MOVES4 Installation Troubleshooting

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1. MOVES Prerequisites

MOVES depends on MariaDB, Java, and Go. However, the current installer includes all the information required to run MOVES. You do not need to install Java or Go on your computer unless you wish to compile MOVES from source. For more information on compiling MOVES from source, see the EPA MOVES Model on GitHub.

2. MariaDB overview

Experienced MOVES users will note that starting with MOVES3, we have switched from using MySQL to MariaDB. This is because versions of MySQL 8.0 and later removed features that MOVES needs to run. MariaDB is a drop-in replacement for MySQL, meaning that language syntax, file formats, and APIs are identical between the two, so it is relatively straightforward to go from one to the other. Moreover, MariaDB intends to maintain the features needed for MOVES, so this change in the MOVES prerequisites is stable and is intended to be permanent.

MariaDB is easier to install than MySQL and it is licensed for use with MOVES. Therefore, we are including MariaDB installation as a feature of the MOVES installer. If you do not have MariaDB installed on your computer before running the MOVES installer, you will be prompted for your MariaDB installation preferences (e.g., installation directory, data directory, port number, etc.), and the MOVES installer will set up both MariaDB and MOVES for you.

Since MariaDB is a drop-in replacement for MySQL, you can use MySQL Workbench to access MariaDB databases if Workbench is the tool that you are used to using. Alternatively, MariaDB comes with its

own free third-party tool called HeidiSQL that contains many of the data access and manipulation features as MySQL Workbench.

For more information about MariaDB, see https://mariadb.com. For help using HeidiSQL, see https://www.heidisql.com/help.php.

3.   Installing MariaDB manually

It is recommended to allow the MOVES installer to set up MariaDB for you. However, if the automatic MariaDB installation fails, you can install MariaDB manually. Download the latest version of MariaDB from https://downloads.mariadb.org.

Note that MariaDB relies on the Microsoft Visual C++ Redistributables. Download the latest version from https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads and run this installer first. Then restart your computer before attempting to install MariaDB.

During manual MariaDB installation, it is important to make the following selections:

- On the feature selection page, make the following selections:
    - Under "MariaDB Server", select "Database Instance" and "Client Programs". These are likely selected by default.
    - Under "Third party tools", select "HeidiSQL". This is likely selected by default.
    - Other selections may be turned on or off at the user's option.
    - If your computer has multiple hard drives (e.g., one for the operating system as well as a dedicated data drive), you may experience better performance by installing MariaDB and its data folder on a different hard drive than the operating system. To customize the installation directories:
        - Click "MariaDB Server" on the feature selection page, and then click the Browse button towards the lower right corner of the window.
        - Do likewise for "Database Instance" to customize where the data directory is installed.
- Remember your selection for the root password; you will need it when installing MOVES.
- Select "Use UTF8 as default server's character set"
- Check the "Install as service" box. The service name can be customized at the user's option. If you have other MySQL or MariaDB servers running on this computer, ensure that your service name is unique to this instance.
- Check the "Enable networking" box. The port number can be customized at the user's option. If you have other MySQL or MariaDB servers running on this computer, ensure that your selected port number is unique and not used by anything else on the computer. 3306 is the default port, but it is common to use 3307-3309 if you have multiple services running on your computer.

After installing MariaDB manually, run the MOVES installer. It should detect your manual installation of MariaDB and use that when installing MOVES. It will also configure MariaDB to work correctly with MOVES.

If manual installation fails, send an email mobile@epa.gov. Please include the MOVES installation log and the MariaDB installation log. Both files can be found in the intended MOVES installation directory

(even if installation failed). By default, these will be text files located at C:\Users\Public\EPA\MOVES\MOVES4.0\installation.

4. Can I have both MariaDB and MySQL installed on the same computer?

Yes, MariaDB and MySQL can both be running on the same computer if they have different service names and port numbers. If you have MySQL installed but not MariaDB, the MOVES installer will set up MariaDB with a unique service name and port number.

The "Quick Start Guide to Accessing MariaDB Data", available on the final screen of the installer and saved permanently to MOVES' "installation" subfolder, has more information on configuring MySQL Workbench to work with MariaDB, archiving old databases, and more.

5. What do I do if I see the screen "MariaDB Service Not Running"?

The MOVES installer searches for any previously installed versions of MariaDB. If it finds a supported version that is actively running, the installer will use that instead of automatically installing its own copy of the program. However, if the installer detects a supported MariaDB service that is not running, it will not be able to use it unless you manually start the service and configure it to run automatically. To do so, follow these steps:

a) From the Windows Start menu, select Control Panel, then Administrative Tools, then Services.
b) Right-click on the MariaDB service in the list and select Properties.
c) For Startup Type, select "Automatic".
d) Click the Start button under Server Status.
e) Click OK.

