Building MySQL from Source
Abstract

This is the Building MySQL from Source extract from the MySQL 5.6 Reference Manual.

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For help with using MySQL, please visit the MySQL Forums, where you can discuss your issues with other MySQL users.

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Chapter 1 Installing MySQL from Source

Building MySQL from the source code enables you to customize build parameters, compiler optimizations, and installation location. For a list of systems on which MySQL is known to run, see https://www.mysql.com/support/supportedplatforms/database.html.

Before you proceed with an installation from source, check whether Oracle produces a precompiled binary distribution for your platform and whether it works for you. We put a great deal of effort into ensuring that our binaries are built with the best possible options for optimal performance. Instructions for installing binary distributions are available in Installing MySQL on Unix/Linux Using Generic Binaries.

**Warning**

Building MySQL with nonstandard options may lead to reduced functionality, performance, or security.
Chapter 2 Installing MySQL Using a Standard Source Distribution

To install MySQL from a standard source distribution:

1. Verify that your system satisfies the tool requirements listed at Source Installation Prerequisites.
2. Obtain a distribution file using the instructions in How to Get MySQL.
3. Configure, build, and install the distribution using the instructions in this section.
4. Perform postinstallation procedures using the instructions in Postinstallation Setup and Testing.

MySQL uses CMake as the build framework on all platforms. The instructions given here should enable you to produce a working installation. For additional information on using CMake to build MySQL, see How to Build MySQL Server with CMake.

If you start from a source RPM, use the following command to make a binary RPM that you can install. If you do not have rpmbuild, use rpm instead.

```
shell> rpmbuild --rebuild --clean MySQL-VERSION.src.rpm
```

The result is one or more binary RPM packages that you install as indicated in Installing MySQL on Linux Using RPM Packages from Oracle.

The sequence for installation from a compressed tar file or Zip archive source distribution is similar to the process for installing from a generic binary distribution (see Installing MySQL on Unix/Linux Using Generic Binaries), except that it is used on all platforms and includes steps to configure and compile the distribution. For example, with a compressed tar file source distribution on Unix, the basic installation command sequence looks like this:

```
# Preconfiguration setup
shell> groupadd mysql
groupadd mysql
shell> useradd -r -g mysql -s /bin/false mysql
useradd -r -g mysql -s /bin/false mysql
# Beginning of source-build specific instructions
tar zxvf mysql-VERSION.tar.gz
shell> cd mysql-VERSION
cd mysql-VERSION
cd mysql-VERSION
shell> mkdir bld
shell> cd bld
shell> cmake ..
cd bld
shell> cmake
shell> make install
make install
# End of source-build specific instructions
cd /usr/local/mysql
cd /usr/local/mysql
shell> scripts/mysql_install_db --user=mysql
scripts/mysql_install_db --user=mysql
shell> bin/mysqld_safe --user=mysql &
bin/mysqld_safe --user=mysql &
# Next command is optional
cp support-files/mysql.server /etc/init.d/mysql.server
cp support-files/mysql.server /etc/init.d/mysql.server
```

mysql_install_db creates a default option file named my.cnf in the base installation directory. This file is created from a template included in the distribution package named my-default.cnf. For more information, see Using a Sample Default Server Configuration File.

A more detailed version of the source-build specific instructions is shown following.

Note

The procedure shown here does not set up any passwords for MySQL accounts. After following the procedure, proceed to Postinstallation Setup and Testing, for postinstallation setup and testing.

• Perform Preconfiguration Setup

• Perform Preconfiguration Setup

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• Perform Preconfiguration Setup

• Perform Preconfiguration Setup
Perform Preconfiguration Setup

- Obtain and Unpack the Distribution
- Configure the Distribution
- Build the Distribution
- Install the Distribution
- Perform Postinstallation Setup

Perform Preconfiguration Setup

On Unix, set up the mysql user and group that will be used to run and execute the MySQL server and own the database directory. For details, see Create a mysql User and Group. Then perform the following steps as the mysql user, except as noted.

Obtain and Unpack the Distribution

Pick the directory under which you want to unpack the distribution and change location into it.

Obtain a distribution file using the instructions in How to Get MySQL.

Unpack the distribution into the current directory:

- To unpack a compressed tar file, tar can uncompress and unpack the distribution if it has z option support:

  shell> tar zxvf mysql-VERSION.tar.gz

  If your tar does not have z option support, use gunzip to unpack the distribution and tar to unpack it:

  shell> gunzip < mysql-VERSION.tar.gz | tar xvf -

  Alternatively, CMake can uncompress and unpack the distribution:

  shell> cmake -E tar zxvf mysql-VERSION.tar.gz

- To unpack a Zip archive, use WinZip or another tool that can read .zip files.

Unpacking the distribution file creates a directory named mysql-VERSION.

Configure the Distribution

Change location into the top-level directory of the unpacked distribution:

shell> cd mysql-VERSION

Build outside of the source tree to keep the tree clean. If the top-level source directory is named mysql-src under your current working directory, you can build in a directory named bld at the same level. Create the directory and go there:

shell> mkdir bld
shell> cd bld

Configure the build directory. The minimum configuration command includes no options to override configuration defaults:

shell> cmake ../mysql-src

The build directory needs not be outside the source tree. For example, you can build in a directory named bld under the top-level source tree. To do this, starting with mysql-src as your current working directory, create the directory bld and then go there:
Configure the build directory. The minimum configuration command includes no options to override configuration defaults:

```
shell> mkdir bld
shell> cd bld
```

Configure the Distribution

If you have multiple source trees at the same level (for example, to build multiple versions of MySQL), the second strategy can be advantageous. The first strategy places all build directories at the same level, which requires that you choose a unique name for each. With the second strategy, you can use the same name for the build directory within each source tree. The following instructions assume this second strategy.

On Windows, specify the development environment. For example, the following commands configure MySQL for 32-bit or 64-bit builds, respectively:

```
shell> cmake .. -G "Visual Studio 12 2013"
shell> cmake .. -G "Visual Studio 12 2013 Win64"
```

On macOS, to use the Xcode IDE:

```
shell> cmake .. -G Xcode
```

When you run `cmake`, you might want to add options to the command line. Here are some examples:

- `DBUILD_CONFIG=mysql_release`: Configure the source with the same build options used by Oracle to produce binary distributions for official MySQL releases.
- `DCMAKE_INSTALL_PREFIX=dir_name`: Configure the distribution for installation under a particular location.
- `DCPACK_MONOLITHIC_INSTALL=1`: Cause `make package` to generate a single installation file rather than multiple files.
- `WITH_DEBUG=1`: Build the distribution with debugging support.

For a more extensive list of options, see Chapter 4, MySQL Source-Configuration Options.

