnicode=true
- smb://server/share/frame/file

Type	Limitation
FTP	HTTP, HTTPS and FTP are supported for reading the data. File must be in text format and unzipped.
network location	The URL to the single file must be relative to the machine where TDV Server is running.
machine without a Web server	It must be mapped to the machine where TDV Server is running.

About Export and Import of Custom Java Procedures

Custom Java Procedure JARs are exported with a TDV full server backup (and when using the backup_export), although the tool backup_export -excludejars option can be used to omit those files when required.

An export exception: If the Custom Java Procedure makes use of one or more classpaths referring to other JAR files, those files must be backed-up or migrated separately because they are not picked up and replicated during export.

When a data source is exported, the adapter from which the data source was created is exported as well. In particular, all the files in the data source directory are included in the CAR file.

Custom Java Procedures (CJP) are normally imported into the directory conf/customjars/ when restoring TDV from the full server backup CAR.

The CJP cluster propagation is immediately propagated across the cluster along with its CJP library. Unlike other TDV-defined resources, those resources that can be referred to by

a CJP data source's classpath are not propagated. Such resources must be manually distributed to all cluster nodes.

Adding a Custom Java Procedure

TDV has a JDBC interface and provides a bridge interface so that you can connect to a data source that is not currently supported. You can create a driver adapter that connects to that interface.

TDV supports custom procedures written in Java created to interface with other data sources. TDV provides APIs to create custom procedures.

A CJP library is a JAR file containing the Java classes implementing a set of Custom Java Procedures (CJPs) and other resources used by the CJPs. A CJP data source is a TDV custom data source that is created in Studio by specifying the signature of the CJP, a CJP library, and, optionally, a classpath. The classpath is needed only if the CJPs need resources that were not included in the CJP library.

For more details on TDV APIs to create custom Java procedures, see “JAVA APIs for Custom Procedures” in the *TDV Reference Guide*.

One adapter is sufficient to connect to any number of the same type of data sources. After it has been uploaded, the JDBC adapter functions like any other JDBC adapter, such as those used by Oracle, SQL Server, or MySQL. Customizations can be made to further change the adapter behavior.

You add a custom Java procedure to TDV Server as you would add a new data source. You must supply the specific JDBC driver and direct the server to the custom procedure JAR location so that TDV can upload it. The TDV server assumes that the JDBC adapter is implemented correctly. The server does not make any accommodations for JDBC adapters that do not supply correct metadata about the data source and it does not retrieve result sets that are not consistent with the metadata.

Note: If you need to export or import previously created custom Java procedures, see [About Export and Import of Custom Java Procedures](#).

To add a custom Java procedure

Make sure that you have the Java code for the procedure.

1. Compile the Java code and put the compiled code into a JAR file.

Your classpath should point at <TDV_install_dir>\apps\extension\lib\csext-xxx.jar, where 'xxx' is your most recent patch level.

For instance, if TDV server is installed under C:\Apps\cis6.1 and you are running 6.1.0.00.24, then you would use:

```
javac -classpath C:\Apps\cis6.1\apps\extension\lib\csext-1024.jar TestCJP.java
```

2. Add the class to a JAR file. For example:

```
jar -cvf TestCJP.jar TestCJP.class
```

3. Place the JAR file on the machine where TDV Server is running.
4. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
5. In the New Physical Data Source dialog, select Custom Java Procedure as the Data Source Adapter and click Next.
6. Supply the information for a custom Java procedure data source:

- Name—Name for the data source.
- Custom procedure jar location—Use the Browse button to locate the path to the JAR file containing the procedures on the server, or type the full path to the JAR file.

For example: file:///C:\myExamples\myProcedures.jar.

The JAR can be uploaded only from a file location that is visible to the TDV Server.

- Additional classpath—Optionally, specify any classpath that might be needed by the Java custom procedure class. To specify multiple classpaths, separate them with semicolons.

For example, if the Java custom procedure uses classes contained in Widget.jar, you can type the path to Widget.jar, as follows:

```
C:/composite/Widget.jar
```

7. Click one of these buttons:
 - Create & Introspect—To proceed immediately with introspection.
 - Create & Close—To create the data source; you can introspect at a later time.
8. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect now or later.

File-Delimited Data Source

Adding a Delimited File Data Source

A file-delimited data source is a file or set of files with value separators.