Restart your computer and relaunch the MOVES installer. If you see the same "MariaDB Service Not Running" screen again, you can continue anyway and the MOVES installer will install a new version for you.

6. What do I do if I see the screen "Connect to MariaDB Server"?

You will see this screen if the MOVES installer detects a compatible version of MariaDB running on your computer and its root password is unknown. This screen requires a successful connection to MariaDB before continuing.

To continue, please ensure that you have entered the correct MariaDB port number and root password, and then click the Test Connection button. If the MOVES installer can connect to MariaDB with the supplied information, you will be able to continue.

If you do not know or remember this information, please contact your system administrator. You may need to reset the MySQL root password (while these instructions are for MySQL, they also work for MariaDB; you'll just need to make sure you are connecting to MariaDB's "mysqld.exe" instead of MySQL's version).

7. What do all the options on the "Set MariaDB Installation Preferences" screen mean?

This page collects the user preferences that you could set if you ran the MariaDB installer manually:

- <u>Root password</u>: This sets the root user's password for MariaDB. This password will be needed whenever performing administrative tasks in MariaDB. Be sure to save this password in a safe location, as the MOVES installer will not be able to recover it for you.
- <u>MariaDB install</u>: The installation directory for MariaDB. If your computer has multiple hard drives (e.g., one for the operating system as well as a dedicated data drive), you may experience better performance by installing MariaDB on a different hard drive than the operating system.
- <u>Data directory</u>: The directory where MariaDB will store your data. If your computer has multiple hard drives (e.g., one for the operating system as well as a dedicated data drive), you may experience better performance by installing the data directory on a different hard drive than the operating system. If you only have one hard drive, we recommend installing the data directory in your ProgramData folder (this option is entered by default). Note: this directory must not exist before clicking "Next".
- <u>Port number</u>: MOVES will connect to MariaDB via TCP/IP, which means MariaDB needs a unique and dedicated port number. 3306 is the default option, but the MOVES installer will suggest other port numbers if 3306 is already taken (e.g., if MySQL is installed on this computer using 3306).
- <u>Service name</u>: All Windows services need a unique name. The MOVES installer will suggest one, but feel free to customize it if that would be helpful.

8. What do all the options on the "Reinstall Options" screen mean?

If the MOVES installer detects that its version of MOVES is the same as what has already been installed on this computer, it will offer you three options:

1. Update Java to the bundled version
   - If this option is selected by itself, the installer will simply overwrite the existing JRE version bundled with MOVES with the version contained in this installer. This is a fairly quick operation.
2. Reinstall MOVES
   - Use this option if your installation of MOVES (or your MOVES default database) has been corrupted. Note that this option automatically includes updating Java.
3. Upgrade or Install MariaDB
   - If your version of MariaDB is the same minor version as what is included in the MOVES installer and only the patch number is different (e.g., you have MariaDB 10.11.X installed and the installer contains MariaDB 10.11.Y), it can be upgraded in place. If you select this option, the MOVES installer may ask you for the mysql root user's password before continuing.
   - If your version of MariaDB is not the minor version as what is included in the MOVES installer (e.g., you have MariaDB 10.X installed and the installer contains MariaDB 10.Y), it **cannot** be upgraded in place. If you wish to use a newer version of MariaDB, the recommended approach is to install the new version of MariaDB, migrate your data, and

uninstall the older version. Therefore, if you select the "Install MariaDB" option on this page, Setup will install the indicated version of MariaDB side-by-side with any other versions of MariaDB previously installed. Setup will then copy data from any other detected instance of MariaDB or MySQL to the new MariaDB service. It will not, however, uninstall any other versions of MariaDB or MySQL. After Setup has finished running, you may safely remove the older version(s) of MariaDB.

Note: Before you decide to uninstall an older version of MariaDB, be sure to connect to the new MariaDB server via HeidiSQL to make sure that all data were successfully migrated. You may also need to configure older versions of MOVES (if installed and still used) to use the new server by saving the new server's port number to a file called "mysql.txt" in the root directory of MOVES.

9. What if there are errors when copying data to the new server?

If you selected the option to install a newer version of MariaDB and the MOVES installer detects any errors during the data copying process, the databases that were not migrated will be listed in the MOVES install log. The MOVES install log can be opened from the final screen of the MOVES installer. Alternatively, you can find it in the "installation" subfolder wherever you installed MOVES. Search for "Copy Error" to see what directories caused the issue. You will need to manually copy these files after installation is complete. Restarting your computer before attempting this may help.

