# Comprehensive Guide to MySQL bin Folder Executables: Categories & Use Cases

| **Executable** | **Category** | **Use Case** |
| --- | --- | --- |
| **mysqld.exe** | MySQL Server | MySQL database server daemon. It runs the MySQL server process. |
| **mysql.exe** | Client Utilities | Command-line client used to connect to and interact with the MySQL server. |
| **mysqladmin.exe** | Client Utilities | Administration tool to perform tasks like shutdown, status check, flush logs, etc. |
| **mysqlshow.exe** | Client Utilities | Displays database and table structure details. |
| **mysqlslap.exe** | Benchmarking Tools | Load testing and benchmarking tool for MySQL performance testing. |
| **mysqldump.exe** | Backup & Restore | Exports database data into a file as SQL statements for backup. |
| **mysqlpump.exe** | Backup & Restore | Parallelized version of mysqldump for faster backups. |
| **mysqlimport.exe** | Data Import/Export | Imports data from text files into MySQL tables. |
| **mysqlbinlog.exe** | Binary Log Utilities | Reads and processes MySQL binary logs for replication and recovery. |
| **mysql\_upgrade.exe** | Upgrade & Maintenance | Upgrades MySQL databases after an update to a new version. |
| **mysql\_secure\_installation.exe** | Security | Performs initial security setup, like setting a root password and removing anonymous users. |
| **mysql\_config\_editor.exe** | Configuration Tools | Manages MySQL login credentials securely in an encrypted configuration file. |
| **mysql\_tzinfo\_to\_sql.exe** | Time Zone Management | Converts system time zone data into MySQL-compatible format. |
| **mysql\_ssl\_rsa\_setup.exe** | Security | Generates SSL certificates and RSA key pairs for secure connections. |
| **mysql\_migrate\_keyring.exe** | Key Management | Migrates keyring encryption keys between storage backends. |
| **mysqlrouter.exe** | MySQL Router | MySQL Router process for high availability and load balancing. |
| **mysqlrouter\_keyring.exe** | MySQL Router | Manages keyring encryption keys for MySQL Router. |
| **mysqlrouter\_passwd.exe** | MySQL Router | Encrypts passwords for use in MySQL Router configuration. |
| **mysqlrouter\_plugin\_info.exe** | MySQL Router | Displays information about installed MySQL Router plugins. |
| **mysqlcheck.exe** | Database Maintenance | Checks, repairs, and optimizes MySQL tables. |
| **ibd2sdi.exe** | Storage Engine Tools | Extracts serialized dictionary information (SDI) from InnoDB tablespaces. |
| **innochecksum.exe** | Storage Engine Tools | Verifies and calculates checksums for InnoDB tablespaces. |
| **myisamchk.exe** | MyISAM Tools | Checks, repairs, and optimizes MyISAM tables. |
| **myisam\_ftdump.exe** | MyISAM Tools | Dumps full-text index information from MyISAM tables. |
| **myisamlog.exe** | MyISAM Tools | Reads and processes MyISAM log files. |
| **myisampack.exe** | MyISAM Tools | Compresses MyISAM tables to save space. |
| **my\_print\_defaults.exe** | Configuration Tools | Displays MySQL configuration settings based on option files. |
| **lz4\_decompress.exe** | Compression Utilities | Decompresses LZ4-compressed data files used by MySQL. |
| **zlib\_decompress.exe** | Compression Utilities | Decompresses zlib-compressed data files used by MySQL. |
| **perror.exe** | Error Handling | Displays descriptions for MySQL and system error codes. |