If the file does not have a header row, the column names are determined automatically.

If this data source is exported from a staging machine and imported to a production machine, the path for the logs directory might change from C:\<staging>\logs to C:\<production>\logs. Then, only the path to the root directory in the file data source needs to be modified after the data source is imported, and none of the queries to this data source need to be modified. After the root path is modified, it is your responsibility to re-introspect your data to ensure the existence of all the files. If the file structure of the new location is different from the old one, it entails adding/deleting/changing some of the files.

To add a file-delimited data source

1. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
2. In the New Physical Data Source dialog, select File-Delimited.
3. Click Next.
4. Type a name for the data source.
5. Select one of the following:
 - Local File System
 - URL
6. If the file is on the local file system, Select Browse and navigate to the root directory of the files for this data source.

With this option, you can select one, more, or all the files in a directory. You can also select all the directories and all the files of the same type in those directories.

However, even if all the files in the directory are of the comma-separated values (CSV) type, detailed characteristics such as whether a header row exists must match.

7. If the files are located at a URL, specify the URL.

If file is at	Description
FTP URL	HTTP, HTTPS and FTP are supported for reading the data. The file must be in text format and unzipped.
network location	The URL to a single file must be relative to the machine where TDV Server is running.
machine without a Web server	It must be mapped to the machine where TDV Server is running.

8. Select Use Credentials if you want to specify user credentials here (rather than with system configuration) for connecting the data source.

Field	Description
Domain	User's domain; for example, composite.
User Name	Name of the user.
Password	User's password.

9. Accept the default or specify the Character Set encoding type.
10. Accept the default or specify the delimiter from among the following supported options:
 - , (comma)
 - : (colon)
 - ; (semicolon)
 - . (period)
 - / (forward slash)
 - \ (backward slash)
 - <TAB> (horizontal tab—ASCII code character 09 hexadecimal)
 - <SOH> (start of heading—ASCII code character 01 hexadecimal)
11. Accept the default or specify a Text Qualifier for which the whole text in the file is enclosed.

12. Accept the default or specify the number of the row in the file where the data begins.
13. Select the Has Header Row check box if the file text has a header row.
14. Select Ignore trailing delimiter check box if each row can contain a trailing delimiter that you want to ignore.
15. Accept the default file extensions to filter the root directory for, or type in the file extension values for which you want to filter. Example of two filters: `*.csv,*.txt` (a space is allowed between two filters)

Rules for the filters:

 - `*` (asterisk) means that any character in the filename occurs zero or more times.
 - `?` (question mark) means that any character in the filename occurs exactly once.
 - `,` (comma) is a separator between filters.
 - `\` (backslash) is an escape character to escape a filename that contains `*` (asterisk), `?` (question mark), or `,` (comma).
16. Click one of these buttons:
 - Create & Introspect—To proceed immediately with introspection.
 - Create & Close—To create the data source; you can introspect at a later time.
17. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect now or later.

File - Delimited to TDV Data Types Mapping

The following table shows the mapping from a delimited (comma-separated values or “CSV”) file data type to a TDV data type.

CSV Flat File Data Type	TDV Data Type
STRING	VARCHAR

File Function Support

TDV supports the following types of functions for file data sources:

- [File Aggregate Function Support](#)
- [File Character Function Support](#)
- [File Conversion Function Support](#)
- [File Date Function Support](#)
- [File Numeric Function Support](#)

File Aggregate Function Support

TDV supports the aggregate functions listed in the table below for file data sources.

File Aggregate Function	Notes
AVG	
COUNT	
MAX	
MIN	
SUM	

File Character Function Support

TDV supports the character functions listed in the table below for file data sources.

File Character Function	Notes
CONCAT	
LENGTH	

File Character Function	Notes
LOWER	
REPLACE	
RTRIM	
SUBSTRING	
TRIM	
UPPER	

File Conversion Function Support

TDV supports the conversion functions listed in the table below for file data sources.

File Conversion Function	Notes
CAST	
TO_CHAR	
TO_DATE	
TO_NUMBER	
TO_TIMESTAMP	

File Date Function Support

TDV supports the date functions listed in the table below for file data sources.

File Date Function	Notes
CURDAY	

File Date Function	Notes
CURTIME	
CURTIMESTAMP	
DAY	
MONTH	
YEAR	

File Numeric Function Support

TDV supports the numeric functions listed in the table below for file data sources.

