



# TIBCO® Data Virtualization

## DB2 Adapter Guide

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# TDV DB2 Adapter

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## Introduction

This section explains the various connection and configuration options of the datasource DB2 as well as the capabilities:

[Datasource Configuration](#)

[Obtain and Install Drivers for DB2](#)

[DB2 and DB2 z/OS Data Source Limitations](#)

[Data Type Mappings](#)

[DB2 Function Support](#)

[DB2 Mainframe Function Support](#)

[References](#)

## Obtain and Install Drivers for DB2

Download the Jdbc driver for your version of DB2 instance from the following location:

<https://www.ibm.com/support/pages/db2-jdbc-driver-versions-and-downloads>

### To obtain and install JDBC drivers for DB2

1. Get the JAR files for your version of DB2 from its installation directory.

JAR File	Version of DB2
db2jcc.jar or db2jcc4.jar	V9 (Type 2 or Type 4) V10 (Type 4)

JAR File	Version of DB2
db2jcc_license_cu.jar	
common.jar	
db2jcc4.jar	DB2 z/OS
db2jcc_license_cisuz.jar	
db2jcc4.jar	V10 (10.5) and V11 (11.1) Type 4

**Note:** For JDBC 3.0 and earlier, use the db2jcc.jar or db2jcc4.jar file.

- Copy them to the appropriate TDV installation directory:

DB2 Version	Directory Location
DB2 v9 (Type 2 or Type 4)	<TDV_install_dir>\conf\adapters\system\db2_v9_type2 <TDV_install_dir>\conf\adapters\system\db2_v9_type_4
DB2 z/OS	<TDV_install_dir>\conf\adapters\system\db2_z_os_type_4
DB2 V10 (Type 4)	<TDV_install_dir>\conf\adapters\system\db2_v10_type_4
DB2 V11 (Type 4)	<TDV_install_dir>\conf\adapters\system\db2_v11_type_4

The JDBC driver in db2java.zip is the same as the fix pack in DB2.

Refer to the Installation guide for more details about the supported versions.

- Restart the TDV Server.

## Datasource Configuration

This section explains the connection properties that are defined while setting up a datasource.

## Basic Tab

The following table and the sections below lists and explains the connection properties that are in the Basic Tab of the New Data Source Window.

Datasource Name	The name of the Datasource.
Host	Name of the host machine or the host machine's IP address.
Port	Port number for the data source to connect with the host.  The Port number for  DB2—no default  DB2 z/OS—446
Database Name	Name or alias of the underlying data source. TDV Server uses this name to find and connect to the data source.
Login/User, Password	User name and password required to access the data source.
Pass-through Login	Flag to indicate whether pass-through login is enabled or not.
Transaction Isolation	The degree to which transactions are isolated from data modifications made by other transactions.
Authentication Type	The type of Authentication used by the datasource.
Service Principal Name	This field is available only if you choose Kerberos authentication.

### Datasource Name

The name of the data source.

## Data Type

string

## Default Value

""

## Host

Name of the host machine or the host machine's IP address.

## Data Type

string

## Default Value

""

## Port

The Port number

## Data Type

string

## Default Value

""

## Database Name

Name or alias of the underlying data source. TDV Server uses this name to find and connect to the data source.

## Data Type

string

## Default Value

""

## Login/User, Password

User name and password required to access the data source.

## Data Type

string

## Default Value

""

## Remarks

When the data source is used as a target for cache tables or data ship, the user must also have permission to create tables, execute DDL, and perform other required tasks. Refer to the individual data source descriptions for details.

## Transaction Isolation

The degree to which transactions are isolated from data modifications made by other transactions.

## Data Type

string

## Default Value

NONE



## Remarks

Valid values are:

- Read Uncommitted—Dirty reads, nonrepeatable reads, and phantom reads can occur.
- Read Committed—Nonrepeatable reads and phantom reads can occur.
- Repeatable Read—Only phantom reads can occur.
- Serializable—Dirty reads, nonrepeatable reads, and phantom reads are prevented.
- None

## Pass-through Login

Flag to indicate whether pass-through login is enabled or not.

## Data Type

string

## Default Value

""

## Remarks

Disabled (default)—This allows automated provisioning of a connection pool. Open connection threads can be used by authorized users after the validation query verifies connection status. If pass-through login is disabled, the Save Password check box is not available.

