



# **TIBCO® Data Virtualization**

## **JDBC-ODBC Adapter Guide**

Version 8.7.0 | October 2023

# Contents

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<b>Contents</b>	<b>2</b>
<b>TDV JDBC-ODBC Bridge Adapter</b>	<b>3</b>
Getting Started	3
Basic Tab	4
Logging	4
Changelog	5
Advanced Features	8
User Defined Views	9
SSL Configuration	12
Firewall and Proxy	12
Logging	13
Connection String Options	16
Miscellaneous	16
<b>TIBCO Product Documentation and Support Services</b>	<b>20</b>
How to Access TIBCO Documentation	20
How to Contact TIBCO Support	21
Release Version Support	21
How to Join TIBCO Community	22
<b>Legal and Third-Party Notices</b>	<b>23</b>

# TDV JDBC-ODBC Bridge Adapter

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## Requirements and Restrictions

The restrictions are dependent on the ODBC driver being connected to.

## Getting Started

### Connecting to JDBC-ODBC Bridge

[Basic Tab](#) shows how to authenticate to JDBC-ODBC Bridge and configure any necessary connection properties. Additional adapter capabilities can be configured using the available [Connection](#) properties on the Advanced tab. The Advanced Settings section shows how to set up more advanced configurations and troubleshoot connection errors.

### Deploying the JDBC-ODBC Bridge Adapter

To deploy the adapter, you can execute the `server_util` utility via the command line by

1. Unzip the `tdv.jdbcodbc.zip` file to the location of your choice.
2. Open a command prompt window.
3. Navigate to the `<TDV_install_dir>/bin`
4. Enter the `server_util` command with the `-deploy` option:

```
server_util -server <hostname> [-port <port>] -user <user> -  
password <password> -deploy -package <TDV_install_  
dir>/adapters/tdv.jdbcodbc/tdv.jdbcodbc.jar
```

Note: When deploying a build of an existing adapter, you will need to undeploy the existing adapter using the `server_util` command with the `-undeploy` option.

```
server_util -server <hostname> [-port <port>] -user <user> -password  
<password> -undeploy -version 1 -name JDBCODBC
```

## Basic Tab

To connect to an ODBC data source, specify either the DSN (data source name) or specify an ODBC connection string: Set Driver and the connection properties for your ODBC driver.

## Logging

The adapter uses TDV Server's logging (log4j) to generate log files. The settings within the TDV Server's logging (log4j) configuration file are used by the adapter to determine the type of messages to log. The following categories can be specified:

- Error: Only error messages are logged.
- Info: Both Error and Info messages are logged.
- Debug: Error, Info, and Debug messages are logged.

The Other property of the adapter can be used to set Verbosity to specify the amount of detail to be included in the log file, that is:

```
Verbosity=4;
```

You can use Verbosity to specify the amount of detail to include in the log within a category. The following verbosity levels are mapped to the log4j categories:

- 0 = Error
- 1-2 = Info
- 3-5 = Debug

For example, if the log4j category is set to DEBUG, the Verbosity option can be set to 3 for the minimum amount of debug information or 5 for the maximum amount of debug information.

Note that the log4j settings override the Verbosity level specified. The adapter never logs at a Verbosity level greater than what is configured in the log4j properties. In addition, if Verbosity is set to a level less than the log4j category configured, Verbosity defaults to the minimum value for that particular category. For example, if Verbosity is set to a value less than 3 and the Debug category is specified, the Verbosity defaults to 3.

The following list is an explanation of the Verbosity levels and the information that they log.

- 1 - Will log the query, the number of rows returned by it, the start of execution and

the time taken, and any errors.

- 2 - Will log everything included in Verbosity 1 and HTTP headers.
- 3 - Will additionally log the body of the HTTP requests.
- 4 - Will additionally log transport-level communication with the data source. This includes SSL negotiation.
- 5 - Will additionally log communication with the data source and additional details that may be helpful in troubleshooting problems. This includes interface commands.

## Configure Logging for the JDBC-ODBC Bridge Adapter

By default, logging is turned on without debugging. If debugging information is desired, uncomment the following line in the TDV Server's log4j.properties file (default location of this file is: C:\Program Files\TIBCO\TDV Server <version>\conf\server):

```
log4j.logger.com.cdata=DEBUG
```

The TDV Server must be restarted after changing the log4j.properties file, which can be accomplished by running the composite.bat script located at: C:\Program Files\TIBCO\TDV Server <version>\bin. Note that reauthenticating to the TDV Studio is required after restarting the server.