File Numeric Function	Notes
ABS	
ACOS	
ASIN	
ATAN	
CEILING	
COS	
COT	
DEGREES	
EXP	
FLOOR	

File Numeric Function	Notes
LOG	
PI	
POWER	
RADIANS	
ROUND	
SIN	
SQRT	
TAN	

Cache File Data Source

Adding a Cache File Data Source

The file-cache data source is used for storing resource data that are cached using the Automatic storage mode. For additional information, Refer the *User Guide*, Chapter *TDV Caching*. The file-cache data source uses a directory for each table in it, and a file in that directory for storing the data. The data files are binary encoded.

To add a file-cache data source

1. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
2. In the New Physical Data Source dialog, select File-Cache as the Data Source Adapter and click Next.
3. Type a name for the data source.

4. Click Browse and use the Path Selection dialog box to locate the path to the storage directory for the file cache data source.
5. Click one of these buttons:
 - Create & Introspect—To proceed immediately with introspection.
 - Create & Close—To create the data source; you can introspect at a later time.
6. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect now or later.

File - Cache to TDV Data Types Mapping

The following restrictions apply to four file cache data types (BINARY, VARBINARY, CHAR, and VARCHAR) when they are mapped to TDV data types:

- The maximum length is 2147483647.
- The minimum length is 1.

As of TDV 7.0, the BOOLEAN file - cache data type maps to the BOOLEAN TDV data type. For details, see the section *Mapping of Native to TDV Data Types Across TDV Versions* in the *User Guide*, Chapter *Function Support for Data Sources*.

File Cache Mapping

The data type mappings for caches stored in files are shown in the table. Any other data types cannot be cached.

Data Type	Preferred Native Type	Other Allowed Native Types
BIGINT	BIGINT	DECIMAL(19+,0), larger INTEGER types, VARCHAR(20+)
BINARY(n)	BINARY(n) BLOB	BINARY(n+), BLOB
BIT	BIT	DECIMAL(1+,0), larger INTEGER types

Data Type	Preferred Native Type	Other Allowed Native Types
BLOB	BLOB	
CHAR(n)	CHAR(n) CLOB	CHAR(n+), CLOB
CLOB	CLOB	
DATE	DATE	VARCHAR(10+)
DECIMAL(p,s)	DECIMAL(p,s)	DECIMAL(p+,s+), VARCHAR (p+3+), CLOB, INTEGER types with enough resolution
DOUBLE	DOUBLE	VARCHAR(24+)
FLOAT	FLOAT	DOUBLE
INTEGER	INTEGER	DECIMAL(10+,0), larger INTEGER types, VARCHAR(20+)
INTERVAL DAY	VARCHAR(30)	
INTERVAL DAY TO HOUR	VARCHAR(30)	
INTERVAL DAY TO MINUTE	VARCHAR(30)	
INTERVAL DAY TO SECOND	VARCHAR(30)	
INTERVAL HOUR	VARCHAR(30)	
INTERVAL HOUR TO MINUTE	VARCHAR(30)	
INTERVAL HOUR	VARCHAR(30)	

Data Type	Preferred Native Type	Other Allowed Native Types
TO SECOND		
INTERVAL MINUTE	VARCHAR(30)	
INTERVAL MINUTE TO SECOND	VARCHAR(30)	
INTERVAL MONTH	VARCHAR(9)	
INTERVAL SECOND	VARCHAR(30)	
INTERVAL YEAR	VARCHAR(9)	
INTERVAL YEAR TO MONTH	VARCHAR(12)	
NUMERIC(p,s)	NUMERIC(p,s)	DECIMAL(p+,s+), VARCHAR (p+3+), CLOB, INTEGER types with enough resolution
OTHER	[cannot be cached]	
REAL	REAL	
SMALLINT	SMALLINT	DECIMAL(5+0), larger INTEGER types, VARCHAR(20+)
TIME	TIME	VARCHAR(15+)
TIMESTAMP	TIMESTAMP	
TINYINT	TINYINT	DECIMAL(3+,0), larger INTEGER types, VARCHAR(20+)
VARBINARY(n)	VARBINARY(n) BLOB	VARBINARY(n+), BLOB

Data Type	Preferred Native Type	Other Allowed Native Types
VARCHAR(n) What is PROMOTE threshold for this data type in file caches?	VARCHAR(n) CLOB	VARCHAR(n+), CLOB
XML	CLOB	VARCHAR(*) Truncates data if column is too small.