Enabled—A new connection to the data source uses the credentials supplied by the client when data is requested from that data source for the first time. Subsequent requests by the same user reuse the existing connection. When another user attempts to connect to a data source, a new connection is created.

See “Managing Security for TDV Resources” in the TDV Administration Guide for details.

## Authentication Type

Indicates the type of authentication used by the data source.

## Data Type

String

## Default Value

BASIC

## Remarks

Select BASIC or Kerberos authentication method, where offered.

See the *TDV Administration Guide* for more information about Kerberos authentication.

## Service Principal Name

This field is available only if you choose Kerberos authentication.

## Data Type

String

## Default Value

""

## Remarks

None

## Advanced Tab

The following table and the sections below lists and explains the connection properties that are in the Advanced Tab of the New Data Source Window.

Connection URL Pattern	A template for generating a URL to connect to the physical data source.
Connection URL String	The URL string generated from the connection URL pattern with the connection information you provide.
JDBC Connection Properties	Lets you specify property-value pairs to pass to the JDBC data source
Connection Pool Maximum Size	Maximum number of connections (both active and idle) allowed for the data source. When the maximum is reached, new requests must wait until a connection is available.
Connection Pool Minimum Size	Minimum number of connections in the pool even when the pool is inactive.
Connection Pool Idle Timeout	Number of seconds that a connection can remain idle without being dropped from the pool when there are more than the minimum number of connections.
Maximum Connection Lifetime	The number of minutes that a connection that was returned to the pool persists if there are more open connections than the minimum pool size.
Connection Validation Query	A data-source-specific query that the TDV query engine sends to see if the data source connection is valid. This query is executed every time a connection is checked out from the pool. Enter a query that returns quickly.
Execution Timeout	The number of seconds an execution query on the data source can run before being canceled.
Execute SELECTs Independently	Lets a SELECT statement be executed using a new connection from the connection pool, and committed immediately after completion. INSERT, UPDATE, and DELETE statements are executed using the same connection as part of the transaction.

<a href="#">Connection Checkout Procedure</a>	A procedure that returns a valid SQL statement that can be used to initialize the connection.
<a href="#">Supports Star Schema</a>	Check only if this data source supports very large predicates and very large cardinalities for star schema semijoins.
<a href="#">Max Source Side of Semi Join To Use OR Syntax</a>	See the documentation for semijoins and the TDV Administration Guide for more information.
<a href="#">Min Target to Source Ratio for Semi Join</a>	Sets the minimum target-to-source ratio of cardinality for semijoins. Refer to the TDV Administration Guide for more information.
<a href="#">Max Source Side Cardinality for Semi Join</a>	See the documentation for semijoins and the TDV Administration Guide for more information.
<a href="#">Enable Native Data Loading</a>	Lets the data source use its proprietary functionality to optimize performance.
<a href="#">Collation Sensitive</a>	TDV does not use the SORT MERGE join algorithm if any data source involved in the join is marked Collation Sensitive.
<a href="#">Concurrent Request Limit</a>	Works with the Massively Parallel Processing engine configuration parameters to control the amount of parallelization for the queries for a particular data source.
<a href="#">Is dataship source</a>	Indicates whether the physical data source might be used as a source of shipped tables to another data ship enabled data source
<a href="#">Is dataship target</a>	Indicates whether the physical data source might be used to receive shipped tables from another data ship enabled data source.
<a href="#">Lower bound/Upper bound for dataship</a>	TDV uses Explain Plan to arrive at a numeric estimate of the cost of shipping data from a node to the Data

	Virtualizer. When the cost of shipping a federated query node falls between the limits of the Lowerbound and Upperbound, it is considered eligible for shipment so that it can be processed locally.
<a href="#">Schema Path for Temp Tables</a>	A relative path to set the location of the temp tables on the data source. It is the name of a schema in the data source.
<a href="#">Temp Table Prefix</a>	A character string addition to temporary table names so that they are recognized if they are needed.
<a href="#">Use global temp space for temp tables</a>	Option that can be used to improve performance when using this data source with the TDV data ship feature. This option would allow you to manage the temp tables created for the data source like any other temp table that you have defined in your source database.
<a href="#">Database Alias (Used for bulk load)</a>	Alternative name for the name of the Database.

## Connection URL Pattern

A template for generating a URL to connect to the physical data source.

## Data Type

string

## Default Value

jdbc:<DATA SOURCE>//<HOST>:<PORT>/<DATABASE\_NAME>

## Remarks

TDV does not validate modifications at the time of configuration. The data source adapter might not validate changes.

