

Configuring Java DB and Installing Apache Derby

Beginning with Java 7, the Java DB database engine was bundled with the Java JDK. When you installed either Java 7 or Java 8, Java DB was automatically installed. Beginning with Java 9, however, Java DB is no longer bundled with the JDK. This is because Java DB is simply a rebranded version of Derby, an open source DBMS that is provided by the Apache Software Foundation. If you are using Java 9, you will need to separately download Derby from the Apache Software Foundation's website and install it. This appendix can help you configure Java DB, or install and configure Apache Derby, depending on the version of Java you are using.

Configuring Java DB with Java 7 or Java 8

In Java 7 and Java 8, Java DB is automatically installed on your system when you install the JDK. When you install the JDK, take note of the location on your system where it is installed. If you accept the default location for the JDK, it will be installed in a folder with a path such as this:

```
C:\Program Files\Java\jdk1.8.0_101
```

The name of the last folder in the path might be different on your system, because it's name indicates the version of the JDK that you are using. Nevertheless, the path will be similar to the one shown here.

If you look inside the folder where the JDK is installed, you will see another folder named `db`. Inside the `db` folder, you will see another folder named `lib`, and inside the `lib` folder, you will see a file named *derby.jar*. The *derby.jar* file contains the Java DB database engine and its associated JDBC embedded driver. Take a moment to verify that you can locate the *derby.jar* file, and make a note of its path. For example, if you are using the JDK 8, update 101, the path of the *derby.jar* file will be something like:

```
C:\Program Files\Java\jdk1.8.0_101\db\lib\derby.jar
```

Once you have verified the path of the *derby.jar* file, you need to set the CLASSPATH environment variable on your system.

Setting the CLASSPATH Environment Variable

To use Java DB with this text, you will need to set your system's CLASSPATH environment variable to include the location of the *derby.jar* file. The CLASSPATH environment variable contains a list of class libraries that are needed by the Java Virtual Machine and other Java applications.

The following instructions describe the procedure for setting the CLASSPATH variable on Windows 10, Windows 8, and Windows 7.

Windows 10

In the Windows search box, type “environment variables” then select **Edit the system environment variables** from the search results. This will display the *System Properties* window (with the *Advanced* tab selected at the top of the window). Click the **Environment Variables . . .** button. Look in the **System Variables** list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the **Edit** button. Add a semicolon to the end of the existing contents and then add the path of the *derby.jar* file to the end of the list.
- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

If the CLASSPATH variable does not exist, perform the following:

- Click the **New . . .** button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.
- In the Variable value box, type a period, followed by a semicolon, followed by the path of the *derby.jar* file. For example, the value will be something similar to the following (depending on the version of the JDK that you are using):

```
.;C:\Program Files\Java\jdk1.8.0_101\lib\derby.jar
```

- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

Windows 8

In the right bottom corner of the screen, click on the **Search** icon and type “Control Panel”. Click on **Control Panel**, then click **System**, then click **Advanced system settings**. Click on the **Advanced** tab, then click **Environment Variables**. Look in the System Variables list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the **Edit** button. Add a semicolon to the end of the existing contents and then add the path of the *derby.jar* file to the end of the list.
- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

If the CLASSPATH variable does not exist, perform the following:

- Click the **New . . .** button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.

- In the Variable value box, type a period, followed by a semicolon, followed by the path of the *derby.jar* file. For example, the value will be something similar to the following (depending on the version of the JDK that you are using):
`.;C:\Program Files\Java\jdk1.8.0_101\db\lib\derby.jar`
- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

Windows 7

Click the **Start button** and then right-click **Computer**. On the pop-up menu, select **Properties**. In the window that appears next, click **Advanced system settings**. This displays the System Properties window. Click the Environment Variables . . . button. Look in the System Variables list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the Edit button. Add a semicolon to the end of the existing contents and then add the path of the *derby.jar* file to the end of the list.
- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