LDAP Data Source

Adding an LDAP Data Source

You can add an LDAP data source and configure it to behave like a relational table. During introspection, TDV maps all LDAP data types to the string data type.

The Active Directory objectGUID attribute displays in the "binding GUID string" format. For example, c208521a-6fcd-43f2-90ad-ed790c9715c1. If a value for the objectGUID comes from anywhere other than LDAP or is specified in a TDV view or script, that value must use the same dashed string format.

To add an LDAP data source

1. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
2. In the New Physical Data Source dialog, select LDAP and click Next.
3. Type a name for the data source.

When the process of adding the data source is complete, this name is displayed in the Studio resource tree representing the data source.

4. On the Basic tab, provide this information:

- URL—Type the path to the LDAP data source in the URL field, in the following format:

ldap://<host_name>:<port_number>/o=<organization_name>

For example:

ldap://platinum:370/o=earth.com

The directory suffix depends on how the LDAP is set up: o for organization, ou for organizational unit, cn for common name, dn for distinguished name, or dc for domain component.

- Login—Valid username, if required, to access the underlying data source. When the data source is used as a target for cache tables or for data ship, the sign-in user must be granted the ability to create tables, execute DDL, and perform other tasks. In some cases, the LDAP connection does not require a username.

Example of a username: cn=Ldap Manager

- Password—Valid password, if required, to access the underlying data source. In some cases, the LDAP connection does not require a password.
- Save Password—Check box is enabled only if Pass-through Login (further down in this window) is enabled. Refer the *User Guide, Section About Pass- Through Login* for additional details.
- Authentication—Choose the method the LDAP client is to use to authenticate itself to the data source.
 - Simple: The client sends the LDAP server its fully qualified domain name and a clear-text password. This authentication mechanism can be used within an encrypted channel such as SSL, if it is supported by the LDAP server.
 - Digest
 - Kerberos
- Pass-through Login—Choose whether pass-through login is to be Enabled or Disabled. Refer the *User Guide, Section About Pass-Through Login* for additional details.

5. Click the Advanced tab.

6. On the Advanced tab, provide this information:

- Delimiter—Select a field delimiter from among the following supported options:

, (comma)

. (period)

: (colon)

- ; (semicolon)
- / (forward slash)
- \ (backward slash)
- | (vertical bar)

- Connection Pool Min Size—Minimum number of connections per connection identity (data source) that can be maintained concurrently (default 10).
- Connection Pool Max Size—Maximum number of connections per connection identity (data source) that can be maintained concurrently (default 100).
- Connection Pool Timeout (s)—Number of seconds (default 30) that a connection can remain idle in the pool without being closed and removed from the pool.
- Execution Timeout (s)—Number of seconds an execution query on the data source is allowed to run before it is canceled. The default value of zero seconds lets even long processes run to completion.

7. Click one of these buttons:

- Create & Introspect—To proceed immediately with introspection.
- Create & Close—To create the data source; you can introspect at a later time.

8. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect (now or later).

LDAP to TDV Data Types

The following table shows the mapping from a LDAP data type to a TDV data type.

Data Type	TDV Data Type
OCTET STRING	VARCHAR

Microsoft Excel Data Sources

There are two ways to introspect and use Microsoft Excel files. The method used depends on whether the TDV Server you are working with is hosted on a Windows operating system or UNIX operating system:

- [Adding Microsoft Excel Data Sources](#)
- [Adding Microsoft Excel \(non-ODBC\) Data Sources](#)

In both cases the Microsoft Excel files must be locally accessible to the TDV Server on a mapped or mounted drive. Flat files do not expose a JDBC interface, so direct (mapped or mounted) LAN access to those flat files is required.

If you want to introspect Excel documents that contain non-US characters, you should use the Non-ODBC Excel data source.

Note: Excel files are loaded into managed memory. If managed memory is insufficient, the introspection fails.

Adding Microsoft Excel Data Sources

The Microsoft Excel driver leverages Microsoft ODBC. Excel sheets and named areas within sheets are introspected as TDV tables.

For more information about semijoin fields, see the *TDV Administration Guide*.