## Connection URL String

The URL string generated from the connection URL pattern with the connection information you provide.

## Data Type

string

## Default Value

“”

## Remarks

This string is used by the JDBC adapter to connect to the physical data source. This field cannot be edited. For details, see the section “Connecting through JDBC Adapters” in the *TDV Administration Guide*.

## JDBC Connection Properties

Lets you specify property-value pairs to pass to the JDBC data source.

## Data Type

string

## Default Value

“”

## Remarks

Click to add custom connection properties for any JDBC data source. Commonly used properties are populated with default values. Use the Add Argument button to specify other properties and values.

TDV does not validate property names. Some data source adapters ignore invalid property names or values; others return an error.

The driver properties specify connection timeout settings required by specific drivers. To avoid leaving connections open indefinitely, specify properties explicitly for your data source.

## Connection Pool Maximum Size

Maximum number of connections (both active and idle) allowed for the data source. When the maximum is reached, new requests must wait until a connection is available.

## Data Type

Numeric

## Default Value

100

## Remarks

If the maximum number of connections is in use when a request comes in (even with pass-through authentication), the new request is blocked and queued until a connection is available or the Connection Pool Idle Timeout is reached.

If no connection was made available within the specified timeout, a check is made for an available connection by the same user. If none is available, the least recently used connection for another user is dropped and a new connection is opened.

Studio reuses pooled connections if they continue to be valid after changes (such as connection name), but JDBC requests are forced to use new connections if any part of the data source connection configuration has changed.

## Connection Pool Minimum Size

Minimum number of connections in the pool even when the pool is inactive.

## Data Type

Numeric

**Default Value**

0

**Remarks**

When a connection has been idle, a validation query is used to verify whether an open connection is still valid just prior to submission of a request. If the connection is invalid, the connection is discarded and another is used.

**Connection Pool Idle Timeout**

Number of seconds that a connection can remain idle without being dropped from the pool when there are more than the minimum number of connections.

**Data Type**

Numeric

**Default Value**

30

**Maximum Connection Lifetime**

The number of minutes that a connection that was returned to the pool persists if there are more open connections than the minimum pool size.

**Data Type**

Numeric

**Default Value**

30



## Remarks

The duration is calculated from connection creation. Default value is 60 minutes. Set a smaller value if the pool is likely to run out of connections. Be sure to add a validation query. Set a larger value if you want the connections to be held for a longer period. Set a value of 0 to keep connections alive indefinitely.

## Connection Validation Query

A data-source-specific query that the TDV query engine sends to see if the data source connection is valid. This query is executed every time a connection is checked out from the pool. Enter a query that returns quickly.

## Data Type

string

## Default Value

""

## Remarks

If this query returns a non-error result, the data source connection is considered valid. If this query fails, the connection is discarded and a new connection is checked out from the available pool.

No one SELECT statement works with all data sources. To verify that TDV is running and that it can connect to the data source, devise a query against a published table from that data source.

## Enable Native Data Loading

Lets the data source use its proprietary functionality to optimize performance.

## Data Type

Bool

## Default Value

True

## Remarks

See the User Guide, Chapter About Data Source Native Load Performance Options” for more details,.

## Collation Sensitive

TDV does not use the SORT MERGE join algorithm if any data source involved in the join is marked Collation Sensitive.

## Data Type

Bool

## Default Value

False

## Remarks

None

## Concurrent Request Limit

Works with the Massively Parallel Processing engine configuration parameters to control the amount of parallelization for the queries for a particular data source.

## Data Type

Numeric

## Default Value

0

## Remarks

None

## Is dataship source

Indicates whether the physical data source might be used as a source of shipped tables to another data ship enabled data source.

## Data Type

Bool

## Default Value

False

## Remarks

None

## Is dataship target

Indicates whether the physical data source might be used to receive shipped tables from another data ship enabled data source.

## Data Type

Bool

## Default Value

False

## Remarks

To make changes in this field, Is dataship source must be enabled.

## Lower bound/Upper bound for dataship

TDV uses Explain Plan to arrive at a numeric estimate of the cost of shipping data from a node to the Data Virtualizer. When the cost of shipping a federated query node falls between the limits of the Lowerbound and Upperbound, it is considered eligible for shipment so that it can be processed locally.