To list the configuration options, use one of the following commands:

```
shell> cmake .. -L # overview
shell> cmake .. -LlH # overview with help text
shell> cmake .. -LAlH # all params with help text
shell> ccmake .. # interactive display
```

If `CMake` fails, you might need to reconfigure by running it again with different options. If you do reconfigure, take note of the following:

- If `CMake` is run after it has previously been run, it may use information that was gathered during its previous invocation. This information is stored in `CMakeCache.txt`. When `CMake` starts, it looks for that file and reads its contents if it exists, on the assumption that the information is still correct. That assumption is invalid when you reconfigure.

- Each time you run `CMake`, you must run `make` again to recompile. However, you may want to remove old object files from previous builds first because they were compiled using different configuration options.

To prevent old object files or configuration information from being used, run these commands in the build directory on Unix before re-running `CMake`:

```
shell> make clean
shell> rm CMakeCache.txt
```
Or, on Windows:

```
shell> devenv MySQL.sln /clean
shell> del CMakeCache.txt
```

Before asking on the MySQL Community Slack, check the files in the `CMakeFiles` directory for useful information about the failure. To file a bug report, please use the instructions in How to Report Bugs or Problems.

## Build the Distribution

### On Unix:

```
shell> make
shell> make VERBOSE=1
```

The second command sets `VERBOSE` to show the commands for each compiled source.

Use `gmake` instead on systems where you are using GNU `make` and it has been installed as `gmake`.

### On Windows:

```
shell> devenv MySQL.sln /build RelWithDebInfo
```

If you have gotten to the compilation stage, but the distribution does not build, see Chapter 5, Dealing with Problems Compiling MySQL, for help. If that does not solve the problem, please enter it into our bugs database using the instructions given in How to Report Bugs or Problems. If you have installed the latest versions of the required tools, and they crash trying to process our configuration files, please report that also. However, if you get a `command not found` error or a similar problem for required tools, do not report it. Instead, make sure that all the required tools are installed and that your `PATH` variable is set correctly so that your shell can find them.

## Install the Distribution

### On Unix:

```
shell> make install
```

This installs the files under the configured installation directory (by default, `/usr/local/mysql`). You might need to run the command as `root`.

To install in a specific directory, add a `DESTDIR` parameter to the command line:

```
shell> make install DESTDIR="/opt/mysql"
```

Alternatively, generate installation package files that you can install where you like:

```
shell> make package
```

This operation produces one or more `.tar.gz` files that can be installed like generic binary distribution packages. See Installing MySQL on Unix/Linux Using Generic Binaries. If you run `CMake` with `-DCPACK_MONOLITHIC_INSTALL=1`, the operation produces a single file. Otherwise, it produces multiple files.

### On Windows:

```
shell> devenv MySQL.sln /build RelWithDebInfo /project initial_database
shell> devenv MySQL.sln /build RelWithDebInfo /project package
```

You can install the resulting `.zip` archive where you like. See Installing MySQL on Microsoft Windows Using a `noinstall` ZIP Archive.
Perform Postinstallation Setup

The remainder of the installation process involves setting up the configuration file, creating the core databases, and starting the MySQL server. For instructions, see Postinstallation Setup and Testing.

Note

The accounts that are listed in the MySQL grant tables initially have no passwords. After starting the server, you should set up passwords for them using the instructions in Postinstallation Setup and Testing.
Chapter 3 Installing MySQL Using a Development Source Tree

This section describes how to install MySQL from the latest development source code, which is hosted on GitHub. To obtain the MySQL Server source code from this repository hosting service, you can set up a local MySQL Git repository.

On GitHub, MySQL Server and other MySQL projects are found on the MySQL page. The MySQL Server project is a single repository that contains branches for several MySQL series.

MySQL officially joined GitHub in September, 2014. For more information about MySQL’s move to GitHub, refer to the announcement on the MySQL Release Engineering blog: MySQL on GitHub

- Prerequisites for Installing from Development Source
- Setting Up a MySQL Git Repository

Prerequisites for Installing from Development Source

To install MySQL from a development source tree, your system must satisfy the tool requirements listed at Source Installation Prerequisites.

Setting Up a MySQL Git Repository

To set up a MySQL Git repository on your machine, use this procedure:

1. Clone the MySQL Git repository to your machine. The following command clones the MySQL Git repository to a directory named mysql-server. The initial download will take some time to complete, depending on the speed of your connection.

   ```bash
   ~$ git clone https://github.com/mysql/mysql-server.git
   Cloning into 'mysql-server'...
   remote: Counting objects: 1035465, done.
   remote: Total 1035465 (delta 0), reused 0 (delta 0)
   Receiving objects: 100% (1035465/1035465), 437.48 MiB | 5.10 MiB/s, done.
   Resolving deltas: 100% (855607/855607), done.
   Checking connectivity... done.
   Checking out files: 100% (21902/21902), done.
   ```

2. When the clone operation completes, the contents of your local MySQL Git repository appear similar to the following:

   ```bash
   ~$ cd mysql-server
   ~/mysql-server$ ls
   BUILD            COPYING             libmysqld    regex          tests
   BUILD-CMAKE      dbug                libservices  scripts        unittest
   client           Docs                man          sql            VERSION
   cmake            extra               mysql-test   sql-bench      vio
   CMakeLists.txt   include             mysys        sql-common     win
   cmd-line-utils   INSTALL-SOURCE      plugin       strings
   config.cmake     INSTALL-WIN-SOURCE  README       support-files
   ```

3. Use the `git branch -r` command to view the remote tracking branches for the MySQL repository.

   ```bash
   ~/mysql-server$ git branch -r
   origin/5.5
   origin/5.6
   origin/5.7
   origin/HEAD -> origin/5.7
   origin/cluster-7.2
   origin/cluster-7.3
   origin/cluster-7.4
   ```
4. To view the branches that are checked out in your local repository, issue the `git branch` command. When you cloned the MySQL Git repository, the MySQL 5.7 branch was checked out automatically. The asterisk identifies the 5.7 branch as the active branch.

```
~/mysql-server$ git branch
 * 5.7
```

5. To check out a different MySQL branch, run the `git checkout` command, specifying the branch name. For example, to check out the MySQL 5.6 branch:

```
~/mysql-server$ git checkout 5.6
Branch 5.6 set up to track remote branch 5.6 from origin.
Switched to a new branch '5.6'
```

6. Run `git branch` again to verify that the MySQL 5.6 branch is present. MySQL 5.6, which is the last branch you checked out, is marked by an asterisk indicating that it is the active branch.

```
~/mysql-server$ git branch
 * 5.6
  5.7
```

The `git checkout` command is also used to switch branches. For example, to make MySQL 5.7 the active branch again, you would run `git checkout 5.7`.

7. To obtain changes made after your initial setup of the MySQL Git repository, switch to the branch you want to update and issue the `git pull` command:

```
~/mysql-server$ git checkout 5.6
~/mysql-server$ git pull
```

To examine the commit history, use the `git log` option:

```
~/mysql-server$ git log
```

You can also browse commit history and source code on the GitHub MySQL site.