To add a Microsoft Excel data source on Windows

1. Before introspecting the Excel data sheet as a TDV available data source, configure it as an ODBC-available data source with a DSN locally accessible to the TDV Server.
2. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
3. In the New Physical Data Source dialog, select Microsoft Excel and click Next.
4. Type a name for the data source.
5. On the Basic tab, provide this information for a Microsoft Excel data source:
 - DSN—Type the DSN (Data Source Name) that was defined when the data source was added to the host machine.
 - Character Set—Character encoding type. See [Supported Character Encoding Types](#).
6. Click the Advanced tab.
7. On the Advanced tab, provide:—

Advanced Tab Options	Description
Connection URL Pattern	<p>A URL pattern that functions as a template for generating an actual URL to connect to the physical data source. Modify this template per implementation requirements, but be aware that TDV does not validate modifications. The data source adapter may or may not validate changes, ignoring invalid URL connection parameters.</p>
Connection URL String	<p>The literal URL string that is generated from the connection URL pattern with the connection information you provide. This string is used by the JDBC adapter to connect to the physical data source. This field is generated by the system and is not editable. For further details, see “Configuring TDV Data Connections” in the <i>TDV Administration Guide</i>.</p> <p>When TDV is running on a Windows platform you can access a file located on the network with a file URL like the following:</p> <p style="text-align: center;"><code>file://10.1.2.199/d\$/public/folder/ExcelFileName.xls</code></p> <p>If you map a network drive from the computer hosting TDV to connect the computer to file resources, you can browse to the directory to introspect more than one Excel file at a time, or specify a file URL to add a single file. The following is an example of a Windows file URL:</p> <p><code>file:///Z:/shared/folder/ExcelFileName.xls</code></p>
Connection Properties	<p>Enables specification of property-value pairs that are passed to the targeted JDBC data source to determine the data source behavior for the connection with TDV. A selection of commonly used properties for all the supported versions of MySQL, Oracle, and Sybase are populated on the Advanced tab with default values.</p>
JDBC Connection Properties	<p>Click to open a window in which to add custom JDBC connection properties for any JDBC data source. You can add multiple property-value pairs by clicking the Add Argument button, or delete pairs by clicking the Remove Argument button</p>

Advanced Tab Options	Description
Maximum Connection Lifetime (m)	adjacent to them. TDV does not validate property names. The data source adapter might ignore incorrectly named properties or invalid values, or it might provide an error code.
Maximum Connection Lifetime (m)	Sets the duration, in minutes, that an inactive connection (a connection that was returned to the pool) persists if there are more open connections than the minimum pool size. The duration is calculated from the creation time not from the time that the connection was released to the pool. A value of “0” allows connections to last indefinitely. Default: 60 minutes.
Connection Validation Query	A native data source query that is sent directly to the data source without evaluation by the TDV query engine. Enter a query that gives a quick return. If the validation query returns a non-error result, this fact validates the connection to the data source.
Execution Timeout (s)	The number of seconds an execution query on the data source is allowed to run before it is canceled. The default value of zero seconds disables the execution timeout so processes that take a long time are allowed to run. For example, cache updates set to run at non-peak processing hours can be resource intensive processes that take much longer than a client initiated request.
Execute SELECTs Independently	If this option is checked, a SELECT statement submitted to this data source is executed using a new connection from the connection pool and committed immediately after the SELECT is completed. INSERT, UPDATE, and DELETE statements continue to be executed using the same connection as part of the transaction.
Connection Check-out Procedure	Specify the procedure to return a valid SQL statement for that database which can be used to initialize the connection. One common case is to initialize Oracle Virtual Private Database (VPD)-based systems.

