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# Teradata JDBC Driver for Presto

## Installation and Configuration Guide

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## About This Guide

### Purpose

The *Teradata Presto JDBC Driver Installation and Configuration Guide* explains how to install and configure the Teradata Presto JDBC Driver on all supported platforms. The guide also provides details related to features of the driver.

### Audience

The guide is intended for end users of the Teradata Presto JDBC Driver.

### Knowledge Prerequisites

To use the Teradata Presto JDBC Driver, the following knowledge is helpful:

- Familiarity with the platform on which you are using the Teradata Presto JDBC Driver
- Ability to use the data store to which the Teradata Presto JDBC Driver is connecting
- An understanding of the role of JDBC technologies in connecting to a data store
- Experience creating and configuring JDBC connections
- Exposure to SQL

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**Bold** is used in procedures for graphical user interface elements that a user clicks and text that a user types.

Monospace font indicates commands, source code or contents of text files.

Underline is not used.



The pencil icon indicates a short note appended to a paragraph.



The star icon indicates an important comment related to the preceding paragraph.

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## About Presto

Presto is a low latency distributed query engine capable of querying large datasets from multiple data stores using SQL.

The data sources that Presto supports include MySQL and PostgreSQL. Presto also integrates with the Hive metastore seamlessly to complement existing Hive environments with low latency queries. Presto can query self-describing data as well as complex or multi-structured data that is commonly seen in big data systems.

The Teradata Presto JDBC Driver lets organizations connect their BI tools to Presto. Presto provides an ANSI SQL query layer and also exposes the metadata information through an ANSI SQL standard metadata database called INFORMATION\_SCHEMA. The Teradata Presto JDBC Driver leverages INFORMATION\_SCHEMA to expose Presto's metadata to BI tools as needed.

The Teradata Presto JDBC Driver complies with the JDBC 4.0, 4.1, and 4.2 data standards. JDBC is one of the most established and widely supported APIs for connecting to and working with databases. At the heart of the technology is the JDBC driver, which connects an application to the database. For more information about JDBC, see the *Data Access Standards Glossary*.

<http://www.simba.com/resources/data-access-standards-library>.

This guide is suitable for users who want to access data residing within Presto from their desktop environment. Application developers might also find the information helpful. Refer to your application for details on connecting via JDBC.

## System Requirements

Each machine where you use the Teradata Presto JDBC Driver must have Java Runtime Environment (JRE) installed. The version of JRE that must be installed depends on the version of the JDBC API you are using with the driver. The following table lists the required version of JRE for each version of the JDBC API.

JDBC API Version	JRE Version
4.0	6.0 or later
4.1	7.0 or later
4.2	8.0 or later

# Teradata Presto JDBC Driver Files

The Teradata Presto JDBC Driver is delivered in the following ZIP archives, where *[Version]* is the version number of the driver:

- PrestoJDBC4\_*[Version]*.zip
- PrestoJDBC41\_*[Version]*.zip
- PrestoJDBC42\_*[Version]*.zip

Each archive contains the driver supporting the JDBC API version indicated in the archive name.

Each archive uses the following file and folder structure, where *[LibVersion]* is the version number of the library and *[APIVersion]* is the JDBC API version that the driver supports:

- PrestoJDBC*[APIVersion]*
  - commons-codec-*[LibVersion]*.jar
  - commons-logging-*[LibVersion]*.jar
  - httpclient-*[LibVersion]*.jar
  - httpcore-*[LibVersion]*.jar
  - jackson-annotations-*[LibVersion]*.jar
  - jackson-core-*[LibVersion]*.jar
  - jackson-databind-*[LibVersion]*.jar
  - PrestoJDBC*[APIVersion]*.jar

## Using the Teradata Presto JDBC Driver

To access a Presto data store using the Teradata Presto JDBC Driver, you need to configure the following:

- The class path
- The Driver or DataSource class
- The connection URL for the driver

### Setting the Class Path

To use the Teradata Presto JDBC Driver, you must set the class path to include all the JAR files from the ZIP archive containing the driver that you are using.

The class path is the path that the Java Runtime Environment searches for classes and other resource files. For more information, see "Setting the Class Path" in the Java SE Documentation:

<http://docs.oracle.com/javase/7/docs/technotes/tools/windows/classpath.html>.

### Initializing the Driver Class

Before connecting to Presto, initialize the appropriate class for your application.