If you see changes or code that you have a question about, ask on the MySQL Community Slack. For information about contributing a patch, see Contributing to MySQL Server.

8. After you have cloned the MySQL Git repository and have checked out the branch you want to build, you can build MySQL Server from the source code. Instructions are provided in Chapter 2, Installing MySQL Using a Standard Source Distribution, except that you skip the part about obtaining and unpacking the distribution.

Be careful about installing a build from a distribution source tree on a production machine. The installation command may overwrite your live release installation. If you already have MySQL installed and do not want to overwrite it, run CMake with values for the CMAKE_INSTALL_PREFIX, MYSQL_TCP_PORT, and MYSQL_UNIX_ADDR options different from those used by your production server. For additional information about preventing multiple servers from interfering with each other, see Running Multiple MySQL Instances on One Machine.

Play hard with your new installation. For example, try to make new features crash. Start by running `make test`. See The MySQL Test Suite.
Chapter 4 MySQL Source-Configuration Options

The CMake program provides a great deal of control over how you configure a MySQL source distribution. Typically, you do this using options on the CMake command line. For information about options supported by CMake, run either of these commands in the top-level source directory:

```
cmake . -LH
ccmake .
```

You can also affect CMake using certain environment variables. See Environment Variables.

For boolean options, the value may be specified as 1 or ON to enable the option, or as 0 or OFF to disable the option.

Many options configure compile-time defaults that can be overridden at server startup. For example, the CMAKE_INSTALL_PREFIX, MYSQL_TCP_PORT, and MYSQL_UNIX_ADDR options that configure the default installation base directory location, TCP/IP port number, and Unix socket file can be changed at server startup with the --basedir, --port, and --socket options for mysqld. Where applicable, configuration option descriptions indicate the corresponding mysqld startup option.

The following sections provide more information about CMake options.

- CMake Option Reference
- General Options
- Installation Layout Options
- Storage Engine Options
- Feature Options
- Compiler Flags
- CMake Options for Compiling NDB Cluster

CMake Option Reference

The following table shows the available CMake options. In the Default column, PREFIX stands for the value of the CMAKE_INSTALL_PREFIX option, which specifies the installation base directory. This value is used as the parent location for several of the installation subdirectories.

Table 4.1 MySQL Source-Configuration Option Reference (CMake)