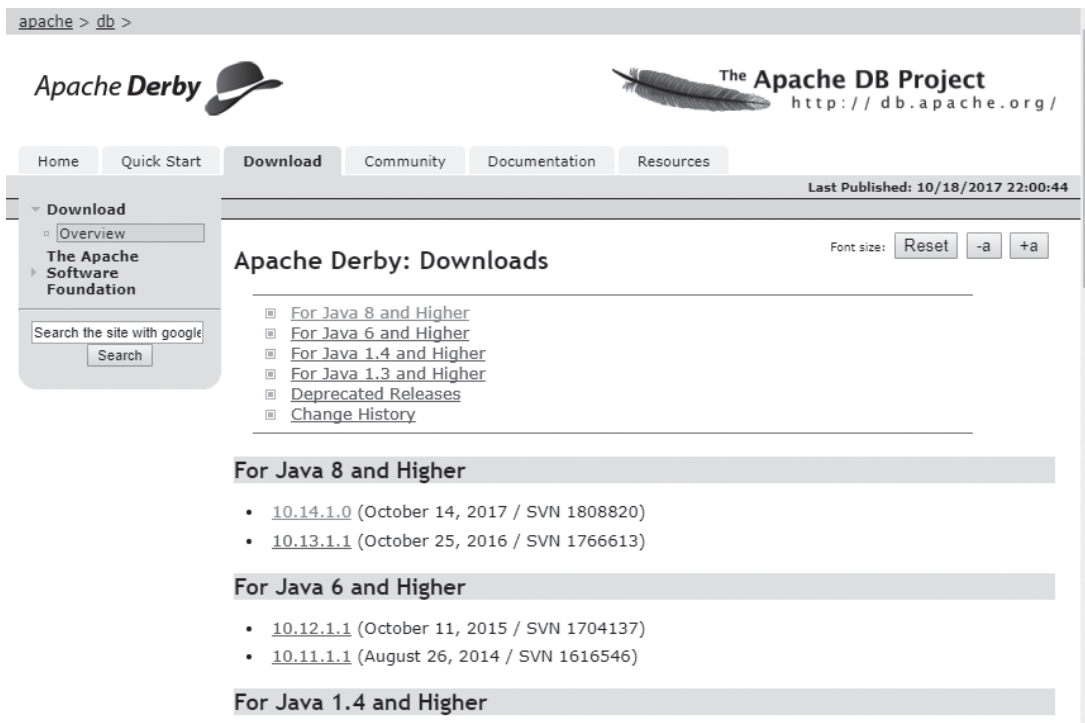
If the CLASSPATH variable does not exist, perform the following:

- Click the New . . . button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.
- In the Variable value box, type a period, followed by a semicolon, followed by the path of the *derby.jar* file. For example, the value will be something similar to the following (depending on the version of the JDK that you are using):
`.;C:\Program Files\Java\jdk1.8.0_101\db\lib\derby.jar`
- Click the OK buttons until all the dialog boxes are closed and exit the control panel.

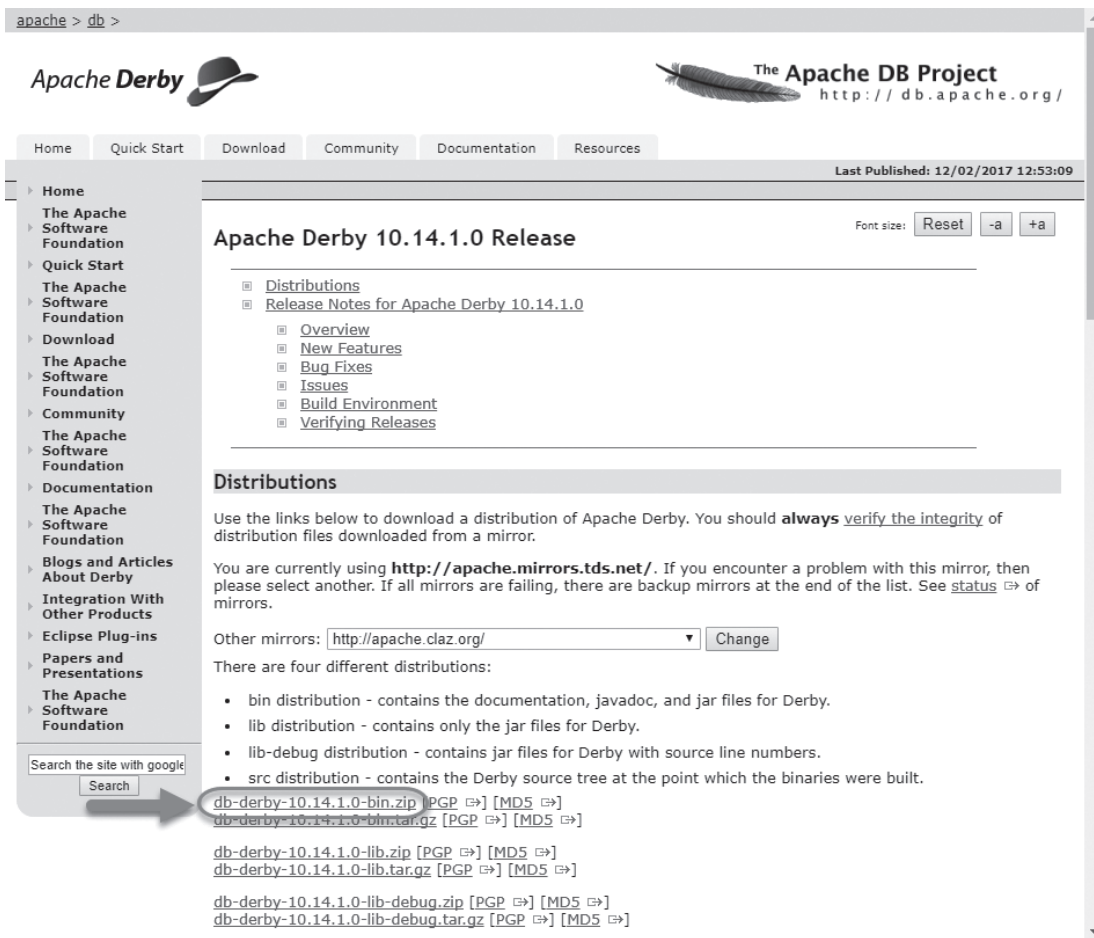
Configuring Derby with Java 9

Derby is available as a free download from the Apache Software Foundation. To download Derby, follow these instructions:

