



TIBCO® Data Virtualization

Google Cloud Storage Adapter Guide

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TDV Google Cloud Storage Adapter

Google Cloud Storage (GCS) is a service for storing objects in the cloud. It is a storage system that provides shared access to file data.

This topic describes the configuration of this Cloud File System based data source. TDV supports the following Cloud based File Systems:

- Amazon S3
- Microsoft Azure Data Lake Storage
- Local File Storage
- Google Cloud Storage

Refer to the corresponding Adapter guides for details on how to configure those.

The File formats supported for GCS adapter are:

- Delimited file format
- Parquet file format

Note: The delimited file format is a flat file format while the Parquet files can store data in a hierarchical format also. If the “Infer Schema” option is selected for the data source, TDV will infer the schema and datatypes of each column based on the data in the file.

In this chapter, the following topics are discussed:

[Connecting to GCS Data Source](#)

[Data Type Mapping](#)

[Supported Functions](#)

Connecting to Google Cloud Storage Data Source

From the New Data Source dialog window, choose Google Cloud Storage data source to connect to it. The following sections explain the different connection parameters.

Basic Tab

Google Cloud Storage

To connect to the GCS file system adapter, set the following properties in the basic tab of the New Data Source connection window:

Field	Description
URL	A URL to connect to the physical data source.
Project Id	Set this to the Id of the project that you want to connect to.
Service Account	Each service account is associated with a public/private RSA key pair. The Service Account Credentials API uses this internal key pair to create short-lived service account credentials, and to sign blobs and JSON Web Tokens (JWTs). This key pair is known as the Google-managed key pair. In addition, you can create multiple public/private RSA key pairs, known as user-managed key pairs, and use the private key to authenticate with Google APIs. This private key is known as a service account key. Refer to https://cloud.google.com/iam/docs/keys-create-delete for details about how to create a Service account key.

Advanced Tab

To connect to the GCS file system adapter, set the following properties in the basic tab of the New Data Source connection window:

Field	Description
Concurrent Request Limit	This configuration can take a value between 0 to 65536. It specifies the concurrency limits to be imposed on the underlying data source.

Field	Description
Default String Length	The default VARCHAR length.
Detect Partition During Introspection	<p>Include this option to automatically detect partitions that the file might have.</p> <p>Note that if they are not properly detected, both usability and performance will be adversely impacted</p>
CSV Options	
Include CSV Files	Check this option to include the delimited files from the storage area.
Character Set	The character set used by the datasource.
Delimiter	Indicates the file delimiter character.
Text Qualifier	Indicates the type of qualifier that is used in the file to enclose a string field.
Has Header Row	Indicates whether or not the file has a header row.
Infer Schema	<p>Choosing this option enables the parser to infer the schema and datatypes of each column based on the data in the file.</p> <p>Note: If this option is selected, it is recommended to provide a “sampling ratio” while introspecting the data source, where sampling of the data might be used when inferring the schema. Providing the sampling ratio helps reduce the overhead of not having to read all the rows while inferring the schema. Parquet files do not require schema inference as their schema is encoded in their metadata</p>
CSV Escape Character	Indicates the character that should be ignored by the parser in the file.
CSV Parser Lib	The libraries used to parse the delimited files. The libraries supported

Field	Description
	<p>currently are commons (default) and uniVocity. For more information, refer:</p> <ul style="list-style-type: none"> • http://commons.apache.org/proper/commons-csv/ • https://www.univocity.com/
CSV Parsing Mode	The various parsing modes used by the data source. Allowed values are “PERMISSIVE (include a malformed row), DROPMALFORMED (Drop bad rows), FAILFAST (Fail the introspection when a bad row is encountered).
CSV Comment Character	Indicates the character that is used as comment in the file.
CSV Null Value	Indicates what is considered a Null value in a row.
CSV File Name Filters	Indicates the file name extensions that are valid.
Parquet Options	
Include Parquet Files	Check this option to include the parquet files from the storage area.
Binary as String	Check this option to read binary value as string.
INT96 as Timestamp	Check this option to read INT96 value as Timestamp.
Compression Codec	<p>Parquet files are typically compressed. This setting controls the compression algorithm used to process them. For more information about the different options, refer</p> <p>https://spark.apache.org/docs/2.4.3/sql-data-sources-parquet.html</p>
Filter Push-Down	Controls whether a predicate specified in a WHERE clause in a SQL query will be pushed down to the Cloud File System data source.
Convert	Controls whether to use the built-in Parquet reader and writer for Hive

Field	Description
Metastore	tables with the parquet storage format. By default, this is set to True.
Merge Schema	In case of partitioned files, choosing this option merges the data and creates a single schema that includes columns from all partitions.
Parquet File Name Filters	Indicates the file name extensions that are valid.

Data Type Mapping

GCS to TDV Data Types

Mapped GCS data types have the following restrictions:

- Maximum VARBINARY length is 2000.
- Maximum CHAR length is 10485760.
- Maximum VARCHAR length is 10485760.
- Maximum Precision length is 38.
- Minimum CHAR length is 1.
- Minimum VARCHAR length is 1.