# mysqld.exe - The MySQL Server

* **What It Is**: The core MySQL database server that manages data storage, queries, and client connections.
* **Key Operations**:
  + **Starts the Server** – Runs MySQL and waits for client connections.
  + **Handles Data** – Reads, writes, updates, and deletes records.
  + **Manages Multiple Users** – Supports concurrent connections efficiently.
  + **Authenticates Users** – Enforces login credentials and access control.
  + **Logs Events** – Tracks errors, slow queries, and general activity.
  + **Reads Configuration** – Uses my.cnf or my.ini for settings.
  + **Supports Replication** – Syncs databases across multiple servers.
  + **Shuts Down Safely** – Ensures data integrity during shutdown.
* **Common Options**:
  1. --port=3307 → Runs MySQL on a different port.
  2. --datadir="C:\mysql\data" → Sets database storage location.
  3. --user=mysql → Runs under a specific user.
  4. --log-error="errors.log" → Saves error logs.
  5. --defaults-file="config.ini" → Loads a custom config file.
* **Check Available Options**:
* mysqld --verbose --help

# mysql.exe - MySQL Command-Line Client

* **What It Is**: A command-line client tool to interact with the MySQL server.
* **Key Operations**:
  + **Connects to MySQL Server** – Allows users to execute SQL queries.
  + **Runs SQL Commands** – Insert, update, delete, and manage database data.
  + **Exports and Imports Data** – Transfers data between databases.
* **Common Options**:
  1. -u root → Connect as root user.
  2. -p → Prompt for password.
  3. -h 127.0.0.1 → Connect to a specific host.
  4. -e "SHOW DATABASES;" → Execute a query without opening a session.
* **Check Available Options**:
* mysql --help

# mysqladmin.exe - MySQL Administration Tool

* **What It Is**: A command-line tool to perform administrative tasks on a MySQL server.
* **Key Operations**:
  + **Manage MySQL Server** – Start, stop, or restart MySQL.
  + **Check Server Status** – Get server uptime and running stats.
  + **Flush Logs and Tables** – Clear memory and optimize tables.
  + **Change Passwords** – Update MySQL user passwords.
* **Common Options**:
  1. ping → Check if the MySQL server is running.
  2. shutdown → Stop the MySQL server.
  3. status → Display MySQL server status.
  4. flush-logs → Rotate logs.
* **Check Available Options**:
* mysqladmin --help

# mysqlshow.exe - MySQL Database and Table Viewer

* **What It Is**: Displays information about databases and tables in MySQL.
* **Key Operations**:
  + **List Databases** – Show available databases.
  + **List Tables** – Display tables inside a database.
  + **Show Table Structure** – Display column details of a table.
* **Common Options**:
  1. mysqlshow → List all databases.
  2. mysqlshow mydatabase → Show tables inside mydatabase.
  3. mysqlshow mydatabase mytable → Show column details of mytable.
* **Check Available Options**:
* mysqlshow --help

# mysqlslap.exe - MySQL Benchmarking Tool

* **What It Is**: A tool for stress-testing and benchmarking MySQL performance.
* **Key Operations**:
  + **Simulate Load** – Generate multiple concurrent queries.
  + **Measure Performance** – Evaluate query execution speed.
  + **Test Scalability** – Analyze how MySQL handles increased workload.
* **Common Options**:
  1. --concurrency=50 → Simulate 50 concurrent users.
  2. --iterations=10 → Run the test 10 times.
  3. --query="SELECT COUNT(\*) FROM employees" → Test a specific query.
* **Check Available Options**:
* mysqlslap --help

# mysqldump.exe - MySQL Backup Tool

* **What It Is**: Exports database data into a file as SQL statements for backup.
* **Key Operations**:
  + **Backup Databases** – Export schema and data as SQL.
  + **Restore Backups** – Import dumped SQL files into MySQL.
  + **Export Specific Tables** – Dump only selected tables.
* **Common Options**:
  1. mysqldump -u root -p mydb > backup.sql → Backup mydb.
  2. mysqldump --all-databases > all\_backup.sql → Backup all databases.
  3. mysqldump -h 192.168.1.1 -u user -p mydb > remote\_backup.sql → Backup from a remote server.
* **Check Available Options**:
* mysqldump --help