<table>
<thead>
<tr>
<th>Formats</th>
<th>Description</th>
<th>Default</th>
<th>Introduced</th>
<th>Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILD_CONFIG</td>
<td>Use same build options as official releases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMAKE_BUILD_TYPE</td>
<td>Type of build to produce</td>
<td>RelWithDebInfo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMAKE_CXX_FLAGS</td>
<td>Flags for C++ Compiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMAKE_C_FLAGS</td>
<td>Flags for C Compiler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMAKE_INSTALL_PREFIX</td>
<td>Installation base directory</td>
<td>/usr/local/mysql</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPILATION_COMMENT</td>
<td>Comment about compilation environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPACK_MONOLITHIC_INSTALL</td>
<td>Whether package build produces single file</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEFAULT_CHARSET</td>
<td>The default server character set</td>
<td>latin1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEFAULT_COLLATION</td>
<td>The default server collation</td>
<td>latin1_swedish_ci</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formats</td>
<td>Description</td>
<td>Default</td>
<td>Introduced</td>
<td>Removed</td>
</tr>
<tr>
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<td>--------------------------------------------------</td>
<td>---------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>ENABLED_LOCAL_INFILE</td>
<td>Whether to enable LOCAL for LOAD DATA</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENABLED_PROFILING</td>
<td>Whether to enable query profiling code</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENABLE_DEBUG_SYNC</td>
<td>Whether to enable Debug Sync support</td>
<td>ON</td>
<td>5.6.36</td>
<td></td>
</tr>
<tr>
<td>ENABLE_DOWNLOADS</td>
<td>Whether to download optional files</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENABLE_DTRACE</td>
<td>Whether to include DTrace support</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENABLE_GCOV</td>
<td>Whether to include gcov support</td>
<td>ON</td>
<td>5.6.3</td>
<td></td>
</tr>
<tr>
<td>ENABLE_GPROF</td>
<td>Enable gprof (optimized Linux builds only)</td>
<td>OFF</td>
<td>5.6.6</td>
<td></td>
</tr>
<tr>
<td>IGNORE_AIO_CHECK</td>
<td>With -DBUILD_CONFIG=mysql_release, ignore libaio check</td>
<td>OFF</td>
<td>5.6.1</td>
<td></td>
</tr>
<tr>
<td>INNODB_PAGE_ATOMIC_REF</td>
<td>Enable or disable atomic page reference counting</td>
<td>ON</td>
<td>5.6.15</td>
<td></td>
</tr>
<tr>
<td>INSTALL_BINDIR</td>
<td>User executables directory</td>
<td>PREFIX/bin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL_DOCDIR</td>
<td>Documentation directory</td>
<td>PREFIX/docs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL_DOCREADMEDIR</td>
<td>README file directory</td>
<td>PREFIX/docs</td>
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<td></td>
</tr>
<tr>
<td>INSTALL_INCLUDEDIR</td>
<td>Header file directory</td>
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<td></td>
</tr>
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<td>INSTALL_INFODIR</td>
<td>Info file directory</td>
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<td></td>
</tr>
<tr>
<td>INSTALL_LAYOUT</td>
<td>Select predefined installation layout</td>
<td>STANDALONE</td>
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<td>INSTALL_LIBDIR</td>
<td>Library file directory</td>
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<td>INSTALL_MANDIR</td>
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<td></td>
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<td>INSTALL_MYSQLSHAREDIR</td>
<td>Shared data directory</td>
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<tr>
<td>INSTALL_MYSQLTESTDIR</td>
<td>mysql-test directory</td>
<td>PREFIX/mysql-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL_PLUGINDIR</td>
<td>Plugin directory</td>
<td>PREFIX/lib/plugin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL SBINDIR</td>
<td>Server executable directory</td>
<td>PREFIX/bin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL_SCRIPTDIR</td>
<td>Scripts directory</td>
<td>PREFIX/scripts</td>
<td></td>
<td></td>
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<tr>
<td>INSTALL_SECURE_FILE_PRIV</td>
<td>secure_file_priv default value</td>
<td>platform specific</td>
<td>5.6.34</td>
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<tr>
<td>INSTALL_SECURE_FILE_PRIV_EMBEDDED</td>
<td>secure_file_priv default value for libmysqld</td>
<td>platform specific</td>
<td>5.6.34</td>
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<tr>
<td>INSTALL_SHAREDIR</td>
<td>aclocal/mysql.m4 installation directory</td>
<td>PREFIX/share</td>
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<td></td>
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<tr>
<td>INSTALL_SQLBENCHDIR</td>
<td>sql-bench directory</td>
<td>PREFIX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALL_SUPPORTFILESDIR</td>
<td>Extra support files directory</td>
<td>PREFIX/support-files</td>
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<td>MEMCACHED_HOME</td>
<td>Path to memcached</td>
<td>[none]</td>
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</tr>
<tr>
<td>Formats</td>
<td>Description</td>
<td>Default</td>
<td>Introduced</td>
<td>Removed</td>
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<td>MYSQL_DATADIR</td>
<td>Data directory</td>
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<tr>
<td>MYSQL_MAINTAINER_MODE</td>
<td>Whether to enable MySQL maintainer-specific development environment</td>
<td>OFF</td>
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<td></td>
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<tr>
<td>MYSQL_PROJECT_NAME</td>
<td>Windows/OS X project name</td>
<td>MySQL</td>
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<tr>
<td>MYSQL_TCP_PORT</td>
<td>TCP/IP port number</td>
<td>3306</td>
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<tr>
<td>MYSQL_UNIX_ADDR</td>
<td>Unix socket file</td>
<td>/tmp/mysql.sock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODBC_INCLUDES</td>
<td>ODBC includes directory</td>
<td></td>
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<tr>
<td>ODBC_LIB_DIR</td>
<td>ODBC library directory</td>
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<td>OPTIMIZER_TRACE</td>
<td>Whether to support optimizer tracing</td>
<td></td>
<td>5.6.3</td>
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<tr>
<td>REPRODUCIBLE_BUILD</td>
<td>Take extra care to create a build result independent of build location and time</td>
<td></td>
<td>5.6.37</td>
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<tr>
<td>SUNPRO_CXX_LIBRARY</td>
<td>Client link library on Solaris 10+</td>
<td></td>
<td>5.6.20</td>
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<tr>
<td>SYSCONFDIR</td>
<td>Option file directory</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>TMPDIR</td>
<td>tmpdir default value</td>
<td></td>
<td>5.6.16</td>
<td></td>
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<tr>
<td>WITHOUT_xxx_STORAGE_ENGINE</td>
<td>Exclude storage engine xxx from build</td>
<td></td>
<td>5.6.16</td>
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<tr>
<td>WITH_ASAN</td>
<td>Enable AddressSanitizer</td>
<td>OFF</td>
<td>5.6.15</td>
<td></td>
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<tr>
<td>WITH_BUNDLED_LIBEVENT</td>
<td>Use bundled libevent when building ndbmemcache</td>
<td>ON</td>
<td></td>
<td></td>
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<tr>
<td>WITH_BUNDLED_MEMCACHED</td>
<td>Use bundled memcached when building ndbmemcache</td>
<td>ON</td>
<td></td>
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<tr>
<td>WITH_CLASSPATH</td>
<td>Classpath to use when building MySQL Cluster Connector for Java. Default is an empty string.</td>
<td></td>
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<tr>
<td>WITH_DEBUG</td>
<td>Whether to include debugging support</td>
<td>OFF</td>
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<tr>
<td>WITH_DEFAULT_COMPILER_OPTIONS</td>
<td>Whether to use default compiler options</td>
<td>ON</td>
<td>5.6.6</td>
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<tr>
<td>WITH_DEFAULT_FEATURE_SET</td>
<td>Whether to use default feature set</td>
<td>ON</td>
<td>5.6.6</td>
<td></td>
</tr>
<tr>
<td>WITH_EDITLINE</td>
<td>Which libedit/editline library to use</td>
<td>bundled</td>
<td>5.6.12</td>
<td></td>
</tr>
<tr>
<td>WITH_EMBEDDED_SERVER</td>
<td>Whether to build embedded server</td>
<td>OFF</td>
<td></td>
<td></td>
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<tr>
<td>WITH_EMBEDDED_SHARED_LIBRARY</td>
<td>Whether to build a shared embedded server library</td>
<td>OFF</td>
<td>5.6.17</td>
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<tr>
<td>WITH_ERROR_INSERT</td>
<td>Enable error injection in the NDB storage engine. Should not be used for building binaries intended for production.</td>
<td>OFF</td>
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<td></td>
</tr>
<tr>
<td>Formats</td>
<td>Description</td>
<td>Default</td>
<td>Introduced</td>
<td>Removed</td>
</tr>
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<td>---------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>WITH_EXTRA_CHARSETS</td>
<td>Which extra character sets to include</td>
<td>all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_GMOCK</td>
<td>Path to googlemock distribution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_INNODB_MEMCACHED</td>
<td>Whether to generate memcached shared libraries.</td>
<td>OFF</td>
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<td></td>
</tr>
<tr>
<td>WITH_LIBEDIT</td>
<td>Use bundled libedit library</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_LIBEVENT</td>
<td>Which libevent library to use</td>
<td>bundled</td>
<td>5.6.12</td>
<td></td>
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<tr>
<td>WITH_LIBWRAP</td>
<td>Whether to include libwrap (TCP wrappers) support</td>
<td>OFF</td>
<td></td>
<td></td>
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<tr>
<td>WITH_NDBCLUSTER</td>
<td>Build the NDB storage engine; alias for</td>
<td>ON</td>
<td></td>
<td></td>
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<tr>
<td>WITH_NDBCLUSTER_STORAGE_ENGINE</td>
<td>Build the NDB storage engine</td>
<td>ON</td>
<td></td>
<td></td>
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<tr>
<td>WITH_NDBMTD</td>
<td>Build multithreaded data node.</td>
<td>ON</td>
<td></td>
<td></td>
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<tr>
<td>WITH_NDB_BINLOG</td>
<td>Enable binary logging by default by mysqld.</td>
<td>ON</td>
<td></td>
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</tr>
<tr>
<td>WITH_NDB_DEBUG</td>
<td>Produce a debug build for testing or troubleshooting.</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_NDB_JAVA</td>
<td>Enable building of Java and ClusterJ support.</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_NDB_PORT</td>
<td>Default port used by a management server built</td>
<td>[none]</td>
<td>5.6.27</td>
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<tr>
<td>WITH_NDB_TEST</td>
<td>Include NDB API test programs.</td>
<td>OFF</td>
<td></td>
<td></td>
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<tr>
<td>WITH_NUMA</td>
<td>Set NUMA memory allocation policy</td>
<td></td>
<td>5.6.27</td>
<td></td>
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<tr>
<td>WITH_READLINE</td>
<td>Use bundled readline library</td>
<td>OFF</td>
<td>5.6.5</td>
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<tr>
<td>WITH_SSL</td>
<td>Type of SSL support</td>
<td>system</td>
<td></td>
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<tr>
<td>WITH_SYMVER16</td>
<td>Whether libmysqlclient.so.18 contains both symver 16 and 18 symbols.</td>
<td>OFF</td>
<td>5.6.31</td>
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<tr>
<td>WITH_UNIT_TESTS</td>
<td>Compile MySQL with unit tests</td>
<td>ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_UNIXODBC</td>
<td>Enable unixODBC support</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_VALGRIND</td>
<td>Whether to compile in Valgrind header files</td>
<td>OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WITH_ZLIB</td>
<td>Type of zlib support</td>
<td>bundled</td>
<td></td>
<td></td>
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<tr>
<td>WITH_xxx_STORAGE_ENGINE</td>
<td>Compile storage engine xxx statically into server</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General Options

- **-DBUILD_CONFIG=mysql_release**
  This option configures a source distribution with the same build options used by Oracle to produce binary distributions for official MySQL releases.