Advanced Tab Options	Description
	<p>VPD is a method of doing row-level security. Complex security policies can be set to allow or deny access to subsets of data in a table. After the connection is made, often with a generic account, the client enables certain sets of access rights by setting a security context. In this case, the <code>init</code> procedure returns something like <code>dbms_session.set_identifier('username')</code>. This would then be executed on the connection, changing the privileges associated with that connection from the default to those associated with the username passed.</p> <p>In addition, other parameters can be changed. A block like this might be returned by the <code>init</code> procedure:</p> <pre data-bbox="553 827 1179 961"> BEGIN dbms_session.set_identifier('username'); EXECUTE IMMEDIATE 'alter session set optimizer_index_cost_adj=10'; EXECUTE IMMEDIATE 'alter session set optimizer_index_caching=90'; EXECUTE IMMEDIATE 'alter session set "_complex_view_merging"=true'; </pre> <pre data-bbox="553 1035 602 1056"> END; </pre> <p>This example code is Oracle-specific. Others databases have similar functions.</p> <p>The signature of the <code>init</code> procedure should look like this:</p> <pre data-bbox="553 1289 984 1310"> IN ds_name VARCHAR, OUT sqlText VARCHAR) </pre> <p>The code should be written such that the <code>init</code> procedure causes rights to be revoked if not called with the appropriate context.</p>
Supports Star Schema	<p>Check this option if this data source can support large predicates for star schema semijoins. Do not check this option unless you are sure the data source can support receiving queries with large predicates and large cardinalities. Refer to Refer the <i>User Guide</i>, Section <i>Star Schema Semijoin</i> for more information.</p>

Advanced Tab Options	Description
Max Source Side Cardinality for Semi Join	Sets the maximum source-to-source ratio of cardinality for semijoins.
Min Target to Source Ratio for Semi Join	Sets the minimum target-to-source ratio of cardinality for semijoins.
Max Source Side of Semi Join to Use OR Syntax	Sets the maximum source-side use of the OR syntax for semijoins.

8. Click one of these buttons:
 - Create & Introspect—To proceed immediately with introspection.
 - Create & Close—To create the data source; you can introspect at a later time.
9. See Refer the *User Guide*, Section *Introspecting Data Sources* for how to introspect now or later.

Adding Microsoft Excel (non-ODBC) Data Sources

When adding Microsoft Excel files as data sources on UNIX platforms, use the Microsoft Excel (non-ODBC) data source adapter to begin configuration. The TDV Server uses a non-ODBC Microsoft Excel driver based on Apache POI to enable introspection and to use multiple Excel data files at one time.

To add a Microsoft Excel data source on a UNIX platform

1. Before introspecting the Excel data sheet as a TDV available data source, configure it as an ODBC-available data source with a DSN locally accessible to the TDV Server.
2. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
3. In the New Physical Data Source dialog, select Microsoft Excel (non-ODBC).
4. Click Next.

5. Type a name for the data source.
6. Select one of the following:

Selection	Description
Local File System	<p>Select if the Excel file is on the local file system. With this option, you can select one, more, or all the files in a directory. You can also select all the directories and all the files of the same type in those directories to introspect all Excel spreadsheets at the same time.</p> <p>Specify the root path to begin the search for the files on the local file system. Root path is the absolute path to the root directory where the files reside.</p>
URL	<p>For TDV running on UNIX operating systems, you can add an Excel file located on the local machine with a URL file protocol like the following:</p> <pre data-bbox="456 863 1365 940">file:///usr/name/folder/excel_filename.xls</pre> <p>The directory containing the source Excel file must be mounted to the UNIX server hosting TDV. For example if the computer directory 10.1.2.199/d\$/public contains the Excel file, it could be mounted as /root/public. The Excel file could be accessed with a file URL like:</p> <pre data-bbox="456 1150 1000 1184">file:///root/public/folder/excel_filename.xls</pre>

- 7.
8. Optionally, specify a filename filter to restrict what types of files are to be introspected. This adapter supports introspection and use of two kinds of Excel data source files: *.xls (Excel 97-2003) and *.xlsx (Excel 2007). During introspection, the introspection tree only displays the filenames with this extension. If you want to introspect more than one type of file, separate the type filters with commas.

Rules for the filters:

- * (asterisk) means that any character in the filename occurs zero or more times.
- ? (question mark) means that any character in the filename occurs exactly once.
- , (comma) is a separator for each filter.
- \ (backslash) is an escape character to escape a filename that contains an asterisk, question mark, or comma.

Note: Only files that match the filter you specify here are exposed later on during the process of adding or removing data source resources (through the Add/Remove Resources menu option) and also during data source re-introspection.