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

Google Cloud Storage Data Type	TDV Data Type
BYTEA	BLOB
CHAR	CHAR

Google Cloud Storage Data Type	TDV Data Type
CHARACTER	CHAR
CHARACTER_VARYING	VARCHAR
DECIMAL	DECIMAL
BPCHAR	CHAR
TEXT	CLOB
DOUBLE	DOUBLE
FLOAT	FLOAT
LONG	CLOB
NUMBER	DECIMAL
RAW	BYTEA
ROWID	VARCHAR
UROWID	VARCHAR
VARCHAR	VARCHAR
VARCHAR2	VARCHAR
DATETIME	TIMESTAMP
TIMESTAMP	TIMESTAMP
TIMESTAMPZ	TIMESTAMP

Google Cloud Storage Data Type	TDV Data Type
SMALLDATETIME	TIMESTAMP
TIMETZ	TIME
FLOAT	REAL
FLOAT4	REAL
FLOAT8	DOUBLE
REAL	REAL
INTEGER	INTEGER
INT	INTEGER
BIGINT	BIGINT
INT8	BIGINT
INT4	INTEGER
INT2	SMALLINT
SMALLINT	SMALLINT
BOOL	BOOLEAN
BOOLEAN	BOOLEAN
BIT	CHAR
VARBIT	VARCHAR
TINYINT	SMALLINT

Google Cloud Storage Data Type	TDV Data Type
NUMERIC	NUMERIC
UUID	CHAR
XID	INTEGER
XML	XML
BOX	VARCHAR
OID	BLOB
BINARY_DOUBLE	DOUBLE
DOUBLE_PRECISION	DOUBLE
CIDR	VARCHAR
INET	VARCHAR
LINE	VARCHAR
LSEG	VARCHAR
MACADDR	VARCHAR
MONEY	DECIMAL
SERIAL	INTEGER
BIGSERIAL	BIGINT
CIRCLE	VARCHAR

Google Cloud Storage Data Type	TDV Data Type
PATH	VARCHAR
POINT	CHAR
POLYGON	VARCHAR
BINARY_FLOAT	REAL
TIMESTAMP	TIMESTAMP
INTERVAL	INTERVAL/DAY/TO/SECOND
INTERVAL_YEAR	INTERVAL/YEAR
INTERVAL_MONTH	INTERVAL/MONTH
INTERVAL_DAY	INTERVAL/DAY
INTERVAL_HOUR	INTERVAL/HOUR
INTERVAL_MINUTE	INTERVAL/MINUTE
INTERVAL_SECOND	INTERVAL/SECOND
INTERVAL_YEAR_TO_MONTH	INTERVAL/YEAR/TO/MONTH
INTERVAL_DAY_TO_HOUR	INTERVAL/DAY/TO/HOUR
INTERVAL_DAY_TO_MINUTE	INTERVAL/DAY/TO/MINUTE

Google Cloud Storage Data Type	TDV Data Type
INTERVAL_DAY_TO_SECOND	INTERVAL/DAY/TO/SECOND
INTERVAL_HOUR_TO_MINUTE	INTERVAL/HOUR/TO/MINUTE
INTERVAL_HOUR_TO_SECOND	INTERVAL/HOUR/TO/SECOND
INTERVAL_MINUTE_TO_SECOND	INTERVAL/MINUTE/TO/SECOND

TDV to Google Cloud Storage Data Types

TDV Data Types	GCS Data Types
DECIMAL_FLOAT	VARCHAR(128)
BIGINT	BIGINT
BINARY	BYTEA
BINARY_PROMOTE	BYTEA
BIT	SMALLINT
BLOB	BYTEA
BOOLEAN	BOOLEAN

TDV Data Types	GCS Data Types
CHAR	CHAR(&1)
CHAR_PROMOTE	TEXT
CLOB	TEXT
DATE	VARCHAR
DECIMAL	DECIMAL(&p, &s)
DECIMAL_PROMOTE	TEXT
DOUBLE	DOUBLE
FLOAT	FLOAT
INTEGER	INTEGER
NUMERIC	DECIMAL(&q, &s)
NUMERIC_PROMOTE	TEXT
REAL	REAL
SMALLINT	SMALLINT
TIME	VARCHAR
TIMESTAMP	TIMESTAMP
TINYINT	SMALLINT
VARBINARY	BYTEA
VARBINARY_PROMOTE	BYTEA
VARCHAR	VARCHAR(&1)

TDV Data Types	GCS Data Types
VARCHAR_PROMOTE	TEXT
XML	XML
INTERVAL_YEAR	INTERVAL YEAR
INTERVAL_MONTH	INTERVAL MONTH
INTERVAL_DAY	INTERVAL DAY
INTERVAL_HOUR	INTERVAL HOUR
INTERVAL_MINUTE	INTERVAL MINUTE
INTERVAL_SECOND	INTERVAL SECOND
INTERVAL_YEAR_TO_MONTH	INTERVAL_YEAR_TO_MONTH
INTERVAL_DAY_TO_HOUR	INTERVAL_DAY_TO_HOUR
INTERVAL_DAY_TO_MINUTE	INTERVAL DAY TO MINUTE
INTERVAL_DAY_TO_SECOND	INTERVAL DAY TO SECOND
INTERVAL_HOUR_TO_MINUTE	INTERVAL HOUR TO MINUTE
INTERVAL_HOUR_TO_SECOND	INTERVAL HOUR TO SECOND
INTERVAL_MINUTE_TO_SECOND	INTERVAL MINUTE TO SECOND

Supported Functions

Following functions are supported within TDV for the GCS Cloud File System adapter:

- CAST
- COUNT

- EXTRACT
- LOWER
- MAX
- MIN
- SUM
- UPPER
- NTILE

TIBCO Product Documentation and Support Services

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.

How to Join TIBCO Community

TIBCO Community is the official channel for TIBCO customers, partners, and employee subject matter experts to share and access their collective experience. TIBCO Community offers access to Q&A forums, product wikis, and best practices. It also offers access to extensions, adapters, solution accelerators, and tools that extend and enable customers to gain full value from TIBCO products. In addition, users can submit and vote on feature requests from within the [TIBCO Ideas Portal](#). For a free registration, visit [TIBCO Community](#).

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