- **-DCMAKE_BUILD_TYPE=type**
  The type of build to produce:
  - **RelWithDebInfo**: Enable optimizations and generate debugging information. This is the default MySQL build type.
  - **Debug**: Disable optimizations and generate debugging information. This build type is also used if the **WITH_DEBUG** option is enabled. That is, **-DWITH_DEBUG=1** has the same effect as **-DCMAKE_BUILD_TYPE=Debug**.

- **-DCPACK_MONOLITHIC_INSTALL=bool**
  This option affects whether the **make package** operation produces multiple installation package files or a single file. If disabled, the operation produces multiple installation package files, which may be useful if you want to install only a subset of a full MySQL installation. If enabled, it produces a single file for installing everything.

Installation Layout Options

The **CMAKE_INSTALL_PREFIX** option indicates the base installation directory. Other options with names of the form **INSTALL_xxx** that indicate component locations are interpreted relative to the prefix and their values are relative pathnames. Their values should not include the prefix.

- **-DCMAKE_INSTALL_PREFIX=dir_name**
  The installation base directory.
  This value can be set at server startup with the **--basedir** option.

- **-DINSTALL_BINDIR=dir_name**
  Where to install user programs.

- **-DINSTALL_DOCDIR=dir_name**
  Where to install documentation.

- **-DINSTALL_DOCREADMEDIR=dir_name**
  Where to install **README** files.

- **-DINSTALL_INCLUDEDIR=dir_name**
  Where to install header files.

- **-DINSTALL_INFODIR=dir_name**
  Where to install Info files.

- **-DINSTALL_LAYOUT=name**
  Select a predefined installation layout:
  - **STANDALONE**: Same layout as used for **.tar.gz** and **.zip** packages. This is the default.
Installation Layout Options

- **RPM**: Layout similar to RPM packages.
- **SVR4**: Solaris package layout.
- **DEB**: DEB package layout (experimental).

You can select a predefined layout but modify individual component installation locations by specifying other options. For example:

```
make . -DINSTALL_LAYOUT=SVR4 -DMYSQL_DATADIR=/var/mysql/data
```

- **-DINSTALL_LIBDIR=dir_name**
  Where to install library files.
- **-DINSTALL_MANDIR=dir_name**
  Where to install manual pages.
- **-DINSTALL_MYSQLSHAREDIR=dir_name**
  Where to install shared data files.
- **-DINSTALL_MYSQLTESTDIR=dir_name**
  Where to install the `mysql-test` directory. As of MySQL 5.6.12, to suppress installation of this directory, explicitly set the option to the empty value (`-DINSTALL_MYSQLTESTDIR=`).
- **-DINSTALL_PLUGINDIR=dir_name**
  The location of the plugin directory.
  This value can be set at server startup with the `--plugin_dir` option.
- **-DINSTALL_SBINDIR=dir_name**
  Where to install the `mysqld` server.
- **-DINSTALL_SCRIPTDIR=dir_name**
  Where to install `mysql_install_db`.
- **-DINSTALL_SECURE_FILE_PRIVDIR=dir_name**
  The default value for the `secure_file_priv` system variable. The default value is platform specific and depends on the value of the `INSTALL_LAYOUT` CMake option; see the description of the `secure_file_priv` system variable in Server System Variables. This option was added in MySQL 5.6.34. To set the value for the `libmysqld` embedded server, use `INSTALL_SECURE_FILE_PRIV_EMBEDDEDDIR`.
- **-DINSTALL_SECURE_FILE_PRIV_EMBEDDEDDIR=dir_name**
  The default value for the `secure_file_priv` system variable, for the `libmysqld` embedded server. This option was added in MySQL 5.6.34.
- **-DINSTALL_SHAREDIR=dir_name**
  Where to install `aclocal/mysql.m4`.
- **-DINSTALL_SQLBENCHDIR=dir_name**
  Where to install the `sql-bench` directory. To suppress installation of this directory, explicitly set the option to the empty value (`-DINSTALL_SQLBENCHDIR=`).
Storage Engine Options

- **--INSTALL_SUPPORTFILES=dir_name**
  Where to install extra support files.

- **--MYSQL_DATADIR=dir_name**
  The location of the MySQL data directory. This value can be set at server startup with the `--datadir` option.

- **--ODBC_INCLUDES=dir_name**
  The location of the ODBC includes directory, and may be used while configuring Connector/ODBC.

- **--ODBC_LIB_DIR=dir_name**
  The location of the ODBC library directory, and may be used while configuring Connector/ODBC.

- **--SYSCONFDIR=dir_name**
  The default my.cnf option file directory. This location cannot be set at server startup, but you can start the server with a given option file using the `--defaults-file=file_name` option, where file_name is the full path name to the file.

- **--TMPDIR=dir_name**
  The default location to use for the tmpdir system variable. If unspecified, the value defaults to `P_tmpdir` in `<stdio.h>`. This option was added in MySQL 5.6.16.

### Storage Engine Options

Storage engines are built as plugins. You can build a plugin as a static module (compiled into the server) or a dynamic module (built as a dynamic library that must be installed into the server using the `INSTALL PLUGIN` statement or the `--plugin-load` option before it can be used). Some plugins might not support static or dynamic building.

The **InnoDB**, **MyISAM**, **MERGE**, **MEMORY**, and **CSV** engines are mandatory (always compiled into the server) and need not be installed explicitly.

To compile a storage engine statically into the server, use `--WITH_engine_STORAGE_ENGINE=1`. Some permissible `engine` values are **ARCHIVE**, **BLACKHOLE**, **EXAMPLE**, **FEDERATED**, **NDB** or **NDBCLUSTER** (NDB), **PARTITION** (partitioning support), and **PERFSHEMA** (Performance Schema). Examples:

```
-DWITH_ARCHIVE_STORAGE_ENGINE=1
-DWITH_BLACKHOLE_STORAGE_ENGINE=1
-DWITH_PERFSHEMA_STORAGE_ENGINE=1
```

**Note**

`WITH_NDBCLUSTER_STORAGE_ENGINE` is supported only when building NDB Cluster using the NDB Cluster sources. It cannot be used to enable clustering support in other MySQL source trees or distributions. In NDB Cluster source distributions, it is enabled by default. See Building NDB Cluster from Source on Linux, and Compiling and Installing NDB Cluster from Source on Windows, for more information.