### Data Type

Numeric

### Default Value

Lower bound - 50000

Upper bound - 5000000

### Remarks

To make changes in this field, Is dataship source must be enabled.

## Schema Path for Temp Tables

A relative path to set the location of the temp tables on the data source. It is the name of a schema in the data source.

### Data Type

String

### Default Value

""

### Remarks

To make changes in this field, Is dataship target must be enabled.

## Temp Table Prefix

A character string addition to temporary table names so that they are recognized if they are needed.

## Data Type

String

## Default Value

T

## Remarks

To make changes in this field, Is dataship target must be enabled.

## Use global temp space for temp tables

Option that can be used to improve performance when using this data source with the TDV data ship feature. This option would allow you to manage the temp tables created for the data source like any other temp table that you have defined in your source database.

## Data Type

Bool

## Default Value

False

## Execution Timeout

The number of seconds an execution query on the data source can run before being canceled.

## Data Type

Numeric

**Default Value**

0

**Remarks**

None

**Execute SELECTs Independently**

Lets a SELECT statement be executed using a new connection from the connection pool, and committed immediately after completion. INSERT and UPDATE statements are executed using the same connection as part of the transaction.

**Data Type**

Bool

**Default Value**

True

**Remarks**

None

**Connection Checkout Procedure**

A procedure that returns a valid SQL statement that can be used to initialize the connection.

**Data Type**

string

**Default Value**

""

## Remarks

The signature of the initialization procedure should be:

```
(IN ds_name VARCHAR, OUT sqlText VARCHAR)
```

Give the full path to the procedure in the Connection Check-out Procedure box.

## Max Source Side Cardinality for Semi Join

See the documentation for semijoins and the TDV Administration Guide for more information.

## Data Type

Numeric

## Default Value

""

## Remarks

None

## Max Source Side of Semi Join To Use OR Syntax

See the documentation for semijoins and the TDV Administration Guide for more information.

## Data Type

Numeric

## Default Value

2147483647

## Remarks

None

## Min Target to Source Ratio for Semi Join

Sets a minimum ratio to trigger use of semi join optimization.

## Data Type

Numeric

## Default Value

""

## Remarks

None

## Supports Star Schema

Check only if this data source supports very large predicates and very large cardinalities for star schema semijoins.

## Data Type

Bool

## Default Value

False

## Remarks

Refer to the section Star Schema Semijoin in the User Guide, for more information.



## Database Alias (Used for bulk load)

Alternative name for the name of the Database.

## Data Type

String

## Default Value

""

## Remarks

None

# DB2 and DB2 z/OS Data Source Limitations

See the IBM DB2 Universal Database client documentation for more information on installing and connecting with DB2 instances.

## DB2 Native (Bulk) Loading Caching Limitations

When bulk load is in use, the following data types cannot be cached to DB2:

Data Source	Data Types Not Supported	Cache Target
Oracle	BLOB and LONGRAW	DB2
SQL Server	BINARY and VARBINARY	DB2
Sybase IQ	BINARY, BLOB, and VARBINARY	DB2

# Data Type Mappings

## DB2 to TDV Data Types

The following limits apply to DB2 data type mapping:

- The maximum length for BINARY, CHAR, VARBINARY, and VARCHAR is 32000.
- The minimum length for BINARY, CHAR, VARBINARY, and VARCHAR is 1.
- The maximum precision (p) is 38.
- The maximum scale (s) for CAST functions is 38.
- When a DECIMAL/NUMERIC data type has a precision greater than 38, it is mapped to the DB2 DOUBLE data type.

The following table shows the mapping from DB2 data types to TDV data types.

DB2 Data Type	TDV Data Type
BIGINT	BIGINT
BLOB	BLOB
CHAR	CHAR
CHAR FOR BIT DATA	BINARY
CHARACTER	CHAR
CHARACTER VARYING	VARCHAR
CLOB	CLOB
DATE	DATE
DBCLOB	CLOB
DECIMAL	DECIMAL

DB2 Data Type	TDV Data Type
DOUBLE	DOUBLE
FLOAT	FLOAT
FLOAT(1) – FLOAT(21)	FLOAT [on z/OS platforms only]
FLOAT(22) – FLOAT(53)	DOUBLE [on z/OS platforms only]
GRAPHIC	CHAR
INTEGER	INTEGER
LONG VARCHAR	CLOB
LONG VARCHAR FOR BIT DATA	BLOB
LONG VARGRAPHIC	CLOB
LONGVAR	CLOB
LONGVARG	CLOB
REAL	REAL
ROWID	BINARY
SMALLINT	SMALLINT
TIME	TIME
TIMESTAMP	TIMESTAMP
VARCHAR	VARCHAR
VARCHAR FOR BIT DATA	VARBINARY

DB2 Data Type	TDV Data Type
VARGRAPH	VARCHAR
VARGRAPHIC	VARCHAR
XML	XML
XMLCLOB	XML
XMLFILE	XML
XMLVARCHAR	XML

## DB2 Cache Mapping

The data type mappings for caches stored on DB2 are as follows.