The following classes extend `java.sql.Driver` and are used to connect the Teradata Presto JDBC Driver to Presto data stores.

- To support JDBC 4.0, a class with the fully-qualified class name (FQCN) `com.teradata.presto.jdbc4.Driver` is available.
- To support JDBC 4.1, a class with the fully-qualified class name (FQCN) `com.teradata.presto.jdbc41.Driver` is available.
- To support JDBC 4.2, a class with the fully-qualified class name (FQCN) `com.teradata.presto.jdbc42.Driver` is available.

### Building the Connection URL

Use the connection URL to supply connection information to the data store that you are accessing. The connection URL for the Teradata Presto JDBC Driver takes the following form:

```
jdbc:presto://[Host]:[Port];User=[User];
```

The placeholders in the connection URL are defined as follows:

- `[Host]` is the DNS or IP address of the server.



- *[Port]* is the port to connect to on *Host*.
- *[User]* is the user name that you use to access the Presto server.

For example, to connect to a Presto server on port 8080, you would use the following connection URL:

```
jdbc:presto://192.168.203.141:8080;User=username;
```

**! IMPORTANT:**

- Properties are case-sensitive.
- Do not duplicate properties in the connection URL.

For a list of configuration options, see [Driver Configuration Options](#) on page 16.

## Using Kerberos Authentication

You can configure the driver to use the Kerberos protocol to authenticate the connection.

Kerberos must be installed and configured before you can use this authentication mechanism. For information about how to install and configure Kerberos, see the MIT Kerberos Documentation: <http://web.mit.edu/kerberos/krb5-latest/doc/>.

Before you can use Kerberos authentication with the Teradata Presto JDBC Driver, you must do the following:

1. When you configure your Kerberos server, in the `/etc/presto/config.properties` file, set the following properties:
 

```
http.server.authentication.krb5.service-name=HTTP
http.server.authentication.krb5.keytab=HTTP.keytab
```
2. On your client machine, in the `java.policy` file for your Java environment, include the following line:
 

```
permission java.util.PropertyPermission
    "javax.security.auth.useSubjectCredsOnly", "write";
```
3. On your client machine, in your Java environment, install the appropriate Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files.

When you use Kerberos authentication, the driver loads the credentials from the Kerberos credential cache. Therefore, the Kerberos ticket must be generated before you run the driver. To generate a Kerberos ticket, run the `kinit` Kerberos command with the appropriate principal.

### To configure Kerberos authentication:

1. Run the `kinit` command, using the following syntax, where `[Keytab]` is the Kerberos credential and `[Principal]` is the Kerberos user principal to use for authentication:
 

```
kinit -kt [Keytab] [Principal]
```
2. Connect to the Presto server using a connection URL written in the following format:
 

```
jdbc:presto://[Host]:[Port];User=
[User];enableKerberos=true;SSLCertificate=[SSLCert]
```

The variables are defined as follows:

- `[Host]` is the DNS or IP address of the server.
- `[Port]` is the number of the TCP port to connect to.

- *[User]* is the name of the Kerberos user.
- *[SSLCert]* is the full path to a `.jks` file that contains the SSL certificate for the server.

For example:

```
jdbc:presto://presto-demo-cdh:
  7778;User=Kerberos;enableKerberos=true;SSLCertificate=
  C:\\Program Files\\Java\\jdk1.8.0_
  73\\jre\\bin\\keystore.jks
```

For more information about connection URL syntax, see [Building the Connection URL](#) on page 8.

## Configuring Logging

To help troubleshoot issues, you can enable logging in the driver.

**! IMPORTANT:** Only enable logging long enough to capture an issue. Logging decreases performance and can consume a large quantity of disk space.

Set the `LogLevel` key in your connection URL to enable logging and specify the amount of detail included in log files. The following table lists the logging levels provided by the Teradata Presto JDBC Driver, in order from least verbose to most verbose.

LogLevel Value	Description
0	Disable all logging.
1	Log severe error events that lead the driver to abort.
2	Log error events that might allow the driver to continue running.
3	Log potentially harmful situations.
4	Log general information that describes the progress of the driver.
5	Log detailed information that is useful for debugging the driver.
6	Log all driver activity.

### To enable logging:

1. Set the `LogLevel` property to the desired level of information to include in log files.
2. Set the `LogPath` property to the full path to the folder where you want to save log files.