To exclude a storage engine from the build, use `--WITHOUT_engine_STORAGE_ENGINE=1`. Examples:

```
-DWITHOUT_EXAMPLE_STORAGE_ENGINE=1
```

---

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### Feature Options

- **WITHOUT_FEDERATED_STORAGE_ENGINE=1**
- **WITHOUT_PARTITION_STORAGE ENGINE=1**

If neither **WITH_engine_STORAGE_ENGINE** nor **WITHOUT_engine_STORAGE_ENGINE** are specified for a given storage engine, the engine is built as a shared module, or excluded if it cannot be built as a shared module.

#### Feature Options

- **-DCOMPILATION_COMMENT=string**
  
  A descriptive comment about the compilation environment.

- **-DDEFAULT_CHARSET=charset_name**
  
  The server character set. By default, MySQL uses the latin1 (cp1252 West European) character set.

  The possible character sets are listed in the `cmake/character_sets.cmake` file as the value of `CHARSETS_AVAILABLE`.

  This value can be set at server startup with the `--character_set_server` option.

- **-DDEFAULT_COLLATION=collation_name**
  
  The server collation. By default, MySQL uses latin1_swedish_ci. Use the `SHOW COLLATION` statement to determine which collations are available for each character set.

  This value can be set at server startup with the `--collation_server` option.

- **-DENABLE_DEBUG_SYNC=bool**
  
  Whether to compile the Debug Sync facility into the server. This facility is used for testing and debugging. This option is enabled by default, but has no effect unless MySQL is configured with debugging enabled. If debugging is enabled and you want to disable Debug Sync, use `-DENABLE_DEBUG_SYNC=0`.

  When compiled in, Debug Sync is disabled by default at runtime. To enable it, start `mysqld` with the `--debug-sync-timeout=N` option, where `N` is a timeout value greater than 0. (The default value is 0, which disables Debug Sync.) `N` becomes the default timeout for individual synchronization points.

  For a description of the Debug Sync facility and how to use synchronization points, see MySQL Internals: Test Synchronization.

- **-DENABLE_DOWNLOADS=bool**
  
  Whether to download optional files. For example, with this option enabled, `CMake` downloads the Google Test distribution that is used by the test suite to run unit tests.

- **-DENABLE_DTRACE=bool**
  
  Whether to include support for DTrace probes. For information about DTrace, see Tracing mysqld Using DTrace.
Feature Options

- **-DENABLE_GCOV=bool**
  Whether to include gcov support (Linux only).

- **-DENABLE_GPROF=bool**
  Whether to enable gprof (optimized Linux builds only).

- **-DENABLED_LOCAL_INFILE=bool**
  This option controls the compiled-in default LOCAL capability for the MySQL client library. Clients that make no explicit arrangements therefore have LOCAL capability disabled or enabled according to the ENABLED_LOCAL_INFILE setting specified at MySQL build time.

  By default, the client library in MySQL binary distributions is compiled with ENABLED_LOCAL_INFILE enabled. If you compile MySQL from source, configure it with ENABLED_LOCAL_INFILE disabled or enabled based on whether clients that make no explicit arrangements should have LOCAL capability disabled or enabled, respectively.

  ENABLED_LOCAL_INFILE controls the default for client-side LOCAL capability. For the server, the local_infile system variable controls server-side LOCAL capability. To explicitly cause the server to refuse or permit LOAD DATA LOCAL statements (regardless of how client programs and libraries are configured at build time or runtime), start mysqld with local_infile disabled or enabled, respectively. local_infile can also be set at runtime. See Security Considerations for LOAD DATA LOCAL.

- **-DENABLED_PROFILING=bool**
  Whether to enable query profiling code (for the SHOW PROFILE and SHOW PROFILES statements).

- **-DIGNORE_AIO_CHECK=bool**
  If the -DBUILD_CONFIG=mysql_release option is given on Linux, the libaio library must be linked in by default. If you do not have libaio or do not want to install it, you can suppress the check for it by specifying -DIGNORE_AIO_CHECK=1.

- **-DINNODB_PAGE_ATOMIC_REF_COUNT=bool**
  Whether to enable or disable atomic page reference counting. Fetching and releasing pages from the buffer pool and tracking the page state are expensive and complex operations. Using a page mutex to track these operations does not scale well. With INNODB_PAGE_ATOMIC_REF_COUNT=ON (default), fetch and release is tracked using atomics where available. For platforms that do not support atomics, set INNODB_PAGE_ATOMIC_REF_COUNT=OFF to disable atomic page reference counting.

  When atomic page reference counting is enabled (default), "[Note] InnoDB: Using atomics to ref count buffer pool pages" is printed to the error log at server startup. If atomic page reference counting is disabled, "[Note] InnoDB: Using mutexes to ref count buffer pool pages" is printed instead.

  INNODB_PAGE_ATOMIC_REF_COUNT was introduced with the fix for MySQL Bug #68079. The option is removed in MySQL 5.7.5. Support for atomics is required to build MySQL as of MySQL 5.7.5, which makes the option obsolete.

- **-DMYSQL_MAINTAINER_MODE=bool**
  Whether to enable a MySQL maintainer-specific development environment. If enabled, this option causes compiler warnings to become errors. It may also cause some minor changes in generated code, to initialize some variables to 0.
Feature Options

- **-DMYSQL_PROJECT_NAME=name**
  For Windows or macOS, the project name to incorporate into the project file name.

- **-DMYSQL_TCP_PORT=port_num**
  The port number on which the server listens for TCP/IP connections. The default is 3306.
  This value can be set at server startup with the `--port` option.

- **-DMYSQL_UNIX_ADDR=file_name**
  The Unix socket file path on which the server listens for socket connections. This must be an absolute path name. The default is `/tmp/mysql.sock`.
  This value can be set at server startup with the `--socket` option.

- **-DOPTIMIZER_TRACE=bool**
  Whether to support optimizer tracing. See MySQL Internals: Tracing the Optimizer.

- **-DREPRODUCIBLE_BUILD=bool**
  For builds on Linux systems, this option controls whether to take extra care to create a build result independent of build location and time.
  This option was added in MySQL 5.6.37.

- **-DWITH_ASAN=bool**
  Whether to enable AddressSanitizer, for compilers that support it. The default is off. This option was added in MySQL 5.6.15.

- **-DWITH_DEBUG=bool**
  Whether to include debugging support.
  Configuring MySQL with debugging support enables you to use the `--debug="d,parser_debug"` option when you start the server. This causes the Bison parser that is used to process SQL statements to dump a parser trace to the server's standard error output. Typically, this output is written to the error log.
  As of MySQL 5.6.36, enabling `WITH_DEBUG` also enables Debug Sync. For a description of the Debug Sync facility and how to use synchronization points, see MySQL Internals: Test Synchronization.

- **-DWITH_DEFAULT_FEATURE_SET=bool**
  Whether to use the flags from `cmake/build_configurations/feature_set.cmake`.