Data Type	Preferred Native Type	Other Allowed Native Types
BIGINT	BIGINT	DECIMAL(19+,0), larger INTEGER types, VARCHAR(20+)
BINARY(n)	BLOB	
BIT	SMALLINT	DECIMAL(1+,0), larger INTEGER types
BLOB	BLOB	
BOOLEAN	SMALLINT	INTEGER, BIGINT
CHAR(n)	CHAR(n); CLOB [if n > 254]	CHAR(n+), GRAPHIC(n+), VARCHAR(n+), VARGRAPHIC(n+), CLOB
CLOB	CLOB	LONG VARGRAPHIC

<b>Data Type</b>	<b>Preferred Native Type</b>	<b>Other Allowed Native Types</b>
DATE	DATE	VARCHAR(10+)
DECIMAL(p,s)	DECIMAL(p,s); CLOB [if p > 31]	DECIMAL(p+,s+), VARCHAR (p+3+), VARGRAPHIC(p+3+), CLOB, LONG VARGRAPHIC
DOUBLE	DOUBLE	VARCHAR(24+)
FLOAT	DOUBLE	VARCHAR(24+)
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 TO SECOND	VARCHAR(30)	
INTERVAL MINUTE	VARCHAR(30)	
INTERVAL MINUTE TO SECOND	VARCHAR(30)	

Data Type	Preferred Native Type	Other Allowed Native Types
INTERVAL MONTH	VARCHAR(9)	
INTERVAL SECOND	VARCHAR(30)	
INTERVAL YEAR	VARCHAR(9)	
INTERVAL YEAR TO MONTH	VARCHAR(12)	
NUMERIC(p,s)	DECIMAL(p,s); CLOB [if p > 31]	DECIMAL(p+,s+), VARCHAR (p+3+), GRAPHIC(p+3+), CLOB
OTHER	[cannot be cached]	
REAL	REAL	
SMALLINT	SMALLINT	DECIMAL(5+,0), larger INTEGER types, VARCHAR(20+)
TIME	TIME	VARCHAR(15+)
TIMESTAMP	TIMESTAMP	VARCHAR(26+)
TINYINT	SMALLINT	DECIMAL(3+,0), larger INTEGER types, VARCHAR(20+)
VARBINARY(n)	BLOB	
VARCHAR(n)	VARCHAR(n); CLOB [if n > 254]	VARCHAR(n+), VARGRAPHIC(n+), CLOB, LONG VARGRAPHIC
XML	CLOB	VARCHAR(*) [truncates data if column is too small], VARGRAPHIC(*), LONG VARGRAPHIC

## DB2-on-z/OS Cache Mapping

The data type mappings for caches stored on DB2 (z/OS platform) are as follows.

Data Type	Native Type
BIGINT	BIGINT
BINARY	BLOB
BIT	SMALLINT
BLOB	BLOB
BOOLEAN	SMALLINT
CHAR	CHAR CLOB (if > 254 bytes)
CLOB	CLOB
DATE	DATE
DECIMAL	DECIMAL CLOB (if precision >31)
DOUBLE	DOUBLE
FLOAT	DOUBLE
INTEGER	INTEGER
NUMERIC	DECIMAL CLOB (if precision >31)
REAL	REAL
SMALLINT	SMALLINT

Data Type	Native Type
TIME	TIME
TIMESTAMP	TIMESTAMP
TINYINT	SMALLINT
VARBINARY	BLOB
VARCHAR	VARCHAR CLOB (if length >255)
XML	CLOB

## DB2 Function Support

If the TDV and DB2 data source settings do not match for case sensitivity or trailing spaces, use the STRICT option in any query that includes a DISTINCT operator.