Here is an example of the calls:

```
.\composite.bat monitor restart
```

All logs for the adapter are written to the "cs\_server\_dsrc.log" file as specified in the log4j properties.

**Note:** The "log4j.logger.com.cdata=DEBUG" option is not required if the **Debug Output Enabled** option is set to true within the TDV Studio. To set this option, navigate to **Administrator > Configuration**. Select **Server > Configuration > Debugging** and set the Debug Output Enabled option to **True**.

## Changelog

### General Changes

Date	Build Number	Change Type	Description
12/14/2022	8383	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the Default column to the sys_procedureparameters table.</li> </ul>
09/30/2022	8308	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the IsPath column to the sys_procedureparameters table.</li> </ul>
08/17/2022	8264	General	<b>Changed</b> <ul style="list-style-type: none"> <li>We now support handling the keyword "COLLATE" as standard function name as well.</li> </ul>
09/02/2021	7915	General	<b>Added</b> <ul style="list-style-type: none"> <li>Added support for the STRING_SPLIT table-valued function in the CROSS APPLY clause.</li> </ul>
08/07/2021	7889	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the KeySeq column to the sys_foreignkeys table.</li> </ul>
08/06/2021	7888	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the new sys_primarykeys system table.</li> </ul>
07/23/2021	7874	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Updated the Literal Function Names for relative date/datetime functions. Previously relative date/datetime functions resolved to a different value when used in the projection vs the predicate. I.e: SELECT LAST_MONTH() AS lm, Col FROM Table WHERE</li> </ul>

			<p>Col &gt; LAST_MONTH()). Formerly the two LAST_MONTH() methods would resolve to different datetimes. Now they will match.</p> <ul style="list-style-type: none"> <li>As a replacement for the previous behavior, the relative date/datetime functions in the criteria may have an 'L' appended to them. I.e: WHERE col &gt; L_LAST_MONTH(). This will continue to resolve to the same values that previously were calculated in the criteria. Note that the "L_" prefix will only work in the predicate - it not available for the projection.</li> </ul>
07/08/2021	7859	General	<p><b>Added</b></p> <ul style="list-style-type: none"> <li>Added the TCP Logging Module for the logging information happening on the TCP wire protocol. The transport bytes that are incoming and ongoing will be logged at verbosity=5.</li> </ul>
04/23/2021	7785	General	<p><b>Added</b></p> <ul style="list-style-type: none"> <li>Added support for handling client side formulas during insert / update. For example: UPDATE Table SET Col1 = Concat (Col1, " - ", Col2) WHERE Col2 LIKE 'A%'</li> </ul>
04/23/2021	7783	General	<p><b>Changed</b></p> <ul style="list-style-type: none"> <li>Updated how display sizes are determined for varchar primary key and foreign key columns so they will match the reported length of the column.</li> </ul>
04/16/2021	7776	General	<p><b>Added</b></p> <ul style="list-style-type: none"> <li>Non-conditional updates between two columns is now available to all drivers. For example: UPDATE Table SET Col1=Col2</li> </ul>

**Changed**

- Reduced the length to 255 for varchar primary key and foreign key columns.
- Updated implicit and metadata caching to improve performance and support for multiple connections. Old metadata caches are not compatible - you would need to generate new metadata caches if you are currently using CacheMetadata.
- Updated index naming convention to avoid duplicates
- Updated and standardized Getting Started connection help.
- Added the Advanced Features section to the help of all drivers.
- Categorized connection property listings in the help for all editions.

04/15 /2021

7775

General

**Changed**

- Kerberos authentication is updated to use TCP by default, but will fall back to UDP if a TCP connection cannot be established

## Advanced Features

This section details a selection of advanced features of the JDBC-ODBC Bridge adapter.

### User Defined Views

The adapter allows you to define virtual tables, called *user defined views*, whose contents are decided by a pre-configured query. These views are useful when you cannot directly control queries being issued to the drivers. See [User Defined Views](#) for an overview of creating and configuring custom views.



## SSL Configuration

Use [SSL Configuration](#) to adjust how adapter handles TLS/SSL certificate negotiations. You can choose from various certificate formats; see the [SSLServerCert](#) property under "Connection String Options" for more information.