9. Optionally type values for or make selections for the following:

Element	Description
Character Set	Character encoding type. See Supported Character Encoding Types .
Data Range	Enter the value that indicates the data range you want to introspect.
Blank Column Type	Choose the data type to apply to blank columns: Varchar, Double, Boolean, or Datetime.
Has Header Row	Check if the first row of all the introspected Excel sheets has a row of column names. If it is not selected, the first row of each Excel data sheet is introspected as a data row and the column names are: COL1, COL2, COL3. After the connection is established and the Excel files are introspected, each sheet is made available as a TABLE that can be defined as having or not having a header row independently of the original schema header row setting.
Columns in Every Row Use Format Categories of Columns in First Row	Check to introspect the data in every row formatted as specified in the first row.
Ignore Invalid Data	Check to ignore invalid data.
Introspect with Formatted Display Values instead of Actual Values	Check to introspect the formatted display values.
Blank Value as Null Value	Check to introspect blank values as null values.

10. Click one of these buttons:

- Create & Introspect—To proceed immediately with introspection.
- Create & Close—To create the data source; you can introspect at a later time.

11. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect now or later.

Microsoft Excel to TDV Data Types

The following table shows the mapping from Microsoft Excel data types to TDV data types.

Note: The NUMBER data types returned from the JDBC/ODBC driver do not accurately reflect the real precision and scale if you have formatted the cells in Excel with the following categories: NUMBER, PERCENTAGE, SCIENTIFIC, and FRACTION.

Microsoft Excel Data Type	TDV Data Type
BIT	BIT
BIGINT	BIGINT
CURRENCY	DOUBLE
DATETIME	TIMESTAMP
NUMBER	DOUBLE
VARCHAR	VARCHAR(32676)

Microsoft Excel Function Support

TDV supports the Microsoft Excel functions listed in the table below.

TDV Excel integration is through the Apache POI project. The following supported function list and limitations are based on the open source documentation for that project. Further details can be found on the Web.

Function or Operator	Notes
Operators	Arithmetic and logical operators; some region operators.
Built-in functions	More than 350 recognized.
Add-in functions	Three from Analysis Toolpak recognized.

Limitations

The following is a list of some of the known limitations of TDV's implementation of Microsoft Excel functions:

- TDV cannot manipulate Excel array or table formulas of the form “{=...}” (rather than of the form “=...”).
- TDV cannot handle the region operators (UNION and INTERSECTION).
- TDV cannot parse add-in functions that have not previously been called.
- TDV cannot preserve white space in formulas.
- TDV cannot convert charts or macros to TDV objects.
- TDV does not support pivot tables.

XML File Data Source

Adding an XML File Data Source

If this data source is exported from a staging machine and imported to a production machine, the path for the logs directory might change from C:\<staging>\logs to C:\<production>\logs. Then, only the path to the root directory in the file data source needs to be modified after the data source is imported, and none of the queries to this data source need to be modified. After the root path is modified, it is your responsibility to re-introspect your data to ensure the existence of all the files. If the file structure of the

new location is different from the old one, it entails adding/deleting/changing some of the files.

After you have added a file-XML data source to the resource tree, you cannot change its file path. If you want a new file path, delete it and create it again.

To add a file-XML data source

1. Right-click at a location in the Studio resource tree where you want this data source to reside, and select New Data Source.
2. In the New Physical Data Source dialog, select File-XML.
3. Click Next.
4. Type a name for the data source.
5. Select one of the following:
 - Local File System
 - URL
6. If the file is on the local file system, Select Browse and navigate to the root directory of the files for this data source.

With this option, you can select one, more, or all the files in a directory. You can also select all the directories and all the files of the same type in those directories. However, even if all the files in the directory are of the comma-separated values (CSV) type, detailed characteristics such as whether a header row exists must match.
7. If the files are located at a URL, specify

If file is at	Important Information
FTP URL	HTTP, HTTPS and FTP are supported for reading the data. File must be in text format and unzipped.
network location	The URL to the single file must be relative to the machine where TDV Server is running.
machine without a Web server	It must be mapped to the machine where TDV Server is running.

8. Select Use Credentials if you want to specify user credentials here (rather than with system configuration) for connecting the data source.

Field	Description
Domain	User's domain; for example, composite.
User Name	Name of the user.
Password	User's password.

9. Accept the default or specify the Character Set encoding type. The Character Set drop-down list includes <auto-detect> as the default option for file-XML data sources, letting Studio detect the character set automatically.

10. Optionally, type in the location of the XML schema file using this syntax:

```
<namespace> <location> [<namespace> <location>]
```

- <namespace> is the target namespace for the XML schema
- <location> is the absolute path (including the name of the file) to the XSD file.
- A white space is needed between the target namespace and location.