# mysqlpump.exe - MySQL Parallel Backup Tool

* **What It Is**: An enhanced version of mysqldump that performs parallelized backups for improved performance.
* **Key Operations**:
  + **Backup Databases** – Exports database schema and data in parallel.
  + **Selective Dumping** – Supports including or excluding databases and tables.
  + **Faster Performance** – Uses multiple threads to speed up backups.
* **Common Options**:
  1. mysqlpump -u root -p --databases mydb > backup.sql → Backup mydb.
  2. mysqlpump --all-databases > all\_backup.sql → Backup all databases.
  3. mysqlpump --exclude-databases=test > backup.sql → Exclude a specific database from backup.
* **Check Available Options**:
* mysqlpump --help

# mysqlimport.exe - MySQL Data Import Utility

* **What It Is**: A tool for importing text-based data files (CSV, TSV) into MySQL tables.
* **Key Operations**:
  + **Import Data** – Load large text-based datasets into MySQL tables.
  + **Handle Different Formats** – Supports CSV, tab-delimited, and other file formats.
  + **Efficient Loading** – Optimized for bulk data insertions.
* **Common Options**:
  1. mysqlimport -u root -p --local mydb employees.csv → Import employees.csv into mydb.
  2. mysqlimport --ignore-lines=1 mydb data.txt → Skip first line while importing.
  3. mysqlimport --fields-terminated-by=, mydb file.csv → Define CSV format.
* **Check Available Options**:
* mysqlimport --help

# mysqlbinlog.exe - MySQL Binary Log Reader

* **What It Is**: Reads and processes MySQL binary logs for replication and recovery.
* **Key Operations**:
  + **Analyze Binary Logs** – View queries executed on MySQL.
  + **Recover Data** – Replay binary logs to restore lost transactions.
  + **Extract SQL Statements** – Convert binary log contents into human-readable format.
* **Common Options**:
  1. mysqlbinlog binlog.000001 → Read and display a binary log.
  2. mysqlbinlog --start-datetime="2024-01-01 10:00:00" binlog.000001 → Filter by start time.
  3. mysqlbinlog --stop-datetime="2024-01-01 12:00:00" binlog.000001 → Stop at a specific time.
* **Check Available Options**:
* mysqlbinlog --help

# mysql\_upgrade.exe - MySQL Upgrade Tool

* **What It Is**: Checks and updates MySQL system tables after an upgrade.
* **Key Operations**:
  + **Upgrade Metadata** – Updates system tables to match new MySQL versions.
  + **Check for Incompatibilities** – Ensures old tables work with the new MySQL version.
  + **Optimize Tables** – Repairs and updates table structures if needed.
* **Common Options**:
  1. mysql\_upgrade -u root -p → Perform a full upgrade check.
  2. mysql\_upgrade --force → Force an upgrade even if MySQL seems up to date.
  3. mysql\_upgrade --verbose → Show detailed output during upgrade.
* **Check Available Options**:
* mysql\_upgrade --help

# mysql\_secure\_installation.exe - MySQL Security Setup

* **What It Is**: A security script to improve the default MySQL installation.
* **Key Operations**:
  + **Set Root Password** – Prompts to set or update the root password.
  + **Remove Anonymous Users** – Eliminates guest access to MySQL.
  + **Disable Remote Root Login** – Enhances security by restricting root access.
  + **Remove Test Database** – Deletes unnecessary test databases.
* **Common Options**:
  + This script is interactive and does not take common options. Run it with:
* mysql\_secure\_installation

# mysql\_config\_editor.exe - MySQL Credential Storage Tool

* **What It Is**: Manages encrypted MySQL login credentials.
* **Key Operations**:
  + **Store Credentials Securely** – Saves login info in an encrypted format.
  + **Automate Logins** – Avoids needing to enter passwords manually.
  + **Manage Multiple Profiles** – Supports different MySQL connection configurations.
* **Common Options**:
  1. mysql\_config\_editor set --login-path=local --user=root --password → Store credentials.
  2. mysql\_config\_editor print --all → Show stored login details.
  3. mysql\_config\_editor remove --login-path=local → Remove a stored login.
* **Check Available Options**:
* mysql\_config\_editor --help