## Firewall and Proxy

Configure the adapter for compliance with [Firewall and Proxy](#), including Windows proxies and HTTP proxies. You can also set up tunnel connections.

## Logging

See [Logging](#) for an overview of configuration settings that can be used to refine CData logging. For basic logging, you only need to set two connection properties, but there are numerous features that support more refined logging, where you can select subsets of information to be logged using the [LogModules](#) connection property.

## User Defined Views

The JDBC-ODBC Bridge Adapter allows you to define a virtual table whose contents are decided by a pre-configured query. These are called *User Defined Views*, which are useful in situations where you cannot directly control the query being issued to the driver, e.g. when using the driver from a tool. The User Defined Views can be used to define predicates that are always applied. If you specify additional predicates in the query to the view, they are combined with the query already defined as part of the view.

There are two ways to create user defined views:

- Create a JSON-formatted configuration file defining the views you want.
- DDL statements.

### Defining Views Using a Configuration File

User Defined Views are defined in a JSON-formatted configuration file called *UserDefinedViews.json*. The adapter automatically detects the views specified in this file.

You can also have multiple view definitions and control them using the UserDefinedViews connection property. When you use this property, only the specified views are seen by the adapter.

This User Defined View configuration file is formatted as follows:

- Each root element defines the name of a view.
- Each root element contains a child element, called **query**, which contains the custom SQL query for the view.

For example:

```
{
  "MyView": {
    "query": "SELECT * FROM Account WHERE MyColumn = 'value'"
  },
  "MyView2": {
    "query": "SELECT * FROM MyTable WHERE Id IN (1,2,3)"
  }
}
```

Use the UserDefinedViews connection property to specify the location of your JSON configuration file. For example:

```
"UserDefinedViews",
"C:\\Users\\yourusername\\Desktop\\tmp\\UserDefinedViews.json"
```

## Defining Views Using DDL Statements

The adapter is also capable of creating and altering the schema via DDL Statements such as CREATE LOCAL VIEW, ALTER LOCAL VIEW, and DROP LOCAL VIEW.

### Create a View

To create a new view using DDL statements, provide the view name and query as follows:

```
CREATE LOCAL VIEW [MyViewName] AS SELECT * FROM Customers LIMIT 20;
```

If no JSON file exists, the above code creates one. The view is then created in the JSON configuration file and is now discoverable. The JSON file location is specified by the UserDefinedViews connection property.

## Alter a View

To alter an existing view, provide the name of an existing view alongside the new query you would like to use instead:

```
ALTER LOCAL VIEW [MyViewName] AS SELECT * FROM Customers WHERE  
TimeModified > '3/1/2020';
```

The view is then updated in the JSON configuration file.

## Drop a View

To drop an existing view, provide the name of an existing schema alongside the new query you would like to use instead.

```
DROP LOCAL VIEW [MyViewName]
```

This removes the view from the JSON configuration file. It can no longer be queried.

## Schema for User Defined Views

User Defined Views are exposed in the **UserViews** schema by default. This is done to avoid the view's name clashing with an actual entity in the data model. You can change the name of the schema used for UserViews by setting the UserViewsSchemaName property.

## Working with User Defined Views

For example, a SQL statement with a User Defined View called *UserViews.RCustomers* only lists customers in Raleigh:

```
SELECT * FROM Customers WHERE City = 'Raleigh';
```

An example of a query to the driver:

```
SELECT * FROM UserViews.RCustomers WHERE Status = 'Active';
```

Resulting in the effective query to the source:

```
SELECT * FROM Customers WHERE City = 'Raleigh' AND Status = 'Active';
```

That is a very simple example of a query to a User Defined View that is effectively a combination of the view query and the view definition. It is possible to compose these

queries in much more complex patterns. All SQL operations are allowed in both queries and are combined when appropriate.

## SSL Configuration

### Customizing the SSL Configuration

By default, the adapter attempts to negotiate SSL/TLS by checking the server's certificate against the system's trusted certificate store.

To specify another certificate, see the [SSLServerCert](#) property for the available formats to do so.

## Firewall and Proxy

### Connecting Through a Firewall or Proxy

#### HTTP Proxies

To connect through the Windows system proxy, you do not need to set any additional connection properties. To connect to other proxies, set [ProxyAutoDetect](#) to false.

In addition, to authenticate to an HTTP proxy, set [ProxyAuthScheme](#), [ProxyUser](#), and [ProxyPassword](#), in addition to [ProxyServer](#) and [ProxyPort](#).