TDV supports the following types of functions for DB2:

- [DB2 Aggregate Function Support](#)
- [DB2 Analytic Function Support](#)
- [DB2 Analytic Aggregate Function Support](#)
- [DB2 Character Function Support](#)
- [DB2 Conditional Function Support](#)
- [DB2 Conversion Function Support](#)
- [DB2 Date Function Support](#)
- [DB2 Linear Regression Function Support](#)
- [DB2 Numeric Function Support](#)
- [DB2 XML Function Support](#)



## DB2 Aggregate Function Support

TDV supports the aggregate functions listed in the table below for DB2.

DB2 Aggregate Function	Notes
AVG	BLOB, CLOB, and string-type arguments not supported.
CORR	BLOB and CLOB arguments not supported; arguments must be numeric.
COUNT	BLOB and CLOB arguments not supported; DISTINCT not supported with LONGVAR.
MAX	BLOB and CLOB arguments not supported.
MIN	BLOB and CLOB arguments not supported.
SUM	BLOB and CLOB arguments not supported.

## DB2 Analytic Function Support

TDV supports the analytic functions listed in the table below for DB2..

DB2 Analytic Function	Notes
AVG	AVG DISTINCT not supported for versions 8 and 9.
COUNT	COUNT DISTINCT not supported for versions 8 and 9.

DB2 Analytic Function	Notes
CUME_DIST	Supported only for version 11.
DENSE_RANK	
MAX	MAX DISTINCT not supported for versions 8 and 9.
MIN	MIN DISTINCT not supported for versions 8 and 9.
PERCENT_RANK	
RANK	
ROW_NUMBER	
SUM	SUM DISTINCT not supported for versions 8 and 9.

## DB2 Analytic Aggregate Function Support

TDV supports the analytic aggregate functions listed in the table below for DB2.

DB2 Analytic Aggregate Function	Notes
MEDIAN	Supported only for version 11.
PERCENTILE_CONT	Supported only for version 11.
PERCENTILE_DISC	Supported only for version 11.
STDDEV	Supported only for version

DB2 Analytic Aggregate Function	Notes
	11.  Note: To prevent nonstandard results, add OPTION STRICT to the query.
STDDEV_POP	
STDDEV_SAMP	Not supported for version 8.
VARIANCE_POP	
VARIANCE_SAMP	Not supported for version 8.

## DB2 Character Function Support

TDV supports the character functions listed in the table below for DB2.

DB2 Character Function	Notes
BTRIM	Supported only for version 11.
CONCAT	LONGVARCHAR not supported.
LEFT	Supported only for version 11.
LENGTH	
LOWER	
POSITION	
REGEXP_REPLACE	Supported only for version 11.

DB2 Character Function	Notes
REPLACE	
RIGHT	Supported only for version 11.
RTRIM	
SPACE	SMALLINT and INTEGER arguments only.
STRPOS	Supported only for version 11.
SUBSTRING	
TRIM	
UPPER	

## DB2 Conditional Function Support

TDV supports the conditional functions listed in the table below for DB2.

DB2 Conditional Function	Notes
COALESCE	
DECODE	Mapped to CASE.
NULLIF	NULL not supported; BLOB, CLOB, LONGVARCHAR_FOR_BIT_DATA, LONG_VARCHAR arguments not allowed. For string comparisons, ignores trailing spaces.

## DB2 Conversion Function Support

TDV supports the conversion functions listed in the table below for DB2.

DB2 Conversion Function	Notes
CAST	The maximum length for BINARY and VARBINARY is 4000. The maximum length for CHAR is 254. The maximum length of precision (p) and scale (s) is 31.
FORMAT_DATE	
PARSE_TIMESTAMP	
TO_CHAR	
TO_DATE	
TO_NUMBER	Empty-string input returns an exception.
TO_TIMESTAMP	Input of a string of eight white spaces returns a timestamp value. Shorter input string or a trimmed value throws an exception.

## DB2 Date Function Support

TDV supports the date functions listed in the table below for DB2.

Function	Notes
ADD_DAYS	Supported only for version 11.
ADD_MONTHS	Result differs between pushed and not pushed. When pushed, if expression is the last day of month or if the resulting month has fewer days than the day component of the expression, the result is the last day of the resulting month. When not pushed, the result has the same day component as the

Function	Notes
	expression.
CURRENT_DATE	
CURRENT_TIME	
CURRENT_TIMESTAMP	
DATE_ADD	Supported only for version 11.
DATE_PART	Supported only for version 11.
DATE_TRUNC	Supported only for version 11.
DAY	
DAYOFMONTH	Supported only for version 11.
DAYS_BETWEEN	Supported only for version 11.
MONTH	
NOW	Supported only for version 11.
YEAR	Version >8, or DB2 XML Extender enabled.