If you want to use an external XSD file for resolving the schema, specify the location of the XSD file in the Schema Location field. If you want to let the system decide the XML schema for you, leave the Schema Location field blank.

Example:

```
http://www.compositesw.com/services/webservices/system/admin/resource file:///C:/test.xsd
```

namespace	http://www.compositesw.com/services/webservices/system/admin/resource
-----------	-----------------------------------------------------------------------

location	file:///C:/test.xsd
----------	---------------------

11. Optionally, type in the No Namespace Schema Location to specify the location for an XML Schema that does not have a target namespace.

12. Accept the default file extensions to filter the root directory for, or type in the file extension values for which you want to filter.

Rules for the filters:

- * (asterisk) means that any character in the filename occurs zero or more times.
- ? (question mark) means that any character in the filename occurs exactly once.
- , (comma) is a separator between filters.
- \ (backslash) is an escape character to escape a filename that contains * (asterisk), ? (question mark), or , (comma).

13. Click one of these buttons:

- Create & Introspect—To proceed immediately with introspection.
- Create & Close—To create the data source; you can introspect at a later time.

14. Refer the *User Guide*, Chapter *Retrieving Data Source Metadata* for how to introspect now or later.

XML Function Support

TDV supports the following types of functions for XML data sources:

- [XML Aggregate Function Support](#)
- [XML Character Function Support](#)
- [XML Conversion Function Support](#)
- [XML Date Function Support](#)
- [XML Numeric Function Support](#)

XML Aggregate Function Support

TDV supports the aggregate functions listed in the table below for XML data sources.

XML Aggregate Function	Notes
AVG	

XML Aggregate Function	Notes
COUNT	
MAX	
MIN	
SUM	

XML Character Function Support

TDV supports the character functions listed in the table below for XML data sources.

XML Character Function	Notes
CONCAT	
LENGTH	
LOWER	
REPLACE	
RTRIM	
SUBSTRING	
TRIM	
UPPER	

XML Conversion Function Support

TDV supports the conversion functions listed in the table below for XML data sources.

XML Conversion Function	Notes
CAST	
TO_CHAR	
TO_DATE	
TO_NUMBER	
TO_TIMESTAMP	

XML Date Function Support

TDV supports the date functions listed in the table below for XML data sources.

XML Date Function	Notes
CURDAY	
CURTIME	
CURTIMESTAMP	
DAY	
MONTH	
YEAR	

XML Numeric Function Support

TDV supports the numeric functions listed in the table below for XML data sources.

XML Numeric Function	Notes
ABS	

XML Numeric Function	Notes
ACOS	
ASIN	
ATAN	
CEILING	
COS	
COT	
DEGREES	
EXP	
FLOOR	
LOG	
PI	
POWER	
RADIANS	
ROUND	
SIN	
SQRT	
TAN	

TIBCO Documentation and Support Services

For information about this product, you can read the documentation, contact TIBCO Support, and join TIBCO Community.

How to Access TIBCO Documentation

Documentation for TIBCO products is available on the [Product Documentation website](#), mainly in HTML and PDF formats.

The [Product Documentation website](#) is updated frequently and is more current than any other documentation included with the product.

Product-Specific Documentation

The following documentation for this product is available on the [TIBCO® Data Virtualization](#) page.

Users

- TDV Getting Started Guide
- TDV User Guide
- TDV Web UI User Guide
- TDV Client Interfaces Guide
- TDV Tutorial Guide
- TDV Northbay Example

Administration

- TDV Installation and Upgrade Guide
- TDV Administration Guide
- TDV Active Cluster Guide
- TDV Security Features Guide

Data Sources

- TDV Adapter Guides

TDV Data Source Toolkit Guide (Formerly Extensibility Guide)

References

TDV Reference Guide

TDV Application Programming Interface Guide

Other

TDV Business Directory Guide

TDV Discovery Guide

TDV and Business Directory Release Notes - Read the release notes for a list of new and changed features. This document also contains lists of known issues and closed issues for this release.

Release Version Support

TDV 8.5 and 8.8 are designated as Long Term Support (LTS) versions. Some release versions of TIBCO® Data Virtualization products are selected to be long-term support (LTS) versions. Defect corrections will typically be delivered in a new release version and as hotfixes or service packs to one or more LTS versions. See also [Long Term Support](#).

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