#### Other Proxies

Set the following properties:

- To use a proxy-based firewall, set [FirewallType](#), [FirewallServer](#), and [FirewallPort](#).
- To tunnel the connection, set [FirewallType](#) to TUNNEL.
- To authenticate, specify [FirewallUser](#) and [FirewallPassword](#).
- To authenticate to a SOCKS proxy, additionally set [FirewallType](#) to SOCKS5.

# Logging

Capturing adapter logging can be very helpful when diagnosing error messages or other unexpected behavior.

## Basic Logging

You will simply need to set two connection properties to begin capturing adapter logging.

- Logfile: A filepath which designates the name and location of the log file.
- Verbosity: This is a numerical value (1-5) that determines the amount of detail in the log. See the page in the Connection Properties section for an explanation of the five levels.
- MaxLogFileSize: When the limit is hit, a new log is created in the same folder with the date and time appended to the end. The default limit is 100 MB. Values lower than 100 kB will use 100 kB as the value instead.
- MaxLogFileCount: A string specifying the maximum file count of log files. When the limit is hit, a new log is created in the same folder with the date and time appended to the end and the oldest log file will be deleted. Minimum supported value is 2. A value of 0 or a negative value indicates no limit on the count.

Once this property is set, the adapter will populate the log file as it carries out various tasks, such as when authentication is performed or queries are executed. If the specified file doesn't already exist, it will be created.

## Log Verbosity

The verbosity level determines the amount of detail that the adapter reports to the Logfile. Verbosity levels from 1 to 5 are supported. These are described in the following list:

- 
- |   |   |
|---|---|
| 1 | Setting <u>Verbosity</u> to 1 will log the query, the number of rows returned by it, the start of execution and the time taken, and any errors. |
|---|---|
- 
- |   |  |
|---|--|
| 2 | Setting <u>Verbosity</u> to 2 will log everything included in <u>Verbosity</u> 1 and additional information about the request. |
|---|--|
- 
- |   |  |
|---|--|
| 3 | Setting <u>Verbosity</u> to 3 will additionally log HTTP headers, as well as the body of the |
|---|--|
-

---

request and the response.

---

- |   |  |
|---|--|
| 4 | Setting <u>Verbosity</u> to 4 will additionally log transport-level communication with the data source. This includes SSL negotiation.   |
| 5 | Setting <u>Verbosity</u> to 5 will additionally log communication with the data source and additional details that may be helpful in troubleshooting problems. This includes interface commands. |
- 

The Verbosity should not be set to greater than 1 for normal operation. Substantial amounts of data can be logged at higher verbosity levels, which can delay execution times.

To refine the logged content further by showing/hiding specific categories of information, see LogModules.

## Sensitive Data

Verbosity levels 3 and higher may capture information that you do not want shared outside of your organization. The following lists information of concern for each level:

- Verbosity 3: The full body of the request and the response, which includes all the data returned by the adapter
- Verbosity 4: SSL certificates
- Verbosity 5: Any extra transfer data not included at Verbosity 3, such as non human-readable binary transfer data

## Best Practices for Data Security

Although we mask sensitive values, such as passwords, in the connection string and any request in the log, it is always best practice to review the logs for any sensitive information before sharing outside your organization.

## Java Logging

When Java logging is enabled in Logfile, the Verbosity will instead map to the following logging levels.

- 0: Level.WARNING

- 1: Level.INFO
- 2: Level.CONFIG
- 3: Level.FINE
- 4: Level.FINER
- 5: Level.FINEST

## Advanced Logging

You may want to refine the exact information that is recorded to the log file. This can be accomplished using the LogModules property.

This property allows you to filter the logging using a semicolon-separated list of logging modules.

All modules are four characters long. **Please note that modules containing three letters have a required trailing blank space.** The available modules are:

- **EXEC**: Query Execution. Includes execution messages for original SQL queries, parsed SQL queries, and normalized SQL queries. Query and page success/failure messages appear here as well.
- **INFO**: General Information. Includes the connection string, driver version (build number), and initial connection messages.
- **HTTP**: HTTP Protocol messages. Includes HTTP requests/responses (including POST messages), as well as Kerberos related messages.
- **SSL** : SSL certificate messages.
- **OAUT**: OAuth related failure/success messages.
- **SQL** : Includes SQL transactions, SQL bulk transfer messages, and SQL result set messages.
- **META**: Metadata cache and schema messages.
- **TCP** : Incoming and Ongoing raw bytes on TCP transport layer messages.