- **-DWITH_EDITLINE=value**
  Which libedit/editline library to use. The permitted values are bundled (the default) and system.
  `WITH_EDITLINE` was added in MySQL 5.6.12. It replaces `WITH_LIBEDIT`, which has been removed.

- **-DWITH_EMBEDDED_SERVER=bool**
  Whether to build the `libmysqld` embedded server library.

- **-DWITH_EMBEDDED_SHARED_LIBRARY=bool**
Whether to build a shared `libmysqld` embedded server library. This option was added in MySQL 5.6.17.

- `-DWITH_EXTRA_CHARSETS=name`

Which extra character sets to include:
- `all`: All character sets. This is the default.
- `complex`: Complex character sets.
- `none`: No extra character sets.

- `-DWITH_GMOCK=path_name`

The path to the googlemock distribution, for use with Google Test-based unit tests. The option value is the path to the distribution Zip file. Alternatively, set the `WITH_GMOCK` environment variable to the path name. It is also possible to use `-DENABLEDOWNLOADS=1` and CMake will download the distribution from GitHub.

If you build MySQL without the Google Test-based unit tests (by configuring without `WITH_GMOCK`), CMake displays a message indicating how to download it.

- `-DWITH_INNODB_MEMCACHED=bool`

Whether to generate memcached shared libraries (`libmemcached.so` and `innodb_engine.so`).

- `-DWITH_LIBEVENT=string`

Which libevent library to use. Permitted values are `bundled` (default), `system`, and `yes`. If you specify `system` or `yes`, the system libevent library is used if present. If the system library is not found, the bundled libevent library is used. The libevent library is required by InnoDB memcached.

- `-DWITH_LIBEDIT=bool`

Whether to use the libedit library bundled with the distribution.

`WITH_LIBEDIT` was removed in MySQL 5.6.12. Use `WITH_EDITLINE` instead.

- `-DWITH_LIBWRAP=bool`

Whether to include libwrap (TCP wrappers) support.

- `-DWITH_NUMA=bool`

Explicitly set the NUMA memory allocation policy. CMake sets the default `WITH_NUMA` value based on whether the current platform has NUMA support. For platforms without NUMA support, CMake behaves as follows:

  - With no NUMA option (the normal case), CMake continues normally, producing only this warning: NUMA library missing or required version not available
  - With `-DWITH_NUMA=ON`, CMake aborts with this error: NUMA library missing or required version not available

This option was added in MySQL 5.6.27.
Feature Options

- \texttt{-DWITH_SSL=\{ssl_type|path\_name\}}

For support of encrypted connections, entropy for random number generation, and other encryption-related operations, MySQL must be built using an SSL library. This option specifies which SSL library to use.

- \texttt{ssl\_type} can be one of the following values:
  - \texttt{no}: No SSL support. This is the default before MySQL 5.6.6. As of 5.6.6, this is no longer a permitted value and the default is \texttt{bundled}.
  - \texttt{yes}: Use the system OpenSSL library if present, else the library bundled with the distribution.
  - \texttt{bundled}: Use the SSL library bundled with the distribution. This is the default from MySQL 5.6.6 through 5.6.45. As of 5.6.46, this is no longer a permitted value and the default is \texttt{system}.
  - \texttt{system}: Use the system OpenSSL library. This is the default as of MySQL 5.6.46.

- \texttt{path\_name}, permitted for MySQL 5.6.7 and after, is the path name to the OpenSSL installation to use. This can be preferable to using the \texttt{ssl\_type} value of \texttt{system} because it can prevent CMake from detecting and using an older or incorrect OpenSSL version installed on the system. (Another permitted way to do the same thing is to set \texttt{WITH\_SSL} to \texttt{system} and set the \texttt{CMAKE\_PREFIX\_PATH} option to \texttt{path\_name}.)

For additional information about configuring the SSL library, see Configuring SSL Library Support.

- \texttt{-DWITH\_SYMVER16=bool}

If enabled, this option causes the \texttt{libmysqlclient} client library to contain extra symbols to be compatible with \texttt{libmysqlclient} on RHEL/OEL 5, 6, and 7; and Fedora releases. All symbols present in \texttt{libmysqlclient.so.16} are tagged with symver 16 in \texttt{libmsqlclient.so.18}, making those symbols have both symver 16 and 18. The default is \texttt{OFF}.

This option was added in MySQL 5.6.31.

- \texttt{-DWITH\_UNIT\_TESTS=\{ON|OFF\}}

If enabled, compile MySQL with unit tests. The default is ON unless the server is not being compiled.

- \texttt{-DWITH\_UNIXODBC=1}

Enables unixODBC support, for Connector/ODBC.

- \texttt{-DWITH\_VALGRIND=bool}

Whether to compile in the Valgrind header files, which exposes the Valgrind API to MySQL code. The default is \texttt{OFF}.

To generate a Valgrind-aware debug build, \texttt{-DWITH\_VALGRIND=1} normally is combined with \texttt{-DWITH\_DEBUG=1}. See Building Debug Configurations.

- \texttt{-DWITH\_ZLIB=zlib\_type}

Some features require that the server be built with compression library support, such as the \texttt{COMPRESS()} and \texttt{UNCOMPRESS()} functions, and compression of the client/server protocol. The \texttt{WITH\_ZLIB} indicates the source of \texttt{zlib} support:

- \texttt{bundled}: Use the \texttt{zlib} library bundled with the distribution. This is the default.
- \texttt{system}: Use the system \texttt{zlib} library.
Compiler Flags

- **-DCMAKE_C_FLAGS="flags"**

Flags for the C Compiler.

- **-DCMAKE_CXX_FLAGS="flags"**

Flags for the C++ Compiler.

- **-DWITH_DEFAULT_COMPILER_OPTIONS=bool**

Whether to use the flags from `cmake/build_configurations/compiler_options.cmake`.

### Note

All optimization flags were carefully chosen and tested by the MySQL build team. Overriding them can lead to unexpected results and is done at your own risk.

- **-DSUNPRO_CXX_LIBRARY="lib_name"**

Enable linking against `libCstd` instead of `stlport4` on Solaris 10 or later. This works only for client code because the server depends on C++98.

This option was added in MySQL 5.6.20.

To specify your own C and C++ compiler flags, for flags that do not affect optimization, use the `CMAKE_C_FLAGS` and `CMAKE_CXX_FLAGS` CMake options.

When providing your own compiler flags, you might want to specify `CMAKE_BUILD_TYPE` as well.