# mysql\_tzinfo\_to\_sql.exe - Time Zone Data Loader

* **What It Is**: Converts system time zone data into MySQL-compatible format.
* **Key Operations**:
  + **Load Time Zone Data** – Imports system time zones into MySQL tables.
  + **Update MySQL Time Zones** – Ensures MySQL uses correct time zone information.
* **Common Options**:
  1. mysql\_tzinfo\_to\_sql /usr/share/zoneinfo | mysql -u root -p mysql → Load time zones into MySQL.
* **Check Available Options**:
* mysql\_tzinfo\_to\_sql --help

# mysql\_ssl\_rsa\_setup.exe - SSL & RSA Key Generator

* **What It Is**: Generates SSL certificates and RSA key pairs for MySQL secure connections.
* **Key Operations**:
  + **Create SSL Certificates** – Generates self-signed SSL certificates for MySQL.
  + **Generate RSA Keys** – Required for secure password exchange.
* **Common Usage**:
  + Run the command without arguments to generate the required keys:
  + mysql\_ssl\_rsa\_setup
* **Check Available Options**:
* mysql\_ssl\_rsa\_setup --help

# mysql\_migrate\_keyring.exe - Keyring Migration Tool

* **What It Is**: Migrates MySQL keyring encryption keys between storage backends.
* **Key Operations**:
  + **Move Encryption Keys** – Transfers keys between keyring storage methods.
  + **Support Secure Data Encryption** – Ensures continuity of encrypted data.
* **Common Options**:
  1. mysql\_migrate\_keyring --source=keyring\_file --destination=keyring\_encrypted\_file
* **Check Available Options**:
* mysql\_migrate\_keyring --help

# mysqlrouter.exe - MySQL Router Process

* **What It Is**: Routes MySQL connections for high availability and load balancing.
* **Key Operations**:
  + **Handles Read/Write Splitting** – Distributes queries efficiently.
  + **Supports High Availability** – Connects to MySQL Group Replication.
  + **Manages Failover** – Redirects traffic if a server goes down.
* **Common Options**:
  1. mysqlrouter --bootstrap user@localhost → Set up MySQL Router with a MySQL instance.
  2. mysqlrouter --config=mysqlrouter.conf → Load a specific configuration.
* **Check Available Options**:
* mysqlrouter --help

# mysqlrouter\_keyring.exe - MySQL Router Keyring Manager

* **What It Is**: Manages keyring encryption keys for MySQL Router.
* **Key Operations**:
  + **Handle Router Encryption** – Manages keyring-based encryption for Router security.
* **Common Usage**:
  + Run the command to display available options:
  + mysqlrouter\_keyring --help

# mysqlrouter\_passwd.exe - MySQL Router Password Encryption Tool

* **What It Is**: Encrypts passwords for use in MySQL Router configuration.
* **Key Operations**:
  + **Generate Secure Password Hashes** – Encrypts credentials for Router authentication.
* **Common Options**:
  1. mysqlrouter\_passwd → Interactive mode to encrypt a password.
* **Check Available Options**:
* mysqlrouter\_passwd --help

# mysqlrouter\_plugin\_info.exe - MySQL Router Plugin Info

* **What It Is**: Displays information about installed MySQL Router plugins.
* **Key Operations**:
  + **List Installed Plugins** – Shows available MySQL Router plugins.
* **Common Usage**:
* mysqlrouter\_plugin\_info

# mysqlcheck.exe - MySQL Table Maintenance Tool

* **What It Is**: Checks, repairs, and optimizes MySQL tables.
* **Key Operations**:
  + **Verify Table Integrity** – Checks for corruption.
  + **Repair Corrupt Tables** – Fixes issues in MyISAM and InnoDB tables.
  + **Optimize Tables** – Reduces fragmentation and improves performance.
* **Common Options**:
  1. mysqlcheck -u root -p --all-databases → Check all databases.
  2. mysqlcheck --repair mydb mytable → Repair mytable in mydb.
  3. mysqlcheck --optimize mydb mytable → Optimize a specific table.
* **Check Available Options**:
* mysqlcheck --help