1. Open your browser and go the following address: http://db.apache.org/derby/derby_downloads.html
2. The page that opens will look similar to Figure I-1. Look at the section titled *For Java 8 and Higher*, and click on the most recent version number that is listed. (The most recent version number will most likely be different than the one shown in the figure.)

Figure I-1 The Apache Derby Download Page (Apache Software Foundation)

3. The page that opens will look similar to Figure I-2. In the *Distributions* section you will see links to download various different distributions. As shown in the figure, click on the link with the most recent version number ending with `bin.zip`. (The most recent version number will most likely be different than the one shown in the figure.)
4. The ZIP file that you downloaded contains a folder with a name such as `db-derby-10.14.1.0-bin`. (This name reflects the version number of the distribution. The name you see will be similar, but most likely it will be a different version number.) Extract this folder and its contents to a location on your system. Make a note of the location to which you extracted the folder. For example, on a Windows system, if you extracted the folder to the root folder of drive C: the path would be `C:\db-derby-10.14.1.0-bin`.

Figure I-2 Select the latest bin distribution (Apache Software Foundation)

Setting the CLASSPATH Environment Variable

The Derby distribution file that you downloaded and extracted contains a file named `derby.jar`. This file is the Derby database engine. The `derby.jar` file will be located in the `lib` folder, which is in the distribution folder that you extracted. For example, suppose you extracted the `db-derby-10.14.1.0-bin` distribution file to the root folder of drive C:. The path of the `derby.jar` file would be:

```
C:\db-derby-10.14.1.0-bin\lib\derby.jar
```

You will need to configure your system so the Java Virtual Machine can find the `derby.jar` file. You do this by setting your system's `CLASSPATH` environment variable to include the path of the file. The following instructions describe the procedure for setting the `CLASSPATH` variable on Windows 10, Windows 8, and Windows 7.

Windows 10

In the Windows search box, type *environment variables* and then select *Edit the system environment variables* from the search results. This will display the System Properties window (with the Advanced tab selected at the top of the window). Click the *Environment Variables . . .* button. Look in the System Variables list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the *Edit* button. Add a semicolon to the end of the existing contents and then add the path of the `derby.jar` file to the end of the list.
- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.

If the CLASSPATH variable does not exist, perform the following:

- Click the *New . . .* button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.
- In the Variable value box, type a period, followed by a semicolon, followed by the path of the `derby.jar` file. For example, the value will be something similar to the following (depending on the version of the Derby distribution that you are using):

```
.; C:\db-derby-10.14.1.0-bin\lib\derby.jar
```

- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.

Windows 8

In the right bottom corner of the screen, click on the Search icon and type *Control Panel*. Click on *Control Panel*, then click *System*, then click *Advanced system settings*. Click on the *Advanced* tab, then click *Environment Variables*. Look in the System Variables list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the *Edit* button. Add a semicolon to the end of the existing contents and then add the path of the `derby.jar` file to the end of the list.
- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.

If the CLASSPATH variable does not exist, perform the following:

- Click the *New . . .* button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.
- In the Variable value box, type a period, followed by a semicolon, followed by the path of the `derby.jar` file. For example, the value will be something similar to the following (depending on the version of the Derby distribution that you are using):

```
.; C:\db-derby-10.14.1.0-bin\lib\derby.jar
```

- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.

Windows 7

Click the Windows Start button and then right-click *Computer*. On the pop-up menu, select *Properties*. In the window that appears next, click *Advanced system settings*. This displays the System Properties window. Click the *Environment Variables . . .* button. Look in the System Variables list to see if the CLASSPATH variable exists.

If the CLASSPATH variable already exists, perform the following:

- Select the CLASSPATH variable and click the *Edit* button. Add a semicolon to the end of the existing contents and then add the path of the *derby.jar* file to the end of the list.
- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.

If the CLASSPATH variable does not exist, perform the following:

- Click the *New . . .* button that appears below the list of system variables.
- In the Variable name box, type CLASSPATH.
- In the Variable value box, type a period, followed by a semicolon, followed by the path of the *derby.jar* file. For example, the value will be something similar to the following (depending on the version of the Derby distribution that you are using):
`. ; C:\db-derby-10.14.1.0-bin\lib\derby.jar`
- Click the *OK* buttons until all the dialog boxes are closed and exit the control panel.