An example value for this property would be.

```
LogModules=INFO;EXEC;SSL ;SQL ;META;
```

Note that these modules refine the information as it is pulled after taking the [Verbosity](#) into account.

## Connection String Options

The connection string properties are the various options that can be used to establish a connection. This section provides a complete list of the options you can configure in the connection string for this provider. Click the links for further details.

For more information on establishing a connection, see [Basic Tab](#).

### Miscellaneous

Property	Description
<a href="#">Driver</a>	The ODBC Driver to connect to.
<a href="#">DSN</a>	The ODBC DSN to connect to.
<a href="#">Password</a>	The database account password.
<a href="#">User</a>	The database user account id.
<a href="#">Verbosity</a>	The verbosity level that determines the amount of detail included in the log file.

### Miscellaneous

This section provides a complete list of the Miscellaneous properties you can configure in the connection string for this provider.

Property	Description
<a href="#">Driver</a>	The ODBC Driver to connect to.



<b>DSN</b>	The ODBC DSN to connect to.
<b>Password</b>	The database account password.
<b>User</b>	The database user account id.
<b>Verbosity</b>	The verbosity level that determines the amount of detail included in the log file.

## Driver

The ODBC Driver to connect to.

## Data Type

string

## Default Value

""

## Remarks

This property is used to specify the ODBC Driver to use, along with any connection properties that are required.

For example: {SQL  
Server};Server=myServerAddress;Database=myDataBase;Uid=myUsername;Pwd=myPassword;

## DSN

The ODBC DSN to connect to.

## Data Type

string

## Default Value

""

## Remarks

This property is used to specify the name of the ODBC DSN to use.

Set this property to the name as it is listed within the ODBC Data Source Administrator on Windows or the odbc.ini file on other operating systems.

## Password

The database account password.

## Data Type

string

## Default Value

""

## Remarks

This field maps to PWD connection property.

## User

The database user account id.

## Data Type

string

## Default Value

""

## Remarks

This field maps to UID connection property.

## Verbosity

The verbosity level that determines the amount of detail included in the log file.

## Data Type

string

## Default Value

"1"

## Remarks

The verbosity level determines the amount of detail that the adapter reports to the [Logfile](#). Verbosity levels from 1 to 5 are supported. These are described below:

- 
- |   |   |
|---|---|
| 1 | Setting <u>Verbosity</u> to 1 will log the query, the number of rows returned by it, the start of execution and the time taken, and any errors. |
|---|---|
- 
- |   |  |
|---|--|
| 2 | Setting <u>Verbosity</u> to 2 will log everything included in <u>Verbosity</u> 1 and additional query details. |
|---|--|
- 
- |   |   |
|---|---|
| 3 | Setting <u>Verbosity</u> to 3 will additionally log further details about the specific execution of the statements. |
|---|---|
- 
- |   |   |
|---|---|
| 4 | Setting <u>Verbosity</u> to 4 will additionally log ODBC specific calls made. |
|---|---|
- 
- |   |  |
|---|--|
| 5 | Setting <u>Verbosity</u> to 5 will additionally log communication with the ODBC driver and additional details that may be helpful in troubleshooting problems. This includes interface commands. |
|---|--|
- 

The Verbosity should not be set to greater than 1 for normal operation. Substantial amounts of data can be logged at higher verbosity levels, which can delay execution times.

# TIBCO Product Documentation and Support Services

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

## How to Access TIBCO Documentation

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

The [TIBCO 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

- *TIBCO 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.

## How to Contact TIBCO Support

Get an overview of [TIBCO Support](#). You can contact TIBCO Support in the following ways:

- For accessing the Support Knowledge Base and getting personalized content about products you are interested in, visit the [TIBCO Support](#) website.
- For creating a Support case, you must have a valid maintenance or support contract with TIBCO. You also need a user name and password to log in to [TIBCO Support](#) website. If you do not have a user name, you can request one by clicking **Register** on the website.

## Release Version Support

TDV 8.5 is designated as a Long Term Support (LTS) version. 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

[https://docs.tibco.com/pub/tdv/general/LTS/tdv\\_LTS\\_releases.htm](https://docs.tibco.com/pub/tdv/general/LTS/tdv_LTS_releases.htm).

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