## DB2 Linear Regression Function Support

TDV supports the linear regression functions listed in the table below for DB2 version 11..

DB2 Linear Regression Function	Notes
REGR_SLOPE	

DB2 Linear Regression Function	Notes
REGR_INTERCEPT	
REGR_COUNT	
REGR_R2	
REGR_AVGX	
REGR_SXX	
REGR_SYY	
REGR_SXY	

## DB2 Numeric Function Support

TDV supports the numeric functions listed in the table below for DB2. DB2 does not support string-type arguments in numeric functions.

DB2 Numeric Function	Notes
ABS	
ACOS	
ASIN	
ATAN	
CEILING	
COS	
COT	

DB2 Numeric Function	Notes
DEGREES	
EXP	
FLOOR	
LOG	
PI	Not supported.
POW	Supported only for version 11.
POWER	
RADIANS	
RANDOM	
ROUND	
SIN	
SQRT	
TAN	

## DB2 XML Function Support

TDV supports the XML functions listed in the table below for DB2.

The XML functions can be used only if all DB2 data sources of version 8 or earlier have DB2 XML Extender enabled; otherwise an exception will be thrown.



DB2 XML Function	Notes
XMLATTRIBUTES	
XMLCOMMENT	
XMLCONCAT	
XMLDOCUMENT	
XMLELEMENT	
XMLFOREST	
XMLNAMESPACES	
XMLPI	
XMLQUERY	
XMLTEXT	

## DB2 Mainframe Function Support

TDV supports the functions listed in the table below for DB2 Mainframe:

- [DB2 Mainframe Aggregate Function Support](#)
- [DB2 Mainframe Character Function Support](#)
- [DB2 Mainframe Conditional Function Support](#)
- [DB2 Mainframe Conversion Function Support](#)
- [DB2 Mainframe Date Function Support](#)
- [DB2 Mainframe Numeric Function Support](#)
- [DB2 Mainframe XML Function Support](#)

## DB2 Mainframe Aggregate Function Support

TDV supports the aggregate functions listed in the table below for DB2 Mainframe.

DB2 Mainframe Aggregate Function	Notes
AVG	BLOB, CLOB, and string-type arguments not supported.
COUNT	BLOB and CLOB arguments not supported.
MAX	BLOB and CLOB arguments not supported.
MIN	BLOB and CLOB arguments not supported.
SUM	BLOB and CLOB arguments not supported.

## DB2 Mainframe Binary Function Support

TDV supports the binary functions listed in the table below for DB2 Mainframe

DB2 Mainframe Conditional Function	Notes
BITAND, BITANDNOT, BITOR, BITXOR, BITNOT	

## DB2 Mainframe Character Function Support

TDV supports the character functions listed in the table below for DB2 Mainframe.

DB2 Mainframe Character Function	Notes
CONCAT	LONGVARCHAR not supported.
LENGTH	
LOWER	
POSITION	String-type arguments only.
REPLACE	
RTRIM	
SPACE	SMALLINT and INTEGER arguments only.
SUBSTRING	
TRIM	
UPPER	
SUBSTR	
ASCII	
INSERT	
LPAD	Result differs between pushed and not pushed. When pushed, the length argument will not accept non-constant value.
RPAD	Result differs between pushed and not pushed. When pushed, the length argument will not accept non-constant value.

DB2 Mainframe Character Function	Notes
DIFFERENCE	
TRIM	
REPEAT	

## DB2 Mainframe Conditional Function Support

TDV supports the conditional function listed in the table below for DB2 Mainframe.

DB2 Mainframe Conditional Function	Notes
NULLIF	NULL not supported; BLOB, CLOB, LONGVARCHAR_FOR_BIT_DATA, LONG_VARCHAR arguments not allowed. For string comparisons, ignores trailing spaces.
IFNULL	
DECODE	
NVL	

## DB2 Mainframe Conversion Function Support

TDV supports the conversion functions listed in the table below for DB2 Mainframe.