For example, the following connection URL enables logging level 3 and saves the log files in the `C:\temp` folder:

```
jdbc:presto://localhost;User=username;LogLevel=3;LogPath=C:\temp
```

3. To make sure that the new settings take effect, restart your JDBC application and reconnect to the server.

The Teradata Presto JDBC Driver produces a log file named `presto.log` in the location specified in the `LogPath` property.

If the `LogPath` value is invalid, then the driver sends the logged information to the standard output stream (`System.out`).

**To disable logging:**

1. Remove the `LogLevel` and `LogPath` properties from the connection URL.
2. To make sure that the new settings take effect, restart your JDBC application and reconnect to the server.

## Features

More information is provided on the following features of the Teradata Presto JDBC Driver:

- | [Catalog and Schema Support](#) on page 14
- | [Supported Connectors](#) on page 14
- | [Parameters](#) on page 14
- | [Data Types](#) on page 14

### Catalog and Schema Support

The Teradata Presto JDBC Driver supports both catalogs and schemas to make it easy for the driver to work with various JDBC applications.

### Parameters

A parameterized query contains placeholders that are used for parameters. The values of those parameters are supplied at execution time.

The Teradata Presto JDBC Driver fully supports parameterized queries.

### Supported Connectors

The Teradata Presto JDBC Driver supports the following connectors:

- MySQL
- PostgreSQL
- Hive

### Data Types

The Teradata Presto JDBC Driver supports many common SQL and Java data types, and converts between them.

The following table lists the supported data type mappings.

SQL Type	Java Type
ARRAY	VARCHAR
BIGINT	BIGINT

SQL Type	Java Type
BOOLEAN	BOOLEAN
DATE	DATE
DECIMAL	DECIMAL
DOUBLE	DOUBLE
INTERVAL DAY TO SECOND	VARCHAR
INTERVAL YEAR TO MONTH	VARCHAR
JSON	VARCHAR
MAP	VARCHAR
ROW	VARCHAR
TIME	TIME
TIME WITH TIME ZONE	VARCHAR
TIMESTAMP	TIMESTAMP
TIMESTAMP WITH TIME ZONE	VARCHAR
VARBINARY	VARBINARY
VARCHAR	VARCHAR

## Driver Configuration Options

Driver Configuration Options lists and describes the properties that you can use to configure the behavior of the Teradata Presto JDBC Driver.

You can set configuration properties using the connection URL. For more information, see [Building the Connection URL](#) on page 8.

### enableKerberos

Default Value	Data Type	Required
None	Boolean	No

#### Description

This option specifies whether the driver uses Kerberos authentication.

For more information about Kerberos authentication, see the MIT Kerberos Documentation: <http://web.mit.edu/kerberos/krb5-latest/doc/>.

### LogLevel

Default Value	Data Type	Required
0	Integer	No

#### Description

Use this property to enable or disable logging in the driver and to specify the amount of detail included in log files.

**! IMPORTANT:** Only enable logging long enough to capture an issue. Logging decreases performance and can consume a large quantity of disk space.

Set the property to one of the following numbers:

- 0: Disable all logging.
- 1: Enable logging on the FATAL level, which logs very severe error events that will lead the driver to abort.
- 2: Enable logging on the ERROR level, which logs error events that might still allow the driver to continue running.



- 3: Enable logging on the WARNING level, which logs potentially harmful situations.
- 4: Enable logging on the INFO level, which logs general information that describes the progress of the driver.
- 5: Enable logging on the DEBUG level, which logs detailed information that is useful for debugging the driver.
- 6: Enable logging on the TRACE level, which logs all driver activity.

When logging is enabled, the driver produces a log file named `presto.log` in the location specified in the `LogPath` property.

If the `LogPath` value is invalid, then the driver sends the logged information to the standard output stream (`System.out`).

## LogPath

Default Value	Data Type	Required
The current working directory.	String	No

### Description

The full path to the folder where the driver saves log files when logging is enabled.

## SSLCertificate

Default Value	Data Type	Required
None	String	Yes, if the authentication type is set to Kerberos

### Description

This option specifies the path to the SSL certificate that is used by the Kerberos server.

## TimeZoneID

Default Value	Data Type	Required
None	String	No

## Description

This option specifies the local time zone that the driver uses.

Valid values for this option are specified in the IANA Time Zone Database. For a complete list of time zones, download the database from

<http://www.iana.org/time-zones>.

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