For example, to create a 32-bit release build on a 64-bit Linux machine, do this:

```bash
mkdir bld
cd bld
cmake .. -DCMAKE_C_FLAGS=-m32 -DCMAKE_CXX_FLAGS=-m32 -DCMAKE_BUILD_TYPE=RelWithDebInfo
```

If you set flags that affect optimization (`-O` or `--opt`), you must set the `CMAKE_C_FLAGS_build_type` and/or `CMAKE_CXX_FLAGS_build_type` options, where `build_type` corresponds to the `CMAKE_BUILD_TYPE` value. To specify a different optimization for the default build type (RelWithDebInfo) set the `CMAKE_C_FLAGS_RELWITHDEBINFO` and `CMAKE_CXX_FLAGS_RELWITHDEBINFO` options. For example, to compile on Linux with `-O3` and with debug symbols, do this:

```bash
cmake .. -DCMAKE_C_FLAGS_RELWITHDEBINFO=-O3 -g* -DCMAKE_CXX_FLAGS_RELWITHDEBINFO=-O3 -g*
```

### CMake Options for Compiling NDB Cluster

The following options are for use when building NDB Cluster with the NDB Cluster sources; they are not currently supported when using sources from the MySQL 5.6 Server tree.

- **-DMEMCACHED_HOME=dir_name**

Perform the build using the memcached (version 1.6 or later) installed in the system directory indicated by `dir_name`. Files from this installation that are used in the build include the memcached binary, header files, and libraries, as well as the `memcached_utilities` library and the header file `engine_testapp.h`. 


You must leave this option unset when building ndbmemcache using the bundled memcached sources (WITH_BUNDLED_MEMCACHED option); in other words, the bundled sources are used by default).

This option was added in MySQL NDB Cluster 7.2.2.

While additional CMake options—such as for SASL authorization and for providing dtrace support—are available for use when compiling memcached from external sources, these options are currently not enabled for the memcached sources bundled with NDB Cluster.

- **-DWITH_BUNDLED_LIBEVENT={ON|OFF}**

Use the libevent included in the NDB Cluster sources when building NDB Cluster with ndbmemcached support (MySQL NDB Cluster 7.2.2 and later). Enabled by default. OFF causes the system's libevent to be used instead.

- **-DWITH_BUNDLED_MEMCACHED={ON|OFF}**

Build the memcached sources included in the NDB Cluster source tree (MySQL NDB Cluster 7.2.3 and later), then use the resulting memcached server when building the ndbmemcache engine. In this case, make install places the memcached binary in the installation bin directory, and the ndbmemcache engine shared library file ndb_engine.so in the installation lib directory.

This option is ON by default.

- **-DWITH_CLASSPATH=path**

Sets the classpath for building NDB Cluster Connector for Java. The default is empty. In MySQL NDB Cluster 7.2.9 and later, this option is ignored if -DWITH_NDB_JAVA=OFF is used.

- **-DWITH_ERROR_INSERT={ON|OFF}**

Enables error injection in the NDB kernel. For testing only; not intended for use in building production binaries. The default is OFF.

- **-DWITH_NDBCLUSTER_STORAGE_ENGINE={ON|OFF}**

Build and link in support for the NDB (NDBCLUSTER) storage engine in mysqld. The default is ON.

This is an alias for WITH_NDBCLUSTER_STORAGE_ENGINE.

- **-DWITH_NDBMTD={ON|OFF}**

Build the multithreaded data node executable ndbmtd. The default is ON.

- **-DWITH_NDB_BINLOG={ON|OFF}**

Enable binary logging by default in the mysqld built using this option. ON by default.

- **-DWITH_NDB_DEBUG={ON|OFF}**

Enable building the debug versions of the NDB Cluster binaries. OFF by default.

- **-DWITH_NDB_JAVA={ON|OFF}**

Enable building NDB Cluster with Java support, including ClusterJ.

This option was added in MySQL NDB Cluster 7.2.9, and is ON by default. If you do not wish to compile NDB Cluster with Java support, you must disable it explicitly by specifying -
DWITH_NDB_JAVA=OFF when running CMake. Otherwise, if Java cannot be found, configuration of the build fails.

- DWITH_NDB_PORT=port

Causes the NDB Cluster management server (ndb_mgmd) that is built to use this port by default. If this option is unset, the resulting management server tries to use port 1186 by default.

- DWITH_NDB_TEST={ON|OFF}

If enabled, include a set of NDB API test programs. The default is OFF.
Chapter 5 Dealing with Problems Compiling MySQL

The solution to many problems involves reconfiguring. If you do reconfigure, take note of the following:

- If CMake is run after it has previously been run, it may use information that was gathered during its previous invocation. This information is stored in CMakeCache.txt. When CMake starts, it looks for that file and reads its contents if it exists, on the assumption that the information is still correct. That assumption is invalid when you reconfigure.

- Each time you run CMake, you must run make again to recompile. However, you may want to remove old object files from previous builds first because they were compiled using different configuration options.

To prevent old object files or configuration information from being used, run the following commands before re-running CMake:

On Unix:

```
shell> make clean
shell> rm CMakeCache.txt
```

On Windows:

```
shell> devenv MySQL.sln /clean
shell> del CMakeCache.txt
```

If you build outside of the source tree, remove and recreate your build directory before re-running CMake. For instructions on building outside of the source tree, see How to Build MySQL Server with CMake.

On some systems, warnings may occur due to differences in system include files. The following list describes other problems that have been found to occur most often when compiling MySQL:

- To define which C and C++ compilers to use, you can define the CC and CXX environment variables. For example:

```
shell> CC=gcc
shell> CXX=g++
shell> export CC CXX
```

To specify your own C and C++ compiler flags, use the CMAKE_C_FLAGS and CMAKE_CXX_FLAGS CMake options. See Compiler Flags.

To see what flags you might need to specify, invoke mysql_config with the --cflags and --cxxflags options.

- To see what commands are executed during the compile stage, after using CMake to configure MySQL, run make VERBOSE=1 rather than just make.

- If compilation fails, check whether the MYSQL_MAINTAINER_MODE option is enabled. This mode causes compiler warnings to become errors, so disabling it may enable compilation to proceed.

- If your compile fails with errors such as any of the following, you must upgrade your version of make to GNU make:

```
make: Fatal error in reader: Makefile, line 18:
Badly formed macro assignment
```

Or:

```
make: file `Makefile' line 18: Must be a separator {;
```

Or:
Solaris and FreeBSD are known to have troublesome `make` programs.

GNU `make` 3.75 is known to work.

- The `sql_yacc.cc` file is generated from `sql_yacc.yy`. Normally, the build process does not need to create `sql_yacc.cc` because MySQL comes with a pregenerated copy. However, if you do need to re-create it, you might encounter this error:

```
"sql_yacc.yy", line xxx fatal: default action causes potential...
```

This is a sign that your version of `yacc` is deficient. You probably need to install a recent version of `bison` (the GNU version of `yacc`) and use that instead.

Versions of `bison` older than 1.75 may report this error:

```
sql_yacc.yy:#####: fatal error: maximum table size (32767) exceeded
```

The maximum table size is not actually exceeded; the error is caused by bugs in older versions of `bison`.

For information about acquiring or updating tools, see the system requirements in Chapter 1, *Installing MySQL from Source*. 