DB2 Mainframe Conversion Function	Notes
CAST	The maximum length for BINARY and

DB2 Mainframe Conversion Function	Notes
	VARBINARY is 4000. The maximum length for CHAR is 254. The maximum length of precision (p) and scale (s) is 31.
TO_CHAR	
TO_DATE	
TO_NUMBER	
TO_TIMESTAMP	
TO_TIMESTAMP_TZ	

## DB2 Mainframe Date Function Support

TDV supports the date functions listed in the table below for DB2 Mainframe.

DB2 Mainframe Date Function	Notes
CURRENT_DATE	
CURRENT_TIME	
CURRENT_TIMESTAMP	
DAY	
MONTH	
YEAR	
ADD_MONTHS	

DB2 Mainframe Date Function	Notes
DAYOFMONTH	
DAYOFWEEK	
DAYOFWEEK_ISO	
DAYOFYEAR	
DAYS	
HOUR	
JULIAN_DAY	
LAST_DAY	
MICROSECOND	
MIDNIGHT_SECONDS	
MINUTE	
MONTHS_BETWEEN	
NEXT_DAY	
QUARTER	
SECOND	
TIMESTAMP	
WEEK	
WEEK_ISO	
EXTRACT	

## DB2 Mainframe Numeric Function Support

TDV supports the numeric functions listed in the table below for DB2 Mainframe. DB2 Mainframe does not support string-type arguments in numeric functions.

DB2 Mainframe Numeric Function	Notes
ABS	
ACOS	
ASIN	
ATAN	
CEILING	
COS	
COT	
DEGREES	
EXP	
FLOOR	
LOG	
PI	Not supported.
POWER	
RADIANS	
ROUND	
SIN	

DB2 Mainframe Numeric Function	Notes
SQRT	
TAN	
UNICODE	
SIGN	
QUANTIZE	
DECFLOAT	
NORMALIZE_DECFLOAT	
ATAN2	
LN	
MOD	
RAND	

## DB2 Mainframe XML Function Support

TDV supports the XML functions listed in the table below for DB2 Mainframe.

The XML functions can be used only if all DB2 data sources of version 8 or earlier have DB2 XML Extender enabled; otherwise an exception will be thrown.

DB2 Mainframe XML Function	Notes
XMLATTRIBUTES	
XMLCOMMENT	



DB2 Mainframe XML Function	Notes
XMLCONCAT	
XMLDOCUMENT	
XMLELEMENT	
XMLFOREST	
XMLNAMESPACES	
XMLPI	
XMLQUERY	
XMLTEXT	
XMLAGG	

## DB2 Specific Properties

This section describes the connection properties that are specific to the DB2 data source.

Port	<p>Port number for the data source to connect with the host.</p> <p>The Port number for DB2—no default</p> <p>DB2 z/OS—446</p>
Service Principal Name	This field is available only if you choose Kerberos authentication.
Use global temp space for	Option that can be used to improve performance when

temp tables	using this data source with the TDV data ship feature. This option would allow you to manage the temp tables created for the data source like any other temp table that you have defined in your source database.
Is dataship source	Indicates whether the physical data source might be used as a source of shipped tables to another data ship enabled data source
Lower bound/Upper bound	TDV uses Explain Plan to arrive at a numeric estimate of the cost of shipping data from a node to the Data Virtualizer. When the cost of shipping a federated query node falls between the limits of the Lowerbound and Upperbound, it is considered eligible for shipment so that it can be processed locally.
Is dataship target	Indicates whether the physical data source might be used to receive shipped tables from another data ship enabled data source.
Schema path for Temp Tables	A relative path to set the location of the temp tables on the data source. It is the name of a schema in the data source.
Temp Table Prefix	A character string addition to temporary table names so that they are recognized if they are needed.

## References

Refer to the following Guides for further details about the capabilities of the data source:

Capabilities	Section
Query Engine	User Guide, Chapter <b><i>TDV Query Engine Optimizations</i></b>
Data ship	User Guide, Chapter <b><i>Data Ship</i></b>

Capabilities	Section
<b><i>Performance Optimization</i></b>	
Caching	User Guide, Chapter <b><i>TDV Caching</i></b>
Performance Optimization	User Guide, Chapter <b><i>Performance Tuning</i></b>
TDV Massively Parallel Processing Engine	User Guide, Chapter <b><i>Configuring the TDV MPP Engine</i></b>
Kerberos	Administration Guide Chapter <b><i>Configuring Kerberos</i></b>

# 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.

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- 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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