If the MOVES installer reports that it could not detect the MariaDB data location, you will need to manually find this location and copy your data to the new server.

10. How do I resolve the "Cannot Load the Default Database" issue?

If you get an error message during the installation of MOVES notifying you that setup could not load the default database, you will need to manually install it after setup completes, following these steps:

a) Restart your computer.
b) Open HeidiSQL and select the MOVES Connection.
    i.   If this option does not appear, manually connect to MariaDB with user "moves" and password "moves" (both without quotes) and enter the port number that you selected on the MariaDB preferences page.
    ii. If this connection does not work, connect with the root user and the password that you selected on the MariaDB preferences page.
    iii. If this connection still does not work, you may need to uninstall MariaDB and manually reinstall, following the instructions regarding manually installing MariaDB earlier in this document. Then continue with the rest of these steps here.
c) Select File > Run SQL file…
d) Navigate to the directory where you installed MOVES and select the .sql file that begins with "movesdb." Please note that this action may take several minutes to complete since this is a large file.
e) If the file executes with no errors, then your installation is complete. You can delete the .sql file if you wish to save hard drive space.
f) If there are errors, ensure that a database with the same name as the MOVES default database doesn't already exist on your computer. If it does, remove it and try the above steps again.

g) If there are still errors, it is possible that the database file was corrupted when it was extracted. Run the MOVES installer again to see if that solves the issue.

h) If that does not help, contact mobile@epa.gov and include the error messages in your note.

11. How do I resolve the "Cannot Confirm if MOVES is Installed Correctly" issue?

If you get an error message during installation stating setup couldn't confirm if MOVES was installed correctly, it means that a test run of MOVES performed by the installer resulted in errors or no output. The install log located in the installation folder in the MOVES directory may have more information about what failed. If you get this error, restart your computer and then try running a very simple RunSpec. If you continue to receive error messages when running MOVES or do not get output, please contact mobile@epa.gov with your installation log and a description of the error messages that you are receiving.

12. How do I install/uninstall MOVES via the command line?

If you need to install MOVES silently (i.e., with no dialog boxes—this is useful, for example, if installing remotely over a network), execute the MOVES installer from a command prompt with the flag `/VERYSILENT` to suppress all dialog boxes. If you want the MOVES installer to use a previously installed version of MariaDB that does not have a standard password value (such as "moves" or "root"), you can supply the MariaDB root password using the command line flag `/mysqlrootpass=password` (replacing "password" with the actual password). Please note that supplying the root password on the command line is not secure and all command line parameters are saved in the installation log. If you share the installation log with anybody (including mobile@epa.gov), be sure to delete the password first. The installation log is saved to the "installation" sub-folder of the selected MOVES directory.

To avoid passing the root password on the command line, you may initially set the MariaDB root password to "moves" (without quotes), and then run the MOVES installer silently. With this root password, you do not need to include it on the command line. After MOVES is successfully installed, you may change the root password as you see fit.

If, when running silently, the MOVES installer is not correctly detecting the MariaDB service that you wish to use (and you do not want the MOVES installer to setup a new version of MariaDB), you can explicitly set the MySQL client, port number, and root password with the following command line arguments (replacing the sample values with the correct values):

```
/mysqlexe=\path\to\mysql.exe /sqlport=3306 /sqlrootpass=password
/VERYSILENT
```

If MariaDB is not installed, the MOVES installer will use the following default parameters when installing MariaDB. These parameters may be overwritten using the indicated flag.

MariaDB Parameter	Default Value	Command line flag
Port	3306	/sqlport=
Installation directory	C:\Program Files\MariaDB\MariaDB 10.4	/sqlinstalldir=
Data directory	C:\ProgramData\MariaDB\MariaDB 10.4\data	/sqldatadir=

MariaDB Parameter	Default Value	Command line flag
Service name	MariaDB10_4	/sqlservicename=
Root password	moves	/sqlrootpass=

If you are using the MOVES installer on a computer that already has MOVES installed, it will ask you if you if you want to install a newer version of MariaDB, update Java, or reinstall MOVES. To make these selections via the command line, use the parameters as shown in the table below:

Parameter name	Default Value	Command line flag with option enabled
installmaria	0	/installmaria=1
updatejava	0	/updatejava=1
reinstallmoves	0	/reinstallmoves=1

The MOVES uninstaller is the executable located in the "uninstaller" directory of MOVES. If you need to uninstall MOVES silently, use the `/VERYSILENT` flag. By default, the uninstaller will not remove MariaDB or MariaDB's data folder. However, if MariaDB was installed by the MOVES installer, you can use the following flags to instruct the uninstaller to remove MariaDB and optionally the data folder: `/uninstallmariadb=1 /deletemariadbdata=1`