# ibd2sdi.exe - InnoDB Metadata Extraction Tool

* **What It Is**: Extracts serialized dictionary information (SDI) from InnoDB tablespaces.
* **Key Operations**:
  + **Retrieve Metadata** – Extracts table schema from InnoDB files.
  + **Validate Tablespaces** – Checks for corruption or inconsistencies.
* **Common Options**:
  1. ibd2sdi mytable.ibd → Extract SDI from a specific file.
* **Check Available Options**:
* ibd2sdi --help

# innochecksum.exe - InnoDB Tablespace Checksum Validator

* **What It Is**: Verifies and calculates checksums for InnoDB tablespaces.
* **Key Operations**:
  + **Detect Corruption** – Identifies broken InnoDB tablespaces.
  + **Validate Checksums** – Ensures InnoDB file integrity.
* **Common Options**:
  1. innochecksum ibdata1 → Check checksum of ibdata1 tablespace.
* **Check Available Options**:
* innochecksum --help

# myisamchk.exe - MyISAM Table Maintenance Tool

* **What It Is**: Checks, repairs, and optimizes MyISAM tables.
* **Key Operations**:
  + **Detect and Fix Corruption** – Repairs MyISAM table damage.
  + **Optimize MyISAM Performance** – Reduces fragmentation.
* **Common Options**:
  1. myisamchk mytable.MYI → Check a MyISAM table.
  2. myisamchk --repair mytable.MYI → Repair a table.
* **Check Available Options**:
* myisamchk --help

# myisam\_ftdump.exe - MyISAM Full-Text Index Dumper

* **What It Is**: Dumps full-text index information from MyISAM tables.
* **Key Operations**:
  + **Analyze Full-Text Search Index** – Extracts indexed words from MyISAM tables.
* **Common Usage**:
* myisam\_ftdump mytable.MYI

# myisamlog.exe - MyISAM Log File Processor

* **What It Is**: Reads and processes MyISAM log files.
* **Key Operations**:
  + **Analyze MyISAM Logs** – Helps in debugging and performance tuning.
* **Common Usage**:
* myisamlog mylogfile

# myisampack.exe - MyISAM Table Compressor

* **What It Is**: Compresses MyISAM tables to save disk space.
* **Key Operations**:
  + **Reduce Table Size** – Creates read-only compressed MyISAM tables.
* **Common Usage**:
* myisampack mytable.MYI

# my\_print\_defaults.exe - MySQL Configuration Inspector

* **What It Is**: Displays MySQL configuration settings based on option files.
* **Key Operations**:
  + **Check Default Configurations** – Shows MySQL options applied from config files.
* **Common Usage**:
* my\_print\_defaults --defaults-file=my.cnf

# lz4\_decompress.exe - LZ4 Decompression Tool

* **What It Is**: Decompresses LZ4-compressed data files used by MySQL.
* **Key Operations**:
  + **Extract LZ4 Data** – Uncompresses files stored in LZ4 format.
* **Common Usage**:
* lz4\_decompress compressed\_file.lz4

# zlib\_decompress.exe - zlib Decompression Tool

* **What It Is**: Decompresses zlib-compressed data files used by MySQL.
* **Key Operations**:
  + **Extract zlib Data** – Unpacks zlib-compressed files.
* **Common Usage**:
* zlib\_decompress compressed\_file.zlib

# perror.exe - MySQL Error Code Lookup Tool

* **What It Is**: Displays descriptions for MySQL and system error codes.
* **Key Operations**:
  + **Translate MySQL Errors** – Provides explanations for error codes.
  + **Check OS-Level Errors** – Displays operating system error messages.
* **Common Options**:
  1. perror 1045 → Display error description for MySQL error 1045.
  2. perror 13 → Check what OS error 13 means.
* **Check Available Options**:
* perror --help